January 22, 2004

Mr. Jay K. Thayer
Site Vice President - Vermont Yankee
Entergy Nuclear Vermont Yankee, LLC
P.O. Box 0500
185 Old Ferry Road
Brattleboro, Vermont 05302-0500

SUBJECT: VERMONT YANKEE NUCLEAR POWER STATION - NRC INTEGRATED INSPECTION REPORT 05000271/2003007

Dear Mr. Thayer:

On December 31, 2003, the US Nuclear Regulatory Commission (NRC) completed an inspection at your Vermont Yankee Nuclear Power Station (VY). The enclosed report documents the inspection findings which were discussed on January 16, 2004, with you and members of your staff.

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

This report documents two findings of very low safety significance (Green). One of the findings was also determined to involve a violation of NRC requirements. Because of the very low safety significance and because the finding was entered into your corrective actions program, the NRC is treating it as a non-cited violation (NCV), consistent with Section VI.A of the NRC's Enforcement Policy. If you contest this non-cited violation, 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, D.C. 20555-0001; with copies to the Regional Administrator Region I; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, D.C. 20555-0001; and the NRC Resident Inspector at the Vermont Yankee Nuclear Power Station.

Since the terrorist attacks on September 11, 2001, NRC has issued five Orders and several threat advisories to licensees of commercial power reactors to strengthen licensee capabilities, improve security force readiness, and enhance controls over access authorization. In addition to applicable baseline inspections, the NRC issued Temporary Instruction (TI) 2515/148, "Inspection of Nuclear Reactor Safeguards Interim Compensatory Measures," and its subsequent revision, to audit and inspect licensee implementation of the interim compensatory measures required by order. Phase 1 of TI 2515/148 was completed at all commercial nuclear power plants during calendar year (CY) '02, and the remaining inspection activities for Vermont Yankee were completed in CY '03. The NRC will continue to monitor overall safeguards and security controls at Vermont Yankee.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC 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/adams.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 05000271/2003007
w/Attachment: Supplemental Information

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket No.	50-271
Licensee No.	DPR-28
Report No.	05000271/2003007
Licensee:	Entergy Nuclear Vermont Yankee, LLC
Facility:	Vermont Yankee Nuclear Power Station
Location:	320 Governor Hunt Road Vernon, Vermont 05354-9766
Dates:	September 28, 2003 - December 31, 2003
Inspectors:	David L. Pelton, Senior Resident Inspector Beth E. Sienel, Resident Inspector Chris R. Welch, Resident Inspector Daniel L. Schroeder, Resident Inspector Todd H. Fish, Senior Operations Engineer Joseph T. Furia, Senior Health Physicist Gilbert Johnson, Operations Engineer
Approved by:	Clifford J. Anderson, Chief Projects Branch 5 Division of Reactor Projects

SUMMARY OF FINDINGS

IR 05000271/2003007; 09/28/03 - 12/31/03; Vermont Yankee Nuclear Power Station; Licensed Operator Requalification and Identification and Resolution of Problems.

This report covered a 13-week period of baseline inspection conducted by resident inspectors. Additionally, announced inspections were performed by regional inspectors in the areas of radiation protection and licensed operator requalification. One Green non-cited violation (NCV) and one Green finding were identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, “Significance Determination Process” (SDP). Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000.

A. NRC- Identified and Self-Revealing Findings

Cornerstone: Initiating Events

Green. The inspectors identified a non-cited violation of 10 CFR 50, Appendix B, Criterion V, “Instructions, Procedures, and Drawings,” for an inadequate procedure for the development and use of work instructions for work affecting quality. Consequently, no work instructions were provided to include proper verifications of safety-related piping locations in the vicinity of core boring activities. As a result, contractor personnel inadvertently perforated the "B" SW supply header while core boring.

This finding is greater than minor because it resulted in the degradation of the SW system. However, the inspectors determined that this issue is of very low safety significance (Green) because the performance deficiency did not result in an increase in the likelihood of a loss of service water initiating event and it did not result in a loss of safety function of the system. (Section 4OA2.3)

Cornerstone: Mitigating Systems

Green. A finding was identified associated with operating crew performance on the simulator during facility-administered requalification examinations. Of nine crews evaluated, two failed to pass their simulator examinations.

The finding is considered to be greater than minor because it reflected the potential inability of the operating crews to take appropriate safety-related actions in response to actual abnormal or emergency conditions. The finding is of very low safety significance (Green) because less than 34 percent of the operating crews failed, the failed crews were remediated prior to returning to shift, and there were no operating crew failures the previous year. (Section 1R11.2)

B. Licensee Identified Findings

None.

REPORT DETAILS

Summary of Plant Status

At the beginning of the inspection period, Vermont Yankee Nuclear Power Station was shut down due to a step-change in drywell leakage which required a technical specification-required shut down on September 27. The increased leakage was found to be due to a packing leak on a reactor head vent valve, V2-19. Following repairs to the valve, operators took the reactor critical the evening of September 28. On September 29, operators again shut down the reactor to replace the "B" recirculation pump seal which failed during the start up. After the recirculation pump seal was replaced, operators took the plant critical on October 2. Following restoration to approximately 100% power on October 5, Vermont Yankee operated throughout the remainder of the inspection period at or near full power, with only minor power reductions for control rod pattern adjustments or surveillances.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R01 Adverse Weather Protection (71111.01)

1. Readiness for Seasonal Susceptibilities

a. Inspection Scope (one sample)

The inspectors reviewed measures established by the licensee for minimizing the impact of cold weather on the condensate storage tank (CST) and associated instrumentation. The inspectors reviewed the Individual Plant Examination of External Events (IPEEE), the Updated Final Safety Analysis Report (UFSAR), and the associated design basis documents (DBDs) to ensure all weather-related vulnerabilities had been identified and appropriately addressed. The inspectors reviewed condition reports (CRs) related to the CST focusing on weather-related issues and reviewed CST temperatures recorded during operator rounds in December to ensure that appropriate corrective actions were taken if the temperature in the area fell below the administrative limits identified. Finally, the inspectors walked down the CST enclosure to ensure physical protection against cold weather was in place and intact.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment (71111.04)

a. Inspection Scope (three samples)

The inspectors performed three partial system walk-downs of risk significant systems to verify system alignment and to identify any discrepancies that could impact system operability. Observed plant conditions were compared to the standby alignment of equipment specified in the licensee's system operating procedures. The inspectors also

observed valve positions, the availability of power supplies, and the general condition of selected components to verify there were no obvious deficiencies. The inspectors verified the alignment of the following systems:

- The "A," "B," and "D" trains of residual heat removal service water (RHRSW) during planned maintenance of the "C" train of RHRSW on October 27, 2003;
- The "B," "C," and "D" trains of RHRSW during planned maintenance of the "A" train of RHRSW on November 3, 2003; and
- The "A" and "B" trains of the service water (SW) system during planned maintenance of the alternate cooling system on November 12, 2003.

b Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05Q)

a. Inspection Scope (seven samples)

The inspectors identified seven areas important to plant risk based on a review of the licensee's Safe Shutdown Capability Analysis and IPEEE. Additional plant areas were selected based on their increased significance due to on-going plant maintenance. The inspectors toured these plant areas important to safety in order to verify the suitability of the licensee's control of transient combustibles and ignition sources, and to evaluate the material condition and operational status of fire protection systems, equipment, and barriers. In addition, the inspectors discussed attributes of several of the areas with the fire protection engineer. The following fire areas were inspected:

- Main and auxiliary transformers (no fire zone designation);
- Radwaste corridor (fire zone FA 13);
- Reactor Building (RB), 318 feet elevation (fire zone FZ RB7);
- "A" emergency core cooling system (ECCS) corner room (fire zone FZ RB2);
- "B" ECCS corner room (fire zone FZ RB2);
- High pressure coolant injection (HPCI) room (fire designation FZ RB2); and
- Discharge structure (no fire zone designation).

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures (71111.06)

a. Inspection Scope (one sample)

The inspectors reviewed the flood protection actions implemented by the licensee in support of planned maintenance of the RHRSW system on the 213 feet elevation of the reactor building. Items focused on during this inspection included the removal of a floor plug on the 252 feet elevation of the reactor building and the condition of adjacent watertight doors, penetrations, and floor drains. The inspectors compared observed conditions to the requirements of the licensee's UFSAR, IPEEE, Vermont Yankee Operating Procedure (OP) 2217, "Temporary Flood Barrier Installation and Removal," and reviewed completed form VYAPF 0077.01, "Barrier Control Permit."

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification (71111.11)

1. Requalification Activities Review by the Resident Staff (71111.11Q)

a. Inspection Scope (one sample)

The inspectors reviewed training presented to licensed operators regarding recent significant modifications made to the reactor plant and changes made to plant operations. The inspectors reviewed training material to ensure lessons learned and industry experience had been incorporated. The following training material was reviewed:

- Licensed Operator Requalification (LOR) Training Program Instructor Guide LOR-23-101, Scenario 1, Events 5 and 6, "EPR [electronic pressure regulator] Modifications and Operation";
- LOR-23-101, Scenario 1, Events 2, 3, and 4, "Feedwater Level Control System Modifications and Operation"; and
- LOR-23-501, Scenario 4, Event 1, "Recirculation Pump Instability Region."

The inspectors reviewed comments generated by training instructors regarding operator performance during evaluated training sessions covering the above material. The inspectors performed walk-downs of the main control room and the plant-specific simulator to ensure adequate simulator physical fidelity (i.e., to ensure changes were made to the simulator to reflect the physical changes, operational changes, and changes in plant response resulting from recent modifications and changes in operation). The inspectors reviewed simulator deficiency logs to ensure simulator deficiencies were being entered into the licensee's corrective action program in accordance with Vermont Yankee Simulator Administration Manual SIM-343, "Discrepancy Reporting."

b. Findings

No findings of significance were identified.

2. In-Office Review of Licensed Operator Requalification Examination Results (71111.11B)

a. Inspection Scope (one sample)

The inspectors conducted an in-office review of two comprehensive written exams to ensure that exam quality met or exceeded the criteria of the Examination Standards and 10 CFR 55.59.

The inspectors also reviewed the results of the licensee-administered annual operating tests and comprehensive written exams for 2003. The inspection assessed whether pass rates were consistent with the guidance of NRC Manual Chapter 0609, Appendix I, "Operator Requalification Human Performance Significance Determination Process (SDP)." The inspectors reviewed:

- The operating crew failure rates;
- The individual operator failure rate on the dynamic simulator test;
- The individual failure rates on the walk-through test;
- The individual failure rate on the comprehensive written exam; and
- The overall failure rate among individual operators for all portions of the exam.

b. Findings

Introduction A finding of very low safety significance (Green) was identified for two of nine crews failing their facility-administered annual simulator examinations.

Description During facility-administered annual operating testing of the licensed operators, licensee training staff evaluated crew performance on dynamic simulator scenarios using performance standards derived from NUREG-1021, "Operator Licensing Examination Standards for Power Reactors." Facility results of crew performance showed that two of the nine crews evaluated (22.2 percent) did not pass their simulator exams. The licensee initiated CR 2003-1975 for the first crew failure, CR 2003-1976 for the second crew failure, and CR 2003-1977 to address the trend in crew failures.

Analysis The inspectors determined that the crew failures constituted a performance deficiency because licensed operators are expected to operate the plant with acceptable standards of knowledge and abilities, as demonstrated through required periodic testing. Traditional enforcement does not apply because the issue did not have any actual safety consequence or potential for affecting the NRC's regulatory function and was not the result of any willful violation of NRC requirements or licensee procedures. The finding is greater than minor because the performance deficiency affected at least the Mitigating Systems Cornerstone (and potentially Initiating Events and Barrier Integrity) objective and its related attribute regarding Human Performance. Specifically, the finding reflected the potential inability of the crews to take appropriate safety related actions in response to actual abnormal or emergency conditions. The perceived risk associated with the number of crews failing the annual operating tests is provided in the Simulator Operational Evaluation Matrix of NRC Manual Chapter 0609, Appendix I, "Operator

Requalification Human Performance Significance Determination Process (SDP)." The Matrix was entered using the number of crews that took the simulator test; nine and the number of crews with unsatisfactory performance; two. Based on the results indicated by the Matrix, the fact that the failed operating crews were remediated (i.e., operating crews were re-trained and successfully retested) prior to returning to shift, and because there were no operating crew failures the previous year, the finding was characterized as having very low safety significance or Green.

Enforcement NRC regulations require that licensed operators pass an annual operating test; the regulations do not specify minimum pass/fail rates. Additionally, crews who failed the annual operating test were properly remediated prior to returning to shift. Therefore, no violation of regulatory requirements occurred: FIN 50-271/03-07-01, Two of Nine Operating Crews Failing Their Facility-Administered Annual Simulator Examinations.

1R12 Maintenance Effectiveness Implementation (71111.12)

1. Bi-Annual Periodic Evaluation Inspection (71111.12B)

a. Inspection Scope (six samples)

The inspectors reviewed the periodic evaluation required by 10 CFR 50.65 (a)(3) for Vermont Yankee facility to verify that the structures, systems, and components (SSCs) within the scope of the maintenance rule were included in the evaluation and, balancing of reliability and unavailability was given adequate consideration. The inspectors reviewed the licensee's most recent periodic evaluation report which covered the interval from May 20, 2001 through November 1, 2002. The inspectors reviewed the periodic evaluation to verify that it was completed within the required two year time period.

The inspector selected the following systems that were either of high risk significance or listed in an (a)(1) status for detailed review:

- Heating, ventilation and air conditioning;
- Feedwater;
- HPCI;
- Control rod drive;
- Instrument air; and
- 125 volt direct current (DC).

The inspectors conducted the review to verify that: (1) goals and performance criteria were appropriate, (2) industry operating experience was considered, (3) problem identification and resolution of maintenance rule-related issues were addressed, (4) corrective action plans were effective, and (5) performance was being effectively monitored. The inspectors reviewed adjustments that were made in action plans for SSCs in (a)(1) status as a result of the licensee's review of system performance against established goals. The inspectors reviewed documentation for a sample of high safety significant SSC's to verify that the licensee balanced reliability and availability/unavailability and adjusted (a)(1) goals as necessary.

The inspectors reviewed to verify that the licensee had established appropriate performance criteria for these systems and that they had examined any functional failures experienced by these SSCs against those performance criteria for consideration of moving the SSC to an (a)(1) status.

b. Findings

No findings of significance were identified.

2. Routine Maintenance Effectiveness Inspection (71111.12Q)

a. Inspection Scope (one sample)

The inspectors performed one history-oriented inspection of the recirculation pump seals. The inspectors reviewed the system's maintenance rule scoping document, most recent system health report, maintenance rule functional failure determination for the recent failure of the "B" recirculation pump inner seal, and corrective actions taken in response to the equipment problems in accordance with station procedures and the requirements of 10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants." The inspectors also reviewed to confirm that the licensee appropriately tracked the occurrences against the system's performance criteria, both for functional failures and unavailability time, as applicable.

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessment and Emergent Work Evaluation (71111.13)

a. Inspection Scope (four samples)

The inspectors evaluated on-line risk management for four planned maintenance activities. The inspectors reviewed maintenance risk evaluations, work schedules, recent corrective actions, and control room logs to verify that other concurrent or emergent maintenance activities did not significantly increase plant risk. The inspectors compared reviewed items and activities to requirements listed in procedures AP 0125, "Equipment Release," and AP 0172, "Work Schedule Risk Management - Online." The inspectors reviewed the following on-line work activities:

- Planned outage of the Vernon tie-line (i.e., the licensee's station blackout power supply) concurrent with the planned outage of 125 volt battery B-AS-1;
- Planned limiting condition for operation (LCO) outage of the "C" train of RHRSW involving both Yellow and Orange on-line risk;
- Planned LCO outage of the "A" train of RHRSW involving both Yellow and Orange on-line risk; and
- Planned LCO outage of the alternate cooling system.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope (two samples)

The inspectors reviewed two operability determinations prepared by the licensee. The inspectors evaluated the reviewed operability determinations against the requirements and guidance contained in NRC Generic Letter 91-18, "Resolution of Degraded and Nonconforming Conditions," as well as procedure AP 0167, "Operability Determinations." The inspectors verified the adequacy of the following evaluations of degraded or non-conforming conditions:

- Packing leakage and scored valve stem on main steam isolation valve (MSIV) V2-86D; and
- Failure of the diesel-driven fire pump to meet Technical Requirements Manual (TRM) requirements for discharge pressure and flow.

b. Findings

No findings of significance were identified.

1R16 Operator Work-Arounds (71111.16)

a. Inspection Scope (one sample)

The inspectors reviewed the following to assess their impact, both individually and cumulatively, on the station operators' ability to respond to plant transients and accidents in a correct and timely manner:

- Operator work arounds;
- Operator burdens;
- Temporary modifications;
- Main control room annunciator deficiencies;
- Control room deficiencies;
- Danger and caution tags in effect for greater than 60 days; and
- Lineup deviations.

The impact on system reliability, availability, and the potential for mis-operation was also considered. The inspectors performed walk-downs of the reactor building, turbine building, screen house and emergency diesel generator rooms to identify significant operator work arounds or burdens not captured in the licensee's program.

b. Findings

No findings of significance were identified.

1R17 Permanent Plant Modifications (71111.17A)

a. Inspection Scope (one sample)

The inspectors reviewed minor modification package 2002-036, "Replacement of P-8-1C Suction Barrel," and compared the package to the requirements of Vermont Yankee Administrative Procedure (AP) 0020, "Control of Temporary and Minor [permanent] Modifications." The inspectors performed in-field observations of the suction barrel replacement and of removed RHRSW system piping and components. The inspectors also reviewed the adequacy of the design of the modification; the licensee's preparation, staging, and implementation of the modification; and the testing performed to verify proper installation of the modification and to ensure the reestablishment of system operability.

b. Findings

No findings of significance were identified.

1R19 Post Maintenance Testing (71111.19)

a. Inspection Scope (six samples)

The inspectors reviewed six post-maintenance test (PMT) activities on risk-significant systems. Where testing was directly observed, the inspectors verified that installed test equipment was appropriate and controlled and that the test was performed in accordance with applicable station procedures. The inspectors either directly observed or reviewed completed PMT documentation to verify that the test data met the required acceptance criteria contained in the licensee's Technical Specifications (TS), UFSAR, Vermont Yankee Program Procedure (PP) 7013, "In-Service Testing Program Implementation," and procedure AP 4000, "Surveillance Testing Program." The inspectors also ensured that the test activities were adequate to ensure system operability and functional capability following maintenance; that systems were properly restored following testing; and that any discrepancies had been appropriately documented in the corrective actions program. The inspectors reviewed the following PMT activities:

- Testing of the "A" RHRSW system following planned maintenance, in accordance with Minor Modification 2002-037 and OP 4124, "Residual Heat Removal and Residual Heat Removal Service Water System Surveillance";
- Testing of the "C" RHRSW system following planned maintenance, in accordance with Minor Modification 2002-036, "Replacement of P-8-1C Suction Barrel," and OP 4124;
- Testing of the "E" Average Power Range Monitor (APRM) following emergent repair activities, in accordance with OP 4302, "Average Power Range Monitor Functional (RMSS [reactor manual shutdown switch] in Run)";
- Testing performed following planned maintenance on alternate cooling system tower CT 2-1;
- Testing performed following emergent work to repair a failed card in the HPCI system flow controller; and
- Testing performed following planned replacement of the reactor core isolation cooling (RCIC) relief valve.

b. Findings

No findings of significance were identified.

1R20 Refueling and Outage Activities (71111.20)

a. Inspection Scope (one sample)

From September 28 through October 2, 2003, Vermont Yankee was in a forced outage due to unidentified drywell leakage that had exceeded TS limits followed by the failure of the "B" recirculation pump seal. The inspectors reviewed the following areas related to the forced outage for conformance to technical specification requirements and approved procedures. Selected activities were verified for each evolution.

- Shutdown risk evaluations;
- Startup Scheduling;
- Plant heat-up;
- Criticality following recirculation pump seal replacement;
- Power ascension; and
- Synchronization of the main generator to the grid

The inspectors observed portions of the reactor and plant shutdown to verify that control room personnel were appropriately focused on plant operations and that technical specification requirements were satisfied. During the outage, the inspectors reviewed equipment that had been taken out of service and verified compliance with technical specifications as well as verifying that adequate redundant systems or subsystems remained available to satisfy key safety functions. The inspectors observed portions of the reactor and plant startup to verify, on a sampling basis, that prerequisite conditions had been met and that control room personnel were appropriately focused on plant operations.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope (five samples)

The inspectors observed surveillance testing to verify that the acceptance criteria specified for each test was consistent with the requirements of the licensee's TS and UFSAR, to verify that testing was performed as written in the procedure, that the test data was complete and met procedural requirements, and that the system was properly returned to service following the completion of testing. The inspectors reviewed procedure PP 7013, "In-Service Testing Program Implementation," procedure AP 4000, "Surveillance Testing Program," and observed selected pre-job briefings supporting testing. The inspectors also verified that discrepancies identified had been entered into

the corrective actions program. The inspectors verified that testing in accordance with the following procedures met the above requirements:

- OP 4105, “Fire Protection Systems Surveillance,” Section D, “Eighteen Month Fire Pump Operational Performance and Capacity Check and Diesel Fire Pump Alarm/Shutdown Test”;
- OP 4126, “Diesel Generator Surveillance,” Section B.1, “Diesel Generator Readiness Demonstration - Monthly (Remote Control Mode - Locally Set for Slow Start)”;
- OP 4181, “Service Water/Alternate Cooling System Surveillance,” Section A, “Service Water Pump Operability and Discharge Check Valve Test”;
- OP 4181, “Service Water/Alternate Cooling System Surveillance,” Section E, “Service Water Piping Delta P [pressure] Test”; and
- OP 4400, “Calibration of the Average Power Range Monitoring System to Core Thermal Power.”

b. Findings

No findings of significance were identified.

1R23 Temporary Modifications (71111.23)

a. Inspection Scope (one sample)

The inspectors reviewed temporary modification (TM) 2003-019, “Install Temporary Instrumentation to Monitor Drywell-To-Torus D/P [differential pressure] Low Alarm Module” to ensure that the modification did not adversely affect the availability, reliability, or functional capability of any risk-significant structures, systems, or components. The inspectors compared the information in TM 2003-019 to the licensee’s TM program requirements contained in AP 0020. The inspectors also performed walk-downs of accessible portions of this TM to verify that required tags and markings had been applied and that the TM was being properly maintained. The inspectors also reviewed a sample of TM-related problems identified in the licensee’s corrective actions program to verify that the licensee had identified and implemented appropriate corrective actions.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Cornerstone: Public Radiation Safety

2PS2 Radioactive Material Processing and Shipping (71122.02)

a. Inspection Scope (six samples)

The inspectors reviewed the licensee’s program for the collection, processing, treatment, shipping, storage and disposal of radioactive materials and radwaste. The

inspectors conducted reviews of in-plant liquid and solid waste systems; waste processing and sampling program; shipment activities and records; and quality assurance, including corrective action reports; and training.

The inspectors conducted system reviews, which included system descriptions, control panel review, facilities tours, and a review of system changes in accordance with 10 CFR 50.59. Systems and subsystems reviewed included high purity waste processing, low purity waste processing, chemical waste processing, detergent waste processing, and solid waste processing.

The inspectors toured current and "abandoned-in-place" radwaste equipment and facilities and interim storage locations used for processed radwaste. Areas toured included the condensate phase separator tanks (TK-23-1A & -1B) room; the spent resin tank (TK-30-1A) room (this equipment is considered abandoned-in-place); the waste sludge tank (TK-18-1A) room; the floor drain collector, waste collector, and chemical waste collector tanks (TK-15-1A, TK-9-1A, & TK-19-1A) room; and the cask handling room.

The inspectors reviewed data collected by the licensee's chemistry department to track and trend the performance of various radwaste processing systems including the reactor water clean-up system, the spent fuel pool clean-up system, the condensate drain system, the reactor building floor drain system; and the reactor building equipment drain system.

The inspectors reviewed the licensee's Process Control Program including procedure PP 7504, "Process Control Program"; procedure OP 2527, "Sampling and Analysis for Radwaste Classification"; various process documentation; scaling factor derivations; sampling types; sampling frequencies; the effect of changing plant conditions; and determination of waste characteristics and waste classification.

The inspectors selected the following five solid radwaste shipping records for detailed review against the requirements contained in 10 CFR Parts 20, 61 and 71, and 49 CFR Parts 100-177: 2003-30, "Shipment of dry, active waste"; 2003-32, "Shipment of condensate system resin"; 2003-35, "Shipment of six safety relief valves"; 2003-40, "Shipment of condensate system resin"; and 2003-41, "Shipment of manhole samples." The inspectors also conducted direct observations of shipment 2003-70 involving dry active wastes.

The inspectors reviewed the licensee's program for assurance of quality in the radwaste processing and radioactive materials transportation program by reviewing quality assurance audits and surveillances (Audit Report No. AR-2002-03; Quality Assurance Activity-Based Surveillance Report 2003-021; Standard Surveillance Report 2003-044); departmental self-assessments (Radiation Protection Department Self-Assessment Report 2003-2); and CRs involving the radwaste and transportation program in 2003.

The inspectors reviewed the licensee's program of training for personnel involved in the radwaste and radioactive materials transportation program with regard to the requirements contained in NRC IE Bulletin 79-19 and 49 CFR, Subpart H (NRC Inspection No. 50-271/2003-005). Records reviewed during this inspection included test

questions, examinations and examination scores. Reviewed records were for licensee personnel in radiation protection and radwaste.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151)

a. Inspection Scope (four samples)

The inspectors sampled licensee submittals for the performance indicators (PIs) listed below for the period from October 2002 to September 2003. The PI definitions and guidance contained in Nuclear Energy Institute (NEI) 99-02, "Regulatory Assessment Indicator Guideline" and Vermont Yankee Administrative Procedure (AP) 0094, "NRC Performance Indicator Reporting," were used to verify the accuracy and completeness of the PI data reported during this period.

Mitigating Systems Cornerstone

- Emergency Alternating Current (AC) Power System Unavailability;
- Residual Heat Removal System Unavailability; and
- Safety System Functional Failures.

The inspectors reviewed licensee event reports (LERs), portions of operator logs, Maintenance Rule Program out-of-service logs, equipment operational data (i.e., pump or motor start/stop data), condition reports, and work orders. The inspectors also interviewed System Engineering Department and Technical Support Department personnel responsible for the collection, evaluation, and distribution of the PIs.

Public Radiation Safety Cornerstone

- Radiological Effluent Technical Specifications (RETS)/Off-Site Dose Calculations Manual (ODCM) Radiological Effluent Occurrences.

The inspectors reviewed a listing of licensee condition reports for issues related to radiological effluent release occurrences at the site that may have exceeded 1.5 mrem per quarter whole body or 5 mrem per quarter organ dose for liquid effluents; or 5 mrads per quarter gamma air dose, 10 mrads per quarter beta air dose; or 7.5 mrem per quarter organ doses from I-131, I-133, H-3 and particulates for gaseous effluents.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems (71152)

1. Routine Review of Identification and Resolution of Problems

a. Inspection Scope

The inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify these issues were being entered into the licensee's corrective action system at an appropriate threshold and that adequate attention was being given to timely corrective actions. Additionally, in order to identify repetitive equipment failures and/or specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the licensee's corrective action program. This review was accomplished by reviewing selected hard copies of condition reports (a listing of CRs reviewed is included in the Attachment to this report) and by attending daily screening meetings.

b. Findings

No findings of significance were identified.

2. Annual Sample Review of Recirculation Pump Seal Failures

a. Inspection Scope (one sample)

The inspectors selected the recirculation pumps for inspection based on the recent failure of the "B" recirculation pump inner seal on September 29, 2003, and seal wear issues identified over the past several years. A listing of reviewed CRs is included in the Attachment to this report. The CRs were reviewed to ensure the full extent of documented issues were identified, an appropriate evaluation was performed, and appropriate corrective actions were specified and prioritized. The inspectors evaluated CRs against the requirements of AP 0009, "Condition Reports," Revision 15. The inspectors reviewed the root cause report for the most recent failure and discussed the results of that evaluation and the licensee's planned corrective actions with the responsible system engineers to understand the basis of established long-term corrective actions.

b. Findings and Observations

No findings of significance were identified. The inspectors concluded that the completed immediate and planned short and long-term corrective actions were appropriate.

3. Annual Sample Review of Inadvertent Perforation of the "B" SW Header

a. Inspection Scope (one sample)

The inspectors selected the licensee's September 8, 2003, inadvertent breach of the "B" service water (SW) header for review based on the potential risk significance of degrading one train of a safety related system. The inspectors reviewed the licensee's root cause analysis and proposed corrective actions to ensure the full extent of the issue was identified, an appropriate evaluation was performed, and appropriate corrective actions were specified and prioritized. The inspectors also discussed the

results of the licensee's evaluation and identified corrective actions with engineering management personnel.

b. Findings

Introduction: A Green, NRC-identified NCV was identified for an inadequate procedure for the development and use of work instructions for activities affecting quality as required by 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings."

Description: The inspectors identified a finding regarding the adequacy of the licensee's procedure of the development and use of work instructions as they related to core boring activities performed in the vicinity of subterranean, safety-related, system piping. Core boring, in this case, involved drilling into the ground to assess soil composition.

On September 8, 2003, contractor personnel inadvertently perforated the "B" SW supply header while performing core boring. The leak was identified by contractor personnel who noted water issuing unexpectedly from the core bore location. No change in service water header pressure was noted by control room operators and no additional SW pumps automatically started or were required to be started to maintain SW header pressure. The SW system was declared inoperable and, within a few hours, the affected section of the "B" SW header was isolated to effect repairs. On September 12, following the completion of a code repair of the piping, the licensee realigned the affected piping and the SW system was declared operable.

In their root cause analysis, the licensee determined that there were several root and contributing causes of the event including failure to develop a specific work order (i.e., work instruction) for the performance of the core boring activities; contractor personnel's over reliance on ground-penetrating radar and failure to use station system drawings to verify the location of subterranean piping (including SW system piping); the cognizant station engineer was assigned too many concurrent tasks; and project management ownership was not clearly established. Although the root cause was generally thorough, the deficiency with the work order procedure was not identified by the licensee.

Analysis: In accordance with Inspection Manual Chapter (IMC) 0612, Appendix B, "Issue Disposition Screening," the inspectors determined that the issue was more than minor because it was associated with the equipment performance attribute of both the initiating event and mitigating systems cornerstone objectives. Specifically, the availability and reliability of the service water system was adversely impacted by inadequate work controls associated with core boring activities in the protected area. In accordance with IMC 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At-Power Situations," the inspectors conducted an SDP Phase 1 screening and determined that an SDP Phase 2 evaluation was required because the performance deficiency degraded two cornerstones, initiating event and mitigating systems. The inspectors conducted an SDP Phase 2 evaluation of the risk significance of the performance deficiency and determined that the finding was of very low safety significance (Green) because the performance deficiency did not result in an increase in the likelihood of a loss of service water initiating event and it did not result in a loss of safety function of the system.

Enforcement: 10 CFR 50, Appendix B, Criterion V states, in part, that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a

type appropriate to the circumstances. Vermont Yankee Administrative Procedure (AP) 0021, "Work Orders," Revision 33, provides instructions for the development and use of work orders (i.e., work instructions). Contrary to the above NRC requirement, procedure AP 0021 did not contain requirements to ensure a work order (i.e., work instructions) would be developed for work affecting quality. Consequently, no work instructions were provided to include proper verifications of safety-related piping locations in the vicinity of core boring activities. As a result, on September 8, 2003, contractor personnel inadvertently perforated the "B" SW supply header while core boring. Because the finding was of very low safety significance and has been entered into the licensee's Corrective Actions Program (CR 2003-1957), this violation is being treated as a Non-Cited Violation (NCV), consistent with Section VI.A of the NRC Enforcement Policy: NCV 50-271/03-07-02, Failure to Provide Adequate Work Instructions Resulted in "B" Service Water Header Degradation.

The inspectors concluded that the completed and planned immediate, short, and long-term corrective actions were appropriate.

4OA6 Meetings, including Exit

Resident Exit

On January 16, 2004, the resident inspectors presented the inspection results to Mr. J. Thayer and members of his staff. The inspectors asked whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel:

J. Thayer	Site Vice President
K. Bronson	General Plant Manager
P. Corbett	Maintenance Manager
J. Dreyfuss	Project Engineering Manager
J. Devincentis	Licensing Manager
J. Geyster	Radiation Protection Superintendent
D. Giorowall	Programs Supervisor
S. Goodwin	Mechanical Design Department Manager
M. Gosekamp	Superintendent of Operations Training
D. Leach	Director of Engineering
R. Morissette	Principal As Low As Reasonably Achievable (ALARA) Engineer
M. Pletcher	Radiation Protection Supervisor - Instruments
B. Renny	Supervisor, Access Authorization
K. Stupak	Technical Training
C. Wamser	Operations Manager
R. Wanczyk	Director of Nuclear Safety

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-271/03-07-01	FIN	Two of Nine Operating Crews Failing Their Facility-Administered Annual Simulator Examinations (Section 1R11.2)
50-271/03-07-02	NCV	Failure to Provide Adequate Work instructions Resulted in “B” Service Water Header Degradation (Section 4OA2.3)

Closed

50-271/03-07-01	FIN	Two of Nine Operating Crews Failing Their Facility-Administered Annual Simulator Examinations (Section 1R11.2)
50-271/03-07-02	NCV	Failure to Provide Adequate Work Instructions Resulted in “B” Service Water Header Degradation (Section 4OA2.3)

LIST OF DOCUMENTS REVIEWED

Section 4OA2.1: Routine Review of Problem Identification and Resolution

Condition Reports (CRs)

2000-0675	Recirculation pump seal adverse trend
2003-1957	Core bore into service water header
2003-2132	"B" Recirc pump inner seal leakage hi/lo alarm
2003-2139	Packing leak on MSIV V2-86D
*2003-2244	Untimely initiation of condition reports
2003-2258	Vernon dam generator trips
2003-2268	Cable tray walkdowns identify additional missing cable tray covers
2003-2272	Missed AP-4000 surveillance for service water system leakage code case
2003-2275	Temporary modification status not logged per AP-0020
2003-2277	LCO action statement not entered for differential pressure surveillance testing
*2003-2307	APRM amplifier and flow control reference card relay clips missing
*2003-2329	Corrective action to address ER 03-1368 not completed in a timely manner ("B" EDG fan louver motor replacement
*2003-2330	Inconsistencies between maintenance rule data base and system health reports
*2003-2331	Individual sample for gamma spectrography data lost
2003-2415	DPS-104-76B-1 found corroded terminals during maintenance
2003-2429	AP 0009 requirements for operability determinations not followed
2003-2441	Inadequate training and untimely change management for implementation of new corrective actions program
*2003-2452	Pump P-7-1B oil level low
*2003-2453	PI-104-22B as-left calibration data out of specification
*2003-2455	CR not written for out of specification calibration data
*2003-2457	As-left calibration data out of specification for river temperature
2003-2491	Fan blade pitch angle on CT-2-1 found out of expected range
2003-2535	The HPCI flow controller is erratic in automatic
2003-2622	RCIC relief valve setpoint test failure

*Inspector-identified issue.

LIST OF ACRONYMS

ADAMS	Automated Document Access Management System
AP	Vermont Yankee Administrative Procedure
APRM	Average Power Range Monitor
CFR	Code of Federal Regulations
CRs	Condition Report
CST	Condensate Storage Tank
CY	Calendar Year
ECCS	Emergency Core Cooling System
HPCI	High Pressure Coolant Injection
IMC	Inspection Manual Chapter
IPEEE	Individual Plant Evaluation of External Events
LCO	Limiting Condition for Operation
LOR	Licensed Operator Requalification
MSIV	Main Steam Isolation Valve
NCV	Non-Cited Violation
NRC	Nuclear Regulatory Commission
OP	Vermont Yankee Operating Procedure
PIs	Performance Indicator
PMT	Post Maintenance Testing
PP	Vermont Yankee Program Procedure
RB	Reactor Building
RCIC	Reactor Core Isolation Cooling
RHRSW	Residual Heat Removal Service Water
SDP	Significance Determination Process
SSCs	Structures, Systems, and Components
SW	Service Water
TM	Temporary Modification
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
VY	Vermont Yankee