



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

July 27, 2004

Jeffrey S. Forbes, Vice President,
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**SUBJECT: ARKANSAS NUCLEAR ONE - NRC INTEGRATED INSPECTION REPORT
05000313/2004003 and 05000368/2004003**

Dear Mr. Forbes:

On June 23, 2004, 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 June 30, 2004, with Mr. C. Eubanks 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 nine NRC identified and self-revealing findings of very low safety significance (Green). Eight of these findings were determined to involve violations of NRC requirements; 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 noncited violations (NCVs) consistent with Section VI.A of the NRC Enforcement Policy. Additionally, a licensee-identified violation, which was determined to be of very low safety significance, is listed in Section 4OA7 of this report. 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 inspection

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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/

Troy W. Pruett, Chief
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Dockets: 50-313
50-368

Licenses: DPR-51
NPF-6

Enclosure:

NRC Inspection Report 05000313/2004003 and 05000368/2004003
w/Attachment: Supplement Information

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7/19/04	7/19/04	7/19/04	7/18/04	7/21/04
C:DRS/PSB	C:DRS/EB	C:DRS/OB	C:DRS/PEB	C:DRP/D
MPShannon	JAClark	ATGody	LJSmith	TWPrueett
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7/25/04	7/22/04	7/23/04	7/23/04	7/27/04

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

Dockets: 50-313, 50-368

Licenses: DPR-51, NPF-6

Report: 05000313/2004003 and 05000368/2004003

Licensee: Entergy Operations, Inc.

Facility: Arkansas Nuclear One, Units 1 and 2

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

Dates: March 25 through June 23, 2004

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SUMMARY OF FINDINGS

IR 05000313/2004003, 05000368/2004003; 03/25/04 - 06/23/04; Arkansas Nuclear One, Units 1 and 2; Equip. Align., Fire Prot., Maint. Risk Assess., Op. Eval., Perm. Plant Mods., Out. Act., Access Control, Event Followup, Other Activities.

This report covered a 3-month period of inspection by resident and regional inspectors. Eight Green noncited violations and one Green finding 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: Initiating Events

- Green. A self revealing finding was reviewed for the inadequate identification and resolution of problems with the main turbine trip oil system that contributed to a turbine trip and reactor trip on Unit 1. Because the licensee did not adequately address problems with operation of the main turbine lube oil system, an operator released the main turbine reset lever after mistakenly thinking a main turbine trip had been reset. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. This issue involved human performance cross-cutting aspects associated with operations personnel not fully informing all members of the on-shift crew of plant conditions.

The finding is greater than minor because it was analogous to Example 4.d in Appendix E, "Examples of Minor Issues," of Manual Chapter 0612, "Power Reactor Inspection Reports," because the failure to take adequate corrective action contributed to an operator error. Using the Phase 1 worksheet in Manual Chapter 0609, "Significance Determination Process," the finding was determined to have very low safety significance because, although it resulted in a reactor trip, no other complicating events were caused by the error and all mitigating systems remained available to the operators (Section 4OA3).

Cornerstone: Mitigating Systems

- Green. The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion XVI, for the failure to correct inaccurate main control room valve position indicators on the Unit 2 high and low pressure safety injection system motor-operated valves. The valve position indicators were not calibrated for approximately 8 years yet were relied upon for indication in station procedures, including the loss of shutdown cooling procedure. Corrective

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actions taken or planned by the licensee have been entered into the licensee's corrective action program. This issue involved problem identification and resolution cross-cutting aspects associated with operations personnel not identifying conditions adverse to quality.

The finding is greater than minor because it affected the mitigating systems cornerstone objective of ensuring the reliability of systems that respond to initiating events to prevent undesirable consequences. Using the Phase 1 worksheets in Manual Chapter 0609, "Significance Determination Process," the finding was determined to have very low safety significance because the safety function of the valves was not affected and other indications were available to monitor system performance (Section 1R04).

- Green. The inspectors identified a noncited violation of Unit 1 Technical Specification 5.4.1.c and Unit 2 Technical Specification 6.8.1.f when the licensee provided inadequate manual suppression firefighting equipment upon a loss of automatic and manual suppression to the intake structures and service water pump areas. The equipment staged by the licensee would have required numerous actions by the fire brigade to ready a fire hose for manual fire suppression. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. This issue involved human performance cross-cutting aspects associated with operations personnel not implementing appropriate compensatory measures.

The finding is greater than minor because it affected the mitigating systems cornerstone objective of ensuring the availability of systems that respond to initiating events to prevent undesirable consequences. Using Appendix F, "Determining Potential Risk Significance of Fire Protection and Post-Fire Safe Shutdown Inspection Findings," of Manual Chapter 0609, "Significance Determination Process," the finding was determined to have very low safety significance because all remaining mitigating systems needed to respond to a loss of service water on either unit were available (Section 1R05).

- Green. The inspectors identified a noncited violation of 10 CFR 50.65(a)(4) for the failure to perform adequate risk assessments on Units 1 and 2. The licensee failed to update a prior risk assessment due to changing external events (declaration of a tornado watch) that could have had an impact on the existing assessment (increased likelihood of grid instability). In addition, the licensee did not include the added external risk from fire and its impact on safe shutdown equipment in aggregate risk assessments for the plant. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program.

The inspectors determined that these issues are more than minor because, if left uncorrected, they would become a more significant safety concern in that future risk assessments could result in failures to properly manage increases in risk. Using the Phase 1 worksheets in Manual Chapter 0609, "Significance

Determination Process," the finding was determined to have very low safety significance because mitigating systems were available and it did not affect the likelihood of external initiating events (Section 1R13).

- Green. The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion XVI, for the failure to take timely corrective action to correct indications of material wastage on Unit 2 Containment Spray Pump B. Specifically, the licensee did not implement actions to remove discolored boric acid deposits from the containment spray pump for approximately 9 months. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. This issue involved problem identification and resolution cross-cutting aspects associated with the timely implementation of corrective actions for conditions adverse to quality.

The inspectors determined that this issue is more than minor because if left uncorrected it could become a more significant safety concern in that continued wastage of the pump could impact operability. Using the Phase 1 worksheets in Manual Chapter 0609, "Significance Determination Process," the finding was determined to have very low safety significance because the actual wastage of the pump studs, nuts, and washers did not affect the safety function of the containment spray pump (Section 1R15).

- Green. The inspectors identified a noncited violation of Unit 1 Technical Specification 5.4.1.a for the failure to follow procedures for equipment control. The licensee failed to follow Procedure OP-102, "Protective Tagging," Revision 1, in several respects in their use of "Do Not Operate" tags on motor-operated valve handwheels prior to the Unit 1 refueling outage.

These failures are greater than minor in that they affected the mitigating systems cornerstone attribute of equipment availability. Using the Phase 1 worksheets in Manual Chapter 0609, "Significance Determination Process," the finding was determined to have very low safety significance because the tagging process did not affect any automatic safety functions (Section 1R20).

Cornerstone: Barrier Integrity

- Green. The inspectors identified a noncited violation of Unit 1 Technical Specification 5.4.1.a for the failure to follow written procedures associated with the inspection of the reactor vessel bottom nozzle penetrations during Refueling Outage 1R18. Specifically, the licensee failed to inspect 100 percent of the lower head penetrations during inspections required by Procedure 2311.09, "Unit 1 and Unit 2 Alloy 600 Inspection," Revision 5 as described in NRC Bulletin 2003-002. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. This issue involved human performance cross-cutting aspects associated with inattention to detail by engineering personnel during inservice examinations.

This finding is greater than minor because it affected the reactor safety barrier integrity cornerstone objective for providing reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. Using the Phase 1 worksheets in Manual Chapter 0609, "Significance Determination Process," the finding was determined to have very low safety significance because no actual leakage from the reactor vessel penetrations occurred (Section 4OA5).

Cornerstone: Occupational Radiation Safety

- Green. The inspector identified an event in which the licensee failed to control a high radiation area in violation of Unit 2 Technical Specification 6.13.1 after workers received abnormal dosimeter readings on October 14, 2003. The licensee performed dose measurements and found an uncontrolled high radiation area in the Unit 2 sample cooler room. The licensee should have been alerted to the potential for a high radiation area in this room when reactor coolant system radioactivity levels increased and high radiation areas were identified in adjoining areas on October 12, 2003. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. The issue involved human performance cross-cutting aspects associated with the thoroughness of radiation surveys by radiation protection personnel.

The failure to control a high radiation area is a performance deficiency. This finding is greater than minor because it was associated with one of the cornerstone attributes and affected the cornerstone objective, in that, inadequate exposure controls of a high radiation area affected the licensee's ability to ensure adequate protection of worker health and safety from exposure to radiation. Because the finding involved the potential for workers to receive significant, unplanned, unintended dose as a result of conditions contrary to Technical Specification requirements, the inspector used the occupational radiation safety significance determination process described in Manual Chapter 0609, "Significance Determination Process," Appendix C, "Occupational Radiation Safety Significance Determination Process," to analyze the significance of the finding. The inspector determined that the finding was of very low safety significance because it did not involve (1) ALARA planning and controls, (2) an overexposure, (3) a substantial potential for overexposure, or (4) an impaired ability to assess dose (Section 2OS1).

Cornerstone: Public Radiation Safety

- Green. A self revealing noncited violation of Unit 2 Technical Specification 6.8.1.a was reviewed for the failure to follow written procedures associated with the modification of the reactor coolant sample sink. Specifically, the licensee improperly connected the discharge of the reactor coolant sample sink into a secondary drain header which ultimately drained into the main condenser. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program.

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This finding is more than minor because it was analogous to Example 3.a in Appendix E, "Examples of Minor Issues," of Manual Chapter 0612, "Power Reactor Inspection Reports," because the modification required rework to correctly address design concerns. Using Appendix D, "Public Radiation Safety Significance Determination Process," of Manual Chapter 0609, "Significance Determination Process," the finding was determined to have very low safety significance because the licensee was able to assess the amount and curie content of the reactor coolant introduced into the secondary plant and there was no dose impact to the public (Section 1R17).

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 and remained there until April 20, 2004, when the unit was shut down for Refueling Outage 1R18. The unit was restarted on May 12 and resumed 100 percent power operation on May 16. The unit remained at or near 100 percent power until June 11 when the unit was shut down to repair an internal leak on the main turbine. The unit was restarted on June 19 and resumed 100 percent power operation on June 20. The unit remained at or near 100 percent power for the remainder of the inspection period.

Unit 2 began the inspection period at 100 percent rated thermal power and remained there throughout the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R01 Adverse Weather Protection (71111.01)

a. Inspection Scope

During the week of June 7, 2004, the inspectors reviewed the actions taken by the licensee to prepare for tornadoes, specifically looking at precautions and design features to ensure the operability, functionality, and availability of the Q condensate storage tank (QCST). The inspectors performed a walkdown of the QCST and its surroundings to verify prescribed measures were taken to ensure an adequate water inventory would be available to the emergency feedwater systems in the event of a tornado. Finally, the inspectors reviewed Calculations 82-D-2086-01, "Volume of Condensate Storage Tank T41-B Requiring Tornado Missile Protection," Revision 2, and 97-E-0010-01, "Emergency Feedwater Pump Suction Low Pressure Alarm," Revision 0, to verify adequate tornado missile coverage of the QCST.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment (71111.04)

a. Inspection Scope

Partial System Walkdowns. The inspectors performed three partial system walkdowns of systems important to reactor safety during this inspection period in order to verify the operability of the systems. The inspectors reviewed system operating instructions and required system valve and breaker lineups and then compared them to operator logs, control room indications, valve positions, breaker positions, and control circuit indications to verify these components were in their required configuration for making

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the systems operable. The inspectors also examined component material condition. The following walkdowns were conducted:

- On April 27, 2004, the inspectors performed a partial system walkdown of accessible portions of Unit 1 Emergency Diesel Generator (EDG) K-4A and its support systems during a refueling outage when the Unit 1 EDG K-4B was inoperable due to maintenance.
- On June 2, 2004, the inspectors performed a partial system walkdown of the red train of the Unit 1 reactor building spray system when the green train of the reactor building spray was removed from service during maintenance on Reactor Building Spray Pump P-35B.
- During the week of June 7, 2004, the inspectors performed a partial system walkdown of the green train of the Unit 2 high pressure safety injection system (HPSI) during the installation and testing of the temporary HPSI pressurization system. The walk-down included the temporary HPSI pressurization system.

b. Findings

Introduction. The inspectors identified a Green noncited violation of 10 CFR Part 50, Appendix B, Criterion XVI, for the licensee's failure to correct inaccurate main control room valve position indicators on the Unit 2 HPSI and low pressure safety injection (LPSI) motor-operated valves (MOVs).

Description. During a control room walkdown in Unit 2, inspectors noted that the HPSI and LPSI injection MOVs had remote position indicators, commonly called z-tape indicators, adjacent to their valve operating switches which indicate the percentage the valves are opened. The valves, which allow flow to the reactor coolant system loops, were in their normally closed positions. The inspectors noted that while the valve position indication lights for the MOVs indicated that the valves were closed, the z-tape indicators showed various positions other than the actual position of the valves.

When the inspectors questioned the operators as to the true position of the valves, the operators responded that the indicators were not accurate. The inspectors discovered that the indicators had been out of calibration for approximately 8 years. A review of operating procedures by inspectors demonstrated that, in numerous instances, control room operators were directed to open the valves to 10 percent. Most of the operations were just to bleed off system pressure, but for the LPSI MOV's, opening the valves provided a flow path to prevent pump damage to the LPSI pumps. Licensee operators indicated that they would accomplish this step by use of the z-tape indicators. The inspectors determined that operations personnel could not rely upon the z-tape indicators alone to prevent pump damage.

The inspectors could not find, nor could the licensee produce: (1) any open work orders to calibrate the indicators, (2) condition reports (CRs) to address the deficiency, or

(3) any procedure changes to discontinue use of the indicators. As a result, the inspectors concluded that the licensee had not adequately addressed the deficiency in their corrective action program processes.

Analysis. The inspectors determined that this finding is greater than minor because it affected the mitigating systems cornerstone objective of ensuring the reliability of systems that respond to initiating events to prevent undesirable consequences. Using the Phase 1 worksheets in Manual Chapter 0609, "Significance Determination Process," the finding was determined to have very low safety significance (Green) because the safety function of the HPSI and LPSI valves were not affected and other indications were available to monitor system performance. This issue involved problem identification and resolution cross-cutting aspects associated with operations personnel not identifying conditions adverse to quality.

Enforcement. 10 CFR Part 50, Appendix B, Criterion XVI, requires that measures be established to correct conditions adverse to quality. Contrary to the above, licensee personnel did not identify or correct a condition adverse to quality involving errant valve position indicators on the Unit 2 HPSI and LPSI injection MOVs. Because of the very low safety significance and because the licensee included this condition in their corrective action program as CR ANO-2-2004-0840, this violation is being treated as a noncited violation (NCV), consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000368/2004003-01, Failure to Correct Inaccurate HPSI and LPSI Valve Position Indications.

1R05 Fire Protection (71111.05)

a. Inspection Scope

Routine Inspection

The inspectors referenced the Fire Hazards Analysis Report, Revision 8, during the following inspections of seven fire areas to ensure that conditions were consistent with the requirements of the licensee's fire protection program for system design, control of transient combustibles and ignition sources, fire detection and suppression capability, fire barriers, and any related compensatory measures:

- Fire Zone 144-D, Unit 1 upper south electrical penetration room on April 6, 2004
- Fire Zone 20-Y, Unit 1 radwaste processing room on April 9, 2004
- Fire Area N, Unit 1 intake structure on May 4, 2004
- Fire Area OO, Unit 2 intake structure on May 4, 2004
- Fire Zone 2024-JJ, Unit 2 emergency feedwater pump room (turbine driven) on May 18, 2004

- Fire Zone 2025-JJ, Unit 2 emergency feedwater pump room, on June 2, 2004
- Fire Zone 167-B, Unit 1 computer transformer room, on June 4, 2004

b. Findings

Introduction. The inspectors identified a Green NCV of Unit 1 Technical Specification 5.4.1.c and Unit 2 Technical Specification 6.8.1.f when the licensee provided inadequate compensatory fire fighting equipment in response to a loss of manual and automatic suppression to the Unit 1 and 2 intake structures.

Description. On May 1, 2004, the licensee discovered a leak in the site fire water header. Upon isolating the leak, the licensee isolated the fire water supply to the intake structures for Units 1 and 2. This action secured the water supply to the fire fighting hose reel in the Unit 1 intake structure and the automatic fire suppression systems for both intake structures, thus rendering all manual and automatic firefighting systems inoperable.

The licensee posted fire watches as a compensatory action for degraded fire fighting features as required by Procedure 1000.152, "Unit 1 & 2 Fire Protection System Specifications," Revision 3. This procedure required routing of an additional equivalent capacity fire hose from an operable hose station.

On May 4, 2004, the inspectors walked down the compensatory fire hose and noted several deficiencies. First, the large fire hose was not readily connectable to a usable fire hose. In the event of an intake structure fire, the fire brigade would have to retrieve a Y-connector from a hose house in order to hook up a standard fire hose. Second, the inspectors noted that the fire brigade would have to break the existing Hose Reel 57 connection and hook it up to the large fire hose with the freshly retrieved Y-connector. Finally, the inspectors noted that the fire brigade would have to connect the large fire hose to the hydrant and unroll the large fire hose across the maintenance access road and connect it to the hose leading to the intake structure. The inspectors considered this compensatory fire hose layout to be inadequate, and therefore, concluded that the licensee did not meet the requirements of the fire protection program.

Analysis. The inspectors determined that this finding was greater than minor because it affected the mitigating systems cornerstone objective of ensuring the availability of systems that respond to initiating events to prevent undesirable consequences. Using Appendix F, "Determining Potential Safety Significance of Fire Protection and Post-Fire Safe Shutdown Inspection Findings," of Manual Chapter 0609, "Significance Determination Process," the inspectors evaluated a fire scenario in each intake structure which caused a loss of service water on that unit assuming that manual suppression and automatic suppression were highly degraded. The inspectors used the ignition frequencies from the licensee's internal plant examination for external events, combined with the remaining mitigation capability determined from the significance determination process Phase 2 notebooks for the loss of service water scenarios on Units 1 and 2. The inspectors determined that this issue was of very low safety significance (Green)

because of the availability of mitigating systems and the short duration of the condition. This issue involved human performance cross-cutting aspects associated with operations personnel not following procedures and not implementing appropriate compensatory measures.

Enforcement. Unit 1 Technical Specification 5.4.1.c, "Fire Protection Program Implementation," and Unit 2 Technical Specification 6.8.1.f, "Fire Protection Program Implementation," required establishing back-up fire suppression equipment upon a loss of normal fire suppression equipment to the intake structures. Contrary to the above, during the period of May 1-4, 2004, the licensee failed to provide adequate back-up fire suppression equipment upon a loss of fire suppression equipment at the intake structures. Because of the very low safety significance and because the licensee included this condition in their corrective action program as CR ANO-C-2004-0828, this violation is being treated as an NCV, consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000313/2004003-02; 05000368/2004003-02, Failure to Provide Adequate Compensatory Measures for a Loss of Fire Water to the Intake Structure.

1R08 Inservice Inspection Activities (71111.08)

1. Inspection Scope

a. Performance of Nondestructive Examination Activities Other than Steam Generator Tube Inspections

Inspection Procedure 71111.08 specifies that a minimum of two examinations be reviewed, either through direct observation or by record review. The inspector completed review of three examinations (one ultrasonic, one liquid penetrant, and one radiographic). The inspector observed the ultrasonic and liquid penetrant examinations and reviewed the records for the radiographic examination, all listed in the attachment under Section 1R08.

During the observation of the ultrasonic and liquid penetrant examinations, the inspector verified that the examiners used the correct nondestructive examination procedure, met the requirements specified in the procedure, and used properly calibrated test instrumentation and equipment. The inspector verified the certifications of the individuals observed performing the examination. The inspector also reviewed the radiographic procedure and certifications of the radiographer and the Level III reviewer.

The inspection procedure also specifies a review of examinations from the previous outage with recordable indications that were accepted for continued service. There were no recordable indications accepted for continued service.

The inspection procedure further specifies that, if welding had been completed on the pressure boundary for the American Society of Mechanical Engineer (ASME) Code Class 1 or 2 systems, then the inspector should verify that acceptance and preservice examinations were done in accordance with the ASME Code for at least one weld. The

inspection procedure also specifies that verification of at least one ASME Code, Section XI repair or replacement meet ASME Code requirements. The inspector reviewed the four weld packages listed in the attachment under Section 1R08. Included in these packages were two welds performed as repair activities.

b. Steam Generator Tube Inspection Activities

Section 03.02 of the procedure requires, at a minimum, the completion of steps 02.04a., c., d., g.(1), h., i., and j. for all steam generator tube inspections. In addition, because the steam generator tubes are made of mill annealed Inconel Alloy 600 steel, the remainder of Section 02.04 is also required to be performed. The inspector reviewed the in-situ testing criteria, compared the estimated number and size of flaws to the actual numbers, reviewed the scope and expansion criteria for eddy current testing, verified that all areas of potential degradation were examined, confirmed that the repair methods and criteria were approved, and verified that the probes and equipment were qualified. As a result, the inspector performed all of the required inspection activities with the following exceptions:

Section 02.02a.3. was not performed because all in-situ testing had been completed,

Section 02.02d. was not performed because no new degradation mechanisms were identified,

Section 02.02h. was not performed because the leakage was less than 3 gallons per day, and

Section 02.02j. was not performed because no loose parts or foreign material was identified.

c. Identification and Resolution of Problems

The inspector reviewed four CRs issued since the last outage on inservice inspection and steam generator eddy current testing activities. The inspector verified that licensee personnel identified, evaluated, corrected, and trended inservice inspection problems.

2. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification Program (71111.11)

a. Inspection Scope

The inspectors observed one session of licensed operator requalification training activities in the Unit 2 simulator to assess the licensee's effectiveness in conducting the requalification program and to verify that licensed individuals received the appropriate level of training required to maintain their licenses.

- On June 17, 2004, the inspectors observed the Unit 2 licensed operator simulator qualification training Scenario A2SPGLOR040401, "Fire or Explosion," conducted for Training Cycle 4.

The inspectors compared their observations for this scenario to the applicable abnormal operating procedures, emergency plan procedures, and applicable Technical Specifications. In addition, the inspectors attended the critique following the scenario held by the Unit 2 training organization.

b. Findings

No findings of significance were identified.

1R12 Maintenance Implementation (71111.12)

a. Inspection Scope

The inspectors reviewed a performance problem associated with failures of the Unit 1 main steam safety valves to lift within tolerance in order to assess the effectiveness of the Maintenance Rule Program. The inspectors independently verified that licensee personnel properly implemented 10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants."

The inspectors focused the review on whether the structures, systems, or components (SSCs) that experienced problems were properly characterized in the scope of the program. They also reviewed whether the SSC failure or performance problem was properly characterized. The inspectors assessed the adequacy of the licensee's significance classification for the SSC. This included the appropriateness of the performance criteria established for the SSC and the adequacy of corrective actions for SSCs classified in accordance with 10 CFR 50.65 (a)(1).

b. Findings

No findings of significance were identified.

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

a. Inspection Scope

The inspectors evaluated and discussed with the licensee the six risk assessments listed below to verify that they were performed when required. The inspectors reviewed these assessed risk configurations against actual plant conditions and in-progress evolutions or external events to verify that the assessments were accurate, complete, and appropriate for the conditions. In addition, the inspectors walked down the control room and plant areas to verify that compensatory measures identified by the risk assessments were appropriately performed.

- Planned maintenance on the Unit 2 Service Water Pump C during the week of March 1, 2004
- Planned maintenance on the Unit 1 Door 48, the south switchgear room/turbine building door, from April 12-14, 2004
- Daily review of risk assessments during Refueling Outage 1R18 completed in accordance with ANO Shutdown Operations Protection Plan dated January 16, 2004, and comparison to actual plant conditions to ensure that the licensee implemented acceptable defense-in-depth strategies for critical safety functions
- Planned maintenance and severe weather affecting Unit 2 during the week of April 26, 2004
- Maintenance on Unit 2 during the week of May 10, 2004
- Maintenance on Unit 1 during the week of May 17, 2004

b. Findings

Introduction. The inspectors identified a Green NCV of 10 CFR 50.65(a)(4) for the failure to perform an adequate risk assessment due to emergent external conditions and found previous instances where the licensee failed to adequately consider external events.

Description. The licensee failed to update a prior risk assessment due to changing external environmental conditions. During the week of March 1, 2004, the licensee performed maintenance on the Unit 2 Service Water Pump C, 2P-4C. During the maintenance period, the National Weather Service issued a tornado watch. The inspectors questioned licensee personnel on how the tornado watch impacted their risk assessment for the unit. The inspectors determined that the licensee had not reassessed risk for weather conditions which had an imminent or high probability of occurrence. Also, the inspectors discovered that the licensee's Common Operations Directive COPD-024, "Risk Assessment Guidelines," Revision 9, along with both units'

procedures for natural emergencies, Procedures OP 1203.025, "Natural Emergencies," Revision 19, and OP 2203.008, "Natural Emergencies," Revision 8, did not contain instructions to re-evaluate risk based on changing external conditions (e.g., adverse weather). The Risk Assessment Guidelines directive is the document the licensee uses to implement 10 CFR 50.65(a)(4). The Natural Emergencies procedures are the procedures that would trigger the operators to re-evaluate plant risk for the changing external conditions, using the Risk Assessment Guidelines. From this, the inspectors concluded that the licensee did not have in place a method to re-evaluate plant risk for either unit based on changing external conditions and, as a result, did not adequately reassess risk due to this emerging condition.

The inspectors also found that the licensee failed to consider the external risk from fire and its impact on safe shutdown equipment in previous risk assessments. The emergency feedwater pumps, EDGs, and high pressure and low pressure safety injection systems are important safety significant systems needed to achieve and maintain safe shutdown conditions following a fire event (switchgear fire, main control room fire, etc.). The licensee had not evaluated the removal of these systems from service; even though, they are needed to mitigate identified risk from fire initiating events. Consequently, additional actions to manage the increased risk were not considered. The inspectors reviewed COPD-024, "Risk Assessment Guidelines," Revision 9, and determined that no provisions were made in the licensee's process to account for known risk contributors.

Analysis. The inspectors determined that these issues were more than minor because if left uncorrected they would become a more significant safety concern in that actions to manage increases in risk may not be implemented. Using the Phase 1 worksheets in Manual Chapter 0609, "Significance Determination Process," the finding was determined to have very low safety significance (Green) because mitigating systems were available and it did not affect the likelihood of an external initiating event.

Enforcement. 10 CFR 50.65(a)(4) requires, in part, that the licensee shall assess and manage the increase in risk that may result from the proposed maintenance activities. Contrary to this, the licensee did not adequately assess risk based on external events. Because of the very low safety significance and because the licensee included this condition in the corrective action program as CRs ANO-C-2004-0548 and -0982, this violation is being treated as an NCV, consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000313/2004003-03; 05000368/2004003-03, Failure to Adequately Assess Risk Due to External Conditions.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

The inspectors reviewed the five operability determinations listed below to assess the evaluations, the use of compensatory measures, and compliance with the Technical Specifications. The inspectors' review included a verification that operability determinations were made as specified by the licensee's Procedure LI-102, "Corrective

Action Process," Revision 2, and Procedure 1015.047, "Condition Reporting Operability and Immediate Reportability Determinations," Revision 0. The technical adequacy of the determinations was reviewed and compared to the Technical Specifications, the Technical Requirements Manual, the Updated Final Safety Analysis Report, and the associated licensing-basis documentation.

- Unit 2 HPSI voiding in the green train header, primarily around the injection valve for the Safety Injection Tank A 2CV-5016-2
- Unit 1 Model HFB Westinghouse molded case circuit breaker failures for Battery Room Exhaust Fan VEF-34, Hydrogen Purge Supply Isolation MOV CV-7444, and Decay Heat Removal Unit Cooler VUC-1D
- Accumulation of discolored boric acid deposits on studs, nuts, and washers for the Unit 2 Containment Spray Pump 2P-35B motor mounts
- Unit 1 Room 170 environmental qualification for electrical equipment essential to the operation of the turbine-driven emergency feedwater pump
- Unit 1 Decay Heat Removal Unit Cooler VUC-1B and Decay Heat Removal Room Cooler E-35B did not meet design service water flows during as-found service water flow test done in Refueling Outage 1R18

b. Findings

Introduction. The inspectors identified a Green NCV of 10 CFR Part 50, Appendix B, Criterion XVI, for the failure to promptly clean discolored boric acid deposits on Unit 2 Containment Spray Pump B.

Description. On February 15, 2004, operations personnel noted discolored boric acid deposits on three of the Unit 2 Containment Spray Pump B studs and initiated CR ANO-2-2004-0292. This CR documented the fact that boric acid deposits had been a recurring issue on this pump as documented in CR ANO-2-2003-0674 initiated May 9, 2003. The inspectors independently discovered the same condition on February 24, 2004. The inspectors questioned licensee personnel to determine why the boric acid deposits had not been cleaned and evaluated. Licensee personnel informed the inspectors that they could not find any records associated with the removal of boric acid from the pump and that they would address removal of the deposits on the pump.

In a follow-up tour of the pump area on March 24, 2004, the inspectors noted that the boric acid deposits were still present on the pump. The inspectors noted that the deposits had existed for approximately nine months with indications of material wastage (discolored boric acid) and no apparent action by the licensee to remove the boric acid. Licensee personnel informed the inspectors that removal of the deposits would occur during an inspection of the pump in July 2004. The inspectors considered this action to be untimely due to the indications of active material wastage. Additionally, the

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inspectors determined that Procedure 1032.037A, "Identification and Evaluation of Boric Acid Leakage," did not provide guidance for correcting conditions where boric acid was corroding material. The licensee, subsequently, cleaned the deposits on March 26, 2004. A picture of the pump before cleaning is included in the attachment.

Analysis. The inspectors determined that the issue was greater than minor because if left uncorrected it would become a more significant safety concern in that continued wastage could impact the integrity of the pump. Using the Phase 1 worksheets in Manual Chapter 0609, "Significance Determination Process," the inspectors determined that the finding had very low safety significance (Green) because the containment spray pump remained functional. This issue involved problem identification and resolution cross-cutting aspects associated with the timely implementation of corrective actions for conditions adverse to quality.

Enforcement. 10 CFR Part 50, Appendix B, Criterion XVI, states, in part, that measures shall be established to assure that conditions adverse to quality are promptly identified and corrected. Contrary to the above, the licensee did not promptly correct a condition adverse to quality involving material wastage on the Unit 2 containment spray pump. Because of the very low safety significance and because the licensee included this condition in their corrective action program as CR ANO-2-2004-0620, this violation is being treated as an NCV, consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000368/2004003-04, Untimely Corrective Action to Clean Discolored Boric Acid Deposits.

1R16 Operator Work-Arounds (71111.16)

a. Inspection Scope

Semiannual Review. The inspectors sampled three attributes in a semi-annual review of all operator workarounds listed on the licensee's operator work-around list for both Units 1 and 2. The cumulative effects of all workarounds on each unit were reviewed for: (1) the reliability, availability, and potential for misoperation of a system, (2) potential affects on multiple mitigating systems, and (3) the ability of operators to respond to plant transients or accidents in a correct and timely manner.

b. Findings

No findings of significance were identified.

1R17 Permanent Plant Modifications (71111.17)

a. Inspection Scope

Annual Review. The inspectors reviewed the licensee's modification to the Unit 2 reactor coolant sample sink. The modification involved the use of a hydrogen/oxygen analyzer and the use of a pH/conductivity analyzer for online sampling of the reactor coolant system. The inspectors' review assessed the controls related to the modification

of the Unit 2 primary sample sink, which resulted in connecting the reactor coolant system sample piping to a drain header that communicates with secondary plant systems. The inspectors also verified that: (1) any design bases, licensing bases, and performance capabilities of the component would not be degraded as a result of the modification; (2) the modification did not place the reactor plant in any unsafe conditions; and, (3) adequate testing was performed to verify the modification functioned as expected.

b. Findings

Introduction. A Green self revealing NCV of Technical Specification 6.8.1.a was identified for the failure to correctly implement a modification to the reactor coolant sample sink.

Description. On August 23, 1995, the licensee initiated a design change to provide online sampling capabilities for reactor coolant system hydrogen, oxygen, pH, and conductivity for Unit 2. The intent of the modification was to divert a portion of reactor coolant flow to hydrogen, oxygen, pH, and conductivity analyzers and then direct the effluent to the low level radioactive waste drain header. While walking down the system to prepare a field sketch of the modification, the responsible engineer incorrectly identified the header to the main feedwater pump seal drain tank as the low level radioactive waste drain header. The inspectors reviewed the modification package and determined that the text description had correctly specified that the effluent would discharge to the radioactive waste system.

The modification was issued on April 2, 1997, and was worked in several phases over the following 6 years with final connections being performed in August 2003. During this time, three different responsible engineers and six different instrumentation and control technicians worked various portions of the modification. The error with the field sketch was not identified during the installation of the modification. From April 3, 2003, through April 4, 2004, the licensee performed testing of the modification using demineralized water. Licensee personnel performed their first test of the analyzers using reactor coolant on April 7, 2004. The test was terminated after approximately 45 minutes due to improper operation of the oxygen analyzer. Following repairs to the oxygen analyzer, the test was again performed on April 14, 2004. During each test, approximately 25 liters of reactor coolant was allowed to flow through the sample piping to the main feedwater pump seal water drain tank and eventually into the main condenser. The curie content of the reactor coolant passing through the sample line during the first test was approximately 2.66×10^{-2} curies. The curie content of the reactor coolant during the second test was 2.76×10^{-2} curies. Approximately 1 hour following the termination of each test, the steam generator radiation monitors generated the Unit 2 control room "Steam Generator B Blowdown Rad Monitor Hi" annunciator alarm. Approximately 4 hours after the second test, the licensee was able to determine reactor coolant had reached the main feedwater pump seal water drain tank and was circulated throughout the secondary plant generating the steam generator radiation monitor alarms. The licensee placed danger tags on the isolation valves associated with this modification to prevent additional reactor coolant from reaching the secondary plant.

Analysis. The inspectors determined this finding was greater than minor because it is analogous to Example 3.a in Appendix E of Manual Chapter 0612 in that the modification error was significant enough to require rework to resolve design concerns. Using Appendix D, "Public Radiation Safety Significance Determination Process," of Manual Chapter 0609, "Significance Determination Process," The inspectors determined that the finding had very low safety significance (Green) because the licensee was able to assess the amount and curie content of the reactor coolant introduced into the secondary plant and there was no dose impact to the public.

Enforcement. Unit 2 Technical Specification 6.8.1.a requires that written procedures be implemented covering the activities listed in Regulatory Guide 1.33, Revision 2. The general procedure for the control of maintenance, repair, replacement, and modification work is Procedure 6000.030. Section 5.0, "Responsibility and Authority," "Control of Installation," Revision 7, requires inspection of modification work to ensure the installation process complies with design documents. Contrary to the above, the licensee did not perform an adequate inspection of the modification work in that: (1) on February 19, 1997, the responsible engineer for the design modification to the reactor coolant sample sink incorrectly identified the drain header to be used for the effluent of the H₂/O₂ analyzer which led to incorrectly directing the effluent of the H₂/O₂ analyzer to the main feedwater pump seal water drain tank, and (2) personnel installing the modification did not identify that the sample effluent was directed to the main feedwater pump seal drain tank. Because of the very low safety significance and because the licensee included this condition in their corrective action program as CR ANO-2-2004-0772, this violation is being treated as an NCV, consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000368/2004003-05, Improperly Installed Reactor Coolant Sample Sink Modification.

1R19 Postmaintenance Testing (71111.19)

a. Inspection Scope

For the five maintenance activities listed below, the inspectors reviewed the test data obtained from the field and ensured: (1) the procedures' acceptance criteria were consistent with the Technical Specifications and the supporting license change application, (2) the results recorded met the test acceptance criteria, and (3) test deficiencies were recorded and resolved.

- On June 15, 2004, the inspectors reviewed the postmaintenance testing of the Unit 2 Containment Spray Pump 2P-35A following breaker replacement. The postmaintenance test was in accordance with Procedure 2104.005, "Containment Spray," Revision 41, Supplement 1.
- On June 16, 2004, the inspectors reviewed the postmaintenance testing of the Unit 1 Emergency Feedwater Pump P-7A following a minimum flow recirculation

line flow valve/orifice modification. The test was in accordance with Procedure 1106.006, "Emergency Feedwater Pump Operation," Revision 64, Supplement 12.

- On June 17, 2004, the inspectors reviewed the postmaintenance testing of Unit 1 Emergency Feedwater Pump P-7B following a minimum flow recirculation line flow valve/orifice modification. The postmaintenance test was in accordance with Procedure 1106.006, "Emergency Feedwater Pump Operation," Revision 64, Supplement 11.
- On June 22, 2004, the inspectors reviewed the postmaintenance testing of Unit 2 EDG 2K-4B following replacement of degraded hoses on the gage panel. The postmaintenance test was in accordance with Procedure 2104.036, "Emergency Diesel Generator Operations," Revision 47, Supplement 2A.
- On June 23, 2004, the inspectors reviewed the postmaintenance testing of the Unit 1 pressurizer emergency relief valve following troubleshooting of an electrical ground. The postmaintenance test contained in Work Order 00043411-02 was in accordance with Procedure 1103.005, "Pressurizer Operation," Revision 30, Supplement 1.

b. Findings

No findings of significance were identified.

1R20 Refueling and Outage Activities (71111.20)

a. Inspection Scope

Refueling Outage 1R18. The inspectors reviewed the outage safety plan and contingency plans for the Unit 1 Refueling Outage 1R18, conducted April 20 through May 13, 2004, to confirm that the licensee 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:

- Licensee configuration management, including maintenance of defense-in-depth commensurate with the outage safety plan for key safety functions and compliance with the applicable Technical Specifications when taking equipment out of service
- Implementation of clearance activities and 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 and an accounting for instrument error
- Controls over the 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, including a review of the adequacy and availability of backup processes
- Controls to ensure 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
- Refueling activities including fuel handling
- Startup and ascension to full power operation, tracking of startup prerequisites, walkdown of the reactor building to verify that debris had not been left which could block emergency core cooling system (ECCS) suction strainers
- Licensee identification and resolution of problems related to refueling outage activities

Unit 1 Main Turbine Forced Outage. On June 11, 2004, in response to elevated noise levels and vibrations on the main turbine casing, the licensee shut down Unit 1 to remove and inspect the turbine casing to identify and eliminate the source of the casing vibrations. The inspectors reviewed the outage plan and contingency plans to confirm that the licensee 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 outage, the inspectors reviewed computer trends for portions of the shutdown and cooldown, monitored licensee configuration management, reviewed controls over the status and configuration of mitigating systems, monitored controls over activities that could affect reactivity, and reviewed trends associated with startup and ascension to full power operation. Finally, the inspectors reviewed the licensee's identification and resolution of problems related to outage activities.

b. Findings

Introduction. The inspectors identified a Green NCV of Unit 1 Technical Specification 5.4.1.a for the failure to follow procedures for equipment control.

Description. On April 20, 2004, the inspectors toured portions of Unit 1 to determine if outage preparations for Refueling Outage 1R18, commencing later that day, had any

adverse affect on plant operation. The inspectors identified that danger tags were hung on components associated with a number of ECCS systems and trains. Specifically, the inspectors observed that danger tags were hung on MOVs associated with both trains of emergency feedwater, high pressure injection, reactor building spray, and other components. The hanging of these tags was conducted on April 19 and 20, 2004.

The inspectors questioned operations and work control personnel about the condition of the equipment. The station personnel stated that equipment had been "tagged out" prior to the outage in an effort to expedite work release. Components which would not be operated, and were presently in the condition needed for the outage work control process, were danger tagged in advance of the outage. The personnel stated that the MOVs were an official tagging boundary and were part of the overall system or component tagout that would be activated later. This process also included the MOV handwheels for suction valves, discharge valves, and associated support systems (such as service water flow) for the ECCS trains. The MOV handwheel danger tags stated no required position of the valve itself but had the instruction "Do Not Operate." The inspectors were told this process permitted the equipment to be tagged in advance, and would not really affect ECCS operation because the equipment would respond to actuation signals, and could be manually operated under administrative controls (i.e., upon removing tags). Upon further discussion with operations personnel and management, the inspectors were informed that the MOV tags did not establish any boundary and were not to be used as a restriction to remote operation.

The inspectors noted several CRs, including CR ANO-1-2004-1475, where station personnel questioned this tagging process and demonstrated a lack of understanding of the new process. The inspectors interviewed operations and maintenance personnel regarding their understanding of adherence to the tags. The inspectors were informed that if a change of a tagged MOV's position was required, then removal or temporary lift of the danger tag must be performed. The inspectors verified that this statement came directly from Procedure OP-102, "Protective Tagging," Revision 1, Attachment 9.2, Section 3.7.2. The General Employee Training that was provided to all employees appeared confusing in that it stated, "You may see an MOV with a tag on its handwheel stroke open or closed. This is OK since it is not on a tagout with work being performed until the Real tagout is issued." The inspectors noted a wide range of responses to new requirements, from an understanding that the tags meant nothing, to the impression that the equipment could not be operated at all, including remotely. The inspectors were concerned that the new tagging process could lead to personnel errors.

The inspectors were also concerned about the administrative condition of essential ECCS equipment isolation valves. While the licensee presented information and documentation that equipment would still function automatically, and thereby fulfill the safety function, the inspectors were given only judgmental information regarding the timeliness of equipment operation under abnormal or accident conditions. The inspectors determined that administrative removal of the tags could lead to delays in required local manual operations.

The inspectors determined that the licensee failed to follow Procedure OP-102, "Protective Tagging," Revision 1, requirements involving: (1) the use of a partial tagout, (2) not establishing safety boundaries during the preparation, approval, and hanging of the tagout, and (3) not providing adequate training to station personnel on the changes to the tagging process.

Analysis. The inspectors determined that the tagging program failures affected the mitigating systems cornerstone attribute of equipment availability, and if left uncorrected the issue could become a more significant safety concern in that a delay in local manual operation of valves could occur. Using the Phase 1 worksheets in Manual Chapter 0609, "Significance Determination Process," the finding was determined to have very low safety significance (Green) because the tagging process did not affect any automatic safety functions.

Enforcement. Unit 1 Technical Specification 5.4.1.a states that procedures will be properly implemented for those activities listed in Appendix A of Regulatory Guide 1.33, Revision 2. In their implementation of "Do Not Operate" tags on Unit 1 during April 19-20, 2004, the licensee failed to follow numerous aspects of their tagging Procedure OP-102, "Protective Tagging." Specifically:

- No section or area of the procedure provided for "partial" tagouts (i.e., the hanging of some tags now and others at a later date) for an established work boundary. However, the licensee hung the MOV tags which were part of an overall outage tagout to be implemented later.
- Section 5.3 (Tagout Preparation) requires the determination of safety boundaries for the tagout. As explained to the inspectors, no actual boundaries were implemented for this tagout. This section also required the hang and restoration positions of equipment. The "Do Not Operate" tags did not specify a position and, therefore, did not meet this condition.
- Section 5.5 (Tagout Approval) requires review to ensure equipment status and boundary establishment. Again, no boundaries were actually established.
- Section 5.6 (Hanging Tagouts) requires that first and second persons independently verify required positions. These tags did not specify a position, so no verification was performed.
- Section 5.22 (Training) requires employees be appropriately informed about changes and revision to the protective tagging procedure. The inspectors' interviews established that training was confusing and inadequate.

Because the failures to correctly implement the tagging program were determined to be of very low safety significance and has been entered into the licensee's corrective action program as CR ANO-C-2004-00723, this violation is being treated as an NCV,

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consistent with Section VI.A.1 of the NRC Enforcement Policy: NCV 05000313/2004003-06, Failure to Follow Tagout Procedure in the Use of "Do Not Operate Tags."

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors assessed the performance of the four surveillance tests listed below. The inspectors verified that the surveillance tests were performed in accordance with approved licensee procedures and met Technical Specifications requirements. In addition, the applicable test data was also reviewed to verify that Technical Specifications, Updated Final Safety Analysis Report, and licensee procedure requirements were met.

- On March 31, 2004, the inspectors reviewed the documentation for the quarterly surveillance of High Pressure Injection Pump P-36C which was performed on March 30, 2004. This test was performed in accordance with Procedure OP-1104.002, Revision 57, Supplement 5, and Work Order Package 50689580.
- On March 31, 2004, the inspectors reviewed the monthly surveillance of Unit 2 EDG 2K-4B. This test was performed in accordance with Procedure OP-2104.036, Revision 47, Supplement 2A.
- On April 5, 2004, the inspectors reviewed the documentation for the quarterly surveillance of Service Water Pump 2P-4B which was performed on March 26, 2004. This test was performed in accordance with Procedure OP-2104.029, Revision 53, Supplement 1B.
- On June 3, 2004, the inspectors reviewed the documentation for the 18-month surveillance of the pressurizer electromatic Relief Valve PSV-1000. This test was performed in accordance with Procedure OP-1103.005, Revision 30, Supplement 1.

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications (71111.23)

a. Inspection Scope

The inspectors reviewed the two temporary alterations listed below to assess the following attributes: (1) the adequacy of the safety evaluation; (2) the consistency of the installation with the modification documentation; (3) the updating of drawings and procedures, as applicable; and (4) the adequacy of post-installation testing. Also, the

inspectors confirmed that these temporary modifications were implemented and installed as authorized by Procedure 1000.028, "Control of Temporary Alterations," Revision 23.

- Temporary alteration to remove Door 48, red train south vital switchgear room to turbine building door per Work Order 50244579 to support maintenance for pulling electrical cabling for Service Water Pump 2P-4B in Unit 1. The door removal was evaluated under Engineering Request ER-ANO-2004-0014-000.
- Temporary alteration to install auxiliary heating for ensuring safety-related battery operability in the EDG corridor in Unit 2. The heater installation was evaluated under Engineering Request ER-ANO-2002-0145-000.

b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness (EP)

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

a. Inspection Scope

The inspector performed an in-office review of Revision 29 to the ANO Emergency Plan submitted November 2003. The revision included removal of the Arkansas Department of Health as a notification recipient in favor of direct notification to local officials, clarification of off-site responsibilities, incorporation of previous changes to the emergency action levels, removal of specific reference to the type of radios used for public alerting, update of the evacuation time study and letters of agreement, removal of specific methods of performing functions such as providing public information and distribution of tone alert radios, and other administrative and editorial changes.

The revision was compared to the previous revisions, to the criteria of NUREG-0654, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," Revision 1, and to the requirements of 10 CFR 50.47(b) and 50.54(q) to determine if the revisions decreased the effectiveness of the plan. The inspector completed one sample during the inspection.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Cornerstone: Occupational Radiation Safety (OS)

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:

- Controls (surveys, posting, and barricades) of three 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; and workers' knowledge of required actions when their electronic personnel dosimeter noticeably malfunctions or alarms.
- Physical and programmatic controls for highly activated or contaminated materials (nonfuel) stored within spent fuel and other storage pools.
- Self-assessments and audits related to the access control program since the last inspection
- Corrective action documents related to access controls
- Radiation work permit briefings and worker instructions
- Adequacy of radiological controls such as required surveys, radiation protection job coverage, and contamination controls during job performance
- Dosimetry placement in high radiation work areas with significant dose rate gradients
- Controls for special areas that have the potential to become very high radiation areas during certain plant operations
- Posting and locking of entrances to all accessible high dose rate - high radiation areas and very high radiation areas
- Radiation worker and radiation protection technician performance with respect to radiation protection work requirements

The inspector reviewed the following areas; however, because the conditions did not exist or an event had not occurred, there were no specific examples to review:

- Performance indicator (PI) events and associated documentation packages reported by the licensee in the occupational radiation safety cornerstone
- Barrier integrity and performance of engineering controls in airborne radioactivity areas
- Adequacy of the licensee's internal dose assessment for any actual internal exposure greater than 50 millirem committed effective dose equivalent
- Licensee event reports (LERs) and special reports related to the access control program since the last inspection
- Licensee actions in cases of repetitive deficiencies or significant individual deficiencies
- Changes in licensee procedural controls of high dose rate - high radiation areas and very high radiation areas

The inspector completed 21 of the required 21 samples.

b. Findings

Introduction. The inspector identified a Green self revealing NCV of Unit 2 Technical Specification 6.13.1 involving the licensee's failure to post and control high radiation areas.

Description. After workers reported "abnormal" electronic dosimeter readings on October 14, 2003, the licensee identified an uncontrolled high radiation area in the Unit 2 sample cooler room. The licensee's subsequent review determined: (1) on October 12, 2003, chemistry personnel notified radiation protection personnel of increased reactor coolant system radioactivity, (2) also on October 12, 2003, radiation protection personnel posted the rooms beside and below the Unit 2 sample cooler room (the primary sample room and the Charging Pump Room 2P-36) as high radiation areas, and (3) the lack of written documentation was the likely cause for this condition not being identified prior to the workers entering the area. Based on this information, the inspector concluded that the licensee had sufficient information and should have identified and controlled the high radiation area on October 12, 2003. The finding is considered to be self-revealing because the licensee was alerted to the situation by circumstances outside its normal process for identifying high radiation areas.

Analysis. The failure to control a high radiation area is a performance deficiency. This finding was greater than minor because it was associated with one of the cornerstone attributes and affected the cornerstone objective, in that, inadequate controls of high

radiation areas affected the licensee's ability to ensure adequate protection of worker health and safety from exposure to radiation. Because the finding involved the potential for workers to receive significant, unplanned, unintended dose as a result of conditions contrary to Technical Specification requirements, the inspector used the occupational radiation safety significance determination process described in Manual Chapter 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process," to analyze the significance of the examples. The inspector determined that the finding was of very low significance because it did not involve (1) ALARA planning and controls, (2) an overexposure, (3) a substantial potential for overexposure, or (4) an impaired ability to assess dose. The issue involved human performance cross-cutting aspects associated with the thoroughness of radiation surveys by radiation protection personnel.

Enforcement. Unit 2 Technical Specification 6.13.1 states, "Pursuant to 20.1601(c), in lieu of the requirements of 20.1601(a), each high radiation area, as defined in 10 CFR Part 20, in which the intensity of radiation is greater than 100 millirem per hour, but equal to or less than 1000 millirem per hour at 30 centimeters from the radiation source or from any surface which the radiation penetrates shall be barricaded and conspicuously posted as a high radiation area and the entrance thereto shall be controlled by radiation work permit." Contrary to this, the licensee did not barricade, post, and control a high radiation area in the Unit 2 sample cooler room. Because the failure to correctly control high radiation areas was determined to be of very low safety significance and has been entered into the licensee's corrective action program as CR 2-2003-01643, this violation is being treated as an NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy: NCV 05000368/2004003-07, Failure to Control a High Radiation Area.

4. OTHER ACTIVITIES

4OA1 PI Verification (71151)

a. Inspection Scope

The inspectors sampled licensee submittals for the four PIs listed below for the period from April 1, 2003 through March 30, 2004. The inspectors verified: (1) the accuracy of the PI data reported during that period and (2) used the PI definitions and guidance contained in NEI 99-02, "Regulatory Assessment Indicator Guideline," Revision 2, to verify the basis in reporting for each data element.

Reactor Safety Cornerstone

- Reactor coolant system specific activity, Units 1 and 2
- Reactor coolant system identified leak rate, Units 1 and 2

The inspectors reviewed operator log entries, daily shift manager reports, plant computer data, CRs, maintenance action item paperwork, maintenance rule data, and PI data sheets to determine whether the licensee adequately verified the PIs listed above. This number was compared to the number reported for the PI during the past 3 quarters.

Enclosure

Also, the inspectors interviewed licensee personnel responsible for compiling the information.

Occupational Radiation Safety Cornerstone

- Occupational Exposure Control Effectiveness PI

Licensee records reviewed included corrective action documentation that identified occurrences of locked high radiation areas (as defined in Technical Specification 6.13.2), very high radiation areas (as defined in 10 CFR 20.1003), and unplanned personnel exposures (as defined in NEI 99-02). Additional items reviewed included radiological control area entry and electronic dosimeter alarm setpoints. The inspector interviewed licensee personnel that were accountable for collecting and evaluating the PI data. In addition, the inspector toured plant areas to verify that high radiation, locked high radiation, and very high radiation areas were properly controlled.

Public Radiation Safety Cornerstone

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

Licensee records reviewed included corrective action documentation that identified occurrences for liquid or gaseous effluent releases that exceeded PI thresholds and those reported to the NRC. The inspector interviewed licensee personnel that were accountable for collecting and evaluating the PI data.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems (71152)

1. Annual Sample Review

a. Inspection Scope

The inspectors chose one issue for more in depth review to verify that licensee personnel had taken corrective actions commensurate with the significance of the issue. The issue and its bases for selection is described below:

- In 2002 during Refueling Outage 2R15, ANO management assigned Unit 2 personnel to work overtime in excess of Technical Specification limits under blanket authorizations. This practice led to a NCV in NRC Inspection Report 05000313/2002002; 05000368/2002002. The inspectors reviewed CR ANO-2-2002-1339 which the licensee used to correct the issue and questioned its effectiveness. The inspectors reviewed protected area ingress and

gress records, interviewed numerous licensee personnel, and reviewed overtime authorization forms from Refueling Outage 1R18 to determine if the corrective action program adequately resolved the issue.

When evaluating the effectiveness of the licensee's corrective actions for this issue, 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

b. Findings and Observations

No findings of significance were identified. While the inspectors found that the licensee had corrected the widespread assignment of overtime, they did find two isolated instances where the licensee's program for the control of overtime was not thorough. These instances involved isolated examples of: (1) working in excess of 24 hours in a 48 hour period without prior authorization, and (2) not meeting the definition of very unusual circumstances for authorized overtime as set forth in Generic Letter 82-12.

2. Cross-References to Problem Identification and Resolution (PI&R) Findings Documented Elsewhere

Section 1R04 documents a condition where the licensee did not take corrective actions to assure that uncalibrated valve position indicators for HPSI and LPSI MOVs were not being used in procedures to operate Unit 2.

Section 1R15 documents a condition where the licensee was not taking timely corrective actions to clean discolored boric acid off of a Unit 2 containment spray pump.

Section 4OA3 documents a condition where licensee personnel did not implement

effective corrective actions to address abnormal conditions in the main turbine lube oil system in Unit 1. As a result, an operator tripped the reactor as a result of confusing indications brought about by the failure to correct the abnormal condition.

3. Semi-Annual Trend Review

a. Inspection Scope

On June 23, 2004, the inspectors completed a semi-annual review of licensee internal documents, reports, audits, and PIs to identify trends that might indicate the existence of more significant safety issues. The inspectors reviewed the following:

- system health indicators
- temporary alterations
- CRs
- work requests
- maintenance rule failures

b. Findings

No findings of significance were identified. However, during the review, the inspectors observed the following issues which were discussed with licensee management:

- Licensee personnel documented 17 instances where personnel discovered amounts of transient combustibles to be in excess of the prescribed administrative limits set for the associated area. Four of these administrative limit violations were identified by NRC inspectors. The inspectors considered these issues minor since the fire hazards analysis limits were not violated, but also considered the large number of instances to be indicative of the existence of a programmatic problem in the control of combustible materials which could result in large amounts of uncontrolled combustibles. The inspectors considered this trend to be examples of poor human performance by multiple disciplines in that the combustibles limits were exceeded by different departments. Licensee management was aware of this performance issue and has implemented corrective actions as set forth in CR ANO-C-2004-0909.
- Licensee personnel documented several dozen instances where training has either lapsed, been inadequate, missed, not performed, incorrectly processed, inappropriately tracked, or incorrectly documented. The number of instances and the variety of the issues have the potential for: (1) using unqualified or undertrained individuals to perform work, (2) reducing the quality of workmanship, and (3) and challenging Technical Specifications manning requirements. None of these instances have actually challenged plant reliability, but the number of findings is indicative of a need for improved oversight of training. Licensee management was aware of this performance issue and has implemented corrective actions as set forth in CR ANO-C-2003-0647 and CR ANO-C-2004-0063.

- Licensee personnel documented numerous instances where too much lube oil was added to equipment important to safety. For example, Emergency Control Room Chillers 2VE-1A and 2VE-1B, Diesel Fire Water Pump P-6B, Unit 2 EDGs 2K-4A and 2K-4B, and the Unit 2 Emergency Feedwater Turbine 2K-3 were all found to have excess oil added and required an evaluation for operability. None of the components were determined to be inoperable, but the inspectors considered the numerous amount of instances to have the potential for making a component inoperable due to an excessive addition of oil in the future. Licensee management was aware of this performance issue and have implemented corrective actions as set forth in CR ANO-C-2004-0526.

4. PI&R Review of Access Control to Radiologically Significant Areas

During the performance of Inspection Procedure 71121.01, the inspector evaluated the effectiveness of the licensee's PI&R processes regarding access controls to radiologically significant areas and radiation worker practices. While comparing the root cause analysis and the corrective action assignments associated with CR 2-2003-01405, the inspector noted that all planned corrective actions were not implemented. Specifically, an action to address one contributing cause stated, "Incorporate lessons learned training of this event into Operations Continuing Training Program. . . ." The action was approved by the corrective action review group and assigned a due date of March 11, 2004; however, a subsequent action assignment was not added to the CR. Licensee representatives confirmed that the corrective action was not implemented. In response, the licensee initiated CR 2-2004-00872 to document the problem.

4OA3 Event Followup (71153)

1. (Closed) LER 05000313/2002001-00, Main Steam Safety Valve As-Found Lift Settings were not Within Technical Specifications Limits

On September 27, 2002, prior to the upcoming scheduled Refueling Outage 1R17, planned surveillance testing revealed the as-found setpoints for three of the eight main steam safety valves on the Steam Header A and five of the eight main steam safety valves on the Steam Header B were outside the limits provided by the Unit 1 Technical Specifications. Three of the main steam safety valves actual lift settings were in excess of the +3 percent nominal setpoint limit. The remaining five main steam safety valves actual lift settings were below the -3 percent nominal setpoint limit. The licensee initiated CRs ANO-1-2002-1088 and -1089, conducted a root cause investigation, and performed subsequent testing of installed and spare safety valves. The licensee determined that the combination of spindle run-out and the change in test method was the root cause. These CRs and their associated root cause investigation were reviewed by the inspectors. This finding constituted a violation of minor significance because the as-found setpoints were bounded by the accident analysis assumptions. This LER is closed.

2. (Closed) LER 05000313/2002002-00: Main Turbine Trip due to Binding of the Mechanical Trip Spool Valve Resulted in an Automatic Actuation of the Reactor Protection System

a. Inspection Scope

The inspectors reviewed the LER and corrective action document CR ANO-2-2002-1144 which documented this event and the circumstances which led to it, to verify that the cause of the October 4, 2002, Unit 1 reactor trip event was identified and that corrective actions were reasonable. The reactor trip was caused by an operator who released the main turbine test lever with a turbine trip signal still in effect. The inspectors reviewed plant parameters and verified that licensee staff properly implemented the appropriate plant procedures and that plant equipment performed as required. The inspectors also reviewed the cause of the sequence of events dating back to the original indication of equipment problems.

b. Findings

Introduction. A self revealing Green finding was identified for the failure of personnel to correct the cause of contaminants in the Unit 1 main turbine lube oil system.

Description. The inspectors discovered that prior to October 2002, the licensee had found and documented the following problems with the operation of the Unit 1 main turbine front standard levers:

- In March 1993, while performing maintenance, the low bearing oil trip failed to trip the main turbine on Unit 1. CR ANO-1-1993-0083 was initiated and its corrective actions included testing the trip block during the shutdown and subsequent startup and increasing the frequency of testing of the trip block to semi-annually.
- In May 1996, the latch/trip lever for the main turbine did not trip. CR ANO-1-1996-0185 was initiated and its corrective actions included increasing testing frequency of the trip block to quarterly.
- In March 2002, the trip pressure for low condenser vacuum and low bearing oil pressure were outside the acceptable ranges. The cause was attributed to a sticking latch/trip lever or sticking of its associated spool. CR ANO-1-2002-0398 was initiated which included corrective actions of scheduling another trip test before summer 2002 and exercising the latch/trip lever.

All of these instances with trouble in the main turbine lube oil system were addressed by increasing the test frequency of the front standard or exercising the affected components. No corrective actions were aimed at determining what was causing the sticking components and preventing recurrence.

On October 4, 2002, with Unit 1 at 42 percent power and in the process of shutting down for Refueling Outage 1R17, the licensee was performing Procedure 1106.009, "Turbine

Oil Trip Test," Supplement 4, "Turbine Startup (Warmup and Roll)," Revision 31, to test the main turbine lube oil system. During the low vacuum and low bearing oil trip portion of the test, the latch/trip lever did not move when the trips occurred. Despite this abnormality, licensee personnel continued with the overspeed trip test.

The test lever was then taken to the test position to override the overspeed trip to inhibit a turbine trip during the test. When the overspeed trip test condition was initiated, the latch/trip lever moved slightly towards the trip position. One of the two local operators attempted to reset the trip by positioning the latch/trip lever to the reset position, but felt resistance in the movement of the lever. After discussions with instrumentation and controls personnel, the operator again attempted to reset the latch/trip lever, but again encountered resistance in movement of the lever. The resistance in the trip lever was an indication that water contamination was interfering with the lever operation. The operator again had discussions with instrumentation and controls personnel. The second operator then ordered the release of the test lever. Because the trip lever was sticking, the turbine trip had not been reset. Consequently when the test lever was released the turbine trip occurred, and as a result, the reactor tripped.

Analysis. The finding is greater than minor because it was analogous to Example 4.d in Appendix E, "Examples of Minor Issues," of Manual Chapter 0612, "Significance Determination Process," in that the failure to take adequate corrective action contributed to an operator error. Using the Phase 1 worksheet in Manual Chapter 0609, "Significance Determination Process," the finding was determined to have very low safety significance (Green) because, although it resulted in a reactor trip, no other complicating events were caused by the error and all mitigating systems remained available to the operators.

Several human performance cross-cutting errors were made which contributed to this finding. First, the operator who was conducting the test later stated that he was only 90 percent certain that the turbine trip had reset, but decided to proceed. Second, despite previous questionable results earlier in the test when the latch/trip lever did not move, the operator decided to continue with the test. Third, the operator never raised either of the first two issues to the on-duty control room supervisor or shift manager. Inclusion of these personnel could have allowed a power reduction of approximately 1 percent to avert a reactor trip or even allow the control room staff to be prepared for the reactor trip.

Enforcement. No violation of regulatory requirements occurred. The inspectors determined that the finding did not represent a noncompliance because it occurred on non-safety secondary plant equipment. Licensee personnel entered this issue into the corrective action program as CR ANO-1-2002-1144. FIN 05000313/2004003-08, Failure to Implement Corrective Actions for Turbine Lube Oil System.

40A4 Cross Cutting Aspects of Findings

Cross-Reference to Human Performance Findings Documented Elsewhere

Section 1R04 describes a condition where HPSI and LPSI valve indicators in Unit 2 were left uncalibrated for approximately 8 years yet were still referenced for use in plant procedures.

Section 1R05 describes a finding where operations personnel staged inadequate equipment as a compensatory action for degraded firefighting equipment upon loss of all manual and automatic suppression to the intake structures.

Section 40A2 documents a trend where numerous groups across the site have repeatedly violated the administrative limits for loading of transient combustibles in various areas throughout both units. Also documented were the repeat instances of overfilling components with oil and inadequate training.

Section 40A3 describes a finding in which a reactor trip was caused by ineffective corrective actions for problems with the main turbine trip oil system. The inspectors noted several human performance errors which led to a turbine trip and reactor trip.

Section 40A5 describes a finding where human errors in the performance of the inspection of the lower reactor vessel head penetration nozzles led to an incomplete inspection.

40A5 Other Activities

1. (Closed) Unresolved Item (URI) 05000368/2003005-04, Design Deficiencies with Mechanical Nozzle Seal Assemblies (MNSAs)

During the Unit 2 Refueling Outage 2R16 in September 2003, licensee personnel discovered leakage from one of the MNSAs that was installed on certain pressurizer heater sleeves to prevent the recurrence of leakage. As part of the inspection effort for this occurrence, regional NRC personnel conducted a review of the design of the MNSA and its installation on the Unit 2 pressurizer. The inspectors found nonconservatisms in the analyses for the MNSA, but the licensee demonstrated and the NRC confirmed that adequate safety margin remained in the design such that ASME Code requirements were met. The licensee documented the problems in CR ANO-2-2003-0070. This URI is closed.

2. Temporary Instruction (TI) 2515/145/150, "Reactor Pressure Vessel Head and Vessel Head Penetration Nozzles"

In October 2002, the inspectors completed the review of the licensee's Unit 1 reactor pressure vessel head bare metal visual examination using TI 2515/145. This review was documented in NRC Inspection Report 0500313/2002-05. TI 2515/145 was not performed on Unit 2. Per TI 2515/150, Section 07, "Expiration," the October 2002

completion of TI 2515/145 was credited as one of the two required TI 2515/150 reviews. Therefore, TI 2515/145 is closed for Units 1 and 2.

3. Temporary Instruction (TI) 2515/152, "Reactor Pressure Vessel Lower Head Penetration Nozzles"

a. Inspection Scope

On April 23, 2004, the inspectors completed the review of the licensee's Unit 1 reactor pressure vessel lower head bare metal visual examination. The inspectors reviewed the licensee's videotape for evidence of boric acid deposits on the lower reactor vessel head. Unit 2 has no bottom mounted penetration nozzles and thus is exempt from inspection under Temporary Instruction 2515/152. The completion of the Unit 1 Reactor Pressure Vessel Lower Head Penetration inspection closes out TI 2515/152 for Arkansas Nuclear One.

b. Findings

Introduction: The inspectors identified a Green NCV of Unit 1 Technical Specification 5.4.1.a for the failure to perform a complete examination of the lower reactor vessel head.

Description: The inspection of the lower reactor vessel head was performed using a video camera mounted on a very small robotic crawler (about 2-3" long) which was magnetically attached to the lower vessel head and looked up at the nozzles and down at the insulation below. A certified Level III nondestructive examiner performed the examination. The examination was conducted in accordance with Procedure 2311.09, "Unit 1 and Unit 2 Alloy 600 Inspection," Revision 5.

The inspectors determined that: (1) the inspection provided 360 degree coverage of all the nozzles, (2) the licensee could identify small boric acid leaks as described in Bulletin 2003-02, "Leakage from Reactor Pressure Vessel Lower Head Penetrations and Reactor Coolant Pressure Boundary Integrity," (3) licensee personnel were able to disposition and resolve identified deficiencies, (4) licensee personnel could determine if there was any pressure boundary leakage or reactor pressure vessel lower head corrosion as described in the bulletin, (5) the clarity of the video was good and the lighting was adequate, and (6) insulation and instrumentation were not impediments.

The inspectors noted that the head did have boric acid stains which the licensee attributed to cavity seal ring leakage during past refueling outages. The licensee did not take any chemical samples of the deposits. There were several locations with flaking high temperature paint and associated corrosion as a result of the past refueling outage cavity seal ring leakage. The licensee appropriately dispositioned the traces of boric acid and flaking paint in their corrective action program. The licensee's examiners were able to verify that there were no leaks in the annulus regions between the bottom head and penetration piping. No material deficiencies that required repair were noted during the inspection of the lower reactor vessel head.

Enclosure

The inspectors identified two impediments for completing a successful inspection of the lower head. First, no landmark or reference point was used to identify each specific nozzle while the inspection progressed. Second, the crawler had an upward view of the inspection surface while the nozzle location map viewpoint was from above.

During the review of the videotape, the inspectors determined that the licensee's examiner lost place-keeping after inspecting 18 of the 52 lower head nozzles. As a result, at least one nozzle was not fully inspected and approximately 24 nozzles were misidentified on the videotape. A significant cause of this loss of placekeeping was the lack of references for the crawler mounted video camera operator.

As a result of concerns raised by the inspectors with performing the bare metal inspection of the bottom mounted instruments, the licensee performed a more in-depth verification of the inspection of the already completed reactor upper head control rod drive mechanism's (CRDM) nozzles. The licensee's review discovered that a 100 percent inspection of the upper head nozzles was not obtained on the initial performance of Procedure 2311.009. This inspection demonstrated that the crawler mounted video camera operator became misoriented and thus all or portions of 15 CRDMs did not receive a full 360° inspection. The licensee's investigation for these missed inspection items identified several causes that involved, in part: (1) a lack of adequate verification and review practices, (2) an inadequate inspection plan, (3) inconsistent crawler paths, and (4) inadequate direction to ensure the video was correctly captured if unexpectedly interrupted.

Analysis. The inspectors determined that this finding was greater than minor since it affected the barrier integrity cornerstone objective for providing reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. Using the Phase 1 worksheets in Manual Chapter 0609, "Significance Determination Process," the issue was determined to have very low safety significance (Green) because no actual leakage from the reactor vessel penetrations was identified on subsequent inspections. This issue involved human performance cross-cutting aspects associated with inattention to detail by engineering personnel during inservice examinations.

Enforcement. Unit 1 Technical Specification 5.4.1.a requires that the licensee establish and implement written procedures recommended in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978 which required procedures for inspections of the reactor coolant system pressure boundary. Attachment 1 of ANO Procedure 2311.009, Step 8.1.7, required that the licensee inspect each incore instrument nozzle at the reactor vessel bottom penetrations for indication of RCS leakage. Contrary to this, the licensee did not inspect 100 percent of the lower head nozzles during their initial inspection of the lower reactor vessel head nozzle penetrations in Refueling Outage 1R18. This finding was of very low safety significance and has been entered into the licensee's corrective action program as CR 1-ANO-2004-0827; therefore, it is being

Enclosure

treated as a NCV consistent with Section VI.A of the NRC Enforcement Policy (NCV 05000313/2004003-09), Failure to Follow Reactor Vessel Bottom Head Inspection Procedure.

4. TI 2515/153, "Reactor Containment Sump Blockage (NRC Bulletin 2003-01)"

a. Inspection Scope

On June 18, 2004, the inspectors completed a review of the licensee's implementation of compensatory measures for the Unit 1 and 2 containment recirculation sumps. The compensatory measures were delineated in Entergy's response to NRC Bulletin 2003-01, Letter 0CAN080302, "60-Day Response to NRC Bulletin 2003-01, Potential Impact of Debris Blockage on Emergency Sump Recirculation at Pressurized Water Reactors," dated August 7, 2003, and Letter 0CAN060402, "NRC Bulletin 2003-01 Additional Information," dated June 10, 2004. In these letters, Entergy described measures that have been implemented to reduce the potential risk of ECCS and containment spray system degradation. These measures addressed:

- Providing operator training on indications of and responses to sump clogging
- Implementing procedure modifications that would delay switchover to the containment sump recirculation
- Ensuring alternate water sources are available to refill the refueling water storage tank
- Implementing more aggressive containment cleaning and increased foreign material controls
- Ensuring containment drainage paths are unblocked
- Ensuring sump screens are free of adverse gaps and breaches

In addition to reviewing the licensee's response to NRC Bulletin 2003-01, the inspectors reviewed the licensee's programs and procedures for performing containment walkdowns and controlling containment coating and insulating materials. Additionally, the inspectors performed containment walkdowns during outages on Unit 2 on February 7, 2004, and Unit 1 on May 8, 2004, to quantify potential debris sources and to check for gaps in the sumps' screened flowpath. The inspectors also viewed the internal portions of the Unit 1 containment sump several times during routine containment walkdowns conducted during Refueling Outage 1R18.

The inspectors observed the installation of one sump-related modification for Unit 1, which was implemented during Refueling Outage 1R18, to address concerns of spalling

and cracking of the concrete liner. The licensee installed a stainless steel liner to prevent

any future complications from the degrading concrete. The TI 2515/153, inspections are complete for Units 1 and Unit 2.

b. Findings

No findings of significance were identified.

5. TI 2515/156, "Offsite Power System Operational Readiness"

a. Inspection Scope

The inspectors collected data from licensee maintenance records, event reports, corrective action documents and procedures and through interviews of station engineering, maintenance, and operations staff as required by TI 2515/156. The data was gathered to assess the operational readiness of the offsite power systems in accordance with NRC requirements such as Appendix A to 10 CFR Part 50, General Design Criterion (GDC) 17; Criterion XVI of Appendix B to 10 CFR Part 50; Plant Technical Specifications (TS) for offsite power systems; 10 CFR 50.63; 10 CFR 50.65(a)(4); and licensee procedures. Documents reviewed for this TI are listed in the attachment under Section 4OA5.

b. Findings

No findings of significance were identified. Based on the inspection, no immediate operability issues were identified. In accordance with TI 2515/156 reporting requirements, the inspectors provided the required data in the work sheets provided with the TI to the headquarters staff for further analysis. This completes the inspection requirements for TI 2515/156.

4OA6 Meetings, Including Exit

On May 7, 2004, a regional inspector presented the results of the inspection of access control to radiologically significant areas to Mr. J. Forbes, Vice President, Operations and other members of his staff. The licensee acknowledged the inspection findings.

On May 7, 2004, a regional inspector presented the results of the inspection of nondestructive examination and steam generator tube inspection activities to Mr. J. Forbes, Vice President, Operations, and other members of his staff. The licensee acknowledged the inspection findings.

On May 27, 2004, regional inspectors presented the results of the permanent plant modifications inspection to Mr. J. Kowalewski, Director, Engineering, and other licensee employees. The licensee acknowledged the inspection findings.

On June 3, 2004, a regional inspector conducted an exit interview by telephone, and presented the inspection results from their review of emergency plan changes to Mr. R. Holeyfield, Emergency Preparedness Manager. The licensee acknowledged the

inspection findings.

On June 30, 2004, the resident inspectors presented the results of their inspections to Mr. C. Eubanks, General Manager, Plant Operations, and other members of the licensee's management staff. The licensee acknowledged the inspection findings.

All of the inspectors noted that while proprietary information may have been reviewed, none would be included in this report.

40A7 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 an NCV.

10 CFR Part 50, Appendix B, Criterion V, states, in part, that activities affecting quality shall be accomplished in accordance with prescribed instructions. From February 2-6 and February 16-20, 2004, during the respective Unit 2 red and green train EDG extended allowed outages, the licensee did not control transient combustibles in the diesel corridor, Fire Area 2109-U to the zero level as prescribed in Procedure OPS-146, "Extended EDG Outage Coordinator Checklist." A heater which was part of a temporary alteration for battery room temperature control was left in the corridor, thereby, introducing transient combustibles which were not controlled. This condition is described in the licensee's corrective action program in CR ANO-2-2004-0821. This finding is of very low safety significance because the amount of added combustibles did not exceed the amount assumed in the licensee's fire hazards analysis.

ATTACHMENT: SUPPLEMENTAL INFORMATION

Enclosure

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

R. Beard, Supervisor, Systems Engineering
S. Bennett, Licensing Specialist
B. Berryman, Manager, Planning and Scheduling
C. Chadburn, Supervisor, Design Engineering
L. Compton, Manager, Engineering Programs and Components
S. Cotton, Manager, Training
G. Dobbs, Supervisor, Design Engineering
C. Eubanks, General Manager, Plant Operations
J. Forbes, Vice President, Operations
F. Forrest, Unit 1 Operations Manager
R. Gordon, Manager, Systems Engineering
A. Hawkins, Licensing Specialist
A. Heflin, Unit 2 Operations Manager
J. Hoffpauir, Manager, Maintenance
R. Holeyfield, Manager, Emergency Planning
B. James, Manager, Alloy 600 Project
D. James, Manager, Licensing
J. Kowalewski, Director, Engineering
R. Lingle, Plant Manager, Operations
D. Meatheany, Steam Generator Lead, Engineering Projects and Components
J. Miller, Manager, Nuclear Engineering Design
T. Mitchell, Director, Nuclear Safety Assurance
K. Nichols, Manager, Design Engineering
G. Parks, Supervisor, Quality Control/Nondestructive Examination
R. Partridge, Manager, Technical Support
B. Patrick, Manager, Radiation Protection
S. Pyle, Licensing Specialist
R. Schwartz, Specialist, Radiation Protection
R. Scheide, Licensing Specialist
W. Sims, Supervisor, Design Engineering
C. Tyrone, Manager, Quality Assurance

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000368/2004003-01	NCV	Failure to correct inaccurate HPSI and LPSI valve position indications (Section 1R04)
05000313/2004003-02 05000368/2004003-02	NCV	Failure to provide adequate compensatory measures for a loss of fire water to the intake structure (Section 1R05)

05000313/2004003-03	NCV	Failure to adequately assess risk due to external conditions (Section 1R13)
05000368/2004003-03		
05000368/2004003-04	NCV	Untimely corrective actions to clean discolored boric acid deposits (Section 1R15)
05000368/2004003-05	NCV	Improperly installed reactor coolant sample sink modification (Section 1R17)
05000313/2004003-06	NCV	Failure to follow tagout procedure in the use of Do Not Operate tags (Section 1R20)
05000368/2004003-07	NCV	Failure to control a high radiation area (Section 2OS1)
05000313/2004003-08	FIN	Failure to implement corrective actions for turbine lube oil System (Section 4OA3)
05000313/2004003-09	NCV	Failure to follow reactor vessel bottom head inspection procedure (Section 4OA5)

Closed

05000368/2003005-04	URI	Mechanical nozzle seal assemblies unresolved item (Section 4OA5)
05000313/2002001-00	LER	Main steam safety valve as-found lift settings were not within Technical Specification limits (Section 4OA3)
05000313/2002002-00	LER	Main turbine Trip due to mechanical trip spool valve resulted in an automatic actuation of the reactor protection system (Section 4OA3)

Discussed

None

LIST OF DOCUMENTS REVIEWED

In addition to the documents called out 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 1R05: Fire Protection (71111.05)

Procedures/Plant Document:

Arkansas Nuclear One Fire Hazards Analysis, Revision 8

Plant Drawings:

FP-101, "Fire Zone Fuel Handling Floor Plan El. 404'-0" and 422'-6", " Sheet 1, Revision 29
FP-102, "Fire Zone Operating Floor Plan El. 386'-0", " Sheet 1, Revision 29
FP-105, "Fire Zone Plan Below Grade El. 335'-0", " Sheet 1, Revision 18

Engineering Calculation

85-E-0053-15, Revision 45

Section 1R08: Inservice Inspection (71111.08)

Nondestructive Examinations

Low Pressure Safety Injection	Pipe to Ell Circumferential Seam	Ultrasonic
Make-up System	Recirculation Orifice	Radiographic
Reactor Vessel Head	Nozzle 61	Liquid Penetrant

Miscellaneous

Arkansas Nuclear One Unit 1 In-Situ Pressure Testing, March 2004

Engineering Report ER-01-R-1001-05, "ANO-1 OTSG 20 Percent Tube Plugging Report,"
Revision 0

Engineering Report ER-ANO-2002-1148-000, "ANO-1 Once Through Steam Generator 1R17
Cycle 18 Operational Assessment," December 2002

Engineering Report ER-ANO-2003-0671-000, "Once-Through Steam Generator Degradation
Assessment for Arkansas Nuclear One Unit 1 1R18," April 2004

Procedure Qualification Record PQR-AS-006, WPS P8-AT-Ag, Revision 9

Procedure Qualification Record PQR-170, "Manual Gas Tungsten & Shielded Metal Arc Welding
(GTAW & SMAW)," Revision 1

Section III, Division 1, Subsection NB, "ASME Boiler and Pressure Vessel Code," 1989 Edition,
No Addenda

Section IX, "ASME Boiler and Pressure Vessel Code," 2001 Edition through 2004 Addenda

TD Y006.0010, "Short Form Catalog for Yokogawa Electrical Indicating Instrumentation,"
Revision 0

Welding Procedure Specification WPS-E-P8-T-A8, Ar, Revision 0

Procedures

54-PT-6-09, "Visible Solvent Removable Liquid Penetrant Examination Procedure," revised February 11, 2004

5120.500, "Steam Generator Integrity Program Implementation," Change Number 010-00-0

5120.509, "Steam Generator Inservice Inspection Implementation Program," Change 001-03-0

5120.518, "ANO Steam Generator Testing and Repair," Change 001-01-0

5120.519, "ANO Steam Generator In-Situ Testing," Change 001-00-0

NDE9.23, "Ultrasonic Examination of Austenitic Piping Welds (ASME Section XI)," Revision 2

NDE9.55, "Radiographic Examination of ASME, ANSI, AWS, API, AWWA Welds, and Components," Revision 2

Weld Packages

04-07, "Piping Downstream of Valve SF-56 (Repair)"

04-27, "Valves MU-1025A and MU-1032A/B (Replacement)"

04-73, "Valve SF-32 (Replacement)"

04-98, "Valve RC-1030B (Repair)"

Work Orders

MAI 11384, MAI 66979, MAI 711110, MAI 711325, MAI 711326, MAI 838620, and MAI 965238

Section 1R15: Operability Evaluations (71111.15)

Photograph of boric acid deposits on containment spray pump 2P-35B

Condition Reports

CRs ANO-1-2004-0104, -00980, -01373; CRs ANO-2-2004-0065, -0253, -0406, -0420, -0446, -0472, -0597, -0671, -0694, and -0722; and CR ANO-C-2002-00596

Procedures

1104.002, "Makeup & Purification System Operation," Supplement 3, "HPI Pump P-36A Test," Change 057-04-0

1104.005, "Reactor Building Spray System Operation," Supplement 3, "RB Spray Pump P-35A Quarterly Test," Change 042-05-0

1107.002, "ES Electrical System Operation," Revision 19

1403.179, "Molded Case Breaker Testing," Revision 3

Engineering Calculations

83-D-1034-03, Revision 0
97-E-0207-01, Revision 3

Section 1R17: Permanent Plant Modifications (71111.17)

V-SG-1-05, "Seismic Evaluation of Sluice Gate SG-1," Revision 1

V-SG-3-10, "MOV Torque Switch Setpoints," Revision 0

85-E-0118-01, "RB Penetration Overcurrent Protection Study," Revision 1

95-E-0059-01, "Amendment to RB Overcurrent Protection Study Calculation 85-E-0118-01,"
Change 0

Condition Reports

CRs ANO-1-2002-00280, -01646; -2004-00793, -01049, -01098, -01496; 2-1998-00334;
and -2004-00950

Drawings

15-FPC-5, "Spent Fuel Cooling Isometric," Revision 5

15-FPC-6, "Spent Fuel Cooling Isometric," Revision 6

MU-200, "Small Pipe Isometric Make-up Pump Discharge 2P-35A, B, & C Disch to 2E-26A & B,"
Revision 9

Engineering Requests

ERs ANO-1997-4783-002; -1998-0912-002, -1037-002; -1999-2143-007, -008; -2000-3258-002;
-2001-0541-001, -002, -1280-000; -2002-0271-000, -0528-005, and -0875-000

Procedures

1012.020, "Radioactive Material Control, "Revision 6

1052.022, "Radiological Effluents and Environmental Monitoring Program," Revision 2

6000.030, "Control of Installation," Revision 7

6010.001, "DCP Development," Revision 8

6010.003, "Limited Change Package and Plant Change Development," Revision 2

6030.005, "Control of Modification Work," Revision 6

6030.100, "Modification Implementation Procedure Program," Revision 4

Section 1R19: Postmaintenance Testing (71111.19)

Procedures

1103.005, "Pressurizer Operation," Supplement 1, Change 030-04-0
1106.006, "Emergency Feedwater Pump Operation," Supplement 11, Change 064-03-0
1106.006, "Emergency Feedwater Pump Operation," Supplement 12, Change 064-03-0
2104.005, "Containment Spray," Supplement 1, Change 041-08-0
2104.036, "Emergency Diesel Generator Operations," Supplement 2A, Change 047-06-0

Section 1R22: Surveillance Testing (71111.22)

Procedures

1103.005, "Pressurizer Operation," Supplement 5, Change 030-04-0
1104.002, "Makeup & Purification System Operations," Supplement 5, Change 057-12-0
2104.029, "Service Water Systems Operations," Supplement 1B, Change 053-08-0
2104.036, "Emergency Diesel Generator Operations," Supplement 2A, Change 047-06-0

Work Order Packages

50689580 and MAI - 75944

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

Radiation Work Permits

2004-1439, "Remove/Replace Plenum; Install/Remove Indexing Fixture"
2004-1442, "Remove/Replace Steam Generator Manways"
2004-1452, "Reactor Head Nozzle Repair Activities"
2004-1453, "Reactor Head Nozzle Inspection"

Procedures

1000.031, "Radiation Protection Manual," Change Notice 019-03-0
1012.017, "Radiological Posting and Entry/Exit," Change Notice 007-03-0
1012.018, "Administration of Radiological Surveys," Change Notice 006-03-0
RP-108, "Radiation Protection Posting," Revision 1, dated January 02, 2002

Condition Reports

CRs C-2003-00397, -00754, -00929; C-2004-00739; 1-2003-00515; 2-2003-01473, and -01643

Audits

QA-15-2003-RBS-1-Multi September 6 through November 19, 2003
QA-14-2004-ANO-1 January 5 through February 19, 2004
LO-ALO-2004-00011 February 23-27, 2004
QS 2003-ENS-017

Section 40A5: Other

Procedures

1104.036, "Emergency Diesel Generator Operations," Revision 41
1107.001, "Electrical System Operations," Revision 60
1015.008, "Unit 2 SDC Control," Revision 18
1015.033, "ANO Switchyard and Transformer Yard Controls," Revision 2
2104.036, "Emergency Diesel Generator Operations," Revision 47
2107.001, "Electrical System Operations," Revision 48

Forms

OPS-146, "Extended EDG Outage Coordinator Checklist" revision dated May 5, 2004

Miscellaneous

Maintenance Rule Database for Unit 1 and Unit 2 Main, Unit Auxiliary, and Startup Transformers

Videotapes associated with Procedure 2311.09, "Units 1 and 2 Alloy 600 Inspection," Revision 5, on the review of reactor vessel lower head inspection

LIST OF ACRONYMS

ANO	Arkansas Nuclear One
ASME	American Society of Mechanical Engineers
CFR	<i>Code of Federal Regulations</i>
CR	condition report
CRDM	control rod drive mechanism
ECCS	emergency core cooling system
EDG	emergency diesel generator
HPSI	high pressure safety injection
kV	kilovolt
LER	licensee event report
LPSI	low pressure safety injection
MOV	motor-operated valve
MNSA	mechanical nozzle seal assembly
MVA	megavolt amp
NCV	noncited violation
PI	performance indicator
PI&R	problem identification and resolution
QCST	Q condensate storage tank
SSC	structure, system, or component
TI	temporary instruction
URI	unresolved item

Unit 2 Containment Spray Pump B
Boric Acid Deposits

