



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

July 25, 2016

Mr. Jack Boyle  
Director, Nuclear Decommissioning  
Entergy Nuclear Operations, Inc.  
Vermont Yankee Nuclear Power Station  
Vernon, VT 05354

SUBJECT: NRC INSPECTION REPORT NO. 05000271/2016002, ENTERGY NUCLEAR OPERATIONS, INC., VERMONT YANKEE NUCLEAR POWER STATION, VERNON, VERMONT

Dear Mr. Boyle:

On June 30, 2016, the U.S. Nuclear Regulatory Commission (NRC) completed its quarterly inspection under Inspection Manual Chapter 2561, "Decommissioning Power Reactor Inspection Program," at the permanently shut down Vermont Yankee Nuclear Power Station (VY). On-site inspections were performed on April 11-14, and May 16-19, 2016. In-office reviews of information supplied by Entergy Nuclear Operations, Inc. were also performed during the inspection period. The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations, and the conditions of your license. The inspection consisted of observations by the inspectors, interviews with personnel, and a review of procedures and records. The results of the inspection were discussed with Corey Daniels, Senior Manager, Production, and other members of the VY staff on July 11, 2016, and are described in the enclosed report. No findings of safety significance were identified.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure(s), and your response, will be made available electronically for public inspection in the NRC Public Document Room or from the NRC document system (ADAMS), accessible from the NRC website at <http://www.nrc.gov/reading-rm/adams.html>. To the extent possible, your response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the Public without redaction.

Current NRC regulations and guidance are included on the NRC's website at [www.nrc.gov](http://www.nrc.gov); select Radioactive Waste; Decommissioning of Nuclear Facilities; then Regulations, Guidance and Communications. The current Enforcement Policy is included on the NRC's website at [www.nrc.gov](http://www.nrc.gov); select About NRC, Organizations & Functions; Office of Enforcement; Enforcement documents; then Enforcement Policy (Under 'Related Information'). You may also obtain these documents by contacting the Government Printing Office (GPO) toll-free at 1-866-512-1800. The GPO is open from 8:00 a.m. to 5:30 p.m. EST, Monday through Friday (except Federal holidays).

J. Boyle

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No reply to this letter is required. Please contact Steve Hammann, at 610-337-5399, if you have any questions regarding this matter.

Sincerely,

*/RA/*

Raymond Powell, Chief  
Decommissioning and Technical Support  
Branch  
Division of Nuclear Materials Safety

Docket No. 05000271

License No. DPR-28

Enclosure: Inspection Report 05000271/2016002  
w/Attachment

cc w/encl: Distribution via ListServ

J. Boyle

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U.S. NUCLEAR REGULATORY COMMISSION  
REGION I

INSPECTION REPORT

Inspection No. 05000271/2016002  
Docket No. 05000271  
License No. DPR-28  
Licensee: Entergy Nuclear Operations, Inc. (Entergy)  
Facility: Vermont Yankee Nuclear Power Station (VY)  
Location: Vernon, VT 05354  
Inspection Dates: April 1, 2016 to June 30, 2016  
Inspectors: Stephen Hammann, Senior Health Physicist  
Decommissioning and Technical Support Branch  
Division of Nuclear Materials Safety, Region I  
  
Eugene DiPaolo, Senior Reactor Inspector  
Engineering Branch 3  
Division of Reactor Safety, Region I  
  
Approved By: Raymond Powell, Chief  
Decommissioning and Technical Support Branch  
Division of Nuclear Materials Safety, Region I

## **EXECUTIVE SUMMARY**

Entergy Nuclear Operations, Inc.  
Vermont Yankee Nuclear Power Station  
NRC Inspection Report No. 05000271/2016002

An announced quarterly inspection was completed at Vermont Yankee Nuclear Power Station (VY) on June 30, 2016. On-site inspections were conducted on April 11-14, and May 16-19, 2016. In-office reviews of information supplied by Entergy Nuclear Operations, Inc. (Entergy) were also performed during the inspection period. The inspection included a review of radiation protection (RP), maintenance and surveillance, and fire protection. The inspection consisted of observations by the inspectors, interviews with Entergy personnel, a review of procedures and records, and plant walk-downs. The NRC's program for overseeing the safe operation of a shut-down nuclear power reactor is described in Inspection Manual Chapter (IMC) 2561, "Decommissioning Power Reactor Inspection Program."

Based on the results of this inspection, no findings of safety significance were identified.

## **REPORT DETAILS**

### **1.0 Background**

On January 12, 2015, VY certified the permanent removal of fuel from the reactor vessel [Agencywide Document and Access Management System (ADAMS) Accession No. ML15013A426]. This met the requirements of 10 Code of Federal Regulations (CFR) 50.82(a)(1)(i) and 50.82(a)(1)(ii). On January 20, 2015, the NRC notified VY that the Operating Reactor Assessment Program would cease on January 24, 2015 and that implementation of the Decommissioning Power Reactor Inspection Program would begin on January 25, 2015 (ADAMS Accession No. ML15020A482). As of the end of this reporting period, VY has moved from the "Post Operation Transitional Phase" of decommissioning to the safe storage (SAFSTOR) phase of decommissioning as described in IMC 2561.

### **2.0 SAFSTOR Performance and Status Review**

#### **a. Inspection Scope [Inspection Procedures (IPs) 62801, 83750]**

The inspectors reviewed RP activities and documentation associated with the occupational exposure to determine the effectiveness of site radiological programs. The inspectors accompanied VY RP technicians during a walk-down of the reactor building refuel floor which included: radiation and contamination surveys, checking and verifying radiological postings, and general area housekeeping. The inspectors also observed RP technicians performing source checks of instrumentation and providing job coverage of workers in a radiation/contamination area. The inspectors reviewed procedures associated with occupational exposure, 2015 dose totals, radiation work permits, surveys, and worker qualifications to verify radiation work activities were performed effectively to limit worker exposure. The inspectors also reviewed pre-and post-radiation surveys related to the reactor vessel draindown.

The inspectors conducted plant tours throughout the inspection period to evaluate the housekeeping and the material condition of structures and components that support decommissioning. The inspectors observed worker activities and reviewed the completed work package and related procedures for preventative maintenance of the single-failure proof crane on the reactor building refuel floor to verify equipment is being properly maintained. The inspectors also accompanied a site engineer on a surveillance of the spent fuel pool (SFP) heat exchanger pumps. The inspectors also met with VY maintenance and production managers and discussed staffing levels, how routine maintenance and emergent work is requested, prioritized, and scheduled, and reviewed the current maintenance workload. The inspectors reviewed the backlog of maintenance work to assess the age and prioritization of the items. The inspectors reviewed the maintenance rule program and procedures, as well as the performance criteria and monitoring procedures of systems and components.

#### **b. Observations and Findings**

The inspectors determined that survey records were clear and complete, RP staff effectively controlled work activities, and technician training and qualifications were up to

date. The inspectors verified that dose assessments were being performed in accordance with plant procedures and that “As Low as is Reasonably Achievable” dose reports continuously track occupational dose. The inspectors noted that the RP staff is supplemented with contractors on an as needed basis.

The inspectors verified that the maintenance and surveillance program for systems and components had been conducted in accordance with the technical specifications requirements and established procedures. The inspectors noted that throughout the inspection period housekeeping and plant material condition standards were being maintained. The inspectors determined that workers followed work plans, surveillance procedures and industrial safety protocols and were aware of job controls specified in work instructions.

c. Conclusions

Based on the results of this inspection, no findings of safety significance were identified.

### **3.0 Decommissioning Fire Protection Program (FPP)**

a. Inspection Scope (Inspection Procedure (IP) 64704)

The inspectors performed an inspection to determine whether Entergy maintained the FPP in a state of operational readiness and whether changes made to the program continued to meet commitments and the NRC requirements. The inspection consisted of interviews with Entergy personnel, a review of procedures and records, and plant walk-downs. The inspectors conducted the inspection to:

- Verify that the licensee had developed and implemented technically adequate procedures to implement the FPP;
- Verify the proper installation, operability, and maintenance of fire protection systems and equipment; and
- Verify the adequacy and implementation of the quality assurance program for the FPP.

Specifically, the inspectors reviewed the updated FPP and a sample of FPP implementation procedures to ensure compliance with the current FPP and to ensure that they reflected the current decommissioning status of the facility. The reviewed procedures included storage of combustibles and flammables, conduct of hot-work, control of ignition sources, and control of transient combustibles. The inspectors reviewed fire brigade training, training with off-site responders, qualifications, and responsibilities to ensure they were qualified to participate in firefighting activities. The inspectors performed a walkdown of firefighting equipment and equipment carts to ensure that they were properly maintained, inventoried and ready for use. Pre-fire plans were reviewed to ensure that they were updated and reflected the plant’s decommissioning status.

The inspectors conducted walk-downs of active plant detection systems, suppression systems, fire barriers, and fire pumps/water sources to ensure that the material condition

was maintained. This included a review of fire pump testing to ensure that an adequate water supply was available to the necessary systems and standpipes for fire suppression/firefighting activities. The inspectors performed a focused review of the installed fire detection, suppression systems, and fire barriers in fire areas associated with the SFP, SFP cooling equipment, SFP power supply, and SFP inventory to ensure that they were maintained, surveillances were performed on a periodic basis, and they were capable of performing their intended function. Also, a review of detection and suppression systems for the cable spreading room was performed.

The inspectors reviewed a sample of self-assessments and corrective action documents to ensure that Entergy was identifying FPP decommissioning deficiencies and entering the issues into the corrective action program for resolution.

b. Observations and Findings

Based on the inspection results, the inspectors concluded that Entergy maintained the FPP within NRC requirements and the FPP. Required fire protection detection systems, suppression systems, barriers, and fire water supply systems were being maintained and appropriately tested and were in a state of operational readiness. The inspectors noted that fire brigade training, qualifications and the conduct of fire drills were adequate. Proper FPP emphasis was placed on SFP systems, components, and support systems.

During the review of changes made or approved to the VY FPP, the inspector did not identify any issues which reduced the program's effectiveness. The inspectors noted that screenings and evaluations contained the appropriate level of detail and sufficient basis to support the changes.

c. Conclusions

Based on the results of this inspection, no findings of safety significance were identified.

#### **4.0 Exit Meeting Summary**

On July 11, 2016, the inspectors presented the inspection results, via teleconference, to Corey Daniels, Senior Manager, Production, and other members of Entergy's staff. The inspectors confirmed that proprietary information was not removed from the site.



**PARTIAL LIST OF PERSONS CONTACTED**

Licensee

M. Anderson, Fire Protection Engineer, Engineering Planning Management  
G. Bailey, Engineering Programs Supervisor  
H. Breite, Sr. Lead Engineer  
C. Chappell, Licensing and CA&A Manager  
C. Daniels, Plant Manager  
K. Farabaugh, System Engineer  
S. Hill, Training  
D. Holmquist, RP Technician  
M. McKenney  
J. Meyer, Licensing  
M. Pletcher, Radiation Protection and Chemistry Manager  
S. Shippey, RP Technician  
T. Silko, Licensing  
D. Tkatch  
C. Wamser, Site Vice President  
K. Whippie, Chemistry Supervisor

State of Vermont

A. Leshinskie, Engineer

**ITEMS OPEN, CLOSED, AND DISCUSSED**

None

**LIST OF DOCUMENTS REVIEWED**

Condition Reports

CR-VTY-2015-00305, 01882, 01883, 01891, 01893, 01896, 01897, 02031  
CR-VTY-2016-00152, 00218, 00268, 00292, 00331, 00418, 00419, 00423, 00424

Audits and Reports

Fire Protection Audit QA-9-2016-VY-1, dated 2/24/2016  
LO-VTYLO-2015-16, Fire Protection Program Self-Assessment, dated 11/19/15  
Maintenance Rule-System Annunciator Report, 3/31/2016

Drawings

G-191298, Main One Line Wiring Diagram, Rev. 8  
G-191163, Sheet 1, Flow Diagram, Fire Protection System Inner Loop, Rev. 54  
G-191163, Sheet 2, Flow Diagram, Fire Protection System Outer Loop, Rev. 22  
G-191176, Sheet 3, Torus as Condensate Storage Tank, Rev. 0  
Sump Routing Diagram, EC 52085

Evaluations/Engineering Changes

Fire Protection Engineering Evaluation, 5-Man Fire Brigade Abandonment, Rev. 0

Evaluations/Engineering Changes Cont'd

EC-49146, Radioactive Waste Disposal System  
EC 49915, Abandon Emergency Diesel Generator System, Rev. 0  
EC 51405, Abandon all Mechanical Components made Non-Functional by EC 51464 and  
Modify Fire Protection Detection System Logic, Rev. 0  
EC 51464, Turbine and Reactor Building Fire Protection System Modifications, Rev. 0  
EC Test 51464-01, Cut, Cap, Heat Trace and Insulate 8" Reactor Building Fire Protection  
Supply in Turbine Building – Period 1 Implementation Functional Test of Reactor Building  
Refueling Floor Fire Hose Standpipes, Rev. 1  
EC-52085, Installation of Sump Pumps  
Transient Combustible Evaluation 2015-16, dated 11/24/2015

Pre-Fire Plans

Vermont Yankee Nuclear Power Station Fire Brigade Pre-Fire Plans, Rev. 9

Procedures

AP-0042, Plant Fire Prevention and Fire Protection, Rev. 9  
AP-10088, SAFSTOR Work Schedule Risk Management, Rev. 6  
AP-10090, Loss of Large Areas of the Plant due to Fire or Explosion, Rev. 3  
DP-4107, Emergency Tools and Supplies Surveillance, Rev. 26  
DP 4531, Radioactive Contamination Surveys, Rev. 32  
EN-RP-102, Radiological Control, Rev. 4  
EN-RP-105-DP, Decommissioning Plant Radiological Work Permits, Rev. 0  
EN-RP-106, Radiological Survey Documentation, Rev. 5  
MTAP 10084, Work Management Process, Rev. 3  
ON-3157, Loss of Fuel Pool Level/Cooling, Rev. 15  
OP-3020, Fire Emergency Response Procedure, Rev. 61  
OP-3020, Fire Emergency Response Procedure, Rev. 62  
OP 4530, Dose Rate Radiation Surveys, Rev. 29  
RP-2185, Spent Fuel Pool Makeup System, Rev. 47  
SPAD-SOCA-10031, Owner Controlled Area/Security Owner Controlled Area Access Control,  
Rev. 6  
V-EN-DC-127, Control of Hot Work and Ignition Sources, Rev. 16  
V-EN-DC-128, Fire Protection Impact Reviews, Rev. 8  
V-EN-DC-161, Control of Combustibles, Rev. 10  
V-EN-DC-203, Maintenance Rule Program, Rev. 3  
V-EN-DC-204, Maintenance Rule Scope and Basis, Rev. 4  
V-EN-DC-205, Maintenance Rule Monitoring, Rev. 6  
V-EN-DC-206, Maintenance Rule (a)(1) Process, Rev. 4  
V-EN-DC-207, Maintenance Rule Periodic Assessment, Rev. 4  
V-EN-RP-101-DP, Decommissioning Plant Access Control for Radiologically Controlled Areas,  
Rev. 1  
VYOPF 0150, Operations Shift Rounds, Rev. 200

Procedures-Completed Surveillance Procedures

Diesel Fire Pump 18-Month Surveillance, Completed 9/12/2013  
Diesel Fire Pump 18-Month Surveillance, Completed 10/21/2014  
Diesel Fire Pump 18-Month Surveillance, Completed 7/7/2015

Procedures-Completed Surveillance Procedures Cont'd

Electric Fire Pump 18-Month Surveillance, Completed 6/26/2012  
Electric Fire Pump 18-Month Surveillance, Completed 10/13/2013  
Electric Fire Pump 18-Month Surveillance, Completed 6/7/2015  
EN-RP-203, Dose Assessment, Attachment 9.6  
OP 4103, Quarterly Fire Brigade Equipment Surveillance, Completed 9/23/2015  
OP 4103, Quarterly Fire Brigade Equipment Surveillance, Completed 10/23/2015  
OP 4103, Quarterly Fire Brigade Equipment Surveillance, Completed 1/25/2016  
OP 4103, 3 Year Hydraulic Check of the Outside Fire Loop, Completed 6/11/2013  
Site Fire Prevention Survey, Completed 1/27/2016  
V-EN-LI-100, Attachment 9.1, EC-49146: Abandon Radioactive Waste Disposal System

Licensing Bases Documents

Entergy Letter dated 1/12/2015, Certifications of Permanent Cessation of Power Operation and Permanent Removal of Fuel from the Reactor Vessel  
SEP-FP-VTY-003, Vermont Yankee Fire Protection Program, Rev. 2  
SEP-FP-VTY-003, Vermont Yankee Fire Protection Program, Rev. 3  
Vermont Yankee Nuclear Power Station Defueled Safety Analysis Report, Rev. 0  
Vermont Yankee Nuclear Power Station Fire Hazards Analysis, Rev. 16  
Vermont Yankee Nuclear Power Station Technical Requirements Manual, Rev. 56  
Vermont Yankee Nuclear Power Station Quality Assurance Program Manual, Rev. 3

Miscellaneous

Dosimetry Exposure Records - 2015  
Letter and Report, Reactor Building Crane Inspection, Simmers Crane Design and Services, May 23, 2016  
Letter of Agreement between Entergy Nuclear Vermont Yankee, LLC and Brattleboro Fire Department, dated 6/11/2015  
Letter of Agreement between Entergy Nuclear Vermont Yankee, LLC and Vernon Vermont Fire Department, dated 6/11/2015  
Maintenance Backlog List, May 2016  
RWP 20160702, Spent Fuel Pool Cleanout Project  
System Performance Monitoring Plan, Service Water  
System Performance Monitoring Plan, Standby Fuel Pool Cooling  
Survey Logbook # 160066, 160067, 160068, 160161, 160229, 160230, 160231, 160232, 160236, 160237, 160239, 160244  
Transient Combustible Evaluation Log, dated 4/11/2016  
National Fire Protection Association 600, Standard on Industrial Fire Brigades, 2010 Edition  
Preventive Maintenance Deferral 50042970, P-40-1B (Electric-Driven Fire Pump), dated 2/11/2016  
Vermont Yankee Dose Rate Assessment Using Monte Carlo Methodology, June 2015 (WVG 13-150-RE-193)  
Vermont Yankee Cycle 30 Maintenance Rule (a)(3) Periodic Assessment  
Vermont Yankee Nuclear Power Station, 10CFR50.65, Maintenance Rule Scoping Document, Standby Fuel Pool Cooling  
Vermont Yankee SAFSTOR Program Schedule, dated 3/12/2016  
VY Maintenance Rule Memorandum, Expert Panel Meeting Minutes

Miscellaneous Cont'd

Work Request 386116, Install Compatible Adapters on Hose Stations for Offsite Fire Departments, dated 3/1/2016  
Workgroup Qualification Matrix, Radiation Protection

Training-Fire Brigade Lessons and Plans

SAFSTOR Fire Brigade Training Program Description, dated 12/18/2015  
SAFSTOR Fire Brigade Leader Training Program, Fire Brigade Leader Qualification Standard, dated 12/18/2014  
SAFSTOR Fire Brigade Leader Training Program, Fire Brigade Member Qualification Standard, dated 12/18/2014  
FCBT-SAF-FIREWATCH, Hot Work Fire Watch Training, Rev. 3  
FCBT-FP-HWSUPV, Hot Work Supervisor Training, Rev. 3

Training-Fire Brigade Drills and Critiques

Announced Fire Drill, Uninterruptible Power Supply-1B Battery Bank on Reactor Building 318' (Northeast), Completed on 12/17/2015  
Unannounced Fire Drill, Fire in Bus 11 (East of Administration Building), Completed on 1/27/2016  
Announced Fire Drill, Shipping and Receiving Areas with Offsite (Vernon Fire Department) Response, Completed on 9/30/2015

Work Orders

WO 00387775  
WO 52381474  
WO 52643489

**LIST OF ACRONYMS USED**

ADAMS	Agencywide Document and Access Management System
CFR	Code of Federal Regulations
Entergy	Entergy Nuclear Operations, Inc.
FPP	Fire Protection Program
IMC	Inspection Manual Chapter
IP	Inspection Procedure
NRC	U.S. Nuclear Regulatory Commission
RP	Radiation Protection
SFP	Spent Fuel Pool
VY	Vermont Yankee Nuclear Power Station