January 17, 2002

Mr. Michael A. Balduzzi
Senior Vice President
and Chief Nuclear Officer
Vermont Yankee Nuclear Power Corporation
185 Old Ferry Road
P.O. Box 7002
Brattleboro, Vermont 05302-7002

SUBJECT: VERMONT YANKEE - NRC INSPECTION REPORT 50-271/01-12

Dear Mr. Balduzzi:

On December 29, 2001, the NRC completed an inspection at your Vermont Yankee facility. The enclosed report documents the inspection findings which were discussed on January 9, 2002, with Mr. Kevin Bronson and other members of your staff.

This 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.

Based on the results of this inspection, the inspectors identified one issue of very low safety significance (Green) that was determined to involve a violation of NRC requirements. However, because of its safety significance and because the issue has been entered into your corrective action program, the NRC is treating this issue as a Non-Cited Violation, in accordance with Section VI.A.1 of the NRC's Enforcement Policy, issued May 1, 2000, (65FR25368). If you deny this NCV, you should provide a response with the basis for your denial, within 30 days of the date of this inspection report, to the Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington, D.C. 20555-001; with copies to the Regional Administrator, Region I; the Director, Office of Enforcement; and the NRC Resident Inspector at Vermont Yankee.

Immediately following the terrorist attacks on the World Trade Center and the Pentagon, the NRC issued an advisory recommending that nuclear power plant licensees go to the highest level of security, and all promptly did so. With continued uncertainty about the possibility of additional terrorist activities, the Nation's nuclear power plants remain at the highest level of security and the NRC continues to monitor the situation. This advisory was followed by additional advisories, and although the specific actions are not releasable to the public, they generally include increased patrols, augmented security forces and capabilities, additional security posts, heightened coordination with law enforcement and military authorities, and more limited access of personnel and vehicles to the sites. The NRC has conducted various audits of your response to these advisories and their ability to respond to terrorist attacks with the capabilities of the current design basis threat (DBT). From these audits, the NRC has concluded that your security program is adequate at this time.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Clifford J. Anderson, Chief
Projects Branch 5
Division of Reactor Projects

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

Enclosure: Inspection Report 50-271/01-12

Attachment 1- Supplementary Information

cc w/encl:
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G. Sen, Licensing Manager, Vermont Yankee Nuclear Power Corporation
D. Tefft, Administrator, Bureau of Radiological Health, State of New Hampshire
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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket No. 50-271

Licensee No. DPR-28

Report No. 50-271/01-12

Licensee: Vermont Yankee Nuclear Power Corporation

Facility: Vermont Yankee Nuclear Power Station

Location: Vernon, Vermont

Dates: November 18 - December 29, 2001

Inspectors: Brian J. McDermott, Senior Resident Inspector
Edward C. Knutson, Resident Inspector
Julian H. Williams, Senior Operations Engineer

Approved by: Clifford J. Anderson, Chief
Projects Branch 5
Division of Reactor Projects

SUMMARY OF FINDINGS

IR 05000271-01-12, on 11/18-12/29/2001; Vermont Yankee Nuclear Power Station; Vermont Yankee Nuclear Power Corporation; Mitigating Systems

This inspection was performed by the resident inspectors and a region-based operations specialist. The inspection identified one Green finding that was also determined to involve a non-cited violation. The significance of the finding is indicated by its color (Green, White, Yellow, Red) using Inspection Manual Chapter 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply are indicated by "No Color" or by the severity level of the applicable violation. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described at its Reactor Oversight Process website at http://nrc.gov/reactors/operating/oversight.html.

A. Inspector Identified Findings

Mitigating Systems

- **Green.** The inspectors identified a non-cited violation of 10CFR50, Appendix B, Criterion III, "Design Control," for inadequate design control of the RCIC turbine exhaust line. Design changes installed in 1998 and 1999 combined to create an unanalyzed condition through the induction and accumulation of torus water in the turbine's exhaust line after shutdown of the turbine.

  The failure to provide adequate design control for the RCIC turbine exhaust line was considered more than minor since it resulted in a system configuration that had not been analyzed. This finding was of very low safety significance based on a Phase 1 SDP evaluation because VY was able to show that RCIC would remain operable and the containment penetration would not be damaged, if the turbine were started with its exhaust line full of water. Because the finding is of very low safety significance and was captured in the licensee's corrective action program, this finding is being treated as a Non-cited violation, consistent with Section VI.A.1 of the NRC Enforcement Policy. (Section 4OA3)

B. Licensee Identified Findings

None.

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Report Details

Summary of Plant Status: Vermont Yankee (VY) operated at 100 percent power for most of the inspection period. On November 30, operators reduced the reactor power to 70 percent for a control rod pattern exchange and surveillance testing. On December 6, and again on December 14, reactor power was reduced to 60 percent power to identify the location of two minor fuel clad defects. Operators were alerted to the defects by increases in the main condenser offgas radiation level. Power near the defective fuel was suppressed by the insertion of control rods and the offgas radiation level remained significantly below VY's administrative limits and Technical Specification (TS) requirements. As a precaution, VY has elected to perform the required weekly control rod surveillance at 90 percent power (vice 100 percent) until further evaluation has been completed.

1. REACTOR SAFETY

Initiating Events, Mitigating Systems, Barrier Integrity [REACTOR - R]

1R04 Equipment Alignment

a. Inspection Scope

The inspectors performed a detailed system walkdown (visual inspection) of the high pressure coolant injection (HPCI) system to verify system alignment and to identify any discrepancies that would impact system operability. Observed plant conditions were compared with the standby alignment of equipment specified in VY's system operating procedure. In addition, the inspectors referenced the general guidance in NRC Inspection Procedure 71111, Attachment 4, "Equipment Alignment."

b. Findings

No findings of significance were identified.

1R05 Fire Protection

a. Inspection Scope

On December 18, the inspectors observed a plant fire drill that was conducted for the on-shift operations crew. The inspectors' assessment was in accordance with NRC Inspection Procedure 71111, Attachment 5, "Fire Protection."

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification

.1 Biennial Requalification Testing

a. Inspection Scope

A review was conducted of licensee requalification exam results for the biennial testing cycle. The inspection assessed whether pass rates were consistent with the guidance of NUREG-1021, Revision 8, “Operator Licensing Examination Standards for Power Reactors” and NRC Manual Chapter 0609, Appendix I, “Operator Requalification Human Performance Significance Determination Process (SDP)”.

The inspector verified that:

- Crew pass rate was greater than 80%. (Pass rate was 100%)
- Individual pass rate on the written exam was greater than 80%. (No written exam given this year)
- Individual pass rate on the walk-through (JPMs) was greater than 80%. (Pass rate was 100%)
- More than 75% of the individuals passed all portions of the exam. (97.5% of the individuals passed all portions of the exam)

b. Findings

No findings of significance were identified.

.2 Observation of Simulator Training

a. Inspection Scope

The inspectors observed simulator training for one operating crew to assess the performance of the licensed operators and the evaluation by VY's training staff. The inspectors' assessment was in accordance with NRC Inspection Procedure 71111, Attachment 11, "Licensed Operator Requalification Program."

b. Findings

No findings of significance were identified.

1R12 Maintenance Rule Implementation

a. Inspection Scope

The inspectors reviewed VY's implementation of the Maintenance Rule for structures, systems and components that exhibited performance problems. NRC Inspection Procedure 71111, Attachment 12, "Maintenance Rule Implementation," and VY Program Procedure PP 7009, "10 CFR 50.65, Maintenance Rule Program," were used as references during this inspection. VY's assessment of the failure of an automatic valve in the high pressure coolant injection system was reviewed during this inspection period.

b. Findings

No findings of significance were identified.

1R14 Personnel Performance during Non-Routine Plant Evolutions

a. Inspection Scope

The inspectors assessed the control room operators' performance during two non-routine evolutions. Specifically, the adequacy of personnel performance, procedure compliance and use of the corrective action process were evaluated using the guidance in NRC Inspection Procedure 71111, Attachment 14, "Personnel Performance Related To Non-routine Plant Evolutions and Events."

- Single rod scram time testing conducted on November 30.
- Power suppression testing to identify the location of a defective fuel pin conducted on December 6-7.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing

a. Inspection Scope

The inspectors reviewed procedures and observed portions of testing related to the following surveillance tests using the guidance provided in NRC Inspection Procedure 71111, Attachment 22, "Surveillance Testing":

- Emergency diesel generator B monthly surveillance testing performed in accordance with OP 4126 on November 19.
- Reactor core isolation cooling system quarterly surveillance performed in accordance with OP 4121 on November 27.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES [OA]

4OA1 Performance Indicator Verification

.1 Safety System Unavailability - High Pressure Injection and Heat Removal Systems

The inspectors reviewed plant records associated with the HPCI and Reactor Core Isolation Cooling (RCIC) systems in order to validate the NRC Performance Indicator (PI) data submitted by VY. Data for the fourth quarter of 2000 through the third quarter of 2001 was reviewed. The inspectors compared a sample of control room logs, event reports, and maintenance rule program records with the PI data assembled by VY. No findings of significance were identified.

4OA3 Event Follow-up

.1 (Closed) URI 50-271/01-06-01: Operability of RCIC with Water in Turbine Exhaust Line

a. Inspection Scope

The inspectors observed a RCIC system test on August 28 and discussed the results with cognizant VY engineering personnel. VY determined the RCIC test confirmed the bases of the operability determination documented in Basis for Maintaining Operation (BMO) 2001-005. The inspectors also reviewed the events that led to this phenomenon in order to determine if any performance issues contributed to this problem.

b. Findings

Green. The inspectors identified a non-cited violation of 10CFR50, Appendix B, Criterion III, "Design Control" for inadequate design control of the RCIC turbine exhaust line. Design changes installed in 1998 and 1999 combined to create an unanalyzed condition as a result of inducting torus water into the RCIC turbine's exhaust line, following a shutdown of the turbine. Subsequent analysis performed by a VY contractor determined the RCIC system and its associated containment penetrations would be capable of performing their intended safety functions with the turbine exhaust line full of water.

The RCIC turbine exhaust line vacuum breaker valves were replaced and the relief path was changed in 1998 under Engineering Design Change Request (EDCR) 98-402. The turbine exhaust line check valves were replaced and their location relative to the torus penetration was changed in 1999 under EDCR 98-409. Calculation VYC-1790, Revision 0, was used to verify the proper sizing of the RCIC vacuum breaker line. This calculation was revised in 1999 in preparation for the second modification, which relocated the exhaust line check valves. In evaluating this second design change, VY failed to recognize that although the vacuum breaker line design permits enough air to enter the turbine exhaust piping to prevent a significant water hammer, the design did

not preclude water from being drawn up into the line. When the 1999 modification relocated the turbine exhaust valves, torus water would be drawn into a portion of the exhaust piping that would not drain back into the torus and would remain trapped in this piping until the next RCIC turbine start.

The failure to provide adequate design control for the RCIC turbine exhaust line was considered more than minor since it resulted in a system configuration that had not been analyzed. However, the inspectors determined this issue was Green (of very low safety significance) based on a Phase 1 SDP evaluation. During a subsequent analysis, VY was able to show that RCIC would remain operable with the turbine exhaust line full of water, from the exhaust check valves to the highpoint of the line upstream of the torus penetration. VY's evaluation also determined the additional mechanical loading that would be imposed on the exhaust line and containment penetration would be within allowable limits. The results of surveillance testing and observations of the system's operation at the end of the Spring 2001 refueling outage support VY's conclusion.

10CFR50, Appendix B, Criterion III, "Design Control," requires that measures shall be established to assure that applicable regulatory requirements and the design basis are correctly translated into specifications, drawings, procedures, and instructions. Contrary to the above, design changes to the RCIC turbine exhaust line in 1998 (VYDC 98-402) and in 1999 (VYDC 98-409) resulted in the induction of torus water into the turbine exhaust line following shutdown of the system. As a result, the operability of the system and the integrity of the exhaust line torus penetration were subjected to previously unanalyzed conditions. This violation is being treated as a non-cited violation, consistent with Section VI.A.1 of the Enforcement Policy, issued May 1, 2000 (65FR25368). This issue was entered in VY's corrective action program as ER 2001-1695. **(NCV 50-271/01-12-01)**

.2 Licensee Event Report (LER) Reviews

The following LERs were reviewed during on-site inspections:

(Closed) LER 50-271/2001-001: Worn Protective Circuit Auxiliary Contact Results In An Invalid Protective System Actuation - Plant Trip. The unplanned reactor scram described in this LER was reviewed in NRC Inspection Report 50-271/01-02, dated May 3, 2001. All safety systems responded as designed to the scram signal and the overall plant response was normal. No new issues or violations were identified as the result of this LER review. This LER is closed.

(Closed) LER 50-271/2001-004: Exceeded Core Thermal Power Limit Due to Feedwater Flow Nozzle Fouling. Exceeding the licensed core thermal power limit by 0.22 percent due to a calibration error constitutes a violation of minor significance that is not subject to enforcement action in accordance with Section IV of the NRC's Enforcement Policy. VY entered this event into their corrective action program as ER 2001-1839 and has taken adequate immediate actions to prevent recurrence. This LER is closed.

(Closed) LER 50-271/2001-005: Primary Containment Breach Due to Broken Tubing At Hydrogen/Oxygen Monitor. This event was reviewed in NRC Inspection Report 50-271/01-11, dated December 20, 2001. A finding of very low safety significance was identified and resulted in a non-cited violation. No new issues or violations were identified as the result of this LER review. This LER is closed.

4OA6 Exit Meeting

On January 9 , 2002, the resident inspectors presented their overall findings to members of VY management led by Kevin Bronson, Plant Manager, who acknowledged the findings presented.

The inspectors asked whether any materials examined during the inspection should be considered proprietary. Where proprietary information was identified, it was returned to VY after review.

ATTACHMENT 1

SUPPLEMENTARY INFORMATION

a. List of Items Opened, Closed and Discussed

Opened and Closed

NCV 50-271/01-12-01	Inadequate design control of the RCIC turbine exhaust line

Closed

URI 50-271/01-06-01	Operability of RCIC with Water in Turbine Exhaust Line
LER 50-271/2001-001	Worn Protective Circuit Auxiliary Contact Results In An Invalid Protective System Actuation - Plant Trip
LER 50-271/2001-004	Exceeded Core Thermal Power Limit Due to Feedwater Flow Nozzle Fouling
LER 50-271/2001-005	Primary Containment Breach Due to Broken Tubing At Hydrogen/Oxygen Monitor

b. List of Acronyms

BMO	Basis for Maintaining Operation
CFR	Code of Federal Regulations
DBT	Design Basis Threat
EDCR	Engineering Design Change Request
ER	Event Report
HPCI	High Pressure Coolant Injection
JPM	Job Performance Measure
LER	Licensee Event Report
NCV	Non-Cited Violation
NRC	Nuclear Regulatory Commission
PI	Performance Indicator
RCIC	Reactor Core Isolation Cooling
SDP	Significance Determination Process
TS	Technical Specification
URI	Unresolved Item
VY	Vermont Yankee
VYC	Vermont Yankee Calculation