



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

January 27, 2012

Mr. Christopher Wamser  
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 05000271/2011005

Dear Mr. Wamser:

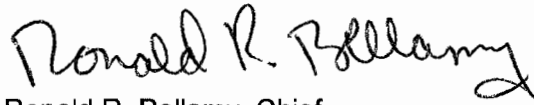
On December 31, 2011, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Vermont Yankee Nuclear Power Station. The enclosed inspection report documents the inspection results, which were discussed on January 24, 2012 with you and other members of your staff.

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

This report documents three self-revealing findings of very low safety significance (Green). These findings were determined to involve violations of NRC requirements. 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 (NCVs), consistent with Section 2.3.2 of the NRC Enforcement Policy. If you contest any NCV 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, U. S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Senior Resident Inspector at Vermont Yankee. In addition, if you disagree with the cross-cutting 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 I, and the NRC Senior Resident Inspector at Vermont Yankee.

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

Sincerely,



Ronald R. Bellamy, Chief  
Reactor Projects Branch 5  
Division of Reactor Projects

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

Enclosure: Inspection Report No. 05000271/2011005  
w/ Attachment: Supplementary Information

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C. Wamser

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Sincerely,

/RA/

Ronald R. Bellamy, Chief  
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## U.S. NUCLEAR REGULATORY COMMISSION

## REGION I

Docket No.: 50-271

License No.: DPR-28

Report No.: 05000271/2011005

Licensee: Entergy Nuclear Operations, Inc.

Facility: Vermont Yankee Nuclear Power Station

Location: Vernon, Vermont 05354-9766

Dates: October 1, 2011 through December 31, 2011

Inspectors: S. Rutenkroger, PhD, Senior Resident Inspector, Division of Reactor Projects (DRP)  
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Approved by: Ronald R. Bellamy, PhD, Chief  
Reactor Projects Branch 5  
Division of Reactor Projects

## TABLE OF CONTENTS

SUMMARY OF FINDINGS.....	3
REPORT DETAILS .....	6
1. REACTOR SAFETY .....	6
1R01 Adverse Weather Protection (71111.01 – 1 sample) .....	6
1R04 Equipment Alignment (71111.04) .....	7
1R05 Fire Protection (71111.05).....	7
1R08 Inservice Inspection, Inspection Procedure 71111.08 (1 sample).....	8
1R11 Licensed Operator Requalification Program (71111.11) .....	10
1R12 Maintenance Effectiveness (71111.12 – 2 samples).....	11
1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 – 5 samples) .....	11
1R15 Operability Evaluations (71111.15 – 2 samples).....	14
1R18 Plant Modifications (71111.18 – 2 samples) .....	15
1R19 Post-Maintenance Testing (71111.19 – 6 samples).....	15
1R20 Refueling and Other Outage Activities (71111.20 – 1 sample) .....	16
1R22 Surveillance Testing (71111.22 – 6 samples).....	18
2. RADIATION SAFETY .....	18
2RS1 Radiological Hazard Assessment and Exposure Controls (71124.01 – 1 sample) .....	18
2RS3 In-Plant Airborne Radioactivity Control and Mitigation (71124.03 – 1 sample).....	22
4. OTHER ACTIVITIES .....	23
4OA1 Performance Indicator Verification (71151).....	23
4OA2 Problem Identification and Resolution (71152) .....	24
4OA6 Meetings, including Exit.....	29
SUPPLEMENTARY INFORMATON.....	A-1
KEY POINTS OF CONTACT .....	A-1
LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED .....	A-1
LIST OF DOCUMENTS REVIEWED .....	A-2
LIST OF ACRONYMS.....	A-11

## SUMMARY OF FINDINGS

IR 05000271/2011005; 10/01/2011 – 12/31/2011; Vermont Yankee Nuclear Power Station; Maintenance Risk Assessments and Emergent Work Control, Refueling and Other Outage Activities, and Problem Identification and Resolution.

This report covered a three-month period of inspection by resident inspectors and announced inspections performed by regional inspectors. There were three self-revealing findings of very low safety significance (Green), which were also non-cited violations (NCVs). The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). The cross-cutting aspects for the findings were determined using IMC 0310, "Components Within Cross-Cutting Areas." Findings for which the SDP 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.

### Cornerstone: Initiating Events

- Green. A self-revealing NCV of very low safety significance of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified because drawing B-191301, Sheet 576, "Control Wiring Diagram – Emergency Heater Drain Valve Diagram" was not of the appropriate quality to allow tagging activities to be accomplished in accordance with the drawing. As a result of the inadequate drawing, the wrong breaker was selected to be tagged out, which resulted in an unexpected loss of shutdown cooling for 12 minutes. Entergy took immediate corrective action to restore shutdown cooling and entered this issue into their corrective action program (CR-VTY-2011-04203).

The inspectors determined that Entergy's tag-out of the distribution breaker to Vital AC subpanel "A" due to a drawing error was a performance deficiency that was reasonably within Entergy's ability to foresee and correct. This finding is more than minor because it is similar to the more than minor statement in example 4.b. of IMC 0612, Appendix E, "Examples of Minor Issues," where an operator inadvertently operated the wrong component and caused a transient. Additionally, the finding is more than minor because it affects the objective of the Initiating Events cornerstone to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. The inspectors determined that this finding was of very low safety significance (Green), using IMC 0609, Appendix G, Checklist 7, "BWR Refueling Operation with RCS Level >23'." This determination was based on the fact that the finding did not degrade Entergy's ability to recover decay heat removal once lost, and that the temperature increase was small enough that it did not represent a loss of control. The inspectors determined that this finding had a cross-cutting aspect in the Human Performance cross-cutting area, Resources component, because components in the tagging database were not labeled correctly [H.2(c)]. (Section 1R20)

### Cornerstone: Mitigating Systems

- Green. A self-revealing NCV of very low safety significance of 10 CFR 50 Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified because Entergy personnel used instructions that were not appropriate to the circumstances, resulting in an inadvertent trip of the "A" emergency diesel generator (EDG) fuel rack. Entergy's corrective actions included promptly restoring the "A" EDG to an operable state, removing the qualifications for the auxiliary operator and field support supervisor involved in the event, and initiating CR-VTY-2011-05483.

The inspectors determined that the inadvertent trip of the "A" EDG fuel rack by Entergy personnel was a performance deficiency that was reasonably within Entergy's ability to foresee and prevent. This finding is more than minor because it is associated with the Human Performance attribute of the Mitigating Systems cornerstone and affected the cornerstone objective to ensure the availability of systems that respond to initiating events to prevent undesirable consequences (i.e. core damage). Specifically, the inadvertent trip of the "A" EDG fuel rack resulted in the unplanned unavailability of the "A" EDG for approximately two minutes. The inspectors determined the significance of the finding using IMC 0609.04, "Phase 1 – Initial Screening and Characterization of Findings." The finding was determined to be of very low safety significance (Green) because it did not represent a loss of system safety function, a loss of safety function of a single train for greater than its technical specification allowed outage time, and did not screen as potentially risk significant due to external initiating events. The inspectors determined that this finding had a cross-cutting aspect in the Human Performance cross-cutting area, Work Practices component, because Entergy did not ensure supervisory oversight of work activity such that nuclear safety was supported [H.4(c)]. (Section 1R13)

### Cornerstone: Occupational/Public Radiation Safety

- Green. A self-revealing NCV of very low safety significance of 10 CFR 20.1501 and 10 CFR 20.2006(b) was identified because Entergy personnel failed to indicate an accurate total of radionuclide activity on the manifest for a radioactive waste shipment on September 19, 2011. Radiation surveys by the receiving personnel at the radioactive waste processing facility identified radiation levels exceeding those indicated on the shipping manifest. Subsequently, Entergy personnel determined that the total radionuclide activity for the shipment was 17 curies instead of 13.4 curies as originally documented. Entergy staff initiated CR-VTY-2011-03902, revised the NRC Form 541, and sent the revision to the radioactive waste processor to correct this error.

The inspectors determined that the failure to indicate an accurate total of radionuclide activity on the manifest for a radioactive waste shipment was a performance deficiency that was reasonably within Entergy's ability to foresee and correct. This finding is more than minor because it affects the Public Radiation Safety cornerstone objective to ensure adequate protection of public health and safety from exposure to radioactive materials released into the public domain as a result of routine civilian nuclear reactor operation. Specifically, the failure to accurately account for all of the radioactive wastes in shipment No. 2011-85 had the potential for misclassifying wastes non-conservatively in subsequent radioactive waste processing and final shipment activities to a low level burial ground facility.

The inspectors evaluated the finding using IMC 0609, Appendix D, "Public Radiation Safety Significance Determination Process." The inspectors determined the finding to be of very low safety significance (Green) because the error was corrected at the waste processor rather than after shipment to a waste disposal facility, and did not affect low level burial ground nonconformance as evaluated under 10 CFR 61, "Licensing Requirements for Land Disposal of Radioactive Wastes." Additionally, there were no radiological consequences (dose) to the public as a result of the shipping manifest error.

The inspectors determined that this finding had a cross-cutting aspect in the Human Performance cross-cutting area, Work Control component, because Entergy did not appropriately coordinate work activities by incorporating actions to address the need for interdepartmental coordination and communication. Specifically, the impact of flushing a reactor water cleanup resin transfer line was not sufficiently communicated or coordinated by all groups to ensure all solid radioactive wastes discharged from the plant into the waste container were accounted for in a subsequent radioactive waste shipment [H.3(b)]. (Section 4OA2)



## REPORT DETAILS

### Summary of Plant Status

Vermont Yankee Nuclear Power Station (VY) began the inspection period operating at 46 percent power due to ongoing repairs to the "B" recirculation pump motor generator set. Following repairs, operators began increasing power on October 1. Operators restored power to the maximum achievable power (approximately 94 percent due to fuel depletion near the end of the operating cycle) on October 3. On October 6, 7 and 8, operators reduced power to 80 percent each day to support transmission line work, at the request of the grid operator, and restored power to the maximum achievable (approximately 92 percent) when work was not in progress. On October 8, operators shut down the reactor to conduct a refueling outage. On November 2, upon completion of the refueling outage, operators commenced start up and restored reactor power to 100 percent on November 6. In addition to the above power reductions, the plant also conducted scheduled power reductions for control rod pattern adjustments. The plant 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 sample)

##### Seasonal Susceptibility

##### a. Inspection Scope

The inspectors performed a review of Entergy's readiness for the onset of seasonal cold temperatures. The review focused on the intake structure, condensate storage tank and the EDGs. The inspectors reviewed the Updated Final Safety Analysis Report (UFSAR), technical specifications, control room logs, and the corrective action program to determine what temperatures or other seasonal weather could challenge these systems, and to ensure Entergy personnel had adequately prepared for these challenges. The inspectors reviewed station procedures, including Entergy's seasonal weather preparation procedure. The inspectors performed walkdowns of the selected systems to ensure station personnel identified issues that could challenge the operability of the systems during cold weather conditions. Documents reviewed for each section of this inspection report are listed in the Attachment.

##### b. Findings

No findings were identified.

1R04 Equipment Alignment (71111.04)Partial System Walkdowns (71111.04Q – 3 samples)a. Inspection Scope

The inspectors performed partial walkdowns of the following systems:

- “A” shutdown cooling during “B” residual heat removal system maintenance on October 11
- Standby fuel pool cooling during a fuel shuffle, with shutdown cooling secured, on October 14
- High pressure coolant injection system with the “B” EDG out of service, on December 1

The inspectors selected these systems based on their risk-significance relative to the reactor safety cornerstones at the time they were inspected. The inspectors reviewed applicable operating procedures, system diagrams, the UFSAR, technical specifications, condition reports (CRs), and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have impacted system performance of their intended safety functions. The inspectors also performed field walkdowns of accessible portions of the systems to verify system components and support equipment were aligned correctly and were operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no deficiencies. The inspectors also reviewed whether Entergy staff had properly identified equipment issues and entered them into the corrective action program for resolution with the appropriate significance characterization.

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05)Resident Inspector Quarterly Walkdowns (71111.05Q – 6 samples)a. Inspection Scope

The inspectors performed inspections of the six fire areas listed below based on a review of the Vermont Yankee Safe Shutdown Capability Analysis and the Fire Hazards Analysis. The inspectors verified that Entergy controlled combustible materials and ignition sources in accordance with administrative procedures. The inspectors verified that fire protection, detection, and suppression equipment was available for use as specified in the area pre-fire plan and fire hazards analysis, and passive fire barriers were maintained in good material condition. The inspectors also verified that station personnel implemented compensatory measures for out of service, degraded, or inoperable fire protection equipment, as applicable, in accordance with procedures.

- Reactor building northeast corner room on October 16
- Drywell 238' elevation on October 18

- Drywell 252' elevation on October 18
- Drywell 266' elevation on October 18
- Turbine building heater bays on October 22
- Control building cable vault 262' elevation on November 16

b. Findings

No findings were identified.

1R08 In-service Inspection Activities (71111.08 – 1 sample)

a. Inspection Scope

The inspectors assessed the effectiveness of Entergy's In-service Inspection (ISI) for monitoring degradation of reactor pressure vessel internals, reactor coolant system boundary, risk significant piping system boundaries, and the containment boundary. The inspectors assessed the ISI activities using requirements and acceptance criteria for component examination specified in the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (Code), Section XI, and applicable NRC regulatory requirements.

During VY's maintenance and refueling outage (RFO) 29, the inspectors selected a sample of nondestructive examination (NDE) activities and verified those test activities complied with the requirements of ASME Section XI and applicable regulatory requirements. The inspectors selected the samples based on the inspection procedure objectives and risk priority of those components and systems where degradation could result in a significant increase in risk of core damage in the event of loss of structural integrity or pressure retaining capability.

The inspectors verified that test procedures and examiner qualifications were current and in accordance with ASME Code requirements by reviewing applicable documents. The inspectors reviewed examiner qualifications to examine welds. The inspectors selected a sample of CRs and corrective actions and reviewed Entergy's effectiveness in the identification and resolution of relevant indications discovered during ISI activities. The inspectors reviewed the following non-destructive testing:

- Manual ultrasonic test examination of reactor pressure vessel (RPV) recirculation outlet nozzle N1A to vessel weld and the nozzle inner radius (IR). The examination coverage was limited by the location of two thermocouples. No recordable indications were detected. The examination summary was documented in examination reports VTY RFO 29-002 and VTY RFO 29-005.
- Magnetic particle test (MT) of a weld of an integral attachment to the high pressure coolant injection (HPCI) system using MT procedure CEP-NDE-0731, revision 3. No recordable indications were identified. The examination was performed using work order (WO) 00269102-01, and the results were documented in report VTY11-MT-005.
- VT-1 and VT-3 examination of RPV internals consisting of four tie-rod shroud supports at shroud ring segment weld H3, jet pump main wedges, steam dryer (selected structural members), various welds of in-vessel core spray piping, and re-

inspection of indications that were identified during the prior in-vessel visual inspection (IVVI) activity during RFO 28. The indications identified in the prior outage were selected for enhanced visual examination and evaluated for indications of growth or changes in configuration/orientation. No discernable change was noted in size or orientation of the indications.

- Liquid penetrant test (PT) of RPV nozzle N11A-SE to safe end butt weld. The liquid penetrant test was performed using procedure CEP-NDE-0641 R005 in accordance with ASME Section XI. There were no recordable indications noted in report VTY11-PT-015.

The inspectors selected the two following ASME Section XI repair/replacement plans for review where welding was performed. The inspectors confirmed that appropriately qualified weld procedures and welders were used and essential variables were indicated as "hold points" and verified on weld traveler documentation by qualified individuals. The inspectors reviewed base materials and weld filler metal to verify they were in accordance with ASME Code requirements. The inspectors determined that qualifications were in compliance with the requirements of ASME Section XI and Section IX for the welding activity and reviewed documentation to ensure the weld examinations were performed in accordance with the ASME code requirements.

- WO 243535: Replacement of service water piping and fittings to preclude failure of originally installed materials. Entergy personnel replaced approximately 50 feet of eight inch carbon steel pipe and fittings with selective configuration changes to assure system integrity and extend service life. The replacement installation was governed by ASME Section XI, safety class 3, and seismic class 1. The acceptance tests were specified as pressure test, magnetic particle, and visual surface examination. No recordable indications were identified and no leakage was noted.
- WO 256119-13 and WO 256119-18: Entergy staff initiated two work orders for the fabrication and installation by welding of inspection ports to the 24" service water lines at the northwest corner of the intake structure (237' elevation). The applicable code for the repair/replacement was ASME Section XI 2001 edition through 2003 addenda with liquid penetrant, visual examination, and pressure tests specified for acceptance. No recordable indications were reported and no leakage was noted.

The inspectors reviewed the results of the visual inspection of portions of the primary containment and additional structural members attached to the liner to assess the condition of the protective coating. The inspectors performed a walkdown of accessible locations and verified the extent of any peeling, blistering, coating loss, or other damage as a result of corrosion, foreign material impact, or lack of maintenance. The evaluation was in accordance with the requirements provided in ASME Section XI, IWE-3510.2 (VT-3).

### Problem Identification and Resolution

The inspectors reviewed a sample of CRs initiated during in-service inspection examinations this outage, for evaluation of the problem identification and corrective actions that were placed in the corrective action process for resolution. Also, the inspectors reviewed one indication notification report (INR VYR28-3 R2) from the previous IVVI, during RFO 28, for comparison with the current results of NDE, RFO 29, to determine if any change had occurred during this operating cycle. The inspectors confirmed there was no change in the indication orientation, size and characteristics, based on the results of the visual examination performed this outage (INR Report VYR29-11-01).

#### b. Findings

No findings were identified.

### 1R11 Licensed Operator Regualification Program (71111.11)

#### .1 Quarterly Review of Licensed Operators' Regualification Testing and Training (71111.11Q – 1 sample)

##### a. Inspection Scope

The inspectors observed licensed operator simulator training on October 28, which included just-in-time training for plant startup following the refueling outage. The inspectors evaluated operator performance during the simulated startup and verified completion of risk significant operator actions, including the use of abnormal operating procedures. The inspectors assessed the clarity and effectiveness of communications, the implementation of actions in response to alarms and degrading plant conditions, and the oversight and direction provided by the control room supervisor. Additionally, the inspectors assessed the ability of the crew and training staff to identify and document crew performance problems.

##### b. Findings

No findings were identified.

#### .2 Written Examination and Operating Test Results (71111.11A – 1 sample)

##### a. Inspection Scope

On December 27, the inspectors reviewed the results of Entergy-administered annual operating tests and comprehensive written exams for 2011. The inspectors assessed whether pass rates were consistent with the guidance of NRC Manual Chapter 0609, Appendix I, "Operator Regualification Human Performance Significance Determination Process (SDP)." The inspectors verified that:

- Crew pass rate was greater than 80 percent. (Pass rate was 100 percent)
- Individual pass rate on the written exam was greater than 80 percent. (Pass rate was 100 percent)

- Individual pass rate on the job performance measures of the operating exam was greater than 80 percent. (Pass rate was 100 percent)
- Individual pass rate on the dynamic simulator test was greater than 80 percent. (Pass rate was 100 percent)
- Overall pass rate among individuals for all portions of the exam was greater than or equal to 75 percent. (Overall pass rate was 100 percent)

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12 – 2 samples)

a. Inspection Scope

The inspectors reviewed the samples listed below to assess the effectiveness of maintenance activities on structure, system and component (SSC) performance and reliability. The inspectors reviewed system health reports, corrective action program documents, and Maintenance Rule basis documents to ensure that Entergy staff were identifying and properly evaluating performance problems within the scope of the Maintenance Rule. For each sample selected, the inspectors verified that the SSC was properly scoped into the Maintenance Rule in accordance with 10 CFR 50.65 and verified that the (a)(2) performance criteria established by Entergy staff were reasonable. For SSCs classified as (a)(2) with a performance evaluation, the inspectors reviewed the performance evaluation to verify the SSCs should remain in (a)(2) status. Additionally, the inspectors ensured that Entergy staff were identifying and addressing common cause failures that occurred within and across Maintenance Rule system boundaries.

- Service water pump train "B"
- Recirculation pumps, motor-generators, and flow control

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 – 5 samples)

a. Inspection Scope

The inspectors reviewed station evaluation and management of plant risk for the planned and emergent work activities listed below to verify that Entergy performed the appropriate risk assessments prior to removing equipment for work. The inspectors selected these activities based on potential risk significance relative to the reactor safety cornerstones. The inspectors verified that Entergy personnel performed risk assessments as required by 10 CFR 50.65(a)(4) and that the assessments were accurate and complete. When Entergy performed emergent work, the inspectors verified that operations personnel promptly assessed and managed plant risk. The inspectors reviewed the scope of maintenance work and discussed the results of the assessment with the station's work week manager to verify 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.

- Refueling outage 29 - Yellow shutdown risk due to "B" shutdown cooling unavailable, control rod drive maintenance, and "B" standby gas treatment unavailable on October 11-12
- Refueling outage 29 - Orange shutdown risk due to both trains of standby gas treatment unavailable on October 24-25
- Refueling outage 29 - Yellow risk due to reduced reactor coolant system inventory on October 25-26
- Workweek 1145 - Yellow risk due to emergent work on the Vernon tie offsite power line on November 11
- Workweek 1148 - Yellow risk due to "B" emergency diesel generator out of service due to 4KV cable replacement on December 2

b. Findings

Introduction: A self-revealing NCV of very low safety significance of 10 CFR 50 Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified because Entergy personnel used instructions that were not appropriate to the circumstances, resulting in an inadvertent trip of the "A" EDG fuel rack.

Description: On November 28, Entergy personnel removed the "B" EDG from service in order to perform cable testing and replace the 4 kV generator output cable in accordance with license renewal commitments. On December 2, a field support supervisor (FSS) instructed an auxiliary reactor operator (AO) to clear tags in order to allow for testing of the newly installed 4 kV cable and provided the AO with the tag clearing sheet. The FSS approved a change to the tag clearing sequence such that mechanical-related tags within the diesel room were cleared first, such as the fuel rack and starting air, prior to clearing electrical-related tags within the switchgear room. When performing the cable test, Entergy electricians obtained unexpected results due to the test being performed prior to removing an electrical ground in the system. Then, after recognizing that the EDG could start and attempt to energize a grounded system, the FSS directed the cleared tags to be restored to the tagged out position on the "B" EDG.

In directing the rehanging of tags, the FSS did not provide the AO with a revised tag sheet, did not conduct a pre-job brief following the scope changes to the tag clearing activity, and did not assign a peer check or provide other human error prevention tools. In particular, the FSS assigned the AO to selectively reverse the cleared tags in reverse order by performing the opposite of the actions described on the clearing sheet, which was marked with placekeeping and signed in the signature blocks for the selected portion of the tags that were cleared. For example, a line directing to "open" a valve, "install" a fuse, or "remove" a grounding strap, which had been circled, slashed, and signed, would have to be used to do the opposite, i.e. "close" the valve, "remove" the fuse, or "install" the grounding strap. In addition, to preserve the proper sequence using placekeeping tools, the operator would need to step through each line working in reverse

order from the last completed step, i.e. "bottom" to "top," recircling, reslashing, and resigning each line that had already been signed.

While walking to the location and reviewing the tag clearing sheet in order to determine the appropriate actions, the AO entered the "A" EDG room instead of the intended "B" EDG room. The AO communicated with a reactor operator prior to performing the first action at the EDG. The AO then tripped the "A" EDG fuel rack.

The control room annunciator for "no fuel" position for the "A" EDG lit. The reactor operator communicated with the AO, and both recognized that the "A" EDG fuel rack had been tripped by mistake. The AO, under control room supervisor direction, promptly reset the "A" EDG fuel rack and tripped the "B" EDG fuel rack. The "A" EDG was inoperable for approximately two minutes.

EN-OP-115, "Conduct of Operations," revision 12, requires the FSS to supervise operational activities outside the control room. The FSS was supervising the activities outside the control room associated with tagging, covered by EN-OP-102, "Protective and Caution Tagging." EN-OP-102 did not clearly state instructions for the performance of reverse tagging and did not provide guidance in the event that a tagging restoration was unable to be completed. Since the FSS instructed the AO to restore the "B" EDG tags using a partially place-marked and signed tag sheet which could not be performed as written, did not conduct a pre-job brief following the scope changes to the tag clearing activity, and did not assign a peer check or any other human error prevention tools, the inspectors determined that the prescribed instructions provided to the AO for accomplishing the activity were not appropriate to the circumstances and affected quality when the "A" EDG fuel rack was tripped by mistake.

The inspectors reviewed Entergy's completed root cause evaluation and identified that procedure EN-OP-102 was categorized as "Non-Quality Related" when the required categorization was "Quality Related." Entergy's corrective actions included initiating CR-HQN-2012-00024.

Analysis: The inspectors determined that the inadvertent trip of the "A" EDG fuel rack by Entergy personnel was a performance deficiency that was reasonably within Entergy's ability to foresee and prevent. Traditional enforcement does not apply because there were no actual safety consequences, no impacts on the NRC's ability to perform its regulatory function, and no willful aspects associated with the issue. This finding is more than minor because it is associated with the Human Performance attribute of the Mitigating Systems cornerstone and affected the cornerstone objective to ensure the availability of systems that respond to initiating events to prevent undesirable consequences (i.e. core damage). Specifically, the inadvertent trip of the "A" EDG fuel rack resulted in the unplanned unavailability of the "A" EDG for approximately two minutes.

The inspectors determined the significance of the finding using IMC 0609.04, "Phase 1 – Initial Screening and Characterization of Findings." The finding was determined to be of very low safety significance (Green) because it did not represent a loss of system safety function, a loss of safety function of a single train for greater than its technical specification allowed outage time, and did not screen as potentially risk significant due to external initiating events.



The inspectors determined that this finding had a cross-cutting aspect in the Human Performance cross-cutting area, Work Practices component, because Entergy did not ensure supervisory oversight of work activity such that nuclear safety was supported [H.4(c)].

**Enforcement:** 10 CFR 50 Appendix B, Criterion V, requires, in part, that activities affecting quality be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and be accomplished in accordance with these instructions, procedures, or drawings. Contrary to the above, on December 2, 2011, an activity affecting quality, i.e. the rehang of tags on the "B" EDG, was not prescribed by documented instructions of a type appropriate to the circumstances and was not accomplished in accordance with the given instructions. Entergy's corrective actions included promptly restoring the "A" EDG to an operable state, removing the qualifications for the AO and FSS, and initiating CR-VTY-2011-05483. Because this violation was of very low safety significance and was entered into the corrective action program (CR-VTY-2011-05483), this violation is being treated as an NCV, consistent with the NRC Enforcement Policy. **(NCV 05000271/2011005-01, Inadvertent Trip of the "A" Emergency Diesel Generator Fuel Rack)**

1R15 Operability Evaluations (71111.15 – 2 samples)

a. Inspection Scope

The inspectors reviewed operability determinations for the following degraded or non-conforming conditions:

- Updated GE-issued recommendations to address fuel channel-control blade interference during a seismic event, CRs initiated on August 12, 2011 and September 29
- Leakage back through the "A" standby liquid control system squib valve, CR initiated on November 6

The inspectors selected these issues based on the risk significance of the associated components and systems. The inspectors evaluated the technical adequacy of the operability determinations to assess whether 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 UFSAR to Entergy's evaluations to determine whether the components or systems were operable. The inspectors determined whether the compensatory measures in place would function as intended and were properly controlled by Entergy staff and ensured compliance with bounding limitations associated with the evaluations.

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18 – 2 samples)a. Inspection Scope

The inspectors evaluated a permanent modification to retire-in-place the recirculation pump bypass valves. The inspectors verified that the design bases, licensing bases, and performance capability of the affected systems were not degraded by the modification. In addition, the inspectors reviewed modification documents associated with the design change, including the closing and electrically disabling of the bypass valves and modification of the control logic for the recirculation pump to allow the recirculation pump discharge valve to be opened part way on pump start-up. The inspectors observed operator training on the new procedure for starting a recirculation pump to verify the procedure was adequate.

The inspectors reviewed a temporary modification to provide an alternate fuel supply for the emergency diesel generators while the fuel oil storage tank was drained for inspection and repair during the refueling outage to determine whether the modification affected the safety function of systems that are important to safety. The inspectors reviewed 10 CFR 50.59 documentation, observed post-modification testing, and conducted additional field walkdowns of the modification to verify that the temporary modification did not degrade the design bases, licensing bases, and performance capability of the affected systems.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19 – 6 samples)a. Inspection Scope

The inspectors reviewed the post-maintenance tests for the maintenance activities listed below to verify that procedures and test activities ensured system operability and functional capability. The inspectors reviewed the test procedure to verify that the procedure adequately tested the safety functions that may have been affected by the maintenance activity, that the acceptance criteria in the procedure were consistent with the information in the applicable licensing basis and/or design basis documents, and that the procedure had been properly reviewed and approved. The inspectors also witnessed the test or reviewed test data to verify that the test results adequately demonstrated restoration of the affected safety functions.

- 125 volt DC station battery B-1-1A service discharge test on October 13-14
- Torus to drywell vacuum breaker V16-19-5E repairs on October 15
- Corrective maintenance on standby gas treatment system valves SB-1-125-2B and SB-1-125-4B on October 26
- "B" residual heat removal heat exchanger leak repair on November 11
- Corrective maintenance on main steam isolation valve V2-80C on October 25
- Repairs of components within cooling tower cells CT-2-1 and CT-2-2 on October 24

b. Findings

No findings were identified.

1R20 Refueling and Other Outage Activities (71111.20 – 1 sample)

a. Inspection Scope

The inspectors reviewed the station's work schedule and outage risk plan for RFO 29, which was conducted October 8 through November 2. The inspectors reviewed Entergy's development and implementation of outage plans and schedules to verify that risk, industry experience, previous site-specific problems, and defense-in-depth were considered. During the outage, the inspectors observed portions of the shutdown, cooldown, and startup processes and monitored controls associated with the following outage activities:

- Configuration management, including maintenance of defense-in-depth, commensurate with the outage plan for the key safety functions and compliance with the applicable technical specifications when taking equipment out of service
- Implementation of clearance activities and confirmation that tags were properly hung and that equipment was appropriately configured to safely support the associated work or testing
- Configuration of reactor coolant pressure, level, and temperature instruments to provide accurate indication and instrument error accounting
- Status and configuration of electrical systems and switchyard activities to ensure that technical specifications were met
- Monitoring of decay heat removal operations
- Impact of outage work on the ability of the operators to operate the spent fuel pool cooling system
- Reactor water inventory controls, including flow paths, configurations, alternative means for inventory additions, and controls to prevent inventory loss
- Activities that could affect reactivity
- Maintenance of secondary containment as required by technical specifications
- Refueling activities, including fuel handling and fuel receipt inspections
- Fatigue management
- Identification and resolution of problems related to refueling outage activities

b. Findings

Introduction. A self-revealing NCV of very low safety significance of 10 CFR 50 Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified because drawing B-191301, Sheet 576, "Control Wiring Diagram – Emergency Heater Drain Valve Diagram" was not of the appropriate quality to allow tagging activities to be accomplished in accordance with the drawing. As a result of the inadequate drawing, the wrong breaker was selected to be tagged out, resulting in an unexpected loss of shutdown cooling.

Description. On October 11, Entergy personnel hung tagging order 1R29-1-AOG-016 in order to de-energize components so an engineering change affecting the steam jet air ejectors could be installed. The tagging order specified circuit breaker #1 on the Vital

AC distribution panel instead of the correct circuit breaker, which was #1 on Vital AC subpanel "A." When the operator opened the circuit breaker on the distribution panel it resulted in a loss of power to the entire Vital AC subpanel "A," which provides power to the control circuit for one of the shutdown cooling suction valves (RHR-17), which subsequently closed. The running pump providing shutdown cooling tripped when the valve closed. This resulted in a loss of shutdown cooling and an alarm in the control room. The operators responded to the alarm and restored shutdown cooling 12 minutes later. During that time, reactor coolant temperature increased 1-2 degrees Fahrenheit.

Entergy determined that the individual preparing the tag-out chose the wrong breaker because the formatting of the component description on drawing B-191301, Sheet 576, "Control Wiring Diagram – Emergency Heater Drain Valve Diagram" was such that the designation "A" was overlooked, and the component descriptions in the database used to create tag-outs were not specific enough to show the error. The individuals reviewing the tag-out for errors did not catch this because they had worked with the preparer on the tag-out instead of remaining independent as required by fleet procedure EN-OP-102, "Protective and Caution Tagging" and administrative procedure AP 0140, "Vermont Yankee Local Control Switching Rules."

Analysis. The inspectors determined that Entergy's tag-out of the distribution breaker to Vital AC subpanel "A" due to a drawing error was a performance deficiency that was reasonably within Entergy's ability to foresee and correct. Traditional enforcement does not apply because there were no actual safety consequences, no impacts on the NRC's ability to perform its regulatory function, and no willful aspects associated with the issue. This finding is more than minor because it is similar to the more than minor statement in example 4.b. of IMC 0612, Appendix E, "Examples of Minor Issues," where an operator inadvertently operated the wrong component and caused a transient. Additionally, the finding is more than minor because it affects the objective of the Initiating Events cornerstone to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations.

The inspectors evaluated the finding using IMC 0609, Attachment 4, "Phase 1 – Initial Screening and Characterization of Findings," and determined that the finding required further review using IMC 0609, Appendix G, "Shutdown Operations Significance Determination Process" because the issue affected the safety of the reactor during a refueling outage. The inspectors determined that this finding was of very low safety significance (Green), using IMC 0609, Appendix G, Checklist 7, "BWR Refueling Operation with RCS Level >23'." This determination was based on the fact that the finding did not degrade Entergy's ability to recover decay heat removal once lost, and that the temperature increase was small enough that it did not represent a loss of control.

The inspectors determined that this finding had a cross-cutting aspect in the Human Performance cross-cutting area, Resources component, because components in the tagging database were not labeled correctly [H.2(c)].

Enforcement. 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires, in part, that activities affecting quality be prescribed by drawings of a type appropriate to the circumstances and that activities be accomplished in accordance with drawings. Contrary to the above, drawing B-191301, Sheet 576, "Control Wiring Diagram – Emergency Heater Drain Valve Diagram" had a component

description that was formatted in a way to increase the likelihood of error, which led to an unexpected loss of shutdown cooling for 12 minutes. Corrective actions taken by Entergy included restoring shutdown cooling within 12 minutes, and entering the issue into the corrective action program (CR-VTY-2011-04203). Because this violation was of very low safety significance (Green) and was entered into the corrective action program, this violation is being treated as an NCV, consistent with the NRC Enforcement Policy. **(NCV 05000271/2011005-02, Loss of Shutdown Cooling due to Tag-Out Error)**

1R22 Surveillance Testing (71111.22 – 6 samples)

a. Inspection Scope

The inspectors observed performance of surveillance tests and/or reviewed test data of selected risk-significant SSCs to assess whether test results satisfied technical specifications, the UFSAR, and Entergy's procedure requirements. The inspectors verified that test acceptance criteria were clear, tests demonstrated operational readiness and were consistent with design documentation, test instrumentation had current calibrations and the range and accuracy for the application, tests were performed as written, and applicable test prerequisites were satisfied. Upon test completion, the inspectors considered whether the test results supported that equipment was capable of performing the required safety functions. The inspectors reviewed the following surveillance tests:

- Main station battery service test of B-1-1A on October 12
- Main steam isolation valve (MSIV) local leak rate testing (containment isolation valve) on October 12
- Emergency core cooling systems testing on October 24
- Vernon tie surveillance on October 24
- High pressure coolant injection steam exhaust check valve, V23-4, local leak rate testing (containment isolation valve) on October 10 and November 3
- Standby liquid control system quarterly test (in-service test) on December 14

b. Findings

No findings were identified.

2. **RADIATION SAFETY**

**Cornerstone: Occupational/Public Radiation Safety (PS)**

2RS1 Radiological Hazard Assessment and Exposure Controls (71124.01 – 1 sample)

a. Inspection Scope

Inspection Planning

The inspectors reviewed the performance indicators (PIs) for the Radiation Safety cornerstone, recent operational occurrences, and the latest quality assurance (QA) audit of the radiation protection program.

### Radiological Hazard Assessment

The inspectors reviewed any changes to plant operations that may result in a significant new radiological hazard for onsite workers or members of the public since the last inspection. The inspectors verified that Entergy personnel assessed the potential impact of the changes and implemented periodic monitoring to detect and quantify the radiological hazard.

The inspectors reviewed recent radiological surveys from seven plant areas during RFO 29 to evaluate the thoroughness and frequency of the surveys and verify they were appropriate based on the radiological hazards.

The inspectors conducted outage walkdowns and performed independent radiation surveys of the facility, including radioactive waste processing, storage, and handling areas, to evaluate the existing radiological conditions and the efficacy of the associated radiological postings and controls.

The inspectors observed and evaluated the following radiological risk-significant work activities:

- Control rod drive replacements
- Drywell scaffold installation
- Refueling and in-vessel inspection
- Drywell shielding installation
- Drywell radiation protection controls

With respect to the above work activities, the inspectors verified that appropriate pre-work surveys were performed and were sufficient to identify and quantify the radiological hazards and establish adequate protective measures. In addition, the inspectors reviewed applicable radiological surveys associated with these work activities to determine if potential hazards were properly identified, including the following: identification of hot particles, presence of alpha emitters, potential for airborne radioactive materials, hazards associated with work activities that could negatively affect the radiological conditions, and significant radiation field dose gradients that could result in non-uniform exposures of the body.

The inspectors selected five air sample survey records during RFO 29 and verified that the samples were collected and counted in accordance with Entergy's procedures. The inspectors observed work in potential airborne areas to evaluate if applicable air monitoring was representative of the breathing air zone of the workers. The inspectors also reviewed the use of continuous air monitors to monitor real-time airborne conditions in accordance with Entergy's procedures. The inspectors verified that Entergy's program for monitoring loose surface contamination in areas of the plant was adequate to assess the potential for airborne contamination conditions.

### Instructions to Workers

The inspectors observed various radioactive material containers and verified they were labeled and controlled in accordance with 10 CFR Part 20 requirements.

The inspectors reviewed radiation work permits (RWPs) associated with the radiological risk-significant work activities listed above to identify the specified work control instructions or control barriers. The inspectors determined that technical specification requirements for high radiation areas were met and applicable electronic personal dosimeter (EPD) alarm set-points were specified in conformance with survey indications and plant policy.

The inspectors reviewed one EPD dose alarm occurrence that was documented in a CR. The inspectors verified that Entergy personnel responded appropriately to the occurrence and corrective actions and dose evaluations were adequate.

#### Contamination and Radioactive Material Control

The inspectors observed the performance of personnel surveying and releasing material for unrestricted use at the main radiological controlled area (RCA) egress location. The review was conducted to verify the activities were performed in accordance with plant procedures and the procedures were sufficient to control the spread of contamination and prevent unintended release of radioactive materials from the site.

The inspectors reviewed Entergy's criteria for the survey and release of potentially contaminated material and verified the radiation detection instrumentation was used at its most effective sensitivity capability.

The inspectors selected three sealed sources from Entergy's inventory records and verified that the required semi-annual leak tests were performed. The inspectors verified that no sources were required to be listed in the National Source Tracking System.

#### Radiological Hazards Control and Work Coverage

During tours of the facility and review of the work activities listed above, the inspectors evaluated the ambient radiological conditions and verified that existing conditions were consistent with posted surveys, RWPs, and worker briefings. The inspectors verified the adequacy of radiological controls, such as required surveys (including system breach radiation, contamination, and airborne surveys), radiation protection job coverage (including audio and visual surveillance for remote job coverage), contamination controls, and Entergy's means of using EPDs in high noise areas as high radiation area (HRA) monitoring devices. The inspectors also verified that radiation monitoring devices were appropriately placed on the individual's body to monitor dose from external radiation sources, including high-radiation work areas with significant dose rate gradients.

The inspectors reviewed two RWPs for work within potential airborne radioactivity areas with the potential for individual worker internal exposures. The inspectors evaluated the airborne radioactivity controls and monitoring, including appropriate controls for activities with potential for significant airborne radioactivity levels (e.g., grinding, grit blasting, system breaches, entry into tanks, cubicles, reactor cavities). For these selected potential airborne radioactive areas, the inspectors verified the appropriate use of high-efficiency particulate air ventilation systems.

The inspectors examined Entergy's physical and programmatic controls for highly activated or contaminated materials (non-fuel) stored within the spent fuel pool and

verified that appropriate controls were in place to preclude inadvertent removal of these materials from the pool.

The inspectors conducted tours within the RCA to evaluate radiological postings and physical controls for HRAs and very high radiation areas (VHRAs) with respect to regulatory requirements.

#### Risk-Significant High Radiation Area and Very High Radiation Area Controls

The inspectors discussed the controls and procedures for high-risk HRAs and VHRAs and actions to be taken during changing plant conditions with the radiation protection manager (RPM) and one first-line health physics supervisor.

#### Radiation Worker Performance

For the work activities listed above, the inspectors evaluated radiation worker performance with respect to applicable radiation protection work requirements, determined the workers' awareness of significant radiological conditions in their workplace, and ensured the workers' activities were within the RWP control/limit requirements specified for the work performed.

The inspectors reviewed several radiological-related CRs initiated since the last inspection that identified the cause of the event to be human performance error, evaluated the potential for common causes, and assessed the adequacy of the corrective actions.

#### Radiation Protection Technician Proficiency

For the work activities listed above, the inspectors evaluated the performance of radiation protection technicians with respect to radiation protection work requirements, determined that technicians were aware of the radiological conditions in their workplace, and ensured that the RWP controls/limits and the technicians' performance were consistent with the requisite training and qualifications and commensurate with the radiological hazards and work activities.

The inspectors reviewed several radiological related CRs initiated since the last inspection that identified the cause of the event to be radiation protection technician error, evaluated the potential for common causes, and assessed the adequacy of corrective actions.

#### Problem Identification and Resolution

The inspectors verified that problems associated with radiation monitoring and exposure control were being identified by Entergy personnel at an appropriate threshold and were properly addressed for resolution in Entergy's corrective action program.

b. Findings

No findings were identified.



### 2RS3 In-Plant Airborne Radioactivity Control and Mitigation (71124.03 – 1 sample)

#### a. Inspection Scope

##### Inspection Planning

The inspectors reviewed the UFSAR to identify areas of the plant designed as potential airborne radiation areas, the associated ventilation systems or airborne monitoring instrumentation, and relevant aspects of the respiratory protection program which included the location and quantity of respiratory protection devices stored for emergency use.

The inspectors reviewed the reported Performance Indicators (PIs) to identify any unintended dose resulting from intakes of radioactive materials.

##### Engineering Controls

For the work activities listed in Section 2RS1, the inspectors verified Entergy's use of ventilation systems as part of its engineering controls (in lieu of respiratory protection devices) to control airborne radioactivity. The inspectors evaluated several temporary high-efficiency particulate air ventilation systems used to support work in contaminated areas during RFO 29 and verified that the use of these systems was consistent with Entergy's procedural guidance and as low as is reasonably achievable (ALARA).

The inspectors observed the use of several continuous air monitors within the RCA that were being used to monitor and warn personnel of changing airborne concentrations in the plant. The inspectors verified that alarms and set-points ensured that doses were maintained within the limits of 10 CFR Part 20 and ALARA.

##### Use of Respiratory Protection Devices

For the work activities listed in Section 2RS1, the inspectors reviewed the use of respiratory protection devices and the use of engineering controls to limit the overall exposure of the workers. The inspectors verified that the respiratory protection devices used to limit the intake of radioactive materials were certified by the National Institute for Occupational Safety and the Mine Safety and Health Administration (NIOSH/MSHA). The inspectors reviewed the respiratory protection qualification records of three respirator users to verify that the individuals were medically certified, fit tested, and appropriately trained in the respirators that they may be required to use during an emergency. During work activity observations, the inspectors assessed the workers' use of respiratory protection devices in the field.

The inspectors verified respiratory protection equipment storage and controls for the equipment staged and ready for use in the plant and stocked for issuance. The inspectors evaluated the physical condition of the equipment and reviewed applicable maintenance and inspection records for selected equipment that was ready for use. The inspectors reviewed recent test results of breathing air for both bottle and service air supply, certifying that Grade D air quality was maintained.

### Self-Contained Breathing Apparatus for Emergency Use

The inspectors reviewed the status and surveillance records of five self-contained breathing apparatus (SCBA) staged in-plant for use during emergencies, and inspected Entergy personnel's capability for refilling and transporting SCBA air bottles to and from the control room and operations support center during emergency conditions. The inspectors selected three individuals on control room shift crews and three individuals from designated departments currently assigned emergency duties and verified that they were trained and qualified in the use of SCBAs and bottle change-out. The inspectors reviewed the past two years of maintenance records for three SCBA units staged for use, verified that the SCBA maintenance technician was certified by the manufacturer of the device to perform SCBA maintenance work, and verified that the periodic air cylinder hydrostatic testing on the SCBA bottles was current.

### Problem Identification and Resolution

The inspectors verified that problems associated with the control and mitigation of in-plant airborne radioactivity were being identified by Entergy personnel at an appropriate threshold and were properly addressed for resolution in Entergy's corrective action program, and that the corrective actions were appropriate commensurate with the safety significance of the issues.

b. Findings

No findings or observations were identified.

## **4. OTHER ACTIVITIES**

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

#### .1 Occupational Exposure Control Effectiveness (1 sample)

a. Inspection Scope

The inspectors reviewed Entergy's submittals for the Occupational Exposure Control Effectiveness PI. The inspectors reviewed CRs and radiological controlled area dosimeter exit logs for the past four calendar quarters (through 3rd quarter 2011). The inspectors reviewed these records for occurrences involving locked HRAs, VHRAs, and unplanned exposures, compared them against the criteria specified in Nuclear Energy Institute (NEI) 99-02, "Regulatory Assessment Performance Indicator Guideline," revision 6, and verified that occurrences that met NEI 99-02 criteria were identified and reported.

b. Findings

No findings were identified.

#### .2 Radiological Effluent Technical Specifications (RETS)/ Offsite Dose Calculation Manual (ODCM) Radiological Effluent Occurrences (1 sample)

a. Inspection Scope

The inspectors reviewed Entergy's submittals for VY for the RETS/ODCM Radiological Effluent PI. The inspectors reviewed a listing of relevant effluent release reports for the past four calendar quarters (through 3rd quarter 2011), for issues related to the PI, which measures radiological effluent release occurrences per site that exceed 1.5 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 for organ dose for gaseous effluents. The inspectors verified that occurrences that met the criteria specified in NEI 99-02 were identified and reported.

The inspectors reviewed the following documents to ensure Entergy met all requirements of the PI:

- 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
- Dose assessment procedures

b. Findings

No findings were identified.

.3 Mitigating Systems Performance Index (3 samples)

a. Inspection Scope

The inspectors reviewed Entergy's submittals for VY for the Mitigating Systems Performance Index for the following systems for the period of July 1, 2010, through June 30, 2011:

- Emergency AC
- Residual Heat Removal
- Cooling Water System

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 also reviewed operator narrative logs, CRs, mitigating systems performance index derivation reports, event reports, and NRC integrated inspection reports to validate the accuracy of the submittals.

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution (71152 – 2 samples)

.1 Routine Review of Problem Identification and Resolution Activities

a. Inspection Scope

As required by Inspection Procedure 71152, "Problem Identification and Resolution," the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify that Entergy entered issues into their corrective action program at an appropriate threshold, gave adequate attention to timely corrective actions, and identified and addressed adverse trends. 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 corrective action program and periodically attended condition report review group meetings.

Occupational/Public Radiation Safety Cornerstone

The inspectors reviewed three corrective action CRs that were initiated since the last health physics inspection that were associated with this reactor oversight program cornerstone area. The inspectors verified that problems identified by these CRs were properly characterized within Entergy's corrective action program and those applicable causes and corrective actions were identified commensurate with the safety significance of the radiological occurrences.

b. Findings and Observations

Introduction: A self-revealing NCV of very low safety significance of 10 CFR 20.1501 and 10 CFR 20.2006(b) was identified because Entergy personnel failed to indicate an accurate total of radionuclide activity on the manifest for a radioactive waste shipment on September 19, 2011. Radiation surveys by the receiving personnel at the radioactive waste processing facility identified radiation levels exceeding those indicated on the shipping manifest. Subsequently, Entergy personnel determined that the total radionuclide activity for the shipment was 17 curies instead of 13.4 curies as originally documented, and revised the original manifest accordingly.

Description: On August 24, 2011, after filling a 14-170 polyethylene liner with spent condensate ion exchange resin, Entergy staff partially lifted the shipping liner out of its shielding cask and conducted a radiation survey that indicated a maximum of 1.75 rem per hour (rem/hr) on contact with the side of the resin liner, and 0.511 rem/hr at one meter. Entergy personnel transcribed these radiation readings on the NRC uniform low-level radioactive waste manifest (NRC Form 541) as the maximum radiation levels associated with the unshielded waste container. Entergy staff calculated the total radionuclide activity in shipment no. 2011-85 to be 13.4 curies based on the spent condensate resin wastes discharged into the liner as recorded on the NRC Form 541, and shipped the waste off-site on September 15, 2011. On September 19, the radioactive waste processor received the radioactive waste shipment. After completely removing the shipping liner from the shield cask, the radioactive waste processor's personnel obtained radiation readings from the bottom of the liner of 19.8 rem/hr contact and 6.4 rem/hr at one meter. The radioactive waste processor contacted VY to indicate the radiation survey discrepancy from that recorded on the NRC Form 541. Entergy staff initiated CR-VTY-2011-03902 and investigated this unexpected occurrence.

Upon review, Entergy personnel determined that in addition to the spent condensate resin wastes that were discharged into the liner, previously, on August 17, 2011, the radiation protection ALARA group directed the flushing of a reactor water cleanup resin

transfer line into the empty polyethylene liner. The resulting waste was not accounted for in the resin liner due to a breakdown in communication and coordination between the ALARA group and the radwaste shipping group. Due to an inadequate radiation survey of the filled shipping liner that did not include a survey of the bottom of the unshielded liner, the higher activity reactor water cleanup resin wastes in the bottom of the liner were not detected until after the shipment was made and received by another licensee. Entergy personnel subsequently determined that an additional 1 cubic foot of reactor water cleanup resin waste had been deposited into the shipping liner and the shipment actually contained 17 curies of radioactive waste instead of 13.4 curies. Entergy staff revised the NRC Form 541 and sent the revision to the radioactive waste processor to correct this error.

Analysis: The inspectors determined that the failure to indicate an accurate total of radionuclide activity on the manifest for a radioactive waste shipment was a performance deficiency that was within Entergy's ability to foresee and correct. Traditional enforcement does not apply because there were no actual safety consequences, no impacts on the NRC's ability to perform its regulatory function, and no willful aspects associated with the issue. This finding is more than minor because it affects the Public Radiation Safety cornerstone objective to ensure adequate protection of public health and safety from exposure to radioactive materials released into the public domain as a result of routine civilian nuclear reactor operation. Specifically, the failure to accurately account for all of the radioactive wastes in shipment no. 2011-85 had the potential for misclassifying wastes non-conservatively in subsequent radioactive waste processing and final shipment activities to a low level burial ground facility.

The inspectors evaluated the finding using IMC 0609, Appendix D, "Public Radiation Safety Significance Determination Process." The inspectors determined the finding to be of very low safety significance (Green) because the error was corrected at the waste processor rather than after shipment to a waste disposal facility, and did not affect low level burial ground nonconformance as evaluated under 10 CFR 61, "Licensing Requirements for Land Disposal of Radioactive Wastes." Additionally, there were no radiological consequences (dose) to the public as a result of the shipping manifest error.

The inspectors determined that this finding had a cross-cutting aspect in the Human Performance cross-cutting area, Work Control component, because Entergy did not appropriately coordinate work activities by incorporating actions to address the need for interdepartmental coordination and communication. Specifically, the impact of flushing a reactor water cleanup resin transfer line was not sufficiently communicated or coordinated by all groups to ensure all solid radioactive wastes discharged from the plant into the waste container were accounted for in a subsequent radioactive waste shipment [H.3(b)].

Enforcement: 10 CFR 20.1501 states, in part, that each licensee shall make or cause to be made, surveys that may be necessary for the licensee to comply with the regulations in this part; and are reasonable under the circumstances to evaluate the magnitude and extent of radiation levels; and ... quantities of radioactive materials. 10 CFR 20.2006(b) states, in part, that any licensee shipping radioactive waste intended for ultimate disposal at a licensed land disposal facility must document the information required on NRC's Uniform Low-Level Radioactive Waste Manifest ... in accordance with Appendix G to 10 CFR 20. 10 CFR 20 Appendix G, I, B, states, in part, that the shipper of the radioactive waste shall provide the following information regarding the waste

shipment on the uniform manifest: 4. The total radionuclide activity in the shipment. Contrary to the above, on September 15, 2011, Vermont Yankee radioactive waste shipment no. 2011-85 was shipped to a radioactive waste processor and the accompanying NRC Uniform Low-Level Radioactive Waste Manifest indicated 13.4 curies of total radionuclide activity in the shipment when the total radionuclide activity in the shipment was 17 curies. Because this violation was of very low safety significance and was entered into the corrective action program (CR-VTY-2011-03902), this violation is being treated as an NCV, consistent with the NRC Enforcement Policy. **(NCV 05000271/2011005-03, Incomplete Inventory for Spent Resin Shipment)**

## .2 Semi-Annual Trend Review

- a. 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 Inspection Procedure 71152, "Identification and Resolution of Problems." The inspectors reviewed trend reports, performance indicators, major equipment problem lists, system health reports, Maintenance Rule assessments, and maintenance and corrective action program backlogs, looking for repetitive or closely-related issues that had not been documented in the corrective action program. The inspectors also reviewed the VY corrective action program database for the third and fourth quarters of 2Q11, to assess CRs written in various subject areas (equipment problems, human performance issues), as well as individual issues identified during the NRCs daily CR review (Section 4OA2.1).

### b. Findings and Observations

No findings were identified.

The inspectors observed a potential emerging trend due to an increasing number of instances in which potentially adverse conditions were documented and/or recognized by Entergy staff without initiating a CR in accordance with EN-LI-102, "Corrective Action Process," revision 17. The inspectors determined the issues were minor with no actual or potential safety impact; therefore, they are not subject to enforcement action in accordance with the NRC Enforcement Policy. However, the inspectors noted more such instances during this semi-annual period than had been typically observed during previous time periods. In particular, the inspectors identified six minor conditions during the fourth quarter which had been documented and/or recognized by Entergy staff without initiating a CR. Entergy personnel initiated CRs following the inspectors' observations.

- When recording battery connector resistance data, Entergy staff initially recorded data using the wrong form and then missed transferring resistance data for 8 cell connections to the correct form. (CR-VTY-2012-00247)
- Entergy staff recorded an as-found out-of-specification value for battery connector resistance which was >20% above baseline. (CR-VTY-2012-00248)
- Entergy staff recorded as-found internal dimension tolerances for MSIVs V2-80C and V2-86D which exceeded the procedure's acceptance criteria. (CR-VTY-2011-05127)

- Entergy staff logged an unplanned entry into a technical specification with an action statement requiring the plant be less than 15% thermal power within 12 hours. (CR-VTY-2011-05191)
- The inspectors identified that double doors used for routine access by Entergy personnel from the administration building into the reactor building were degraded such that their gaseous barrier function was not maintained as required. (CR-VTY-2011-2011-05137)
- Entergy personnel recorded adverse as-found conditions such as pits, marks, gouges, and corrosion, in a work order for core spray check valve V14-13A which, as described within the work order, required an operability determination. (CR-VTY-2011-05556)

### .3 Annual Sample: Operations Procedure Use and Adherence

#### a. Inspection Scope

The inspectors performed an in-depth review of Entergy's corrective actions associated with CRs related to procedure use and adherence by operations staff. The inspectors performed a search of the condition report database to identify relevant CRs. The inspectors reviewed control room logs and site procedures to verify that Entergy personnel implemented prescribed corrective actions. The inspectors assessed Entergy staff's problem identification threshold, extent of condition reviews, and the prioritization and timeliness of corrective actions to determine whether Entergy personnel were appropriately identifying, characterizing, and correcting problems associated with procedure use and whether the completed corrective actions were appropriate. The inspectors compared the actions taken to the requirements of Entergy's corrective action program and 10 CFR 50, Appendix B.

#### b. Findings and Observations

No findings were identified.

The inspectors determined that Entergy personnel took appropriate corrective actions to address each individual occurrence. In some cases, these involved revising the procedure used or putting the procedure through the procedure upgrade project; a process intended to improve the format of procedures to reduce human performance errors. The inspectors determined that there was no increase in the frequency of procedure use issues. The documented deficiencies in the CRs were discrete occurrences and were not representative of a pattern or trend.

**4OA6 Meetings, including Exit**

On January 24, 2012 the inspectors presented the inspection results to Mr. C. Wamser, Site Vice President, and other members of the Entergy staff. The inspectors verified that no proprietary information was retained by the inspectors or documented in this report.

On October 14, 2011, the inspector presented the inspection results to Mr. M. Colomb and other members of his staff. The licensee acknowledged the findings. No proprietary information is contained in this report.

**ATTACHMENT: SUPPLEMENTARY INFORMATION**



## SUPPLEMENTARY INFORMATION

### KEY POINTS OF CONTACT

#### Vermont Yankee Personnel

M. Colomb, Site Vice President (former)  
 C. Wamser, Site Vice President (present)  
 M. Gosekamp, General Manager of Plant Operations  
 M. Romeo, Director of Nuclear Safety  
 R. Wanczyk, Licensing Manager  
 N. Rademacher, Director of Engineering  
 J. Rogers, Design Engineering Manager  
 J. Merkle, System Engineering Manager  
 P. Ryan, Security Manager  
 D. Jones, Operations Manager  
 V. Ferrizzi, Asst. Operations Manager  
 B. Pittman, Asst. Operations Manager  
 E. Harms, Asst. Operations Manager  
 M. Tessier, Maintenance Manager  
 J. Hardy, Chemistry Manager  
 P. Corbett, Quality Assurance Manager  
 S. Naeck, Outage Manager  
 J. Bengtson, CA&A Manager  
 D. Tkatch, Radiation Protection Manager  
 M. Castronova, Manager of Projects  
 J. Ward, I&C Superintendent  
 M. McKenney, Emergency Preparedness Manager  
 P. McKenney, Material, Purchasing and Contracts Manager  
 J. Twarog, Shift Manager  
 K. Sweet, Programs and Components Engineering Supervisor  
 J. Taylor, Operations Training Superintendent

### LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

#### Opened/Closed

05000271/2011005-01	NCV	Inadvertent Trip of the "A" Emergency Diesel Generator Fuel Rack (Section 1R13)
05000271/2011005-02	NCV	Loss of Shutdown Cooling due to Tag-Out Error (Section 1R20)
05000271/2011005-03	NCV	Incomplete Inventory for Spent Resin Shipment (Section 4OA2)

### 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

### **Section 1R01: Adverse Weather Protection**

#### Procedures

OPOP-PREP-2196, "Seasonal Preparedness," Revision 0

#### Condition Reports

CR-VTY-2011-00469

CR-VTY-2010-05369

### **Section 1R04: Equipment Alignment**

#### Procedures

OP 2120, "High Pressure Coolant Injection System," Revision 6

OP 2179, "Standby Fuel Pool Cooling," Revision 15

OPOP-RHR-2124, "Residual Heat Removal System," Revision 5

ON 3156, "Loss of Shutdown Cooling," Revision 13

#### Drawings

G-191169 Sheet 1, "Flow Diagram High Pressure Coolant Injection System," Revision 52

G-191169 Sheet 2, "Flow diagram High Pressure Coolant Injection System," Revision 43

5920-870, "HPCI Turbine Oil Piping Diagram," Revision 14

G-191173 Sheet 1, "Flow Diagram Fuel Pool Cooling and Cleanup System," Revision 39

G-191173 Sheet 2, "Flow Diagram Fuel Pool Cooling and Cleanup System," Revision 10

### **Section 1R05: Fire Protection**

#### Procedures

PP 7011, "Vermont Yankee Fire Protection and Safe Shutdown," Revision 13

EN-DC-127, "Control of Hotwork and Ignition Sources," Revision 8

EN-DC-127 Att. 9.1, "Control of Hotwork and Ignition Source Permit," NECR 252', 232'

#### Pre-Fire Plans

PFP-TB-7, "Condenser Bay Basement," Revision 0

PFP-TB-6, "Elevation 248' Condenser Bay & Ground Floor," Revision 0

PFP-CB-2, "Elevation 260' Cable Vault," Revision 0

#### Miscellaneous Documents

Fire Hazards Analysis App. B, Revision 11

SIP-11-89, "Fire Protection System Impairment Permit – Cable Vault"

VY-SSCA, "Safe Shutdown Capability Analysis," Revision 9

"Nuclear Plant Fire Protection Functional Responsibilities, Administrative Controls and Quality Assurance," August 4, 1977

"Safety Evaluation Report Supporting Amendment No. 43 to Facility Operating License No. DPR-28," January 13, 1978

"Letter from Vermont Yankee to NRC Requesting an Exemption," October 21, 1981

"Exemption to the Appendix R Requirements" Granted on October 23, 1981

Condition Reports  
CR-VTY-2011-05206

**Section 1R08: Inservice Inspection**

NDT Examination Reports

VTY11-PT-015, Liquid Penetrant Examination of RPV Nozzle to Safe End Butt Weld  
VTY11-MT-005, Magnetic Particle Examination of Integral Attachment to HPCI system  
VY-BOP-11-VT-001, Visual Examination Leakage (VT-2) 24" Service Water Piping  
VTYBOP11-MT-023,025,026, Magnetic Particle Examination of 8" Butt Welds in Service Water (SW) System  
VTY RFO29-002, UT Examination Summary Sheet of RPV Nozzle N1A Weld to Safe End  
VTY RFO29-005, UT Examination Summary Sheet of RPV Nozzle N1A Inner Radius and Bore  
IVVI-VYR29-11-03, In Vessel Visual Inspection (VT1 and 3) Top Guide Ring Segment Weld H-3  
IVVI-VYR29-11-01, Indication Notification Report of Visual Exam of Selected Steam Dryer Welds

NDT Examination Procedures

EGNE-8071 R0, In Vessel Visual Inspection (IVVI) of BWR 4 RPV Internals at VY  
CEP-NDE-0731 R3, Magnetic Particle Examination (MT) for ASME Section XI  
CEP-NDE-0641 R7, Liquid Penetrant Examination (PT) for ASME Section XI  
CEP-NDE-0901 R4, Visual Examination (VT-1) for ASME XI Flaws  
CEP-NDE-0902 R7, Visual Examination (VT-2) for ASME XI Leakage  
CEP-NDE-0903 R5, Visual Examination (VT-3) for ASME XI Mechanical Damage  
CEP-NDE-0404 R5, Manual Ultrasonic Exam of Ferritic Piping Welds (ASME XI)

Procedures

AP 0070, "ASME Section XI Repair and Replacement Procedure" Revision 9

Condition Reports

CR-VTY-2011-04489  
CR-VTY-2011-04120  
CR-VTY-2011-04121

Work Orders/Request

WO 256119-11, "Perform Pressure Test Preparation of 24 "SW Piping and Welds"  
WO 256119-13, "Install Hot Tap Valve Assembly in 24" Service Water SW-1A"  
WO 256119-18, "Fabrication of Hot Tap Valve Assembly for Inspection Port "

Miscellaneous

Certificate of Qualification (Level II Examiner)  
WPS-CS-1/1-B R0, Gas Tungsten Arc/Shielded Metal Arc Welding (GTAW/SMAW)  
WPS-BM-8/1-B R0, Gas Tungsten Arc Welding (GTAW) of P-8 to P-1, Stainless to Carbon  
WPS-SS-8/8-B R0, GTAW of P-8 Stainless Steel  
WPS-CS-1/1-A R0, GTAW and SMAW of P-1 Carbon Steel  
CEP-WP-GWS-1 R1, General Welding Standard ASME/ANSI  
256119-02 Weld Map Drawing from WO 256119-13 and 18

## **Section 1R12: Maintenance Effectiveness**

### Procedures

En-DC-205, "Maintenance Rule Monitoring" Revision 3

### Condition Reports

CR-VTY-2008-04624  
CR-VTY-2008-03852  
CR-VTY-2010-01134  
CR-VTY-2011-01041  
CR-VTY-2011-01043  
CR-VTY-2011-05587  
CR-VTY-2009-02217  
CR-VTY-2009-03285  
CR-VTY-2010-03159  
CR-VTY-2011-02050  
CR-VTY-2011-03856  
CR-VTY-2011-04095

### Miscellaneous Documents

VYSE-MRL-2011-002, "Performance Evaluation for Service Water Pump Train "B," Revision 1  
Service Water System Health Report, Q3-2011  
Service Water System SSC Performance History (3 Year Basis)  
SW "Maintenance Rule Scoping Basis Document-Service Water," Revision 8  
Recirc Flow Control System SSC Performance History (3 Year Basis)  
Nuclear Boiler System SSC Performance History (3 Year Basis)  
RR "Maintenance Rule Scoping Basis Document-Recirc Flow Control," Revision 3  
NB "Maintenance Rule Scoping Basis Document-Nuclear Boiler," Revision 5  
State of the System Report for Plant Level Monitoring

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

### Procedures

VY-APF-0173.02, "Critical Outage Safety Systems Status," Completed 10/12/11 – 0200, 1400, 10/11/11 – 1400  
AP 0173, "Work Schedule Risk Management – Outage," Revision 26  
EN-OP-119, Att. 9.1, "Protected Equipment Posting Log Sheet," Completed 10/12/11  
AP 0172, "Work Schedule Risk Management – Online," Revision 23  
VY-APF-0172.01, "Online Maintenance Safety Assessment Review," 11/17/11  
VY-APF-0712.02, "Risk Management Worksheet," 11/17/11  
AP 0125, "Plant Equipment," Revision 37  
AP 0140, "Vermont Yankee Local Control Switching Rules," Revision 65  
EN-OP-102, "Protective and Caution Tagging," Revision 14  
EN-MA-101, "Fundamentals of Maintenance," Revision 9  
EN-MA-125, "Troubleshooting Control of Maintenance Activities," Revision 8  
EN-WM-105, "Planning," Revision 9

### Condition Reports

CR-VTY-2011-05311  
CR-VTY-2010-05020  
CR-VTY-2011-05483

Drawings

G-191238, "HVAC – Flow Diagram Reactor Building," Revision 34

Miscellaneous Documents

Time to Boil Calculation Tool

VY RFO-29 Compensatory Measures and Contingency Plans for Reduced Inventory Operations

VY RFO-29 Compensatory Measures and Contingency Plans for Orange Risk Level for

Secondary Containment Due to Both Trains of SBGT Unavailable

VY Outage Risk Assessment Team Report, Refueling Outage 29, Revision 1

VY SSCA, "Safe Shutdown Capability Analysis," Revision 9

Entergy Quality Assurance Program Manual, Revision 22

**Section 1R15: Operability Determinations and Functionality Assessments**

Condition Reports

CR-VTY-2011-03900

CR-VTY-2011-03199

CR-VTY-2011-05142

Miscellaneous Documents

Night Order for Operability Evaluation No. VTY-2011-03199

MFN-10-245R4, "Description of the Evaluation and Surveillance Recommendations for BWR/2-5 Plants," Sept. 26, 2011

**Section 1R18: Plant Modifications**

Procedures

CHOP-DIES-4613-01, "Sampling and Testing of Diesel Fuel Oil," Revision 2

Drawings

G-191162 Sh. 2, "Flow Diagram Miscellaneous Systems Fuel Oil," Revision 30

Miscellaneous Documents

EC-24660, "Alternate Fuel Oil Supply to Emergency Diesel Generators"

EC-32318, "Recirculation Loop Design and Operational Startup Change," Revision 0

**Section 1R19: Post-Maintenance Testing**

Procedures

OPOP-RHR-2124, "Residual Heat Removal System," Revision 2

OPST-RHR-2124-12B, "RHRSW Pump/Valve B Operability and Full Flow Test," Revision 1

OPST-RHR-4124-13B, "RHR Pump B Operability Test (quarterly)," Revision 0

OP 52106, "MSIV Troubleshooting and Repair Procedure," Revision 1

EN-MA-118, "Foreign Material Exclusion," Revision 7

EN-WM-107, "Post Maintenance Testing," Revision 3

Condition Reports

CR-VTY-2011-04723

Work Orders

WO 295163, "E-14-1B: Investigate/Repair Cause of Heat Exchanger Leakage"

WO 293298, "V2-80C; Disassemble/Repair Seat Leakage"  
WO 293409, "V2-80C; Troubleshoot Low Closing Force on the MSIV Actuator"  
WO 241399, "Implement CT-2-1 2010/2011 Repair Matrix during RFO29"

## **Section 1R20: Refueling and Other Outage Activities**

### Procedures

OP 1100, "Refuel Platform Operators," Revision 41  
OP 1101, "Management of Refueling Activities and Fuel Assembly Movement," Revision 50  
OP 4102, "Refuel Outage/Fuel Movement Periodic Tests," Revision 50  
OP 0105, "Reactor Operations," Revision 91 and Revision 92  
AP 0125, "Plant Equipment," Revision 37  
OP 2144, "120/240 VAC Vital Bus," Revision 45  
VY APF 0173.02, "Critical Outage Safety Systems Status," completed 10/11/11, 2 pm  
EN-HU-103, "Human Performance Error Reviews," Revision 6  
EN-HU-103 Att. 9.2, "Individual Recollection Form" completed 10/11/11  
En-LI-118, "Root Cause Evaluation Process," Revision 15

### Condition Reports

CR-VTY-2011-03995  
CR-VTY-2011-04203  
CR-VTY-2011-04270  
CR-VTY-2011-04272  
CR-VTY-2011-04273  
CR-VTY-2011-04368  
CR-VTY-2011-04460  
CR-VTY-2011-04622  
CR-VTY-2011-04634  
CR-VTY-2011-04714  
CR-VTY-2011-04719  
CR-VTY-2011-04739  
CR-VTY-2011-04121  
CR-VTY-2011-05623

### Work Orders

WO 271277, "Contingency – Patch Plate Reinforce Tank Bottom EC#24659"  
WO 236287, "V14-13A; Repair Failed Cure Spray Check Valve"  
WO 293397, "Bus-T-3; Replace Cracked Insulator 115 KV A-Phase Turb Bldg"

### Drawings

B-191301, Sh. 576, "Control Wiring Diagram – Emergency Heater Drain Valve Diagram,"  
Revision 8  
B-191301, Sh. 1314, "Control Wiring Diagram – RHR System Isolation Valve Control Relays,"  
Revision 6  
B-191301, Sh. 1308, "Control Wiring Diagram – RHR Reactor Shutdown Cooling Isolation Valve  
V10-17 (Outboard)," Revision 20  
G-191372, Sh. 4, "120/240V Vital AC and Instrument AC One Line Diagram," Revision 27

### Miscellaneous

Continental Field Systems Time Sheet, Job Number 5329, Week Ending 10-9-11  
Continental Field Systems Time Sheet, Job Number 5329, Week Ending 10-16-11

Continental Field Systems Time Sheet, Job Number 5329, Week Ending 10-23-11  
EC 32360, "Disposition of Pipe Support RHR-H129 RFO29 ISI Inspection Result," Revision 0  
RHR "Design Basis Document for Residual Heat Removal System," Revision 24

## **Section 1R22: Surveillance Testing**

### Procedures

SEP-FP-001, "VY Fire Protection Program Combustible Loading Worksheets Program Section," Revision 6  
EN-DC-161, "Control of Combustibles," Revision 5  
OP 4142, "Vernon Tie and Delayed Access Power Source Backfeed Surveillance," Revision 16  
OP 4100, "ECCS Integrated Automatic Initiation Test," Revision 50, performed 10/25/11  
OPOT 3122-01, "Loss of Normal Power," Revision 0  
AP 0096 Att. 3, "Temporary Change Form – OP4100," completed 10/23/11  
EN-OP-116 Att. 9.4, "IPTE Pre-Job Brief Preparation Checklist," completed 10/23/11  
OP 52106, "MSIV Troubleshooting and Repair Procedure," Revision 1  
OPST-BLRT-4030, "Types B and C Primary Containment Leakage Rate Testing," Revision 00  
OP 4114, "Standby Liquid Control System Surveillance," Revision 69  
VY-OPF-4114.01, "SLC Pump Operability and Discharge Check Valve Test Data Sheet," Completed 12/14/11

### Work Orders

WO 51644013, "B-1-1A Main Station Battery Performance Test per OP 4215"  
WO 52187881, "B-1-1A Main Station Battery Service Test per OP 4215"  
WO 52298197, "B-1-1A; Battery Service Test IAW EMST-BATT-4215-02"  
WO 52299113, "OPST-BLRT-4030; V23-4 (1 RFO) Leakage Rate Test"  
WO 52295380, "Check Valve Inspection and Disc O-ring Replacement; V23-4"  
WO 293161, "Disassemble/Repair Seat Leakage; V2-86D"

### Drawings

Typical MSIV Testing Lineup

### Miscellaneous Documents

Calculation VYC-2153, "125 VDC Battery A-1 Electrical System Calculation," Revision 1  
VY Transient Combustible Evaluation 2011-31 dated October 5, 2011  
IEEE Standard 450-2010, IEEE Recommended Practice for Maintenance, Testing and Replacement of Vented Lead-Acid Batteries for Stationary Applications

### Condition Reports

CR-VTY-2011-04744  
CR-VTY-2011-04747  
CR-VTY-2011-04749  
CR-VTY-2011-04777  
CR-VTY-2011-04859  
CR-VTY-2011-05572  
CR-VTY-2011-05142  
CR-VTY-2011-04140  
CR-VTY-2011-04867

**Section 2RS: Radiation Safety**Condition Reports:

CR-VTY-2011-3568  
 CR-VTY-2011-3708  
 CR-VTY-2011-3902

Procedures:

EN-RP-201, "Dosimetry Administration," Revision 3  
 EN-RP-202, "Personnel Monitoring," Revision 8  
 EN-RP-501, "Respiratory Protection Program," Revision 3  
 OPOP-SRW-2153, "Solid Radwaste," Revision 3

Miscellaneous Documents

QA Audit Report QA-14/15-2009-VY-1, Radiation Protection/Radwaste

**Section 4OA1: Performance Indicator (PI) Verification**Procedures

AP 0094, "NRC Performance Indicator Reporting," Revision 15  
 AP 0172, "Work Schedule Risk Management – Online," Revision 23  
 OPST-EDG-4126-02A, "Monthly "A" EDG Slow Start Operability Test," Revision 1  
 EN-LI-114, "Performance Indicator Process," Revision 4

Condition Reports

CR-VTY-2010-01019	CR-VTY-2011-04610	CR-VTY-2011-05012
CR-VTY-2011-00007	CR-VTY-2011-04622	CR-VTY-2011-05037
CR-VTY-2011-00104	CR-VTY-2011-04634	CR-VTY-2011-05048
CR-VTY-2011-01161	CR-VTY-2011-04635	CR-VTY-2011-05089
CR-VTY-2011-04140	CR-VTY-2011-04714	CR-VTY-2011-05093
CR-VTY-2011-04203	CR-VTY-2011-04719	CR-VTY-2011-05096
CR-VTY-2011-04256	CR-VTY-2011-04723	CR-VTY-2011-05098
CR-VTY-2011-04261	CR-VTY-2011-04739	CR-VTY-2011-05099
CR-VTY-2011-04262	CR-VTY-2011-04758	CR-VTY-2011-05111
CR-VTY-2011-04270	CR-VTY-2011-04765	CR-VTY-2011-05112
CR-VTY-2011-04272	CR-VTY-2011-04777	CR-VTY-2011-05127
CR-VTY-2011-04273	CR-VTY-2011-04793	CR-VTY-2011-05142
CR-VTY-2011-04336	CR-VTY-2011-04797	CR-VTY-2011-05150
CR-VTY-2011-04362	CR-VTY-2011-04847	CR-VTY-2011-05152
CR-VTY-2011-04368	CR-VTY-2011-04858	CR-VTY-2011-05175
CR-VTY-2011-04418	CR-VTY-2011-04867	CR-VTY-2011-05189
CR-VTY-2011-04460	CR-VTY-2011-04881	CR-VTY-2011-05191
CR-VTY-2011-04489	CR-VTY-2011-04886	CR-VTY-2011-05206
CR-VTY-2011-04491	CR-VTY-2011-04888	CR-VTY-2011-05223
CR-VTY-2011-04518	CR-VTY-2011-04892	CR-VTY-2011-05235
CR-VTY-2011-04530	CR-VTY-2011-04917	CR-VTY-2011-05264
CR-VTY-2011-04532	CR-VTY-2011-04957	CR-VTY-2011-05293
CR-VTY-2011-04548	CR-VTY-2011-04976	CR-VTY-2011-05294
CR-VTY-2011-04590	CR-VTY-2011-04978	CR-VTY-2011-05295
CR-VTY-2011-04600	CR-VTY-2011-04983	CR-VTY-2011-05311
CR-VTY-2011-04608	CR-VTY-2011-04986	CR-VTY-2011-05320



CR-VTY-2011-05321	CR-VTY-2011-05479	CR-VTY-2011-05587
CR-VTY-2011-05335	CR-VTY-2011-05480	CR-VTY-2011-05615
CR-VTY-2011-05337	CR-VTY-2011-05481	CR-VTY-2011-05618
CR-VTY-2011-05340	CR-VTY-2011-05483	CR-VTY-2011-05623
CR-VTY-2011-05369	CR-VTY-2011-05488	CR-VTY-2011-05640
CR-VTY-2011-05377	CR-VTY-2011-05490	CR-VTY-2011-05646
CR-VTY-2011-05394	CR-VTY-2011-05507	CR-VTY-2011-05661
CR-VTY-2011-05447	CR-VTY-2011-05520	CR-VTY-2011-05675
CR-VTY-2011-05465	CR-VTY-2011-05547	CR-VTY-2011-05719
CR-VTY-2011-05477	CR-VTY-2011-05556	
CR-VTY-2011-05478	CR-VTY-2011-05580	

#### Miscellaneous Documents

VY-RPT-06-00001, "VY Mitigating System Performance Index (MSPI) Bases Document,"  
Revision 1

System Health Report, Emergency Diesel Generators, 3<sup>rd</sup> Quarter 2011

System Health Report, Residual Heat Removal, 3<sup>rd</sup> Quarter 2011

System Health Report, Residual Heat Removal Service Water, 3<sup>rd</sup> Quarter 2011

System Health Report, Service Water, 3<sup>rd</sup> Quarter 2011

NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6

#### **Section 40A2: Problem Identification and Resolution**

##### Procedures

OPOP-AOG-2150 "Advanced Offgas System and Air Evacuation Equipment" Revision 4

OP 0105 "Reactor Operations" Revision 92

OPST-HPCI-4120-02 "HPCI Pump Operability Test (Quarterly)" Revision 1

OPST-HPCI-4120-03 "HPCI Pump Comprehensive Test (Biennially)" Revision 1

EN-DC-205, "Maintenance Rule Monitoring," Revision 3

##### Condition Reports

CR-VTY-2010-02564	CR-VTY-2011-03977	CR-VTY-2011-04492
CR-VTY-2010-03312	CR-VTY-2011-04080	CR-VTY-2011-04493
CR-VTY-2010-03648	CR-VTY-2011-04095	CR-VTY-2011-04518
CR-VTY-2010-04169	CR-VTY-2011-04120	CR-VTY-2011-04530
CR-VTY-2010-04282	CR-VTY-2011-04121	CR-VTY-2011-04532
CR-VTY-2010-04588	CR-VTY-2011-04140	CR-VTY-2011-04548
CR-VTY-2010-04862	CR-VTY-2011-04203	CR-VTY-2011-04590
CR-VTY-2010-05253	CR-VTY-2011-04256	CR-VTY-2011-04600
CR-VTY-2010-05451	CR-VTY-2011-04261	CR-VTY-2011-04608
CR-VTY-2010-05643	CR-VTY-2011-04262	CR-VTY-2011-04610
CR-VTY-2011-00715	CR-VTY-2011-04270	CR-VTY-2011-04622
CR-VTY-2011-01425	CR-VTY-2011-04272	CR-VTY-2011-04634
CR-VTY-2011-02530	CR-VTY-2011-04273	CR-VTY-2011-04635
CR-VTY-2011-02696	CR-VTY-2011-04336	CR-VTY-2011-04637
CR-VTY-2011-03025	CR-VTY-2011-04362	CR-VTY-2011-04654
CR-VTY-2011-03087	CR-VTY-2011-04368	CR-VTY-2011-04661
CR-VTY-2011-03433	CR-VTY-2011-04418	CR-VTY-2011-04714
CR-VTY-2011-03966	CR-VTY-2011-04460	CR-VTY-2011-04719
CR-VTY-2011-03971	CR-VTY-2011-04489	CR-VTY-2011-04723
CR-VTY-2011-03973	CR-VTY-2011-04491	CR-VTY-2011-04725

CR-VTY-2011-04739	CR-VTY-2011-05096	CR-VTY-2011-05449
CR-VTY-2011-04758	CR-VTY-2011-05098	CR-VTY-2011-05465
CR-VTY-2011-04765	CR-VTY-2011-05099	CR-VTY-2011-05477
CR-VTY-2011-04777	CR-VTY-2011-05100	CR-VTY-2011-05478
CR-VTY-2011-04789	CR-VTY-2011-05111	CR-VTY-2011-05479
CR-VTY-2011-04793	CR-VTY-2011-05112	CR-VTY-2011-05480
CR-VTY-2011-04797	CR-VTY-2011-05127	CR-VTY-2011-05481
CR-VTY-2011-04821	CR-VTY-2011-05142	CR-VTY-2011-05483
CR-VTY-2011-04822	CR-VTY-2011-05150	CR-VTY-2011-05488
CR-VTY-2011-04823	CR-VTY-2011-05152	CR-VTY-2011-05490
CR-VTY-2011-04824	CR-VTY-2011-05175	CR-VTY-2011-05499
CR-VTY-2011-04826	CR-VTY-2011-05189	CR-VTY-2011-05507
CR-VTY-2011-04827	CR-VTY-2011-05191	CR-VTY-2011-05520
CR-VTY-2011-04847	CR-VTY-2011-05206	CR-VTY-2011-05533
CR-VTY-2011-04858	CR-VTY-2011-05208	CR-VTY-2011-05546
CR-VTY-2011-04867	CR-VTY-2011-05223	CR-VTY-2011-05547
CR-VTY-2011-04881	CR-VTY-2011-05235	CR-VTY-2011-05556
CR-VTY-2011-04886	CR-VTY-2011-05259	CR-VTY-2011-05572
CR-VTY-2011-04888	CR-VTY-2011-05264	CR-VTY-2011-05580
CR-VTY-2011-04892	CR-VTY-2011-05293	CR-VTY-2011-05587
CR-VTY-2011-04897	CR-VTY-2011-05294	CR-VTY-2011-05588
CR-VTY-2011-04904	CR-VTY-2011-05295	CR-VTY-2011-05610
CR-VTY-2011-04917	CR-VTY-2011-05311	CR-VTY-2011-05615
CR-VTY-2011-04936	CR-VTY-2011-05320	CR-VTY-2011-05618
CR-VTY-2011-04957	CR-VTY-2011-05321	CR-VTY-2011-05623
CR-VTY-2011-04959	CR-VTY-2011-05330	CR-VTY-2011-05640
CR-VTY-2011-04961	CR-VTY-2011-05335	CR-VTY-2011-05646
CR-VTY-2011-04966	CR-VTY-2011-05337	CR-VTY-2011-05661
CR-VTY-2011-04976	CR-VTY-2011-05340	CR-VTY-2011-05675
CR-VTY-2011-04978	CR-VTY-2011-05351	CR-VTY-2011-05699
CR-VTY-2011-04983	CR-VTY-2011-05366	CR-VTY-2011-05719
CR-VTY-2011-04986	CR-VTY-2011-05369	CR-VTY-2011-05727
CR-VTY-2011-05012	CR-VTY-2011-05377	CR-VTY-2011-05736
CR-VTY-2011-05033	CR-VTY-2011-05394	CR-VTY-2011-05739
CR-VTY-2011-05037	CR-VTY-2011-05407	CR-VTY-2011-05745
CR-VTY-2011-05048	CR-VTY-2011-05413	CR-VTY-2011-05751
CR-VTY-2011-05069	CR-VTY-2011-05414	CR-VTY-2011-05760
CR-VTY-2011-05089	CR-VTY-2011-05415	CR-VTY-2011-05770
CR-VTY-2011-05093	CR-VTY-2011-05447	

MiscellaneousVermont Yankee Quarterly Trend Report, 2<sup>nd</sup> Quarter 2011Vermont Yankee Quarterly Trend Report, 3<sup>rd</sup> Quarter 2011

# LIST OF ACRONYMS

ADAMS	Agencywide Documents Access and Management System
ALARA	as low as is reasonably achievable
AO	auxiliary reactor operator
AP	administration procedure
ASME	American Society of Mechanical Engineers
CFR	Code of Federal Regulations
CR	condition report
EDG	emergency diesel generator
EPD	electronic pocket dosimeter
FSS	field support supervisor
GTAW	gas tungsten arc welding
HPCI	high pressure coolant injection
HRA	high radiation area
IMC	inspection manual chapter
ISI	in-service inspection
IVVI	in-vessel visual inspection
MSIV	main steam isolation valve
MT	magnetic particle test
NCV	non-cited violation
NDE	non-destructive examination
NDT	non-destructive test
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
PARS	Publicly Available Records System
PI	performance indicator
PT	liquid penetrant test
QA	quality assurance
RCA	radiological controlled area
RFO	refueling outage
RHR	residual heat removal
RO	reactor operator
RPV	reactor pressure vessel
RWP	radiation work permit
SCBA	self-contained breathing apparatus
SDP	significance determination process
SMAW	shielded metal arc welding
SSC	structure, system and component
TS	technical specification
UFSAR	Updated Final Safety Analysis Report
VY	Vermont Yankee
WO	work order
WPS	weld procedure specification