



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

February 14, 2011

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

Subject: ARKANSAS NUCLEAR ONE - NRC INTEGRATED INSPECTION REPORT  
05000313/2010005 AND 05000368/2010005

Dear Mr. Schwarz:

On December 31, 2010, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Arkansas Nuclear One facility. The enclosed integrated inspection report documents the inspection findings, which were discussed on January 7, 2011, with you and on February 3, 2011, with Mr. Al Dodds, Manager, Maintenance, and other members of your staff.

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

This report documents one self-revealing finding and six NRC-identified findings which were evaluated under the risk significance determination process as having very low safety significance (five Green and one Severity Level IV). Six of these findings were determined to involve violations of NRC requirements. Additionally, one licensee-identified violation, which was determined to be of very low safety significance, is listed in this report. However, because of the very low safety significance and because they are entered into your corrective action program, the NRC is treating these findings as noncited violations, consistent with Section 2.3.2 of the NRC Enforcement Policy. If you contest any of the violations or the significance of the noncited violations, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555-0001, with copies to the Regional Administrator, U.S. Nuclear Regulatory Commission, Region IV, 612 E. Lamar Blvd, Suite 400, Arlington, Texas, 76011-4125; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555-0001; and the NRC Resident Inspector at the Arkansas Nuclear One facility. In addition, if you disagree with the crosscutting aspect assigned to any finding in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region IV, and the NRC Resident Inspector at Arkansas Nuclear One.

In accordance with 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 NRC's document system (ADAMS), accessible from the NRC Web site at

<http://www.nrc.gov/reading-rm/adams.html>. To the extent possible, your response should not include any personal privacy or proprietary information so that it can be made available to the public without redaction.

Sincerely,

**/RA/**

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

Docket: 50-313; 50-368  
License: DPR-51; NPF-6

Enclosure:  
NRC Inspection Report 05000313/2010005; 05000368/2010005  
w/Attachment: Supplemental Information

cc w/Enclosure:

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02/11/2011	02/11/2011	02/10/2011	02/10/2011	02/11/2011	
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**U.S. NUCLEAR REGULATORY COMMISSION**

**REGION IV**

Docket: 05000313; 05000368

License: DPR-51, NPF-6

Report: 05000313/20100005 and 05000368/2010005

Licensee: Entergy Operations, Inc.

Facility: Arkansas Nuclear One, Units 1 and 2

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

Dates: October 1 through December 31, 2010

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D. Jones, Senior Reactor Inspector, Region III  
J. Larsen, Senior Physical Security Inspector  
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Approved By: Jeffrey A. Clark, P.E., Chief, Project Branch E  
Division of Reactor Projects

## SUMMARY OF FINDINGS

IR 05000313/2010005; 05000368/2010005; 10/01-12/31/2010; Arkansas Nuclear One, Integrated Resident and Regional Report, Operability Evaluations, Emergency Action Level and Emergency Plan Changes, Identification and Resolution of Problems, Event Follow-up, and Other Activities

The report covered a 3-month period of inspection by resident inspectors and announced baseline inspections by region-based inspectors. The report also includes input from a 12 month NRC inspection of facilities for which Entergy Operations, Inc., holds a license, including Arkansas Nuclear One. One Green finding and six noncited violations (five Green and one Severity Level IV) were identified. The significance of most findings is indicated by their color (Green, White, Yellow, or Red) using Inspection Manual Chapter 0609, "Significance Determination Process." The crosscutting aspect is determined using Inspection Manual Chapter 0310, "Components Within the Cross Cutting Areas." Findings for which the significance determination process does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

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

Cornerstone: Initiating Events

- Green. The inspectors documented a self-revealing finding for contract roofers failing to use human performance tools, per Procedure EN-HU-102, "Human Performance Tools," Revision 5, while performing hot work activities on Arkansas Nuclear One's turbine building roof which resulted in two fires. Specifically, contractors committed human performance errors during activities by not performing self- and peer-checks, or demonstrating a questioning attitude which resulted in a fire on September 17 and again on November 18, 2010. These issues were entered into the corrective action program as Condition Reports CR-ANO-1-2010-3231, CR-ANO-C-2010-2428, and CR-ANO-C-2010-2978.

The failure to use human performance error prevention tools as specified in Procedure EN-HU-102, "Human Performance Tools," Revision 5, was a performance deficiency. The performance deficiency was determined to be more than minor because it was associated with the protection against external activities attribute of the Initiating Events Cornerstone, and affected the cornerstone objective to limit the likelihood of those events that upset plant stability during power operations, and therefore a finding. Using Inspection Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the finding was determined to be of very low safety significance because the finding did not contribute to both the likelihood of a reactor trip and the likelihood that mitigation equipment or function would not be available. The finding was determined to have a crosscutting aspect in the area of human performance, associated with work practices, in that the licensee failed to ensure

supervisory and management oversight of work activities, including contractors, such that nuclear safety is supported. Specifically, the licensee failed to provide adequate oversight of the roofing contractor to prevent fires [H.4(c)] (Section 4OA3.2).

#### Cornerstone: Mitigating Systems

Green. The inspectors identified a noncited violation of Technical Specifications 3.8.4, "DC Sources - Operating," Technical Specification 3.8.7, "Inverters – Operating," and Technical Specification 3.8.9, "Distribution Systems – Operating," due to the failure to enter the appropriate technical specification or complete the associated required action prior to the appropriate completion time when the associated emergency chillers were out of service. Specifically, the licensee did not enter the appropriate technical specification for an inoperable system, subsystem, train or component when the all necessary attendant non-technical specification support equipment that are required for the system, subsystem, train, component, or device to perform its specified safety function(s) are also capable of performing their related support function(s). The issue was entered into the licensee's corrective action program as Condition Reports CR- ANO-1-2010-3075 and CR-ANO-1-2011-0204.

The inspectors determined that not entering the appropriate technical specification when the emergency switchgear chillers or applicable room cooling unit were not available to provide the technical specification support function for technical specific emergency switchgear equipment was a performance deficiency. The performance deficiency was determined to be more than minor because it was associated with the design control attribute of the Mitigating Systems Cornerstone, and affected the associated cornerstone objective to ensure availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences and is therefore a finding. Specifically, CALC-93-R-1040-01, "ANO-1 AB Limiting Component Qualification Temperatures," Revision 3 identifies the temperature limits for each applicable room at 120 degrees F except for Room 110 which is 150 degrees F. Licensee Event Report No. 50-313/77-19 described the permanent solution to maintain room temperatures by the installation of two independent chilled water systems (VCH4s and applicable room coolers) to maintain those rooms and associated enclosed equipment (i.e., 480V motor control centers, inverters, battery chargers, instrument AC panels, etc.) below the rated continuous operating temperatures following a loss of coolant accident concurrent with a loss of offsite power, which was accepted by the NRC in a Safety Evaluation Report dated October 10, 1979. Failure to enter Technical Specifications 3.8.4, "DC Sources - Operating," Technical Specification 3.8.7, "Inverters – Operating," and Technical Specification 3.8.9, "Distribution Systems – Operating," due to the loss of the non-technical specification chilled water cooling support system or complete the associated required action prior to the appropriate completion time when the associated emergency chillers were out of service was a violation of technical specifications. Using Inspection Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," the finding was determined to

require a Phase 2 analysis because removing a VCH-4 chiller from service did result in an actual loss of safety function of a single train for greater than its technical specification allowed outage time. The resident inspectors received support from the regional senior reactor analyst and determined that the finding to be of very low safety significance (Green). Specifically, although the function was lost by the designated support equipment (emergency switchgear chillers), representing the technical specification violation, the licensee had an evaluation that credited compensatory measures and specific environmental conditions that assured the overall functionality of the applicable switchgear train was not lost. The inspectors reviewed the engineering change EC-25691, "Prepare EC markup to CALC-92-E-0103-01 to determine maximum outside ambient temperatures and compensatory measures to allow one chiller train to cool DC/BATT/SWGR areas during maintenance," and determined that it supported the conclusion that the compensatory measures in place assured the overall functionality of the applicable switchgear train was not lost, however, the compensatory measures sufficed for the function, but did not satisfy the technical specification switchgear operability requirements. The finding was determined to have a crosscutting aspect in the area of human performance, associated with decision making, in that the licensee did not use conservative assumptions in decision making and adopt a requirement to demonstrate that the proposed action is safe in order proceed rather than a requirement that it is unsafe in order to disapprove the action. Specifically, the licensee approved an engineering change that relied on the use of compensatory actions and non-safety related equipment to support the operability of technical specification equipment when the safety related support equipment was not available or functional and implemented a procedure change that resulted in not entering the appropriate technical specification when applicable non technical specification safety related equipment was out of service [H.1(b)](Section 1R15).

- Green. Inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion X, "Inspection," for the failure to ensure that quality control verification inspections were consistently included and correctly specified in quality-affecting procedures and work instructions for construction-like work activities as required by the quality assurance program. The licensee performed extensive reviews, and inspectors performed independent reviews of the licensee's conclusions as well as independent sampling, to confirm that improper or missed inspections did not actually affect the operability of plant equipment. Entergy initiated prompt fleet-wide corrective actions to ensure proper work order evaluation and proper inclusion of quality control verification inspections. This issue was entered into the corrective action program under Condition Reports CR-HQN-2009-01184 and CR-HQN-2010-0013.

The failure to ensure that adequate quality control verification inspections were included in quality-affecting procedures and work instructions as required by the quality assurance program was a performance deficiency. This programmatic deficiency was more than minor because, if left uncorrected, it could lead to a more significant safety concern in that the failure to check quality attributes could

involve an actual impact to plant equipment. This issue affected the design control attribute of the Mitigating Systems Cornerstone because missed or improper quality control inspections during plant modifications could impact the availability, reliability, and capability of systems needed to respond to initiating events. This performance deficiency was determined to have very low safety significance in Phase 1 of the Significance Determination Process, since it was confirmed to involve a qualification deficiency that did not result in a loss of operability or functionality. The inspectors determined that this performance deficiency involved a crosscutting aspect related to the human performance in decision-making because the licensee did not have an effective systematic process for obtaining interdisciplinary reviews of proposed work instructions to determine whether quality control verification inspections were appropriate [H.1a] (Section 4OA2.4).

- Green. The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion II, "Quality Assurance Program," for the failure to implement the experience and qualification requirements of the quality assurance program. As a result, the licensee failed to ensure that an individual assigned to the position of quality assurance manager met the qualification and experience requirements of ANSI/ANS 3.1-1978 as required by the quality assurance program. Specifically, the individual assigned to be the responsible person for the licensee's overall implementation of the quality assurance program did not have at least 1 year of nuclear plant experience in the overall implementation of the quality assurance program within the quality assurance organization prior to assuming those responsibilities. This issue was entered into the corrective action program as Condition Report CR-HQN-2010-00386.

Failure to ensure that an individual assigned to the position as quality assurance manager met the qualification and experience requirements of ANSI/ANS 3.1-1978 as required by the quality assurance program was a performance deficiency. This performance deficiency was determined to be more than minor because, if left uncorrected, it could create a more significant safety concern. Failure to have a fully qualified individual providing overall oversight to the quality assurance program had the potential to affect all cornerstones, but this finding will be tracked under the Mitigating Systems Cornerstone as the area most likely to be impacted. The issue was not suitable for quantitative assessment using existing Significance Determination Process guidance, so it was determined to be of very low safety significance using Inspection Manual Chapter 0609, Appendix M, "Significance Determination Process Using Qualitative Criteria." The inspectors determined that there was no crosscutting aspect associated with this finding because this issue was not indicative of current performance because the violation occurred more than 3 years ago (Section 4OA2.5).

- Green. The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," which states, in part, that design control measures shall provide for verifying or checking the adequacy of design,

such as by the performance of design reviews, by the use of alternate or simplified methods of calculation, or by the performance of a suitable testing program. Contrary to the above, the licensee failed to assure that design control measures were provided for verifying or checking the adequacy of design, such as by the performance of design reviews, by the use of alternate or simplified calculation methods, or by the performance of a suitable testing program. Specifically, since 1998, the licensee failed to verify the adequacy of the Unit 2 refueling water tank and the condensate storage tank transfer setpoints to prevent potential air entrainment due to vortexing in safety-related pump suction piping. This finding was entered into the licensee's corrective action program as Condition Report ANO-C-2007-1469.

The inspectors determined that the failure to verify the adequacy of the Unit 2 refueling water tank and the condensate storage tank transfer setpoints was a performance deficiency. The finding was more than minor because it was associated with the design control attribute of the Mitigating Systems Cornerstone and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using Inspection Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the inspectors determined that the finding was of very low safety significance (Green) because it was a design or qualification deficiency confirmed not to result in loss of operability or functionality. Specifically, the licensee performed subsequent analysis which demonstrated that vortexing in the refueling water and condensate storage tanks would not impact safety-related pump operation during a design basis event. This finding did not have a crosscutting aspect because the most significant contributor did not reflect current licensee performance (Section 4OA3.3).

#### Cornerstone: Emergency Preparedness

- Severity Level IV. The inspectors identified a noncited violation of 10 CFR 50.54(q) for the failure to apply for and receive approval by the NRC prior to implementing a change that decreased the effectiveness of the Arkansas Nuclear One Emergency Plan. Specifically, the licensee changed the default Protective Action Recommendation from a 2-mile radius and 5 miles downwind for General Emergency conditions to a 5-miles radius and 10 miles downwind which was determined to be a change that decreased the effectiveness of the approved emergency plan and was implemented without application to and approval by the Commission. Because the violation was entered into the licensee's corrective action program as Condition Report CR-ANO-C-2010-02502, it is being treated as a noncited Severity Level IV violation consistent with Section 2.3.2 of the Enforcement Policy.

The failure to submit, for approval, a change to the Arkansas Nuclear One Emergency Plan that decreases emergency plan effectiveness is a performance deficiency. The finding is more than minor because the change made has the

potential to unnecessarily increase the risk to the public. Because this issue has the potential for impacting the NRC's ability to perform its regulatory function, traditional enforcement is applicable in accordance with NRC Inspection Manual Chapter 0612, Appendix B, "Issue Screening." The finding was determined to be a Severity Level IV violation in accordance with Section 6.6.d.1 of the Enforcement Policy because it involved the licensee's ability to meet or implement any regulatory requirement not related to assessment or notification such that the effectiveness of the emergency plan decreases. This violation of NRC requirements occurred on March 13, 2003, no crosscutting aspect is assigned to this finding because it is not indicative of current performance (Section 1EP4).

Cornerstone: Miscellaneous

- Green. The inspectors identified a noncited violation of 10 CFR 26.207(a)(3), "Waivers and Exceptions," associated with the failure of supervisory personnel to appropriately perform face-to-face fatigue assessments. Specifically, supervisory personnel were performing one face-to-face fatigue assessment prior to the first shift worked under a waiver issued for multiple days, and not performing additional assessments for consecutive shifts worked under the same waivers when there was a break of at least 10 hours provided between the successive work periods covered by these waivers. The failure to perform face-to-face supervisory assessments less than 4 hours before individuals began performing work activities under a waiver was a performance deficiency. The licensee entered this issue in their corrective action program as Condition Report CR-ANO-C-2010-2396.

The failure to perform face-to-face supervisory assessments less than 4 hours before individuals began performing work activities under a waiver was a performance deficiency. The performance deficiency was determined to be more than minor because it was associated with the access authorization attribute of the Security Cornerstone, and affected the associated cornerstone objective to provide assurance that the licensee's security system and material control and accounting program use a defense in-depth approach and can protect against (1) the design basis threat of radiological sabotage from external and internal threats and (2) the theft or loss of radiological materials, and is therefore a finding. Using Inspection Manual Chapter 0609, Appendix E, "Baseline Security Significance Determination Process for Power Reactors," Figures 5 and 6, the finding was determined to have very low safety significance because the calculated point total did not exceed the threshold value for a Green noncited violation. The cumulative total for this finding was zero points, which was calculated by factoring the one impact area (vital areas) against Tier III Element 08.02.08, Security Force Work Hours, of the Access Authorization attribute, which resulted in a total of zero points within this attribute. The finding was determined to have a crosscutting aspect in the area of human performance associated with decision making [H.1(b)] in that the licensee failed to use conservative assumptions in decision making and adopt a requirement to

demonstrate that the proposed action is safe in order to proceed rather than a requirement to show it is unsafe in order to disapprove the action. Specifically, the licensee had defined the work period to be 6 weeks without giving appropriate thought about potential consequences of this decision relative to potential fatigue aspects while continuing to work under a waiver (Section 4OA5).

**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 corrective action tracking number are listed in Section 4OA7.

## REPORT DETAILS

### Summary of Plant Status

Unit 1 operated at 100 percent reactor power for the entire inspection period.  
Unit 2 operated at 100 percent reactor power for the entire inspection period.

#### 1. REACTOR SAFETY

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

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

##### Readiness to Cope with External Flooding

##### a. Inspection Scope

The inspectors evaluated the design, material condition, and procedures for coping with the design basis probable maximum flood. The evaluation included a review to check for deviations from the descriptions provided in the Safety Analysis Report for features intended to mitigate the potential for flooding from external factors. As part of this evaluation, the inspectors checked for obstructions that could prevent draining, checked that the roofs did not contain obvious loose items that could clog drains in the event of heavy precipitation, and determined that barriers required to mitigate the flood were in place and operable. Additionally, the inspectors performed an inspection of the protected area to identify any modification to the site that would inhibit site drainage during a probable maximum precipitation event or allow water ingress past a barrier. The inspectors also reviewed the abnormal operating procedure for mitigating the design basis flood to ensure it could be implemented as written. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of one (1) external flooding sample as defined in Inspection Procedure 71111.01-05.

##### b. Findings

No findings were identified.

#### 1R04 Equipment Alignments (71111.04)

##### Partial Walkdown

##### a. Inspection Scope

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

- December 23, 2010, Unit 1, reactor building spray train B with train A inoperable for a surveillance
- December 27, 2010, Unit 2, containment spray train A for planned maintenance on train B

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

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

b. Findings

No findings were identified.

**1R05 Fire Protection (71111.05)**

Quarterly Fire Inspection Tours

a. Inspection Scope

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

- October 13, 2010, Unit 2, Fire Zone 2115-I, boric acid makeup tank room
- November 11, 2010, Unit 2, Fire Zone 2199-G, control room
- November 11, 2010, Unit 1, Fire Zone 129-F, control room

- December 30, 2010, Unit 1, Fire Zone 47-Y, penetration ventilation area
- December 30, 2010, Unit 1, Fire Zones 99-M and 100-N, north and south switchgear rooms
- December 30, 2010, Unit 1, Fire Zone 104-Z, south electrical penetration room

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

These activities constitute completion of six (6) quarterly fire-protection inspection samples as defined in Inspection Procedure 71111.05-05.

b. Findings

No findings were identified.

**1R06 Flood Protection Measures (71111.06)**

a. Inspection Scope

The inspectors reviewed the Safety Analysis Report, the flooding analysis, and plant procedures to assess susceptibilities involving internal flooding; reviewed the corrective action program to determine if licensee personnel identified and corrected flooding problems; inspected underground bunkers/manholes to verify the adequacy of sump pumps, level alarm circuits, cable splices subject to submergence, and drainage for bunkers/manholes; and verified that operator actions for coping with flooding can reasonably achieve the desired outcomes. The inspectors also inspected the areas listed below to verify the adequacy of equipment seals located below the flood line, floor and wall penetration seals, watertight door seals, common drain lines and sumps, sump pumps, level alarms, and control circuits, and temporary or removable flood barriers. Specific documents reviewed during this inspection are listed in the attachment.

- November 24,2010, Unit 1, MH-9 manhole
- December 15, 2010, Unit 1, MH-3 manhole
- December 28, 2010, Unit 2, Area 2010 -LL, 2P-89C high pressure safety injection pump area

These activities constitute completion of one (1) flood protection measures inspection sample and two (2) manhole samples as defined in Inspection Procedure 71111.06-05.

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors reviewed licensee programs, verified performance against industry standards, and reviewed critical operating parameters and maintenance records for the Unit 1 emergency diesel generator 2 lube oil cooler (E-197B) and emergency control room chiller heat exchanger (2VE-1B). The inspectors verified that performance tests were satisfactorily conducted for heat exchangers/heat sinks and reviewed for problems or errors; the licensee utilized the periodic maintenance method outlined in EPRI Report NP 7552, "Heat Exchanger Performance Monitoring Guidelines," the licensee properly utilized biofouling controls; the licensee's heat exchanger inspections adequately assessed the state of cleanliness of their tubes; and the heat exchanger was correctly categorized under 10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants." Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of two (2) heat sink inspection samples as defined in Inspection Procedure 71111.07-05.

b. Findings

No findings were identified.

**1R11 Licensed Operator Requalification Program (71111.11)**

a. Inspection Scope

On November 19, 2010, the inspectors observed a crew of licensed operators in the plant's simulator to verify that operator performance was adequate, evaluators were identifying and documenting crew performance problems, and training was being conducted in accordance with licensee procedures. The inspectors evaluated the following areas:

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

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

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

b. Findings

No findings were identified.

**1R12 Maintenance Effectiveness (71111.12)**

a. Inspection Scope

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

- December 27, 2010, Unit 1, main steam (safety valves)
- December 29, 2010, Unit 1, emergency diesel generators
- December 30, 2010, Unit 1, reactor building system (airlock issues)

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

- Implementing appropriate work practices

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

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

These activities constitute completion of three (3) quarterly maintenance effectiveness samples as defined in Inspection Procedure 71111.12-05.

b. Findings

No findings were identified.

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

a. Inspection Scope

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

- October 21, 2010, Unit 1, elevated risk due to service water intake bay B and not allowing unplanned switchyard work
- October 25, 2010, Unit 2, inverters 2Y1113 and 2Y13 unexpected trip due to a blown fuse

- October 27-28, 2010, Unit 2, turbine building crane use for roof work

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

These activities constitute completion of three (3) maintenance risk assessments and emergent work control inspection samples as defined in Inspection Procedure 71111.13-05.

b. Findings

No findings were identified.

**1R15 Operability Evaluations (71111.15)**

a. Inspection Scope

The inspectors reviewed the following issues:

- November 24, 2010, Unit 1, emergency diesel generator 1 ventilation modification, for depressurization and repressurization during a tornado, that allowed more recirculation air than what was intended following the modification
- December 14, 2010, Unit 1, emergency switchgear chillers, VCH-4A and B, operability due to use of non-safety related normal battery room coolers, VUC-13 A and B, for compensatory actions during times when the chillers were out of service
- December 27, 2010, Unit 2, check valve 2HPS-38 excessive leak rate during a surveillance
- December 29, 2010, Unit 1, emergency diesel generator 1 shutdown capability from the control room

The inspectors selected these potential operability issues based on the risk significance of the associated components and systems. The inspectors evaluated the technical

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

These activities constitute completion of four (4) operability evaluations inspection samples as defined in Inspection Procedure 71111.15-04

b. Findings

Introduction. The inspectors identified a Green noncited violation of Technical Specifications 3.8.4, "DC Sources - Operating," Technical Specification 3.8.7, "Inverters – Operating," and Technical Specification 3.8.9, "Distribution Systems – Operating," due to the licensee's failure to enter the appropriate technical specification or complete the associated required action prior to the appropriate completion time when the associated emergency chillers were out of service. Specifically, the licensee did not enter the appropriate technical specification for an inoperable system, subsystem, train or component when the all necessary attendant non-technical specification support equipment that are required for the system, subsystem, train, component, or device to perform its specified safety function(s) are not capable of performing their related support function(s).

Description. On August 18, 2010, during a Corrective Action Review Board for an apparent cause evaluation related to a previous failure of a temperature switch on the Unit 1 south emergency switchgear room chiller VCH-4B, the inspectors identified that the licensee had an approved procedure based on engineering analysis to credit the use of compensatory actions and non-safety related equipment to maintain the operability of the emergency switchgear when the VCH-4 A/B chillers and/or their respective safety-related emergency battery room cooling units, VUC-14 A/C, were out of service due to failure or planned maintenance. The licensee had procedural guidance contained in Procedure OP-1027.004, "Battery and Emergency Switchgear Cooling System," Revision 34, that allowed the removal of VCH-4A/B and/or VUC-14 A/C for the applicable switchgear room train through the use of a 30 day administrative allowable outage time clock. The inspectors questioned the appropriateness of the practice of entering a proceduralized administrative allowed outage time clock without evaluating the appropriate system operability and entering the appropriate technical specification for the affected system since removal of the chillers/cooling units could place the applicable system in a configuration outside of its design bases for room temperature for

a design basis accident. The issue was entered into the licensee's corrective action program as Condition Report CR-ANO-1-2010-3075.

In September 1977, Licensee Event Report No. 50-313/77-19 was submitted by licensee to inform the NRC that due to an initial design error, four vital areas of the ANO Unit 1 facility which house Class 1E electrical equipment did not have sufficient qualified cooling available to maintain these rooms and the associated enclosed equipment (i.e., 480V motor control centers, inverters, battery chargers, instrument AC panels, etc.) below the rated continuous operating temperatures following a loss of coolant accident concurrent with a loss of offsite power. The proposed permanent solution involved the installation of two independent chilled water systems, seismically and environmentally qualified, and powered from emergency on-site power. Permanent installation of the chillers and cooling equipment was accepted by the NRC in a Safety Evaluation Report dated October 10, 1979.

Licensee design specifications for the switchgear room cooling were based on original hand calculations of switchgear room heat loads. Currently, and most notably since the 2007 time frame, GOTHIC software has been used to provide more robust and accurate modeling of the switchgear rooms and associated heat calculations. As these heat calculations have evolved, procedurally controlled compensatory actions were able to be analyzed and implemented to enhance the emergency switchgear room cooling functionality under post accident conditions for as long as 30 days post accident. Most recently, Procedure OP-1027.004, Revision 34, was approved on December 3, 2009, and referenced engineering calculation CALC-92-E-0103-01, "ANO-1 Switchgear, Battery, DC, and Corridor 98 HVAC Evaluation," Revision 4. In the calculation, design engineering used GOTHIC software to provide robust and accurate modeling of the switchgear rooms and associated heat load calculations. With these calculations, procedurally controlled compensatory actions and reliance on non-safety related equipment (VUC-13A/B) were implemented to enhance the emergency switchgear room cooling functionality under postaccident conditions and maintain the switchgear rooms below their design basis temperature limit. The decision to utilize the nonsafety-related VUC-13 A/B units was considered acceptable by site licensing and design engineering organizations based on the licensee's interpretation of a safety evaluation provided by the Office of Nuclear Regulatory Regulation in 2002 to a different reactor licensee that had requested Generic Letter 80-30 guidance regarding inoperable non-technical specification support subsystems. The inspectors review of the safety evaluation mentioned above and identified that Arkansas Nuclear One, Unit 1, does not have a similar emergency switchgear heating, ventilation, and air conditioning design as the other reactor site, the safety evaluation did not mention the use of nonsafety-related equipment to compensate for the loss of safety-related support equipment, and the safety evaluation was not issued to be used as generic industry guidance. A review of the Unit 1 control room logs identified six instances where this practice occurred between December 31, 2009, and October 29, 2010. In three of those instances, on May 3, 2010, October 5, 2010, and October 19, 2010, the time the safety related switchgear cooling was not functional was in excess of the technical specification allowed outage times of 8-12 hours (36 hours, 41 hours, and 17 hours respectively). The issue was identified to the licensee and entered into the licensee's corrective action

program as Condition Report CR-ANO-1-2011-0204. The licensee understands this issue and has stopped using non-safety related equipment and compensatory actions for non-technical specification equipment in lieu of entering technical specifications for the supported equipment.

Analysis. The inspectors determined that not entering the appropriate technical specification when the emergency switchgear chillers or applicable room cooling unit were not available to provide the technical specification support function for safety related emergency switchgear equipment was a performance deficiency. The performance deficiency was determined to be more than minor because it was associated with the design control attribute of the Mitigating Systems Cornerstone, and affected the associated cornerstone objective to ensure availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences and is therefore a finding. Specifically, CALC-93-R-1040-01, "ANO-1 AB Limiting Component Qualification Temperatures," Revision 3 identifies the temperature limits for each applicable room at 120 degrees F except for Room 110 which is 150 degrees F. Licensee Event Report No. 50-313/77-19 described the permanent solution to maintain room temperatures by the installation of two independent chilled water systems (VCH4s and applicable room coolers) to maintain those rooms and associated enclosed equipment (i.e., 480V motor control centers, inverters, battery chargers, instrument AC panels, etc.) below the rated continuous operating temperatures following a loss of coolant accident concurrent with a loss of offsite power, which was accepted by the NRC in a Safety Evaluation Report dated October 10, 1979. Failure to enter Technical Specifications 3.8.4, "DC Sources - Operating," Technical Specification 3.8.7, "Inverters - Operating," and Technical Specification 3.8.9, "Distribution Systems - Operating," due to the loss of the non-technical specification chilled water cooling support system or complete the associated required action prior to the appropriate completion time when the associated emergency chillers were out of service was a violation of technical specifications. Using Inspection Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," the finding was determined to require a Phase 2 analysis because removing a VCH-4 chiller from service did result in an actual loss of safety function of a single train for greater than its technical specification allowed outage time. The resident inspectors received support from the regional senior reactor analyst and determined the finding to be of very low safety significance (Green). Specifically, although the function was lost by the designated support equipment (emergency switchgear chillers), representing the technical specification violation, the licensee had an evaluation that credited compensatory measures and specific environmental conditions that assured the overall functionality of the applicable switchgear train was not lost. The inspectors reviewed the engineering change EC-25691, "Prepare EC markup to CALC-92-E-0103-01 to determine maximum outside ambient temperatures and compensatory measures to allow one chiller train to cool DC/BATT/SWGR areas during maintenance," and determined that it supported the conclusion that the compensatory measures in place assured the overall functionality of the applicable switchgear train was not lost, however, the compensatory measures sufficed for the function, but did not satisfy the technical specification switchgear operability requirements. The finding was determined to have a crosscutting aspect in the area of human performance, associated with decision making,

in that the licensee did not use conservative assumptions in decision making and adopt a requirement to demonstrate that the proposed action is safe in order proceed rather than a requirement that it is unsafe in order to disapprove the action. Specifically, the licensee approved an engineering change that relied on the use of compensatory actions and non-safety related equipment to support the operability of technical specification equipment when the safety related support equipment was not available or functional and implemented a procedure change that resulted in not entering the appropriate technical specification when applicable non technical specification safety related equipment was out of service [H.1(b)].

Enforcement. Technical Specifications 3.8.4, “DC Sources - Operating,” requires, in part, both DC electrical power subsystems shall be operable in Modes 1, 2, 3, or 4. Technical Specification 3.8.7, “Inverters – Operating,” requires, in part that two red train inverters and two green train inverters shall be operable in Modes 1, 2, 3, or 4. Technical Specification 3.8.9, “Distribution Systems – Operating,” requires, in part that two AC, DC, and 120 VAC electrical power distribution subsystems shall be operable in Modes 1, 2, 3, or 4. Technical Specification 3.8.4 and 3.8.9 require that if one DC electrical power subsystem, or one AC electrical distribution, or one DC electrical distribution, or one 120 VAC electrical power distribution subsystems are inoperable for greater than 8 hours, action must be taken to place Unit 1 in Mode 3 within 12 hours and Mode 5 within 36 hours. Technical Specification 3.8.7 requires that if two or more inverters are inoperable Unit 1 must be placed in Mode 3 within 12 hours and Mode 5 within 36 hours. Contrary to the required action statements, (1) on May 3, 2010, the Red train DC electrical power subsystem, the Red train inverters, and the Red train, AC, DC, and 120 VAC electrical power distribution subsystems should have been declared inoperable due to a lack of emergency switchgear cooling for greater than the allowed outage time, (2) on October 5, 2010, the Green train DC electrical power subsystem, the Green train inverters, and the Green train, AC, DC, and 120 VAC electrical power distribution subsystems should have been declared inoperable due to a lack of emergency switchgear cooling for greater than the allowed outage time, and (3) on October 19, 2010, the Red train DC electrical power subsystem, the Red train inverters, and the Red train, AC, DC, and 120 VAC electrical power distribution subsystems should have been declared inoperable due to a lack of emergency switchgear cooling for greater than the allowed outage time. Because this violation was of very low safety significance, this violation is being treated as a noncited violation consistent with the NRC Enforcement Policy: NCV 05000313/2010005-01, “Exceeded Technical Specification Allowed Outage Time for Electrical Power Systems Due to Loss of Non-Technical Specification Supported Systems”

## **1R19 Postmaintenance Testing (71111.19)**

### **a. Inspection Scope**

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

- October 22, 2010, Unit 1, service water train B pump following planned maintenance
- October 27-30, 2010, Unit 2, containment spray train B system following replacement of the power supply for flow indicator 2-FIS-5610
- November 18, 2010, Unit 1, emergency diesel generator 1 following fuel rack maintenance and testing

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

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

The inspectors evaluated the activities against the technical specifications, the Safety Analysis Report, 10 CFR Part 50 requirements, licensee procedures, and various NRC generic communications to ensure that the test results adequately ensured that the equipment met the licensing basis and design requirements. In addition, the inspectors reviewed corrective action documents associated with postmaintenance tests to determine whether the licensee was identifying problems and entering them in the corrective action program and that the problems were being corrected commensurate with their importance to safety. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of three (3) postmaintenance testing inspection samples as defined in Inspection Procedure 71111.19-05.

b. Findings

No findings were identified.

**1R22 Surveillance Testing (71111.22)**

a. Inspection Scope

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

- Preconditioning
- Evaluation of testing impact on the plant
- Acceptance criteria
- Procedures
- Test data
- Testing frequency and method demonstrated technical specification operability
- Restoration of plant systems
- Reference setting data
- Annunciators and alarms setpoints

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

- November 5, 2010, Unit 1, quarterly inservice test of emergency feedwater valve stroke testing

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

These activities constitute completion of one (1) surveillance testing inspection sample as defined in Inspection Procedure 71111.22-05.

b. Findings

No findings were identified.

**1EP1 Exercise Evaluation (71114.01)**

a. Inspection Scope

The inspectors reviewed the objectives and scenario for the 2010 biennial emergency plan exercise to determine if the exercise would acceptably test major elements of the emergency plan. The scenario simulated a dropped control element assembly, a steam generator tube failure, fission product barrier failures, core damage and a radiological release to the environment via a stuck open main steam safety valve to demonstrate the licensee personnel's capability to implement their emergency plan.

The inspectors evaluated exercise performance by focusing on the risk-significant activities of event classification, offsite notification, recognition of offsite dose

consequences, and development of protective action recommendations, in the Control Room Simulator and the following dedicated emergency response facilities:

- Technical Support Center
- Operations Support Center
- Emergency Operations Facility

The inspectors also assessed recognition of, and response to, abnormal and emergency plant conditions, the transfer of decision-making authority and emergency function responsibilities between facilities, onsite and offsite communications, protection of emergency workers, emergency repair evaluation and capability, and the overall implementation of the emergency plan to protect public health and safety and the environment. The inspectors reviewed the current revision of the facility emergency plan, emergency plan implementing procedures associated with operation of the licensee's emergency response facilities, procedures for the performance of associated emergency functions, and other documents as listed in the attachment to this report.

The inspectors compared the observed exercise performance with the requirements in the facility emergency plan, 10 CFR 50.47(b), 10 CFR Part 50, Appendix E, and with the guidance in the emergency plan implementing procedures and other federal guidance.

The inspectors attended the postexercise critiques in each emergency response facility to evaluate the initial licensee self-assessment of exercise performance. The inspectors also attended a subsequent formal presentation of critique items to plant management. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of one (1) sample as defined in Inspection Procedure 71114.01-05.

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors performed an on-site and in-office review of a 10 CFR 50.54(q) plan change implemented on March 13, 2003, to the Arkansas Nuclear One Emergency Plan, Revision 28. This change replaced the licensee's previous "standard" minimum Protective Action Recommendation based on NRC and Federal Emergency Management Agency (FEMA) guidance, which used the "keyhole" approach (i.e., evacuate all sectors to 2 miles and downwind sectors 2-5 miles) with an evacuation of a 5-mile radius around the plant and 10 miles downwind.

The change was compared 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 standards in 10 CFR 50.47(b) to determine if the revision adequately implemented the requirements of 10 CFR 50.54(q).

These activities constitute completion of one (1) sample as defined in Inspection Procedure 71114.04-05.

b. Findings

Introduction. The inspectors identified a noncited Severity Level IV violation of 10 CFR 50.54(q) for the failure to apply for and receive approval by the NRC prior to implementing a change that decreased the effectiveness of the Arkansas Nuclear One Emergency Plan.

Description. On March 13, 2003, the licensee implemented an emergency plan change that modified the minimum or default Protective Action Recommendation upon declaration of a General Emergency to evacuate a 5-mile radius around the plant and 10 miles downwind. The change replaced the licensee's previous "standard" minimum Protective Action Recommendation based on NRC and FEMA guidance, which used the "keyhole" approach (i.e., evacuate all sectors to 2 miles and downwind sectors 2-5 miles) with an evacuation of a 5-miles radius around the plant and 10 miles downwind.

The licensee's 10 CFR 50.54(q) review stated that the revised Protective Action Recommendation scheme "moves the protective actions issued... in a more conservative direction" and "... the process will be simplified and the recommendation of the utility and state will be made consistent." The licensee concluded that the change to the plan and corresponding change to Procedure 1903.011, "Emergency Response/Notifications," Revision 27, did not reduce the effectiveness of the emergency plan.

Title 10 of the Code of Federal Regulations, Part 50.54(q), requires a nuclear power reactor licensee follow and maintain in effect emergency plans that meet the standards in 10 CFR 50.47(b). Planning standard 10 CFR 50.47(b)(10) states, in part, a range of protective actions has been developed for the plume exposure emergency planning zone, and guidelines for the choice of protective actions during an emergency, consistent with federal guidance, are developed and in place. The inspectors determined that prior to March 2003 the licensee's default protective action was based on NUREG-0654, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," Revision 1, Supplement 3, "Criteria for Protective Action Recommendations for Severe Accidents," dated July 1996. NUREG-0654, Supplement 3, recommended initial evacuation of a 2-mile radius and 5 miles downwind for a severe reactor accident involving actual or projected severe core damage or loss of control of facility.

The EPA's Manual of Protective Action Guides and Protective Actions for Nuclear Incidents (EPA-400-R-92-001, dated May 1992) provides guidance to public officials in establishing emergency response plans and for making protective action decisions during a nuclear incident. This guidance states, in part, the decision to advise members of the public to take an action to protect themselves from radiation from a nuclear incident involves a complex judgment in which the risk avoided by the protective action must be weighed in the context of the risks involved in taking the action.

The inspectors concluded the licensee's change to the default Protective Action Recommendation implemented in the Arkansas Nuclear One Emergency Plan had the potential to unnecessarily increase risk to the public by causing a recommendation to evacuate emergency planning zone residents not affected by a release of radioactive materials, a nonconservative situation. Accordingly, the inspectors determined the licensee's March 2003 changes to the site emergency plan decreased the effectiveness of the plan and should have received prior approval from the NRC before being implemented by the licensee, pursuant to 10 CFR 50.54(q).

Analysis. The failure to submit, for approval, a change to the Arkansas Nuclear One Emergency Plan is a performance deficiency. The finding is more than minor because the change has the potential to unnecessarily increase the risk to the public. Because this issue has the potential for impacting the NRC's ability to perform its regulatory function, traditional enforcement is applicable in accordance with NRC Inspection Manual Chapter 0612, Appendix B, "Issue Screening." The finding was determined to be a Severity Level IV violation in accordance with Section 6.6.d.1 of the Enforcement Policy because it involved the licensee's ability to meet or implement any regulatory requirement not related to assessment or notification such that the effectiveness of the emergency plan decreases. No crosscutting aspect is assigned this finding because it is not indicative of current plant performance.

Enforcement. Title 10 of the Code of Federal Regulations, Part 50.54(q) states, in part, that a licensee may make changes to these plans without Commission approval only if the changes do not decrease the effectiveness of the plans and the plans, as changed, continue to meet the standards of 50.47(b) and the requirements of Appendix E. Proposed changes that decrease the effectiveness of the approved emergency plans may not be implemented without application to and approval by the Commission. Contrary to the above, on March 13, 2003, the licensee implemented a change to their Emergency Plan and implementing procedures, which decreased the effectiveness of the emergency plans. Specifically, the licensee changed the default Protective Action Recommendation from a 2-mile radius and 5 miles downwind for general emergency conditions to a 5-miles radius and 10 miles downwind which was determined to be a change that decreased the effectiveness of the approved emergency plan and implemented without application to and approval by the Commission. Because the violation was entered into the licensee's corrective action program as Condition Report CR-ANO-C-2010-02502, it is being treated as a noncited Severity Level IV violation consistent with Section 2.3.2 of the Enforcement Policy: NCV 05000313; 368/2010005-02, "Failure to Submit for Approval a Decrease in Effectiveness of Emergency Plan."

## **1EP6 Drill Evaluation (71114.06)**

### Training Observations

#### a. Inspection Scope

The inspectors observed a simulator training evolution for licensed operators on November 9, 2010, which required emergency plan implementation by a licensee operations crew. This evolution was planned to be evaluated and included in performance indicator data regarding drill and exercise performance. The inspectors observed event classification and notification activities performed by the crew. The inspectors also attended the postevolution critique for the scenario. The focus of the inspectors' activities was to note any weaknesses and deficiencies in the crew's performance and ensure that the licensee evaluators noted the same issues and entered them into the corrective action program.

The inspectors also observed a simulator training evolution for licensed operators on November 22, 2010, which required emergency plan implementation by a licensee operations crew. This evolution was planned to be evaluated and included in performance indicator data regarding drill and exercise performance. The inspectors observed event classification and notification activities performed by the crew. The inspectors also attended the postevolution critique for the scenario. The focus of the inspectors' activities was to note any weaknesses and deficiencies in the crew's performance and ensure that the licensee evaluators noted the same issues and entered them into the corrective action program.

As part of the inspections, the inspectors reviewed the scenario package and other documents listed in the attachment.

These activities constitute completion of two (2) samples as defined in Inspection Procedure 71114.06-05.

#### b. Findings

No findings were identified.

## **4. OTHER ACTIVITIES**

### **4OA1 Performance Indicator Verification (71151)**

#### .1 Data Submission Issue

##### a. Inspection Scope

The inspectors performed a review of the performance indicator data submitted by the licensee for the third Quarter 2010 performance indicators for any obvious

inconsistencies prior to its public release in accordance with Inspection Manual Chapter 0608, "Performance Indicator Program."

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

b. Findings

No findings were identified.

.2 Mitigating Systems Performance Index - Emergency ac Power System (MS06)

a. Inspection Scope

The inspectors sampled licensee submittals for the mitigating systems performance index - emergency ac power system performance indicator for Units 1 and 2 for the period from the fourth quarter 2009 through the third quarter 2010. To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6. The inspectors reviewed the licensee's operator narrative logs, mitigating systems performance index derivation reports, issue reports, event reports, and NRC integrated inspection reports for the period of October 2009 through September 2010 to validate the accuracy of the submittals. The inspectors reviewed the mitigating systems performance index component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the performance indicator data collected or transmitted for this indicator and none were identified. Specific documents reviewed are described in the attachment to this report.

These activities constitute completion of two (2) mitigating systems performance index emergency ac power system samples as defined in Inspection Procedure 71151-05.

b. Findings

No findings were identified.

.3 Mitigating Systems Performance Index - High Pressure Injection Systems (MS07)

a. Inspection Scope

The inspectors sampled licensee submittals for the mitigating systems performance index - high pressure injection systems performance indicator for Units 1 and 2 for the period from the fourth quarter 2009 through the third quarter 2010. To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6. The inspectors reviewed the

licensee's operator narrative logs, issue reports, mitigating systems performance index derivation reports, event reports, and NRC integrated inspection reports for the period of October 2009 through September 2010 to validate the accuracy of the submittals. The inspectors reviewed the mitigating systems performance index component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the performance indicator data collected or transmitted for this indicator and none were identified. Specific documents reviewed are described in the attachment to this report.

These activities constitute completion of two (2) mitigating systems performance index high pressure injection system samples as defined in Inspection Procedure 71151-05.

b. Findings

No findings were identified.

.4 Mitigating Systems Performance Index - Heat Removal System (MS08)

a. Inspection Scope

The inspectors sampled licensee submittals for the mitigating systems performance index - heat removal system performance indicator for Units 1 and 2 for the period from the fourth quarter 2009 through the third quarter 2010. To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6. The inspectors reviewed the licensee's operator narrative logs, issue reports, event reports, mitigating systems performance index derivation reports, and NRC integrated inspection reports for the period of for the period of October 2009 through September 2010 to validate the accuracy of the submittals. The inspectors reviewed the mitigating systems performance index component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the performance indicator data collected or transmitted for this indicator and none were identified. Specific documents reviewed are described in the attachment to this report.

These activities constitute completion of two (2) mitigating systems performance index heat removal system samples as defined in Inspection Procedure 71151-05.

b. Findings

No findings were identified.

.5 Mitigating Systems Performance Index - Residual Heat Removal System (MS09)

a. Inspection Scope

The inspectors sampled licensee submittals for the mitigating systems performance index - residual heat removal system performance indicator for Units 1 and 2 for the period from the fourth quarter 2009 through the third quarter 2010. To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6. The inspectors reviewed the licensee's operator narrative logs, issue reports, mitigating systems performance index derivation reports, event reports, and NRC integrated inspection reports for the period for the period of October 2009 through September 2010 to validate the accuracy of the submittals. The inspectors reviewed the mitigating systems performance index component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the performance indicator data collected or transmitted for this indicator and none were identified. Specific documents reviewed are described in the attachment to this report.

These activities constitute completion of two (2) mitigating systems performance index residual heat removal systems sample as defined in Inspection Procedure 71151-05.

b. Findings

No findings were identified.

.6 Mitigating Systems Performance Index - Cooling Water Systems (MS10)

a. Inspection Scope

The inspectors sampled licensee submittals for the mitigating systems performance index - cooling water systems performance indicator for Units 1 and 2 for the period from the fourth quarter 2009 through the third quarter 2010. To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6. The inspectors reviewed the licensee's operator narrative logs, issue reports, mitigating systems performance index derivation reports, event reports, and NRC integrated inspection reports for the period of for the period of October 2009 through September 2010 to validate the accuracy of the submittals. The inspectors reviewed the mitigating systems performance index component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the performance indicator data collected or transmitted for this indicator and none were identified. Specific documents reviewed are described in the attachment to this report.

These activities constitute completion of two (2) mitigating systems performance index cooling water system samples as defined in Inspection Procedure 71151-05.

b. Findings

No findings were identified.

.7 Drill/Exercise Performance (EP01)

a. Inspection Scope

The inspectors sampled licensee submittals for the Drill and Exercise Performance, performance indicator for the period from the second quarter 2009 through the second quarter 2010. To determine the accuracy of the performance indicator data reported during those periods, performance indicator definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 5, were used. The inspectors reviewed the licensee's records associated with the performance indicator to verify that the licensee accurately reported the indicator in accordance with relevant procedures and the Nuclear Energy Institute guidance. Specifically, the inspectors reviewed licensee records and processes including procedural guidance on assessing opportunities for the performance indicator; assessments of performance indicator opportunities during predesignated control room simulator training sessions, performance during the biennial exercise, and performance during other drills. Specific documents reviewed are described in the attachment to this report.

These activities constitute completion of the drill/exercise performance sample as defined in Inspection Procedure 71151-05.

b. Findings

No findings were identified.

.8 Emergency Response Organization Drill Participation (EP02)

a. Inspection Scope

The inspectors sampled licensee submittals for the Emergency Response Organization Drill Participation performance indicator for the period from the second quarter 2009 through the second quarter 2010. To determine the accuracy of the performance indicator data reported during those periods, performance indicator definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 5, were used. The inspectors reviewed the licensee's records associated with the performance indicator to verify that the licensee accurately reported the indicator in accordance with relevant procedures and the Nuclear Energy Institute guidance. Specifically, the inspectors reviewed licensee records and processes including procedural guidance on assessing

opportunities for the performance indicator, rosters of personnel assigned to key emergency response organization positions, and exercise participation records. Specific documents reviewed are described in the attachment to this report.

These activities constitute completion of the emergency response organization drill participation sample as defined in Inspection Procedure 71151-05.

b. Findings

No findings were identified.

.9 Alert and Notification System (EP03)

a. Inspection Scope

The inspectors sampled licensee submittals for the Alert and Notification System performance indicator for the period from the second quarter 2009 through the second quarter 2010. To determine the accuracy of the performance indicator data reported during those periods, performance indicator definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 5, was used. The inspectors reviewed the licensee's records associated with the performance indicator to verify that the licensee accurately reported the indicator in accordance with relevant procedures and the Nuclear Energy Institute guidance. Specifically, the inspectors reviewed licensee records and processes including procedural guidance on assessing opportunities for the performance indicator and the results of periodic alert notification system operability tests. Specific documents reviewed are described in the attachment to this report.

These activities constitute completion of the alert and notification system sample as defined in Inspection Procedure 71151-05.

b. Findings

No findings were identified.

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

**40A2 Identification and Resolution of Problems (71152)**

.1 Routine Review of Identification and Resolution of Problems

a. Inspection Scope

As part of the various baseline inspection procedures discussed in previous sections of this report, the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify that they were being entered into the licensee's

corrective action program at an appropriate threshold, that adequate attention was being given to timely corrective actions, and that adverse trends were identified and addressed. The inspectors reviewed attributes that included the complete and accurate identification of the problem; the timely correction, commensurate with the safety significance; the evaluation and disposition of performance issues, generic implications, common causes, contributing factors, root causes, extent of condition reviews, and previous occurrences reviews; and the classification, prioritization, focus, and timeliness of corrective actions. Minor issues entered into the licensee's corrective action program because of the inspectors' observations are included in the attached list of documents reviewed.

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

b. Findings

No findings were identified.

.2 Daily Corrective Action Program Reviews

a. Inspection Scope

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

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

b. Findings

No findings were identified.

.3 Semi-Annual Trend Review

a. Inspection Scope

The inspectors performed a review of the licensee's corrective action program and associated documents to identify trends that could indicate the existence of a more significant safety issue. The inspectors focused their review on repetitive equipment issues, but also considered the results of daily corrective action item screening discussed in Section 4OA2.3, above, licensee trending efforts, and licensee human performance results. The inspectors nominally considered the 6-month period of June 1, 2010, through December 31, 2010, although some examples expanded beyond those dates where the scope of the trend warranted.

The inspectors also included issues documented outside the normal corrective action program in major equipment problem lists, repetitive and/or rework maintenance lists, departmental problem/challenges lists, system health reports, quality assurance audit/surveillance reports, self-assessment reports, and Maintenance Rule assessments. The inspectors compared and contrasted their results with the results contained in the licensee's corrective action program trending reports. Corrective actions associated with a sample of the issues identified in the licensee's trending reports were reviewed for adequacy.

These activities constitute completion of one (1) semi-annual trend inspection samples as defined in Inspection Procedure 71152-05.

b. Findings

No findings were identified.

.4 Selected Issue Follow-up Inspection

a. Inspection Scope

An inspection was performed at the Entergy corporate office in Jackson, Mississippi on June 14-17, 2010, to review the circumstances surrounding missed quality control (QC) verification inspections documented in CR-HQN-2009-01184 and CR-HQN-2010-00013. The issue involved QC verification inspections performed during construction-related activities which were required as part of the Entergy quality oversight and verification programs. The inspection was performed to determine if the licensee had taken corrective actions commensurate with the significance of the identified issues, and to assess the impact, if any, on the operability of plant equipment caused by the missed inspections. This inspection was conducted by inspectors from Regions I, II, and IV, as well as a Senior Program Engineer from the Quality and Vendor Branch of the Office of Nuclear Reactor Regulation. The inspection covered all NRC-licensed sites owned by Entergy Operations, Inc., including Arkansas Nuclear One, James A. Fitzpatrick, Grand Gulf Nuclear Station, Indian Point Units 2 and 3, Palisades Plant, Pilgrim Nuclear Power Station, River Bend Station, Vermont Yankee, and Waterford 3.

The inspectors reviewed root cause analyses documented in Condition Reports CR-HQN-2009-01184 and CR-HQN-2010-00013, and the results of the licensee's extent of condition reviews and plant impact assessments. The inspectors also independently assessed the potential impacts of the missed inspections on the operability of plant equipment by reviewing all of the examples identified by the licensee, and by independently reviewing completed modifications and work orders to identify additional examples. The inspectors also reviewed the corrective action database to assess reported equipment failures in order to assess whether the failure might have involved missed QC verification inspections.

The inspectors assessed causal factors that may have contributed to missing QC verification inspections. This assessment included reviewing the Entergy Quality

Assurance Program Manual (QAPM) requirements, changes made to the QAPM, and the level of agreement between the QAPM and its implementing procedures.

Specific documents reviewed are listed in the attachment.

b. Findings

**Background**

The inspectors identified problems with the implementation of elements of the Quality Assurance (QA) Program that affected the fleet of Entergy Operations Inc., (hereafter referred to as “Entergy”) nuclear power plants that are licensed by the NRC. While the plant organizations are NRC licensees, Entergy also has corporate groups which are not NRC licensees that are actively involved in some activities affecting sites, including program and procedure changes. Entergy adopted a business strategy of adopting standard programs and procedures at all fleet plants.

On October 30, 2009, the NRC discussed with Entergy the initial concerns about whether QC verification inspections were being performed consistently for the types of work that require that level of inspection. Both the nonlicensed and licensed Entergy organizations responded with an appropriate review of the issues. Entergy’s review of work documents that were potentially affected was extensive at each site. Entergy’s total review examined over 320 engineering change documents and 2676 work orders. Of the 30 work orders identified to have QC verification inspection deficiencies affecting eight safety-related design changes, all 30 were determined by Entergy to have sufficient documentation to provide confidence that the equipment was installed correctly. Specific corrective actions were identified and implemented to ensure that QC verification inspections would be included in current and future work documents, including procedure enhancements.

The information provided to the NRC was used to perform a focused inspection in order to assess the impact of the missed verification inspections at each of the NRC-licensed facilities. The inspection documented below independently assessed the potential impact of missed QC verification inspections on the operability of plant equipment, as well as assessing details of QA Program for the Entergy fleet.

Two findings were identified during this inspection. These findings involved missed QC verification inspections at seven Entergy sites, and the assignment of individuals to the QA manager position that did not meet the experience and qualification requirements at eight sites. Only the findings impacting this licensee are described below.

The inspectors concluded that the Entergy fleet organizational structure and Entergy strategy of adopting standardized procedures across the fleet were contributing factors to the findings. Specifically:

- Changes to adopt the standard fleet QA program created a partially conflict with existing requirements for worker qualifications at some sites. The process for creating and revising standardized fleet procedures and programs used to meet

NRC requirements must ensure that site-specific regulatory requirements and commitments are properly addressed for all sites.

- Changes that removed details from existing site-specific QA and QC program implementing procedures while shifting to standardized fleet procedures contributed to the finding involving missed QC verification inspections. Condition reports at individual sites regarding problems related to this issue were not recognized collectively as symptoms of a problem with these procedures because they were addressed at the site level.

#### 1. Failure to Perform Required Quality Control Inspections

Introduction. The inspectors identified a Green noncited violation of 10 CFR Part 50, Appendix B, Criterion X, "Inspection," for the failure to ensure that QC verification inspections were included in quality-affecting procedures and work instructions for construction-like work activities as required by the QA program.

Description. In response to the inspectors request for information concerning implementation of the quality oversight and verification programs, the licensee performed a review of a representative sample of engineering changes and work order tasks issued between 2006 and 2009. The licensee's review included performing equipment walkdowns, evaluating rework rates and human error rates, and causes for failures of significant components. Based on the results of these reviews, Entergy initiated condition reports at the various sites to document problems with QC verification activities and failures to perform required QC reviews of safety-related engineering changes and construction related work activities. Entergy's investigation concluded that procedures contained inadequate guidance, which resulted in inconsistent implementation of the QC program. Specifically, some safety-related design change work orders were not reviewed to determine whether QC verification inspections were required, and some safety-related design change work orders did not include all required QC verification inspections. These examples were documented in CR-HQN-2009-01083, -01084, -01085, -01093, -01096, -01140, -01169, -01170, -01184, and -01188.

Additional findings identified by Entergy's review included:

- Managers in maintenance organizations did not have a detailed understanding of QC responsibilities, required inspections, or what documents required review (CR-HQN-2009-01150).
- A weakness was identified in the process for ensuring proper approval of contract QC inspection personnel at all Entergy sites. Procedure EN-QV-111, "Training and Certification of Inspection/Verification and Examination Personnel," Section 4.0 [1], required that the manager responsible for QA or designee at each location is responsible for approving ANSI N45.2.6 certification of QC inspection personnel. In practice, contract QC inspectors' qualifications were not approved by the QA manager prior to November 2009. This was determined to be a minor violation because the ANSI Level III inspector at each site was

documenting that the contract QC personnel had the necessary qualifications to perform the inspections for which they were contracted. This issue was entered into the licensee's corrective action program as CR-HQN-2009-1091.

- At individual Entergy plants, 27 condition reports were written in 2008 and 2009 to document potentially missed QC verification inspections or missed reviews to consider QC verification inspections prior to the NRC engaging Entergy on this issue. Of those, 7 were actual missed inspections (CR-RBS-2009-05041, CR-JAF-2008-03648, CR-PNP-2008-00916, CR-PNP-2008-03922, CR-PNP-2009-01798, CR-PNP-2009-02059, and CR-PNP-2009-02255). Multiple condition reports documented work package quality issues that impacted the ability to identify appropriate QC verification inspection requirements.
- Two examples of QC programmatic issues were identified, assigned the Entergy headquarters, and not properly addressed (CR-ANO-C-2009-01884 and CR-HQN-2009-00178). These were considered examples of the violation discussed below.
- River Bend Station was using notification points instead of designating specific QC hold points (CR-RBS-2008-04685). This is further discussed in Section 4OA7.
- Insufficient resources were assigned or qualified to perform the required tasks at Grand Gulf Nuclear Station and River Bend Station. River Bend Station operated with a single QC Level II inspector for more than 3 years, and Grand Gulf Nuclear Station's two QC inspectors did not have all of the discipline certifications for which they were conducting inspections (CR-HQN-2009-01140 and CR-GGN-2009-06575). While these conditions were inappropriate, the inspectors did not identify a separate violation associated with these issues. To the extent that the individuals at River Bend Station were evaluating work documents for QC verification inspections and not correctly identifying those verifications, those examples are part of the violation discussed below.
- Although equipment-related QC condition reports were addressed appropriately, QC programmatic issues were not always effectively addressed.
- QA audits and oversight activities for the QC program missed opportunities to identify the findings of their investigation (CR-HQN-2009-01169, CR-HQN-2009-0153 and CR-HQN-2010-00013). In particular, the Entergy corporate ANSI Level III inspector was required to perform periodic surveillances of QC inspection activities to ensure the program is being adequately implemented and maintained, but these required surveillances were not performed in 2008 (CR-HQN-2009-00111). This is further discussed in Section 4OA7.

Subsequent to the identification of these deficiencies, Entergy initiated prompt corrective actions to ensure that appropriate safety-related, engineering changes and nonroutine

maintenance work orders were identified and routed to the maintenance inspection coordinator for evaluation and inclusion of QC verification inspections in accordance with the revised requirements of Procedure EN-WM-105, "Planning." These corrective actions and actions to preclude recurrence were collectively documented in the following Level A condition reports: CR-HQN-2009-01184, dated December 21, 2009, and CR-HQN-2010-0013, dated January 6, 2010.

In-office NRC reviews identified the need to conduct further inspection activities. On June 14-17, 2010, the inspectors conducted a focused review of work performed at each NRC-licensed Entergy site to assess whether examples of missed QC verification inspections identified by Entergy during their review had the potential to have impacted the operability of important plant equipment. The inspectors also reviewed the corrective action database and maintenance records to independently assess the rigor of the Entergy review and to identify additional examples of missed QC verification inspections. The inspectors identified no additional examples, and concluded that the Entergy reviews were sufficient to identify the scope of the problems and develop actions to address the causes.

The inspectors' reviewed specific work items whose scope met QAPM requirements to have had QC verification inspections but did not have the appropriate inspections. Based in part on interviews with Entergy personnel, the inspectors determined that procedural guidance for work planning was not sufficiently detailed or clear to ensure that work packages with construction-like activities would be reviewed by the specified QC personnel. These individuals were responsible for designating the QC inspections that were required by the QAPM.

The inspectors also identified numerous condition reports written at Entergy sites that documented improper implementation of QC verification inspections. Specific condition reports are listed in the attachment.

Analysis. The failure to ensure that adequate QC verification inspections were included in quality-affecting procedures and work instructions as required by the QA program was a performance deficiency. This programmatic deficiency, if left uncorrected, could lead to a more significant safety concern in that the failure to check quality attributes could involve an actual impact to plant equipment. This issue affected the design control attribute of the Mitigating Systems Cornerstone because missed quality control inspections during plant modifications could impact the availability, reliability, and capability of systems needed to respond to initiating events. This performance deficiency was determined to have very low safety significance in Phase 1 of the Significance Determination Process, since it was confirmed to involve a qualification deficiency that did not result in a loss of operability or functionality. Specifically, inspectors verified by sampling that work documents provided objective quality evidence that work activities that had missed quality control verifications were properly performed.

The inspectors determined that this performance deficiency involved a crosscutting aspect related to human performance in decision making [H.1(a)], because the licensee did not have an effective systematic process for obtaining interdisciplinary reviews of

proposed work instructions to determine whether QC verification inspections were appropriate.

Enforcement: Title 10 of the Code of Federal Regulations, Part 50, Appendix B, Criterion X, "Inspection," requires, in part, that: "Examinations, measurements, or tests of material... shall be performed for each work operation where necessary to assure quality... If mandatory inspection hold points, which require witnessing or inspecting by the licensee's designated representative and beyond which work shall not proceed without the consent of the designated representative are required, the specific hold points shall be indicated in appropriate documents."

Entergy's QAPM, Revision 20, Section B.12., "Inspection," requires, in part, that: "Provisions to ensure inspection planning is properly accomplished are to be established. Planning activities are to identify the characteristics and activities to be inspected, the inspection techniques, the acceptance criteria, and the organization responsible for performing the inspection. Provisions to identify inspection hold points, beyond which work is not to proceed without consent of the inspection organization, are to be defined."

Contrary to the above, from February 2006 to December 2009 the licensee failed to ensure that examinations, measurements, or tests of material were performed for each work operation where necessary to assure quality, and failed to include mandatory inspection hold points in appropriate documents. Specifically, multiple examples of maintenance work orders and engineering change documents for construction-related activities involving safety-related systems structures and components were identified where witnessing or inspections were required to be performed to ensure quality, but these steps were not identified, included in the work documents, or performed as required QC hold points in the work instructions. Condition reports documenting the specific problems and examples of the violation included:

CR-ANO-1-2009-02330	CR-HQN-2009-01083
CR-HQN-2009-01084	CR-HQN-2009-01085
CR-HQN-2009-01093	CR-HQN-2009-01096
CR-HQN-2009-01140	CR-HQN-2009-01169
CR-HQN-2009-01170	CR-HQN-2009-01184
CR-HQN-2009-01188	

Because this issue was of very low safety significance and was entered into the corrective action program as Condition Reports CR-HQN-2009-01184 and CR-HQN-2010-0013, consistent with Section 2.3.2 of the Enforcement Policy, this violation is being treated as a noncited violation: NCV 05000313; 368/2010005-03 "Failure to Perform Required Quality Control Inspections."

2. Failure to Implement the Experience and Qualification Requirements Associated with the Quality Assurance Program

Introduction. The inspectors identified a Green noncited violation of 10 CFR Part 50, Appendix B, Criterion II, "Quality Assurance Program," for the failure to implement the

experience and qualification requirements of the QA program. As a result, the licensee failed to ensure that an individual assigned to the position of QA manager met the qualification and experience requirements of ANSI/ANS 3.1-1978 as required by the QA program.

Description. During their review of the issues surrounding the improper implementation of QC verifications discussed above, the inspectors noted that the root cause analysis documented in CR-HQN-2010-0013 identified that lack of experience of the QA manager contributed to the failure to identify the trend in missed QC verification inspections. The inspectors reviewed the relevant experience and qualifications of the QA manager at each Entergy site. The inspectors also reviewed the NRC's safety evaluation report that approved Entergy's original corporate QAPM, which is the document that contains the QA program. Additionally, the inspectors reviewed the administrative section of the technical specifications for all the Entergy sites and a sample of evaluations, performed in accordance with 10 CFR 50.54(a), that supported Entergy QAPM changes and alignment of plants that were subsequently purchased by Entergy.

The Entergy corporate QAPM required each site to meet the experience and qualification standards in ANSI/ANS 3.1-1978, "American National Standard for Selection and Training of Nuclear Power Plant Personnel." Section 4.4 included qualification and experience requirements for the personnel described as "group leaders" of five professional-technical groups, including QA. Section 4.4.5, "Quality Assurance," required that "...the responsible person shall have six years experience in the field of quality assurance, preferably at an operating nuclear plant, or operations supervisory experience. At least one year of this six years experience shall be nuclear power plant experience in the overall implementation of the quality assurance program. (This experience shall be obtained within the quality assurance organization.)"

On December 15, 2008, Procedure EN-QV-117, "Oversight Training Program," the Entergy procedure used by all Entergy sites to implement the requirements of ANSI/ANS 3.1-1978, was revised by the Entergy corporate QA group. Section 5.7, "Manager/QA Senior Auditor Training," was changed to state:

Either the QA Manager or the Senior QA Auditor will meet the requirements of ANS 3.1-1978 paragraph 4.4.5 for operating plants and if applicable ANS 3.1-1993 paragraph 4.3.7 for new plants.

The inspectors reviewed completed personnel change planning checklist/forms for QA managers at each site. Entergy used this form to evaluate QA manager candidates prior to the implementation of an Entergy fleet-wide restructuring in July 2007. Attachment 8, "Change Management Guidelines for Alignment Implementation," included the following conclusion for the individual that subsequently was assigned to be the QA manager:

[Individual's name redacted] meets the minimum requirements for QA Manager with the exception of at least one year of this six years experience shall be nuclear power plant experience in the overall implementation of the quality assurance program. This requirement must be met by the QA Senior Auditor.

Based on discussions with Entergy corporate QA personnel, the inspectors determined that Entergy personnel had interpreted ANSI/ANS 3.1-1978, Sections 4.4 and 4.4.5 to allow the Senior Auditor to be considered the QA group leader described in the standard for purposes of meeting the experience requirements of Section 4.4.5 in cases where a candidate for the position of QA manager did not satisfy the experience requirements.

In reviewing this issue, the NRC staff has determined that the group leader in this case is the individual filling the position assigned responsibility for overall implementation of the QA program (Entergy used the title "QA Manager" for this position). The individual meeting the experience and qualification requirements must be the individual assigned the responsibilities for overall implementation of the QA program assigned within the QA program.

The inspectors determined that this change to Procedure EN-QV-117 did not ensure that the qualifications for the QA manager would meet the requirements of standard. The inspectors identified an example where the senior auditor was credited as being the group leader for purposes of meeting ANSI/ANS 3.1-1978, and the individual who was assigned as the QA manager did not meet the ANSI/ANS 3.1-1978 experience requirements. The team also determined that the responsibilities assigned to the QA manager under the QAPM were not reassigned to the senior auditor, and the senior auditor did not report directly to the designated senior executive. The senior auditor continued to report to the QA manager, so the person with the greater experience did not have the positional authority to decide issues.

Analysis. Failure to ensure that an individual assigned to the position of QA manager met the qualification and experience requirements of ANSI/ANS 3.1-1978 as required by the QA program was a performance deficiency. This performance deficiency was determined to be more than minor because, if left uncorrected, it could create a more significant safety concern. Failure to have a fully qualified individual providing overall oversight to the QA program had the potential to affect all cornerstones, but this finding will be tracked under the Mitigating Systems Cornerstone as the area most likely to be impacted. The issue was not suitable for quantitative significance determination, so it was assessed using Inspection Manual Chapter 0609, Appendix M, so it was evaluated using the qualitative criteria listed in Table 4.1. This finding was determined to be of very low safety significance because other quality assurance program functions remained unaffected by this performance deficiency, so defense-in-depth continued to exist.

The inspectors determined that there was no crosscutting aspect associated with this finding because this issue was not indicative of current performance because the violation occurred more than 3 years ago.

Enforcement. Appendix B to 10 CFR Part 50, Criterion II, "Quality Assurance Program," requires, in part, that the licensee establish a quality assurance program which complies with Appendix B. This program shall be documented by written policies, procedures, or instructions and shall be carried out throughout plant life in accordance with those

policies, procedures, or instructions. The program shall provide for indoctrination and training of personnel performing activities affecting quality as necessary to assure that suitable proficiency is achieved and maintained.

The Entergy QAPM, Revision 13, is the document used at each Entergy-owned site to describe the quality assurance program. Table 1, Section A, of the QAPM states, in part, that qualifications and experience for station personnel shall meet ANSI/ANS 3.1-1978 except for positions where an exception to either ANSI/ANS 3.1-1978 or N18.1-1971 is stated in the applicable unit's Technical Specifications.

ANSI/ANS 3.1-1978, Section 4.4.5, "Quality Assurance," states, in part, that the responsible person (i.e. the quality assurance manager) shall have six years experience in the field of quality assurance. At least one year of this six years experience shall be obtained within the quality assurance organization.

Contrary to the above, between July 7, 2007, and July 8, 2008, the licensee failed to implement the quality assurance program requirements intended to provide indoctrination and training of personnel performing activities affecting quality as necessary to assure that suitable proficiency was achieved and maintained. Specifically, the individual(s) assigned to be the responsible person for the licensee's overall implementation of the QA program did not have at least 1 year of nuclear plant experience in the overall implementation of the QA program within the quality assurance organization prior to assuming those responsibilities. Because this issue was of very low safety significance and was entered into the corrective action program as Condition Report CR-HQN-2010-00386, consistent with Section VI.A of the Enforcement Policy, this violation is being treated as a noncited violation: NCV 05000313; 368/2010005-04: "Failure to Implement the Experience and Qualification Requirements of the Quality Assurance Program."

#### **40A3 Event Follow-up (71153)**

##### **.1 Fire on Turbine Building Roof During Roofing Activities**

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

On September 17 and November 18, 2010 inspectors were notified of a small fire on the turbine building due to roofing activities involving hot work. The first instance involved roofing cement that had fallen through an opening on the roof into the turbine building. The fire was extinguished within a few seconds via an extinguisher. The second instance involved paper lining for a metal support tube on the turbine building roof catching on fire. The fire was extinguished within seconds via a fire extinguisher. In each case no personnel were injured and no equipment damage occurred. The fire did not cause any perturbations to plant operations. Inspectors reviewed NUREG-1022, "Event Reporting Guidelines," Revision 2, to ensure licensee compliance. No event report was required.

b. Findings

Introduction. The inspectors documented a Green, self revealing finding for failure to use human performance tools, per Procedure EN-HU-102, "Human Performance Tools," Revision 5 while performing hot work activities on the turbine building roof, which resulted in two fires. Specifically, roofing contractors committed human performance errors during activities by not performing self- and peer-checks, or demonstrating a questioning attitude which resulted in two fires on September 17, and on November 18, 2010. These issues were entered into the corrective action program as Condition Reports CR-ANO-1-2010-3231, CR-ANO-C-2010-2428, and CR-ANO-C-2010-2978.

Description. On September 17, 2010, while contract roofers were performing hot work activities, roofing cement caught on fire and fell through an opening around a piping penetration into the turbine building. The fire was successfully extinguished via a fire extinguisher.

Further investigation determined that the contractor inadvertently caught the roofing cement on fire while applying heat to activate the cement for use. It was also determined that the contractors also failed to use human performance error prevention tools, such as peer-and self-checks and a strong questioning attitude, to identify that the gap between the pipe and the roof was abnormally large and an alternate method for roofing in this area should have been implemented and a second fire watch should have been used in the turbine building below the roof work. All worked was stopped until a recovery plan could be assembled and approved by the maintenance manager. The plan consisted of a number of improvement items such as: placing a fire watch above and below roof work around penetrations, modification of roof work method around penetrations, and to increase Arkansas Nuclear One first line supervision. The plan was approved and the roofers were allowed to recommence work.

On November 18, 2010, while performing hot work on the turbine building roof, the contractors inadvertently applied direct open flame to a structural support for the control room exhaust ventilation duct and caught the original metal fabrication liner paper on fire. The fire was quickly extinguished via a fire extinguisher. Follow-up on this issue again revealed that failure to use human error prevention tools such as: peer- and self-check, strong questioning attitude, and a more complete walkdown of the area prior to hot work resulted in this small fire.

The inspectors reviewed the licensee's apparent cause analysis and generally agreed that the roofing contractor did not use human performance tools as specified in Procedure EN-HU-102, "Human Performance Tools," Revision 5. The licensee has determined that each individual roofer will not be trained in human performance tools as the workers are not always the same workers every time roof work is performed. As such, the licensee had determined that more oversight would be required. It was after this was decided and plan approved from the first fire event that the second fire event occurred. The licensee identified that more supervisory oversight was required for the roofing contractor work and was part of the initial corrective action, however, that

increased oversight was not adequate as licensee supervision of the contractor personnel was not present during the second fire event.

Analysis. The failure to use human performance error prevention tools as specified in Procedure EN-HU-102, "Human Performance Tools," Revision 5, was a performance deficiency. The performance deficiency was determined to be more than minor because it was associated with the protection against external activities attribute of the Initiating Events Cornerstone, and affected the cornerstone objective to limit the likelihood of those events that upset plant stability during power operations, and therefore a finding. Using Inspection Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the finding was determined to be of very low safety significance because the finding did not contribute to both the likelihood of a reactor trip and the likelihood that mitigation equipment or function would not be available. The finding was determined to have a crosscutting aspect in the area of human performance, associated with work practices, in that the licensee failed to ensure supervisory and management oversight of work activities, including contractors, such that nuclear safety is supported. Specifically, the licensee failed to provide adequate oversight to a roofing contractor to prevent fires [H.4(c)].

Enforcement. The finding does not involve an enforcement action because no violation of regulatory requirements was identified. Since the finding does not involve a violation, is of very low safety significance, and has been entered into the corrective action program as Condition Reports CR-ANO-1-2010-3231, CR-ANO-C-2010-2428, and CR-ANO-C-2010-2978, it is being identified as FIN 05000313; 368/2010005-05, "Failure to Use Human Performance Tools Results in Two Turbine Building Roof Fires."

.3 (Closed) Unresolved Item 05000313; 368/2007008-02, Refueling Water Tank (Unit 2) and Condensate Storage Tank Vortexing

During an NRC Component Design Basis Inspection, as documented in Inspection Report 05000313; 05000368/2007008, the team found that the level at which the suction for the high pressure safety injection, low pressure safety injection, and containment spray systems swapped from the refueling water tank to the reactor containment building sump was established based on the use of a vortex suppressor that did not have either analytical or test data to support its use. Additionally, the team found that the level at which the suction for the emergency feedwater system swapped from the condensate storage tank to the service water system was established based on the use of a vortex suppressor that did not have either analytical or test data to support its use. The failure to verify the adequacy of the Unit 2 refueling water tank and the condensate storage tank transfer setpoints to prevent potential air entrainment due to vortexing in safety-related pump suction piping was a violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control." The licensee's subsequent analysis concluded that air entrainment would not adversely impact safety-related pump operation during a design basis event. This unresolved item is closed.

b. Findings

Failure to Verify the Adequacy of the Unit 2 Refueling Water Tank and the Condensate Storage Tank Transfer Setpoints

Introduction. The inspectors identified a Green noncited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," after the licensee failed to verify the adequacy of the Unit 2 refueling water storage tank and the condensate storage tank transfer setpoints to prevent potential air entrainment due to vortexing in safety-related pump suction piping.

Description. During an NRC Component Design Basis Inspection, as documented in Inspection Report 05000313; 05000368/2007008, the team found that the level at which the suction for the high pressure safety injection, low pressure safety injection, and containment spray systems swapped from the refueling water tank to the reactor containment building sump was established based on the use of a vortex suppressor that did not have either analytical or test data to support its use. Additionally, the team found that the level at which the suction for the emergency feedwater system swapped from the condensate storage tank to the service water system was established based on the use of a vortex suppressor that did not have either analytical or test data to support its use. The inspectors were concerned that the licensee had not verified that air entrainment due to vortexing in safety-related pump suction piping would not result in substantial pump degradation.

In response to NRC concerns, the licensee evaluated the acceptability of the refueling water tank and condensate storage tank level transfer setpoints through Condition Report CR-ANO-C-2007-1469. The licensee's evaluation included performing hydraulic scaled-model tests for the refueling water tank to study the potential for significant air intrusion. The results of the scaled-model tests indicated that, although some vortexing would occur during the realignment of the refueling water tank outlet valves and the sump outlet valves, the vortexing would be intermittent and would not introduce significant amounts of air into the emergency core cooling system suction header before the onset of radial inflow. Even though significant amounts of air would not be introduced into the suction piping, the licensee chose to add additional margin, to prevent vortices from forming, by installing time delay relays to delay the start of the sump suction isolation valves following the receipt of a recirculation actuation signal.

The inspectors evaluated the methodology, assumptions, and calculations associated with verifying that air entrainment due to vortexing in the refueling water tank would not adversely impact safety-related pump function. Specifically, the inspectors noted that the licensee appropriately evaluated the flow through the refueling water tank and containment sump suction valves as a function of time. The inspectors also noted that the licensee's evaluation appropriately assumed single active failure, conservative minimum containment pressures, and conservative pump flow rates. Additionally, the inspectors reviewed the scaled-model test data and confirmed that sufficient objective evidence existed to support the licensee's conclusions that safety-related pump performance would not be adversely impacted by significant air entrainment during a design basis event.

The licensee also performed scaled-model tests for the condensate storage tank. The inspectors reviewed the scaled-model test results and concluded that existing tank level transfer setpoints were supported by the fact that no air entraining vortices were observed for the conditions tested. The inspectors concluded that the licensee appropriately verified the adequacy of refueling water and condensate storage tank vortex suppressors to support established tank level transfer setpoints.

Analysis. The inspectors determined that the failure to verify the adequacy of the Unit 2 refueling water tank and the condensate storage tank transfer setpoints was a performance deficiency. The finding was more than minor because it was associated with the design control attribute of the Mitigating Systems Cornerstone and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using Inspection Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the inspectors determined that the finding was of very low safety significance (Green) because it was a design or qualification deficiency confirmed not to result in loss of operability or functionality. Specifically, the licensee performed subsequent analysis which demonstrated that vortexing in the refueling water and condensate storage tanks would not impact safety-related pump operation during a design basis event. This finding did not have a crosscutting aspect because the most significant contributor did not reflect current licensee performance.

Enforcement. The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," which states, in part, that design control measures shall provide for verifying or checking the adequacy of design, such as by the performance of design reviews, by the use of alternate or simplified methods of calculation, or by the performance of a suitable testing program. Contrary to the above, the licensee failed to assure that design control measures were provided for verifying or checking the adequacy of design, such as by the performance of design reviews, by the use of alternate or simplified methods of calculation, or by the performance of a suitable testing program. Specifically, since 1998, the licensee failed to verify the adequacy of the Unit 2 refueling water tank and the condensate storage tank transfer setpoints to prevent potential air entrainment due to vortexing in safety-related pump suction piping. This finding was entered into the licensee's corrective action program as Condition Report CR-ANO-C-2007-1469. Because this finding was determined to be of very low safety significance and was entered into the licensee's corrective action program, this violation is being treated as a noncited violation consistent with Section 2.3.2 of the NRC Enforcement Policy: NCV 05000313; 368/2010005-06, "Failure to Verify the Adequacy of the Unit 2 Refueling Water Tank and the Condensate Storage Tank Transfer Setpoints."

#### 40A5 Other Activities

.1 Temporary Instruction 2515/180, "Inspection of Procedures and Processes for Managing Fatigue"

a. Inspection Scope

The inspectors reviewed Entergy procedures and policies to confirm that the fitness for duty program adequately implemented fatigue management requirements for individuals subject to 10 CFR 26, Subpart I. The inspectors confirmed that the licensee had procedures in place that described:

- The process to be followed after any individual makes a self-declaration that he or she is not fit to safely and competently perform his or her duties for any part of a working tour as a result of fatigue
- The process for implementing the work hour controls
- The process for conducting fatigue assessments
- Disciplinary actions that may be imposed on an individual following a fatigue assessment, and the conditions and considerations for taking those disciplinary actions

The inspectors reviewed the licensee's training program to verify implementation and testing of specified knowledge and abilities specified in 10 CFR 26.203(c)(1) and (c)(2). The inspectors confirmed that the licensees' process for developing the annual fitness for duty report include provisions for documenting the summary of instances where work hour controls were waived.

The inspectors also confirmed that the licensee had a process in place to retain the following records for at least 3 years or until the completion of all related legal proceedings, whichever is later:

- Work hours for individuals who are subject to the work hour controls
- Shift schedules and shift cycles of individuals who are subject to the work hour controls
- Waivers and the bases for the waivers
- Work hour reviews
- Fatigue assessments

These activities constitute completion of Temporary Instruction 2515/180, "Inspection of Procedures and Processes for Managing Fatigue."

b. Findings

Introduction. The inspectors identified a Green noncited violation of 10 CFR 26.207(a)(3), "Waivers and Exceptions," associated with the failure of licensee supervisory personnel to appropriately perform face-to-face fatigue assessments. Specifically, supervisory personnel were performing face-to-face supervisory assessments more than 4 hours before individuals performed work activities under a waiver.

Description. The inspectors conducted a review of the licensee's records associated with work hour control and fatigue management for the period of July 6 through September 15, 2010. During this review the inspectors noted that waivers had been granted for individuals to work more than one consecutive shift period for July 6-18, 2010, July 13-18, 2010, and July 14-18, 2010, (two waivers written for this period). The inspectors also noted that for each of these waivers a fatigue assessment had been performed prior to the beginning of the first shift worked by the individuals under the waivers, however, fatigue assessments had not been performed for subsequent shifts worked under the waivers. The inspectors questioned the validity of only performing one fatigue assessment for the multiple days worked under these waivers. Specifically, the inspectors noted that 10 CFR 26.207(a)(1)(ii) states, in part, "A supervisor assesses the individual face to face and determines that there is reasonable assurance that the individual will be able to safely and competently perform his or her duties during the additional work period for which the waiver will be granted. At a minimum, the assessment must address the potential for acute and cumulative fatigue considering the individual's work history for at least the past 14 days, the potential for circadian degradations in alertness and performance considering the time of day for which the waiver will be granted, the potential for fatigue-related degradations in alertness and performance to affect risk-significant functions, and whether any controls and conditions must be established under which the individual will be permitted to perform work." The inspectors informed the licensee of their concern and the licensee initiated Condition Report CR-ANO-C-2010-2396 to capture this issue in their corrective action program.

During subsequent discussions with the licensee, the inspectors were informed that the licensee was defining the work period as the 6-week cycle, and as such their interpretation was that only one fatigue assessment was necessary. The inspectors disagreed with this interpretation and determined that the original fatigue assessment conducted prior to the first shift worked under a waiver would not be sufficient to cover consecutive shifts worked under the same waiver when there was a break of at least 10 hours provided between the successive work periods covered by these waivers.

Analysis. The inspectors determined that the failure to perform face-to-face supervisory assessments less than 4 hours before individuals began performing work activities under a waiver was a performance deficiency. The performance deficiency was determined to be more than minor because it was associated with the access authorization attribute of the Security Cornerstone, and affected the associated cornerstone objective to provide assurance that the licensee's security system and material control and accounting

program use a defense in-depth approach and can protect against (1) the design basis threat of radiological sabotage from external and internal threats, and (2) the theft or loss of radiological materials, and is therefore a finding. Using the Inspection Manual Chapter 0609, Appendix E, "Baseline Security Significance Determination Process for Power Reactors," Figures 5 and 6, the finding was determined to have very low security significance because the calculated point total did not exceed the threshold value for a Green noncited violation. The cumulative total for this finding was zero points, which was calculated by factoring the one impact area (vital areas) against Tier III Element 08.02.08, security force work hours, of the access authorization attribute, which resulted in a total of zero points within this attribute. The finding was determined to have a crosscutting aspect in the area of human performance, associated with decision making [H.1(b)] in that the licensee failed to use conservative assumptions in decision making and adopt a requirement to demonstrate that the proposed action is safe in order to proceed rather than a requirement to it is unsafe in order to disapprove the action. Specifically, the licensee had defined the work period to be 6 weeks without giving appropriate thought about potential consequences of this decision relative to potential fatigue aspects while continuing to work under a waiver.

Enforcement. Title 10 of the Code of Federal Regulations 26.207(a)(3), "Waivers and Exceptions," requires, in part, that "Licensees shall ensure that the timing of the face-to-face supervisory assessment that is required by paragraph (a)(1)(ii) of this section supports a valid assessment of the potential for worker fatigue during the time the individual will be performing work under the waiver. Title 10 of the Code of Federal Regulations 26.207(a)(1)(ii) states, in part, "A supervisor assesses the individual face to face and determines that there is reasonable assurance that the individual will be able to safely and competently perform his or her duties during the additional work period for which the waiver will be granted. At a minimum, the assessment must address the potential for acute and cumulative fatigue considering the individual's work history for at least the past 14 days, the potential for circadian degradations in alertness and performance considering the time of day for which the waiver will be granted, the potential for fatigue-related degradations in alertness and performance to affect risk-significant functions, and whether any controls and conditions must be established under which the individual will be permitted to perform work." Licensees may not perform the face-to-face assessment more than 4 hours before the individual begins performing any work under the waiver." Contrary to the above, from July 6 through September 15, 2010, supervisory personnel were not performing the face-to-face supervisory assessment within 4 hours of individuals performing work activities under a waiver. Specifically, multiple times waivers had been granted for personnel to work more than one consecutive shift work period and fatigue assessments were not conducted for these individuals for subsequent shifts performed under the waivers. Because this finding is of very low security significance and has been entered into the corrective action program as Condition Report CR-ANO-C-2010-2396, this violation is being treated as a noncited violation consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000313; 368/2010005-07, "Failure to Perform Face-to-Face Supervisory Assessments Less than 4 Hours Before Individuals Began Performing Work Activities Under a Waiver."

.2 (Closed) Confirmatory Order, EA-09-060, November 10, 2009, "Failure to Provide Complete and Accurate Information"

a. Inspection Scope

On May 22, 2008, the NRC completed a security baseline inspection at the Palisades Nuclear Plant. The inspection covered one or more of the key attributes of the security cornerstone of the NRC's Reactor Oversight Process. As a result of the inspection observations, the NRC Office of Investigations (OI) initiated an investigation (OI Case No. 3-2008-020). Based on the evidence developed during the inspection and investigation, the NRC identified a violation of 10 CFR 50.9 for inaccurate and incomplete information. Specifically, the licensee failed to ensure that information in corrective action documents was complete and accurate in all material respects and the licensee failed to provide accurate information to the Commission during a telephone conversation between a licensee employee and an NRC inspector.

The results of the investigation were sent to Entergy in a letter, dated July 14, 2009. This letter offered Entergy the opportunity to either participate in Alternate Dispute Resolution (ADR) mediation or to attend a Predecisional Enforcement Conference. On July 28, 2009, the NRC and Entergy agreed to participate in ADR mediation.

On September 15, 2009, the NRC and Entergy participated in an ADR session and, as a result, a Confirmatory Order was issued pursuant to the agreement reached during the ADR process. As part of the ADR settlement agreement, Entergy agreed to a number of organizational, procedural, and management oversight related corrective actions and enhancements at Palisades Nuclear Plant and other Entergy Fleet nuclear sites.

During the inspection at Arkansas Nuclear One, October 18-21, 2010, the inspectors evaluated the overall effectiveness of the licensee's response to the order. The evaluation was conducted through: 1) interviews with nonsupervisory personnel at Arkansas Nuclear One; 2) interviews with program managers and supervisors responsible for implementing the program at the site; and 3) an evaluation of licensee documents and procedures related to compliance with the order. Specifically, the inspectors evaluated whether:

- Entergy published the corrective actions set forth in the Confirmatory Order to the Entergy fleet nuclear workforce, via Inside Entergy, within one month of the issuance of the Confirmatory Order.
- Entergy developed and implemented a formal process, within the current corrective action program, that ensures that safeguards and security-related information, which would otherwise not be contained in the corrective action program, is processed in an auditable manner, consistent with Entergy's existing corrective action program. Entergy completed training for those personnel with safeguards access on the program described above within 90 days of the effective date of the procedure or process.

- Entergy provided training to Entergy's nuclear workforce on the sensitivity and importance of providing complete and accurate information to the NRC within 1 year of the date of the issuance of the Confirmatory Order.
- Entergy assessed its succession planning process with respect to how that process addresses unanticipated, short-term personnel losses in key positions and developed corrective actions, as appropriate.
- Entergy executives met with the three NRC Regional Administrators for the regions in which Entergy owns and operates plants, to share and discuss the results of the safety culture workplace survey conducted at each Entergy nuclear plant in 2009.
- Entergy provided a lessons-learned presentation to the Regional Utility Groups for the NRC Regions in which Entergy operates nuclear facilities within 1 year of the date of the issuance of the Confirmatory Order, and the lessons-learned presentation addressed the events which gave rise to the Confirmatory Order and the corrective actions taken.

b. Findings

No findings were identified.

**40A6 Meetings**

Exit Meeting Summary

On October 1, 2010, the inspectors presented the onsite emergency preparedness inspection results to Mr. B. Berryman, Acting Vice President, and other members of the licensee's staff during a telephonic exit meeting. The licensee acknowledged the issues presented. The inspector asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

On October 19, 2010, the NRC conducted a telephonic exit meeting with Ms. S. Pyle, Licensing Manager, and Mr. D. Bice, Licensing Engineer. The licensee acknowledged the issues presented. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

On October 21, 2010, the inspectors presented the preliminary inspection results to Mr. B. Berryman, Acting Site Vice President and other members of the licensee's staff. The inspectors asked whether any of the material examined during the inspection should be considered proprietary. No proprietary information was identified.

On January 7, 2011 the inspectors presented the inspection results to Mr. Christopher Schwarz, Vice President, Operations, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspector asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

On January 10, 2011, the inspector presented the results of the Selected Issue Follow-up Inspection of quality assurance and quality control issues to Mr. Christopher Schwarz, Vice President, Operations, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspector asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

On February 3, 2011, the inspectors re-exited with Mr. Al Dodds, Manager, Maintenance, and other members of the licensee staff. The purpose of this meeting was to discuss the removal of one noncited violation and the re-characterization of another. The licensee acknowledged the information presented.

#### **40A7 Licensee-Identified Violations**

The following violation of very low safety significance (Green) was identified by the licensee and is a violation of NRC requirements which meets the criteria of Section 2.3 of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as a noncited violation.

- Procedure EN-QV-111, "Training and Certification of Inspection/Verification and Examination Personnel," Section 4.0 [4](i), requires that the Entergy corporate ANSI Level III inspector shall perform periodic (annual) surveillances of quality control inspection activities to ensure that the program is being adequately implemented and maintained. Contrary to the above, no surveillances of quality control inspection activities were performed for any Entergy site during calendar year 2008. The issue was not suitable for quantitative significance determination, so it was assessed using Inspection Manual Chapter 0609, Appendix M, so it was evaluated using the qualitative criteria listed in Table 4.1. This finding was determined to be of very low safety significance because other quality assurance program functions remained unaffected by this performance deficiency, so defense-in-depth continued to exist. This issue was entered into the licensee's corrective action program as Condition Report CR-HQN-2009-00111.

## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### **Licensee Personnel**

J. Abisamra, Echelon Chief Engineer  
J. Barrett, Non-Destructive Examination Specialist  
S. Beagles, Echelon Manager of Fleet Operations  
B. Berryman, Acting Vice President  
R. Byrd, Echelon Senior Staff Engineer  
T. Chernivec, Manager, Outages  
M. Chisum, Acting, General Manager  
R. Colcough, Superintendent, Nuclear Industrial Safety and Human Performance  
J. Dent, Echelon General Manager Plant Operations, Fleet Operations Support  
R. Dodds, Maintenance Manager  
J. Eichenberger, Manager, CA&A  
T. Fineberg, Manager, IT  
B. Ford, Echelon Sr. Manager, Nuclear Safety and Licensing  
R. Fowler, Senior Emergency Preparedness Planner  
R. Fuller, Quality Assurance Manager  
R. Gresham, Senior Emergency Preparedness Planner  
E. Harris, Echelon, Quality Assurance Manager  
R. Holeyfield, Manager, Emergency Preparedness  
D. Jacobs, Echelon Sr. Vice President of Planning, Development and Oversight  
D. James, Director, Nuclear Safety Assurance  
K. Jeffries, Senior Security Supervisor  
K. Jones, Manager, Operations  
T. King, Manager, Chemistry  
B. Lovin, Manager, Security  
D. Martin, Shift Operations Supervisor/ Security  
J. McCann, White Plains Vice President of Nuclear safety, Emergency Preparedness, and Licensing  
J. McCoy, Director, Engineering  
N. Mosher, Licensing Specialist  
P. Morris, Echelon Manager of Administrative Services  
B. Pace, Manager, Nuclear  
T. Palmisano, Echelon Vice President of Oversight  
D. Perkins, Superintendent, Electrical  
R. Phaup, Security Operations Supervisor  
S. Pyle, Acting Manager, Licensing  
W. Renz, Director, Emergency Preparedness  
R. Roach, Senior Security Supervisor  
C. Schwarz, Vice President, Operations  
J. Smith, Manager, Radiation Protection  
T. Tankersly, Echelon Director of Oversight  
F. Van Buskirk, Licensing Specialist

B. Waldron, Quality Control Inspector  
 E. Weinkam, White Plains Senior Manager of Nuclear Safety and Licensing  
 D. White, Emergency Preparedness Planner  
 P. Williams, System Engineering Manager

NRC Personnel

M. Ashley, Office of Nuclear Reactor Regulation  
 K. Fuller, Region IV  
 M. Gray, Region I  
 J. Geissner, Region III  
 N. Hilton, Office of Enforcement  
 D. Holody, Region I  
 D. Jackson, Region I  
 W. Jones, Region IV  
 R. Kellar, Region IV  
 M. Marsh, Office of General Counsel  
 M. McLaughlin, Region I  
 M. Murphy, Office of Nuclear Reactor Regulation  
 C. Schulten, Office of Nuclear Reactor Regulation  
 D. Thatcher, Office of Nuclear Reactor Regulation

**LIST OF ITEMS OPENED AND CLOSED**

Opened and Closed

05000313/2010005-01	NCV	Exceeded Technical Specification Allowed Outage Time for Electrical Power Systems Due to Loss of Non-Technical Specification Supported System (Section 1R15)
05000313; 368/2010005-02	NCV	Failure to Submit for Approval a Decrease in Effectiveness of Emergency Plan (Section 1EP4)
05000313; 368/2010005-03	NCV	Failure to Perform Required Quality Control Inspections (Section 4OA2.4)
05000313; 368/2010005-04	NCV	Failure to Implement the Experience and Qualification Requirements of the Quality Assurance Program (Section 4OA2.5)
05000313; 368/2010005-05	FIN	Failure to Use Human Performance Tools Results in Two Turbine Building Roof Fires (Section 4OA3)
05000313; 368/2010005-06	NCV	Failure to Verify the Adequacy of the Unit 2 Refueling Water Tank and the Condensate Storage Tank Transfer Setpoints (Section 4OA3)

05000313; NCV Failure to Perform Face-to-Face Supervisory Assessments Less  
 368/2010005-07 than 4 Hours Before Individuals Began Performing Work  
 Activities Under a Waiver (Section 4OA5)

Closed

05000313; URI Refueling Water Tank (Unit 2) and Condensate Storage Tank  
 368/2007008-02 Vortexing (Section 4OA3)

Temporary TI 2515/180 Inspection of Procedures and Processes for Managing  
 Instruction Fatigue (Section 4OA5)

Confirmatory Order EA-09-060 November 10, 2009, Failure to Provide Complete and  
 Accurate Information

**LIST OF DOCUMENTS REVIEWED**

**Section 1RO1: Adverse Weather Protection**

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
OP-1203.025	Natural Emergencies	32
OP-2203.008	Natural Emergencies	19

MISCELLANEOUS DOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
ULD-0-TOP-17	ANO Flooding Topical	0

**Section 1RO4: Equipment Alignment**

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
OP-1104.005	Reactor Building Spray System Operation	60
OP-2104.005	Containment Spray	59

DRAWINGS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
M-2236	Containment Spray System	94

**Section 1R05: Fire Protection**

PROCEDURES

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

DRAWINGS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
FZ-1052	Unit 1 fire zone detail – Control room	2
FZ-2048	Unit 2 fire zone detail – Control room	2
FZ-1049	Unit 1 fire zone detail – Penetration ventilation area	2
FZ-2051	Unit 2 fire zone detail – Boric acid makeup tank room	2
FZ-1045	Unit 1 fire zone detail – North/South switchgear room	3
FZ-1044	Unit 1 fire zone detail – South electrical equipment room and lower south electrical penetration room	2

**Section 1R06: Flood Protection Measures**

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
ULD-0-TOP-17	ANO Topical Flooding	0

CALCULATIONS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
CALC-92-R-0024-01	Flooding Evaluation INPO SOER 85-5	0
CALC-92-R-0034-01	Flooding Evaluation INPO SOER 85-5-2 <sup>nd</sup> Iteration	0

**Section 1R07: Heat Sink Performance**

CONDITION REPORTS

ANO-2-2010-0408      ANO-1-2010-1003

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

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
OP-1903.011M	ALERT Emergency Direction and Control Checklist	37
OP-1903.011J	NUE Emergency Direction and Control Checklist	37

MISCELLANEOUS DOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
	SES-2-003 (Dynamic Exam Scenario Exam)	9
	SES-2-063 (Dymamic Exam Scenario Exam)	0

**Section 1R12: Maintenance Effectiveness**

PROCEDURES

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

CONDITION REPORTS

ANO-1-2010-0502    ANO-1-2010-0531    ANO-1-2010-1702    ANO-1-2010-2742  
ANO-1-2010-1780    ANO-1-2010-2179    ANO-1-2010-0524    ANO-1-2010-0525  
ANO-1-2010-0538    ANO-1-2010-0540

MISCELLANEOUS DOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>DATE</u>
	Maintenance Rule Database-Scoping and Performance Criteria – Unit 1 EDG	
	Maintenance Rule a(1) Action Plan for Unit 1 RB	December 14, 2010
	Maintenance Rule a(1) Action Plan for Unit 1 MS	December 14, 2010
	Unit 1 MS FF Determination Report (2008-2010)	December 21, 2010

**Section 1R13: Maintenance Risk Assessment and Emergent Work Controls**

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
COPD-24	Risk Assessment Guidelines	34

MISCELLANEOUS DOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>DATE</u>
	Plant Impact Statement: Switchyard Ground Grid Upgrade (WO# 206853, Task 32-36)	September 16, 2010
	Unit 1 and Unit 2 Station Logs	October 22, 2010

**Section 1R15: Operability Evaluations**

PROCEDURES

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

CONDITION REPORTS

ANO-1-2010-3075    ANO-1-2010-3487    ANO-2-2010-1009    ANO-1-2010-2414

**Section 1R19: Postmaintenance Testing**

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
OP-1104.029	Service Water and Auxiliary Cooling System	80
OP-2104.005	Containment Spray	59
OP-1402.066	24 Month Inspection on Unit One Emergency Diesel Generator Engine	26
OP-1104.036	Emergency Diesel Generator Operation	52

WORK ORDERS

51667283-01

**Section 1R22: Surveillance Testing**

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
OP-1106.006	Emergency Feedwater Pump Operation	80

CONDITION REPORTS

ANO-1-2009-1222

**Section 1EP1: Exercise Evaluation**

DOCUMENT TYPE

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
Plan	Arkansas Nuclear One Emergency Plan	35
REX-10	2010 Exercise Scenario	

DRILL AND EXERCISES

	<u>TYPE</u>	<u>DATE</u>
REX-08		2008
REX-06		2006
Table Top		05/20/2009
Simulator Evaluation		06/11/2009
Simulator Evaluation		07/08/2009
Table Top		10/13/2009
Table Top		10/21/2009
Table Top		11/17/2009
Table Top		11/24/2009
Table Top		01/27/2009
Site Drill		02/24/2010
Table Top		03/09/2010
Site Drill		06/16/2010
Simulator Evaluation		06/23/2010
Table Top		06/28/2010
Simulator Evaluation		07/07/2010
Simulator Evaluation		07/14/2010

**Section 1EP4: Emergency Action Level and Emergency Plan Changes**

MISCELLANEOUS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
1903.11	Emergency Response/Notifications	27
1903.11	Emergency Response/Notifications	36
50.59/50/54(q)	1903.11 Emergency Response/Notifications Review	

#### 40A1: Performance Indicator Verification

##### PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
EN-LI-114	Performance Indicator Process	4
EN-EP-201	Performance Indicators	10

##### PERFORMANCE INDICATOR OPPORTUNITIES

<u>NUMBER</u>	<u>TITLE</u>
DEP	05/20/2009 Shift Engineer Performance Indicator
DEP	06/11/2009 Shift Manager Performance Indicator
DEP	07/08/2009 Shift Manager Performance Indicator
DEP	10/13/2009 Notification Communicator Performance Indicator
DEP	10/21/2009 Shift Engineer Performance Indicator
DEP	11/17/2009 Notification Communicator Performance Indicator
DEP	11/24/2009 Facility Director Performance Indicator
DEP-0004	01/27/2010 Shift Engineer Performance Indicator
DEP-0011	02/24/2010 Full Scale Drill
DEP-0013	03/09/2010 Shift Engineer Performance Indicator
DEP-0019	06/16/2010 Full Scale Drill
DEP-0023	06/23/2010 Shift Manager Performance Indicator
DEP-0026	06/28/2010 Facility Director Performance Indicator
DEP-0036	07/07/2010 Shift Manager Performance Indicator
DEP-0037	07/14/2010 Shift Manager Performance Indicator

##### CORRECTIVE ACTION DOCUMENTS (ANO-C-xxxx-xxxxx)

2008-01652	2008-01846	2008-01951	2008-02107	2008-02295
2009-00056	2009-00281	2009-00540	2009-00571	2009-00658
2009-00771	2009-00781	2009-01209	2009-01247	2009-01314
2009-01315	2009-01329	2009-01354	2009-02020	2010-00093
2010-00372	2010-00943	2010-01062	2010-01240	2010-01483
2010-01560	2010-01862	2010-01898	2010-01912	2010-01976
2010-02249	2010-02328	2010-02455		

MISCELLANEOUS DOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
EN-LI-102	Corrective Action Process	15

**Section 40A2: Identification and Resolution of Problems**

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
EN-LI-121	Entergy Trending Process	8
EN-MA-102	Inspection Program	3 and 4
EN-QV-100	Conduct of Nuclear Oversight	4
EN-QV-109	Audit Process	16
EN-QV-109-02	Audit Process Guidance	0
EN-QV-111	Training and Certification of Inspection/Verification and Examination Personnel	8
EN-QV-117	Oversight Training Program	9
EN-QV-119	Corrective Action Requests, Supplier Stop Work Orders, and Recommendations	6
EN-QV-123	Supplier Audits/Surveys	3
EN-QV-128	Assessments of Nuclear Oversight?	2
EN-QV-129	Vulnerability Review Process	1

TECHNICAL SPECIFICATIONS

	<u>SECTION</u>
Waterford Unit 3	6.3 Unit Staff Qualifications
Arkansas Nuclear One -1	5.3 Unit Staff Qualifications
Arkansas Nuclear One -2	6.3 Unit Staff Qualifications
Grand Gulf	5.3 Unit Staff Qualifications
Indian Point 2	5.3 Unit Staff Qualifications
Indian Point 3	5.3 Unit Staff Qualifications

River Bend	5.3 Plant Staff Qualifications
Vermont Yankee	5.3 Plant Staff Qualifications
James A. Fitzpatrick	5.3 Unit Staff Qualifications
Palisades Nuclear Plant	5.3 Unit Staff Qualifications
Pilgrim Nuclear Power Station	6.2 Unit Staff Qualifications

CONDITION REPORTS

CR-ANO-1-2009-02330	CR-ANO-2010-01503	CR-ANO-1-2010-00743
CR-ANO-C-2009-01884	CR-ANO-1-2010-01724	CR-ANO-1-2010-01080
CR-ANO-C-2009-02608	CR-ANO-1-2010-01182	CR-ANO-1-2010-00719
CR-ANO-2-2010-00028		
CR-JAF-2008-03648	CR-JAF-2009-04592	CR-JAF-2010-03280
CR-HQN-2010-00111	CR-HQN-2009-01188	CR-HQN-2010-00415
CR-HQN-2009-00178	CR-HQN-2009-01197	CR-HQN-2010-00333
CR-HQN-2009-01083	CR-HQN-2010-00013	CR-HQN-2010-00123
CR-HQN-2009-01084	CR-HQN-2010-00386	CR-HQN-2010-00109
CR-HQN-2009-01085	CR-HQN-2010-00571	CR-HQN-2010-00068
CR-HQN-2009-01091	CR-HQN-2010-00593	CR-HQN-2010-00063
CR-HQN-2009-01093	CR-HQN-2010-00515	CR-HQN-2010-00045
CR-HQN-2009-01096	CR-HQN-2010-00550	CR-HQN-2010-00060
CR-HQN-2009-01140	CR-HQN-2010-00511	CR-HQN-2009-01198
CR-HQN-2009-01150	CR-HQN-2010-00510	CR-HQN-2009-01194
CR-HQN-2009-01169	CR-HQN-2010-00475	CR-HQN-2010-00594
CR-HQN-2009-01170	CR-HQN-2010-00499	CR-HQN-2009-01171
CR-HQN-2009-01184	CR-HQN-2010-00338	CR-HQN-2009-01153
CR-IP2-2010-04085	CR-IP3-2009-04917	CR-IP2-2009-05393
CR-IP3-2010-01740	CR-IP3-2009-04920	CR-IP2-2009-05399
CR-IP2-2010-03985	CR-IP3-2009-04897	CR-IP2-2009-05400
CR-IP2-2010-03986	CR-IP2-2009-05404	CR-IP2-2009-05389
CR-IP2-2010-03988	CR-IP2-2009-05409	CR-IP2-2009-05349
CR-IP2-2010-03984	CR-IP3-2009-04868	CR-IP2-2009-05348
CR-IP3-2009-04903	CR-IP3-2009-04883	CR-IP2-2009-05321
CR-IP3-2009-04905	CR-IP3-2009-04884	
CR-PLP-2009-04108	CR-PLP-2010-02288	CR-PLP-2009-05909
CR-PLP-2009-05613	CR-PLP-2010-02290	CR-PLP-2010-02012
CR-PLP-2009-05918	CR-PLP-2009-05942	CR-PLP-2009-05897

CR-PLP-2009-05908		
CR-PNP-2009-01798	CR-PNP-2008-03922	CR-PNP-2009-05303
CR-PNP-2009-02059	CR-PNP-2009-05359	CR-PNP-2009-05297
CR-PNP-2009-02255	CR-PNP-2010-00015	CR-PNP-2010-02124
CR-PNP-2008-00916		
CR-RBS-2008-04685	CR-RBS-2010-01472	CR-RBS-2010-00006
CR-RBS-2009-05041	CR-RBS-2010-02033	CR-RBS-2009-06472
CR-RBS-2009-06123	CR-RBS-2010-00200	CR-RBS-2009-06495
CR-RBS-2009-06446	CR-RBS-2010-00221	CR-RBS-2009-06456
CR-RBS-2009-06451	CR-RBS-2010-00278	CR-RBS-2009-06450
CR-RBS-2009-06471	CR-RBS-2010-00088	CR-RBS-2009-06452
CR-RBS-2009-06473	CR-RBS-2010-00011	CR-RBS-2009-06158
CR-RBS-2009-06490	CR-RBS-2009-06520	CR-RBS-2009-06209
CR-RBS-2010-00044	CR-RBS-2009-06539	CR-RBS-2009-06449
CR-WF3-2010-01198	CR-WF3-2010-00284	CR-WF3-2009-07711
CR-WF3-2010-01356	CR-WF3-2009-07713	CR-WF3-2010-02629
CR-WF3-2010-00746		
CR-VTY-2009-04496	CR-VTY-2010-04432	CR-VTY-2010-04496
CR-VTY-2010-01479	CR-VTY-2010-04434	CR-VTY-2010-00070
CR-VTY-2010-02759		
CR-GGN-2010-04140	CR-GGN-2010-02135	CR-GGS-2009-06921
CR-GGN-2010-02730	CR-GGN-2010-02382	CR-GGS-2009-06922
CR-GGN-2010-04178	CR-GGN-2010-02902	CR-GGS-2009-06923
CR-GGN-2010-04101	CR-GGN-2010-00590	CR-GGS-2009-06927
CR-GGN-2010-04092	CR-GGN-2010-01247	CR-GGS-2009-06806
CR-GGN-2010-03674	CR-GGN-2010-01252	CR-GGN-2010-00164
CR-GGN-2010-03721	CR-GGN-2009-06575	CR-GGN-2009-06904
CR-GGN-2010-03900	CR-GGS-2009-06907	CR-GGN-2009-06910
CR-GGN-2010-03451	CR-GGS-2009-06920	CR-GGN-2009-06505
CR-GGN-2010-03492		
CR-ANO-1-2009-02330	CR-ANO-2010-01503	CR-ANO-1-2010-00743

MISCELLANEOUS DOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
EOI Letter ENOC-10-00002	Response to Request for Information, Revision 1	January 8, 2010

MISCELLANEOUS DOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
EOI Letter ENOC-09-00037	Response to Request for Information	November 30, 2010
QAPM	Entergy Quality Assurance Program Manual	0 through 20
Regulatory Guide 1.8	Personnel Selection and Training	1
ANSI/ANS 3.1-1978	American National Standard for Selection and Training of Nuclear Power Plant Personnel	1978
ANSI N18.1-1971	American National Standard for Selection and Training of Nuclear Power Plant Personnel	1971
NRC SER	NRC Safety Evaluation Report, Entergy Operations, Inc. Quality Assurance Program Consolidation	November 6, 1998
Technical Specification 5.3.1	Unit Staff Qualifications Personnel Change Planning Checklist/Forms for QA Manager Candidates	various July 2007
CEO2009-00195	Corporate ANSI Level III Surveillance of VY Maintenance Inspection Program (VTY)	December 15, 2009
EOI Letter BvY 03-12	Vermont Yankee Nuclear Power Station, Docket No. 50-271 Annual Submittal of QAP Changes (VTY)	February 5, 2003
CIN-2003/00059	Vermont Yankee, 10 CFR Part 50.54(a)(3) Change Review	April 24, 2002
EOI Letter No.CNRO-2003-013	Forms for QAPM	Rev 8 (VTY)
EOI Letter No.CEXO-2003/164	Entergy Quality Assurance Program Manual, Rev. 8 (VTY)	April 24, 2003
EOI Letter NO.CNRO-2002/027	Issuance of Entergy Quality Assurance Program Manual (QAPM) Revision 8 (VTY)	April 24, 2003
10 CFR 50.59 Review Form	Entergy Quality Assurance Program Manual, Revision 7 (PNPS)	April 25, 2002
ENO Letter No.1.2.02-067	Entergy QA Program Manual, Revision 7 (PNPS)	May 2, 2002
EN-QV-104 Attachment 9.1	Entergy QA Program Manual, Revision 7 (PNPS) Independent Spent Fuel Storage Installation	June 30, 2002
ENOC Letter NO. 07-0020	Entergy QA Program Manual Change Review Form 50.54(a) Parts 1,2 and 3 (PLP)	April 5, 2007
AP-20.06, Attachment 1	Entergy QA Program Manual, Revision 16, Annual Report 10 CFR 50.54(a)(3) and 10 CFR 72.140(d) (PLP)	April 15, 2007

MISCELLANEOUS DOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
MCM-4.1 Attachment 4.1	FSAR Change Request Form, Relocate QA Program from Chapter 17 to Entergy QAPM (JAF)	May 6, 2002
AP-20.09 Attachment 1	Nuclear Engineering 10 CFR 50.59 Screening Form (JAF)	April 3, 2002
Entergy Letter JLIC-02-017	Process Applicability Screening – Relocate QA Program From FSAR Ch. 17 to Entergy QAPM (JAF)	April 1, 2002
ENO Letter 1.2.02-060	Cross Reference of QAPM commitments to Implementing procedures at JAF	April 2, 2002
Entergy Letter CNRO-2002-027	Adaptation of Entergy Common QAPM, Revision 7 (JAF)	June 21, 2002
10 CFR 50.54(a)Evaluation	Entergy QA Program Manual, Revision 7 (JAF)	April 25, 2002
ENO Letter 1.2.02-060	QA Program Change/Prior Approval Determination - Part A (IP3)	May 6, 2002
ENO Meeting Summary	Adaptation of Entergy Common QAPM, Revision 7, (IP2 and IP3)	June 21, 2002
	Development of Common QA Manual for northern Entergy Sites and Entergy Nuclear Generating Company Plants	November 30, 2001

ENGINEERING CHANGES/MAINTENANCE WORK ORDERS

ANO U-1 EC 01039	ANO U-1 EC 05054	ANO U-1 EC 05388
ANO U-1 EC 05808	ANO U-1 EC 06241	ANO U-1 EC 07032
ANO U-1 EC 13153	ANO U-1 EC 13224	ANO-EC-00608
ANO-EC-02886	ANO-EC-03069	ANO-EC-04461
ANO-EC-07032	ANO-EC-08043	GGN-EC-00085
GGN-EC-00224	GGN-EC-00494	GGN-EC-01450
GGN-EC-01452	GGN-EC-02048	GGN-EC-02048
GGN-EC-02058	GGN-EC-02065	GGN-EC-02065
GGN-EC-02107	GGN-EC-02110	GGN-EC-02201
GGN-EC-02784	GGN-EC-04538	GGN-EC-06039
GGN-EC-06086	GGN-EC-06299	GGN-EC-06301
GGN-EC-06875	GGN-EC-07471	GGN-EC-07716
GGN-EC-13326	GGN-EC-13354	GGN-EC-13355
PLP-EC-05885	PLP-EC-06553	PLP-EC-09121
PLP-EC-12392	PLP-EC-12731	PLP-EC-14181

PLP-EC-18042	RBS-EC-00893	RBS-EC-02692
RBS-EC-03275	RBS-EC-03275	RBS-EC-03643
RBS-EC-03850	RBS-EC-03852	RBS-EC-03853
RBS-EC-03975	RBS-EC-05932	RBS-EC-06947
RBS-EC-07239	RBS-EC-07368	RBS-EC-08504
RBS-EC-12204	RBS-EC-13128	RBS-EC-16451
RBS-EC-70733	RBS-EC-70734	RBS-EC-70752
VYT-EC-03138	WF30EC-03013	WF3-EC-00935
WF3-EC-01166	WF3-EC-01166	WF3-EC-01396
WF3-EC-01782	WF3-EC-01830	WF3-EC-05854
WF3-EC-07960	WF3-EC-09046	WF3-EC-10706
WF3-EC-11284	WF3-EC-13981	WF3-EC-15451
WF3-EC-844881		

#### AUDIT REPORTS /SURVEILLANCES

Corporate ANSI Level III Surveillance of VY Inspection Program  
 PNP Pre-NIEP 2009 Report  
 PNP Pre-NIEP 2010  
 VY Pre-NIEP 2007 LO-VTYLO-2007-00029  
 Palisades Pre-NIEP 2009  
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 JAF Pre-NIEP August 2007  
 IPEC Pre-NIEP 2009  
 IPEC 2008 Pre- NIEP Assessment  
 GGNS Pre-NIEP Report final May 2008  
 GGNS Pre-NIEP 2009  
 ANO Pre-NIEP 2010  
 WF3 Pre-NIEP 2007 W3 CEO2008-00026  
 QA-13-2009-PLP-01 PLP NIEP 2009  
 QA-13-2009-GGNS-1 GGNS NIEP 2009  
 QA-13-2007-VY-1 NIEP AUDIT REPORT  
 NIEP - River Bend - 2007  
 JAF QA 2008 NIEP Report  
 IPEC 2009 NIEP Report  
 WF3 NIEP 2008  
 QA-10-2006-VY-1 Maintenance  
 QA-10-2006-RBS-1 Maintenance  
 QA-10-2006-JAF-1 Maintenance

QA-10-2006-PNP-1 Maintenance  
QA-10-2006-IP-1 Maintenance  
QA-10-2006-GGNS-1 Maintenance  
QA-10-2006-ANO-1 Maintenance  
QA-10-2006-WF3-1 Maintenance  
QS-2010-PLP-017 PLP QC Inspection Program  
QS-2010-GGNS-011 GGNS QC Inspection Program  
QS-2010-ECH-008 ANSI Level III of IPEC  
QS-2010-ECH-007 Review of EOC for QC Inspection Point Selection  
QS-2010-ECH-006 Review of Fleet Interim Actions  
QS-2010-ECH-002 ANSI Level III of PNP  
QS-2010-ECH-001 ANSI Level III of GGNS  
QS-2009-VY-004 VY Inspection Program  
QS-2009-VY-020 VY Maintenance Inspection Program  
QS-2009-ANO-006 Corporate ANSI Level III of ANO  
QS-2008-VY-004 Peer Inspector Qualification Documentation  
QS-2010-PNPS-019 PNP Inspection Program  
QA-10-2008-VY-1 Maintenance  
QA-10-2008-RBS-1 Maintenance  
QA-10-2008-PNP-1 Maintenance  
QA-10-2008-PLP-1 Maintenance  
QA-10-2008-JAF-1 Maintenance  
QA-10-2008-IP-1 Maintenance  
QA-10-2008-GGNS-1 Maintenance  
QA-10-2008-ANO-1 Maintenance  
QA-10-2008-WF3-1 Maintenance  
Corporate ANSI Level III Surveillance of VY Inspection Program  
PNP Pre-NIEP 2009 Report  
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QA-13-2009-PLP-01 PLP NIEP 2009  
QA-13-2009-GGNS-1 GGNS NIEP 2009  
QA-13-2007-VY-1 NIEP AUDIT REPORT  
NIEP - River Bend - 2007  
JAF QA 2008 NIEP Report  
IPEC 2009 NIEP Report  
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QA-10-2006-IP-1 Maintenance  
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QA-10-2006-ANO-1 Maintenance  
QA-10-2006-WF3-1 Maintenance  
QS-2010-PLP-017 PLP QC Inspection Program  
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QS-2010-ECH-008 ANSI Level III of IPEC  
QS-2010-ECH-007 Review of EOC for QC Inspection Point Selection  
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QS-2009-VY-004 VY Inspection Program  
QS-2009-VY-020 VY Maintenance Inspection Program  
QS-2009-ANO-006 Corporate ANSI Level III of ANO  
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QS-2010-PNPS-019 PNP Inspection Program  
QA-10-2008-VY-1 Maintenance  
QA-10-2008-RBS-1 Maintenance  
QA-10-2008-PNP-1 Maintenance  
QA-10-2008-PLP-1 Maintenance  
QA-10-2008-JAF-1 Maintenance  
QA-10-2008-IP-1 Maintenance  
QA-10-2008-GGNS-1 Maintenance  
QA-10-2008-ANO-1 Maintenance  
QA-10-2008-WF3-1 Maintenance

**Section 40A3: Identification and Resolution of Problems**

CALCULATIONS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
97-E-0212-01	BWST Draindown Analysis	3
98-E-0044-01	RWT Draindown Analysis	5

**Section 40A5: Identification and Resolution of Problems**

MISCELLANEOUS DOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
	Arkansas Nuclear One, Physical Security, Safeguards Contingency and Training and Qualification Plan	10 and 11
CR-HQN-20091107	Response for Actions 2 and 5 of Confirmatory Order EA-09-060	

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
OM14.ID1	Fatigue Management Rule Program	17A

MISCELLANEOUS DOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
	General Employee Training, Instructor Lesson GuideCourse No GFFD100, "Fitness For Duty"	0
	General Employee Training, Instructor Lesson GuideCourse No GFFDCI, "Fitness For Duty Current Issues"	0
	General Employee Training, Instructor Lesson GuideCourse No GFFDSUPFATR & TI, "Fatigue Management For Supervisors"	0