



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION I**  
2100 RENAISSANCE BOULEVARD, SUITE 100  
KING OF PRUSSIA, PENNSYLVANIA 19406-2713

February 6, 2014

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 05000271/2013005 AND NOTICE OF VIOLATION**

Dear Mr. Wamser:

On December 31, 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 January 9, 2014, with you and other members of your staff.

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

One violation of very low safety significance (Green) is cited in the enclosed Notice of Violation (Notice) and the circumstances surrounding it are described in the enclosed inspection report. The violation was evaluated in accordance with the NRC Enforcement Policy. The current Enforcement Policy is included on the NRC's website at <http://www.nrc.gov/aboutnrc/regulatory/enforcement/enforcement-pol.html>. This violation is being cited in the Notice because not all of the criteria specified in Section 2.3.2.a of the NRC Enforcement Policy for a non-cited violation (NCV) were satisfied. Specifically, Entergy Nuclear Operations, Inc., failed to restore compliance within a reasonable amount of time after the issue was first identified in March 2013.

You are required to respond to this letter and should follow the instructions specified in the enclosed Notice when preparing your response. If you have additional information that you believe the NRC should consider, you may provide it in your response to the Notice. The NRC's review of your response to the Notice will also determine whether enforcement action is necessary to ensure compliance with regulatory requirements.

Also, one NRC-identified finding of very low safety significance (Green) was identified during this inspection. This finding was also determined to involve violations of NRC requirements. The NRC is treating this violation as an NCV, consistent with Section 2.3.2 of the Enforcement Policy.

If you contest the violations or significance of the NCV, 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. 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.

As a result of the Safety Culture Common Language Initiative, the terminology and coding of cross-cutting aspects were revised beginning in calendar year (CY) 2014. New cross-cutting aspects identified in CY 2014 will be coded under the latest revision to Inspection Manual Chapter (IMC) 0310. Cross-cutting aspects identified in the last six months of 2013 using the previous terminology will be converted to the latest revision in accordance with the cross-reference in IMC 0310. The revised cross-cutting aspects will be evaluated for cross-cutting themes and potential substantive cross-cutting issues in accordance with IMC 0305 starting with the CY 2014 mid-cycle assessment review.

In accordance with Title 10 *Code of Federal Regulations* 2.390, "Public Inspections, Exemptions, Requests for Withholding," of the NRC's "Rules of Practice," a copy of this letter, its enclosures, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of the NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web Site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

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

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

Enclosures:

1. Notice of Violation
2. Inspection Report 05000271/2013005  
w/ Attachment: Supplementary Information

cc w/encl: Distribution via ListServ

If you contest the violations or significance of the NCV, 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. 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.

As a result of the Safety Culture Common Language Initiative, the terminology and coding of cross-cutting aspects were revised beginning in calendar year (CY) 2014. New cross-cutting aspects identified in CY 2014 will be coded under the latest revision to Inspection Manual Chapter (IMC) 0310. Cross-cutting aspects identified in the last six months of 2013 using the previous terminology will be converted to the latest revision in accordance with the cross-reference in IMC 0310. The revised cross-cutting aspects will be evaluated for cross-cutting themes and potential substantive cross-cutting issues in accordance with IMC 0305 starting with the CY 2014 mid-cycle assessment review.

In accordance with Title 10 *Code of Federal Regulations* 2.390, "Public Inspections, Exemptions, Requests for Withholding," of the NRC's "Rules of Practice," a copy of this letter, its enclosures, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of the NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web Site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

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

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

Enclosures:

1. Notice of Violation
2. Inspection Report 05000271/2013005  
w/ Attachment: Supplementary Information

cc w/encl: Distribution via ListServ  
Distribution: (via email)  
See next page

DOCUMENT NAME: G:\DRP\BRANCH5\Reports\Final\2013\VY 2013005.docx  
ADAMS ACCESSION NUMBER: **ML14037A334**

<input checked="" type="checkbox"/> SUNSI Review		<input checked="" type="checkbox"/> Non-Sensitive <input type="checkbox"/> Sensitive		<input checked="" type="checkbox"/> Publicly Available <input type="checkbox"/> Non-Publicly Available	
OFFICE	RI/DRP	RI/DRP	RI/DRP		
NAME	SRich/SR via phone	SShaffer/SWS	RMcKinley/RRM		
DATE	1/31/14	1/31/14	2/6/14		

OFFICIAL RECORD COPY

Letter to Mr. C. Wamser from R. McKinley, dated February 6, 2014

SUBJECT: VERMONT YANKEE NUCLEAR POWER STATION – NRC INTEGRATED  
INSPECTION REPORT 05000271/2013005 AND NOTICE OF VIOLATION

Distribution: (via email)

W. Dean, RA

D. Lew, DRA

M. Scott, DRP

E. Benner, DRP

R. Lorson, DRS

J. Trapp, DRS

R. McKinley, DRP

S. Shaffer, DRP

E. Keighley, DRP

J. DeBoer, DRP

S. Rutenkroger, DRP, SRI

S. Rich, DRP, RI

A. Rancourt, DRP, AA

E. Quinones, RI OEDO

RidsNrrPMVermontYankee Resource

RidsNrrDorLI1-1 Resource

ROPreports Resource

## NOTICE OF VIOLATION

Entergy Nuclear Operations, Inc.  
Vermont Yankee Nuclear Power Station

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

During an NRC inspection conducted between October 1 and December 31, 2013, a violation of NRC requirements was identified. In accordance with the NRC Enforcement Policy, the violation is listed below:

Title 10 *Code of Federal Regulations* (10 CFR) 50, Appendix B, Criterion XVI, "Corrective Action," requires, in part, that measures shall be established to assure that conditions adverse to quality are promptly identified and corrected.

Contrary to the above, from March 18, 2013, to November 7, 2013, Entergy failed to promptly correct the deficient flooding pathways designed to withstand a flood event. Entergy entered this into their corrective action program as condition report CR-VTY-2013-06330. The NRC documented a performance deficiency related to these flooding pathways on August 9, 2013, as a Green NCV of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," (NCV 05000271/2013003-01). The inspectors determined that Entergy had failed to restore compliance at the first opportunity within a reasonable period of time following the issuance of the finding and NCV.

This violation is associated with a Green significance determination process finding.

Pursuant to the provisions of 10 CFR 2.201, Entergy is hereby required to submit a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with a copy to the Regional Administrator, Region I; and a copy to the NRC Resident Inspector at the facility that is the subject of this Notice, within 30 days of the date of the letter transmitting this Notice of Violation (Notice). This reply should be clearly marked as a "Reply to a Notice of Violation" and should include for each violation: (1) the reason for the violation, or, if contested, the basis for disputing the violation or severity level, (2) the corrective steps that have been taken and the results achieved, (3) the corrective steps that will be taken, and (4) the date when full compliance will be achieved. Your response may reference or include previous docketed correspondence, if the correspondence adequately addresses the required response. If an adequate reply is not received within the time specified in this Notice, an order or a Demand for Information may be issued as to why the license should not be modified, suspended, or revoked, or why such other action as may be proper should not be taken. Where good cause is shown, consideration will be given to extending the response time.

If you contest this enforcement action, you should also provide a copy of your response, with the basis for your denial, to the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

Because your response will be made available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records System (PARS) component of NRC's Agencywide Documents Access and Management System (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>, to the extent possible, it should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your

response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request withholding of such material, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim of withholding (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If safeguards information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21.

In accordance with 10 CFR 19.11, you may be required to post this Notice within two working days of receipt.

Dated this the 6<sup>th</sup> day of February 2014

## U.S. NUCLEAR REGULATORY COMMISSION

## REGION I

Docket No. 50-271

License No. DPR-28

Report No. 05000271/2013005

Licensee: Entergy Nuclear Operations, Inc.

Facility: Vermont Yankee Nuclear Power Station

Location: Vernon, VT 05354

Dates: October 1, 2013 through December 31, 2013

Inspectors: S. Rutenkroger, PhD, Senior Resident Inspector, Division of Reactor  
Projects (DRP)  
S. Rich, Resident Inspector, DRP  
J. Schoppy, Senior Reactor Inspector, Division of Reactor Safety (DRS)  
J. Furia, Senior Health Physicist, DRS  
C. Lally, Operations Engineer, DRS  
J. Laughlin, Emergency Preparedness Inspector, Office of Nuclear  
Security and Incident Response

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

## TABLE OF CONTENTS

SUMMARY .....	3
REPORT DETAILS .....	5
1. REACTOR SAFETY .....	5
1R01 Adverse Weather Protection .....	5
1R04 Equipment Alignment .....	6
1R05 Fire Protection .....	7
1R06 Flood Protection Measures .....	7
1R11 Licensed Operator Requalification Program .....	10
1R12 Maintenance Effectiveness .....	11
1R13 Maintenance Risk Assessments and Emergent Work Control .....	12
1R15 Operability Determinations and Functionality Assessments .....	15
1R18 Plant Modifications .....	15
1R19 Post-Maintenance Testing .....	16
1R22 Surveillance Testing .....	16
1EP4 Emergency Action Level and Emergency Plan Changes .....	17
2. RADIATION SAFETY .....	17
2RS5 Radiation Monitoring Instrumentation .....	17
2RS6 Radioactive Gaseous and Liquid Effluent Treatment .....	19
4. OTHER ACTIVITIES .....	22
4OA1 Performance Indicator Verification .....	22
4OA2 Problem Identification and Resolution .....	23
4OA6 Meetings, Including Exit .....	27
ATTACHMENT: SUPPLEMENTARY INFORMATION .....	27
SUPPLEMENTARY INFORMATION .....	A-1
KEY POINTS OF CONTACT .....	A-1
LIST OF ITEMS OPENED, CLOSED, DISCUSSED AND UPDATED .....	A-1
LIST OF DOCUMENTS REVIEWED .....	A-2
LIST OF ACRONYMS .....	A-9

## SUMMARY

IR 05000271/2013005; 10/01/2013 – 12/31/2013; Vermont Yankee Nuclear Power Station; Flood Protection Measures, Maintenance Risk Assessments and Emergent Work Control.

This report covered a three-month period of inspection by resident inspectors and announced inspections performed by regional inspectors. There was one self-revealing cited violation and one NRC-identified non-cited violation (NCV) of very low safety significance (Green) documented in this report. 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 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. A self-revealing cited violation of Title 10 *Code of Federal Regulations* (10 CFR) 50, Appendix B, Criterion XVI, "Corrective Action," was identified because Entergy did not promptly correct two separate conditions adverse to quality related to flood protection of the switchgear rooms. Specifically, within one conduit a mechanical screw-type flood seal that rotated in place was removed and not promptly replaced with a reliable foam seal and within a second conduit a mechanical screw-type flood seal was left installed and not promptly replaced with a reliable foam seal, allowing for two flooding pathways into the switchgear rooms. The inadequate seals were identified on March 23, 2013, following water intrusion into the switchgear room manholes, and the NRC documented a Green NCV in Inspection Report (IR) 05000271/2013003, ML13224A068; however, the intended corrective actions were not implemented. This violation is cited because Entergy failed to restore compliance within a reasonable period of time after the initial NCV was identified. On November 7, 2013, Entergy restored compliance by installing a SYLGARD foam seal in both the MH-S2 Spare-4 conduit and MH-S2 40805B conduit.

This finding is more than minor because it is associated with the protection against external events attribute of the Mitigating Systems cornerstone and affected the objective to ensure the availability and reliability of systems that respond to external events to prevent undesirable consequences. Specifically, the failed flood barriers provided an external flooding pathway that could impact the reliability and availability of both electrical switchgear rooms during a design basis flood event. In accordance with IMC 0609.04, "Initial Characterization of Findings," and Exhibit 4 of IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," issued June 19, 2012, the inspectors determined that this finding was of very low safety significance (Green) because, in spite of the failed flood barriers, sufficient water removal capability was available to ensure there was no loss of electrical switchgear safety function. The switchgear would still have been able to perform its function because the water level would have been maintained below floor level using the additional sump pump capacity available on site. The inspectors determined that the finding has a cross-cutting aspect in the area of Human Performance, Resources component, because Entergy did not have complete, accurate, and up-to-date design documentation, drawings, and procedures for the switchgear room manhole conduit seals.

Specifically, Entergy did not establish a flood seals program and program document, procedure, or drawing that tracked which conduits had mechanical screw-type flood seals and which had SYLGARD foam seals [H.2(c)]. (Section 1R06)

- Green. The inspectors identified a NCV of 10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," paragraph (a)(4), for Entergy's failure to conduct an adequate risk assessment prior to isolating the nitrogen supply to the containment instrument air system. Specifically, the inspectors identified that Entergy personnel had not correctly analyzed the impact to plant risk with the liquid nitrogen supply, containment air compressor, and safety relief valve (SRV) nitrogen bottle backup supply removed from service. Entergy's corrective actions included establishing a contingency to restore nitrogen supply, protecting further equipment, initiating a condition report, and revising the procedures for drywell entry to maintain the SRV nitrogen backup bottle supply in service until the reactor is shutdown.

This finding is more than minor because it is associated with the configuration control attribute of the Mitigating Systems cornerstone and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The inspectors reviewed IMC 0612, Appendix E, "Examples of Minor Issues," and found that example 7.e was similar to the issue. Specifically, the inspectors determined that the issue was more than minor because the overall elevated plant risk put the plant into a higher risk category established by Entergy. The inspectors determined the significance of the finding using IMC 0609, Appendix K, "Maintenance Risk Assessment and Risk Management Significance Determination Process." The finding was determined to be of very low safety significance (Green) because the Incremental Core Damage Probability Deficit for the timeframe that the nitrogen supply system was unavailable was less than  $1E-6$  (approximately  $1E-7$ ). The inspectors determined that the finding had a cross-cutting aspect in Human Performance, Decision-Making component, because Entergy failed to use a systematic process using available risk assessment guidance and did not obtain interdisciplinary input to make a risk-significant decision [H.1(a)]. (Section 1R13)

## REPORT DETAILS

### Summary of Plant Status

Vermont Yankee Nuclear Power Station (VY) began the inspection period operating at 100 percent power and remained at or near 100 percent power for the remainder of the inspection period.

## 1. REACTOR SAFETY

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

#### 1R01 Adverse Weather Protection (71111.01 – 2 samples)

#### .1 Readiness for Impending Adverse Weather Conditions

##### a. Inspection Scope

The inspectors reviewed Entergy's preparations for a geomagnetic disturbance (GMD) on October 2, 2013. The independent system operator issued a notice that a strong GMD ( $K_p=7$ ) was forecasted for the day. A strong GMD may result in voltage alarms on the grid or false alarms on grid protection devices. Additionally, transformers may be damaged by long-duration GMDs. The inspectors reviewed the implementation of procedure OPOP-PHEN-3127, "Natural Phenomena," during this adverse weather condition. The inspectors walked down the main, auxiliary, and start-up transformers, since those are the plant components that would be most susceptible to impacts from voltage fluctuations on the grid. The inspectors verified that operator actions defined in Entergy's natural phenomena procedure maintained the readiness of essential systems. Actual space weather on October 2 only produced a moderate GMD ( $K_p=6$ ). Documents reviewed for each section of this inspection report are listed in the Attachment.

##### b. Findings

No findings were identified.

#### .2 Readiness for Seasonal Extreme Weather Conditions

##### a. Inspection Scope

The inspectors performed a review of Entergy's readiness for the onset of seasonal cold temperatures. The review focused on the condensate storage tank enclosure, the service water system, and the emergency diesel generators (EDGs). The inspectors reviewed the corrective action program to determine what temperatures or other seasonal weather could challenge these systems, and to ensure Entergy 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 and areas to ensure station personnel identified issues that could challenge the operability of the systems during cold weather conditions.

b. Findings

No findings were identified.

1R04 Equipment Alignment (71111.04)

.1 Partial System Walkdowns (71111.04 – 3 samples)

a. Inspection Scope

The inspectors performed partial walkdowns of the following systems:

- “A” train of residual heat removal service water on October 11
- Reactor core isolation cooling system on November 6
- “A,” “B,” and “C” service water pumps during “D” service water pump planned maintenance from December 9 to 13

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 Updated Final Safety Analysis Report (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.

.2 Full System Walkdown (71111.04S – 1 sample)

a. Inspection Scope

From September 18 to 20, 2013, the inspectors performed a complete system walkdown of accessible safety-related portions of the EDGs to verify the existing equipment lineup was correct. The inspectors reviewed operating procedures, drawings, equipment line-up check-off lists, recent condition reports, the system health report, and the UFSAR to verify the system was aligned to perform its required safety functions. The inspectors also reviewed electrical power availability, component lubrication, hangar and support functionality, and operability of support systems. The inspectors performed field walkdowns of accessible portions of the systems to verify system components and support equipment were aligned correctly and operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no deficiencies. Additionally, the inspectors reviewed a sample

of related condition reports to ensure Entergy appropriately evaluated and resolved any deficiencies. The inspectors discussed the system's condition with the system engineer.

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05)

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.

- Startup transformers with detection out of service on October 17
- Control room on October 18
- Cooling towers on November 4
- Turbine building, elevation 232', on November 4
- Lube oil tank and storage room on December 24

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06 - 1 sample)

Annual Review of Cables Located in Underground Bunkers/Manholes

a. Inspection Scope

The inspectors conducted an inspection of underground manholes/handholes subject to flooding that contain cables whose failure could affect risk-significant equipment. The inspectors performed walkdowns of risk-significant areas, including manholes MH-S2, MH-P3, and MH-P4 and handholes HH-24 and HH-26. These contain cables that run to the switchgear rooms. The inspectors also performed a walkdown of MH-34, which contains cables that run to the EDG fuel oil storage tank house. The inspectors verified that cables were not submerged in water, that cables and splices appeared intact, and that cable support structures were adequate. Additionally, the inspectors observed the condition of installed flood protection seals. The inspectors reviewed the corrective action program and interviewed the cable program engineer to verify manual manhole dewatering efforts were adequate.

b. Findings

Introduction. A self-revealing Green cited violation of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," was identified because Entergy did not promptly correct two separate conditions adverse to quality related to flood protection of the switchgear rooms. Specifically, within one conduit a mechanical screw-type flood seal that rotated in place was removed and not promptly replaced with a reliable foam seal and within a second conduit a mechanical screw-type flood seal was left installed and not promptly replaced with a reliable foam seal, allowing for two flooding pathways into the switchgear rooms. The inadequate seals were identified on March 23, 2013, following water intrusion into the switchgear room manholes, and the NRC documented a Green NCV in IR 05000271/2013003, ML13224A068; however, the intended corrective actions were not implemented. This violation is cited because Entergy failed to restore compliance within a reasonable period of time after the initial NCV was identified.

Description. On November 6, 2013, while performing a 6-month periodic foam flood seal inspection in MH-S2, Entergy personnel recognized that a spare conduit (specifically MH-S2 Spare-4 conduit) did not contain a seal. Entergy personnel also identified that MH-S2 40805B conduit had a mechanical screw-type flood seal installed. The mechanical screw-type flood seal was in place; however, a pull test revealed the seal was loose and not secure. Entergy initiated condition report CR-VTY-2013-06330 to document the condition and performed a root cause analysis.

The Spare-4 conduit was previously identified during refueling outage (RFO) 30 on March 23, 2013, as having a displaced mechanical screw-type flood seal during inspections performed to identify the cause of water intrusion into the switchgear room manholes on March 18. Entergy initiated a work order with instructions to "replace failed flood seal on spare conduit" in MH-S2. There were three conduits in MH-S2 that had the mechanical screw-type flood seals installed as of March 23; these were: 40806B, 40805B and Spare-4. Under the work order, only one of the three seals, within conduit 40806B, was replaced on March 24 with a SYLGARD foam seal. In the work order completion comments, the conduit was referred to only as "spare" and not by number. In licensee event report 2712013001, ML13141A406, and in the apparent cause evaluation of the event Entergy documented that all conduits leading from MH-S2 to the switchgear room were sealed with a SYLGARD foam seal, and referenced the work order. However, the SYLGARD foam seal replacement was never performed within conduits MH-S2 Spare-4 and MH-S2 40805B.

On November 7, 2013 Entergy installed a SYLGARD foam seal in the MH-S2 Spare-4 and MH-S2 40805B conduits.

Entergy had the opportunity to identify and correct the use of mechanical screw-type flood seals in March 2013 and did not because Entergy personnel erroneously concluded that all remaining screw-type flood seals in spare conduits communicating with the switchgear rooms were replaced with SYLGARD seals. A corrective action was initiated to inspect MH-S2 to verify all the seals had been replaced, but the corrective action was canceled with a reference to the work order completed during the RFO.

Entergy's root cause evaluation determined that the root cause of this issue was a lack of effective ownership of flood seals as a program. In 2012, the periodic surveillance testing on the mechanical screw-type flood seals found one that was failed. Further

review showed that the mechanical screw-type flood seals were not reliable, and corrective actions were initiated to increase the periodicity of the surveillance from 18-months to 6-months, and to replace all the mechanical screw-type flood seals with SYLGARD seals. There was no procedure or drawing which specified the location of all flood seals. So, work requests failed to identify all manholes with inadequate seals and the accurate number of seals in each manhole. These work requests were also given a low priority. So, the work requests were not yet implemented when the water intrusion into the switchgear room manholes occurred in March 2013. The NRC documented a performance deficiency related to these flooding pathways on August 9, 2013, as a Green NCV of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," (NCV 05000271/2013003-01). All of the mechanical screw-type seal locations were identified by reviewing design change documents from when they were installed, but this was not done until after the replacement work orders were completed. Additionally, the surveillance was not performed on the increased periodicity required by the corrective action. Entergy determined that a flood seals program would have maintained much of this information in a procedure or other document, and the program owner would have provided oversight to ensure actions were taken commensurate with their safety significance.

Entergy calculated the flow rates through the flood pathways, including design basis leakage of 30 gallons per minute (gpm) through the entire population of properly sealed conduits. They determined that the maximum flow rate through the 4 inch conduit without a seal would be 179 gpm, and that the maximum flow rate through the 4 inch conduit with a tilted flood seal would be 41 gpm. Therefore, the total in-leakage into the switchgear room from the conduits in the event of site-wide flooding would be 250 gpm. This exceeds the 200 gpm total combined capacity of the two gas-powered pumps specified for flood mitigation in OPOP-PHEN-3127, "Natural Phenomena." However, various other sump pumps were available on-site capable of removing water from the manholes in the switchgear rooms during design basis flooding such that the safety function of the switchgear equipment was preserved.

Analysis. The inspectors determined that the failure to take timely and effective corrective actions in accordance with 10 CFR 50, Appendix B, Criterion XVI, following the identification of the flooding pathways, 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 protection against external events attribute of the Mitigating Systems cornerstone and affected the objective to ensure the availability and reliability of systems that respond to external events to prevent undesirable consequences. Specifically, the failed flood barriers provided an external flooding pathway that could impact the reliability and availability of both electrical switchgear rooms during a design basis flood event. In accordance with IMC 0609.04, "Initial Characterization of Findings," and Exhibit 4 of IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," issued June 19, 2012, the inspectors determined that this finding was of very low safety significance (Green) because, in spite of the failed flood barriers, sufficient water removal capability was available to ensure there was no loss of electrical switchgear safety function. The switchgear would still have been able to perform its function because the water level would have been maintained below floor level using the additional sump pump capacity available on site.

The inspectors determined that the finding has a cross-cutting aspect in the area of Human Performance, Resources component, because Entergy did not have complete, accurate, and up-to-date design documentation, drawings, and procedures for the switchgear room manhole conduit seals. Specifically, Entergy did not establish a flood seals program and program document, procedure, or drawing that tracked which conduits required flood seals and had mechanical screw-type flood seals or SYLGARD foam seals. [H.2(c)]

Enforcement. 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," requires, in part, that measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective equipment, and nonconformances are promptly identified and corrected. Contrary to the above, from March 18, 2013, to November 7, 2013, Entergy failed to promptly correct the deficient flooding pathways designed to withstand a flood event. Entergy entered this into their corrective action program as condition report CR-VTY-2013-06330. The NRC documented a performance deficiency related to these flooding pathways on August 9, 2013, as a Green NCV of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," (NCV 05000271/2013003-01). The inspectors determined that Entergy had failed to restore compliance at the first opportunity within a reasonable period of time following the issuance of the finding and NCV. Therefore, this violation is being cited, consistent with NRC Enforcement Policy, Section 2.3.2. On November 7, 2013, Entergy restored compliance by installing a SYLGARD foam seal in both the MH-S2 Spare-4 conduit and MH-S2 40805B conduit. A Notice of Violation is enclosed (Enclosure 1). **(VIO 05000271/2013005-01, Inadequate Corrective Actions to Restore Switchgear Room Flood Boundary).**

1R11 Licensed Operator Regualification Program (71111.11)

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

a. Inspection Scope

On December 31, 2013, the inspectors conducted an in-office review of results of licensee-administered annual operating tests and comprehensive written examinations for 2013. The inspection assessed whether pass rates were consistent with the guidance of NRC Manual Chapter 0609, Appendix I, "Operator Regualification Human Performance Significance Determination Process." The inspectors verified that:

- Individual pass rate on the dynamic simulator test was greater than 80 percent. (Pass rate was 100 percent.)
- Individual pass rate on the job performance measures of the operating examination was greater than 80 percent. (Pass rate was 100 percent.)
- Individual pass rate on the written examination was greater than 80 percent. (Pass rate was 100 percent.)
- More than 80 percent of the individuals passed all portions of the regualification examination. (Pass rate was 100 percent.)
- Crew pass rate was greater than 80 percent. (Pass rate was 100 percent.)

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors observed licensed operator simulator training on October 21, 2013, which included an anticipated transient without scram followed by a steam leak from the high pressure coolant injection system steam line. The inspectors evaluated operator performance during the simulated event and verified completion of risk significant operator actions, including the use of abnormal and emergency operating procedures. The inspectors assessed the clarity and effectiveness of communications, implementation of actions in response to alarms and degrading plant conditions, and the oversight and direction provided by the control room supervisor. The inspectors verified the accuracy and timeliness of the emergency classification made by the shift manager and the technical specification action statements entered by the crew. Additionally, the inspectors assessed the ability of the crew and training staff to identify and document crew performance problems. The inspectors also reviewed the simulator to verify it reflected recent modifications as well as long term control room deficiencies.

b. Findings

No findings were identified.

.3 Quarterly Review of Licensed Operator Performance in the Main Control Room  
(71111.11Q – 1 sample)

a. Inspection Scope

The inspectors observed control room operators on December 18, 2013, during a planned high pressure coolant injection system surveillance, including torus cooling and pumping water from the torus. 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 – 5 samples)

a. Inspection Scope

The inspectors reviewed the samples listed below to assess the effectiveness of maintenance activities on structure, system, and component (SSC) performance and reliability. The inspectors reviewed system health reports, corrective action program documents, maintenance work orders, and maintenance rule basis documents to ensure

that Entergy was identifying and properly evaluating performance problems within the scope of the maintenance rule. For each sample selected, the inspectors verified that the SSC was properly scoped into the maintenance rule in accordance with 10 CFR 50.65, "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. As applicable, 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.

- Reactor building heating, ventilation, and air conditioning system
- High pressure coolant injection system
- Condensate system
- Primary containment atmosphere control system
- Station blackout diesel

b. Findings

No findings were identified.

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.

- Elevated risk while the nitrogen supply to the drywell was isolated for personnel entry, the station blackout diesel generator battery charger 2 was unavailable for unplanned maintenance, and the reactor feedwater pump minimum flow line was isolated – week of September 23
- Planned maintenance on the "A" residual heat removal heat exchanger– week of October 7
- "B" EDG unavailable during surveillance run – week of October 14
- CT-2-1 tagged out for preventive maintenance – week of November 4

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," paragraph (a)(4), for Entergy's failure to conduct an adequate risk assessment prior to isolating the nitrogen supply to the containment instrument air system. Specifically, the inspectors identified that Entergy personnel had not correctly analyzed the impact to plant risk with the liquid nitrogen supply, containment air compressor, and SRV nitrogen bottle backup supply removed from service.

Description. On September 23, 2013, Entergy decided to conduct a primary containment drywell entry at power to investigate the "B" recirculation pump motor oil level due to an oil level alarm. On September 23 and 24, operators tagged out the nitrogen supply and realigned the containment instrument air system to the instrument air system for deinerting primary containment. When the plant is operating at greater than 15% power, the primary containment is inerted with nitrogen. Oxygen levels are maintained within allowable limits in accordance with the technical specifications to maintain a non-combustible atmosphere. In addition, the containment air-operated components are supplied with nitrogen such that any component leakage will not dilute the nitrogen atmosphere with oxygen.

The purpose of containment instrument air is to provide a source of compressed gas to actuate the inboard main steam isolation valves, the main steam SRVs, and other pneumatically operated drywell equipment. The SRV nitrogen bottle backup supply provides an additional seismically-qualified source of compressed nitrogen to the SRVs. This supply ensures the capability to control the valves and depressurize the reactor coolant system after an accident to allow low pressure systems to inject water as a backup to the high pressure coolant injection system. Although accumulators provide a pneumatic reserve, they are not credited in Vermont Yankee's probabilistic safety analysis. The nitrogen backup supply also accommodates additional system leakage and valve manipulations beyond what the accumulators can provide.

For deinerting, the operators aligned the instrument air supply to containment air-operated components and tagged out the nitrogen supply, including the SRV backup supply which has the most risk significance of the nitrogen supply components. The inspectors reviewed the published "Green" plant risk profile and independently modeled the plant risk using Entergy's Equipment Out of Service (EOOS) risk modeling software. The inspectors determined the plant risk to be "Orange" when all the nitrogen supplies were removed from service. The inspectors questioned operators on the risk profile since the nitrogen supply was tagged out but not identified as either unavailable or available by crediting operator manual action. EN-WM-104, "On Line Risk Assessment," and NUMARC 93-01, "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," state that operator manual actions contained in a written procedure that are uncomplicated (generally, a single action), that do not require diagnosis, and that credit a designated local operator positioned at the proper location throughout the duration may allow a system to be considered available.

The operators then reviewed the tagouts, drawings, and procedures to determine the actions needed to restore a nitrogen supply and designated operators capable of performing the actions. Following work to resolve the leak from the "B" recirculation

pump motor oil system, operators cleared the tagouts and restored the nitrogen supply to service on September 25, a time out of service of approximately one and a half days.

The EOOS risk model did not model the cross-connection which permits use of the instrument air system to supply pneumatic pressure to components located within the drywell that are normally supplied from the nitrogen supply system. Therefore, Entergy performed a risk sensitivity analysis to determine the actual risk profile associated with the plant configuration. Entergy determined that, while crediting the cross-connection with instrument air yielded a significant risk reduction, the plant risk profile was still "Orange" given baseline human error values. When crediting guaranteed successful restoration of instrument air following a loss of normal power event the risk was "Yellow." Therefore, the inspectors concluded that the actual plant risk profile was elevated above "Green" and required risk management actions in accordance with EN-WM-104, "On Line Risk Assessment," and administrative procedure (AP)-0172, "Work Schedule Risk Management – On Line."

Entergy's corrective actions included establishing a contingency to restore nitrogen supply, protecting further equipment, initiating condition report CR-VTY-2013-05706, and revising the procedures for drywell entry to maintain the SRV nitrogen backup bottle supply in service until the reactor is shutdown.

Analysis. The inspectors determined that Entergy's incorrect assessment of the risk impact of isolating the nitrogen supply to the containment instrument air system was a performance deficiency that was reasonably within Entergy's ability to foresee and correct and should have been prevented. Traditional enforcement does not apply since there were no actual safety consequences, impacts on the NRC's ability to perform its regulatory function, or willful aspects to the finding.

This finding is more than minor because it is associated with the configuration control attribute of the Mitigating Systems cornerstone and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The inspectors reviewed IMC 0612, Appendix E, "Examples of Minor Issues," and found that example 7.e was similar to the issue. Specifically, the inspectors determined that the issue was more than minor because the overall elevated plant risk put the plant into a higher risk category established by Entergy. The inspectors determined the significance of the finding using IMC 0609, Appendix K, "Maintenance Risk Assessment and Risk Management Significance Determination Process." The finding was determined to be of very low safety significance (Green) because the Incremental Core Damage Probability Deficit for the timeframe that the nitrogen supply system was unavailable was less than 1E-6 (approximately 1E-7).

The inspectors determined that the finding had a cross-cutting aspect in Human Performance, Decision-Making component, because Entergy failed to use a systematic process using available risk assessment guidance and did not obtain interdisciplinary input to make a risk-significant decision. [H.1(a)]

Enforcement. 10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," paragraph (a)(4), requires, in part, that "...the licensee shall assess and manage the increase in risk that may result from the proposed maintenance activities." Contrary to the above, on September 23 and 24, Entergy did

not adequately assess the risk that resulted from isolating the nitrogen supply from the containment instrument air system. In addition, Entergy did not upgrade the advertised plant risk from “Green” to “Orange” and did not specify risk management actions for the increased risk condition. Entergy’s corrective action to restore compliance consisted of implementing risk management actions, such as preparing a contingency to restore the nitrogen supply and protecting additional plant equipment. Because this violation was of very low safety significance and was entered into the corrective action program (CR-VTY-2013-05706), this violation is being treated as an NCV, consistent with the NRC Enforcement Policy. **(NCV 05000271/2013005-02, Inadequate Risk Assessment for Isolating All Nitrogen Supply to the Containment Instrument Air System).**

1R15 Operability Determinations and Functionality Assessments (71111.15 – 3 samples)

a. Inspection Scope

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

- Drywell temperature indication step increase – condition report CR-VTY-2013-5998 initiated on October 14
- Unexpected annunciator alarm for condensate storage tank level instrument power trouble – condition report CR-VTY-2013-06405 initiated on November 12
- No seal and a deficient seal in conduits leading to the west switchgear room – condition report CR-VTY-06330 initiated on November 6 and condition report CR-VTY-2013-06365 initiated on November 7

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. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled by Entergy. The inspectors determined, where appropriate, compliance with bounding limitations associated with the evaluations.

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18 – 1 sample)

Permanent Modifications

a. Inspection Scope

The inspectors evaluated a modification to the “A” EDG service water piping implemented by engineering change 25085, “EDG SW Train “A” Chemical Injection.” The inspectors verified that the design bases, licensing bases, and performance

capability of the EDG, service water, and alternate cooling systems were not degraded by the modification. In addition, the inspectors reviewed modification documents associated with the design change, including calculation and procedure revisions to ensure the design was accurately implemented. The inspectors also interviewed engineering and chemistry personnel on the impact of the design change.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19 – 3 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.

- “A” residual heat removal minimum flow valve, containment spray outboard injection valve, and pump discharge heat exchanger bypass valve maintenance on October 10
- “A” standby gas treatment inlet valve actuator maintenance on October 30
- “D” service water pump replacement on December 14

b. Inspection Scope

No findings were identified.

1R22 Surveillance Testing (71111.22 – 6 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:

- Drywell high pressure emergency core cooling system actuation logic testing on October 17
- "B" EDG starting air receiver inlet check valve quarterly surveillance on October 15 (in-service test)
- "B" EDG monthly surveillance on October 15
- Station blackout diesel generator local start test on October 25
- Residual heat removal service water pumps "B" and "D" quarterly surveillance on October 23
- "A" EDG monthly surveillance on November 24

b. Findings

No findings were identified.

**Cornerstone: Emergency Preparedness**

1EP4 Emergency Action Level and Emergency Plan Changes (71114.04 – 1 sample)

a. Inspection Scope

The Office of Nuclear Security and Incident Response headquarters staff performed an in-office review of the latest revisions of various Emergency Plan Implementing Procedures and the Emergency Plan located under ADAMS accession numbers ML13269A008 and ML13288A159 as listed in the Attachment.

Entergy determined that in accordance with 10 CFR 50.54(q), the changes made in the revisions resulted in no reduction in the effectiveness of the Plan, and that the revised Plan continued to meet the requirements of 10 CFR 50.47(b) and Appendix E to 10 CFR Part 50. The NRC review was not documented in a safety evaluation report and did not constitute approval of licensee-generated changes; therefore, this revision is subject to future inspection.

b. Findings

No findings were identified.

**2. RADIATION SAFETY**

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

2RS5 Radiation Monitoring Instrumentation (71124.05 - 1 sample)

During the week of November 18 to 22, 2013, the inspectors verified that Entergy ensured the accuracy and operability of radiation monitoring instruments that were used to detect and quantify radioactive process streams and effluent releases. 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 the requirements in 10 CFR 20, "Standards for Protection Against Radiation;" 10 CFR 50, Appendix A, Criterion 60, "Control of Releases of Radioactive Materials to the

Environment;" 10 CFR 50, Appendix A, Criterion 64, "Monitoring Radioactivity Releases;" 10 CFR 50, Appendix I, "Numerical Guides for Design Objectives and Limiting Conditions for Operation to meet the Criterion "As Low as is Reasonably Achievable" for Radioactive Material in Light-Water – Cooled Nuclear Power Reactor Effluents;" 40 CFR 190, "Environmental Radiation Protection Standards for Nuclear Power Operations;" NUREG 0737, "Clarification of Three Mile Island Corrective Action Requirements;" the technical specifications and offsite dose calculation manual (ODCM); and Entergy's procedures as criteria for determining compliance.

a. Inspection Scope

Walkdowns and Observations

The inspectors walked down effluent radiation monitoring systems, including liquid and gaseous systems. The inspectors verified that effluent/process monitor configurations aligned with ODCM descriptions.

Calibration and Testing Program

The inspectors verified that channel calibration and functional tests were performed consistent with radiological effluent technical specifications (RETS)/ODCM. The inspectors verified that (a) Entergy calibrated its monitors with National Institute of Standards and Technology traceable sources, (b) if a primary calibration, it adequately represented the plant nuclide mix, (c) if a secondary calibration, it verified the primary calibration, and (d) the channel calibrations encompassed the instrument's range of alarm set points.

The inspectors verified that effluent monitor alarm set points were established as provided in the ODCM and station procedures. For changes to effluent monitor set points, the inspectors evaluated the basis for the changes to ensure that an adequate justification existed.

The inspectors selected in-use laboratory analytical instruments and verified that daily performance checks and calibration data indicated that the frequency of the calibrations were adequate and there were no indications of degraded instrument performance. 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 selected one of the drywell/containment high-range monitors and reviewed the calibration documentation since the last inspection.

The inspectors verified that an electronic calibration was completed for all range decades above 10 rem/hour and that at least one decade at or below 10 rem/hour was calibrated using an appropriate radiation source.

The inspectors determined that the calibration acceptance criteria were reasonable, accounting for the large measurement range and the intended purpose of the instrument.

### 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.

### 2RS6 Radioactive Gaseous and Liquid Effluent Treatment (71124.06 - 1 sample)

During the week of November 18 to 22, 2013, the inspectors ensured that the gaseous and liquid effluent processing systems were maintained so that radiological discharges were properly mitigated, monitored, and evaluated with regard to public exposure. The inspectors used the requirements in 10 CFR 20; 10 CFR 50.36(a), "Technical Specifications on Effluents from Nuclear Power Reactors;" 10 CFR 50, Appendix A, Criteria 60; 10 CFR 50, Appendix A, Criterion 64; 10 CFR 50, Appendix I; 10 CFR 50.75, "Reporting and Recordkeeping for Decommissioning Planning;" 40 CFR 141, "Maximum Contaminant Levels for Radionuclides;" 40 CFR 190, "Environmental Radiation Protection Standards for Nuclear Power Operations;" Regulatory Guide 1.109, "Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50, Appendix I;" Regulatory Guide 1.21, "Measuring, Evaluating, and Reporting Radioactive Material in Liquid and Gaseous Effluents and Solid Waste;" Regulatory Guide 4.1, "Radiological Environmental Monitoring for Nuclear Power Plants;" Regulatory Guide 4.15, "Quality Assurance for Radiological Monitoring Programs (Inception through Normal Operations to License Termination) -- Effluent Streams and the Environment;" NUREG 1302, "Offsite Dose Calculation Manual Guidance: Standard Radiological Effluent Controls for Boiling Water Reactors;" and Entergy's procedures as criteria for determining compliance.

#### a. Inspection Scope

The inspectors reviewed the radiological effluent release reports issued since the last inspection. The inspectors determined that the reports were submitted as required by the ODCM and technical specifications. The inspectors identified radioactive effluent monitor operability issues reported by Entergy as provided in effluent release reports, and determined that the issues were entered into the corrective action program and adequately resolved.

The inspectors reviewed changes to the ODCM made by Entergy since the last inspection with respect to regulatory requirements. The inspectors determined that Entergy had not identified any non-radioactive systems that had become contaminated as disclosed either through an event report or documented in the ODCM since the last inspection.

The inspectors reviewed reported groundwater monitoring results and changes to Entergy's written program for identifying and controlling contaminated spills/leaks to groundwater.

The inspectors reviewed licensee event reports and special reports related to the effluent program issued since the previous inspection. The inspectors identified no additional focus areas for the inspection based on the scope/breadth of problems described in these reports. The inspectors reviewed effluent program implementing procedures, particularly those associated with effluent sampling, effluent monitor setpoint determinations, and dose calculations.

#### Walkdowns and Observations

The inspectors walked down selected components of the radioactive gaseous and liquid discharge systems to verify that equipment configuration and flow paths aligned with the documents reviewed and assessed equipment material condition. For equipment or areas associated with the systems selected that were not readily accessible due to radiological conditions, the inspectors reviewed Entergy's material condition surveillance records. The inspectors walked down those filtered ventilation systems whose test results were reviewed during the inspection. The inspectors verified that there were no conditions, such as degraded high efficiency particulate air (HEPA)/charcoal banks, improper alignment, or system installation issues, that impacted the performance or the effluent monitoring capability of the effluent system.

The inspectors determined that Entergy had not made any significant changes to their effluent release points.

#### Sampling and Analyses

The inspectors observed the routine processing and discharge of effluents including sample collection and analysis. The inspectors verified that appropriate effluent treatment equipment was used.

The inspectors selected effluent sampling activities and verified that adequate controls were implemented to ensure representative samples were obtained. The inspectors determined that the facility was not routinely relying on the use of compensatory sampling in lieu of adequate system maintenance, based on the frequency of compensatory sampling since the last inspection.

The inspectors reviewed the results of the inter-laboratory comparison program to verify the quality of the radioactive effluent sample analyses. The inspectors verified that the inter-laboratory comparison program included hard-to-detect isotopes.

#### Instrumentation and Equipment

The inspectors reviewed the methodology Entergy used to determine the effluent stack and vent flow rates. The inspectors verified that the flow rates were consistent with RETS/ODCM and UFSAR values, and that differences between assumed and actual stack and vent flow rates did not affect the results of the projected public doses.

The inspectors verified that surveillance test results since the previous inspection for selected ventilation effluent discharge systems (HEPA and charcoal filtration) met the technical specification acceptance criteria.

### Dose Calculations

The inspectors reviewed radioactive liquid and gaseous waste discharge permits. The inspectors verified that the projected doses to members of the public were accurate and based on representative samples of the discharge path. The inspectors evaluated the methods used to determine the isotopes that were included in the source term to ensure all applicable radionuclides were included. The inspectors reviewed the current Part 61 analyses to ensure hard-to-detect radionuclides were included in the source term.

The inspectors reviewed changes in Entergy's offsite dose calculations since the last inspection. The inspectors verified that the changes were consistent with the ODCM and Regulatory Guide 1.109. The inspectors reviewed meteorological dispersion and deposition factors used in the ODCM and effluent dose calculations to ensure appropriate factors were being used for public dose calculations. The inspectors reviewed the latest land use census and verified that changes were factored into the dose calculations.

### Ground Water Protection Initiative (GPI) Implementation

The inspectors verified that Entergy was continuing to implement the voluntary GPI since the last inspection. The inspectors reviewed monitoring results of the GPI to determine if Entergy had implemented its program as intended, and to identify any anomalous results. No anomalous results were identified.

The inspectors reviewed identified leakage or spill events and entries made into plant required decommissioning records. The inspectors reviewed evaluations of leaks or spills and reviewed any remediation actions taken for effectiveness. The inspectors reviewed onsite contamination events involving contamination of ground water.

The inspectors verified that on-site ground water sample results and a description of any significant on-site leaks/spills into ground water for each calendar year were documented in the Annual Radiological Environmental Operating Report or the Annual Radiological Effluent Release Report.

### Problem Identification and Resolution

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

#### b. Findings

No findings were identified.

#### 4. OTHER ACTIVITIES

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

##### .1 Mitigating Systems Performance Index (3 samples)

###### a. Inspection Scope

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

- Emergency AC Power System
- Residual Heat Removal System
- Cooling Water System

###### b. Findings

No findings were identified.

##### .2 Occupational Radiation Safety Cornerstone (1 sample)

###### a. Inspection Scope

The inspectors reviewed a listing of Entergy's condition reports for issues related to the occupational radiation safety performance indicator, which measures non-conformances with high radiation areas greater than 1 Roentgen/hour (R/hr) and unplanned personnel exposures greater than 100 millirem (mrem) total effective dose equivalent (TEDE), 5 rem skin dose equivalent (SDE), 1.5 rem lens dose equivalent (LDE), or 100 mrem to the unborn child.

The inspectors determined if any of these PI events involved dose rates >25 R/hr at 30 centimeters or >500 R/hr at 1 meter. If so, the inspectors determined what barriers had failed and if there were any barriers left to prevent personnel access. For unintended exposures >100 mrem TEDE (or >5 rem SDE or >1.5 rem LDE), the inspectors determined if there were any overexposures or substantial potential for overexposure. The inspectors determined that no performance indicator events for occupational radiation safety had occurred during the assessment period.

###### b. Findings

No findings were identified.

##### .3 Public Radiation Safety Cornerstone (1 sample)

###### a. Inspection Scope

The inspectors reviewed a listing of Entergy's condition reports for issues related to the public radiation safety performance indicator, which measures radiological effluent release occurrences per site that exceed 1.5 mrem/quarter (qtr) whole body or 5 mrem/qtr organ dose for liquid effluents; or 5 millirads (mrads)/qtr gamma air dose, 10

mrads/qtr beta air dose; or 7.5 mrems/qtr organ doses from Iodine-131 (I-131), I-133, Hydrogen-3 (H-3) and particulates for gaseous effluents. The inspectors determined that no performance indicator events for public radiation safety had occurred during the assessment period.

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution (71152 – 3 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 Semi-Annual Trend Review

a. Inspection Scope

The inspectors performed a semi-annual review of site issues to identify trends that might indicate the existence of more significant safety issues, as required by Inspection Procedure 71152, "Identification and Resolution of Problems." The inspectors reviewed the VY corrective action program database for the third and fourth quarters of 2013 to assess condition reports written in various subject areas (equipment problems, human performance issues), as well as individual issues identified during the NRC's daily condition report review (Section 4OA2.1).

b. Findings and Observations

No findings were identified.

The inspectors reviewed a potential emerging trend due to a reduction in the average daily rate of condition reports initiated since an announcement on August 27, 2013, to permanently shut down the plant, as documented in condition report CR-VTY-2013-05749. Entergy staff reviewed the numbers of condition reports 25 days prior and 25 days following the announcement and noted a 22.5% decrease in the daily rate of condition report initiation. Entergy personnel reviewed individual department data and assigned an action to departments with decreased rates to determine the reason(s) and

take appropriate corrective action. The inspectors reviewed the responses and noted that every department concluded that either no statistically significant difference existed in the data for that individual department or that improved performance in some area was resulting in fewer documented condition reports.

The inspectors reviewed the numbers and types of condition reports from June 2009 through December 2013 and noted similar initiation rates in 2009, 2010, and 2011, excluding RFOs, to the initiation rate since the announcement. In particular, condition report initiation rates were comparatively higher throughout 2012 and 2013. The inspectors also noted that an emerging trend related to condition report initiation was appropriately resolved during the third and fourth quarters of 2012 after Entergy initiated condition report CR-VTY-2012-03585, performed an apparent cause evaluation, and completed corrective actions related to ensuring personnel initiate condition reports.

While the inspectors noted that performance improvement plans and station improvements (such as installation of automatic sump pumps within outside yard manholes) have resulted in improved conditions and correspondingly fewer condition reports for certain conditions, the inspectors concluded that some of the corrective action responses were not sufficient to address the potential concern. Specifically, some responses credited specific categories of documented conditions as being responsible for overall decreases in condition report initiation. However, in some cases, Entergy staff did not perform a review of the rates of initiation within those specific categories and/or trend codes to verify the conclusions. In addition, statistical analysis which concluded no significant deviation existed included data from RFOs, inappropriately skewing the standard deviation. Finally, using smaller data subsets of individual departments could mask a statistically significant trend observable in aggregate. However, in the interim, the inspectors observed consistent reinforcement of the requirement to initiate condition reports for adverse conditions and promotion of the value of the corrective action program.

The inspectors also reviewed the emerging trend identified with risk not being clearly addressed in long-term corrective actions and interim/periodic reviews documented in June 2013 in condition report CR-VTY-2013-03731. Entergy's second quarter of 2013 trend report documented this as a site-wide issue being addressed by Design Engineering. Previously, a general deficiency in the quality of engineering products was identified in April 2012, in condition report CR-VTY-2012-01699. The associated corrective actions were subsequently identified as not being effectively completed in a timely manner in June 2013, in condition report CR-VTY-2013-04095. The inspectors reviewed the associated condition reports from 2012 and 2013 and noted that significant progress was achieved in completing corrective actions since the initiation of condition report CR-VTY-2013-03731. In addition, the inspectors reviewed condition reports generated from NRC inspections and noted that no similar issues were identified following presentations and training provided to Entergy's engineering staff in the third quarter of 2013.

### .3 Annual Sample: Component Mispositioning

#### a. Inspection Scope

The inspectors performed an in-depth review of Entergy's common cause analysis and corrective actions associated with condition report CR-VTY-2012-05493, operations

adverse trend in component mispositionings. Additionally, the inspectors reviewed the apparent cause for condition report CR-VTY-2013-04347, when fuel pool cooling valves FPC-23 and FPC-22B were found out of position (open), resulting in a non-consequential level 4 component mispositioning event. The inspectors assessed Entergy's problem identification threshold, cause analyses, extent of condition reviews, compensatory actions, and the prioritization and timeliness of Entergy's corrective actions to determine whether Entergy was appropriately identifying, characterizing and correcting problems associated with component mispositioning and whether the completed corrective actions were adequate. The inspectors compared the actions taken to the requirements of Entergy's corrective action program and 10 CFR 50, Appendix B. To assess the effectiveness of the corrective actions, the inspectors reviewed component mispositionings for the last six months, and performed a corrective action program database search for condition reports that described component mispositionings but were not trended as such.

b. Findings and Observations

A finding was identified for this sample and documented in IR 05000271/2013004, ML13310A647. No additional findings were identified.

Entergy identified that there had been 19 component mispositioning events in 2012 as of November, and that their internal performance indicator for component mispositionings over six months was Red. They performed a common cause analysis on the events looking for commonality in who mispositioned the component, where the component was located, and whether the mispositioning was the result of human performance issues or equipment issues. They concluded the apparent cause of the adverse trend was improper implementation of human performance tools by auxiliary operators in the field. Corrective actions included changes to auxiliary operator requalification training and an increase in supervisor observations in the field.

The inspectors reviewed condition reports associated with component mispositionings that occurred between April 2012 and October 2013. There were four during the 6-month period reviewed and only two were related to nuclear safety. These were documented in condition report CR-VTY-2013-04347. Entergy determined the apparent cause of the two open fuel pool cooling valves was that the procedure used to fill, clean, and drain the reactor well during outages does not adequately maintain status control of the valves. Corrective actions included revising the procedure to require test and maintenance tags on the valves. Neither this issue, nor the other two component mispositionings, had the same cause as the common cause from 2012. As a result, the inspectors determined that the corrective actions taken were reasonable to correct the trend in component mispositioning.

.4 Annual Sample: Torus-to-Drywell Vacuum Breaker Performance Issues

a. Inspection Scope

The inspectors performed an in-depth review of Entergy's root cause evaluation and corrective actions associated with repeat failures of two torus-to-drywell vacuum breakers (V16-19-5E and V16-19-5F) during quarterly breakaway torque surveillance tests on February 15, 2012 (CR-VTY-2012-00769). 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 evaluate whether Entergy was appropriately identifying, characterizing, and correcting problems associated with this issue and whether the planned and 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; 10 CFR 50.65; and the technical specifications. The inspectors interviewed operations and engineering personnel to gain an understanding of vacuum breaker maintenance history, performance issues, and implemented corrective actions. In addition, the inspectors performed several vacuum breaker walkdowns to independently assess the material condition, operating environment, and configuration control.

b. Findings and Observations

No findings were identified.

The ten torus-to-drywell vacuum breakers are Atwood & Morrill 18" check valves mounted in piping external to the torus. The vacuum breakers normally remain closed, and are designed to open to prevent the negative differential pressure (D/P) from exceeding 0.5 psi to protect the integrity of the primary containment. Entergy's quarterly vacuum breaker break-away surveillance test demonstrates that the valves open at or below the technical specification-required D/P (0.5 psid). Previously, Entergy used a weight scale to measure the opening force on the vacuum breakers. As a result of a corrective action implemented in 2010, Entergy presently uses a calibrated torque wrench to simulate the torus-to-drywell D/P and considers the vacuum breakers inoperable if they exceed the specified maximum break-away torque. Technical specifications allow continued plant operation with up to two vacuum breakers inoperable.

The "E" and "F" vacuum breakers failed the quarterly operability surveillance test in May 2009 and August 2009, respectively. Entergy declared the valves inoperable, performed corrective maintenance (disassembly, inspection, and cleaning) in May 2010 (RFO 28), and declared the valves operable. In addition, the "F" vacuum breaker failed its quarterly surveillance test in August 2010 and the "E" vacuum breaker failed the surveillance test in August 2011. Entergy performed additional corrective maintenance (including valve seat replacement) on both valves in October 2011 (RFO 29) and declared the valves operable. Subsequently, both vacuum breakers failed the surveillance test in February 2012.

Entergy determined that the root cause of the repeat failures was surface adhesion of the soft seat to the valve hard surface. Valve vendor analysis and design engineering bench testing of the soft seat material showed that surface adhesion could occur between the soft seat of the disk and the metal seat of the valve body. Engineering found evidence of compression marks on the soft seats inspected during the October 2011 RFO internal valve inspections and noted that the breakaway testing failures occurred after the soft seat sat in a compressed condition for longer periods of time. In March 2013 (RFO 30), Entergy implemented an engineering change (EC39348) to replace the existing soft seat material (ethylene-propylene-diene-monomer) with a less pliable material (ultra-high molecular weight-polyethylene). Following the March 2013 modification, the "E" and "F" vacuum breakers satisfactorily passed the quarterly surveillance test in June 2013 and September 2013.

Notwithstanding the longstanding nature of the underlying causal factors, the inspectors concluded that Entergy had taken appropriate actions in accordance with 10 CFR 50.65; 10 CFR 50, Appendix B; technical specifications; and Entergy's corrective action program. The inspectors determined that Entergy's associated root cause evaluation was sufficiently thorough and based on the best available information, sound engineering judgment, independent laboratory analysis, appropriate testing, 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 noted that Entergy's previous corrective actions (dating back to 2009) focused on potential foreign material impact, valve lubrication, a previous counterweight swing arm modification, environmental conditions, and internal valve clearances. The inspectors concluded that Entergy's prior corrective actions, including troubleshooting and causal analyses, were reasonable and commensurate with the safety significance. The inspectors noted that the fact that internal valve disassembly and inspection was limited to RFOs contributed to the longstanding nature of the issue.

#### 4OA6 Meetings, Including Exit

On January 9, 2014, the inspectors presented the inspection results to Mr. Christopher Wamser, Site Vice President, and other members of the Entergy staff who acknowledged the inspection results. 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 Regulatory and Performance Improvement  
 J. Boyle, Engineering Director  
 J. Bengtson, Performance Improvement Manager  
 P. Corbett, Nuclear Oversight Manager  
 J. Hardy, Chemistry Manager  
 D. Jones, Senior Operations Manager  
 M. McKenney, Emergency Preparedness Manager  
 P. Paradis, Senior Maintenance Manager  
 J. Rogers, Design Engineering Manager  
 P. Ryan, Security Manager  
 K. Stupak, Manager, Training and Development  
 D. Tkatch, Radiation Protection Manager  
 F. Aldrich, Control Room Supervisor  
 S. Brabec, Control Room Supervisor  
 C. Chappell, Regulatory Assurance Manager  
 V. Ferrizzi, Shift Manager  
 N. Jennison, Shift Manager  
 P. Jerz, Work Week Manager  
 M. LeFrancois, Engineering Duty Manager  
 T. Marstaller, Shift Manager  
 J. Mully, Systems Engineering Supervisor  
 R. Routhier, Maintenance Support Supervisor  
 J. Taylor, Operations Requalification Training Superintendent  
 D. Toegel, Field Support Supervisor  
 J. Twarog, Shift Manager

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

05000271/2013005-01	VIO	Inadequate Corrective Actions to Restore Switchgear Room Flood Boundary (Section 1R06)
---------------------	-----	---

Opened/Closed

05000271/2013005-02	NCV	Inadequate Risk Assessment for Isolating All Nitrogen Supply to the Containment Instrument Air System (Section 1R13)
---------------------	-----	--

## LIST OF DOCUMENTS REVIEWED

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

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

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

#### Procedures

OPOP-SW-2181, "Service Water/Alternate Cooling Operating Procedure," Revision 10  
 OPOP-PREP-2196, "Seasonal Preparedness," Revision 5  
 OPOP-PHEN-3127, "Natural Phenomena," Revision 13

#### Condition Reports

CR-VTY-2013-04978	CR-VTY-2013-06004	CR-VTY-2013-06566
CR-VTY-2013-05826	CR-VTY-2013-06502	

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

#### Procedures

OP 2121, "Reactor Core Isolation Cooling System," Revision 58  
 OPOP-RHR-2124, "Residual Heat Removal System," Revision 8  
 OP 2126, "Diesel Generators," Revision 60  
 OPST-EDG-4126-12B, "B EDG Standby Verification," Revision 0  
 OP 4181, "Service Water/Alternate Cooling System Surveillance," Revision 79

#### Drawings

G-191159, Sheet 1, "Flow Diagram Service Water System," Revision 86  
 G-191174, Sheet 1, "Flow Diagram Reactor Core Isolation Cooling System," Revision 44  
 G-191174, Sheet 2, "Flow Diagram Reactor Core Isolation Cooling System," Revision 24  
 G-191159, Sheet 1, "Flow Diagram Service Water System," Revision 88

#### Miscellaneous

Emergency Diesel Generators System Health Report, Q2-2013

#### Condition Reports

CR-VTY-2013-01798	CR-VTY-2013-04694	CR-VTY-2013-05983
CR-VTY-2013-04297	CR-VTY-2013-05726	CR-VTY-2013-06001

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

#### Drawings

G-191143, "General Arrangement Turbine Building Basement Floor Plan," Revision 23

#### Pre-Fire Plans

FBPFP, "Fire Brigade Pre-Fire Plans," Revision 4

#### Miscellaneous Documents

SIP-13-84, "Fire Protection System Impairment Permit – S/U Transformers," 7/14/13  
 Fire Hazards Analysis, Revision 12  
 Fire Hazards Analysis, Revision 14

## **Section 1R06: Flood Protection Measures**

### Drawings

G-191384, "Electrical Handhole Details," Sheet 3, Revision 12 and Sheet 6, Revision 7

### Calculations

VYC 3174, "Gravity Flow Through Four Inch Pipe to Manhole," Revision 0

### Work Orders

WO 345695, "MH-52; Replace Failed Flood Seal on Spare Conduit"

WO 366976, "MH-52, Install Sylgard Elastomer Flood Seals"

WO 52416809, "(SA) Manhole, Handhole Conduit Flood Seals Inspection"

### Condition Reports

CR-VTY-2013-02430	CR-VTY-2013-06373	CR-VTY-2013-06582
-------------------	-------------------	-------------------

CR-VTY-2013-06330	CR-VTY-2013-06376	CR-VTY-2013-06724
-------------------	-------------------	-------------------

CR-VTY-2013-06365	CR-VTY-2013-06377	
-------------------	-------------------	--

## **Section 1R11: Licensed Operator Regualification Program**

### Procedures

EN-OP-115, "Conduct of Operations," Revision 14

OP 2115, "Primary Containment," Revision 84

### Miscellaneous Documents

OPOP-RHR-2124, "Residual Heat Removal System," Revision 8

OPST-HPCI-4120-02, "HPCI Pump Operability Test (Quarterly)," Revision 4

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

### Procedures

EN-DC-203, "Maintenance Rule Program," Revision 1

EN-DC-204, "Maintenance Rule Scope and Basis," Revision 2

EN-DC-205, "Maintenance Rule Monitoring," Revision 4

EN-DC-206, "Maintenance Rule (a)(1) Process," Revision 2

EN-DC-207, "Maintenance Rule Periodic Assessment," Revision 2

### Work Orders

WO 002609915, "ST-3-3; Replace HPCI Steamline Drain Line EC-36216"

### Scoping Basis Documents

C, "Condensate," Revision 4

HPCI, "High Pressure Coolant Injection," Revision 5

HVAC, "Heating, Ventilation and Air Conditioning," Revision 5

PCAC, "Primary Containment Atmosphere Control," Revision 2

### Miscellaneous Documents

High Pressure Injection System Health Report, Q2-2013

High Pressure Injection System Health Report, Q3-2013

Condensate System Health Report, Q2-2013

Condensate System Health Report, Q3-2013

VY Maintenance Rule – State of the System Report, Condensate, 9/30/2013

WT-WTVTY-2013-00136

Event Report 96-0136, "Valve SB-16-19-11A Failed to Stroke Event Investigation," dated 6/26/96

LO-WTVTY-2010-0119 CA-016, "10CFR50.65 Maintenance Rule Periodic Assessment Cycle 28 Report," dated 12/13/12

Maintenance Rule Expert Panel Meeting Minutes (C29-02, C29-03, C30-03), dated 3/15/12, 6/11/12 and 9/23/13

Maintenance Rule Monthly Report for August 2013, dated 9/10/13

NP8316A54E, Evaluation of ASCO Solenoid Failure SE-16-19-11A/B, dated 7/25/96

VYEM No. 0059, "Atwood and Morrill 18" - 150# Vacuum Breaker Valves Equipment Manual," Revision 1

VYSE-MRL-2010-013, "10CFR50.65 Maintenance Rule Performance Evaluation and Performance Improvement Action Plan for Primary Containment Atmosphere Control (PCAC)," dated 9/29/10 and 5/2/12

VYSE-MRL-2013-003, "10CFR50.65 Maintenance Rule Performance Evaluation and Performance Improvement Action Plan for Primary Containment Atmosphere Control (PCAC)," dated 8/28/13

Check Valve Program Maintenance History Database, RFO 23 (2002) - RFO 30 (2013)

In-service Test Data (Torus - drywell Vacuum Breakers, for the period 2/8/11 - 9/25/13

PCAC - Primary Containment Atmosphere Control System Health Report, Q1-2013, Q2-2013, and Q4-2012

SSC Performance History (PCAC), for the period 10/1/10 - 9/30/13

24DC, "24 Volts DC Electrical," Revision 6

480AC, "480 Volts AC Electrical," Revision 6

4KV, "4k Volts AC Electrical (4KV)," Revision 4

#### Engineering Evaluations

CR-VTY-2013-4065, "Equipment Failure Evaluation," dated 7/17/13

CR-VTY-2013-4065 CA-01, "MRFF Determination," dated 7/1/13

MMR Project No. 95973, "Analysis of Torus-RB Vacuum Breaker Air Operated Solenoid Valve," dated 7/9/13

#### Condition Reports

CR-VTY-1996-00136	CR-VTY-2011-04380	CR-VTY-2013-01790
CR-VTY-2010-02597	CR-VTY-2011-04840	CR-VTY-2013-02606
CR-VTY-2010-04155	CR-VTY-2012-02052	CR-VTY-2013-04065
CR-VTY-2010-05166	CR-VTY-2012-02972	CR-VTY-2013-04235
CR-VTY-2011-00667	CR-VTY-2012-03511	CR-VTY-2013-05607
CR-VTY-2011-00900	CR-VTY-2012-06082	CR-VTY-2013-05614
CR-VTY-2011-02109	CR-VTY-2013-01678	CR-VTY-2013-05815

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

#### Procedures

AP 0172, "Work Schedule Risk Management – Online," Revision 26

AP 0172, "Work Schedule Risk Management – Online," Revision 27

OP 2115, "Primary Containment," Revision 83

EN-WM-104, "On Line Risk Assessment," Revision 7

EN-WM-104, "On Line Risk Assessment," Revision 8

RPRP-PC-0507-01, "Drywell Clearance Entry," Revision 0

#### Miscellaneous Documents

EOOS Risk Assessment Tool

Workweek 1339 System Schedule

Workweek 1341 System Schedule

Workweek 1345 System Schedule

A RHR LCO Plan

List of Critical Plant Equipment

Numarc 93-01, "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," Revision 4A

PSA-VY-06-07, "VY EOOS Model for Fire (A)(4) Risk Assessments," Revision 0

ADS, "Design Basis Document for Automatic Depressurization System," Revision 0

Condition Reports

CR-VTY-2013-05706

CR-VTY-2013-06038

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

Procedures

OP 4363, "HPCI Suction Transfer on Condensate Storage Tank (CST) Low Level Functional Test and CST Level Instrumentation Calibration," Revision 32

Drawings

3060K19-041, Sheet 2, "Simplified Schematic and External Connection Diagram Alarm Without Lights Type 56032 Dual Type 56011 Single"

B-191301, Sheet 1450A, "Control Wiring Diagram HPCI Suction Valve Logic," Revision 7

B-191391, Sheet 1450, "HPCI Logic System (sh. 2)," Revision 25

B-191301, Sheet 1229A, "Control Wiring Diagram Torus & CST Level Indication," Revision 9

G- 19139-84, Sheet 7, "Electrical Manhole Details," Revision 9

Miscellaneous Documents

"Vermont Yankee Environmental Qualification Program Manual," Revision 1

VYOPF 4115.05, "Drywell Temperature Probe Locations," completed 10/13/13, 10/14/13, 10/15/13

Minor Modification 97-030, Attachment A, "Conduit List"

Condition Reports

CR-VTY-2013-05998

CR-VTY-2013-06462

CR-VTY-2013-06365

CR-VTY-2013-06040

CR-VTY-2013-06555

CR-VTY-2013-02430

CR-VTY-2013-06405

CR-VTY-2013-06330

**Section 1R18: Plant Modifications**

Procedures

CHOP-SWCT-10077, "Chemical Treatment of Normal Isolated Service Water Systems," Revision 0

Miscellaneous Documents

EC 25085, "EDG SW Train "A" Chemical Injection"

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

Procedures

OP 5220, "Limitorque Operator PM," Revision 34

OP 4181, "Service Water Alternate Cooling System Surveillance," Revision 78

OPST-SGT-4117-03, "Standby Gas Treatment System Valve Testing," Revision 0

EMMP-MOV-5219-12, "Diagnostic Testing of Motor Operated Valves with TTC," Revision 1

OPST-RHR-4124-09A, "RHR Loop "A" Valve Operability Test," Revision 3

Work Orders

WO 52414265, "Routine Inspection of Limortorque Operator per OP5220"

WO 52254981, "Perform Boroscopic Inspection of MOV Motor; VIO-65A"

WO 52416802, "VIO-16A Perform Thrust Verification Testing"

WO 52343675, "Remove/Replace Service Water Pump; P-7-1D"

WO 52327601, "SB-1-125-2A; Actuator Refurbishment/Seal Kit Replacement"

Miscellaneous Documents

OPST-RHR-4124-09A, Attachment 1, "RHR Loop A Valve Test Results," completed 10/10/13

VYOPF 4181.04, "Service Water Pump Capacity Test Data Sheet," completed 12/14/13

Condition Reports

CR-VTY-2013-06221

CR-VTY-2013-06794

CR-VTY-2013-06770

CR-VTY-2013-06805

**Section 1R22: Surveillance Testing**

Procedures

OP 4338, "Drywell High Pressure ECCS Functional/Calibration," Revision 36

OPST-EDG-4126-05B, "B" EDG Starting Air Receiver Inlet Check Valve Test (Quarterly),"  
Revision 0

OP 2126, "Diesel Generators," Revision 60

OPST-EDG-4126.02B, "Monthly "B" EDG Slow Start Operability Test," Revision 3

OPST-FO-4195.02B, "Fuel Oil Transfer Pump (P92-1B) and Discharge Check Valve (FO-28B)  
Operability Test (Quarterly)," Revision 2

EN-OP-116, "Infrequently Performed Tests or Evolutions," Revision 12

OPST-RHR-4124-12D, "RHRSW Pump/Valve D Operability and Full Flow Test," Revision 1

OPST-RHR-4124-12B, "RHRSW Pump/Valve B Operability and Full Flow Test," Revision 1

OPST-EDG-4126-02A, "Monthly A EDG Slow Start Operability Test," Revision 3

OPOT-3122-01, "Loss of Normal Power," Revision 2

OPSP-SBO-10067-07, "Station Blackout Diesel Generator Local Start Surveillance (once per  
operating cycle)," Revision 01

Work Orders

WO 52484762, "OP 4338 (Q) Drywell High Pressure ECCS Functional (HRE)"

Data Sheets

VYOPF 4338.01, "Drywell High Pressure ECCS Functional Data Sheet," completed 10/17/13

Miscellaneous Documents

VYC-469B, "Primary Containment Narrow Range High Pressure Trip Loop Accuracy,"  
Revision 1

EDG, "Design Basis Document for Emergency Diesel Generator and Auxiliary Systems,"  
Revision 23

Condition Reports

CR-VTY-2013-06029

CR-VTY-2013-06146

CR-VTY-2013-06563

CR-VTY-2013-06052

CR-VTY-2013-06149

CR-VTY-2013-06564

CR-VTY-2013-06122

CR-VTY-2013-06216

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

Miscellaneous Documents

Emergency Plan, Revision 53

AP 3125, "Emergency Plan Classification and Action Level Scheme," Revision 24

**Section 2RS6: Radioactive Gaseous and Liquid Effluent Treatment**

Procedures

RPST-SBGT-4501-01A, "Standby Gas Treatment "A" Filter Testing," Revision 1

RPST-SBGT-4501-01B, "Standby Gas Treatment "B" Filter Testing," Revision 1

RPST-RM-4503, "Reactor Building Ventilation and Refueling Area Radiation Monitors Source Calibration," Revision 1

RPSP-RM-4507-01, "Source Calibration of Steam Jet Air Ejector Off Gas Monitors," Revision 0

RPST-RM-4505, "Source Calibration of Main Steam Line Radiation Monitors," Revision 1

RPSP-RM-4513, "Calibration of High Range Stack Monitor," Revision 0

Radiation Monitor Calibrations

Stack RM-17-156

Discharge Basin Radiation Monitor RM-17-359

Radwaste Discharge RM-17-350 Advanced Off-Gas Detectors: 3127; 3128; 3121B; 3123; 3125; and 3126

Advanced Off Gas Ventilation Exhaust Air CAM-06-3131

Containment Air Monitor CAM-17-500B

Reactor Building Ventilation Exhaust Air CAM-17-500A

Miscellaneous Documents

Steam Jet Air Ejector Off-Gas Monthly Source Checks for August, September & October 2013

Off-Site Dose Calculation Manual, Revision 34

2012 Radioactive Effluent Report

**Section 40A1: Performance Indicator Verification**

Procedures

OPST-RHR-4124-09A, "RHR Loop "A" Valve Operability Test," Revision 3

OPST-RHR-4124-12A, "RHRSW Pump/Valve "A" Operability and Full Flow Test," Revision 1

OPST-RHR-4124-13A, "RHR Pump "A" Operability Test (Quarterly)," Revision 3

OPST-EDG-4126-02A, "Monthly "A" EDG Slow Start Operability Test," Revision 03

Miscellaneous Documents

Maintenance Rule Database

ERFIS Computer Trending

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

Procedures

EN-LI-102, "Corrective Action Process," Revision 22

EN-FAP-OP-010, "Component Misposition Performance Indicator," Revision 0 and Revision 1

OP 2115, "Primary Containment," Revision 83

OP 4115, "Primary Containment Surveillance," Revision 72

OP 4202, "Primary Containment Vacuum Breaker Inspection and Testing," Revision 45

Drawings

5920-13835, UHMWPE Seal Atwood Morrill 18" Vacuum Breaker, Revision 0, 20804F,  
Vacuum Breaker Valve Body, Revision 3

Calculations

VYC-3134, "Break-Away Torque for Testing Torus Vacuum Breakers," Revision 0

Completed Surveillances

OP 4115, "Primary Containment Surveillance," performed 9/18/13

Design & Licensing Bases

NVY 09-073, "Vermont Yankee Nuclear Power Station - Issuance of Amendment No.

238-Testing and Inspection of Suppression Chamber-to-Drywell Vacuum Breakers (TAC No. ME0767)," dated 7/6/09

Engineering Evaluations

CR-VTY-2012-0769 CA-01, "Root Cause Evaluation Report," dated 6/6/13

CR-VTY-2013-4065 CA-01, "MRFF Determination," dated 7/1/13

EC 39348, "Seals for Vacuum Breakers V16-19-5A thru 5J," Revision 0  
MMR Project No. 85130, Analysis of Cleaner - Exposed New and Old EPDM Diaphragms  
Report, dated 10/13/11

Work Orders

WO 306010-01, "Disassemble, Inspect, Repair Valve V16-19-5E (EC-39348)," performed  
3/14/13

WO 306027-01, "Disassemble, Inspect, Repair Valve V16-19-5F (EC-39348)," performed  
3/14/13

Miscellaneous

LO-VTYLO-2013-00085

LO-VTYLO-2013-00038

"Vermont Yankee Quarterly Trend Report Second Quarter 2013," 08/01/2013

NRC Information Notice 2012-06: Ineffective Use of Vendor Technical Recommendations, dated  
4/24/12

VYSE-MRL-2013-003, "10CFR50.65 Maintenance Rule Performance Evaluation and  
Performance Improvement Action Plan for Primary Containment Atmosphere Control  
(PCAC)," dated 8/28/13

VYEM No. 0059, "Atwood and Morrill 18" - 150# Vacuum Breaker Valves Equipment Manual,"  
Revision 1

Condition Reports

CR-VTY-2011-03246	CR-VTY-2013-05826	CR-VTY-2013-06324
CR-VTY-2011-03498	CR-VTY-2013-05843	CR-VTY-2013-06325
CR-VTY-2012-00769	CR-VTY-2013-05857	CR-VTY-2013-06325
CR-VTY-2012-01699	CR-VTY-2013-05953	CR-VTY-2013-06330
CR-VTY-2012-04095	CR-VTY-2013-05955	CR-VTY-2013-06355
CR-VTY-2012-04297	CR-VTY-2013-05983	CR-VTY-2013-06356
CR-VTY-2012-05493	CR-VTY-2013-05998	CR-VTY-2013-06357
CR-VTY-2013-00269	CR-VTY-2013-06001	CR-VTY-2013-06358
CR-VTY-2013-03103	CR-VTY-2013-06008	CR-VTY-2013-06365
CR-VTY-2013-03140	CR-VTY-2013-06029	CR-VTY-2013-06373
CR-VTY-2013-03144	CR-VTY-2013-06038	CR-VTY-2013-06376
CR-VTY-2013-03262	CR-VTY-2013-06040	CR-VTY-2013-06377
CR-VTY-2013-03414	CR-VTY-2013-06046	CR-VTY-2013-06398
CR-VTY-2013-03556	CR-VTY-2013-06052	CR-VTY-2013-06412
CR-VTY-2013-03731	CR-VTY-2013-06139	CR-VTY-2013-06450
CR-VTY-2013-03901	CR-VTY-2013-06146	CR-VTY-2013-06462
CR-VTY-2013-04331	CR-VTY-2013-06147	CR-VTY-2013-06490
CR-VTY-2013-04342	CR-VTY-2013-06149	CR-VTY-2013-06526
CR-VTY-2013-04347	CR-VTY-2013-06186	CR-VTY-2013-06541
CR-VTY-2013-04432	CR-VTY-2013-06193	CR-VTY-2013-06544
CR-VTY-2013-05477	CR-VTY-2013-06219	CR-VTY-2013-06561
CR-VTY-2013-05749	CR-VTY-2013-06227	CR-VTY-2013-06564
CR-VTY-2013-05750	CR-VTY-2013-06232	CR-VTY-2013-06566
CR-VTY-2013-05756	CR-VTY-2013-06248	CR-VTY-2013-06582
CR-VTY-2013-05758	CR-VTY-2013-06256	CR-VTY-2013-06594
CR-VTY-2013-05763	CR-VTY-2013-06257	CR-VTY-2013-06607
CR-VTY-2013-05768	CR-VTY-2013-06264	CR-VTY-2013-06644
CR-VTY-2013-05787	CR-VTY-2013-06266	CR-VTY-2013-06682
CR-VTY-2013-05800	CR-VTY-2013-06319	CR-VTY-2013-06724
CR-VTY-2013-05811	CR-VTY-2013-06322	CR-VTY-2013-06756
CR-VTY-2013-05815	CR-VTY-2013-06323	CR-VTY-2013-06760

CR-VTY-2013-06764  
 CR-VTY-2013-06770  
 CR-VTY-2013-06794

CR-VTY-2013-06812  
 CR-VTY-2013-06841  
 CR-VTY-2013-06864

CR-VTY-2013-06876  
 CR-VTY-2013-06879  
 CR-VTY-2013-06918

### LIST OF ACRONYMS

10 CFR	Title 10 <i>Code of Federal Regulations</i>
ADAMS	Agencywide Documents Access and Management System
D/P	differential pressure
DRP	[NRC] Division of Reactor Projects
DRS	[NRC] Division of Reactor Safety
EDG	emergency diesel generator
EOOS	Equipment Out of Service
GMD	geomagnetic disturbance
GPI	ground water protection initiative
gpm	gallons per minute
HEPA	high efficiency particulate air
IMC	inspection manual chapter
IR	Inspection Report
LDE	lens dose equivalent
NCV	non-cited violation
NRC	Nuclear Regulatory Commission
ODCM	offsite dose calculation manual
PARS	Publicly Available Records System
RETS	radiological effluent technical specification
RFO	refueling outage
SDE	skin dose equivalent
SRV	safety relief valve
SSC	structures, systems and components
TEDE	total effective dose equivalent
UFSAR	Updated Final Safety Analysis Report
VY	Vermont Yankee Nuclear Power Station