UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
475 ALLENDALE ROAD
KING OF PRUSSIA, PA 19406-1415

February 8, 2011

Mr. Michael Colomb
Site Vice President
Entergy Nuclear Operations, Inc.
Vermont Yankee Nuclear Power Station
Vernon, VT 05354

SUBJECT: VERMONT YANKEE NUCLEAR POWER STATION – NRC INTEGRATED INSPECTION REPORT 05000271/2010005

Dear Mr. Colomb:

On December 31, 2010, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Vermont Yankee Nuclear Power Station. The enclosed inspection report documents the inspection results, which were discussed on January 24, 2011, with Mr. Norman Rademacher, Site Director of Engineering, and other members of your staff.

The inspection examined activities performed 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 two NRC-identified findings of very low safety significance (Green). Both of these findings were determined to be violations of NRC requirements. Additionally, a licensee-identified violation which was determined to be of very low safety significance is listed in this report. However, because of the very low safety significance and because they are entered into your corrective action program, the NRC is treating these findings as non-cited violations (NCV) consistent with Section 2.3.2.a of the NRC's Enforcement Policy. If you contest 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 denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator Region I; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Senior Resident Inspector at Vermont Yankee. In addition, if you disagree with the characterization of the cross-cutting aspect of any finding in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region I, and the NRC Senior Resident Inspector at Vermont Yankee. The information you provide will be considered in accordance with Inspection Manual Chapter 0305.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the

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Sincerely,

Donald E. Jackson, Chief
Projects Branch 5
Division of Reactor Projects

Docket No. 50-271
License Nos. DPR-28

Enclosure: Inspection Report No. 05000271/2010005
w/ Attachment: Supplemental Information

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Sincerely,

**/RA/**

Donald E. Jackson, Chief
Projects Branch 5
Division of Reactor Projects

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w/ Attachment: Supplemental Information

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

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|---|---|
| Docket No.: | 50-271 |
| License No.: | DPR-28 |
| Report No.: | 05000271/2010005 |
| Licensee: | Entergy Nuclear Operations, Inc. |
| Facility: | Vermont Yankee Nuclear Power Station |
| Location: | Vernon, Vermont 05354-9766 |
| Dates: | October 1, 2010 through December 31, 2010 |
| Inspectors: | D. Spindler, Sr. Resident Inspector, Division of Reactor Projects (DRP)<br>S. Rich, Resident Inspector, DRP<br>H. Jones, Resident Inspector, DRP<br>J. Noggle, Sr. Health Physicist, Division of Reactor Safety (DRS)<br>T. Burns, Reactor Inspector, DRS<br>J. Lilliendahl, Reactor Inspector, DRS<br>R. Latta, Senior Reactor Inspector, Region IV<br>D. Jones, Senior Reactor Inspector, Region III<br>P. Prescott, Senior Quality and Vendor Program Engineer, Office of Nuclear Reactor Regulation (NRR) |
| Approved by: | Donald E. Jackson, Chief<br>Projects Branch 5<br>Division of Reactor Projects |

Enclosure

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## SUMMARY OF FINDINGS

IR 05000271/2010005; 10/01/2010 – 12/31/2010; Vermont Yankee Nuclear Power Station; Identification and Resolution of Problems.

This report covered a three-month period of inspection by resident inspectors, regional-based inspectors, headquarters-based inspectors, and a regional health physics inspector. Two NRC-identified non-cited violations (NCVs), and one licensee-identified violation of very low safety significance (Green) were identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. Cross-cutting aspects associated with findings are determined using IMC 0310, "Components Within the Cross-Cutting Areas." 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.

**Cornerstone: Mitigating Systems**

- Green. The inspectors identified a non-cited violation (NCV) of 10 CFR 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. 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 as condition reports (CR) 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 issue 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 be of very low safety significance (Green), 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 issue had a cross-cutting aspect in the Human Performance cross-cutting area, Decision-Making component, 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.1(a)]. (Section 4OA2)

- Green. The inspectors identified an NCV of 10 CFR 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 two individuals 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 one 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 CR-HQN-2010-00386.

The failure 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 was a performance deficiency. This issue was more than minor because, if left uncorrected, it could create a more significant safety concern. The failure to have a fully qualified individual providing overall oversight to the Quality Assurance Program had the potential to affect all cornerstones, but the inspectors determined that 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 NRC Significance Determination Process (SDP) guidance, so it was determined to be of very low safety significance (Green) using NRC Inspection Manual Chapter (IMC) 0609, Appendix M, "Significance Determination Process Using Qualitative Criteria." The inspectors determined that there was no cross-cutting aspect associated with this finding because this issue was not indicative of current performance as it occurred more than three years ago. (Section 4OA2)

**Other Findings**

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. The violation and corrective action tracking numbers are listed in Section 4OA7.

## REPORT DETAILS

### Summary of Plant Status

Vermont Yankee (VY) Nuclear Power Station began the inspection period operating at 100 percent power. On November 6, 2010, VY performed a planned power reduction to 49 percent for control rod scram time testing, feed pump maintenance, and main steam isolation valve testing. VY increased power to 80 percent the same day and held there to support electrical grid maintenance. On November 7, 2010, VY commenced an unplanned shutdown from 80 percent to repair a leak on a feedwater header pipe. VY commenced plant start-up on November 10, 2010, returned to 100 percent power on November 16, 2010, and remained at or near 100 percent power for the remainder of the inspection period.

### 1. REACTOR SAFETY

**Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity**

1R01 Adverse Weather Protection (71111.01)

.1 External Flooding Readiness

a. Inspection Scope (1 sample)

The inspectors reviewed VY's flood protection barriers and procedures for coping with external flooding in the emergency diesel generator rooms. The inspectors reviewed external flooding information contained in the Updated Final Safety Analysis Report (UFSAR) and compared it to the actions specified in Entergy operating procedure (OP) 3127, "Natural Phenomena," Revision 26. The inspectors performed walkdowns of the emergency diesel generator rooms, switchgear rooms, and intake structure, and examined the equipment specified in the OP (sump pumps, floor drain plugs, etc.) to determine if it was available for use. The inspectors also reviewed a sample of external flooding-related conditions identified in VY's corrective action program (CAP) to determine if they were appropriately identified and corrected. The documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

.2 Seasonal Susceptibility

a. Inspection Scope (1 sample)

The inspectors reviewed Entergy's procedures for seasonal preparations to evaluate the process for implementation of cold weather preparedness. The inspectors reviewed adverse weather information contained in the External Events Design Basis Document and compared it to the actions specified in OP 2196, "Seasonal Preparedness,"

Revision 31. The inspectors interviewed operators, performed a walkdown of the condensate storage tank areas, emergency diesel generators and intake structure, and examined the equipment specified in the OP to determine if equipment readiness was maintained to meet the onset of cold weather conditions. The inspectors also reviewed a sample of seasonal preparedness-related condition reports identified in Entergy's CAP to determine if they were appropriately identified and corrected. The documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

1R04 Equipment Alignment (71111.04)

.1 Partial Equipment Alignment (71111.04Q)

a. Inspection Scope (1 sample)

The inspectors performed a partial system walkdown of the service water system while the reactor core isolation cooling system was out of service to verify correct system alignment, and to identify any discrepancies that could impact system operability. Observed plant conditions were compared to the alignment of equipment specified in applicable piping and instrumentation drawings (P&IDs) and operating procedures. The inspectors observed valve positions, power supply availability, and the general condition of selected components. Finally, the inspectors evaluated material condition, housekeeping, and component labeling. The documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

.2 Complete Equipment Alignment (71111.04S)

a. Inspection Scope (2 samples)

The inspectors performed a complete equipment alignment inspection of the accessible portions of the residual heat removal system train 'B', and of the reactor core isolation cooling system. The inspectors compared the actual system configuration to approved drawings, the UFSAR, and operating procedures. Through a system walkdown, the inspectors evaluated whether major system components were properly ventilated; hangers and supports were correctly installed and functional; electrical power was available; ancillary equipment was placed so it would not interfere with the operation of system valves; and deficiencies had been entered into the CAP. The inspectors also assessed housekeeping and component labeling. In addition, the inspectors reviewed the system health reports for each system, evaluated a sample of previously identified deficiencies to determine if they had been properly addressed, and discussed open items with the responsible system engineers to determine if they impacted system

operability. The inspectors performed a search of the CAP for equipment alignment problems to verify that Entergy was identifying problems at an appropriate threshold and resolving them appropriately. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05)

Quarterly Inspection (71111.05Q)

a. Inspection Scope (3 samples)

The inspectors performed inspections of three fire areas based on a review of the VY Safe Shutdown Capability Analysis and the Fire Hazards Analysis. The inspectors reviewed Entergy's fire protection program to determine the specified fire protection design features, fire area boundaries, and combustible loading requirements for the selected areas. During walkdowns of the fire areas, the inspectors verified that combustibles and ignition sources were adequately controlled and passive fire barriers, manual fire-fighting equipment, and detection and suppression equipment were appropriately maintained. The inspectors evaluated the fire protection program for conformance with the requirements of License Condition 3.F. The documents reviewed are listed in the Attachment. The following fire areas were inspected:

- Control Room, FZ ASD-1;
- Reactor Core Isolation Cooling Corner Room, FA RCIC; and
- Reactor Building Elevation 252' North, FZ RB-3.

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06)

Underground Bunkers/Manholes Subject to Flooding

a. Inspection Scope (1 sample)

The inspectors completed one flood protection measures inspection sample. The inspectors evaluated the condition of safety-related cables located in underground manholes. Specifically, the inspectors directly inspected conditions in manholes MH-OG1, MH-OG2, HH-32A and HH-37A which contain safety-related and Maintenance Rule system cables. The inspectors examined the integrity of cables and the condition of cable support structures. In addition, the inspectors evaluated items entered in the licensee's CAP relating to conditions discovered during the manhole inspections; assessed whether the conditions had any adverse impact on operability; and determined

whether appropriate corrective actions were planned. The documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program (71111.11)

Quarterly Inspection (71111.11Q)

a. Inspection Scope (1 sample)

The inspectors observed control room crew performance during an emergency preparedness drill on October 20, 2010. The inspectors assessed the performance of risk significant operator actions, including the use of emergency operating procedures. The inspectors evaluated crew performance in the areas of clarity and formality of communications; ability to take timely actions; prioritization, interpretation, and verification of alarms; procedure usage; control board manipulations; and command and control. The inspectors also compared the simulator configuration with the actual control room configuration. Finally, the inspectors verified that evaluators were identifying and documenting crew performance problems. The documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12)

Quarterly Inspection (71111.12Q)

a. Inspection Scope (1 sample)

The inspectors conducted an in-office review of the process radiation monitoring system for items such as: (1) appropriate work practices; (2) identifying and addressing common cause failures; (3) scoping in accordance with 10 CFR 50.65 paragraph (b) of the Maintenance Rule; (4) characterizing reliability issues for performance; (5) trending key parameters for condition monitoring; (6) balancing reliability and unavailability (performance); (7) charging unavailability for performance; (8) classification and reclassification in accordance with 10 CFR 50.65 paragraph (a)(1) or (a)(2); and (9) appropriateness of performance criteria for structures, systems, and components (SSCs) and functions classified as paragraph (a)(2). The inspectors discussed observations with the system engineer and maintenance representatives. The documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

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

a. Inspection Scope (2 samples)

The inspectors evaluated two maintenance risk assessments for planned and emergent maintenance activities to verify that the appropriate risk assessments were performed prior to removing equipment for work. The inspectors reviewed maintenance risk evaluations, maintenance plans, work schedules, and control room logs to determine if concurrent or emergent maintenance or surveillance activities significantly increased the plant risk. The inspectors reviewed risk assessments to determine if they were performed as required by 10 CFR 50.65 paragraph (a)(4) and implemented in accordance with Entergy's administrative procedures (AP) 0125, "Plant Equipment," and AP 0172, "Work Schedule Risk Management - Online." The inspectors conducted plant walkdowns to verify that appropriate risk management actions had been taken. The documents reviewed are listed in the Attachment. The following maintenance activities were inspected:

- Vernon tie-line transformer replacement; and
- Emergent work on the uninterruptible power supply (UPS) battery and the average power range monitors.

b. Findings

No findings were identified.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope (3 samples)

The inspectors reviewed three operability evaluations associated with degraded or non-conforming conditions to assess the acceptability of the evaluations, the use and control of applicable compensatory measures, and compliance with Technical Specifications. The inspectors reviewed and compared the technical adequacy of the evaluations with the Technical Specifications, UFSAR, associated design basis documents, and Entergy's procedure EN-OP-104, "Operability Determinations." The documents reviewed are listed in the Attachment. The inspectors reviewed evaluations of the following degraded or non-conforming conditions:

- CR 2010-05062, "Residual Heat Removal (RHR) "A" Side Heat Exchange Arcor Coating Removal;"
- CR 2010-2187, "Safety Relief Valves Removed During Refueling Outage (RFO 28) Bench Testing Revealed Minor Diaphragm Air Leakages;" and

- CR 2010-05269, " The Temperature Corrected Life Expectancy of Both UPS Batteries May Not Be Conservative."

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19)

a. Inspection Scope (4 samples)

The inspectors reviewed four post-maintenance test (PMT) activities on risk-significant systems. The inspectors reviewed these activities to determine whether test acceptance criteria were clear and consistent with design basis documents. When testing was directly observed, the inspectors determined whether installed test equipment was appropriate and controlled, and whether the test was performed in accordance with 10 CFR Part 50, Appendix B, Criterion XI, "Test Control," and applicable station procedures. Upon completion, the inspectors performed a walkdown to verify that equipment was returned to the proper alignment necessary to perform its safety function, and evaluated whether conditions adverse to quality were entered into the CAP for resolution. The documents reviewed are listed in the Attachment. The inspectors reviewed the PMTs performed for the following maintenance activities:

- On October 18-22, 2010, reactor core isolation cooling turbine inspection and flow controller replacement;
- On November 4, 2010, "A" residual heat removal (RHR) planned maintenance;
- On November 9, 2010, high pressure coolant injection system steam line drain line repair; and
- On November 30, 2010, "D" APRM power supply replacement.

b. Findings

No findings were identified.

1R20 Refueling and Outage Activities (71111.20)

a. Inspection Scope (1 sample)

For the forced outage that began on November 7, 2010, the inspectors evaluated Entergy's outage activities as described below to verify they adhered to technical specification (TS) requirements and managed outage risk.

Inspection activities performed included:

- Monitoring shutdown activities by observing portions of the power reduction and cooldown process from the control room;
- Inspecting the status and configuration of electrical systems to ensure that TSs and

outage risk requirements were met, and controls over switchyard activities were appropriate;
- Monitoring the status of the decay heat removal system, and checking the alignment of the alternate system;
- Observing portions of startup and ascension to full power operation and tracking startup prerequisites;
- Inspecting station personnel identification and resolution of problems related to forced outage activities; and
- Reviewing work hours for fatigue concerns.

The documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope (2 samples)

The inspectors observed two surveillance tests and reviewed test data of selected risk-significant structures, systems and components (SSCs) to determine whether the testing adequately demonstrated equipment operational readiness and the ability to perform the intended safety functions. The inspectors reviewed selected prerequisites and precautions to determine if they were met; evaluated whether the tests were performed in accordance with the written procedure; determined whether the test data was complete and met procedural requirements; and assessed whether SSCs were properly returned to service following testing. The inspectors also verified that conditions adverse to quality were entered into the CAP for resolution. The documents reviewed are listed in the Attachment. The inspectors reviewed the following surveillance tests:

- High pressure coolant injection quarterly surveillance; and
- Control rod scram time testing.

b. Findings

No findings were identified.

**Cornerstone: Radiation Safety**

2RS8 Radioactive Solid Waste Processing and Radioactive Material Handling, Storage and Transportation (71124.08 – 1 sample)

a. Inspection Scope

During the period October 18 through 22, 2010, the inspector conducted the following activities to verify that the licensee's radioactive material processing and transportation programs complied with the requirements of 10 CFR Parts 20, 61, and 71; and Department of Transportation (DOT) regulations 49 CFR Parts 170-189.

- The inspector reviewed the solid radioactive waste system description in the UFSAR, the 2009 radiological effluent release report for information on the types and amounts of radioactive waste disposed, and the scope of the licensee's audit program to verify that it meets the requirements of 10 CFR 20.1101.

- The inspector reviewed several areas where radioactive materials were stored and verified their controls and posting in accordance with 10 CFR Part 20. All such radioactive materials were secured against unauthorized removal. Containers of stored radioactive materials were observed to verify their material condition in accordance with procedural requirements.

- The inspector performed a walkdown of the liquid and solid radioactive waste processing systems to verify and assess that the current system configuration and operation agree with the descriptions contained in the UFSAR and in the Process Control Program (PCP); reviewed the status of any radioactive waste process equipment that is not operational and/or is abandoned in place; and verified that the changes were reviewed and documented in accordance with 10 CFR 50.59, as appropriate. The inspector reviewed the current processes for recirculating, transferring and dewatering of radioactive waste resin and sludge discharges into shipping/disposal containers to determine if appropriate waste stream mixing and/or sampling procedures, and methodology for waste concentration averaging provide representative samples of the waste product for the purposes of waste classification as specified in 10 CFR 61.55 for waste disposal.

- The inspector reviewed the radio-chemical sample analysis results for each of the licensee's radioactive waste streams; reviewed the licensee's use of scaling factors and calculations with respect to these radioactive waste streams to account for difficult-to-measure radionuclides; verified that the licensee's program assures compliance with 10 CFR 61.55 and 10 CFR 61.56 as required by Appendix G of 10 CFR Part 20; and reviewed the licensee's quality assurance program to ensure that the waste stream composition data accounts for changing operational parameters and thus remains valid between the annual or biennial sample analysis update.

- The inspector observed one radioactive material shipment and one exempt quantity water tanker shipment during the week of October 18 through 22, 2010, to include

the following shipment preparation activities: packaging, surveying, labeling, marking, placarding, vehicle checks, emergency instructions, disposal manifests, shipping papers provided to the driver, and licensee verification of shipment readiness.

- The inspector sampled the following radioactive material shipment records and reviewed these records for compliance with NRC and DOT requirements:

  - 2009-61;
  - 2009-71;
  - 2010-39;
  - 2010-42;
  - 2010-49;
  - 2010-134;
  - 2010-136 (excepted package); and
  - 2010-138 (excepted package).

- The inspector reviewed the licensee's event reports, special reports, audits, state agency reports, and self-assessments related to the radioactive material and transportation programs performed since the last inspection and determined that identified problems are entered into the CAP for resolution. The inspector also reviewed CRs written against the radioactive material and shipping programs since the previous inspection.

b. Findings

No findings were identified.

## 4. OTHER ACTIVITIES [OA]

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

a. Inspection Scope (5 Samples)

Mitigating Systems Cornerstone

The inspectors sampled Entergy submittals for the three Mitigating Systems Performance Index (MSPI) performance indicators (PIs) for the period from October 1, 2009, through September 30, 2010. The inspectors reviewed selected operator logs, plant process computer data, licensee event reports, maintenance rule out of service logs, criticality data, Consolidated Data Entry MSPI Derivation Reports for the unavailability index and unreliability index for each system, monitored component demands and demand failure data. The inspectors discussed the PI data with responsible system engineers and licensing personnel. The PI definitions and guidance contained in Nuclear Energy Institute (NEI) 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, and AP 0094, "NRC Performance Indicator Reporting," were used to verify the accuracy and completeness of the PI data reported during this

period. Documents reviewed are listed in the Attachment. The following performance indicators were inspected:

- MSPI, cooling water systems (MS10);
- MSPI, emergency AC power (MS06); and
- MSPI, residual heat removal system (MS09).

Occupational Exposure Control Effectiveness (OR01)

Additionally, the inspector reviewed implementation of the licensee's Occupational Exposure Control Effectiveness Performance Indicator (PI) Program. Specifically, the inspector reviewed CRs and radiological controlled area dosimeter exit logs for the past four calendar quarters (4th quarter 2009 through 3rd quarter 2010). These records were reviewed for occurrences involving locked high radiation areas, very high radiation areas, and unplanned exposures against the criteria specified in NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, to verify that all occurrences that met the NEI criteria were identified and reported as performance indicators.

Radiological Effluent Technical Specification/Offsite Dose Calculation Manual (RETS)/ (ODCM) Radiological Effluent Occurrences – (PR01)

The inspector reviewed a listing of relevant effluent release reports for the past four calendar quarters (4th quarter 2009 through 3rd quarter 2010), for issues related to the public radiation safety performance indicator, which measures radiological effluent release occurrences per site that exceed 1.5 millirem (mrem)/quarter whole body or 5.0 mrem/quarter organ dose for liquid effluents; 5 mrads/quarter gamma air dose, 10 mrad/quarter beta air dose, and 7.5 mrads/quarter organ dose for gaseous effluents. The review was against applicable criteria specified in NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6. The purpose of the review was to verify that occurrences that met the NEI criteria were recognized and identified as Performance Indicator occurrences.

The inspector reviewed the following documents to ensure the licensee met all requirements of the performance indicator:

- Monthly projected dose assessment results due to radioactive liquid and gaseous effluent releases;
- Quarterly projected dose assessment results due to radioactive liquid and gaseous effluent releases; and
- Dose assessment procedures.

b. Findings

No findings were identified.

4OA2 Identification and Resolution of Problems (71152)

.1 Reviews of Items Entered into the Corrective Action Program

a. Inspection Scope

The inspectors performed a daily screening of each item entered into Entergy's CAP. This review was accomplished by reviewing printouts of each CR, attending daily screening meetings, and/or accessing Entergy's database. The purpose of this review was to identify conditions such as repetitive equipment failures or human performance issues that might warrant additional follow up.

b. Findings

No findings or observations were identified.

.2 Semi-Annual Trend Review

a. Inspection Scope (1 sample)

The inspectors performed a semi-annual review of site issues, to identify trends that might indicate the existence of more significant safety issues, as required by NRC Inspection Procedure 71152, "Identification and Resolution of Problems." The inspectors included in this review repetitive or closely-related issues that may have been documented by VY outside of the corrective action program, such as trend reports, performance indicators, major equipment problem lists, system health reports, maintenance rule assessments, and maintenance or CAP backlogs. The inspectors also reviewed the VY CAP database for the third and fourth quarters of 2010, to assess condition reports (CRs) written in various subject areas (equipment problems, human performance issues, etc.), as well as individual issues identified during the NRCs daily CR review (Section 4OA2.1). The inspectors reviewed the VY quarterly trend report for the third quarter of 2010, conducted under EN-LI-121, "Entergy Trending Process", Revision 8, to verify that VY personnel were appropriately evaluating and trending adverse conditions in accordance with applicable procedures.

b. Findings and Observations

No findings were identified.

The inspectors observed that the documentation in condition reports of the frequent automatic starts of the electric fire pump was not in accordance with EN-LI-102 "Corrective Action Process," Revision 16. This was brought to the attention of station management and condition reports are now generated for all electric fire pump starts.

. 3 Annual Sample: Review of the Leak Detection System

a. Inspection Scope (1 sample)

The inspectors selected CR-VTY-2010-04134 as a sample for a detailed follow-up review. CR-VTY-2010-04134 documented the identification of the drywell floor drain sump pump-out timer found non-conservatively set at 2 minutes, which is above the calculated setting of 1.5 minutes. This means that at this non-conservative setting, the drywell floor drain sump pump-out timer would not alarm the annunciator in the control room to alert operators to leakage in the drywell floor drain sump until leakage reached 9.9 gpm. The issue was identified by inspectors. The inspectors assessed Entergy's operability determination, extent of condition review, and the prioritization and timeliness of corrective actions. The review was conducted to determine whether Entergy personnel were appropriately identifying, characterizing, and correcting problems associated with these issues, and whether the planned or completed corrective actions were appropriate to prevent recurrence. Additionally, the inspectors interviewed operators and engineering personnel. The documents reviewed are listed in the Attachment.

b. Findings and Observations

No findings or observations were identified.

.4 Annual Sample: Service Water System Integrity

a. Inspection Scope (1 sample)

A problem identification and resolution (PI&R) sample inspection was conducted during the period October 25 through 29, 2010. The purpose of the inspection was to assess the effectiveness of actions taken by the licensee to identify, characterize, correct, and prevent reoccurrence of problems which could impact cornerstone objectives. The problem identified for evaluation was pinhole leakage discovered in various locations adjacent to field welds made during original system installation of the service water (SW) supply and return lines to the spent fuel pool cooling (SFPC) system.

The inspector selected CRs 2009-00500, 00238 and 01696 that identified a number of small (pinhole) leaks in the service water (SW) supply and return lines to the SFPC. Also, CRs which identified non-conforming corrosion control chemical treatment activities are noted in the Attachment to this report.

The inspector selected a sample of nondestructive examination (NDE) activities to perform a documentation review of those activities for compliance with the requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code. The inspector reviewed two ultrasonic tests (UT) and two radiographic test (RT) reports. The sample selection was based on a review of the fabrication weld population to assure the sample was representative of identical or similar operational variables to those locations where leakage occurred. The inspector noted the samples selected for extent of condition evaluation were of the same materials of construction and were within

the same system (exhibited same or similar temperature, pressure, media, and flow) as those portions of pipe which exhibited leakage. The inspector verified these though documentation reviews that the tests specified were appropriate for the volumetric examination of the welds and heat affected zones at the failed locations. In addition, the inspector performed this review to determine that nonconforming indications were appropriately identified, characterized, documented, and entered into the CAP.

The licensee performed a sample examination in accordance with ASME Code Case N-513-2, "Evaluation Criteria for Temporary Acceptance of Flaws in Moderate Energy Class 2 or 3 Piping Section XI, Division 1." This examination process required an expansion of sample as each lot was examined until no significant flaw(s) were detected, or until 100 percent of susceptible and accessible locations have been examined. Six sample lots were inspected and calculations performed which found the flaw locations to be acceptable.

b. Findings and Observations

No findings were identified.

The inspector noted that during the extent of condition examination, the licensee performed appropriate reportability and operability assessments. The piping leaks were determined to be not reportable and the SFPC system was determined to be operable. This determination was supported by engineering evaluation and analytical analysis. The inspector noted that as a result of the extent of condition examinations required by ASME Code Case N-513-2, examination of system butt welds revealed several flawed locations within the heat affected zone of those welds.

The leaks were found to be in the heat affected zone of butt welds joining the stainless steel (304) pipe. These welds were made during original construction and during a period when modifications were made to the system to provide additional cooling capacity for periods when abnormally high decay heat loads are placed in the spent fuel pool or subsequent to a seismic event. Also, the modifications were designed to support the use of high density fuel storage racks in the spent fuel pool. The SFPC system is not governed by Technical Specifications.

A failure analysis was performed by the licensee on selected locations which exhibited leakage to determine the failure mechanism resulting in the pinholes. The results of this analysis revealed that failure had occurred from Microbiological Influenced Corrosion (MIC) activity in the heat affected zone (HAZ) of the original stainless steel system fabrication welds. The analysis revealed that the sensitization in the weld HAZ had occurred as the result of the heat input of welding. The sensitization process degraded the corrosion resistance of the material at those locations rendering the area susceptible to intergranular stress corrosion cracking and MIC. The pinhole corrosion failure was the result of the MIC attack. Microbiological organisms were provided by the service water periodically when corrosion inhibitor concentrations in the SW were less than adequate to suppress biological attack.

As a result of these examinations, the licensee concluded that replacement of the entire system with an alternate material and enhancements to the corrosion control system was the appropriate course of action. The licensee selected carbon steel for the replacement material supplemented with more frequent chemical treatment. The replacement material will eliminate the sensitization phenomena of stainless steel in the heat affected zones of welded locations and more effective chemical treatment will reduce aggressive corrosion activity. In addition, piping configuration changes will enable better system drainage and elimination of stagnant locations where treatment is ineffective. Piping replacement was completed in February 2010.

.5 Annual Sample: Review of Low Cell Voltages for B-UPS-1A and B-UPS-1B Batteries

a. Inspection Scope (1 sample)

The inspectors performed a focused review of the actions taken and planned in response to the repeated observation of cells with low individual cell voltages (ICVs) in the B-UPS-1A and B-UPS-1B batteries. The inspectors interviewed system and design engineers to understand the history of the low ICVs, and to assess Entergy's evaluation and corrective actions. The inspectors performed a walkdown of the B-UPS-1A and B-UPS-1B batteries to assess the material condition of the battery cells and to evaluate the adequacy of maintenance for the batteries. The inspectors reviewed work orders, surveillance procedures, and surveillance results to verify that testing and maintenance are being performed in accordance with technical specifications, vendor instructions, and industry standards. The inspectors also reviewed CRs and corrective actions for the past three years to independently verify the operability of the B-UPS-1A and B-UPS-1B batteries. Documents reviewed are listed in the Attachment.

b. Findings and Observations

No findings were identified.

The inspectors determined that Entergy is adequately evaluating, trending, and correcting issues related to low ICVs for the B-UPS-1A and B-UPS-1B batteries. The inspectors reviewed a detailed evaluation of the material condition of the batteries performed by the battery vendor in 2008. The inspectors also reviewed the vendor's response to the current conditions. The inspectors determined that Entergy is adequately operating the battery cells in accordance with vendor recommendations. The inspectors observed that Entergy is formally evaluating the low ICV cells using the operational decision making issue (ODMI) process. The low ICV ODMI increases the monitoring of cells with low ICVs and sets thresholds to take action prior to the cells becoming inoperable. The inspectors determined that Entergy is adequately monitoring low ICV cells in accordance with the ODMI process to ensure that they remain above the technical specification limits. Finally, the inspectors noted that Entergy is proactively replacing cells with low ICVs prior to reaching the established limits.

.6 Sample: Corrective Action Review of Radwaste Transportation Inspection (71124.08)

a. Inspection Scope (71124.08) (1 sample)

The inspector reviewed five corrective action condition reports that were initiated between October 2008 and October 2010 and were associated with the radwaste transportation program. The inspector verified that problems identified by these CRs were properly characterized in the licensee's event reporting system, and that applicable causes and corrective actions were identified commensurate with the safety significance of the radiological occurrences.

b. Findings and Observations

No findings or observations were identified.

.7 Selected Issue Follow-up Inspection

a. Inspection Scope

An inspection was performed at the Entergy corporate office in Jackson, Mississippi on June 14 through 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 (NRR). 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 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. 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 non-licensed 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 Vermont Yankee 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 partial 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. CRs 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.

b.1 Failure to Perform Required Quality Control Inspections

Introduction: The inspectors identified a Green, NCV of 10 CFR 50, Appendix B, Criterion X, "Inspection," for the failure to ensure that Quality Control verification inspections were included in quality-affecting procedures and work instructions for construction-like work activities as required by the Quality Assurance 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 CRs at the various sites to document problems with Quality Control (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 Quality Assurance 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 of 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, seven were actual missed inspections (CR-RBS-2009-05041, CR-JAF-2008-03648, and CR-PNP-2008-00916 and 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 by 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).

- 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 non-routine 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

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 through 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 CRs written at Entergy sites that documented improper implementation of QC verification inspections. Specific CRs are listed in the attachment.

Analysis: 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, 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 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 issue had a cross-cutting aspect in the Human Performance cross-cutting area, Decision-Making component, 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.1(a)].

Enforcement: 10 CFR 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-VTY-2009-04496;
CR-VTY-2011-00073;
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; and
CR-HQN-2009-01188

Because this issue was of very low safety significance and was entered into the CAP as CR-HQN 2009-01184 and CR-HQN-2010-0013, this violation is being treated as an NCV, consistent with Section 2.3.2.a of the NRC's Enforcement Policy **(NCV 05000271/2010005-01, Failure to Perform Required Quality Control Inspections).**

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

Introduction: The inspectors identified a Green NCV of 10 CFR 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 two individuals 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.

Description: During their review of the issues surrounding the improper implementation of quality control (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 Quality Assurance (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 Quality Assurance Program Manual (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 Quality Assurance. 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," 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 two examples where the Senior Auditor was credited as being the group leader for purposes of meeting ANSI/ANS 3.1-1978, and the individuals who were 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: The failure 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 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 IMC 0609, Appendix M, and 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 cross-cutting aspect associated with this finding because this issue was not indicative of current performance as it occurred more than three years ago.

Enforcement: Appendix B to 10 CFR 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 Quality Assurance Program Manual, Revision 13, is the document used at each Entergy-owned site to describe the quality assurance program. Table 1, Section A of the Quality Assurance Program Manual 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 October 1, 2006, and June 2007, and again 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 individuals assigned to be the responsible person for the licensee's overall implementation of the Quality Assurance Program did not have at least one year of nuclear plant experience in the overall implementation of the Quality Assurance 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 CAP as CR-HQN-2010-00386, this violation is being treated as an NCV consistent with Section 2.3.2.a of the NRC's Enforcement Policy. **(NCV 05000271/2010005-02, Failure to Implement the Experience and Qualification Requirements of the Quality Assurance Program).**

4OA3 Event Follow-up (71153)

Operator Performance During Rod Pattern Adjustment

a. Inspection Scope (1 sample)

The inspectors observed an infrequently performed evolution on November 6, 2010. Specifically, the inspectors observed a planned plant downpower for a rod pattern adjustment. The inspectors observed the operators reduce power by lowering recirculation flow and inserting control rods. The inspectors reviewed procedural guidance contained in OP-0105, "Reactor Operations," Revision 88, the power maneuver plan, and observed the pre-job brief, control room conduct, and control of the evolutions.

b. Findings and Observations

No findings or observations were identified.

4OA5 Other Activities

.1 Independent Spent Fuel Storage Installation (ISFSI) Monitoring Controls (60855)

a. Inspection Scope

The inspector reviewed routine operations and monitoring of the ISFSI. The inspector performed a walkdown of the ISFSI; observed the condition of the storage modules including the air cooling ventilation openings; performed independent dose rate measurements of the storage modules; and confirmed twice daily module temperature readings for the month of September 2010 were within the required Certificate of Compliance temperature limits.

b. Findings

No findings were identified.

4OA6 Meetings, including Exit

Exit Meeting Summary

On January 10, 2011, the inspectors presented the results of the Selected Issue Follow-up Inspection of quality assurance and quality control issues to Mr. P. Corbett, Manager, Quality Assurance, and other members of the licensee staff. The inspectors confirmed that no proprietary information was provided or examined during the inspection.

On January 24, 2011, the resident inspectors presented the fourth quarter inspection results to Mr. Norman Rademacher, Director of Engineering, and other members of the Vermont Yankee staff. The inspectors confirmed that no proprietary information was provided or examined during the inspection.

4OA7 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 the NRC Enforcement Policy for being dispositioned as an NCV:

> 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 IMC 0609, Appendix M, and 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 CAP as CR-HQN-2009-00111.

**ATTACHMENT: SUPPLEMENTAL INFORMATION**

SUPPLEMENTAL INFORMATION

**KEY POINTS OF CONTACT**

Vermont Yankee Personnel
M. Colomb, Site Vice President
C. Wamser, General Manager of Plant Operations
M. Romeo, Director of Nuclear Safety
R. Wanczyk, Licensing Manager
J. Devincentis, Sr. Licensing Engineer
N. Rademacher, Director of Engineering
M. Gosekamp, Operations Manager
J. Rogers, Design Engineering Manager
C. Daniels, Superintendent, FIN Team
D. Jones, Asst. Operations Manager
V. Ferrizzi, Shift Manager
D.Deer, Field Support Supervisor
M. McKenney, Emergency Preparedness Manager
K. O'Neil, Work Control Planner
J. Ward, Superintendent, I+C Maintenance
J. Stasolla, Sr. System Engineer
P. Stello, Sr. Electrical I&C System Engineer
J. Anderson, Process Computer Engineer
T. Stetson, Sr. Reactor Engineer
R. Current, Sr. Electrical I&C System Engineer
M. Anderson, Fire Protection Engineer
L. Doucette, EFIN Engineer
S. Jonasch, Sr. System Engineer
B. Neack, Sr. System Engineer
P. Corbett, Quality Assurance Manager
P. Couture, Licensing Specialist
L. Derting, Supervisor, Radwaste
J. Geyster, Superintendent, Radiation Protection
M. Tessier, Maintenance Manager
J. Hardy, Chemistry Manager
M. Morgan, Superintendent, Training
S. Skibniowski, Environmental Specialist
P. Stover, Supervisor, Radiation Protection
D. Tkatch, Manager, Radiation Protection
K. Stupak, Training Manager
D. Jeffries, Sr. System Engineer
T. Horner, Contractor

## LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

| | | |
|---|---|---|
| 05000271/2010005-01 | NCV | Failure to Perform Required Quality Control Inspections (Section 4OA2) |
| 05000271/2010005-02 | NCV | Failure to Implement the Experience and Qualification Requirements of the Quality Assurance Program (Section 4OA2) |

Closed
None

Discussed
None

## LIST OF DOCUMENTS REVIEWED

In addition to the documents identified in the body of this report, the inspectors reviewed the following documents and records:

Vermont Yankee Nuclear Power Station Updated Final Safety Analysis Report
Vermont Yankee Nuclear Power Station Technical Specifications
Vermont Yankee Nuclear Power Station Narrative Logs, Night Orders, and Standing Orders

* Denotes creation as a result of NRC inspection

**Section 1R01, Adverse Weather Protection**
Procedures
OP 2196, "Seasonal Preparedness," Rev. 31

**Section 1R04: Equipment Alignment**
Procedures
OP 2115, "Primary Containment," Rev. 80
OP 2121, "Reactor Core Isolation Cooling System," Rev.55
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Attachment

## LIST OF ACRONYMS

| | |
|---|---|
| ACE | Apparent Cause Evaluation |
| ADAMS | Agencywide Documents Access and Management System |
| AP | Administrative Procedure |
| ASME | American Society of Mechanical Engineers |
| CAP | Corrective Action Program |
| CFR | Code of Federal Regulations |
| CR | Condition Report |
| DOT | U.S. Department of Transportation |
| DRP | Division of Reactor Projects |
| DRS | Division of Reactor Safety |
| EC | Engineering Change |
| ERO | Emergency Response Organization |
| GL | Generic Letter |
| HAZ | Heat Affected Zone |
| HPCI | High Pressure Coolant Injection |
| ICV | Individual Cell Voltages |
| ISFSI | Independent Spent Fuel Storage Installation |
| LOR | Licensed Operator Requalification |
| MIC | Microbiological Influenced (Induced) Corrosion |
| MSPI | Mitigating Systems Performance Index |
| NDE | Non-Destructive Examination |
| NDT | Non-Destructive Test |
| NEI | Nuclear Energy Institute |
| NRC | Nuclear Regulatory Commission |
| ODCM | Offsite Dose Calculation Manual |
| ODMI | Operational Decision Making Issue |
| OP | Operating Procedure |
| PARS | Publicly Available Records System |
| PCP | Process Control Program |
| PI | Performance Indicator |
| PI&D | Piping and Instrumentation Drawing |
| PI&R | Problem Identification and Resolution |
| PMT | Post Maintenance Testing |
| QA | Quality Assurance |
| QC | Quality Control |
| RCIC | Reactor Core Isolation Cooling |
| RETS | Radiological Effluent Technical Specification |
| RFO | Refueling Outage |
| RHR | Residual Heat Removal |
| RHRSW | Residual Heal Removal Service Water |
| RPV | Reactor Pressure Vessel |
| RT | Radiographic Test |
| SFPC | Standby Fuel Pool Cooling |
| SSCs | Structures, Systems and Components |

| | |
|---|---|
| SW | Service Water |
| TS | Technical Specification |
| UPS | Uninterruptible Power Supply |
| UFSAR | Updated Final Safety Analysis Report |
| UT | Ultrasonic Test |
| VY | Vermont Yankee |
| WO | Work Order |
| WPS | Weld Procedure Specification |