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

September 11, 2009

Kevin Walsh, Vice President, Operations
Entergy Operations, Inc.
Arkansas Nuclear One
1448 S.R. 333
Russellville, AR 72802

SUBJECT: ARKANSAS NUCLEAR ONE - NRC COMPONENT DESIGN BASES INSPECTION REPORT 05000313/2009007; 05000368/2009007

Dear Mr. Walsh:

On July 31, 2009, the U.S. Nuclear Regulatory Commission (NRC) completed a component design bases inspection at your Arkansas Nuclear One facility. The enclosed report documents our inspection findings. The findings were discussed in an exit meeting on July 31, 2009, with you and other members of your staff.

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

Based on the results of this inspection, the NRC has identified two findings that were evaluated under the risk significance determination process. Violations were associated with the findings. Both of the findings were found to have very low safety significance. One of the violations is being characterized as Green and the other has no color associated with it. The violations associated with these findings are being treated as noncited violations, consistent with Section VI.A.1 of the NRC Enforcement Policy. If you contest any of the noncited violations or the significance of the 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, 612 East Lamar Blvd., Suite 400, Arlington, Texas 76011; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at Arkansas Nuclear One. In addition, if you disagree with the characterization of any finding in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region IV, and the NRC Resident Inspector at Arkansas Nuclear One. The information you provide will be considered in accordance with Inspection Manual Chapter 0305.

In accordance with Code of Federal Regulations, 10 CFR 2.390 of the NRC's Rules of Practice, a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Thomas Farnholtz, Chief
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Division of Reactor Safety

Dockets: 50-313; 50-368
Licenses: DPR-51; NPF-6

Enclosure:
NRC Inspection Report 05000313/2009007; 05000368/2009007
w/Attachment: Supplemental Information

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U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Dockets:	50-313, 50-368
Licenses:	DPR-51; NPF-6
Report:	05000313/2009007 and 05000368/2009007
Licensee:	Entergy Operations, Inc.
Facility:	Arkansas Nuclear One, Units 1 and 2
Location:	Junction of Hwy. 64 West and Hwy. 333 South Russellville, Arkansas
Dates:	July 6-10, 2009 July 20-31, 2009
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Accompanying Personnel:	J. Leivo, Electrical Contractor S. Spiegelman, Mechanical Contractor
Others:	S. Wong, Risk Analyst, PRA Operational support and Maintenance Branch
Approved By:	Thomas Farnholtz, Branch Chief Engineering Branch 1

SUMMARY OF FINDINGS

IR 05000313/2009007 and 05000368/2009007; July 31, 2009; Arkansas Nuclear One; baseline inspection, NRC Inspection Procedure 71111.21, *Component Design Basis Inspection*.

The report covers an announced inspection by a team of four regional inspectors and two contractors. Two findings were identified. Both of the findings were of very low safety significance. The final significance of most findings is indicated by their color (Green, White, Yellow, 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 review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, *Reactor Oversight Process*, Revision 4, dated December 2006.

A. NRC-Identified Findings

Cornerstone: Mitigating Systems

- Green. The team identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," which states, in part, that design changes, including field changes, shall be subject to design control measures commensurate with those applied to the original design. Contrary to the above, the licensee failed to adequately perform a seismic evaluation for a modification to the Unit 2 safety-related 125 Vdc battery racks. Specifically, on June 17, 1986, a design change was made to the battery racks to add hand-hold and step-on rails for ease of maintenance and inspection of the battery cells. The seismic evaluation for these rails addressed the impact to the battery rack seismic rating, and determined that the bolts for the rails must not be tightened to a specified torque value, but installed "hand tight only." However, the seismic evaluation failed to address the potential for the rails to fall because the bolts were only hand tight. The licensee has entered this into their corrective action program as Condition Report CR-ANO-2009-01573.

  The failure to perform a seismic evaluation for a modification to the Class 1E battery racks was a performance deficiency. The finding is more than minor because it is similar to Example 3.a of Inspection Manual Chapter 0612, "Power Reactor Inspection Reports," Appendix B, Section 1-3, "Screen for More than Minor – ROP," and it also affected the Mitigating Systems cornerstone attribute of design control to ensure the availability, reliability, and capability of safety systems that respond to initiating events to prevent undesirable consequences, and adversely affected the cornerstone objective because actions were required to be taken to ensure the hand tight bolts and rail met seismic qualifications. Using the Inspection Manual Chapter 0609, "Significance Determination Process," Phase 1 Worksheets, the finding was determined to have very low safety significance (Green) because it was a design issue that did not result in loss of operability or function. The inspectors reviewed the finding for cross-cutting aspects and none were identified because the finding was not indicative of current performance.

Cornerstone: Miscellaneous

- The team identified a noncited violation of 10 CFR 50.9, "Completeness and Accuracy of Information," which states in part that information required by statute or by the Commission's regulations, orders, or license conditions to be maintained by the applicant or the licensee shall be complete and accurate in all material respects. Contrary to the above, the licensee's May 7, 2007, response to Generic Letter 2007-01, "Inaccessible or Underground Power Cable Failures that Disable Accident Mitigation Systems or Cause Plant Transients," did not accurately describe the licensee's programs, procedures, or practices for inspection, testing, and monitoring programs to detect the degradation of inaccessible or underground power cables that support emergency diesel generators, offsite power, essential service water, service water, component cooling water, and other systems that are in the scope of 10 CFR 50.65, "The Maintenance Rule." The licensee asserted in their response to Generic Letter 2007-01, Question 2, that "ANO inspection, testing, and monitoring practices presently include visual cable inspection during routine operations, periodic meggering of cables and connected equipment associated with maintenance activities, and periodic inspection of manholes for dewatering." In fact, there was no evidence that these manholes or cables had ever been periodically or routinely inspected for Unit-1, and none of the cables for either of the units were being routinely inspected as the licensee had asserted.

  The finding was more than minor because the information was material to the NRC's decision making processes. In accordance with Inspection Manual Chapter 0612, "Power Reactor Inspection Reports," the violation was subject to the traditional enforcement process because 10 CFR 50.9 violations impact the NRC's ability to perform its regulatory function. Using the Enforcement Policy, Supplement VII, "Miscellaneous Matters," the inspectors characterized the violation as a Severity Level IV violation because it did not meet the Severity Level I, II or III criteria. NRC management reviewed the finding and determined that it was of very low safety significance. Because the violation was of very low safety significance and was entered into the licensee's corrective action program as Condition Report CR-ANO-C-2009-1415, this violation is being treated as a noncited violation, consistent with the NRC Enforcement Policy, Section VI.A. The inspectors determined that the finding has a crosscutting aspect in the area of problem identification and resolution in that the licensee failed to implement operating experience directly communicated with a generic letter through changes to station processes, procedures, and equipment [P.2(b)].

B. Licensee-Identified Violations.

None were identified.

REPORT DETAILS

1. REACTOR SAFETY

Inspection of component design bases verifies the initial design and subsequent modifications and provides monitoring of the capability of the selected components and operator actions to perform their design bases functions. As plants age, their design bases may be difficult to determine and important design features may be altered or disabled during modifications. The plant risk assessment model assumes the capability of safety systems and components to perform their intended safety function successfully. This inspectable area verifies aspects of the Initiating Events, Mitigating Systems and Barrier Integrity cornerstones for which there are no indicators to measure performance.

1R21 Component Design Bases Inspection (71111.21)

The team selected risk-significant components and operator actions for review using information contained in the licensee's probabilistic risk assessment. In general, this included components and operator actions that had a risk achievement worth factor greater than two or a Birnbaum value greater than 1E-6.

a. Inspection Scope

To verify that the selected components would function as required, the team reviewed design basis assumptions, calculations, and procedures. In some instances, the team performed calculations to independently verify the licensee's conclusions. The team also verified that the condition of the components was consistent with the design bases and that the tested capabilities met the required criteria.

The team reviewed maintenance work records, corrective action documents, and industry operating experience records to verify that licensee personnel considered degraded conditions and their impact on the components. For the review of operator actions, the team observed operators during simulator scenarios, as well as during simulated actions in the plant.

The team performed a margin assessment and detailed review of the selected risk-significant components to verify that the design bases had been correctly implemented and maintained. This design margin assessment considered original design issues, margin reductions because of modifications, and margin reductions identified as a result of material condition issues. Equipment reliability issues were also considered in the selection of components for detailed review. These included items such as failed performance test results; significant corrective actions; repeated maintenance; 10 CFR 50.65(a)1 status; operable, but degraded, conditions; NRC resident inspector input of problem equipment; system health reports; industry operating experience; and licensee problem equipment lists. Consideration was also given to the uniqueness and complexity of the design, operating experience, and the available defense in-depth margins.

The inspection procedure requires a review of 20-30 total samples, including 10-20 risk-significant and low design margin components, 3-5 relatively high-risk operator actions, and 4-6 operating experience issues. The sample selection for this inspection was 13 components, 5 operator actions, and 4 operating experience items.

.2 **Results of Detailed Reviews for Components:**

.2.1 125 Vdc Class 1E Battery 2D11 - Unit 2

a. Inspection Scope

The team conducted an onsite and in office review of the Unit 2, red train 125 Vdc safety-related battery bank 2D11 to assess the design aspects of the battery. The team reviewed sizing calculations, short circuit current calculations, coordination studies, design specifications, installation drawings, modifications made to the battery and battery rack, battery vendor manual, maintenance activities performed on the battery, and held discussions with battery system and design engineering personnel to assess the design, installation, testing configuration, and maintenance of this component. A review of the testing methodology was conducted to verify the batteries were being tested to ensure that design requirements were being met. The licensee tested the Unit 2 batteries for station blackout profile and the team determined that the station blackout profile is more challenging than the loss of offsite power/loss of coolant accident profile. The team also performed a visual inspection of the battery and the environs to assess material condition and to verify the battery met installation design requirements.

b. Findings

Inadequate Design Control for Class 1E Batteries and Battery Racks

Introduction. The team identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion III, Design Control, because the licensee failed to perform a seismic evaluation for a modification made to the Class 1E battery system racks.

Description. The battery bank 2D11 is designed as a three-tier configuration, with the upper tier directly above the second tier. This configuration requires technicians to stand on the battery rack to access the upper tier cells during maintenance. During implementation of Design Change 84-D-2022B-04, “Battery Rack Base Plates,” Revision 0, horizontal rails of angle iron were added to the battery rack for use as a “hand-hold” and a “step-on” to access the upper tier cells for maintenance. A seismic evaluation was performed to assess the impact of adding these rails to the existing battery racks. The results of the evaluation determined that the rail bolting shall be installed “hand-tight only,” vice being tightened to a specified torque value. The basis for installing the bolts “hand-tight only” was to minimize the seismic loads on the battery racks from these hand-hold and step-on rails. However, the licensee did not evaluate the impact of these hand-tight bolts during a seismic event, and the impact that the loose bolts would have on the battery system.

The team reviewed the maintenance and Inspection Procedure 2307.043, “Unit 2 2D-11, 2D-12, and 2D-13 Battery Yearly Inspection,” Change 003, and determined that these hand-tight bolts were not included as part of the battery rack inspection. The inspectors then conducted a walkdown of both trains of the Unit 2 battery systems and identified 10 out of approximately 40 bolts that were less than hand tight.

The inspectors notified the control room concerning the operability of the Class 1E batteries due to the conditions found. The licensee determined that the batteries remained operable due to the seismic forces expected were enveloped by the design loading of the rails and bolts. The licensee took immediate corrective actions to restore the bolts to seismic ratings by “staking” the bolts so that significant force would be required to remove the nuts. The licensee determined that this condition did not apply to the Unit 1 batteries because these rails are not installed on the rack due to the different battery cell and rack design.

Analysis. The team determined that the failure to perform a seismic evaluation for a modification to the Class 1E battery racks was a performance deficiency. This finding closely parallels Inspection Manual Chapter 0612, Appendix E, Example 3.a, and is more than minor because actions were required to be taken to ensure seismic qualifications were restored. Also, the finding affected the Mitigating System cornerstone attribute of design control for ensuring the availability, reliability, and capability of safety systems that respond to initiating events to prevent undesirable consequences, and it adversely affected the cornerstone objective because some bolts were found to be less than hand tight and required actions to be taken to restore seismic qualifications. Using the Inspection Manual Chapter 0609, "Significance Determination Process," Phase 1 Worksheets, the finding was determined to be of very low safety significance (Green), because it was a design issue that did not result in a loss of operability or functionality. The inspectors determined that the finding did not have a crosscutting aspect due to the finding not being indicative of current plant performance.

Enforcement. In accordance with 10 CFR Part 50, Appendix B, Criterion III, "Design Control," states, in part, that design changes, including field changes, shall be subject to design control measures commensurate with those applied to the original design. Contrary to the above, the licensee failed to ensure that the design changes were commensurate with the original design. Specifically, on June 17, 1986, the licensee failed to adequately perform a seismic evaluation for a modification to the Class 1E batteries for Unit 2 to ensure the seismic Category I requirements were met. The licensee failed to evaluate the seismic concerns of the hand-tight bolts vibrating loose and the angle iron rail falling onto the battery terminals. Because this finding is of very low safety significance (Green) and was entered into the licensee’s corrective action program as Condition Report CR-ANO-2-2009-01573, this violation is being treated as a noncited violation, consistent with Section VI.A.1 of the NRC Enforcement Policy: NCV 05000368/2009007-01, “Inadequate Design Control for Class 1E Batteries and Battery Racks.”

.2.2 4160 Vac Supply Breaker to Bus A2 from Unit Aux Transformer 1A212 - Unit 1

a. Inspection Scope

The team inspected the 4160 Vac circuit breaker to verify that the circuit breaker met design basis specifications. The team reviewed selected calculations for protection relay settings, maintenance documents to verify the relays were set to the calculation settings, circuit breaker coordination studies, vendor manuals and maintenance procedures, selected condition reports, and operating experience documents. Interview discussions were also conducted with engineering personnel and operating experience personnel to assess the long-term health of the circuit breaker and assess the proper use of operating experience and scheduled maintenance on the circuit breakers.

b. Findings

No findings of significance were identified.

.2.3 Service Water Pump Motor 2P4B – Unit 2

a. Inspection Scope

The team reviewed information found in the vendor manual for motor ratings, maintenance activities, design ratings, operating experience information, motor performance data, selected condition reports, and preventive maintenance activities to ensure the motors are designed and being maintained to ensure design conditions and assumptions are being met. The team performed a visual inspection of the motor to assess the installation configuration, material condition, and potential vulnerability to hazards.

b. Findings

No findings of significance were identified.

.2.4 Emergency Diesel Generators K-4A and K-4B Air Start Systems - Unit 1

a. Inspection Scope

The team reviewed the capability of the air start system for Unit 1 emergency diesel generators K-4A and K-4B to provide starting air for diesel operations. The review included the plant calculation for the capacity of the air receivers to provide five start attempts as required by the FSAR, and testing done to verify that this requirement was met. Inspectors also reviewed NRC safety evaluations and standard review plans to assure that testing for the five start attempt requirement was met. Inspectors reviewed work orders for replacement of air start components in 1990 and other maintenance, condition reports written on the air start system, the circuit logic which allows alternating use of redundant components, and technical manuals for operation of air start system components. The inspectors performed a walkdown of the starting air system.

b. Findings

No findings of significance were identified.

.2.5 Service Water Pump P-4C - Unit 1

a. Inspection Scope

The team reviewed the capability of service water pump P-4C to provide cooling water as required by the FSAR. The review included inservice test reports that recorded and trended flow and vibration data; work orders for pump maintenance and recent repairs to pump bearings; calculations that assure adequate net positive suction head, pump submergence, and flow during all design circumstances; an analysis of the potential for water hammer in the service water system; service water system operating procedures; and an analysis of the environmental conditions in the intake structure housing the pumps. The inspectors performed a walkdown of the service water pumps.

b. Findings

No findings of significance were identified.

.2.6 High Pressure Injection Pump P-36A – Unit 1

a. Inspection Scope

The team reviewed the capability of high pressure injection pump P-36A to inject water into the reactor core following a loss of coolant accident. The review included inservice test reports that recorded and trended flow and vibration, condition reports, work orders for maintenance and repairs including recent refurbishment of pump P-36A and motor, an analysis of net positive suction head available during piggyback operations, a complete high pressure injection system analysis, analyses to demonstrate that environmental conditions in the pump room will remain acceptable during adverse conditions, and calculations for the adequacy of replacement lube oil coolers for the high pressure injection pumps. The inspectors performed a walkdown of high pressure injection pump P-36A and related equipment.

b. Findings

No findings of significance were identified.

.2.7 Emergency Feedwater Pump P-7A – Unit 1

a. Inspection Scope

The team reviewed the capability of emergency feedwater pump P-7A, the steam turbine-driven pump, to provide feedwater to the once-through steam generators during accident conditions. The review included the calculations for pump margins, net positive suction head, and minimum flow. The team also reviewed the setpoint basis and supporting instrument uncertainty calculations for the low steam generator level setpoints that are used to automatically start the pump for a loss of main feedwater event to determine the adequacy of the setpoint for initiating emergency feedwater. The inspectors also reviewed changes to the low level setpoints in response to the replacement of the once-through steam generators. The inspectors reviewed inservice test report trends for pump flow and vibration, work orders for maintenance and repairs, condition reports, and operating procedures for emergency feedwater initiation and pump operations. The inspectors performed a walkdown of emergency feedwater pump P-7A.

b. Findings

No findings of significance were identified.

.2.8 21.5 / 6.9 / 4.16 kV Startup Transformer 1 (X03)

a. Inspection Scope

The team reviewed the electrical one-line diagrams, loading calculations, electrical protection, and nameplate data to determine the adequacy of the transformer to supply required power at acceptable voltage to the associated 4160 Vac buses. The team reviewed recent results of transformer preventive maintenance including dissolved gas analysis, temperature trending, and protective relay calibrations. The team reviewed recent system health reports and associated corrective action history. The team also interviewed the transformer system engineer and performed a visual inspection of the transformer to assess the installation configuration, material condition, and potential vulnerability of the transformer to external hazards.

b. Findings

No findings of significance were identified.

.2.9 Main Feedwater Block Valve Differential Pressure Transmitters PDT-2700 and PDT-2701

a. Inspection Scope

The team inspected the main feedwater block valve differential pressure transmitters. These instruments provide a differential pressure signal for controlling main feedwater pump speed when the feedwater block valves are closed. The team reviewed the risk basis for these instruments with respect to their potential contribution to feedwater transients and reviewed the potential vulnerability to common cause failures and their consequences. This included a review of instrument loop and schematic diagrams interfacing with the integrated control system to identify potential common cause failure modes resulting from power supply failures or other circuit failures, as well as interviews with the integrated control system engineer. The team also reviewed the last three calibration records and 3-year corrective action history for the instruments to assess their reliability.

b. Findings

No findings of significance were identified.

.2.10 Emergency Diesel Generator DG 1 – Unit 2

a. Inspection Scope

The team inspected the Unit 2 emergency diesel generator 1 cooling water system and exhaust system including fires that were reported for this diesel generator. The cooling water system review included all available and credited supply sources. The review included the analysis of both the elevated seasonal water temperature and lowering of design flow to account for measured fouling measurements of the emergency diesel generator heat exchanger. Also reviewed were consistency with the technical specification requirements and the UFSAR description of the cooling water system. The team reviewed corrective actions that were issued during the inspection that relate to a revision of the emergency diesel generator operating procedure to clarify the operator information to account for lowered emergency diesel generator ratings during a design basis accident due to high water temperatures. Corrective actions were investigated for a vendor identified tube cross-flow issue. The exhaust system review consisted of reviews that have taken place to address oil leaks and subsequent fires. Also reviewed was the change in insulation on the emergency diesel generator and restoring the insulation to the original “hard” insulation design.

b. Findings

No findings of significance were identified.

.2.11 Reactor Coolant Pumps – Unit 2:

a. Inspection Scope

The team inspected the reactor coolant pumps based on the high risk significance of the number two seal and industry issues that have been identified for the seals resulting in concerns about potential low margin. Issues that have been identified relate to seal wear due to a variety of factors – the most significant being debris, resulting in seal wear and inadequate venting, due to human error. The industry issues resulted in plant shut downs and extended outages but direct safety significant events were not evident. Condition reports and maintenance work requests for Unit 2 for the past 3 years, were reviewed and an interview was conducted with the systems engineer. Plans to replace the reactor coolant pump seals due to normal wear were reviewed and no unusual factors were identified consistent with the industry concerns. In addition the reactor coolant pump maintenance procedures design margin issues, maintenance logs, drawings and calculations were reviewed to assure consistency with the UFSAR and technical specifications.

b. Findings

No findings of significance were identified.

.2.12 Service Water (SW) Pump 2P4B – Unit 2

a. Inspection Scope

The team inspected the Unit 2 service water pump to determine if it meets the functional requirements in the UFSAR and if it had been operated and maintained consistent with plant operating procedures and technical specifications requirements. The team performed an interview of the systems engineer and conducted a walkdown of the pump, motor, pump-house, and intake system. Net positive suction head, service water flow, and emergency cooling pond calculations were reviewed and data was collected for 10 years of measurements for water temperature. The team reviewed pump testing history and maintenance records. The team identified from trending data that degradation of the service water pump flow was occurring and could continue to the point that the pump no longer satisfied the design basis requirements within the next several years. The licensee identified that plans were in place to replace the pump internal components during the next available outage. The team reviewed the work order to implement the replacement of the pump components.

b. Findings

No findings of significance were identified.

.2.13 High Pressure Safety Injection Pump 2P89C – Unit 2

a. Inspection Scope

The team inspected the Unit 2 high pressure safety injection pump 2P89C. The team interviewed the system engineer to evaluate the current and past operation of the pump and plans for future modifications. The team performed a walkdown of the three high pressure safety injection pumps to determine the physical condition of the pumps and connecting piping, cabling, and instrumentation. The team reviewed calculations relating to net positive suction head and pump flow. The team also reviewed tests and calculations for system response time to assure that the pump complied with the design requirements. Condition reports, work orders, and test results were reviewed for the past 3 years. The team also reviewed design documents including the pump manual, drawings, and operating procedures.

b. Findings

No findings of significance were identified.

.3 Results of Reviews for Operating Experience

.3.1 Inspection of NRC Generic Letter 2007-01, "Inaccessible or Underground Power Cable Failures that Disable Accident Mitigation Systems or Cause Plant Transients"

a. Inspection Scope

Generic Letter 2007-01 documented failures of safety-related cables and their associated systems at several sites due to long-term exposure to moisture. The generic letter requested the licensee to submit the status of all cable failures for those cables in the scope of the generic letter that were inaccessible or underground and requested a description of inspection, testing, and monitoring programs associated with these cables. The team reviewed the licensee's response to the generic letter, which reported five such cable failures, and described the licensee's inspection, testing, and monitoring programs. To assess the licensee's disposition of issues identified in the generic letter, the team selected the ANO service water pump motor feeder cables and the 22 kV cables serving startup transformer 1 from the switchyard and reviewed associated documents including manhole, ductbank, and raceway drawings; available cable specifications; available procedures and completed work orders for dewatering and inspection of manholes; megger test data and procedures for cable testing; and corrective action history associated with any cable degradation or failures since 2005. The team reviewed the types of insulation systems for the cables that replaced the failed cables and the scope of replacement. The team also visually inspected the external configuration and visible conditions of the manholes and conduit runs for these cables, and interviewed cognizant licensee staff.

b. Findings

Failure to Provide Accurate Information in Response to Generic Letter 2007-01, "Inaccessible or Underground Power Cable Failures that Disable Accident Mitigation Systems or Cause Plant Transients"

Introduction. The team identified a noncited violation of 10 CFR 50.9, "Completeness and Accuracy of Information," because the licensee's May 7, 2007, response to Generic Letter-2007-01 did not accurately describe the licensee's programs, procedures, or practices for inspection, testing, and monitoring programs to detect the degradation of inaccessible or underground power cables that support emergency diesel generators, offsite power, essential service water, service water, component cooling water, and other systems that are in the scope of 10 CFR 50.65 (the Maintenance Rule).

Description. The licensee asserted in their May 7, 2007, response to Generic Letter 2007-01, Question 2, that "ANO inspection, testing, and monitoring practices presently include visual cable inspection during routine operations, periodic meggering of cables and connected equipment associated with maintenance activities, and periodic inspection of manholes for dewatering. The ANO corrective action program is used to determine root cause and extent of conditions where deemed necessary and would be the mechanism for determining the need for and extent of any increased cable monitoring."

Contrary to the licensee's assertion, the team identified the following:

- For ANO-1, the licensee had no procedures for inspecting or dewatering any of the manholes in the scope of Generic Letter 2007-01 or for inspecting cables that had been submerged. There was no evidence that these manholes or associated cables had ever been periodically or routinely inspected.

- For ANO-2, the licensee used their repetitive Maintenance Procedure 50015509, "Perform Security Manhole Inspection for Water Levels and Pump." However, this procedure merely requires that water in a manhole be pumped out, and there is no requirement after the dewatering to record the as-found condition or perform inspections and evaluations of the cable or the integrity of structural components supporting the cables. Therefore, none of the cables for either unit were being routinely inspected as the licensee had asserted.

Regarding inaccessible or potentially submerged cable in the scope of Generic Letter 2007-01, the following as-found conditions were observed by the inspection team during the component design basis inspection.

- As described generally above, there was no evidence that manholes containing the 22 kV cables that provide offsite power to startup transformer 1 (X03) had ever been inspected. The team observed that the manhole covers for these cables were not elevated above grade to prevent groundwater intrusion, and the hatches to one of the manholes (MH-12) were warped and poorly fitted, allowing the potential for water intrusion during a rainstorm. To address the team's concern regarding these types of conditions during the inspection, the licensee

initiated Condition Report CR-ANO-C-2009-01410.

- Procurement and preventive maintenance of the 22 kV cables and the maintenance of these manholes were the responsibility of Entergy Arkansas, the transmission and distribution organization that operates and maintains the switchyard**.** During the inspection, the licensee was unable to retrieve source documentation from Entergy Arkansas regarding the cable configuration (insulation system, material, supports, etc.); cable inspection and testing; and manhole inspection and dewatering. The licensee determined that the original cables from the switchyard to startup transformer 1 had been replaced in 1993, but the licensee was unable to confirm the type of cable from field inspections done during the inspection because the labels were no longer legible. As noted in Generic Letter-2007-01, the failure of power cables that connect offsite power to the safety bus can prevent offsite power recovery far longer than the coping time originally considered for station blackout conditions. The team's review of the licensee's condition reports since 2005 for any cable degradation or failure issues identified several instances of flooded cables, including switchyard control cables.

Analysis. The team determined that the failure to provide accurate information in the licensee's response to Generic Letter 2007-01 was a performance deficiency. The finding is more than minor because the information was material to the NRC's decision making processes. Specifically, the information requested by Generic Letter 2007-01 was to enable NRC staff to determine whether the applicable regulatory requirements identified in the generic letter (10 CFR Part 50, Appendix A, General Design Criteria 4, 17, and 18; 10 CFR 50.65(a)(1); 10 CFR Part 50, Appendix B, Criterion XI), were being met in regard to the operational readiness of critical systems that could cause a plant transient or mitigate accidents, and to obtain further information on cable failures. The inspectors determined that the finding has a crosscutting aspect in the area of Problem Identification and Resolution in that the licensee failed to implement Operating Experience directly communicated with a generic letter through changes to station processes, procedures, and equipment [P.2(b)].

Enforcement. In accordance with 10 CFR 50.9, "Completeness and Accuracy of Information," requires, in part, that information provided to the Commission by an applicant for a license or by a licensee or information required by statute or by the Commission's regulations, Orders, or license conditions to be maintained by the applicant or the licensee shall be complete and accurate in all material respects. Contrary to the above, the licensee provided inaccurate information in their May 7, 2007, response to Generic Letter 2007-01 and did not subsequently notify the NRC as required. Specifically, the licensee asserted in their response to Generic Letter 2007-01, Request 2, that "ANO inspection, testing, and monitoring practices presently include visual cable inspection during routine operations, periodic meggering of cables and connected equipment associated with maintenance activities, and periodic inspection of manholes for dewatering." In fact, there was no evidence that these manholes or cables had ever been periodically or routinely inspected for Unit 1, and none of the cables for either unit were being routinely inspected as the licensee had asserted.

The finding was more than minor because the information was material to the NRC's decision making processes. In accordance with Inspection Manual Chapter 0612, "Power Reactor Inspection Reports," the violation was subject to the traditional enforcement process because 10 CFR 50.9 violations impact the NRC's ability to perform its regulatory function. Using the Enforcement Policy, Supplement VII, "Miscellaneous Matters," the inspectors characterized the violation as a Severity Level IV violation because it did not meet the Severity Level I, II, or III criteria. NRC management reviewed the finding and determined that it was of very low safety significance. Because the violation was of very low safety significance and was entered into the licensee's corrective action program as Condition Report CR-ANO-C-2009-1415, this violation is being treated as a noncited violation, consistent with the NRC Enforcement Policy, Section VI.A.: NCV 05000313;05000368/2009007-02, "Failure to Provide Accurate Information," in Response to Generic Letter 2007-01, "Inaccessible or Underground Power Cable Failures that Disable Accident Mitigation Systems or Cause Plant Transients."

.3.2 Inspection of NRC Information Notice 2007-34, "Operating Experience Regarding Electric Circuit Breakers"

a. Inspection Scope

The team reviewed the licensee's response to this information notice under their Operating Experience Program. The team reviewed the operating experience process and self-assessments. The team evaluated the licensee response to each of the issues identified in NRC Information Notice 2007-34. The team also reviewed condition reports to determine whether the licensee responses have been effective in avoiding the problems discussed in the information notice.

b. Findings

No findings of significance were identified.

.3.3 Inspection of NRC Information Notice 2007-06, "Potential Common Cause Vulnerabilities in Essential Service Water Systems"

a. Inspection Scope

The team reviewed the licensee's response to this information notice under their Operating Experience Program. The team reviewed the operating experience process and self-assessments. The team evaluated the licensee response to the issues identified in NRC Information Notice 2007-06. The team also reviewed condition reports to determine whether the licensee responses have been effective in avoiding the problems discussed in the information notice.

b. Findings

No findings of significance were identified.

.3.4 Inspection of NRC Information Notice 2006-31, "Inadequate Fault Interrupting Rating of Breakers"

a. Inspection Scope

The team reviewed the licensee's response to this information notice under their Operating Experience Program. The team reviewed the operating experience process and self-assessments. The team evaluated the licensee response to the issues identified in NRC Information Notice 2006-31. The team also reviewed condition reports to determine whether the licensee responses have been effective in avoiding the problems discussed in the information notice.

b. Findings

No findings of significance were identified.

.4 Results of Reviews for Operator Actions

The team selected risk-significant components and operator actions for review using information contained in the licensee's probabilistic risk assessment. This included components and operator actions that had a risk achievement worth factor greater than two or Birnbaum value greater than 1E-6.

a. Inspection Scope

For the review of operator actions, the team observed operators during simulator scenarios associated with the selected components as well as observing simulated actions in the plant.

Inspection Procedure 71111.21 requires a review of three to five relatively high-risk operator actions. The sample selection for this inspection was six operator actions.

The selected operator actions were

- Unit 1 – Restoration of power from startup transformer 1 to the bus A2,
- Unit 1 – Plant walkdown of operator actions to re-establish instrument air,
- Unit 2 – Tornado striking the unit and switchyard resulting in a loss of startup transformer 1,
- Unit 2 – Failure of emergency diesel generator 2 to auto start requiring local operator action,
- Unit 2 – Trip of steam driven emergency feedwater pump due to overspeed,
- Unit 2 – Increase in reactor coolant system leakage greater than 625 gallons per minute resulting in a loss of subcooling margin

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA2 Identification and Resolution of Problems

The team reviewed corrective action condition reports associated with the selected components, operator actions and operating experience notifications.

4OA6 Meetings, Including Exit

On July 31, 2009, the team leader presented the inspection results to Mr. Walsh, Vice President of Operations, and other members of the licensee's staff. The licensee acknowledged the findings during the meeting. While some proprietary information was reviewed during this inspection, no proprietary information was included in this report.

Attachment: Supplemental Information

SUPPLEMENTAL INFORMATION
KEY POINTS OF CONTACT

Licensee Personnel

K. Walsh, Vice President, Operations
B. Berryman, General Manager
D. Bice, Acting Manager, Licensing
S. Bonner, Unit 2 Essential Feedwater System Engineer
S. Buser, Engineer, Electrical Design Engineering
P. Buttler, Unit 2 Service Water System Engineer
S. Cecil, Operating Experience
B. Daiber, Manager, Design Engineering
G. Dobbs, Supervisor, Design Engineering, Electrical
J. Eichenberger, Manager, Corrective Actions and Assessment
J. Ekis, Engineer, Components Engineering
K. Gaston, Unit 2 High Pressure Injection System Engineer
J. Hale, Engineer, Civil Engineering
A. Meyer, Engineer, System Engineering
B. Miller, Engineer, Electrical Design Engineering
L. Puckett, Engineer, Electrical Design Engineering
P.Rehm, Engineer, Components Engineering
B. Risner, Engineer, Electrical Design Engineering
C. Shively, Engineer, Electrical and I&C Engineering
A. Smith, Engineer, System Engineering
L. Swartz, Supervisor, Design Engineering
F. Van Buskirk, Licensing Specialist
D. Vest, Unit 2 Emergency Diesel Generator System Engineer
P. Williams, Manager, System Engineering
T. Woodson, Unit 2 Reactor Coolant System, System Engineer

NRC personnel

A. Sanchez, Senior Resident Inspector
J. Josey, Resident Inspector
S. Rotton, Resident Inspector

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000368/2009007-01	NCV	Inadequate Design Control for Class 1E Batteries and Battery Racks (Section 1R21.2.1)
05000313/009007-02 05000368/2009007-02	NCV	Failure to Provide Accurate Information in Response to Generic Letter 2007-01, "Inaccessible or Underground Power Cable Failures that Disable Accident Mitigation Systems or Cause Plant Transients" (Section 1R21.3.1)

LIST OF DOCUMENTS REVIEWED

CONDITION REPORTS

CR-ANO-2-1997-00441	CR-ANO-1-2008-02198	CR-ANO-1-1995-00628
CR-ANO-1-2008-02359	CR-ANO-1-2008-02197	CR-ANO-1-1999-00489
CR-ANO-1-2008-02379	CR-ANO-1-2008-02178	CR-ANO-1-2007-01027
CR-ANO-2-2009-01573	CR-ANO-1-2008-02155	CR-ANO-1-2008-01038
CR-ANO-1-2009-01265	CR-ANO-1-2008-01604	CR-ANO-1-2008-01886
CR-ANO-1-2009-01222	CR-ANO-1-2008-00833	CR-ANO-1-2009-00726
CR-ANO-1-2009-00877	CR-ANO-1-2007-01672	CR-ANO-1-2009-00738
CR-ANO-1-2008-02646	CR-ANO-1-2005-03075	CR-ANO-1-2009-01179
CR-ANO-1-2008-02614	CR-ANO-1-2004-00329	CR-ANO-1-2009-01274
CR-ANO-1-2008-01033	CR-ANO-1-2005-01188	CR-ANO-1-2009-01320
CR-ANO-1-2009-01331	CR-ANO-C-2003-00067	CR-ANO-C-2009-00944
CR-ANO-2-1993-00122	CR-ANO-C-2005-01430	CR-HQN-2009-00296
CR-ANO-2-2003-00178	CR-ANO-C-2006-01386	CR-ANO-2-2009-00893
CR-ANO-2-2007-01267	CR-ANO-C-2007-01820	CR-ANO-C-2009-01410
CR-ANO-2-2009-00227	CR-ANO-C-2009-00706	CR-ANO-C-2009-01415
CR-ANO-2-2006-00959	CR-ANO-2-2007-00452	CR-ANO-2-2007-00628
CR-ANO-2-2007-00451	CR-ANO-2-2007-01063	CR-ANO-2-2007-00718
CR-ANO-2-2007-01222	CR-ANO-2-2007-00630	CR-ANO-2-2007-01221
CR-ANO-2-2009-01086	CR-ANO-2-2009-01020	CR-ANO-2-2008-02181
CR-ANO-2-2009-01590	CR-ANO-2-2009-01600	CR-ANO-2-1991-00514

CALCULATIONS

NUMBER	TITLE	REVISION
86-E-0020-01	1E Station Battery 2D11 Duty Cycle and Sizing Calculation	13
84-D-2022B-04	Battery Rack Base Plates	0
84-D-2022B-04	Battery Rack Base Plates	1

NUMBER	TITLE	REVISION
84-E-0103-045	Panel 2D01 – Plant Protection Study	3
92-E-0072-01	ANO Unit 2, Class 1E, 125 VDC, Train 1, DC Voltage Drop Study	0
84-E-0083-88	Breaker 152-212 – Plant Protection Study	0001
98-E-0010-01	ANO-1 EFW Pump Margins for Performance, NPSH and Minimum Flows	1
92-E-0077-04	Unit 1 EFW System Pump Performance Requirements	1
97-E-0010-01	EFW Pump Suction Low Pressure Alarm	0
87-E-0026-09	EFW Pump Room Temperature Profiles	0
87-D-1127-05	Determination of Minimum Required Air Pressure	2
08-E-0009-02	ANO Unit 1 HPI Pump GSI-191 Downstream Effects Analysis	0
87-E-0011-01	Make Up Pump Room Temperature with no Room Cooler & with One Room Cooler	4
87-D-1016-04	Thermal Hydraulic Calculation for Lube Oil Coolers E39 A,B,C	1
89-D-1012-38	ANO-1 HPI System Analysis	4
89-E-0010-27	HPI NPSH During Piggyback Operations	0
89-E-0044-02	ANO-1 SW Pump NPSH and Submergence Requirements	0
92-D-1019-01	Unit 1 Service Water System Water Hammer Analysis	0
93-D-5015-02	Unit 1 Intake Structure Normal Heating & Ventilation	0
93-D-5015-06	GOTHIC Model for ANO-1 Pump Intake Structure	0
80-D-1083C-01	EFIC System Loop Error and Setpoint Analysis	7
85-EQ-0004-11	Loop Error Analysis for the High Pressure Injection Header Flow Loops	0
85-S-00002-01	ANO-2 Diesel Generator #1 (2K4A) and #2 (2K4B) Loading Calculation	16
91-E-0044-01	Unit 2 EDG Load Acceptance and Capability Study	1
95-E-0001-05	ANO Unit 1 Millstone Study-Startup No. 1 Cases	0

NUMBER	TITLE	REVISION
99-E-0033-03	ANO-2 Containment Cooler Fan Motor Horsepower During a DBA under Power Uprate Conditions	0
85-S-0002-01	ANO-2 Diesel Generator #1(2K4A) and #2(2K4B) Loading Calc	16
91-D-2003-01	Emergency Diesel Generator Capacity Ratings	6
2-M-2012-1	Emergency Diesel Generator Exhaust Line Pressure Drop	004-00-0
91-E-0099-10	ECP Peak Temperature and Inventory Loss Analysis	4
91-E-0099-13	ECP Hydrographic Survey	0
89-D-2049-02	Water Hammer Mitigation Analysis	0
89-E-0040-02	ANO-2 ESFAS Response Time Evaluation	7
92-E-0078-10	HPSI System Maximum 2-pump Flow Evaluation	0
92-E-0078-11	Maximum Safety Related Pump Performance	EC-2243
91-E-0116-01	NPSH Calculation for HPSI and RB Spray	6
92-E-0078-02	Unit 2 HPSI Pump Performance Requirements	0
87-E-0002-01	Need for Over Speed Protection by RCP Motor Braking	0

DESIGN BASIS DOCUMENTS

NUMBER	TITLE	REVISION
UFSAR, Chapter 8.0	Electric Power	
ULD-0-SYS-02	Upper Level Document, ANO Units 1 and 2 Offsite Power System	14
ULD-1-SYS-02	Makeup and Purification/High Pressure Injection System	4
ULD-1-SYS-10	ANO Unit 1 Service Water System	14
ULD-1-SYS-12	ANO Unit 1 Emergency Feedwater System	7
ULD-0-SYS-12	Upper Level Document, ANO Unit 1 Emergency Feedwater System	7
ULD-0-TOP-11	Upper Level Document, ANO Unit 1 and 2 Degraded Grid Voltage	9
ULD-1-SYS-13	Upper Level Document, ANO-1 Main Feedwater System	3

NUMBER	TITLE	REVISION
ULD-2-Sys-01	ANO Upper Level Document, ANO Unit 2, Emergency Diesel Generator	08
ULD-2-SYS-10	ANO Upper Level Document, ANO Unit 2, Service Water System	11
ULD-2-SYS-02	ANO Upper Level Document, ANO Unit 2, High Pressure Safety Injection System	4
ULD-2-SYS-14	ANO Upper Level Document, ANO Unit 2, Reactor Coolant System	0

DRAWINGS

NUMBER	TITLE	REVISION
E-1 Sheet 1	Station Single Line Diagram	54
E-4 Sheet 1	Single Line Meter & Relay Diagram 4160 Volt system, Main Supply	26
E-2017 Sheet 1B	Red Train Vital AC and 125V DC Single Line and Distribution	7
E-2899 Sheet 10	Battery Rack Side View	0
E-2899 Sheet 4	Electrical Equipment Foundation Details	1
M-8958 Sheet 1	Arrangement, (58) LC-31 Cells on Special 2-Step/Tier Spliced EP3 Rack	1
E-102	Schematic Diagram: Diesel Generator Engine Control	29
M-209	Circ. Water, Service Water & Fire Water Intake Structure Equipment	112
	Bailey Meter Company Schematic Diagram D8034779F [PDT-2700 / 2701]	16
	Bechtel Piping Isometric Drawing MFW-202, Pressure Differential Connections CV 2625 & CV 2675 [PDT-2700 / 2701]	4
E-3	Single Line Meter & Relay Diagram, 6900 Volt System	22
E-34	Schematic Meter & Relay Diagram, 4160VSystem, Main Supply	11
E-601, Sheet 1	Electrical Plot Plan - Outdoor Area	33

NUMBER	TITLE	REVISION
E-613	Underground Conduit & Grounding -Transformer Yard Area	13
E-616	Embedded Conduit & Grounding - Intake Structure	22
E-617	Conduit & Tray Layout – Intake Structure	42
E-2801	Plot Plan – Grounding and Underground Conduit Layout	48
E-2814	Underground Conduits Sections and Details	9
E-2815	Underground Conduits Sections and Details	24
E-2817	Underground Conduits Sections and Details	9
E-2818	Manholes 2MH04, 2MH05, 2MH06, 2MH07, 2MH11, 2MH12, & 2MH13	12
M2217, Sheet 1	Piping and Instrument Diagram, Emergency Diesel Generator, Fuel Oil System	1
M-2232 Sheet 1	Piping and Instrument Diagram, Safety Injection System	117
660-M2012-47-3	US Bellows Corp, 20 Flanged Tandem Unit	6/72
Flowserve 4XB950000	4X9C Pump	C
M-2230, Sheet 1	Piping and Instrument Diagram, Reactor Coolant System	78
M-2238, Sheet 1	Piping and Instrument Diagram, Reactor Coolant Pump Connections	56
M-2233,Sheet 1	Piping and Instrument Diagram, Reactor Coolant Pump Oil Collection System	9
T-34325-B	Byron Jackson Pump Curve Drawing Cold Water Retest with Impeller Rework	A

ENGINEERING REPORTS

NUMBER	TITLE	REVISION
ER-ANO-2005-0250-000	2D-11 Battery Bank – Evaluate New Battery Cell Post-to-Connector Strap Misalignment	0
ER-ANO-2000-2804-022	LOCA Containment Analysis – Supplemental Cases for RSG / Power Uprate	5
ER-ANO-2002-0528-002	Electrical System Impacts by HPSI Pump 2P-89B	0

NUMBER	TITLE	REVISION
ER-002368 / Response E202	Review the Following for Impact by the Power Uprate Project Scheduled for 2R15: EDG	0
ER-ANO-2005-149-004	Qualification of 800 gpm Design Flow to the ANO-2 EDG Heat Exchangers	0
ER-ANO-2003-0539-002	ANO-2 SW & ACW Hydraulic Model for Power Uprate	0

SAFETY EVALUATION REPORTS

NUMBER	TITLE	REVISION
SER 139	Safety Evaluation Related to Amendment 139 to Facility Operating License No. DPR-51	0
1CAN109006	Additional Information Concerning the EDG Starting Air Modification – Technical Specification 4.6.1.5 Change Request	0
1CAN099005	Technical Specification 4.6.1.5 change request – EDG starting air modification	0

MAINTENANCE WORK ORDERS

51030923	51082972	00047637	51690580	00037565
51017573-01	51098569	51677580	51681826	00102572
50276823-01	51206591	51648740	51681825	00105175
00201786-01	51211586	51563755	51681824	50274125
00201786-01	51511587	51211821	51667825	50965162
51022781	51511988	51211819	51663546	51006157
51029748	51639804	51086613	51651972	51015202
51038129	51655643	51048133	51569042	51024243
51044902	51668171	51041455	51211674	51085250
51050622	51681720	1409.285	51211673	51510727
51213882	51083680	51038216	51207415	51051075
51020839	51099239	00070276	51022872	

PROCEDURES

NUMBER	TITLE	REVISION/ DATE
2307.043	Unit 2 2D-11, 2D-12, and 2D-13 Battery Yearly Inspection	Change 003

NUMBER	TITLE	REVISION/ DATE
2403.052	Unit 2 2D11, 2D12, 2D13 Battery Bank Maintenance	Change 006
2403.027	Unit II 2D11 Battery Service Discharge Test	Change 013
2403.001	Unit II 2D11 Performance Test Electrical Maintenance	Change 014
1416.038	Siemens Vacuum Circuit Breaker Preventive Maintenance	Change 003
EN-OE-100	Operating Experience Program	7
1105.005	Emergency Feedwater Initiation and Control	32
1106.006	Emergency Feedwater Pump Operation,	76
1104.029	Service Water and Auxiliary Cooling System	72
Repetitive Maintenance Procedure 50015509	Perform Security Manhole Inspection for Water Levels and Pump	June 18-23, 2009
Repetitive Maintenance Procedure 50238547	Perform Transformer PM, X-03 (SU1) Transformer	January 7, 2009
Model Work Order 50236669	Preventive Maintenance – X-01A/B/C/S, X02/3/4, [oil sampling]	0
Model Work Order 51511470-01	Perform X-03 (SU1) Transformer Inspection Performed WO-51511470 on November 9, 2008 Performed WO-50982956 on October 13, 2005	3
EN-DC-153	Preventive Maintenance Component Classification	3
1203.001	ICS Abnormal Operation	Change 010
2104.036	Emergency Diesel Generator Operations	Change 065
2202.010	Standard Attachments, Attachment 11	011
2202.003	Loss of Coolant Accident	010
2311.002	Service Water System Flow Test	17
2104-029	Service Water System Operations	076
2305-048	ESF Anti-Pump Reset Feature Test	055
2104039	HPSI System Operations	055

COMPLETED SURVEILLANCE PACKAGES, CALIBRATIONS, AND TESTS

NUMBER	TITLE	REVISION/ DATE
1305.029	Off-Site Power Undervoltage and Protective Relay Test	Change 008-00-0
1403.171	Insulation Resistance Testing	Change 003-00-0
1403.191	Motor Testing Using MCE/EMAX	Change 005
1416.512	Transformer Differential Relay with Percentage and Harmonic Restraint Performed WO50981778 on October 9, 2005 Performed WO51210858 on November 8, 2008	Change 000-00-0
	Doble Test Data Sheets, X03 Startup 1 Transformer	November 8, 2008
	Doble Test Data Sheets, X03 Startup 1 Transformer	October 13, 2005
WO-50278475	PM Temperature Instruments for SU1 Transformer	October 23, 2003
WO-50968909	PM Temperature Instruments for SU1 Transformer	April 21, 2005
WO-51016885	PM Temperature Instruments for SU1 Transformer	April 14, 2008
WO-51668411-01	Semi-Annual EDG #1 Test per 2104.036 Supplement 1C	October 29,
MAI-28445	PM – SG B MFW Block Valve Delta P	March 9, 2001
WO-50286441-01	Inspect, Clean, and Calibrate PDT-2700 & PDT-2701	May 9, 2004
WO-51034925-01	Inspect, Clean, and Calibrate PDT-2700 & PDT-2701	May 12, 2007

VENDOR MANUALS

NUMBER	TITLE	REVISION
TD C173.0310	Installation and Operating Instructions for C & D Charter Power Systems Standby Battery Vented Cell	0
TDS188 0240	Installation, Operation & Maintenance Instructions for Siemens Type 3AF-GER Vertical Lift	0
TD E147.0010	Diesel Generator Technical Manual	0

NUMBER	TITLE	REVISION
TD E147.0020	Diesel Generator Technical Manual – Air Starting System	0
ULD-1-SYS-01	Emergency Diesel Generator System	5
TD-C470.0020	Installation & Operating Instructions, Fairbanks Morse No. 6900-F Deep Well Turbine Pump	0
TD G080.0950	Instructions – Power Transformer Maintenance	0
TD G080.1490	Instruction Book – Power Transformers	0
TDB580 0040	Instruction Manual, Part ii, Reactor Coolant Pump	7
3800TD8-1	Fairbanks Morse Opposing Engines Technical Manual	
TDF010.0030	Instructions, Diesel Stationary Model 38TD-1/8	
TDF019 0020	Instruction Manual for Service Water Pumps 34 Figure 7000	4
TDI075 0260	Ingersoll Rand, High Pressure, Safety Injection, Pumps	7

MISCELLANEOUS DOCUMENTS

NUMBER	TITLE	REVISION/ DATE
IEEE 450	IEEE Recommended Practice for Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Generating Stations and Substations	1980
Purchase Order 10070193	LCR-31 Lead Calcium Battery	001
	2D11 Battery Trend Data	March 2005 through June 2009
0CAN050701	Response to Generic Letter 2007-01	May 7, 2007
1CANA010602	ANO-1 Issuance of Amendment Re: Revision of the Allowable Value for Emergency Feedwater Initiation and Control Function (TAC No. MC9437)	January 13, 2006
	PM Template for X03 Transformer Component Report	6
	Table of Monitored Parameters, Unit 1 Transformers	June 15, 2009

NUMBER	TITLE	REVISION/ DATE
	ANO Fire Hazard Analysis, Subsection 25.2	12
ANO Letter 2CAN109006	Arkansas Nuclear One – Unit 2, Docket 50-368, License No. NPF-6 Electric Power Systems – Diesel Generator, Technical Specification Change Request	October 9, 1990
ANO Letter 2CAN095201	Arkansas Nuclear One – Unit 2, Docket 50-368, License No. NPF-6 Response to Request for Additional Information and Revision to Technical Change Request for Electrical Power Systems – Diesel Generator	May 12, 1992
NRC Letter Docket 05000368	Issuance of Amendment No. 141 to Facility Operating License No. NPF-6 – Arkansas Nuclear One, Unit No. 2 (TAC No. M77957)	December 15, 1992
LER-50-368-91-015-00	Inadequate vendor analysis of coolant cross flow for Emergency Diesel Generators	0
Specification 6600-M-2012	Specification for Emergency Diesel Generators for ANO Unit 2, Arkansas Power and Light	3
STM 2-03-2	System Training Manual, Reactor Coolant Pumps, RCP Vibration Monitoring	13

Summary of results of insulation tests for ANO service water pump motors / cables performed for pump P4A on October 3, 2007; April 10, 2006; and April 28, 2004; pump P4B on March 26, 2009; September 25, 2007, and April 18, 2006; pump P4C on March 4, 2008, February 27, 2007, and December 10, 2004; pump 2P4A February 17, /2009, January 19, 2008, and January 18, 2007; pump 2P4B on January 20, 2009, September 18, 2007, and September 20, 2005; and pump 2P4C on October 8, 2008, October 11, 2007, and January 5, 2006

Trending data provided by system engineering for startup transformer X03 dissolved gas concentrations determined by portable instrument, March 9 through July 13, 13/2009

Trending data provided by system engineer for Startup Transformer X03 dissolved gas concentrations determined by laboratory analysis, August 4, 2005, through May 14, 2009

WO System Health Report

ANO-2 Reactor Coolant Pump/Motor Major Maintenance History

Unit 2, RCS Design Margin Issues and Actions