

July 28, 2000

Mr. Samuel L. Newton
Vice President, Operations
Vermont Yankee Nuclear Power Corporation
185 Old Ferry Road
Brattleboro, Vermont 05301

SUBJECT: NRC INSPECTION REPORT 05000271/2000-005

Dear Mr Newton:

On July 1, 2000, the NRC completed an inspection at your Vermont Yankee reactor facility. The preliminary findings were discussed on July 18, 2000, with Mr. Kevin Bronson and other members of your staff. The enclosed report presents the results of that inspection.

This inspection was an examination of 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. Within these areas, the inspection consisted of a selected examination of procedures and representative records, observations of activities, and interviews with personnel.

The NRC evaluated two findings under the risk significance determination process, and these findings were determined to be of very low safety significance (Green). These findings have been entered into your corrective action program, and are discussed in the summary of findings and in the body of the attached inspection report. Furthermore, the two findings were determined to involve violations of NRC requirements, but because of their very low safety significance, the violations are non-cited.

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Sincerely,

/RA/

Glenn W. Meyer, Chief
Reactor Projects Branch 3
Division of Reactor Projects

Docket No.: 50-271

Enclosure: Inspection Report 05000271/2000-005

Mr. Samuel Newton

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket No. 05000271

Licensee No. DPR-28

Report No. 05000271/2000-005

Licensee: Vermont Yankee Nuclear Power Corporation

Facility: Vermont Yankee Nuclear Power Station

Location: Vernon, Vermont

Dates: May 14 - July 1, 2000

Inspectors: Brian J. McDermott, Senior Resident Inspector
Edward C. Knutson, Resident Inspector
Russell J. Arrighi, Resident Inspector, Pilgrim NPS

Approved by: Glenn W. Meyer, Chief
Projects Branch 3
Division of Reactor Projects

SUMMARY OF FINDINGS

IR 05000271/2000-005 on June 14 - July 1, 2000; Vermont Yankee Nuclear Power Station; Vermont Yankee Nuclear Power Corporation; Fire Protection; Surveillance Testing; Other Activities

The inspection was conducted by resident inspectors. This inspection identified two green issues, which were non-cited violations. The significance of issues is indicated by their color (green, white, yellow, red) and was determined by the Significance Determination Process (SDP).

Mitigating Systems

- **Green.** The inspectors identified two examples of nonconformances with the cable separation design basis described in the Final Safety Analysis Report. In the first example, adjacent cable trays in the cable spreading room were not properly enclosed, and in the second example, several nonsafety-related cables in the switchgear room went between two safety-related cable trays.

This finding was determined to be Green (of very low safety significance) using Phase 1 of the SDP because the non-conforming conditions did not render the associated equipment inoperable. The failure to maintain adequate design control for cable separation was determined to be a non-cited violation of NRC requirements. (Section 1R05).

- **Green.** VY identified that the unseating force for the primary containment vacuum breakers had been tested on a semiannual frequency, not the quarterly frequency required by Technical Specification 4.6.E and Section OM - 10 of ASME/ANSI OMa - 1988.

This finding was determined to be Green (of very low safety significance) using Phase 1 of the SDP, because the vacuum breakers were demonstrated to be operable during the semiannual testing. VY's failure to measure the primary containment vacuum breaker unseating force on a quarterly basis is a non-cited violation of 10 CFR 50.55a and TS 4.6.E. (Section 4OA4)

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Report Details

Summary of Plant Status: The plant operated at 100 percent power throughout the inspection period with the exception of two planned power reductions. On June 12 operators reduced reactor power to 70 percent for a control rod pattern exchange, single control rod scram time testing, and other surveillance testing. On June 29 operators reduced reactor power to 70 percent in support of an investigation into the apparent slow opening time of one of the main steam isolation valves.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R01 Adverse Weather

a. Inspection Scope

Due to a severe thunderstorm on May 18, the inspectors examined the facility's preparedness for heavy rain and high winds.

b. Issues and Findings

There were no findings identified.

1R04 Equipment Alignment

a. Inspection Scope

On May 31 the inspectors performed a partial system walkdown (visual inspection) of the HPCI system prior to planned maintenance on the reactor core isolation cooling system (RCIC).

b. Issues and Findings

There were no findings identified.

1R05 Fire Protection

.1 Material Condition of Fire Protection Features

a. Inspection Scope

The inspectors evaluated the cable spreading room and the switchgear room to assess VY's control of transient combustibles and ignition sources, the material condition and operational alignment of fire protection system, and the material condition and operational alignment of fire barriers. The configuration of cable raceways and the separation of divisional cables were compared to the design basis information in Chapter 8 of VY's Final Safety Analysis Report (FSAR).

b. Issues and Findings

The inspectors identified two non-conforming conditions with respect to electrical cable separation criteria:

- VY FSAR section 8.4.6, "Cable Installation and Separation Criteria," states that in locations where Division SI and Division SII cable trays are separated by less than 15 feet, the cable trays will be enclosed. In the cable spreading room a Division SI riser (a vertical cable tray) and a Division SII riser within approximately one foot of each other did not have metal covers installed for physical separation.
- VY FSAR section 8.4.6 states that non-vital cables may not be run through more than one safety-related (SI or SII) cable tray. In the switchgear room the inspectors identified one example where non-vital cables were run through both SI and SII cable trays.

VY engineering evaluated these conditions and concluded that system operability was not affected. The inspectors reviewed the operability determinations and determined that this conclusion was adequately supported.

This issue was considered more than minor based on the following criteria: 1) It suggests a programmatic problem that has a credible potential to impact safety and is more than an isolated case; and, 2) It involves degraded conditions that could concurrently influence mitigation equipment. This finding was determined to be Green (of very low safety significance) using Phase 1 of the SDP because the non-conforming conditions did not render the associated equipment inoperable.

10 CFR 50, Appendix B, Criterion III, "Design Control," requires that the design basis for structures, systems, and components is correctly translated into specifications and drawings. VY FSAR, section 8.4.6, "Cable Installation and Separation Criteria," describes the design basis requirements for SI and SII cable separation. Contrary to the above, two examples were identified where the design basis for cable separation was not adequately implemented, resulting in a non-conforming plant configuration. This violation is being treated as a non-cited violation, consistent with Section VI.A of the NRC Enforcement Policy, issued on May 1, 2000 (65 FR 25368). This issue was entered into VY's corrective action program as ER 2000-0767 and ER 2000-0897.

(NCV 05000271/2000-005-01)

.2 Operational Check of Fire Pumps

a. Inspection Scope

The inspectors observed the performance of operating procedure OP-4105, "Monthly Operational Check of Fire Pumps," to assess material condition, operational lineup, and operational effectiveness of fire protection equipment.

b. Issues and Findings

There were no findings identified.

1R11 Licensed Operator Requalification

a. Inspection Scope

The inspectors observed a simulator evaluation for one operating crew on June 26, to identify deficiencies and discrepancies in the training, and to assess licensed operator performance and the evaluator's critique.

b. Issues and Findings

There were no findings identified.

1R12 Maintenance Rule Implementation

a. Inspection Scope

The inspectors reviewed implementation of VY's Maintenance Rule Program as related to the following:

- Failure of a 480 volt AC breaker to trip on high current (one phase only) during a bench test, as a potential maintenance rule functional failure. (The breaker supplies motor operated valve SW-19B, a safety-related isolation valve for the non-essential service water loads during accident conditions);
- Proper classification and reporting of equipment failures in the residual heat removal (RHR) and RCIC systems, as documented in the event reporting system from April 1999 to May 2000;
- Corrective actions associated with the replacement of two degraded cells in the B 125 volt DC Main Station Battery; and
- Failure of a local power range monitor, as a potential maintenance rule functional failure of the neutron monitoring system.

Equipment failures were compared to the specific criteria in VY's "10 CFR 50.65 Maintenance Rule Scoping Basis" document. VY's disposition and corrective actions for the above issues were evaluated against the requirements of 10 CFR 50.65,

"Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," and guidance provided in NRC Regulatory Guide 1.160.

b. Issues and Findings

There were no findings identified.

1R13 Maintenance Risk Assessment and Emergent Work

a. Inspection Scope

The inspectors reviewed the maintenance risk assessment and work controls associated with the following activities:

- Four day maintenance outage of the RCIC system;
- Five day maintenance outage of the A emergency diesel generator (EDG); and
- Freeze seal on the 8 inch service water (SW) supply line to the A EDG.

b. Issues and Findings

There were no findings identified.

1R14 Personnel Performance During Non-routine Plant Evolutions

a. Inspection Scope

The inspectors observed portions of the following infrequent evolutions:

- Replacement of two cells in the B 125 volt DC Main Station Battery; and
- Troubleshooting on the slow opening of a main steam isolation valve (MSIV), MSIV-86C (outboard).

b. Issues and Findings

There were no findings identified.

1R15 Operability Evaluations

.1 Routine Review of Operability Evaluations

a. Inspection Scope

The inspectors reviewed operability determinations associated with the following plant equipment challenges:

- Potentially non-conservative meteorological assumptions in the calculation of post-accident control room thyroid dose contribution from main steam isolation valve leakage;
- Division SI/SII cable separation issues in the cable spreading room; and
- Degraded instantaneous over-correct trip relays on the safety-related 4160 volt switchgear.

b. Issues and Findings

There were no findings identified.

.2 Slow Open Stroke of MSIV-86C

a. Inspection Scope

The inspectors reviewed the operability determination for MSIV-86C associated with ER 2000-0918. On June 12 operators noted that MSIV-86C took approximately three times the expected 5 seconds to reopen following a quarterly fast closure surveillance test. The valve met the surveillance procedure acceptance criteria for fast closure (there is no acceptance criteria for the open stroke time), and the operators documented the completion of the test as satisfactory. Although station personnel and some management were aware of the degraded condition, an ER was written to address operability until June 16 (see Section 4OA2 regarding corrective action program implementation).

The inspectors reviewed VY's operability determination and assessment of probable causes, and observed portions of the troubleshooting activities, which confirmed that MSIV-86C would still be capable of performing its intended safety function.

b. Issues and Findings

There were no findings identified.

1R19 Post-Maintenance Testing

a. Inspection Scope

The inspectors observed portions of the following post-maintenance testing activities and/or reviewed test documentation associated with the following:

- RCIC system testing following a four day LCO maintenance period;
- A EDG air start valve rebuild and flex hose replacement; and
- A EDG testing and auxiliary systems testing following a five day LCO maintenance period.

b. Issues and Findings

There were no findings identified.

1R22 Surveillance Testing

a. Inspection Scope

The inspectors reviewed and observed portions of the following surveillance testing:

- A EDG monthly surveillance;
- Secondary containment capability test; and
- HPCI system quarterly surveillance.

b. Issues and Findings

During the post-run portion of the HPCI surveillance on June 6, operators identified that the turbine overspeed-trip did not meet the time acceptance criterion, which indicated apparent binding of the mechanism. As a result, HPCI was declared inoperable at 10:20 a.m., and a four hour non-emergency notification was made to the NRC in accordance with 10 CFR 50.72 (reference EN# 37061). VY later determined that the operator had held the mechanism up too long, this inadvertently affected the test result, and there was no actual binding of the overspeed-trip mechanism. HPCI was declared operable at 5:21 p.m. VY concluded that weak procedural guidance existed for adjusting the overspeed-trip reset time and entered the issue in the corrective action program as ER 2000-0867.

VY subsequently concluded that the condition would not have affected the ability of the HPCI system to perform its design function of high pressure injection, and retracted the 10 CFR 50.72 notification. Also, the overspeed-trip feature is not required by TS or credited as part of the HPCI safety function. The issue has been documented for completeness on the event notification.

1R23 Temporary Plant Modifications

a. Inspection Scope

The inspectors reviewed the following temporary plant modification:

- Disabling of "_3" rod positions (i.e., 13, 23, etc) on control rod 10-35.

b. Issues and Findings

There were no findings identified.

4. **OTHER ACTIVITIES**

4OA1 Performance Indicator Verification

a. Inspection Scope

The inspectors reviewed the first quarter 2000 data for the following performance indicators to verify that VY characterized past events in accordance with the criteria described in NEI 99 - 02, "Regulatory Assessment of Performance Indicator Guideline," Revision 0:

- Unplanned scrams per 7,000 critical hours.
- Scrams with loss of normal heat removal.
- Unplanned power changes per 7,000 critical hours.

In addition, a review of VY's data collecting and reporting process for these performance indicators was performed in accordance with NRC Temporary Instruction 2515/144.

b. Issues and Findings

There were no findings identified.

4OA2 Identification and Resolution of Problems

Inspection findings in previous sections of this report also had implications regarding VY's identification, evaluation, and resolution of problems, as follows:

- Section 1R15 - On June 12 the operating crew demonstrated good insight in recognizing the slow opening of MSIV-86C (not a test acceptance criterion) but did not identify the observation as a degraded condition that needed a timely operability determination under the guidance of NRC Generic Letter 91-18 and VY's AP 009 Event Report process. As a result, a formal operability determination was delayed for several days, and VY management review during the ER Screening Meeting was delayed until June 19. After inspector

discussions with VY management regarding this delay, ER 2000-0942 was issued to document the delay in reporting a condition adverse to quality.

- Section 1R05 - The two examples of cable separation problems identified by the NRC are long standing deficiencies that were not identified by VY during corrective action efforts associated with LER 05000271/1997-006-04. Based on these recent NRC findings and subsequent VY-identified issues, VY initiated an adverse trend ER on June 16 to re-visit the issue of cable separation and review the effectiveness of previous corrective actions (reference ER 2000-0930).

4OA4 Other

- .1 (Closed) LER 05000271/2000-003-00: Inadequate Change Management Results in the Failure to Test Primary Containment Vacuum Breakers at the Required Frequency

VY identified that the existing semiannual surveillance frequency for the primary containment vacuum breakers did not meet the quarterly requirement for measurement of the unseating force in ASME Section XI, Part OM - 10. Technical Specification 4.6.E and 10 CFR 50.55a require VY meet the requirements of Section XI of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code. VY was meeting the similar semiannual requirement in ASME Section XI, Part OM - 1. VY concluded that the frequency error was the result of a change to the surveillance program in October 1996.

The inspectors noted that there have been other similar problems associated with VY's Inservice Test (IST) Program related to components that were inadvertently omitted from the scope or not tested at the required periodicity. Some of these problems have required reports to the NRC under 10 CFR 50.73 requirements (reference VY LERs 1998-021-00, 1996-011-00, and 1996-001-00). As such, the IST program deficiency was considered more than minor based on the following criteria: 1) It suggests a programmatic problem that has a credible potential to impact safety and is more than an isolated case; and, 2) It could affect the reliability of mitigating systems.

This finding was determined to be Green (of very low safety significance) using Phase 1 of the SDP because the vacuum breakers were demonstrated to be operable during the semiannual testing. VY's failure to measure the primary containment vacuum breaker unseating force on a quarterly basis in accordance with 10 CFR 50.55a and TS 4.6.E represented a non-cited violation (NCV), consistent with Section VI.A of the NRC Enforcement Policy, issued on May 1, 2000 (65 FR 25368). This problem was entered in VY's corrective action program as Event Report 2000-0880. **(NCV 05000271/2000-005-02)**

- .2 (Closed) LER 05000271/2000-002-00: Valve Repair/Replacement Activities Were Not Performed In Accordance With ASME Section XI Requirements

The issue identified by VY in this LER was minor and occurred as the result of work performed between 1996 and 1998. Programmatic changes implemented by VY in response to LER 1998-018-01 can reasonably be expected to prevent recurrence.

4OA5 Management Meetings

.1 Exit Meeting Summary

On July 18, 2000, the inspectors presented the preliminary inspection results to Mr. Kevin Bronson, Operations Superintendent, and other members of VY management, who acknowledged the findings presented. The inspectors asked whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

M. Balduzzi, Plant Manager
K. Bronson, Operations Superintendent
J. Dreyfuss, Technical Services Superintendent
R. Sojka, Maintenance Superintendent
R. January, Manager Electrical/I&C Engineering
R. Rusin, Manager System Engineering
S. Primavera, System Engineering Program Lead
E. Harms, Assistant Operations Manager
C. Wamser, Operations Supervisor
C. Nichols, Manager Maintenance Support
M. Laporte, Work Management Supervisor
R. Burns, Maintenance Rule Program Coordinator
J. Boivin, System Engineer

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

none.

Opened and Closed During this Inspection

NCV 05000271/2000-005-01:	Violation of FSAR Cable Separation Criteria
NCV 05000271/2000-005-02:	Failure to Test Primary Containment Vacuum Breakers at the Required Frequency

Closed

LER 05000271/2000-003-00:	Inadequate Change Management Results in the Failure to Test Primary Containment Vacuum Breakers at the Required Frequency
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LIST OF ACRONYMS USED

ASME	American Society of Mechanical Engineers
CFR	Code of Federal Regulations
EDG	Emergency Diesel Generator
EN	Event Notification
ER	Event Report
FSAR	Final Safety Analysis Report
HPCI	High Pressure Coolant Injection
IST	Inservice Test
LCO	Limiting Condition for Operation
LER	Licensee Event Report
LOCA	Loss of Coolant Accident
MSIV	Main Steam Isolation Valve
NCV	Non-Cited Violation
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
RCIC	Reactor Core Isolation Cooling
RHR	Residual Heat Removal
SDP	Significance Determination Process
SW	Service Water
VY	Vermont Yankee

NRC's REVISED REACTOR OVERSIGHT PROCESS

The federal Nuclear Regulatory Commission (NRC) recently revamped its inspection, assessment, and enforcement programs for commercial nuclear power plants. The new process takes into account improvements in the performance of the nuclear industry over the past 25 years and improved approaches of inspecting and assessing safety performance at NRC licensed plants.

The new process monitors licensee performance in three broad areas (called strategic performance areas): reactor safety (avoiding accidents and reducing the consequences of accidents if they occur), radiation safety (protecting plant employees and the public during routine operations), and safeguards (protecting the plant against sabotage or other security threats). The process focuses on licensee performance within each of seven cornerstones of safety in the three areas:

Reactor Safety

- Initiating Events
- Mitigating Systems
- Barrier Integrity
- Emergency Preparedness

Radiation Safety

- Occupational
- Public

Safeguards

- Physical Protection

To monitor these seven cornerstones of safety, the NRC uses two processes that generate information about the safety significance of plant operations: inspections and performance indicators. Inspection findings will be evaluated according to their potential significance for safety, using the Significance Determination Process, and assigned colors of GREEN, WHITE, YELLOW or RED. GREEN findings are indicative of issues that, while they may not be desirable, represent very low safety significance. WHITE findings indicate issues that are of low to moderate safety significance. YELLOW findings are issues that are of substantial safety significance. RED findings represent issues that are of high safety significance with a significant reduction in safety margin.

Performance indicator data will be compared to established criteria for measuring licensee performance in terms of potential safety. Based on prescribed thresholds, the indicators will be classified by color representing varying levels of performance and incremental degradation in safety: GREEN, WHITE, YELLOW, and RED. GREEN indicators represent performance at a level requiring no additional NRC oversight beyond the baseline inspections. WHITE corresponds to performance that may result in increased NRC oversight. YELLOW represents performance that minimally reduces safety margin and requires even more NRC oversight. And RED indicates performance that represents a significant reduction in safety margin but still provides adequate protection to public health and safety.

The assessment process integrates performance indicators and inspection so the agency can reach objective conclusions regarding overall plant performance. The agency will use an Action Matrix to determine in a systematic, predictable manner which regulatory actions should be taken based on a licensee's performance. The NRC's actions in response to the significance (as represented by the color) of issues will be the same for performance indicators as for inspection findings. As a licensee's safety performance degrades, the NRC will take more and increasingly significant action, which can include shutting down a plant, as described in the Action Matrix.

More information can be found at: <http://www.nrc.gov/NRR/OVERSIGHT/index.html>.