



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**

**REGION I**  
2100 RENAISSANCE BOULEVARD, SUITE 100  
KING OF PRUSSIA, PENNSYLVANIA 19406-2713

November 5, 2013

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 05000271/2013004**

Dear Mr. Wamser:

On September 30, 2013, 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 October 11, 2013, with Mr. Michael Romeo, Director of Nuclear Safety Assurance, 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 one NRC-identified finding and two self-revealing findings of very low safety significance (Green). Two of 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, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at Vermont Yankee Nuclear Power Station. 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 Resident Inspector at Vermont Yankee Nuclear Power Station.

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's Public Document Room or from the Publicly Available Records component of the NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC website at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

**/RA/**

Raymond R. McKinley, Chief  
Reactor Projects Branch 5  
Division of Reactor Projects

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

Enclosure: Inspection Report 05000271/2013004  
w/Attachment: Supplementary Information

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket No: 50-271

License No: DPR-28

Report No: 05000271/2013004

Licensee: Entergy Nuclear Operations, Inc.

Facility: Vermont Yankee Nuclear Power Station

Location: Vernon, Vermont 05354-9766

Dates: July 1, 2013 through September 30, 2013

Inspectors: S. Rutenkroger, PhD, Senior Resident Inspector, Division of Reactor  
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R. Clagg, Acting Senior Resident Inspector, DRP  
S. Rich, Resident Inspector, DRP  
J. Furia, Senior Health Physicist, Division of Reactor Safety (DRS)  
J. Schoppy, Senior Reactor Inspector, DRS  
T. Burns, Reactor Inspector, DRS  
J. DeBoer, Project Engineer, DRP

Approved by: Raymond R. McKinley, Chief  
Reactor Projects Branch 5  
Division of Reactor Projects

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## SUMMARY

IR 05000271/2013004; 07/01/2013 – 09/30/2013; Vermont Yankee Nuclear Power Station; Maintenance Effectiveness, Occupational As Low As is Reasonably Achievable Planning and Controls, Problem Identification and Resolution.

This report covered a three-month period of inspection by resident inspectors and announced inspections performed by regional inspectors. Inspectors identified three findings of very low safety significance (Green), one NRC-identified and two self-revealing, two of which were non-cited violations (NCVs). The significance of most findings is indicated by their color (i.e., greater than Green, or Green, White, Yellow, Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process (SDP)," dated June 2, 2011. Cross-cutting aspects are determined using IMC 0310, "Components Within the Cross-Cutting Areas," dated October 28, 2011. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy, dated July 9, 2013. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4.

### Cornerstone: Mitigating Systems

- Green. The inspectors identified a NCV of Title 10 *Code of Federal Regulations* (10 CFR) 50.65, "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," because Entergy did not monitor the performance of the "B" control rod drive (CRD) equipment train. Specifically, Entergy did not include seven days of unavailability for the "B" CRD flow control valve in the tracking database, and therefore did not initiate corrective actions when the train exceeded its unavailability criterion. Entergy initiated a condition report to document exceeding the performance criterion, entered the unavailability into the tracking database, and initiated a condition report to document the oversight in unavailability tracking.

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 of ensuring the availability of systems that respond to initiating events to prevent undesirable consequences. Specifically, since Entergy personnel did not recognize that this unavailability put the plant into a higher integrated risk category and did not recognize the plant risk impact of the flow control valve's extended unavailability, no corrective actions were taken to address the maintenance practices which caused the unavailability performance criterion to be exceeded unnecessarily. In accordance with IMC 0609.04, "Initial Characterization of Findings," and Exhibit 2 of IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," issued June 19, 2012, the inspectors determined that this finding is of very low safety significance (Green) because the performance deficiency did not represent a loss of system safety function or a loss of safety function of a single train for greater than its Technical Specification allowed outage time. In addition, the failure to recognize and manage the plant risk associated with the 169 hours of unavailability of the "B" CRD flow control valve resulted in an incremental core damage probability of approximately  $2E-10$ , which is less than  $1E-6$ , and therefore also of very low safety significance. The inspectors determined that this finding has a cross-cutting aspect in the Human Performance area, Work Practices component, because Entergy personnel did

not follow the maintenance rule program procedures. Specifically, operations did not log the unavailability in the maintenance rule out-of-service log and the system engineer did not review the scoping document to verify which components counted toward the train unavailability [H.4(b)]. (Section 1R12)

- Green. A self-revealing NCV of Technical Specification 6.4, "Procedures," was identified because Entergy overloaded the "B" emergency diesel generator to 130 percent of its sustained load rating. Specifically, an auxiliary operator (AO) took the speed droop switch to zero before the output breaker was opened, contrary to procedure, which resulted in the overload condition. Entergy's immediate corrective actions included initiating a condition report, conducting a root cause evaluation, and performing management assessment of control room communications.

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. Specifically, the "B" emergency diesel generator was unavailable for an additional 24 hours in order to perform required inspections and testing to verify it was not damaged by the overload condition. In accordance with IMC 0609.04, "Initial Characterization of Findings," and Exhibit 2 of IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," issued June 19, 2012, the inspectors determined that this finding is of very low safety significance (Green) because the performance deficiency did not represent a loss of system safety function or a loss of safety function of a single train for greater than its Technical Specification allowed outage time. The inspectors determined that this finding has a cross-cutting aspect in the Human Performance area, Work Practices component, because Entergy personnel did not use human performance error prevention techniques commensurate with the risk of the assigned task such that work activities were performed safely. Specifically, self-checking, peer checking, and three-part communications were not used effectively to prevent performing procedure steps out of order [H.4(a)]. (Section 4OA2)

### **Cornerstone: Occupational/Public Radiation Safety**

- Green. A self-revealing finding was identified because Entergy inadequately planned and controlled work while performing reactor reassembly and reactor cavity decontamination activities during refueling outage (RFO) 30 resulting in excessive unintended occupational collective exposure that exceeded the planned dose exposure established by Radiation Work Permit (RWP) 2013-702. Inadequate work planning and control resulted in unplanned, unintended collective exposure due to conditions that were reasonably within Entergy's ability to control. The work activity performance deficiencies resulted in the collective exposure for these activities increasing from the original estimate of 9.950 person-rem to an actual dose of 18.940 person-rem. Entergy entered the issues into their corrective action program.

This finding is more than minor because it is associated with the program and process attribute of the Occupational Radiation Safety cornerstone and affected the cornerstone objective to ensure the adequate protection of the worker health and safety from exposure to radiation from radioactive material during routine civilian nuclear reactor operation. Additionally, the performance deficiency was determined to be more than minor based on a similar example (6.i) in Appendix E of IMC 0612, in that the actual collective dose exceeded 5 person-rem and exceeded the planned, intended dose by more than 50 percent. In

accordance with IMC 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process," the inspectors determined that this finding is of very low safety significance (Green) because the plant's current three year rolling average collective dose (142.6 person-rem/reactor years for 2010 through 2012) is less than the criteria of 240 person-rem per boiling water reactor unit. The inspectors determined that this finding has a cross-cutting aspect in the Human Performance area, Work Control component, because Entergy did not implement the planned work as intended, which involved job site activities, and impacted radiological safety [H.3(a)]. (Section 2RS2)



## REPORT DETAILS

### Summary of Plant Status

Vermont Yankee Nuclear Power Station (VY) began the inspection period operating at 100 percent power. On July 7, operators reduced power to 48 percent for a control rod pattern adjustment and returned VY to 100 percent power on July 9. On September 23, operators reduced power to 29 percent for single loop operation and personnel entry in the primary containment drywell to inspect and repair an oil leak from the "B" recirculation pump motor upper bearing oil reservoir. On September 24, operators reduced power further to 13 percent in accordance with Technical Specification requirements associated with the primary containment atmosphere, i.e. containment not inerted with nitrogen and differential pressure between the drywell and suppression chamber not met. On September 27, operators returned VY to 100 percent power. On September 29, operators reduced power to 72 percent for a control rod pattern adjustment and returned VY to 100 percent power on September 30.

### 1. REACTOR SAFETY

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

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

##### Readiness for Seasonal Extreme Weather Conditions

##### a. Inspection Scope

The inspectors performed a review of Entergy's readiness for the onset of seasonal high temperatures. The review focused on the reactor building supplemental cooling and the service water system. 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 and applicable operating procedures. The inspectors performed walkdowns of the selected systems to ensure station personnel identified issues that could challenge the operability of the systems during hot 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 (71111.04 – 4 samples)a. Inspection Scope

The inspectors performed partial walkdowns of the following systems:

- “B” emergency diesel generator during “A” emergency diesel generator surveillance testing and repair of the room exhaust fan damper on July 2
- Standby gas treatment system during and after planned maintenance on July 20
- “A” residual heat removal (RHR) during “B” RHR planned maintenance from July 22 to July 25
- Station blackout diesel during “A” emergency diesel generator inoperability due to a degraded air start line to cylinder six on September 26

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, 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).1 Resident Inspector Quarterly Walkdowns (71111.05Q – 5 samples)a. Inspection Scope

The inspectors conducted tours of the areas listed below to assess the material condition and operational status of fire protection features. The inspectors verified that Entergy controlled combustible materials and ignition sources in accordance with administrative procedures. The inspectors verified that fire protection and suppression equipment was available for use as specified in the area pre-fire plan, 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 252' elevation on July 9
- Turbine building feedwater pump room on August 21
- Station blackout diesel generator and switchgear enclosures on September 26
- Reactor building torus room on September 30
- Reactor building 345' elevation on September 30

b. Findings

No findings were identified.

.2 Fire Protection – Drill Observation (71111.05A – 1 sample)

a. Inspection Scope

The inspectors observed a fire brigade drill scenario conducted on September 5, 2013, that involved a fire in the cable vault 260' 6" elevation. The inspectors evaluated the readiness of the plant fire brigade to fight fires. The inspectors verified that Entergy personnel identified deficiencies, openly discussed them in a self-critical manner at the debrief, and took appropriate corrective actions as required. The inspectors verified that the fire brigade:

- Properly used turnout gear and self-contained breathing apparatus
- Properly used and laid out fire hoses
- Employed appropriate fire-fighting techniques
- Brought sufficient fire-fighting equipment to the scene
- Effectively used command and control
- Searched for victims and for propagation of the fire into other plant areas
- Conducted smoke removal operations
- Properly used pre-planned strategies
- Adhered to the pre-planned drill scenario
- Met drill objectives

The inspectors also evaluated the fire brigade's actions to determine whether these actions were in accordance with Entergy's fire-fighting strategies.

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06 – 1 sample)Internal Flooding Reviewa. Inspection Scope

The inspectors reviewed the UFSAR, the site flooding analysis, and drawings to assess susceptibilities involving internal flooding. The inspectors also reviewed the corrective action program to determine if Entergy identified and corrected flooding problems and whether operator actions for coping with flooding were adequate. The inspectors focused on the reactor building 252' elevation, southeast portion, during "B" RHR planned maintenance to verify the adequacy of equipment seals located below the flood line, floor and water penetration seals, common drain lines, and sumps.

b. Findings

No findings were identified.

1R07 Heat Sink Performance (711111.07A – 1 sample)a. Inspection Scope

The inspectors reviewed the "B" RHR heat exchanger to determine its readiness and availability to perform its safety functions. The inspectors reviewed the design basis for the component and verified Entergy's commitments to NRC Generic Letter 89-13. The inspectors observed the draining and cleaning of the heat exchanger as well as its reassembly. The inspectors discussed the results of the most recent inspection with engineering staff and reviewed pictures of the as-found and as-left conditions. The inspectors verified that Entergy initiated appropriate corrective actions for identified deficiencies. The inspectors also verified that the number of tubes plugged within the heat exchanger did not exceed the maximum amount allowed.

b. Findings

No findings were identified.

1R11 Licensed Operator Regualification Program (71111.11 – 2 samples).1 Quarterly Review of Licensed Operators' Regualification Testing and Traininga. Inspection Scope

The inspectors observed licensed operator simulator training on July 31, which involved a seismic event that exceeded the operating basis earthquake, standby liquid control pump suction line break, recirculation pump and controller failure, recirculation loop leak, and increasing primary containment pressure. The inspectors assessed the clarity and effectiveness of communications, implementation of actions in response to alarms and changing 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 Quarterly Review of Licensed Operator Performance in the Main Control Rooma. Inspection Scope

The inspectors observed control room operators during a planned down power on July 7 for a control rod pattern sequence exchange. The inspectors observed the pre-job brief to verify that roles and responsibilities, critical steps, expected results, and hold points were discussed. The inspectors verified that procedure use, crew communications, and response to alarms met established expectations and standards.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12Q – 1 sample)a. Inspection Scope

The inspectors reviewed the “B” CRD subsystem 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 was identifying and properly evaluating performance problems within the scope of the maintenance rule. For the sample selected, the inspectors verified that the SSC was properly scoped into the maintenance rule in accordance with 10 CFR 50.65, “Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants,” and verified that the (a)(2) performance criteria established by Entergy staff were reasonable. For SSCs classified as (a)(1), the inspectors assessed the adequacy of goals and corrective actions to return these SSCs to (a)(2). Additionally, the inspectors ensured that Entergy staff was identifying and addressing common cause failures that occurred within and across maintenance rule system boundaries.

b. Findings

Introduction. The inspectors identified a Green NCV of 10 CFR 50.65, “Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants,” because Entergy did not appropriately monitor the performance of the “B” CRD equipment train. Specifically, Entergy did not include seven days of unavailability for the “B” CRD flow control valve in the tracking database, and therefore did not initiate corrective actions when the train exceeded its unavailability criterion.

Description. The “B” CRD flow control valve was tagged out of service on Wednesday, July 3, for replacement of the valve positioner. Maintenance staff performed the work on Wednesday. Operations staff left the valve tagged out (and unavailable) through the five-day weekend. No additional work was performed on the valve, and it was ultimately returned to service on Wednesday, July 10, resulting in 169 hours of unavailability for the “B” train.

At the time, the "B" train of CRD was in (a)(1) status, goal monitoring, with all corrective actions completed, following a repeat functional failure of the "B" CRD pump. The goal was no pump trips due to the cause of the repeat functional failures, which was unrelated to the flow control valve issue. Since the (a)(1) goal only affected unreliability, the unavailability standard remained the same criterion as the (a)(2) performance criterion of 1.79 percent. When the July unavailability was added to the previous unavailability time of 387.04 hours, the "B" CRD train unavailability significantly exceeded the performance criterion.

The inspectors reviewed the Maintenance Rule Monthly Report for July 2013 and observed that the unavailability for the "B" flow control valve work was not included. The inspectors determined that Entergy personnel were unaware that the maintenance rule scoping basis for the CRD system established that tagging out the "B" CRD flow control valve resulted in accrued unavailability for the "B" train, even though either CRD pump can provide flow through either flow control valve. As a result, operations did not enter the unavailability into the maintenance rule out-of-service log. In addition, the system engineer did not reference the scoping document to determine whether or not unavailability had accrued. Entergy initiated condition report CR-VTY-2013-05327 to document exceeding the performance criterion, entered the unavailability into the tracking database, and initiated CR-VTY-2013-05629 to document the oversight in unavailability tracking.

Analysis. The inspectors determined that the failure to appropriately monitor the performance of the "B" CRD equipment train in accordance with 10 CFR 50.65(a)(1) was a performance deficiency that was reasonably within Entergy's ability to foresee and correct, and should have been prevented. 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 of ensuring the availability of systems that respond to initiating events to prevent undesirable consequences. Specifically, since Entergy personnel did not recognize that this unavailability put the plant into a higher integrated risk category and did not recognize the plant risk impact of the flow control valve's extended unavailability, no corrective actions were taken to address the maintenance practices which caused the unavailability performance criterion to be exceeded unnecessarily.

In accordance with IMC 0609.04, "Initial Characterization of Findings," and Exhibit 2 of IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," issued June 19, 2012, the inspectors determined that this finding is of very low safety significance (Green) because the performance deficiency did not represent a loss of system safety function or a loss of safety function of a single train for greater than its Technical Specification allowed outage time. In addition, the failure to recognize and manage the plant risk associated with the 169 hours of unavailability of the "B" CRD flow control valve resulted in an incremental core damage probability of approximately  $2E-10$ , which is less than  $1E-6$ , and therefore also of very low safety significance.

The inspectors determined that this finding has a cross-cutting aspect in the Human Performance area, Work Practices component, because Entergy personnel did not follow the maintenance rule program procedures. Specifically, operations did not log the

unavailability in the maintenance rule out-of-service log and the system engineer did not review the scoping document to verify which components counted toward the train unavailability [H.4(b)].

**Enforcement.** 10 CFR 50.65, “Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants,” section (a)(1), requires, in part, that holders of an operating license shall monitor the performance of SSCs, within the scope of the rule as defined by 10 CFR 50.65(b), against established goals, in a manner sufficient to provide reasonable assurance that such SSCs are capable of fulfilling their intended functions. Contrary to the above, Entergy did not monitor the unavailability of the “B” CRD equipment train against its established goals. Specifically, unavailability associated with the “B” CRD flow control valve maintenance was not recognized and not counted in the database in a manner sufficient to provide reasonable assurance that such SSCs are capable of fulfilling their intended functions. Entergy’s immediate corrective actions included entering the unavailability into the database and initiating condition report CR-VTY-2013-05327 identifying that the “B” train had exceeded its unavailability criterion. Because this violation was of very low safety significance (Green), and Entergy entered this issue into their corrective action program, this violation is being treated as an NCV, consistent with Section 2.3.2 of the Enforcement Policy. **(NCV 05000271/2013004-01, Failure to Monitor the Unavailability of the “B” Control Rod Drive Equipment Train)**

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 – 4 samples)

a. Inspection Scope

The inspectors reviewed station evaluation and management of plant risk for the maintenance 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. As applicable for each activity, 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.

- “A” emergency diesel generator monthly surveillance and room exhaust fan damper repair – week of July 1
- “A” RHR and “A” residual heat removal service water (RHRSW) quarterly surveillance and “B” CRD flow control valve planned maintenance – week of July 8
- Vernon tie unavailable for station blackout diesel generator modification – week of August 19
- Vernon tie unavailable for station blackout diesel generator start time testing and “A” emergency diesel generator monthly surveillance – week of August 26

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15 – 6 samples)

a. Inspection Scope

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

- Groundwater in-leakage and corrosion of electrical conduit were identified in the reactor building 213' elevation torus room, condition report CR-VTY-2013-04249 initiated on June 30
- Alternate shutdown battery bank cells were identified as physically degraded, condition report CR-VTY-2013-04289 initiated on July 10
- "A" emergency diesel generator exhaust silencer damage was identified on the turbine building roof, condition report CR-VTY-2013-04469 initiated on July 12
- Service water leak from standby fuel pool cooling heat exchanger north end bell was identified, condition report CR-VTY-2013-04641 initiated on July 21
- "B" RHR/RHRSW heat exchanger lower inner service water head was identified to be less than specified minimum wall thickness, condition report CR-VTY-2013-04704 initiated on July 23
- Reactor building ventilation radiation monitor RM-17-452B spiked upscale and caused a primary containment isolation system group 3 actuation, condition report CR-VTY-2013-04719 initiated on July 24

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, where appropriate, compliance with bounding limitations associated with the evaluations.

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18 – 2 samples)

.1 Temporary Modifications

a. Inspection Scope

The inspectors reviewed a temporary modification to install a replacement for the refuel floor west blowout panel BP-RXB-5 to determine whether the modification affected the safety functions of systems that are important to safety. The inspectors reviewed the



process applicability determination documentation and post-modification testing results, and conducted 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.

.2 Permanent Modifications

a. Inspection Scope

The inspectors evaluated the modification that installed a stand-alone diesel generator as the station's 10 CFR 50.63, "Loss of All Alternating Current Power," back-up alternating current (ac) power source, i.e. station blackout power source. The inspectors verified that the design bases, licensing bases, and performance capability of the vital busses were not degraded by the modification. The modification included pouring a concrete pad to support an air-cooled three megawatt diesel generator, a load bank for testing and a new switchgear enclosure to allow use of either the Vernon tie power line or the diesel generator to power the station's vital busses. The diesel generator and switchgear use digital controls, with operator interface panels located in the switchgear enclosure and the main control room.

The inspectors reviewed modification documents associated with the design change to verify they agreed with the NRC's safety evaluation report written for the license amendment. The inspectors also interviewed engineering, operations, project management, and contracted maintenance personnel involved with the modification. The inspectors observed testing to verify the regulatory commitments listed in the safety evaluation report were met. Additional inspections related to this modification are documented in sections 1R04, 1R05, 1R13 and 1R19.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19 – 8 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.

- Replacement of high side switch for “A” RHR minimum flow bypass valve on July 16
- “B” RHR heat exchanger following “B” RHRSW header maintenance on July 26
- Reactor core isolation cooling (RCIC) planned maintenance on August 7
- Radiation monitor detectors replacement on August 8
- Station blackout diesel generator switchgear relay logic installation on August 13
- Station blackout diesel generator jacket cooling repair on August 21
- Station blackout diesel generator remote start repair on August 27
- High pressure coolant injection (HPCI) turbine gasket replacement on September 19

b. Inspection Scope

No findings were identified.

1R22 Surveillance Testing (71111.22 – 5 samples)

a. Inspection Scope

The inspectors observed performance of surveillance tests and 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:

- “A” emergency diesel generator monthly slow start surveillance on July 2
- RCIC auto suction transfer water level functional test and calibration on August 8
- “B” core spray pump quarterly surveillance on August 21 (in-service test)
- “A” emergency diesel generator quarterly fast start surveillance on August 28
- Routine sampling of the reactor water system on September 17 (reactor coolant system leakage detection)

b. Findings

No findings were identified.

### **Cornerstone: Emergency Preparedness**

#### 1EP6 Drill Evaluation (71114.06 – 1 sample)

##### a. Inspection Scope

The inspectors evaluated the conduct of a routine Entergy emergency drill on September 11 to identify any weaknesses and deficiencies in the classification, notification, and protective action recommendation development activities. The inspectors observed emergency response operations in the simulator and emergency operations facility to determine whether the event classification, notifications, and protective action recommendations were performed in accordance with procedures. The inspectors also attended the drill critique in the emergency operations facility to compare inspector observations with those identified by Entergy staff in order to evaluate Entergy's critique and to verify whether the Entergy staff was properly identifying weaknesses and entering them into the corrective action program.

##### 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)

During the week of July 8 to 12, the inspectors reviewed Entergy's performance in assessing the radiological hazards in the workplace associated with licensed activities and the implementation of appropriate radiation monitoring and exposure control measures for both individual and collective exposures. The inspectors verified that Entergy is properly identifying and reporting performance indicators for the Occupational Radiation Safety Cornerstone and identifying those performance deficiencies that were reportable as a performance indicator and which may have represented a substantial potential for overexposure of the worker. The inspectors used 10 CFR 20, "Standards for Protection Against Radiation," Regulatory Guide 8.38, "Control of Access to High and Very High Radiation Areas for Nuclear Plants," Technical Specifications, and Entergy's procedures as criteria for determining compliance.

##### a. Inspection Scope

The inspectors reviewed Entergy's performance indicators for the Occupational Exposure Cornerstone for follow-up. The inspectors reviewed the results of radiation protection program audits. The inspectors reviewed reports of operational occurrences related to occupational radiation safety since the last inspection.

##### Radiological Hazard Assessment

The inspectors determined whether, since the last inspection, there have been changes to plant operations that may result in a significant new radiological hazard for onsite workers or members of the public. The inspectors reviewed the last two radiological

surveys from selected plant areas. The inspectors verified the thoroughness and frequency of the surveys. The inspectors conducted walk downs of the facility, including radioactive waste processing, storage, and handling areas to evaluate material conditions and potential radiological conditions.

The inspectors selected air sample survey records and verified that samples were collected and counted in accordance with Entergy procedures. The inspectors observed work in potential airborne areas, and verified that air samples were representative of the breathing air zone. The inspectors verified that Entergy has a program for monitoring levels of loose surface contamination in areas of the plant.

#### Instructions to Workers

The inspectors selected containers of radioactive materials and verified that they were labeled and controlled.

The inspectors selected occurrences where a worker's electronic personal dosimeter noticeably malfunctioned or alarmed. The inspectors verified that workers responded appropriately to the off-normal condition. The inspectors verified that the issue was included in the corrective action program and appropriate dose evaluations were conducted.

#### Contamination and Radioactive Material Control

The inspectors observed several locations where Entergy monitors material leaving the radiologically controlled area and inspected the methods used for control, survey, and release from these areas. The inspectors verified that the radiation monitoring instrumentation had appropriate sensitivity for the type(s) of radiation present.

The inspectors reviewed Entergy's criteria for the survey and release of potentially contaminated material. The inspectors reviewed Entergy's procedures and records to verify that the radiation detection instrumentation was used at its expected alarm sensitivity.

The inspectors selected two sealed sources from Entergy's inventory records and verified that sources are accounted for and had been verified to be intact. The inspectors verified that any transactions involving nationally tracked sources were reported in accordance with 10 CFR 20.2207.

#### Radiological Hazards Control and Work Coverage

The inspectors examined Entergy's physical and program controls for highly activated materials stored within the spent fuel pool. The inspectors verified that appropriate controls were in place to preclude inadvertent removal of these materials from the pool.

The inspectors conducted selective inspection of posting and physical controls for high radiation areas and very high radiation areas.

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

The inspectors discussed with the Radiation Protection Manager any changes to the controls and procedures for high-risk high radiation areas and very high radiation areas.

The inspectors discussed with first-line health physics supervisors the controls in place for special areas that have the potential to become very high radiation areas during certain plant operations.

### Problem Identification and Resolution

The inspectors verified that problems associated with radiation monitoring and exposure control were being identified by Entergy at an appropriate threshold and were properly addressed for resolution within Entergy's corrective action program. The inspectors also determined that Entergy was properly assessing the applicability of operating experience.

#### b. Findings

No findings were identified.

### 2RS2 Occupational As Low As is Reasonably Achievable Planning and Controls (71124.02 - 1 sample)

During the week of July 8 to 12, the inspectors assessed Entergy's performance with respect to maintaining individual and collective radiation exposures as low as is reasonably achievable (ALARA). The inspectors used 10 CFR 20, Regulatory Guide 8.8, "Information Relevant to Ensuring that Occupational Radiation Exposures at Nuclear Power Plants will be As Low As Reasonably Achievable," Regulatory Guide 8.10, "Operating Philosophy for Maintaining Occupational Radiation Exposure As Low as Reasonably Achievable," Technical Specifications, and Entergy's procedures as criteria for determining compliance.

#### a. Inspection Scope

##### Radiological Work Planning

The inspectors compared the results achieved with the intended dose established in Entergy's ALARA planning for selected work activities. The inspectors compared the person-hour estimates provided by maintenance planning and other groups to the radiation protection group with the actual work activity time requirements and evaluated the accuracy of the time estimates. The inspectors evaluated the reasons for any inconsistencies between intended and actual work activity doses.

The inspectors determined that post-job reviews were conducted and that identified problems were entered into Entergy's corrective action program.

##### Source Term Reduction and Control

Using Entergy's records, the inspectors determined the historical trends and current status of significant tracked plant source terms known to contribute to elevated facility

aggregate exposure. The inspectors determined that Entergy was making allowances or developing contingency plans for expected changes in the source term as the result of changes in plant fuel performance issues or changes in plant primary chemistry.

#### Problem Identification and Resolution

The inspectors verified that problems associated with ALARA planning and controls were being identified by Entergy at an appropriate threshold and were properly addressed for resolution in Entergy's corrective action program.

#### b. Findings

Introduction: A self-revealing Green finding was identified because Entergy inadequately planned and controlled work while performing reactor reassembly and reactor cavity decontamination activities during RFO 30 resulting in excessive unintended occupational collective exposure that exceeded the planned dose exposure established by RWP 2013-702. Inadequate work planning and control resulted in unplanned, unintended collective exposure due to conditions that were reasonably within Entergy's ability to control. The work activity performance deficiencies resulted in the collective exposure for these activities increasing from the original estimate of 9.950 person-rem to an actual dose of 18.940 person-rem.

Description: RWP 2013-702 provided the applicable plan for dose execution related to reactor reassembly and reactor cavity decontamination work activities during RFO 30. The unintended collective exposure during RFO 30 for the reactor reassembly and reactor cavity decontamination work activities was greater than 50 percent above the intended collective exposure of 9.950 person-rem, and greater than five person-rem. This unintended exposure was a result of the following: (1) failure to use a cavity strippable coating as planned resulted in an additional 3.5 person-rem to perform manual cavity decontamination, and (2) assorted issues with the retensioning of the reactor pressure vessel, including the tensioner becoming stuck at one location, two sets of head washers not properly mated, and three sets of head washers inserted inverted, resulted in an additional 1.9 person-rem.

Following cavity decontamination activities performed in RFO 29, Entergy included a requirement for strippable coating to be applied throughout the reactor cavity, including the floor surface, during reactor disassembly within the RFO 30 outage plan. However, only approximately 30 percent of that coating was applied, with no coating applied on the floor, when outage management decided to cancel the application of the strippable coating. Cavity decontamination following reactor reassembly was subsequently performed manually, and as a result, greater efforts to perform a manual decontamination resulted in additional collective exposure of 3.5 person-rem.

During reactor head placement and stud tensioning, issues with six stud locations led to additional time and rework. The stud tensioner became stuck on one stud; two sets of reactor pressure vessel head washers were originally not mated correctly and required reinstallation; and three sets of reactor pressure vessel head washers were installed inverted and required reinstallation. The result was an additional collective exposure of 1.9 person-rem.

Consequently, the total collective dose for the refueling activities increased from the original estimate of 9.950 person-rem to the actual collective exposure of 18.940 person-rem. Entergy entered these issues into their corrective action program as condition reports CR-VTY-2013-02336; CR-VTY-2013-02346; CR-VTY-2013-02352; CR-VTY-2013-02353; CR-VTY-2013-02276; CR-VTY-2013-02364; and CR-VTY-2013-02644.

Analysis: The inspectors determined that Entergy's failure to prevent unnecessary exposure during reactor cavity decontamination and reactor head retensioning was a performance deficiency that was within their ability to foresee and correct and should have been prevented. This finding is more than minor because it is associated with the program and process attribute of the Occupational Radiation Safety cornerstone and affected the cornerstone objective to ensure the adequate protection of the worker health and safety from exposure to radiation from radioactive material during routine civilian nuclear reactor operation. Additionally, the performance deficiency was determined to be more than minor based on a similar example (6.i) in Appendix E of IMC 0612, in that the actual collective dose exceeded 5 person-rem and exceeded the planned, intended dose by more than 50 percent.

In accordance with IMC 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process," the inspectors determined that this finding is of very low safety significance (Green) because the plant's current three year rolling average collective dose (142.6 person-rem/reactor years for 2010 through 2012) is less than the criteria of 240 person-rem per boiling water reactor unit.

The inspectors determined that this finding has a cross-cutting aspect in the Human Performance area, Work Control component, because Entergy did not implement the planned work as intended, which involved job site activities, and impacted radiological safety [H.3(a)].

Enforcement: This finding does not involve enforcement action because no violation of a regulatory requirement was identified. The ALARA rule (10 CFR 20.1101 (b)) Statements of Consideration indicates that compliance with the ALARA requirement will be judged on whether Entergy has incorporated measures to track and, if necessary, to reduce exposures, and not whether exposures and doses represent an absolute minimum or whether Entergy has used all possible methods to reduce exposures. The overall exposure performance of a nuclear power plant is used to determine its compliance with the ALARA rule. Since VY is below a three year rolling average of 240 person-rem per unit and has an established ALARA program to reduce exposure consistent with the 10 CFR Part 20.1101 Statements of Consideration, no violation of 10 CFR Part 20.1101 (b) was identified. Because this finding does not involve a violation and is of very low safety significance, it is identified as a FIN. **(FIN 05000271/2013004-02, Failure to Maintain Radiation Exposure ALARA during Refueling Activities)**

2RS4 Occupational Dose Assessment (71124.04 - 1 sample)

During the week of August 12 to 16, the inspectors determined the accuracy and operability of personal monitoring equipment; determined the accuracy and effectiveness of Entergy's methods for determining total effective dose equivalent; and ensured that occupational dose is appropriately monitored. The inspectors used 10 CFR 20,

Regulatory Guide 8.13, "Instructions Concerning Prenatal Radiation Exposures," Regulatory Guide 8.36, "Radiation Dose to Embryo Fetus," Regulatory Guide 8.40, "Methods for Measuring Effective Dose Equivalent from External Exposure," Technical Specifications, and Entergy's procedures as criteria for determining compliance.

a. Inspection Scope

The inspectors reviewed the results of radiation protection program audits related to internal and external dosimetry. The inspectors reviewed the most recent National Voluntary Laboratory Accreditation Program (NVLAP) accreditation report on Entergy. The inspectors reviewed Entergy's procedures associated with dosimetry operations, including issuance/use of external dosimetry, assessment of internal dose, and evaluation of and dose assessment for radiological incidents.

The inspectors verified that Entergy had established procedural requirements for determining when external and internal dosimetry was required.

External Dosimetry

The inspectors verified that Entergy's personnel dosimeters that require processing were NVLAP accredited. The inspectors verified the vendor's NVLAP accreditation. The inspectors ensured that the approved irradiation test categories for each type of personnel dosimeter used were consistent with the types and energies of the radiation present, and the way that the dosimeter was being used.

The inspectors evaluated the onsite storage of dosimeters before their issuance, during use, and before processing/reading, and the guidance provided to radiation workers with respect to care and storage of dosimeters.

The inspectors determined that Entergy uses a "correction factor" to address the response of the electronic dosimeter as compared to thermoluminescent or optically stimulated luminescence docimeters for situations when the electronic dosimeter must be used to assign dose. The inspectors verified that the correction factor was based on sound technical principles.

The inspectors selected dosimetry occurrence reports or corrective action program documents for adverse trends related to electronic dosimeters, such as interference from electromagnetic frequency, dropping or bumping, failure to hear alarms, etc. The inspectors determined that Entergy implemented appropriate corrective actions and had not identified any trends.

Internal Dosimetry

The inspectors reviewed procedures used to assess dose from internally deposited nuclides using whole body counting equipment. The inspectors verified that the procedures addressed methods for determining whether an individual was internally or externally contaminated, the release of contaminated individuals, the determination of entry route, and assignment of dose. The inspectors verified that the frequency of such measurements was consistent with the biological half-life of the potential nuclides



available for intake. The inspectors evaluated the minimum detectable activity of the instrument. The inspectors determined that the minimum detectable activity was adequate to determine the potential for internally deposited radionuclides sufficient to prompt additional investigation.

The inspectors verified that the system used in each bioassay had sufficient counting time/low background to ensure appropriate sensitivity for the potential radionuclides of interest. The inspectors verified that the appropriate nuclide library was used. The inspectors verified that any anomalous count peaks/nuclides indicated in each output spectra received appropriate disposition.

The inspectors selected internal dose assessments obtained using in-vitro monitoring. The inspectors reviewed and assessed the adequacy of Entergy's program for in-vitro monitoring of radionuclides, including collection and storage of samples.

The inspectors reviewed the counting laboratory's quality assurance program, including Entergy's audits. The inspectors verified that the lab participated in an analysis cross-check program and that out-of-tolerance results were evaluated and resolved appropriately.

The inspectors reviewed the adequacy of Entergy's program for dose assessments based on airborne and derived air concentration (DAC) monitoring. The inspectors verified that flow rates and/or collection times for fixed head air samplers or lapel breathing zone air samplers were adequate to ensure that appropriate lower limits of detection are obtained. The inspectors reviewed the adequacy of procedural guidance used to assess dose when Entergy applies protection factors. The inspectors reviewed dose assessments performed using airborne/DAC monitoring. The inspectors verified that Entergy's DAC calculations were representative of the actual airborne radionuclide mixture, including hard-to-detect nuclides.

The inspectors reviewed the adequacy of Entergy's internal dose assessments for any actual internal exposure greater than 10 millirem committed effective dose equivalent. The inspectors determined that while no exposures occurred during the period from January 1, 2012 to August 12, 2013, Entergy had programs and procedures in place to ensure internal exposures would be properly monitored with calibrated equipment, analyzed, and assessed.

#### Special Dosimetric Situations

The inspectors verified that Entergy informed workers of the risks of radiation exposure to the embryo/fetus, the regulatory aspects of declaring a pregnancy, and the specific process to be used for (voluntarily) declaring a pregnancy. There was one declared pregnant worker during the period from January 1, 2012 to August 12, 2013. The inspectors verified that Entergy's radiological monitoring program for declared pregnant workers was technically adequate to assess the dose to the embryo/fetus. The inspectors reviewed the exposure results and monitoring controls employed by Entergy.

The inspectors reviewed Entergy's methodology for monitoring external dose in situations in which non-uniform fields are expected or large dose gradients exist. The inspectors verified that Entergy had established criteria for determining when alternate monitoring techniques were to be implemented. The inspectors reviewed dose

assessments performed using multibadging during the current assessment period. The inspectors verified that the assessment was performed consistently with Entergy's procedures and dosimetric standards. The inspectors reviewed shallow dose equivalent assessments for adequacy. The inspectors evaluated Entergy's method for calculating SDE from distributed skin contamination or discrete radioactive particles.

The inspectors evaluated Entergy's neutron dosimetry program, including dosimeter type(s) and/or survey instrumentation. The inspectors selected neutron exposure situations and verified that (a) dosimetry and/or instrumentation was appropriate for the expected neutron spectra, (b) there was sufficient sensitivity for low dose and/or dose rate measurement, and (c) neutron dosimetry was properly calibrated. The inspectors verified that interference by gamma radiation had been accounted for in the calibration. The inspectors verified that time and motion evaluations were representative of actual neutron exposure events, as applicable.

For the special dosimetric situations reviewed in this section, the inspectors determined how Entergy assigned dose of record for total effective dose equivalent, shallow dose equivalent, and lens dose equivalent.

#### Problem Identification and Resolution

The inspectors verified that problems associated with occupational dose assessment were being identified by Entergy at an appropriate threshold and were properly addressed for resolution in Entergy's corrective action program. In addition, the inspectors verified the appropriateness of the corrective actions for a selected sample of problems documented by Entergy involving occupational dose assessment.

#### b. Findings

No findings were identified.

#### 2RS5 Radiation Monitoring Instrumentation (71124.05 – 1 sample)

During the week of August 12 to 16, the inspectors verified that Entergy was ensuring the accuracy and operability of radiation monitoring instruments that are used to monitor areas, materials, and workers to ensure radiologically safe work. The instrumentation subject to this review included equipment used to monitor radiological conditions incident to normal plant operations, including anticipated operational occurrences, and conditions resulting from postulated accidents. The inspectors used 10 CFR 20, applicable industry standards, and Entergy's procedures as criteria for determining compliance.

#### a. Inspection Scope

##### Walkdowns and Observations

The inspectors selected portable survey instruments in use or available for issuance. The inspectors checked calibration and source check stickers for currency, and assessed instrument material condition and operability. The inspectors evaluated Entergy staff performance as the staff demonstrated source checks for various types of portable survey instruments. The inspectors determined that high-range instruments were source checked on all appropriate scales. The inspectors walked down area

radiation monitors and continuous air monitors and determined that they were appropriately positioned relative to the radiation sources or areas they were intended to monitor. The inspectors selected personnel contamination monitors and small article monitors and verified that the periodic source checks were performed in accordance with the manufacturer's recommendations and Entergy procedures.

#### Calibration and Testing Program

As part of the problem identification and resolution review, the inspectors verified that appropriate corrective actions were implemented in response to indications of degraded instrument performance. The inspectors reviewed the methods and sources used to perform whole body counter functional checks before daily use of the instrument. The inspectors determined that check sources were appropriate and aligned with VY's isotopic mix. The inspectors reviewed whole body counter calibration reports completed since the last inspection to verify that calibration sources were representative of the plant source term and that appropriate calibration phantoms were used.

The inspectors selected samples of personnel contamination monitors and small article monitors used on site, and verified that the alarm set-point values were reasonable under the circumstances to ensure that licensed material is not released from the site. The inspectors reviewed calibration documentation for each instrument selected above, and discussed the calibration methods with Entergy to determine consistency with the manufacturer's recommendations. For portable survey instruments and area radiation monitors, the inspectors reviewed detector measurement geometry and calibration methods and observed Entergy staff demonstrate use of the instrument calibrator.

The inspectors selected portable survey instruments that did not meet acceptance criteria during calibration or source checks. The inspectors verified that Entergy had taken appropriate corrective action for instruments found significantly out of calibration. The inspectors verified that Entergy had evaluated the possible consequences of instrument use since the last successful calibration or source check. The inspectors reviewed the current output values for Entergy's portable survey and area radiation monitor instrument calibrator units. The inspectors verified that Entergy periodically measured calibrator output over the range of the instruments used through measurements by ion chamber/electrometer. The inspectors verified that the measuring devices had been calibrated by a facility using National Institute of Standards and Technology traceable sources and that correction factors for these measuring devices were properly applied by Entergy in its output verification.

The inspectors reviewed Entergy's 10 CFR 61, "Licensing Requirements for Land Disposal of Radioactive Waste," source term to determine whether the calibration sources used were representative of the types and energies of radiation encountered in the plant

#### Problem Identification and Resolution

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

b. Findings

No findings were identified.

**4. OTHER ACTIVITIES**

4OA1 Performance Indicator Verification (71151)

.1 Safety System Functional Failures (1 sample)

a. Inspection Scope

The inspectors sampled Entergy's submittals for the Safety System Functional Failures performance indicator for the period of July 1, 2012, through June 30, 2013. To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in the Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, and NUREG-1022, "Event Reporting Guidelines 10 CFR 50.72 and 10 CFR 50.73." The inspectors reviewed Entergy's operator narrative logs, operability assessments, maintenance rule records, condition reports, event reports, and NRC integrated inspection reports to validate the accuracy of the submittals.

b. Findings

No findings were identified.

.2 Mitigating Systems Performance Index (2 samples)

a. Inspection Scope

The inspectors reviewed Entergy's submittal of the Mitigating Systems Performance Index for the following systems for the period of July 1, 2012 through June 30, 2013:

- High Pressure Injection System
- Heat Removal System

To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in Nuclear Energy Institute Document 99-02. The inspectors also reviewed Entergy's operator narrative logs, operating procedures, 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.

###### b. Findings

No findings were identified.

##### .2 Annual Sample: Reactor Core Isolation Cooling System Leakage

###### a. Inspection Scope

The inspectors performed an in-depth review of Entergy's apparent cause evaluation and corrective actions associated with a RCIC turbine casing leak that operators identified during a quarterly in-service test on November 8, 2012 (CR-VTY-2012-05536). In addition, the inspectors reviewed Entergy's corrective actions associated with a small steam leak on a 1-inch RCIC steam line drain line that operators identified during the same RCIC in-service test in November 2012 (CR-VTY-2012-05535).

The inspectors assessed Entergy's problem identification threshold, cause analysis, extent-of-condition reviews, compensatory actions, and the prioritization and timeliness of corrective actions to determine whether Entergy was appropriately identifying, characterizing, and correcting problems associated with these issues and whether the planned and/or completed corrective actions were appropriate. The inspectors compared the actions taken to the requirements of Entergy's corrective action program, 10 CFR 50 Appendix B, and Electric Power Research Institute (EPRI) 1007460, "Terry Turbine Maintenance Guide, RCIC Application." In addition, the inspectors performed field walkdowns and interviewed operations and engineering personnel to assess the effectiveness of the implemented corrective actions. Furthermore, on August 7, 2013, the inspectors observed the RCIC comprehensive in-service test from the RCIC turbine room to independently assess the material condition (including potential system leakage), operating environment, test control, and configuration control. The inspectors also performed an extent-of-condition walkdown of the HPCI turbine and torus room to independently assess the material condition and configuration control.

###### b. Findings and Observations

No findings were identified.

On November 8, 2012, following a successful quarterly RCIC in-service test, Entergy decided to remove the RCIC system from service to address turbine casing and steam line drain leakage that did not adversely impact RCIC operability in the short-term. During RCIC turbine disassembly, Entergy identified a leak path past the gasket/string material (Temp-Tite II), indicating that the gasket material had failed. The RCIC turbine case is split horizontally. The leak path existed at the turbine casing top and bottom halves joint. Entergy's associated apparent cause evaluation identified inconsistencies in maintenance's work effort during the prior RCIC turbine overhaul in October 2010.

Specifically, the work order instructions for turbine reassembly did not include direction to the specific location in the EPRI guide for assembling the turbine within ten hours of applying the joint compound, proper casing nut tightening sequence, and final torque sequence. Entergy also identified that the turbine case leak was originally identified in February 2012 (CR-VTY-2012-00660) during a RCIC in-service test. The leak was reported as minor and Entergy initiated work request 263577 to address the leak during the next scheduled overhaul. Entergy noted that no turbine casing leak was identified during the RCIC in-service test in May 2012. Entergy's work control process converted work request 263577 to work order 305812 which was the work order subsequently used to perform the RCIC overhaul in November 2012. Entergy determined that the previous turbine casing leak was appropriately dispositioned with the Entergy corrective action program and work control process based on the pre-existing condition and available information.

Entergy incorporated the EPRI guide torque requirements and industry operating experience during their turbine overhaul in November 2012. Following the corrective maintenance, Entergy performed a satisfactory post-maintenance test on November 16, 2012, and documented no leakage. The HPCI/RCIC system engineer initiated preventive maintenance change requests for the respective HPCI and RCIC turbine overhaul preventive maintenance tasks to include specific references to the applicable EPRI guide sections regarding proper TEMP-Tite II application and turbine casing bolt torque requirements. In addition, engineering performed a thorough gap analysis between the existing HPCI and RCIC turbine preventive maintenance tasks and the applicable EPRI turbine maintenance guide and initiated preventive maintenance change requests as appropriate.

Entergy determined that the cause of the pinhole leak in the 1-inch steam drain line was saturated steam from the RCIC turbine impinging on the internal surface of the 90 degree drain line elbow. Engineering noted that although the drain line material was chrome-moly (chromium and molybdenum, CrMo) steel, there was an ultimate service life, especially for an elbow under these conditions. Entergy replaced the leaking steam line elbow during the November 2012 RCIC system outage. In addition, Entergy performed a risk-informed, extent-of-condition review that included the HPCI system. Entergy's short-term corrective actions included replacing several sections of chrome-moly steam line drain piping and installing manual isolation valves (to allow on-line maintenance) in RFO 30 in March 2013 and initiating long-term actions to replace additional steam line drain piping sections.

The inspectors concluded that Entergy had taken timely and appropriate actions in accordance with 10 CFR 50.65, 10 CFR 50 Appendix B, and Entergy's corrective action program. The inspectors determined that Entergy's associated apparent cause evaluation was sufficiently thorough and based on the best available information, sound

judgment, and relevant operating experience. Entergy's assigned corrective actions were aligned with the identified causal factors, adequately tracked, appropriately documented, and completed as scheduled. Based on the documents reviewed, control room and plant walkdowns, and discussions with engineering and operations personnel, the inspectors noted that Entergy personnel identified problems and entered them into the corrective action program at a low threshold.

The inspectors independently evaluated the turbine casing work control deficiencies noted above for significance in accordance with the guidance in IMC 0612, Appendix B, "Issue Screening," and Appendix E, "Examples of Minor Issues." As described above, the inspectors determined the associated Entergy performance deficiencies were of minor significance and, therefore, were not subject to enforcement action in accordance with the NRC's Enforcement Policy. Specifically, the shortcoming in Entergy's work order instructions had no safety impact as RCIC system operability was not impacted by the turbine casing leakage. Furthermore, Entergy proactively removed the RCIC system from service, promptly repaired the casing leak, and addressed other minor RCIC system issues. The inspectors did not identify any Entergy performance deficiencies associated with the steam line drain pinhole leak.

### .3 Annual Sample: "A" Reactor Recirculation Pump Motor-Generator Set Trip

#### a. Inspection Scope

The inspectors performed an in-depth review of Entergy's root cause analysis and corrective actions associated with condition report CR-VTY-2012-02811, written for the trip of the "A" reactor recirculation pump motor-generator set trip. A cable connection in the junction box for the drive motor failed, which tripped the "A" reactor recirculation pump motor-generator set and put the plant in single recirculation loop operation.

The inspectors assessed Entergy's problem identification threshold, cause analysis and extent of condition reviews to determine whether Entergy was appropriately identifying and characterizing problems associated with this issue. Additionally, the inspectors reviewed Entergy's completed corrective actions for appropriateness, prioritization and timeliness to verify they met the requirements of Entergy's corrective action program. In addition, the inspectors interviewed engineering personnel about the effectiveness of the completed corrective actions.

#### b. Findings and Observations

No findings were identified.

Entergy determined the most probable cause was degradation of the T6 neutral motor lead connection that led to excessive temperatures and ultimately a short circuit. Entergy also identified four contributing causes, including: lack of thermographic imaging of the junction boxes as part of the Predictive Maintenance program; no work instructions that required engineering to review components near those needing repair for degradation; use of the incorrect preventive maintenance discovery status feedback code for maintenance performed on the junction box during the outage; and failure to incorporate operating experience on these types of failures into the Predictive Maintenance program.

Entergy took corrective action to repair the connection, clean the motor and test the cables and motor before returning it to service. For corrective actions to prevent recurrence (CAPRs), Entergy added steps to the procedures for offline motor maintenance, EMMP-MG-5277-11, "Maintenance and Inspection of Recirc MG-1-1A," and OP 5235, "AC and DC Motor Maintenance," to require evaluation of components near a heated zone for degradation and added requirements for thermographic imaging of junction boxes for large motors every six months. Entergy reviewed the extent of condition and extent of the root cause and determined that almost all large motors on site would require the same corrective actions. Additional corrective actions included instructions to site electricians and engineers about the expectations for component evaluation.

The inspectors reviewed the effectiveness reviews for the CAPRs, and found that the success criteria were written to narrowly cover the CAPRs listed in the root cause, instead of to determine whether those CAPRs were actually successful in preventing recurrence of the issue, as required in EN-LI-118, "Root Cause Evaluation Process." In the process of implementing the CAPR related to component evaluation, Entergy determined that the instructions should be placed in the maintenance procedure rather than the individual work orders, as originally discussed in the root cause report. Therefore, the success criterion of "Minor Motor and Generator Inspection WOs have added steps..." was not met, because the steps were added to the procedure instead, although the intent of the corrective action was still met. The effectiveness reviewer looked more broadly at whether the corrective actions taken were successful in preventing repeat motor trips and determined the CAPRs were effective. The reviewer's scope met the intent of EN-LI-118, but the planned effectiveness review did not.

Additionally, the inspectors identified one case where a CAPR due date had been extended and the corrective action review board approval had not been documented as required by EN-LI-102, "Corrective Action Process." However, approval had been obtained.

#### .4 Annual Sample: Component Mispositioning

##### a. Inspection Scope

The inspectors began an in-depth review of component mispositionings caused by Entergy staff. The inspectors reviewed the root cause evaluation report on the "B" emergency diesel generator exceeding its operating limits due to a procedure step being performed too early. Additional mispositioning causal evaluations will be reviewed in the fourth quarter.

The inspectors assessed Entergy's problem identification threshold, cause analysis and extent of condition reviews to determine whether Entergy was appropriately identifying and characterizing problems associated with this issue. Additionally, the inspectors reviewed Entergy's completed corrective actions for appropriateness, prioritization and timeliness to verify they met the requirements of Entergy's corrective action program. In addition, the inspectors interviewed operations personnel about the effectiveness of the completed corrective actions.



b. Findings and Observations

Introduction. A self-revealing Green NCV of Technical Specification 6.4, "Procedures," was identified because Entergy overloaded the "B" emergency diesel generator to 130 percent of its sustained load rating. Specifically, an AO took the speed droop switch to zero before the output breaker was opened, contrary to procedure, which resulted in the overload condition.

Description. On June 14, Entergy personnel performed post-maintenance testing on the "B" emergency diesel generator. For the day shift, one slow-start test and three fast-start tests were planned. On the third and final fast start performed in accordance with surveillance procedure OPST-EDG-4126-03B, "6 Month B EDG Fast Start Operability Test," after all required readings were taken, the AO in the field called the reactor operator (RO) in the control room to confirm that all data was recorded and the emergency diesel generator was ready to be shut down. However, the RO and the AO failed to communicate clearly. After the communication ended, the RO believed the next step in the field was to standby for resetting the speed droop switch, whereas the AO believed the next step in the field was to proceed and reset the speed droop switch. The AO did not call the designated second AO to the room to perform a peer check, the expected human performance tool. The AO checked the "B" emergency diesel generator output breaker position, incorrectly determined it was open, and reset the speed droop switch to zero.

The emergency diesel generators are designed to run as stand-alone units during a loss of offsite power. For this function, they operate in isochronous mode by setting the speed droop switch to zero, and the emergency diesel generator controls the bus frequency at 60 Hertz (Hz). For testing purposes, an emergency diesel generator is connected via an output circuit breaker to an electrical bus that is connected to the electricity grid. The grid frequency, and therefore bus frequency, is maintained close to 60 Hz, but not precisely. With the speed droop switch set sufficiently greater than zero, the emergency diesel generator operates normally. With the output breaker closed such that the emergency diesel generator is connected to the grid and the speed droop switch set to zero, the emergency diesel generator picks up increasingly greater load in an attempt to force overall grid frequency to 60 Hz.

A few minutes after the call with the AO, the RO noticed that the indicated load for the "B" emergency diesel generator was significantly higher than expected. The RO informed the control room supervisor. The control room supervisor then directed the RO to open the output breaker and shut down the diesel generator. The overload was 130 percent of the continuous load rating for the emergency diesel generator and lasted for approximately two minutes. Entergy contacted the vendor for the emergency diesel generator, performed the recommended inspections following an overload condition, and verified that the emergency diesel generator was not damaged. On June 15, Entergy performed a slow-start test of the "B" emergency diesel generator and declared it operable. The "B" emergency diesel generator was out of service for an additional 24 hours beyond the planned scope of the maintenance window due to the overload condition, but was not out of service for longer than the seven days allowed by Technical Specifications.

Entergy initiated condition report CR-VTY-2013-03950 and performed a root cause evaluation. Immediate corrective actions included twenty-four hour management assessment of communications in the control room for a week, followed by less frequent assessments for the next three weeks. Further corrective actions included appropriate personnel accountability actions for the individuals involved.

Analysis. The inspectors determined that Entergy's failure to follow procedures in accordance with Technical Specification 6.4, "Procedures," was a performance deficiency that was within Entergy's ability to foresee and correct, and should have been prevented. 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. Specifically, the "B" emergency diesel generator was unavailable for an additional 24 hours in order to perform required inspections and testing to verify it was not damaged by the overload condition.

In accordance with IMC 0609.04, "Initial Characterization of Findings," and Exhibit 2 of IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," issued June 19, 2012, the inspectors determined that this finding is of very low safety significance (Green) because the performance deficiency did not represent a loss of system safety function or a loss of safety function of a single train for greater than its Technical Specification allowed outage time.

The inspectors determined that this finding has a cross-cutting aspect in the Human Performance area, Work Practices component, because Entergy personnel did not use human error prevention techniques commensurate with the risk of the assigned task such that work activities were performed safely. Specifically, self-checking, peer checking, and three-part communications were not used effectively to prevent performing procedure steps out of order [H.4(a)].

Enforcement. Technical Specification 6.4, "Procedures," requires that written procedures be established, implemented, and maintained covering surveillance and testing requirements. Contrary to this, Entergy did not implement procedure OPST-EDG-4126-03B, "6 Month B EDG Fast Start Operability Test," during a post-maintenance test of the "B" emergency diesel generator. Specifically, the speed droop switch was taken to zero, putting the emergency diesel generator in isochronous mode, before the output breaker to the bus was opened. Entergy's immediate corrective actions included entering the issue in their corrective action program as condition report CR-VTY-2013-03950, conducting a root cause evaluation, and performing management assessment of control room communications. Because this violation was of very low safety significance (Green), and Entergy entered this issue into their corrective action program, this violation is being treated as an NCV, consistent with Section 2.3.2 of the Enforcement Policy.  
**(NCV 05000271/2013004-03, Operator Error Results in Diesel Generator Overload)**

4OA5 Other Activities.1 Temporary Instruction 2515/182, Review of the Implementation of the Industry Initiative to Control Degradation of Underground Piping and Tanks, Phase 2 (1 sample)a. Inspection Scope

Entergy's buried piping and underground piping and tanks program was inspected in accordance with paragraphs 03.02.a of the Temporary Instruction 2515/182, and it was confirmed that activities which correspond to the completion dates, specified in the program, which have passed since the Phase 1 inspection was conducted, have been completed.

Entergy's buried piping and underground piping and tanks program was inspected in accordance with paragraph 03.02.b of the temporary instruction and responses to specific questions found in [www.nrc.gov/reactors/operating/ops-experience/buried-pipe-ti-phase-2-insp-req-2011-11-16.pdf](http://www.nrc.gov/reactors/operating/ops-experience/buried-pipe-ti-phase-2-insp-req-2011-11-16.pdf) were submitted to NRC headquarters staff.

b. Findings

No findings were identified.

.2 Temporary Instruction 2515/190, Inspection of the Licensee's Proposed Interim Actions as a Result of the Near-Term Task Force Recommendation 2.1 Flooding Reevaluation (1 sample)a. Inspection Scope

The inspectors independently verified that Entergy's proposed interim actions would perform their intended function for flooding mitigation by:

- Reviewing the calculation performed to determine the type of storm that would cause flooding due to local intense precipitation
- Reviewing OPOP-PHEN-3127, "Natural Phenomena," to verify flooding mitigation entry criteria matched the calculated storm, and that the actions listed would be sufficient to mitigate the flooding
- Inspecting the swale credited for flood water diversion in the calculation

The inspectors verified that issues identified were entered into Entergy's corrective action program.

b. Findings

No findings were identified.

**4OA6 Meetings, Including Exit**

On October 11, 2013, the inspectors presented the inspection results to Mr. Michael Romeo, Director of Nuclear Safety Assurance, and other members of the Entergy staff. The inspectors verified that no proprietary information was retained by the inspectors or documented in this report.

**ATTACHMENT: SUPPLEMENTARY INFORMATION**

**SUPPLEMENTARY INFORMATION****KEY POINTS OF CONTACT**Vermont Yankee Personnel

C. Wamser, Site Vice President  
 V. Fallacara, General Manager of Plant Operations  
 M. Romeo, Director of Nuclear Safety Assurance  
 J. Boyle, Director of Engineering  
 J. Bengtson, CA&A Manager  
 A. Cardine, Engineering Supervisor  
 C. Chappell, Licensing Manager  
 P. Corbett, Quality Assurance Manager  
 J. Hardy, Chemistry Manager  
 E. Harms, Assistant Operations Manager  
 N. Jennison, Shift Manager  
 D. Jones, Operations Manager  
 M. LeFrancois, Engineering Supervisor  
 S. Lyford, Project Manager  
 M. McKenney, Emergency Preparedness Manager  
 B. Mully, Control Room Supervisor  
 P. Paradis, Maintenance Manager  
 J. Rogers, Design Engineering Manager  
 R. Routhier, Maintenance Support Supervisor  
 P. Ryan, Security Manager  
 K. Stupak, Training and Development Manager  
 K. Swanger, Project Manager  
 D. Tkatch, Radiation Protection Manager  
 R. Wanczyk, Licensing Manager

**LIST OF ITEMS OPENED, CLOSED, DISCUSSED AND UPDATED**Opened/Closed

05000271/2013004-01	NCV	Failure to Monitor the Unavailability of the "B" Control Rod Drive Equipment Train (Section 1R12)
05000271/2013004-02	FIN	Failure to Maintain Radiation Exposure ALARA During Refueling Activities (Section 2RS2)
05000271/2013004-03	NCV	Operator Error Results in Diesel Generator Overload (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  
Vermont Yankee Nuclear Power Station Equipment Out of Service (EOOS) Risk Model  
Vermont Yankee Nuclear Power Station Workweek Schedules

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

#### Procedures

OPOP-PREP-2196, "Seasonal Preparedness," Revision 3  
OPOP-SW-2181, "Service Water/Alternate Cooling Operating Procedure," Revision 8

#### Condition Reports

CR-VTY-2013-02976

#### Miscellaneous

Tagout HVAC-181-SCH-1-2  
OPOP-PREP-2196, Attachment 2, "Warm Weather Initiation Operations Checklist," 6/12/2013  
SWSYS, "Service Water Systems Design Basis Document," Revision 32

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

#### Procedures

OPOP-SGT-2117, "Standby Gas Treatment System," Revision 1  
OPOP-SBO-10066, "Station Blackout Diesel Generator," Revision 0  
OPOT-3122-01, "Loss of Normal Power," Revision 2  
OPOT-3122-02, "Station Blackout," Revision 2

#### Condition Reports

CR-VTY-2013-05750

#### Miscellaneous

EC 31986, "10 CFR 50.63 Station Blackout Diesel Generator"

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

#### Procedures

EN-DC-161, "Control of Combustibles," Revision 8

#### Pre-Fire Plans

FBPFP, "Fire Brigade Pre-fire Plans Vermont Yankee Power Station," Revision 3  
FBPFP, "Fire Brigade Pre-fire Plans Vermont Yankee Power Station," Revision 4

#### Condition Reports

CR-VTY-2013-05745

#### Miscellaneous

Fire Hazards Analysis, Revision 12  
Fire Hazards Analysis, Revision 13

Fire Drill Scenario, Drill Number 12A, 09/05/13  
EC 31986, "10 CFR 50.63 Station Blackout Diesel Generator"

**Section 1R06: Flood Protection Measures**

Procedures

OP-2217, "Temporary Flood Barrier Installation and Removal," Revision 6  
OPAP-BCP-0077, "Barrier Control Process," Revision 2

Miscellaneous

IF, "Topical Design Basis Document for Internal Flooding," Revision 9

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

Procedures

OP 0105, Phase 5, "Reactor Power Decrease," Revision 95  
OT 3167, "Control Rod Drift," Revision 7  
EN-OP-120, "Operator Fundamentals Program," Revision 0

Miscellaneous

EN-RE-215, Attachment. 9.4, "Reactivity Maneuver Instruction Forms," 7/15/2013  
VYOPF 2403.02, "Pattern Exchange Sequence of Steps," 6/27/2013

**Section 1R12: Maintenance Effectiveness**

Procedures

EN-WM-104, "On Line Risk Assessment," Revision 7  
AP 0125, "Plant Equipment," Revision 40

Condition Reports

CR-VTY-2013-05629  
CR-VTY-2013-04437  
CR-VTY-2013-03184

Miscellaneous

CRD Equipment Train "B" SSC Performance History Report, 8/1/10 – 7/31/13  
Control Rod Drive System Health Report, Q2-2013

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

Procedures

AP 0172, "Work Schedule Risk Management – Online," Revision 26  
EN-WM-104, "On Line Risk Assessment," Revision 7

Condition Reports

CR-VTY-2013-04437

Miscellaneous

WW 1328 System Schedule  
WW 1335 System Schedule  
Tagout CRD-007-FCV-3-19B  
VY-NE-11-00001, Appendix E12, "Probability Safety Assessment System Notebook – Control Rod Drive System," Revision 0

VYAPF0172.02, "Risk Management Worksheet," 7/3/2013  
VY EOOS Risk Management – WW1334 @ T-1. Revision 0  
On-line Maintenance Safety Assessment Review, 8/28/13

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

Procedures

EN-OP-104, "Operability Determination Process," Revision 6

Condition Reports

CR-VTY-2013-04249	CR-VTY-2013-04465	CR-VTY-2013-04249
CR-VTY-2013-04469	CR-VTY-2013-04702	CR-VTY-2013-04641
CR-VTY-2013-04641	CR-VTY-2013-04703	CR-VTY-2013-04469
CR-VTY-2013-04704	CR-VTY-2013-04719	

Miscellaneous

EXEV, "Topical Design Basis Document for External Events," Revision 2  
SWSYS, "Topical Design Basis Document for Service Water," Revision 32  
SGT, "Design Basis Document for Standby Gas Treatment System/Secondary Containment,"  
Revision 11  
RPST-RM-4503, "Reactor Building Ventilation and Refueling Area Radiation Monitors Source  
Calibration," Revision 1, 7/25/2013  
RPST-RM-4503, "Reactor Building Ventilation and Refueling Area Radiation Monitors Source  
Calibration," Revision 1, 7/31/2013

**Section 1R18: Plant Modifications**

Procedures

EN-DC-115, "Engineering Change Process," Revision 15  
EN-DC-117, "Post Modification Testing and Special Instruction," Revision 5

Condition Reports

CR-VTY-2013-04972

Work Orders

WO 316976, "Implement EC 37986, 10 CFR 50.63 Station Blackout Diesel Generator"  
WO 345093, "BP-RXB-5: Refuel Floor West Blowout Panel"

Miscellaneous

EC 37986, "10 CFR 50.63 Station Blackout Diesel Generator"  
EC 43398, "Fabricate and Install a Temporary RB Wall Panel"

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

Procedures

EN-OP 116, "Infrequently Performed Tests or Evolutions," Revision 11  
OPST-HPCI-4120-02, "HPCI Pump Operability Test," Revision 4  
ECT-37986-01, "10 CFR 50.63 Station Blackout Diesel Generator Testing"  
ECT-37986-01, "SBO Diesel Generator Timed Start Test"

Condition Reports

CR-VTY-2013-04465	CR-VTY-2013-04719	CR-VTY-2013-05638
CR-VTY-2013-04702	CR-VTY-2013-04036	
CR-VTY-2013-04703	CR-VTY-2013-05607	



Work Orders

WO 356800, "FIS-10-148A, "Replace High Switch and Cal per Cal Data File"  
WO 357875, "Replace Radiation Monitor Detectors"  
WO-357594, "MDM – Repair Gasket Leak from Turbine Casing Access Flange"

Miscellaneous

RPST-RM-4502, "Reactor Building Ventilation and Refueling Area Radiation Monitors Source Calibration," Revision 1, 7/25/2013  
RPST-RM-4502, "Reactor Building Ventilation and Refueling Area Radiation Monitors Source Calibration," Revision 1, 7/31/2013  
RPST-RM-4503, "Reactor Building Ventilation and Refueling Area Radiation Monitors Source Calibration," Revision 1, 7/25/2013  
RPST-RM-4503, "Reactor Building Ventilation and Refueling Area Radiation Monitors Source Calibration," Revision 1, 7/31/2013  
EN-MA-125, Attachment 9.3, "Troubleshooting Control of Maintenance Activities," 7/12/13  
OPST-RHR-4124-13A, "RHR Pump A Operability Test," 7/12/2013  
OPST-RHR-4124-13C, "RHR Pump C Operability Test," 7/12/2013 and 7/13/2013  
SGT, "Design Basis Document for Standby Gas Treatment System/Secondary Containment,"  
Revision 11

**Section 1R22: Surveillance Testing**

Procedures

OP 4355, "RCIC – Auto Suction Transfer Water Level Functional/Calibration," Revision 33  
OP 0631, "Radiochemistry," Revision 2  
CHOP-RWS-4612-01, "Reactor Water System Sampling and Treatment," Revision 5  
OPST-CS-4123-06B, "Core Spray Pump B Quarterly Operability Test," Revision 3  
OPST-EDG-4126-02A, "Monthly "A" EDG Slow Start Operability Test," Revision 3

Work Orders

WO 52474768, ""B" Core Spray Pump Operability Test"

Drawings

G-191160, Sheet 7, "F/D Diesel Start Air System," Revision 23

Miscellaneous

EDG, "Design Basis Document for Emergency Diesel Generator and Auxiliary Systems,"  
Revision 23  
VYC-1717, "Emergency Diesel Generator Starting Air System Capacity Calculation," Revision 1  
OPST-EDG-4126-03A, "6 Month A EDG Fast Start Operability Test," 8/28/13  
VYDPF 2631.02, Counting Dialog Log," counter log 2, 9/16/13  
VYDPF 2631.02, Counting Dialog Log," counter log 2, 9/17/13  
VYDPF 2631.02, Counting Dialog Log," counter log 2, 9/18/13  
VYDPF 2631.02, Counting Dialog Log," counter log 2, 9/19/13  
VYDPF 2631.02, Counting Dialog Log," counter log 2, 9/20/13  
VYDPF 2631.02, Counting Dialog Log," counter log 2, 9/23/13  
VYDPF 2631.02, Counting Dialog Log," counter log 2, 9/24/13

**Section 2RS1: Radiological Hazard Assessment and Exposure Controls**Procedures

EN-RP-101, "Access Control for Radiologically Controlled Areas," Revision 7  
 EN-RP-108, "Radiation Protection Posting," Revision 13

Condition Reports

CR-VTY- 2013-04099  
 CR-VTY- 2013-04343

Miscellaneous

EN-RP-143, Attachment 9.4, "Sealed Source Leak Test Worksheet," Revision 9  
 EN-RP-143, Attachment 9.5, "Radioactive Source List," Revision 9  
 Self-Assessment LO-VTYLO-2012-214, 5/30/2013

**Section 2RS2: Occupational ALARA Planning and Controls**Miscellaneous

Vermont Yankee RFO-30 ALARA Report  
 ALARA Plans: 2013-003; 2013-015A; 2013-11; 2013-12A; 2013-019

**Section 2RS4: Occupational Dose Assessment**Procedures:

EN-RP-201, "Dosimetry Administration," Revision 3  
 EN-RP-202, "Personnel Monitoring," Revision 8  
 EN-RP-203, "Dose Assessment," Revision 5  
 EN-RP-204, "Special Monitoring Requirements," Revision 6  
 EN-RP-205, "Prenatal Monitoring," Revision 3  
 EN-RP-206, "Dosimetry of Legal Record Quality Assurance," Revision 5  
 EN-RP-208, "Whole Body Counting/In-Vitro Bioassay," Revision 5

Condition Reports:

CR-VTY-2012-00231	CR-VTY-2013-00987	CR-VTY-2013-02221
CR-VTY-2012-00802	CR-VTY-2013-01166	CR-VTY-2013-02222
CR-VTY-2012-02127	CR-VTY-2013-01167	CR-VTY-2013-02402
CR-VTY-2012-03025	CR-VTY-2013-01429	CR-VTY-2013-02465
CR-VTY-2012-03228	CR-VTY-2013-01525	CR-VTY-2013-02588
CR-VTY-2012-04432	CR-VTY-2013-01546	CR-VTY-2013-02652
CR-VTY-2012-04550	CR-VTY-2013-01694	CR-VTY-2013-03798
CR-VTY-2012-04752	CR-VTY-2013-01761	CR-VTY-2013-03395
CR-VTY-2012-04857	CR-VTY-2013-02062	CR-VTY-2013-03860
CR-VTY-2012-06285	CR-VTY-2013-02079	CR-VTY-2013-04595
CR-VTY-2013-00742	CR-VTY-2013-02220	CR-VTY-2013-04834

Miscellaneous

NVLAP Scope of Accreditation to Landauer (#100518-0)  
 GEL Laboratories, LLC Quality Assurance Plan, Revision 26  
 Snapshot Assessment LO-VTYLO-2012-00087, Airborne Radiation Dose, 4/3/2012  
 Self-Assessment LO-VTYLO-2012-000047, Dosimetry, 12,10-13, 2012

**Section 2RS5: Radiation Monitoring Instrumentation**Condition Reports:

CR-VTY-2012-02440	CR-VTY-2012-04571	CR-VTY-2012-04916
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CR-VTY-2012-04919	CR-VTY-2013-00429	CR-VTY-2013-03424
CR-VTY-2012-05279	CR-VTY-2013-00857	CR-VTY-2013-04860
CR-VTY-2013-00413	CR-VTY-2013-03355	

**Section 4OA1: Performance Indicator Verification**

Performance Indicator Data 2Q12-2Q13.

OP 4355, "RCIC – Auto Suction Transfer Water Level Functional/Calibration," Revision 33

**Section 4OA2: Problem Identification and Resolution**

Procedures

EN-MA-145, "Maintenance Standard for Torque Applications," Revision 21

EN-LI-118, "Root Cause Evaluation Process," Revision 18

EN-LI-102, "Corrective Action Process," Revision 21

Condition Reports

CR-VTY-2002-01880	CR-VTY-2013-04092	CR-VTY-2013-04956
CR-VTY-2009-03160	CR-VTY-2013-04270	CR-VTY-2012-02811
CR-VTY-2011-00667	CR-VTY-2013-04297	CR-VTY-2013-05434
CR-VTY-2011-00900	CR-VTY-2013-04434	CR-VTY-2013-05454
CR-VTY-2012-00660	CR-VTY-2013-04702	CR-VTY-2013-05476
CR-VTY-2012-01150	CR-VTY-2013-04703	CR-VTY-2013-05491
CR-VTY-2012-01250	CR-VTY-2013-04719	CR-VTY-2013-05528
CR-VTY-2012-02453	CR-VTY-2013-04732	CR-VTY-2013-05544
CR-VTY-2012-02648	CR-VTY-2013-04871	CR-VTY-2013-05552
CR-VTY-2012-02811	CR-VTY-2013-04894	CR-VTY-2013-05562
CR-VTY-2012-03024	CR-VTY-2013-04904	CR-VTY-2013-05581
CR-VTY-2012-03059	CR-VTY-2013-04925	CR-VTY-2013-05585
CR-VTY-2012-03591	CR-VTY-2013-04954	CR-VTY-2013-05597
CR-VTY-2012-03945	CR-VTY-2013-05059	CR-VTY-2013-05600
CR-VTY-2012-04698	CR-VTY-2013-05114	CR-VTY-2013-05607
CR-VTY-2012-05535	CR-VTY-2013-05141	CR-VTY-2013-05629
CR-VTY-2012-05536	CR-VTY-2013-05182	CR-VTY-2013-05630
CR-VTY-2012-05543	CR-VTY-2013-05243	CR-VTY-2013-05638
CR-VTY-2012-05567	CR-VTY-2013-05281	CR-VTY-2013-05665
CR-VTY-2012-05613	CR-VTY-2013-05318	CR-VTY-2013-05706
CR-VTY-2012-05641	CR-VTY-2013-05327	CR-VTY-2013-05708
CR-VTY-2012-05645	CR-VTY-2013-05338	CR-VTY-2013-05709
CR-VTY-2012-05949	CR-VTY-2013-05354	CR-VTY-2013-05726
CR-VTY-2012-06041	CR-VTY-2013-05355	CR-VTY-2013-05745
CR-VTY-2013-03684	CR-VTY-2013-05361	CR-VTY-2013-05749
CR-VTY-2013-03795	CR-VTY-2013-05407	CR-VTY-2013-05750
CR-VTY-2013-03806	CR-VTY-2013-05432	CR-VTY-2013-05756
CR-VTY-2013-03807	CR-VTY-2013-01442	CR-VTY-2013-05758
CR-VTY-2013-03822	CR-VTY-2013-01720	CR-VTY-2013-05763
CR-VTY-2013-03950	CR-VTY-2013-04923	CR-VTY-2013-05768
CR-VTY-2013-04036	CR-VTY-2013-04954	CR-VTY-2013-05787

Miscellaneous

Snapshot Assessment LO-VTYLO-2012-00162, Radiation Monitoring Instrumentation,  
9/19/2012

EGNE-8064 Attachment 4, "Vermont Yankee Non-Code Leak Check Examination Report (P-47-1A, TU-2-1A Casing/Horizontal Joint)," 11/15/12  
EPRI 1007460, "Terry Turbine Maintenance Guide, RCIC Application," September 2012  
Garlock 9920 Nuclear Grade Gasketing Specification Sheet  
OPST-RCIC-4121 Attachment 2, "RCIC Pump Operability Test Checklist," 11/8/12 and 5/8/13  
OPST-RCIC-4121 Attachment 3, RCIC Valve Operability Test Checklist, 5/8/13  
RCIC System Maintenance Rule Unavailability Trend Report, 12/09 - 11/12  
RCIC System SSC Performance History Database, 1/1/10 - 12/31/12  
Reactor Core Isolation Cooling System Health Report, Q2-2013  
VY 332979, Work Order 332979-01 Weld Map, Revision 0  
VYEM- 0119, "RCIC Turbine - Operation and Maintenance Instruction Manual," Revision 4  
VYSE-MRL-2012-006, "10CFR50.65 Maintenance Rule Performance Evaluation and Performance Improvement Action Plan," 2/6/13  
RCIC, "Reactor Core Isolation Cooling System Design Basis Document," Revision 20  
LO-VTYLO-2012-0152  
LO-VTYLO-2013-0017

Drawings

G-191174 Sheets 1 & 2, "Reactor Core Isolation Cooling System Flow Diagram," Revisions 46 & 25

Engineering Evaluations

EC Reply 41030, "RCIC Steam Supply Drain Piping Operability Evaluation," Revision 0  
ER 2002-1880, "RCIC Turbine Casing Leak Evaluation," Revision 0  
VYI-HPCI-Part-3A Sh. 2, "EC 36216 Engineering Change Mark-up," Revision 0

Work Orders

WO 00305812, "Repair Turbine Casing Leak, Pump End, Near Seal Area"  
WO 00332979, "Replace Leaking Elbow, Upstream of FCV-13-34"  
WO 52237005, "Inspect Internals RCIC Turbine, TU-2-1A"

**Section 4OA5: Other Activities**

Procedures

OPOP-PHEN-3127, "Natural Phenomena," Revision 13

Miscellaneous

BVY 13-021, "Flooding Hazard Reevaluation Report"

**LIST OF ACRONYMS**

AO	auxiliary operator
ADAMS	Agencywide Documents Access and Management System
ALARA	as low as is reasonably achievable
CAPR	corrective action to prevent recurrence
CFR	Code of Federal Regulations
CR	condition report
CRD	control rod drive
DAC	derived air concentration
DRP	[NRC] Division of Reactor Projects
DRS	[NRC] Division of Reactor Safety
EPRI	Electric Power Research Institute
FIN	finding
HPCI	high pressure coolant injection
Hz	Hertz
IMC	inspection manual chapter
NCV	non-cited violation
NRC	Nuclear Regulatory Commission
NVLAP	National Voluntary Laboratory Accreditation Program
PARS	Publicly Available Records System
RCIC	reactor core isolation cooling
RFO	refueling outage
RHR	residual heat removal
RHRSW	residual heat removal service water
RO	reactor operator
RWP	radiation work permit
SDP	significance determination process
SSC	structure, system or component
UFSAR	Updated Final Safety Analysis Report
VY	Vermont Yankee Nuclear Power Station