



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION IV  
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ARLINGTON, TEXAS 76011-4005

May 3, 2007

Timothy G. Mitchell  
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SUBJECT: ARKANSAS NUCLEAR ONE - NRC INTEGRATED INSPECTION REPORT  
05000313/2007002 AND 05000368/2007002

Dear Mr. Mitchell:

On March 24, 2007, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Arkansas Nuclear One, Units 1 and 2, facility. The enclosed integrated report documents the inspection findings, which were discussed on March 23, 2007, with you and other members of your staff.

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

This report documents two NRC identified findings and two self-revealing findings of very low safety significance (Green). The four findings were determined to involve violations of NRC requirements. Additionally, a 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 are entered into your corrective action program, the NRC is treating these findings as noncited violations consistent with Section VI.A.1 of the NRC Enforcement Policy. If you contest these 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 DC 20555-0001; with copies to the Regional Administrator, U.S. Nuclear Regulatory Commission Region IV, 611 Ryan Plaza Drive, Suite 400, Arlington, Texas 76011-4005; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington DC 20555-0001; and the NRC Resident Inspector at Arkansas Nuclear One, Units 1 and 2, 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 (if any) will be made available electronically for public

Entergy Operations, Inc.

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inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

Jeff Clark, P.E.  
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Division of Reactor Projects

Dockets: 50-313  
50-368

Licenses: DPR-51  
NPF-6

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NRC Inspection Report 05000313/2007002 and 05000368/2007002  
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SUNSI Review Completed: \_\_\_\_\_ ADAMS:  Yes  No Initials: \_\_\_\_\_  
 Publicly Available  Non-Publicly Available  Sensitive  Non-Sensitive  
 R:\\_REACTORS\\_ANO\2007\ANO2007-02RP-RWD.wpd

RIV:RI:DRP/E	RI:DRP/E	SRI:DRP/E	C:DRS/OB
CHYoung	JEJosey	RWDeese	ATGody
T-JAC	T-JAC	T-JAC	TFStetka for
4/1/2007	4/1/2007	4/1/2007	4/26/2007
C:DRS/PSB	C:DRS/EMB	C:DRS/EB2	C:DRP/E
MPShannon	WBJones	LJSmith	JAClark
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4/27/2007	4/27/2007	4/26/2007	5/3/2007

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**U.S. NUCLEAR REGULATORY COMMISSION  
REGION IV**

Dockets: 50-313, 50-368

Licenses: DPR-51, NPF-6

Report: 05000313/2007002 and 05000368/2007002

Licensee: Entergy Operations, Inc.

Facility: Arkansas Nuclear One, Units 1 and 2

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

Dates: January 1 - March 24, 2007

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## SUMMARY OF FINDINGS

IR 05000313/2007002, 05000368/2007002; 01/01/07 - 03/24/07; Arkansas Nuclear One, Units 1 and 2; Operability Evaluations, Permanent Plant Modifications, Access Control to Radiologically Significant Areas, and Follow-up of Events and Notices of Enforcement Discretion.

This report covered a 3-month period of inspection by resident and regional specialist inspectors. Four Green findings, all of which were noncited violations, 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." Findings for which the significance determination process does not apply may be Green or be assigned a severity level after NRC management's review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000.

### A. NRC-Identified and Self-Revealing Findings

#### Cornerstone: Mitigating Systems

- Green. An NRC identified noncited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," was identified for the failure of the licensee to ensure that the 125 Vdc safety-related batteries would remain operable if all the intercell and terminal connections were at the resistance value of 150 micro-ohms as allowed by Unit 2 Technical Specification Surveillance Requirement 4.8.2.3. This issue was entered into the licensee's corrective action program as Condition Report ANO-2-2007-0085.

The finding was greater than minor because it is associated with the mitigating systems cornerstone attribute of design control and affected the associated cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using Manual Chapter 0609, "Significance Determination Process," Phase 1 Worksheet, the finding was determined to have very low safety significance because the condition did not result in a loss of safety function of the equipment and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. The finding had crosscutting aspects in the area of human performance associated with decision making because the licensee did not use conservative assumptions and failed to verify the validity of the underlying assumptions (Section 1R15).

- Green. An NRC identified noncited violation of Unit 2 Technical Specification 6.4.1.a, "Procedures," was identified for the failure of operations personnel to follow applicable work management procedures while conducting instrumentation and control maintenance. In an effort to comply with the requirements of Technical Specifications following a dropped control element assembly event, licensee personnel adjusted the high linear power level trip

setpoints without explicit work order instructions and prior to the formal revision of the applicable procedure. Licensee Procedure EN-WM-100 "Work Request Generation, Screening, and Classification," Revision 1, did not allow the shift manager to direct these work activities to commence prior to the completion of detailed work package planning. This issue was entered into the licensee's corrective action program as Condition Reports ANO-2-2007-0125 and ANO-2-2007-0503.

This finding was greater than minor because, if left uncorrected, the conduct of maintenance activities on safety-related systems prior to the formal development of associated work order instructions and/or applicable procedural guidance would become a more significant safety concern. Specifically, the misunderstanding by Unit 2 operations department management of the circumstances under which expedited work order provisions apply could result in the inappropriate bypassing of established work control processes. The finding affected the mitigating systems cornerstone. Using Manual Chapter 0609, "Significance Determination Process," Phase 1 Worksheet, the finding was determined to have very low safety significance (Green) since the finding did not represent an actual loss of system safety function and posed no risk significance due to a seismic, flooding, or severe weather initiating event. The finding had crosscutting aspects in the area of human performance associated with decision making in that operations personnel failed to verify the validity of underlying assumptions that factored into a safety-significant decision involving procedural non-compliance. (Section 4OA3).

Cornerstone: Barrier Integrity

- Green. A self-revealing noncited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," was identified associated with the failure of the Unit 1 control room Damper CV-7907 to close on December 18, 2006. The licensee failed to control critical design parameters of the damper during a modification performed in 2004 to address a similar previous failure. This issue was entered into the licensee's corrective action program as Condition Report ANO-C-2006-2080.

This finding was greater than minor because it is associated with the barrier integrity cornerstone attribute of design control and affects the associated cornerstone objective to provide reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. Using Manual Chapter 0609, "Significance Determination Process," Phase 1 Worksheet, the finding was determined to have very low safety significance because the condition only represented a degradation of the radiological barrier function provided for the control room. The finding had crosscutting aspects in the area of human performance associated with decision making because the licensee did not use conservative assumptions in decision making and had failed to verify the validity of the underlying assumptions that were used as justification (Section 1R17).

Cornerstone: Occupational Radiation Safety (OS)

- Green. The inspector reviewed a self-revealing noncited violation of Technical Specification 6.7.1.d because a worker entered a high radiation area without possessing a radiation monitoring device that appropriately alarmed when the device's set point was reached. The worker did not possess the required vibrating electronic alarming dosimeter and could not hear dosimeter's audible alarm. The problem was identified when the worker was prevented from logging out of the radiologically controlled area by the dosimetry software. The licensee's immediate corrective action was to counsel and restrict the access of the individual. The licensee plans to implement a software system that can place restrictions on workers such that they would not be able to log into the radiologically controlled area without the required monitoring device.

The finding was greater than minor because it was associated with the Occupational Radiation Safety Cornerstone attribute of program and process and affected the cornerstone objective to ensure the adequate protection of a worker's health and safety from exposure to radiation because the worker could have received additional dose. The finding involved the potential for a worker's unplanned or unintended dose resulting from actions contrary to technical specifications. When processed through the Occupational Radiation Safety Significance Determination Process, the finding was determined to be of very low safety significance because the finding did not involve ALARA planning or work controls, there was no overexposure or substantial potential for an overexposure, and the ability to assess dose was not compromised. In addition, this finding has crosscutting aspects in the area of human performance associated with work practices because the failure to implement human performance error prevention techniques such as peer checking or self checking directly contributed to the finding. The finding was entered into the licensee's corrective action program as Condition Report CR-ANO-2-2006-02342 (Section 2OS1).

B. Licensee-Identified Violations

A violation of very low safety significance which was identified by the licensee has been reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. This violation and its corrective actions are listed in Section 4OA7 of this report.

## REPORT DETAILS

### Summary of Plant Status

Unit 1 began the inspection period at 100 percent rated thermal power (RTP). Reactor power was lowered to 70 percent RTP on March 8, 2007, to facilitate axial power shaping rod alignments and returned to 100 percent RTP on March 11, 2007. The unit remained at 100 percent RTP for the remainder of the inspection period.

Unit 2 began the inspection period at 100 percent RTP. The unit performed a Technical Specification (TS) required shutdown to hot standby in response to a dropped Control Element Assembly (CEA) on January 25, 2007. Unit 2 was restarted, and main generator output breakers were closed on February 1, 2007. The unit achieved 100 percent RTP on February 2, 2007, and remained there for the remainder of the inspection period.

#### 1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

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

##### .1 Readiness for Seasonal Susceptibilities

###### a. Inspection Scope

The inspectors completed a review of the licensee's readiness of seasonal susceptibilities involving low temperatures. The inspectors: (1) reviewed plant procedures, the Updated Final Safety Analysis Report (UFSAR), and TSs to ensure that operator actions defined in adverse weather procedures maintained the readiness of essential systems; (2) walked down portions of the two systems listed below to ensure that adverse weather protection features (heat tracing, space heaters, weatherized enclosures, temporary chillers, etc...) were sufficient to support operability including the ability to perform safe shutdown functions; (3) evaluated operator staffing levels to ensure the licensee could maintain the readiness of essential systems required by plant procedures; and (4) reviewed the corrective action program (CAP) to determine if the licensee identified and corrected problems related to adverse weather conditions.

- January 23-24, 2007, Units 1 and 2 intake structures and engineered safety feature DC electrical systems

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed one sample.

###### b. Findings

No findings of significance were identified.

1R04 Equipment Alignment (71111.04)

.1 Partial Walkdown

The inspectors: (1) walked down portions of the three below listed risk important systems and reviewed plant procedures and documents to verify that critical portions of the selected systems were correctly aligned, and (2) compared deficiencies identified during the walk down to the licensee's UFSAR and CAP to ensure problems were being identified and corrected.

- January 9, 2007, Unit 2, Emergency Feedwater (EFW) Pump 2P-7B
- January 30, 2007, Unit 2, Low Pressure Safety Injection (LPSI) 2P-60A
- March 19, 2007, Unit 2, Service Water Pumps 2P-4A and 2P-4C

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed three samples.

.2 Complete Walkdown

a. Inspection Scope

On February 27, 2007, the inspectors: (1) reviewed plant procedures, drawings, the UFSAR, TSs, and vendor manuals to determine the correct alignment of the Unit 1 service water system; (2) reviewed outstanding design issues, operator workarounds, and UFSAR documents to determine if open issues affected the functionality of the Unit 1 service water system; and (3) verified that the licensee was identifying and resolving equipment alignment problems.

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed one sample.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05)

.1 Quarterly Inspection

a. Inspection Scope

The inspectors walked down the six below listed plant areas to assess the material condition of active and passive fire protection features and their operational lineup and readiness. The inspectors: (1) verified that transient combustibles and hot work activities were controlled in accordance with plant procedures; (2) observed the

condition of fire detection devices to verify they remained functional; (3) observed fire suppression systems to verify they remained functional and that access to manual actuators was unobstructed; (4) verified that fire extinguishers and hose stations were provided at their designated locations and that they were in a satisfactory condition; (5) verified that passive fire protection features (electrical raceway barriers, fire doors, fire dampers steel fire proofing, penetration seals, and oil collection systems) were in a satisfactory material condition; (6) verified that adequate compensatory measures were established for degraded or inoperable fire protection features and that the compensatory measures were commensurate with the significance of the deficiency; and (7) reviewed the UFSAR to determine if the licensee identified and corrected fire protection problems.

- February 27, 2007, Unit 2, Fire Zone 2098-C, new core protection calculator room
- March 5, 2007, Unit 2, Fire Zone 2109-U, diesel generator room access corridor and motor control center
- March 13, 2007, Unit 1, Fire Zone 67-U, lab and demineralizer access area
- March 14, 2007, Unit 2, Fire Zone 2006-LL, general access area
- March 20, 2007, Unit 1, Fire Zone 86-G, north diesel generator room
- March 20, 2007, Unit 1, Fire Zone 87-H, south diesel generator room

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed six samples.

b. Findings

No findings of significance were identified.

1R07 Heat Sink Performance (71111.07)

Biennial Heat Sink Performance

.1 Performance of Testing, Maintenance, and Inspection Activities

a. Inspection Scope

Inspection Module 71111.07, "Heat Sink Performance," requires on a biennial basis that samples of two or three heat exchangers are reviewed. The inspector selected two heat exchangers that were directly connected to the safety-related service water system. The inspector reviewed the licensee's testing and cleaning methodology for the following heat exchangers:

- Unit 1 engineered safety feature pump room coolers

- Unit 1 decay heat removal system heat exchanger

Specifically, the inspector verified proper extrapolation of test conditions to design conditions, appropriate use of test instrumentation, and appropriate accounting for instrument inaccuracies. The inspector reviewed chemical controls used to avoid fouling and heat exchanger test, inspection, and cleaning results. The inspector reviewed the methods and results of heat exchanger inspection and cleaning, verified that the methods used to inspect and clean were consistent with industry standards, and ensured that the as-found results were appropriately dispositioned such that the final conditions were acceptable. Additionally, the inspector verified that the licensee appropriately trended these inspection and cleaning results, assessed the causes of the trends, and took necessary actions for any step changes in these trends.

The inspector completed two inspection samples.

b. Findings

No findings of significance were identified.

.2 Verification of Conditions and Operations Consistent with Design Bases

a. Inspection Scope

For the selected heat exchangers, the inspector verified that the licensee established heat sink and heat exchanger condition and operation and test criteria that were consistent with the design assumptions. Specifically, the inspector reviewed the applicable calculations to ensure that the thermal performance test acceptance criteria for the heat exchangers were being applied consistently throughout the calculations. In addition, the inspector reviewed test data for the heat exchangers and design and vendor-supplied information to ensure that the heat exchangers were performing within their design bases.

b. Findings

No findings of significance were identified.

.3 Identification and Resolution of Problems

a. Inspection Scope

The inspector verified that the licensee had entered significant heat exchanger/heat sink performance problems into the CAP. The inspector reviewed 16 condition reports (CRs) listed in the attachment.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification Program (71111.11)

a. Inspection Scope

On February 2, 2007, the inspectors observed testing and training of senior reactor operators and reactor operators in the Unit 2 simulator to identify deficiencies and discrepancies in the training, to assess operator performance, and to assess the evaluator's critique. The training scenario involved the crew response to a steam generator tube rupture event.

Documents reviewed by the inspectors included:

- Procedure A2SPG-LOR-070304, "Shift Manager's Choice," Revision 0

The inspectors completed one sample.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12)

a. Inspection Scope

The inspectors reviewed the below listed maintenance activity to: (1) verify the appropriate handling of structure, system, and component (SSC) performance or condition problems; (2) verify the appropriate handling of degraded SSC functional performance; (3) evaluate the role of work practices and common cause problems; and (4) evaluate the handling of SSC issues reviewed under the requirements of the Maintenance Rule, 10 CFR Part 50, Appendix B, and TSs.

- March 16, 2007, Unit 1, control room safety parameter display system

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed one sample.

b. Findings

No findings of significance were identified.

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

.1 Risk Assessment and Management of Risk

a. Inspection Scope

Risk Assessment and Management of Risk

The inspectors reviewed the six below listed assessment activities to verify: (1) performance of risk assessments when required by 10 CFR 50.65 (a)(4) and licensee procedures prior to changes in plant configuration for maintenance activities and plant operations; (2) the accuracy, adequacy, and completeness of the information considered in the risk assessment; (3) that the licensee recognized, and/or entered as applicable, the appropriate licensee-established risk category according to the risk assessment results and licensee procedures; and (4) that the licensee identified and corrected problems related to maintenance risk assessments.

- January 16, 2007, Unit 2, LPSI Train A maintenance
- January 22-26, 2007, use of large mobile crane for the removal of the Tendon Gantry Crane L-28
- February 7, 2007, Unit 1, EFW Initiation and Control (EFIC) Channel B cable replacement
- February 20, 2007, Unit 1, Service Water/Circulating Water Pump Bay C maintenance
- March 1, 2007, Unit 1, impact of adverse weather
- March 12, 2007, Unit 1, Intermediate Cooling Water Pump P-33B maintenance

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed six samples.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

The inspectors: (1) reviewed plants status documents, such as operator shift logs, emergent work documentation, deferred modifications, and standing orders, to determine if an operability evaluation was warranted for degraded components; (2) referred to the UFSAR and design basis documents to review the technical adequacy of licensee operability evaluations; (3) evaluated compensatory measures

associated with operability evaluations; (4) determined degraded component impact on any TSs; (5) used the significance determination process to evaluate the risk significance of degraded or inoperable equipment; and (6) verified that the licensee has identified and implemented appropriate corrective actions associated with degraded components.

- January 9, 2007, Containment Spray Header A level
- January 19, 2007, ultra low sulfur diesel fuel
- January 22, 2007, Unit 2, 125 Vdc safety related battery TS surveillance requirement (SR) value
- January 25, 2007, Unit 2, EFW Condensate Suction Valve B
- March 15, 2007, Units 1 and 2, electrical cable heat load analysis
- March 16, 2007, Unit 2, Service Water Pump 2P-4C

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed six samples.

b. Findings

Introduction. The inspectors identified a Green noncited violation (NCV) of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," for the failure of the licensee to ensure that the 125 Vdc safety-related batteries would remain operable if all the intercell and terminal connections were at the resistance value of 150 micro-ohms as allowed by Unit 2 TS SR 4.8.2.3.

Description. During a review of industry operating experience data from an inspection finding at another facility that dealt with a nonconservative TS Surveillance Requirement (SR), the licensee determined that Unit 2 TS SR 4.8.2.3 appeared to be similar. A condition had been identified where the design calculations used a reference value for the intercell and terminal connections resistance for the safety-related batteries that was less than the value in the station TS SR. The licensee identified that the design value for Unit 2 Safety-Related Batteries 2D-11 and 2D-12 was 20 micro-ohms, and the TS SR value was less than or equal to 150 micro-ohms. On January 22, 2007, this issue was entered into the CAP as CR ANO-2-2007-0085, and the licensee performed an operability determination to demonstrate operability of the safety-related batteries with the noted discrepancy.

The inspectors reviewed this CR and the attached operability determination and determined that the licensee had not addressed all of the potential aspects of the identified condition. No apparent discussion or evaluation of the SR limit being applicable to all of the cells of the battery was made in the operability determination, and as such, no discussion of the capability of the batteries to perform their design safety function with the larger resistance values was present. When questioned by the

inspectors, the licensee stated their position was that maintaining the battery connections at a given resistance did not ensure capability of performing its required function. Instead, they had concluded that the 150 micro-ohm SR limit was to ensure that unacceptable overheating would not occur at the intercell connectors and that the intent of this limit was not to permit all battery connections to operate at 150 micro-ohms, but to ensure that no single connection could prevent the battery from performing its design function. The inspectors questioned this position since the wording of the TS SR states, "The resistance of each cell-to-cell and terminal connection is less than or equal to  $150 \times 10^{-6}$  ohm."

The licensee requested a TS interpretation from the Office of Nuclear Reactor Regulation. Subsequently, the electrical branch of Nuclear Reactor Regulation determined that the intent of TS SR 4.8.2.3 was to ensure that, if all of the connections were at or just below the TS limit of 150 micro-ohms, the batteries would remain capable of performing their intended design function. As a result, the licensee instituted an administrative limit of 50 micro-ohms per intercell connection and the requirement to perform an operability evaluation if any resistance value is above 50 micro-ohms.

Analysis. The performance deficiency associated with this finding involved the licensee's failure to ensure that the 125 Vdc safety-related batteries would remain operable if all the intercell and terminal connections were at the resistance value of 150 micro-ohms as allowed by TS SR 4.8.2.3. This finding was greater than minor because it was associated with the mitigating systems cornerstone attribute of design control and affects the associated cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using Manual Chapter 0609, "Significance Determination Process," Phase 1 Worksheet, the finding was determined to have very low safety significance because the condition only affected the mitigation systems cornerstone and does not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. The finding had crosscutting aspects in the area of human performance associated with decision making because the licensee did not use conservative assumptions and failed to verify the validity of the underlying assumptions that were used as justification.

Enforcement. 10 CFR Part 50, Appendix B, Criterion III, "Design Control," requires, in part, that measures shall be established to assure that applicable regulatory requirements and the design basis for SSCs are correctly translated in specifications, drawings, procedures, and instructions. It further states that design control measures shall provide for verifying or checking the adequacy of design, such as by the performance of design reviews, by the use of alternate or simplified calculational methods, or by the performance of a suitable testing program. Contrary to the above, the licensee failed to verify that the specified 150 micro-ohm criterion would be sufficient to ensure safety-related battery operability in accordance with the design basis. Because this finding is of very low safety significance and has been entered into the CAP as CR ANO-2-2007-0085, this violation is being treated as an NCV consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000368/2007002-01, "Nonconservative Battery Intercell Connection Resistance Value Specified in TS SR."

## 1R17 Permanent Plant Modifications (71111.17)

### Annual Review

#### a. Inspection Scope

The inspectors reviewed key affected parameters associated with energy needs, materials/replacement components, timing, heat removal, control signals, equipment protection from hazards, operations, flowpaths, pressure boundary, ventilation boundary, structural, process medium properties, licensing basis, and failure modes for one modification listed below. The inspectors verified that: (1) modification preparation, staging, and implementation does not impair emergency/abnormal operating procedure actions, key safety functions, or operator response to loss of key safety functions; (2) postmodification testing maintained the plant in a safe configuration during testing by verifying that unintended system interactions will not occur, SSC performance characteristics still meet the design basis, the appropriateness of modification design assumptions, and the modification test acceptance criteria has been met; and (3) the licensee has identified and implemented appropriate corrective actions associated with permanent plant modifications.

- February 28, 2007, Unit 1, Damper CV-7907

#### b. Findings

Introduction. A self-revealing NCV of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," was identified associated with the failure of the control room Damper CV-7907 to close on December 18, 2006. Specifically, the licensee failed to control critical design parameters of the damper during a modification performed in 2004 to address a similar previous failure.

Description. On December 23, 2004, while the control room was being placed on recirculation for surveillance testing, control room isolation Damper CV-7907 failed to indicate fully shut. During subsequent investigation, the licensee discovered that damper had become disconnected from the hinges that attach the operating shaft to the damper. Specifically, the bolts used on the hinges were found to be sheared off. An apparent cause evaluation (ACE) was performed in which the licensee determined the cause of the failure was due to a combination of fatigue and overload on the bolts. Subsequently, the licensee developed and implemented a plant modification ER ANO-2004-0961-002, "Alternate Bolting for Damper Hinge CV-7907," to change the style (shouldered bolts were being replaced with nonshouldered bolts) and material of the bolts used to secure the hinges to the damper.

On December 18, 2006, while the licensee was performing troubleshooting activities on the limit switches and damper hub of Damper CV-7907, maintenance personnel noted loud noises coming from the damper housing when the damper was stroked in both the open and closed direction. Maintenance personnel also noted that damper stroked fully with some evidence of binding most likely from the damper. The licensee declared the damper inoperable and entered a 24-hour TS shutdown action statement due to the

potential failure of Damper CV-7907. The licensee began installation of a fire damper as an emergency temporary alteration to provide a boundary for control room envelope.

During installation of this fire damper, the licensee discovered that the bolts used to attach the hinges of the operating shaft to the damper had been pulled out of the damper, causing the operating shaft to become detached from the damper, and two of the hinges had fallen beneath the damper plate. This resulting configuration prevented the damper from performing its design function of going fully closed to isolate the control room.

The licensee performed an ACE of this condition and documented it in CR ANO-C-2006-2080. The licensee discovered that the modification that had been performed in 2004 did not meet the original design intent of the damper. Specifically, the removal of the shouldered bolts, and the lack of a controlled height between the bolt heads and the damper plate, were not consistent with the original design.

The inspectors reviewed the licensee's ACE of this event and determined the apparent cause to be design/configuration not consistent with system operation. The higher than typical amount of cycles to which the damper was exposed and the unnecessary higher forces experienced during opening and closing may have created a condition that caused the failures of the damper. During this review, the inspectors noted that the licensee had not questioned or investigated either the purpose of the shouldered bolts or the gap requirements between the bolt heads and the damper plate. Instead, the licensee had evaluated the new configuration to be better than or equal to the original configuration. The inspectors also determined that the licensee had neither fully understood nor corrected the cause of the damper failure in 2004.

Analysis. The inspectors determined that the licensee's failure to adequately evaluate the purpose of the shouldered bolts and the height between the bolt heads and the damper plate with respect to these being critical design and installation parameters was a performance deficiency. This finding was greater than minor because it is associated with the barrier integrity cornerstone attribute of design control and affects the associated cornerstone objective to provide reasonable assurance that physical design barriers protect the public from radio nuclide releases caused by accidents or events. Using Manual Chapter 0609, "Significance Determination Process," Phase 1 Worksheet, the finding was determined to have very low safety significance because the condition only represented a degradation of the radiological barrier function provided for the control room. This finding had crosscutting aspects in the area of human performance associated with decision making because the licensee did not use conservative assumptions in decision making and had failed to verify the validity of the underlying assumptions that were used as justification.

Enforcement. 10 CFR Part 50, Appendix B, Criterion III, "Design Control," requires, in part, that measures shall be established to assure that applicable regulatory requirements and the design basis, as defined in 10 CFR 50.2 and as specified in the license application, for those SSCs to which this appendix applies are correctly translated in specifications, drawings, procedures, and instructions. Contrary to the above, the licensee failed to verify that critical design and installation parameters were controlled for the modification performed on Damper CV-7907. Because this finding is

of very low safety significance and has been entered into the CAP as CR ANO-C-2006-2080, this violation is being treated as an NCV consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000313/2007002-02, "Inadequate Modification Contributes to Failure of Control Room Isolation Damper."

1R19 Postmaintenance Testing (71111.19)

a. Inspection Scope

The inspectors selected the six below listed postmaintenance test activities of risk significant systems or components. For each item, the inspectors: (1) reviewed the applicable licensing basis and/or design-basis documents to determine the safety functions; (2) evaluated the safety functions that may have been affected by the maintenance activity; and (3) reviewed the test procedure to ensure it adequately tested the safety function that may have been affected. The inspectors either witnessed or reviewed test data to verify that acceptance criteria were met, plant impacts were evaluated, test equipment was calibrated, procedures were followed, jumpers were properly controlled, the test data results were complete and accurate, the test equipment was removed, the system was properly realigned, and deficiencies during testing were documented. The inspectors also reviewed the UFSAR to determine if the licensee identified and corrected problems related to postmaintenance testing.

- January 11, 2007, Unit 1, Control Room Emergency Air Recirculation Fan VSF-9
- January 12, 2007, Unit 2, Containment Spray Pump 2P-35B
- January 24, 2007, Unit 2, EFW Condensate Suction Valve B
- February 14, 2007, Unit 1, EFIC Channel A to D cable replacement
- February 28, 2007, Unit 2, LPSI Pump 2P-60B
- March 8, 2007, Unit 2, High Pressure Safety Injection Pump 2P-89B

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed six samples.

b. Findings

No findings of significance were identified.

1R20 Refueling and Outage Activities (71111.20)

.1 Unit 2 Forced Outage Caused by Dropped CEA

a. Inspection Scope

The inspectors reviewed the following risk significant outage activities to verify defense in depth commensurate with the outage risk control plan and compliance with the TSs: (1) the risk control plan, (2) tagging/clearance activities, (3) heatup and cooldown activities, and (4) restart activities. The inspectors' containment inspections included observation of the containment sump for damage and debris; supports, braces, and snubbers for evidence of excessive stress, water hammer, or aging; and work on the Reactor Coolant Pump 2B control bleed off line.

The inspectors completed one sample.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors reviewed the UFSAR, procedure requirements, and TSs to ensure that the six below listed surveillance activities demonstrated that the SSC's tested were capable of performing their intended safety functions. The inspectors either witnessed or reviewed test data to verify that the following significant surveillance test attributes were adequate: (1) preconditioning; (2) evaluation of testing impact on the plant; (3) acceptance criteria; (4) test equipment; (5) procedures; (6) jumper/lifted lead controls; (7) test data; (8) testing frequency and method demonstrated TS operability; (9) test equipment removal; (10) restoration of plant systems; (11) fulfillment of ASME Code requirements; (12) updating of performance indicator (PI) data; (13) engineering evaluations, root causes, and bases for returning tested SSCs not meeting the test acceptance criteria were correct; (14) reference setting data; and (15) annunciators and alarms setpoints. The inspectors also verified that the licensee identified and implemented any needed corrective actions associated with the surveillance testing.

- January 11, 2007, Unit 1, Decay Heat Removal Pump P-4B
- January 17, 2007, Unit 2, reactor coolant system leak detection
- January 24, 2007, Unit 1, power range nuclear instrument calibration
- February 1, 2007, Unit 2, LPSI Pump Full Flow Inservice Test 2P-60B
- February 13, 2007, Unit 2, Containment Purge System Damper 2V-2 local leak rate test

- February 14, 2007, Unit 1, Reactor Building Spray Pump P-35B

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed six samples.

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications (71111.23)

a. Inspection Scope

The inspectors reviewed the UFSAR, plant drawings, procedure requirements, and TSs to ensure that the one below listed temporary modification was properly implemented. The inspectors: (1) verified that the modification did not have an affect on system operability/availability, (2) verified that the installation was consistent with the modification documents, (3) ensured that the postinstallation test results were satisfactory and that the impact of the temporary modification on permanently installed SSC's were supported by the test, (4) verified that the modifications were identified on control room drawings and that appropriate identification tags were placed on the affected drawings, and (5) verified that appropriate safety evaluations were completed. The inspectors verified that licensee identified and implemented any needed corrective actions associated with temporary modifications.

- January 19, 2007, Unit 1, Decay Heat Cooler Outlet Isolation Valve SW-22B

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed one sample.

b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation (71114.06)

a. Inspection Scope

For the below listed simulator-based training evolution contributing to drill/exercise performance, emergency response organization, and PIs, the inspectors: (1) observed the training evolution to identify any weaknesses and deficiencies in classification, notification, and protective action requirements development activities; (2) compared the identified weaknesses and deficiencies against licensee identified findings to determine whether the licensee is properly identifying failures; and (3) determined whether licensee

performance is in accordance with the guidance of the Nuclear Energy Institute (NEI) 99-02, "Voluntary Submission of Performance Indicator Data," acceptance criteria.

- March 13, 2007, Unit 2, simulator-based exercise involving the declaration of a notice of unusual event

Documents reviewed by the inspectors included:

- ANO Unit 2 Dynamic Exam Scenario SES-2-021 Revision 4
- Procedure 1903.010, "Emergency Action Level Classification," Change 037-05-0
- Procedure 1903.011, "Emergency Response/Notification," Change 028-03-0

The inspectors completed one sample.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Cornerstone: Occupational Radiation Safety

2OS1 Access Control To Radiologically Significant Areas (71121.01)

a. Inspection Scope

This area was inspected to assess the licensee's performance in implementing physical and administrative controls for airborne radioactivity areas, radiation areas, high radiation areas, and worker adherence to these controls. The inspector 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 inspector interviewed the radiation protection manager, radiation protection supervisors, and radiation workers. The inspector performed independent radiation dose rate measurements and reviewed the following items:

- Performance indicator events and associated documentation packages reported by the licensee in the Occupational Radiation Safety Cornerstone
- Controls (surveys, posting, and barricades) of radiation, high radiation, or airborne radioactivity areas
- Radiation work permit, procedure, and engineering controls, and air sampler locations
- Conformity of electronic personal dosimeter alarm set points with survey indications and plant policy; workers' knowledge of required actions when their electronic personnel dosimeter noticeably malfunctions or alarms
- Radiation work permit briefings and worker instructions

- Dosimetry placement in high radiation work areas with significant dose rate gradients

The inspector completed 7 of the required 21 samples.

b. Findings

Introduction. The inspector reviewed a Green self-revealing noncited violation of Technical Specification 6.7.1.d because a worker entered a high radiation area without a radiation monitoring device that appropriately alarmed when the dose set point was reached.

Description. On October 23, 2006, a radiation worker entered a posted high radiation area in the Unit 2 south reactor cavity by the "A" reactor coolant pump without possessing a vibrating electronic alarming dosimeter (VEAD). The dose rates in the area were as high as 150 millirem per hour at 30 centimeters from the source. Prior to entering this area, the worker obtained an electronic alarming dosimeter (EAD) with only an audible alarm, instead of a VEAD. When the EAD reached the dose alarm set point of 20 millirem, the audible alarm sounded; however, the worker was not able to hear the alarm due to a hearing deficiency and did not possess a VEAD. The problem was revealed to the licensee when the dosimetry system prevented the worker from logging out of the radiological controlled area (RCA) because of the dose alarm. The worker received approximately 28 millirem during this RCA entry. In addition, the worker was in the RCA for over 2.5 hours and did not periodically check the dose on the EAD as was required by the radiation work permit.

The licensee's immediate corrective actions were to counsel and restrict the worker's access to the RCA. The licensee plans to implement a dosimetry software system that will prevent the recurrence of this violation.

Analysis. The failure to possess a radiation monitoring device that appropriately alarms in a high radiation area is a performance deficiency. The finding was greater than minor because it was associated with the Occupational Radiation Safety Cornerstone attribute of program and process and affected the cornerstone objective to ensure the adequate protection of a worker's health and safety from exposure to radiation. The finding involved the potential for a worker's unplanned or unintended dose resulting from actions contrary to technical specifications. When processed through the Occupational Radiation Safety Significance Determination Process, the finding was determined to be of very low safety significance because the finding did not involve as low as is reasonably achievable (ALARA) planning or work controls, there was no overexposure or substantial potential for an overexposure, and the ability to assess dose was not compromised.

In addition, this finding has crosscutting aspects in the area of human performance associated with work practices because the failure to implement human performance error prevention techniques such as peer checking or self checking directly contributed to the finding.

Enforcement. Technical Specification 6.7.1.d, states, that each individual or group entering a high radiation area with dose rates not exceeding 1.0 rem per hour at 30 centimeters from the radiation source or any surface penetrated by the radiation shall possess: (1) a radiation monitoring device that continuously displays radiation dose rates in the area, or (2) a radiation monitoring device that continuously integrates the radiation dose rates in the area and alarms when the device's dose alarm set point is reached, with an appropriate set point, or (3) a radiation monitoring device that continuously transmits dose rate and cumulative dose information to a remote receiver monitored by radiation protection personnel responsible for controlling personnel radiation exposure within the area, or (4) a self-reading dosimeter (e.g., pocket ionization chamber or electronic dosimeter) and,

(i) be under the surveillance, as specified in the RWP or equivalent, while in the area, of an individual qualified in radiation protection procedures, equipped with a radiation monitoring device that continuously displays radiation dose rates in the area; who is responsible for controlling personnel exposure within the area,

or

(ii) be under the surveillance as specified in the RWP or equivalent, while in the area, by means of closed circuit television, of personnel qualified in radiation protection procedures, responsible for controlling personnel radiation exposure in the area, and with the means to communicate with individuals in the area who are covered by such surveillance.

On October 23, 2006, the licensee chose to implement option 2 and chose not to implement options 1, 3, or 4. Contrary to this requirement, a radiation worker entered a high radiation area without a vibrating electronic alarming dosimeter that would have appropriately notified the individual when the set points were reached. Because the finding was of very low safety significance and has been entered into the corrective action program as Condition Report CR-ANO-2-2006-02342, this violation is being treated as a noncited violation consistent with Section VI.A of the NRC Enforcement Policy: NCV 50-368/2007002-03, Failure to possess a radiation monitoring device that appropriately alarms in a high radiation area.

## 2OS2 ALARA Planning and Controls (71121.02)

### a. Inspection Scope

The inspector assessed licensee performance with respect to maintaining individual and collective radiation exposures ALARA. The inspector used the requirements in 10 CFR Part 20 and the licensee's procedures required by technical specifications as criteria for determining compliance. The inspector interviewed licensee personnel and reviewed:

- Current 3-year rolling average collective exposure
- Eight work activities from the previous outage, which resulted in the highest personnel collective exposures
- Site-specific ALARA procedures

- Interfaces between operations, radiation protection, maintenance, maintenance planning, scheduling and engineering groups
- Integration of ALARA requirements into work procedure and radiation work permit (or radiation exposure permit) documents
- Dose rate reduction activities in work planning
- Use of engineering controls to achieve dose reductions and dose reduction benefits afforded by shielding
- Workers' use of the low dose waiting areas
- First-line job supervisors' contribution to ensuring work activities are conducted in a dose efficient manner
- Radiation worker and radiation protection technician performance during work activities in radiation areas, airborne radioactivity areas, or high radiation areas
- Declared pregnant workers during the current assessment period, monitoring controls, and the exposure results
- Resolution through the corrective action process of problems identified through post-job reviews and post-outage ALARA report critiques

The inspector completed 12 of the required 29 samples.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151)

.1 Cornerstone: Initiating Events

a. Inspection Scope

The inspectors sampled licensee submittals for the three performance indicators listed below for the period from January 1 through December 31, 2006, for Units 1 and 2. The definitions and guidance of Nuclear Energy Institute 99-02, "Regulatory Assessment Indicator Guideline, Revision 2, were used to verify the licensee's basis for reporting each data element in order to verify the accuracy of PI data reported during the assessment period. The inspectors reviewed licensee event reports, monthly operating reports, and operating logs as part of the assessment. Licensee performance indicator data were also reviewed against the requirements of EN-LI-114 "Performance Indicator Process," Revision 2.

- Unplanned scrams per 7,000 critical hours
- Unplanned scrams with loss of normal heat removal
- Unplanned power changes per 7,000 critical hours

b. Findings

No findings of significance were identified.

.2 Occupational Radiation Safety Cornerstone

a. Inspection Scope

Occupational Exposure Control Effectiveness

The inspector reviewed licensee documents from October 1, 2006, through December 31, 2006. The review included corrective action documentation that identified occurrences in locked high radiation areas (as defined in the licensee's technical specifications), very high radiation areas (as defined in 10 CFR 20.1003), and unplanned personnel exposures (as defined in Nuclear Energy Institute (NEI) 99-02, "Regulatory Assessment Indicator Guideline," Revision 4). Additional records reviewed included ALARA records and whole body counts of selected individual exposures. The inspector interviewed licensee personnel that were accountable for collecting and evaluating the performance indicator data. In addition, the inspector toured plant areas to verify that high radiation, locked-high radiation, and very high radiation areas were properly controlled. Performance indicator definitions and guidance contained in NEI 99-02, Revision 4, were used to verify the basis in reporting for each data element.

The inspector completed the required sample (1) in this cornerstone.

Public Radiation Safety Cornerstone

Radiological Effluent Technical Specification/Offsite Dose Calculation Manual  
Radiological Effluent Occurrences

The inspector reviewed licensee documents from October 1, 2006, through December 31, 2006. Licensee records reviewed included corrective action documentation that identified occurrences for liquid or gaseous effluent releases that exceeded performance indicator thresholds and those reported to the NRC. The inspector interviewed licensee personnel that were accountable for collecting and evaluating the performance indicator data. Performance indicator definitions and guidance contained in NEI 99-02, Revision 4, were used to verify the basis in reporting for each data element.

The inspector completed the required sample (1) in this cornerstone.

b. Findings

No findings of significance were identified.

## 4OA2 Identification and Resolution of Problems (71152)

### .1 Review of Identification and Resolution of Problems for Occupational Radiation Safety

#### a. Inspection Scope

The inspector evaluated the effectiveness of the licensee's problem identification and resolution process with respect to the following inspection areas:

- Access Control to Radiologically Significant Areas (Section 2OS1)
- ALARA Planning and Controls (Section 2OS2)

#### b. Findings

No findings of significance were identified.

### .2 Routine Review of Identification and Resolution of Problems

#### a. Inspection Scope

The inspectors performed a daily screening of items entered into the licensee's CAP. This assessment was accomplished by reviewing CRs and attending corrective action review and work control meetings. The inspectors: (1) verified that equipment, human performance, and program issues were being identified by the licensee at an appropriate threshold and that the issues were entered into the CAP; (2) verified that corrective actions were commensurate with the significance of the issue; and (3) identified conditions that might warrant additional follow-up through other baseline inspection procedures.

#### b. Findings

No findings of significance were identified.

### .3 Selected Issue Follow-up Inspection

#### a. Inspection Scope

In addition to the routine review, the inspectors selected the one below listed issue for a more in-depth review. The inspectors considered the following during the review of the licensee's actions: (1) complete and accurate identification of the problem in a timely manner; (2) evaluation and disposition of operability/reportability issues; (3) consideration of extent of condition, generic implications, common cause, and previous occurrences; (4) classification and prioritization of the resolution of the problem; (5) identification of root and contributing causes of the problem; (6) identification of corrective actions; and (7) completion of corrective actions in a timely manner.

- March 20, 2007, Unit 1, formation of lead peroxide on positive plates of Safety-Related Battery D06

When evaluating the effectiveness of the licensee's corrective actions for these issues, the following attributes were considered:

- Complete and accurate identification of the problem in a timely manner commensurate with its significance and ease of discovery
- Evaluation and disposition of operability and reportability issues
- Consideration of extent of condition, generic implications, common cause, and previous occurrences
- Classification and prioritization of the resolution of the problem commensurate with its safety significance
- Identification of root and contributing causes of the problem for significant conditions adverse to quality
- Identification of corrective actions which are appropriately focused to correct the problem
- Completion of corrective actions in a timely manner commensurate with the safety significance of the issue

On February 28, 2007, the inspectors reviewed CR ANO-1-2007-0300 which was written in response to lead peroxide being found on the positive post of two cells of Station Battery D06. During this review, the inspectors noted resistance checks were performed on the post in question and were noted to be 30 and 26 micro-ohms. The licensee determined this to be acceptable based on a maintenance limit for the battery intercell resistance being 50 micro-ohms and the administratively controlled operability limit being 150 micro-ohms.

The inspectors questioned the licensee about the design assumptions for the battery intercell resistance values based on a similar issue that had been identified on the Unit 2 batteries. As a result of the inspectors' questions, the licensee identified during a review of the design calculations that the design assumption for the intercell resistance was 20 micro-ohms. Based on this, the licensee initiated CR ANO-1-2007-0315 to document this issue, and performed an operability evaluation to verify that the Unit 1 safety-related batteries would perform their design function.

Documents reviewed by the inspectors are listed in the attachment.

b. Findings

No findings of significance were identified.

4OA3 Follow-up of Events and Notices of Enforcement Discretion (71153)

a. Inspection Scope

The inspectors: (1) reviewed operator logs, plant computer data, and/or strip charts for the below listed evolutions to evaluate operator performance in coping with nonroutine

events and transients; (2) verified that operator actions were in accordance with the response required by plant procedures and training; and (3) verified that the licensee has identified and implemented appropriate corrective actions associated with personnel performance problems that occurred during the nonroutine evolutions sampled.

- January 25, 2007, Unit 2, dropped CEA
- February 21, 2007, Unit 2, loss of component cooling water

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed two samples.

b. Findings

Introduction. The inspectors identified a Green NCV of Unit 2 TS 6.4.1.a, for the licensee's failure to follow applicable work management procedures while conducting instrumentation and control maintenance to adjust a limiting safety system setting parameter associated with the reactor protection system.

Description. On January 25, 2007, a CEA dropped into the reactor core of Unit 2, causing the azimuthal power tilt to exceed the applicable limits referenced by TS Limiting Condition for Operation 3.2.3. Action Statement b.2 of this LCO requires the licensee, if the unit is to remain in Mode 1 above 20 percent RTP in this condition, to reduce the high linear power level trip setpoints to less than or equal to 55 percent RTP within 6 hours of entry into the action statement.

The Unit 2 procedure (OP-2304.256 "Unit 2 High Linear Setpoint Adjustment for Reduced Power," Change 005-00-0) for adjusting the high linear trip setpoints for reduced power levels was written to comply with the power levels for a different TS (TS 3.7.1.1 for main steam line code safety valves), and only contained guidance for reducing the trip setpoints to levels prescribed by that TS. Operations personnel decided to maintain the unit in Mode 1 and reduce the trip setpoints to 54 percent RTP, which was not a setpoint level that was included in the procedure.

Section 13.1 of licensee Procedure 1000.006 "Procedure Control," Revision 58, requires that, "If a procedure cannot or should not be performed exactly as written, the procedure user shall stop work and consult with supervision. For the activity to proceed without a procedure revision, a deviation must be approved before continuing with the activity." The criteria for allowing a procedure deviation (which included altering a step sequence, designating a step as N/A, making editorial enhancements, adding a note, or correcting a reference to another document) were not met in this situation; therefore, a procedure revision was required.

Operations personnel decided to proceed with the high linear power level trip setpoint reduction activity prior to the preparation of a complete work request and work order package and without completing a revision to the procedure. The shift manager authorized the use of the existing procedure as a template with handwritten changes annotated for trip setpoint voltages associated with the chosen setpoint power level (54 percent RTP). Operations personnel believed that the classification of a maintenance activity as Priority 1 according to Procedure EN-WM-100, "Work Request (WR) Generation, Screening, and Classification," Revision 1, would allow the shift

manager to authorize the maintenance activity to commence prior to the development of work order instructions and a formally revised procedure. In fact, Procedure EN-WM-100 only allowed this to be done in situations that met the criteria for emergency maintenance. The circumstances at the time did not meet the established criteria for emergency maintenance.

Analysis. The performance deficiency associated with this finding involved the failure of operations personnel to follow applicable work management procedures. This finding was greater than minor because, if left uncorrected, the conduct of maintenance activities on safety-related systems prior to the formal development of associated work order instructions and/or applicable procedure guidance would become a more significant safety concern. The misunderstanding on the part of operations management of the circumstances under which the emergency maintenance and expedited work order provisions apply could result in the inappropriate bypassing of established work control processes for activities involving risk important equipment under conditions that do not meet the prescribed criteria for emergency maintenance. The finding affected the mitigating systems cornerstone. Using Manual Chapter 0609, "Significance Determination Process," Phase 1 Worksheet, the finding was determined to have very low safety significance (Green) since the finding did not represent an actual loss of system safety function and posed no risk significance due to a seismic, flooding, or severe weather initiating event. The cause of the finding is related to the crosscutting element of human performance associated with decision making in that operations personnel failed to verify the validity of underlying assumptions that factored into a safety-significant decision involving procedural noncompliance.

Enforcement. Unit 2 TS 6.4, "Procedures," requires that written procedures be established, implemented, and maintained covering the applicable procedures recommended in Regulatory Guide 1.33, Revision 2, Appendix A, dated February 1978. Regulatory Guide 1.33 states that maintenance which can affect the performance of safety-related equipment should be properly preplanned and performed in accordance with written procedures, documented instructions, or drawings appropriate to the circumstances. Procedure EN-WM-100, "Work Request (WR) Generation, Screening, and Classification," is one of the licensee's procedures that prescribe guidelines for the planning and performance of maintenance. Procedure EN-WM-100 allows the shift manager to direct Priority 1 work activities to commence prior to the completion of detailed work package planning only under conditions that meet the criteria of emergency maintenance as defined in Section 3.0[2]. Contrary to this, on January 25, 2007, the shift manager directed Priority 1 work activities to commence prior to the completion of detailed work package planning under conditions that did not meet the criteria of emergency maintenance. Because the finding is of very low safety significance and has been entered into the licensee's CAP as CRs ANO-2-2007-0125 and CR ANO-2-2007-0503, this violation is being treated as an NCV consistent with Section VIA of the Enforcement Policy: NCV 05000368/2007002-04, "Failure to Follow Work Management Procedures While Adjusting Reactor Protection System Parameters."

#### 4OA6 Meetings, Including Exit

On January 12, 2007, the health physicist inspector presented the inspection results to Mr. T. Mitchell, who was then General Manager of Plant Operations, and other members of the staff, who acknowledged the findings. The inspector confirmed that proprietary information was not provided or examined during the inspection.

On February 15, 2007, the inspector presented the heat sink performance inspection results to Mr. J. Kowalewski, Acting General Manager, and other members of licensee management at the conclusion of the onsite inspection. No propriety information was reviewed.

March 23, 2007 the resident inspectors presented the inspection results of the resident inspections to Mr. T. Mitchell, Vice President, Operations, and other members of the licensee's management staff. The licensee acknowledged the findings presented. The inspectors noted that while proprietary information was reviewed, none would be included in this report.

#### 4OA7 Licensee-Identified Violations

The following violation of very low significance (Green) was identified by the licensee and is a violation of NRC requirements which meet the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as a NCV.

- 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires, in part, that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings. Contrary to the above requirement, the licensee failed to adequately implement Procedure 2106.032, "Unit Two Freeze Protection Guide," Revision 12. Specifically, Step 5.6 of this procedure requires, in part, that the roof hatch for Service Water Pump 2P-4C must be removed if actual or forecast temperatures are greater than or equal to 75°, and the licensee identified that on March 12 and 15 this did not occur. This was licensee identified because an auxiliary operator identified that ambient temperature was

above the procedural requirement on routine rounds. In accordance with Manual Chapter 0609, Appendix A, this finding was of very low safety significance (Green), because it did not screen as potentially risk significant due to external events. This issue was entered into the licensee's CAP as CR ANO-2-2007-0466.

ATTACHMENT: SUPPLEMENTAL INFORMATION

## SUPPLEMENTAL INFORMATION

### KEY POINTS OF CONTACT

#### Licensee Personnel

J. Bacquet, ALARA Supervisor, Radiation Protection  
R. Barnes, Manager, Planning, Scheduling, and Outages  
S. Bennett, Project Manager, Licensing  
B. Berryman, Manager, Operations Unit 1  
E. Blackard, Supervisor, Engineering Programs  
J. Browning, Manager, Operations Unit 2  
S. Chandler, System Engineer  
S. Cotton, Manager, Training  
B. Daiber, Supervisor, Systems Engineering  
D. Edgell, Supervisor, System Engineering  
J. Eichenberger, Manager, Corrective Actions and Assessments  
J. Forbes, Vice President, Operations  
R. Fowler, Emergency Planner  
R. Freeman, Emergency Planner  
J. Giles, Manager, Technical Support  
M. Ginsberg, Supervisor, Engineering Programs and Components  
R. Gresham, Emergency Planner  
D. Harris, Emergency Planner  
A. Hawkins, Licensing Specialist  
J. Hoffpauir, Manager, Maintenance  
R. Holeyfield, Manager, Emergency Planning  
M. Huff, Supervisor, Project Engineering  
D. James, Manager, Licensing  
W. James, Manager, Engineering Projects  
J. Kowalewski, Acting General Manager  
J. Looer, Units 1 and 2 Supervisor, Radiation Protection  
D. MacPhee, Mechanical Design Engineer  
T. Marlow, Director, Nuclear Safety Assurance  
J. Miller, Jr., Manager, System Engineering  
T. Mitchell, General Manager, Plant Operations  
D. Moore, Manager, Radiation Protection  
K. Panther, Nondestructive Examination Site Level III  
C. Reasoner, Manager, Engineering Programs and Components  
R. Scheide, Licensing Specialist  
B. Starkey, Technical Support Supervisor, Radiation Protection  
D. Tucker, Engineering Programs Engineer  
C. Tyrone, Manager, Quality Assurance  
F. Van Buskirk, Licensing Specialist  
D. White, Emergency Planner  
P. Williams, Supervisor, Systems Engineering  
M. Woodby, Manager, Design Engineering

## LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

### Opened and Closed

05000368/2007002-01	NCV	Non-conservative Battery Intercell Connection Resistance Value Specified in TS SR (Section 1R15)
05000313/2007002-02	NCV	Inadequate Modification Contributes to Failure of Control Room isolation Damper (Section 1R17)
05000368/2007002-03	NCV	Failure to Possess a Radiation Monitoring Device that Appropriately Alarms in a High Radiation Area (Section 2OS1)
05000368/2007002-04	NCV	Failure to Follow Work Management Procedures While Adjusting Reactor Protection System Parameters (Section 4OA3)

### Opened

None

### Closed

None

### Discussed

None

## LIST OF DOCUMENTS REVIEWED

In addition to the documents referred to in the inspection report, the following documents were selected and reviewed by the inspectors to accomplish the objectives and scope of the inspection and to support any findings:

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

#### Procedures

NUMBER	TITLE	REVISION
OP-1104.007	Screen Wash System	020-00-0
OP-2106.032	Unit 2 Freeze Protection Guide	012-00-0

**Section 1R04: Equipment Alignment**

Procedures

NUMBER	TITLE	REVISION
1104.029	Service Water and Auxiliary Cooling Water System	062-00-0
1015.008	Unit 2 SDC Control	020-00-0

Drawings

M-2210, "Piping and Instrumentation Diagram Service Water System," Sheet 1, Revision 85

M-2204, "Piping and Instrument Diagram EFW," Sheet 4, Revision 65

M-209, "Piping and Instrument Diagram Circ. Water, Service Water & Fire Water Intake Structure Equipment," Sheet 1, Revision 110

M-210, "Piping and Instrument Diagram Service Water," Sheet 1, Revision 143

CR

ANO-1-2006-0584

**Section 1R05: Fire Protection**

Drawings

FZ-1038, Sheet 1, Revision 2                      FZ-2041, Sheet 1, Revision 2  
FZ-2045, Sheet 1, Revision 2

Procedures

NUMBER	TITLE	REVISION
	Arkansas Nuclear One Fire Hazards Analysis	11
PFP-U1	ANO Prefire Plan (Unit 1) - Section 1B-357-67-U.doc, Section 1B-354-79-U.doc	2
PFP-U2	ANO Prefire Plan (Unit 2) - Section 2B-335-2040-JJ.doc	2
OP-1000.152	Unit 1 & 2 Fire Protection System Specifications	5

CRs

ANO-2-2007-0504                      ANO-2-2007-0329                      ANO-2-2007-0496

Calculations

85-E-0053-20, "Fire Area G Combustible Loading," Revision 1

**Section 1R07: Biennial Heat Sink Performance Inspection**

Calculations

- 98-E-0022-05, "Decay Heat Removal Cooler E-35B 1R6 Thermal Performance Test," Revision 0
- 92-E-0079-01, "Determination of Service Water Cooled Rooms Heat Loads under Various Operating Conditions," Revision 0
- 91-D-2003-01, "Emergency Diesel Generator Capacity Ratings," Revision 6
- 89-E-0200-17, "ANO-2 Boric Acid(2M39) and Waste(2M41) Concentrators," Revision 2
- 87-E-0006-08, "Rooms 10 and 11 (East DH Removal Pump Room) Heat Load Evaluation," Revision 1
- 87-E--0006-07, "Rooms 13 and 14 (West DH Removal Pump Room) Heat Load Evaluation," Revision 1

CRs

ANO-1-1999-0254	ANO-2-1997-0320	ANO-2-2005-1048
ANO-1-2003-0479-CA-00003	ANO-2-1999-0036	ANO-2-2005-1116
ANO-1-2005-0825	ANO-2-2005-0054	ANO-2-2006-0930
ANO-1-2005-1542	ANO-2-2005-0091	ANO-C-2005-1060
ANO-1-2006-0522	ANO-2-2005-0227	ANO-C-2006-0296

Operability Evaluation

EN-OP-104, "Operability Evaluation for CR-ANO-2-2005-00227," dated September 15, 2005

Work Orders

- 00073893 01, "Both Red and Green Train Work to Perform Service Water System Flow Test," dated October 15, 2006
- 51022620 01, "Inspect the Condition of VUC-1A, 1B, 1C, and 1D Filter Elements," dated April 3, 2006
- 51005892 01, "Ventilation Cooling Coil Cleaning and Inspection," dated April 3, 2006
- 50966254 01, "Perform Air Flow Testing of Auxiliary Building Service Water," dated March 14, 2006

Procedures

STER - 5.04, "Shell and Tube Heat Exchanger Rating Program," Copyright 1995 by Holtec International

ER-003292-E301, "Service Water Excessive Flow Evaluation for ANO-1 and ANO-2," dated December 8, 2000

Reports

91-R-2013-01, "Service Water Performance Testing Methodology and Results," Revision 17

ER-991916-E-101, "ANO-1 DH Heat Coolers, E-35A/B Minimum Service Water Flow," Revision 0

**Section 1R12: Maintenance Effectiveness**

Drawings

NUMBER	TITLE	REVISION
96-R-0003-01	ANO Maintenance Rule Program	2

CR

ANO-C-200-900

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

Procedures

NUMBER	TITLE	REVISION
COPD-024	Risk Assessment Guidelines	018

Drawings

NUMBER	TITLE	REVISION
M-2263 Sheet 6		

CRs

ANO-1-2007-114                      ANO-C-2007-120

Miscellaneous Documents

Plant Risk Assessment dated 01/16/2007  
Plant Risk Assessment dated 02/26/2007  
Plant Risk Assessment dated 03/12/2007  
ER-ANO-2006-0479-000 10CFR50.65(a)(4) Assessment, Revision 1

**Section 1R15: Operability Evaluations**

Procedures

NUMBER	TITLE	REVISION
2403.024	2D11 Quarterly Surveillance	14
2403.023	2D12 Quarterly Surveillance	17
2106.032	Unit Two Freeze Protection Guide	12

CRs

ANO-2-2007-0028	ANO-2-2007-0466	ANO-C-2007-0289
ANO-2-2007-0085	ANO-2-2007-0393	ANO-C-2006-2044
ANO-2-2007-0110	ANO-2-2007-0467	ANO-C-2007-0125
ANO-2-2007-0116	ANO-2007-2-0442	
ANO-2-2007-0126		

Work Orders

50970300	51014455
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Drawings

M-2204, Sheet 4, "Piping and Instrument Diagram Emergency Feedwater," Revision 65

Miscellaneous Documents

ER-ANO-2006-0457-006

Calculations

- 91-E-0090-03, "ANO-2 Battery DC and Corridor 2104 Emer. Ventilation," Revision 1 PC-2
- 91-E-0090-05, "North Electrical Room 2091 Ventilation," Revision 1
- 91-E-0090-04, "4160V Switchgear Room Ventilation," Revision 2
- 91-E-0090-12, "Effects of Loss of 4160V Switchgear Exhaust Ventilation," Revision 1

**Section 1R17: Permanent Plant Modifications**

Procedures

NUMBER	TITLE	REVISION
EN-LI-101	10 CFR 50.59 Review Program	2
EN-LI-100	Process Applicability Determination	2
2104-007	Control Room Emergency Air Conditioning and Ventilation	027-04-0

Drawings

M-263, "Piping & Instruments Diagram Units 1 & 2 Control & Computer Rooms HVAC,"  
Revision 71

CRs

ANO-C-2004-2274  
ANO-C-2006-1949

ANO-C-2006-2080  
ANO-C-2006-2091

ANO-C-2007-0132

Work Order

96242

Miscellaneous Documents

ER-ANO-2004-0961-002, "Alternate Bolting for CV-7907 Damper Hinge," Revision 0

"TDp777X0020, Maintenance Manual for Pressure Power Group Normal Press Bubble Tight  
Damper Model #NPBT-1," Revision 0

EC-194, "Develop Repair Configuration for CV-7907," Revision 0

**Section 2OS1: Access to Radiologically Significant Areas (71121.01)**

CRs

ANO-2-2006-1947

ANO-2-2006-2342

Procedures

NUMBER	TITLE	REVISION
1012.017	Radiological Posting and Entry/Exit Requirements,	11
1601.300	Job Coverage	11
EN-RP-131	Air Sampling	1

**Section 1R19: Postmaintenance Testing**

Procedures

NUMBER	TITLE	REVISION
2104.007	Control Room Emergency Air Conditioning and Ventilation	027-04-0
2104.005	Containment Spray	045-00-0
1304.205	Unit 1 EFIC Channel Monthly Test, SG Pressure Greater Than 750 PSIG	019-00-0

1412.001	Preventative Maintenance of Limitorque SB/SMB Motor Operators	15
2104.040	LPSI System Operation	39

Work Orders

00070805-05	00084367-02	51014413-01
00071234-01	00092006-01	51027537
00082826-01	50236015-01	51051288-01
00084367-01	51009255-01	51054483-01

Miscellaneous Document

Risk Assessment of EFIC Channel A OOS Condition dated 2/1/2007

**Section 1R22: Surveillance Testing**

Procedures

NUMBER	TITLE	REVISION
1104.004	Decay Heat Removal Operating Procedure	074
1104.005	Reactor Building Spray System Operation	46
1304.032	Unit 1 Power Range Linear Amp Calibration at Power (NI-CAL)	23
2104.040	LPSI System Operation	38
2304.197	Unit 2 Containment Purge Systems 2V1 and 2V2 Leak Rate Test	011-00-0
2305.002	Reactor Coolant System Leak Detection.	014-00-0

Work Orders

50280327-01	51051003
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**Section 1R23: Temporary Plant Modifications**

Procedures

NUMBER	TITLE	REVISION
EN-OP-104	Operability Determinations	2
EN-LI-101	10 CFR 50.59 Review Program	2
EN-LI-100	Process Applicability Determination	2

CRs

ANO-1-2006-1328

ANO-1-2006-01330

ANO-1-2007-00073

**Section 2OS1: Access to Radiologically Significant Areas (71121.01)**

Corrective Action Documents

CR-ANO-2-2006-01947, CR-ANO-2-2006-02342

Procedures

1012.017 Radiological Posting and Entry/Exit Requirements, Revision 11

1601.300 Job Coverage, Revision 11

EN-RP-131 Air Sampling, Revision 1

**Section 2OS2: ALARA Planning and Work Controls (71121.02)**

Corrective Action Documents

CR-ANO-2-2006-01626, CR-ANO-2-2006-01784, CR-ANO-2-2006-01934,  
CR-ANO-2-2006-01973, CR-ANO-2-2006-02070, CR-ANO-2-2006-02073,  
CR-ANO-2-2007-00029

Radiation Work Permits

2006-2420 2R18 Scaffolding Activities  
2006-2421 2R18 Insulation Activities  
2006-2430 Refueling Path Activities  
2006-2453 Open, Inspect, Repair 2SI-15A  
2006-2471 Reactor Vessel Closure Head Nozzle Inspection  
2006-2501 Remove and Replace the Pressurizer  
2006-2502 Remove and Replace the Pressurizer  
2006-2520 Incore Instrumentation Thimble Tube Replacement  
2006-2530 Remove/Replace Plenum & Install Sump Screens

Procedures

NUMBER	TITLE	REVISION
1012.032	ALARA Work Control and Planning	0
1601.003	Control of Temporary Shielding	9
EN-RP-110	ALARA Program	0
EN-RP-205	Prenatal Monitoring	0
ENS-RP-105	Radiation Work Permits	7

Miscellaneous

Radiation Protection Observation Oversight Checklists 9/15/2006 through 12/14/2006

**Section 4OA1: PI Verification (71151)**

Procedures

NUMBER	TITLE	REVISION
EN-RP-112	Radiation Protection PI Program	0
RPD-5	Radiation Protection Directive, Review of NRC PIs	1

Miscellaneous

PI Data Sheets for Occupational Exposure Control Effectiveness and Radiological Effluent Occurrences for the 4<sup>th</sup> Quarter 2006.

**Section 4OA2: Identification and Resolution of Problems**

Procedure

NUMBER	TITLE	REVISION
EN-OP-104	Operability Determinations	2

CRs

ANO-1-2007-0300                      ANO-1-2007-0315

Calculations

NUMBER	TITLE	REVISION
92-E-0021-09	Class 1E 125 VDC Train 1 DC Voltage Drop Study	0
92-E-0021-08	Class 1E 125 VDC Train 2 DC Voltage Drop Study	0

**Section 4OA3: Follow-up of Events and Notices of Enforcement Discretion**

Procedures

NUMBER	TITLE	REVISION
1000.006	Procedure Control	58
1000.006-R	Procedure Deviation	52
EN-WM-100	Work Request (WR) Generation, Screening, and Classification	1
2203.003	CEA Malfunction	16
2304.256	Unit 2 High Linear Setpoint Adjustment For Reduced Power	5

2304.100	Unit 2 High Linear and High Log Power Levels Excure Safety Channel A	91
2304.101	Unit 2 High Linear and High Log Power Levels Excure Safety Channel B	62
2304.102	Unit 2 High Linear and High Log Power Levels Excure Safety Channel C	57
2304.103	Unit 2 High Linear and High Log Power Levels Excure Safety Channel D	89

CRs

ANO-2-2007-0124  
ANO-2-2007-0125

ANO-2-2007-0503  
ANO-C-2007-0286

Work Order

00102360-01

## LIST OF ACRONYMS

ACE	apparent cause evaluation
ALARA	as low as reasonably achievable
CAP	corrective action program
CEA	control element assembly
CFR	<i>Code of Federal Regulations</i>
CR	condition report
EAD	electronic alarming dosimeter
EFIC	emergency feedwater initiation and control
EFW	emergency feedwater
LPSI	low pressure safety injection
NCC	noncited violation
NEI	Nuclear Energy Institute
PI	performance indicator
RTP	rated thermal power
SR	surveillance requirement
SSC	structure, system, and component
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
VEAD	vibrating electronic alarming dosimeter