U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No.	90-18
Docket No.	50-271
Licensee No.	DPR-28
Licensee:	Vermont Yankee Nuclear Power Corporation RD 5, Box 169 Ferry Road Brattleboro, VT 05301
Facility:	Vermont Yankee Nuclear Power Station Vernon, Vermont
Inspection Period:	November 27, 1990 - January 5, 1991
Inspectors:	Harold Eichenholz, SRI Thomas G. Hiltz, Resident Inspector John B. Macdonald, SRI, Pilgrim Richard S. Barkley, Project Engineer
Approved by:	Richard S. Barkley, Acting Chief, Section 3A 1/14/91 for John F. Rogge, Chief, Reactor Projects Section 3A Date

Inspection Summary: This inspection report documents routine resident safety inspections conducted between November 27, 1990 and January 5, 1991. Station activities inspected during this period included: plant operations; radiation protection; surveillance and maintenance; emergency preparedness; security; engineering and technical support; and safety assessment and quality verification.

Results: Inspection results and conclusions are summarized in the attached Executive Summary.

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EXECUTIVE SUMMARY

Vermont Yankee Nuclear Power Station
Report No. 50-271/90-18

Plant Operations

The unit experienced an unusual number of controlled power transients due to offsite transmission system problems and extremely light load grid conditions. Adequacy of corrective actions, levels of review, and event analysis surrounding an APRM miscalibration (LER 90-17) remain unresolved (UNR 90-18-001). A previous violation (VIO 89-04-01) regarding inadequate verification of fire suppression operability is closed based on USNRC review of an alternate testing method report. No deficiencies were noted during the performance of Engineered Safety Feature (ESF) walkdowns of the High Pressure Coolant Injection system and the Residual Heat Removal system. Routine inspection of the reactor building and the turbine building identified some minor safety concerns involving placement of internally contaminated tubing, application of greases to valve stems, placement of material on instrument sensing lines, a broken pipe hanger, and a level indication mismatch.

Radiological Controls

A Technical Specification required locked high radiation area door was found closed but unlocked (LER 90-16) and is considered a non-cited violation (NCV 90-18-002). A reduction in the number of contaminated areas is noted. Personnel monitoring practices when exiting the Radiological Controlled Area (RCA) are reviewed and determined to be adequate. A weakness is identified involving the adequacy of Vermont Yankee program to thoroughly investigate the sources of contamination and work activities associated with personnel clothing contamination events. One weakness is identified in the posting of contaminated areas.

Maintenance and Surveillance

Maintenance activities associated with the replacement of DC generator brushes for the Rotating Uninterruptable Power Supply and with the repair of a reactor building ventilation valve (SB-10) were well coordinated. The conduct of observed surveillance testing is evaluated favorably.

Emergency Preparedness

Three tests/drills in the emergency preparedness area were completed satisfactorily. These tests/drills included public notification siren testing, a medical emergency response drill, and an emergency call-in communications test.

Security

Vermont Yankee response to a security threat was appropriate. The security threat was determined to be not credible.

Executive Summary

Engineering and Technical Support

Unresolved item 89-02-02 regarding Vermont Yankee's review of battery cell differential temperature limits is reviewed and closed.

Safety Assessment and Quality Verification

The expected safety benefits from the Engineering Department reorganization are discussed. The process for resolution of reportability determination differences is discussed and inspector conclusions developed to help achieve consistent reportability determinations are presented. An unresolved item (90-09-02) involving the adequacy of the safety evaluation for closure of Core Spray (CS)-11B valve is closed. Recent Nuclear Safety Audit and Review Committee activities indicate that the committee is fulfilling its safety audit review responsibilities.

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DETAILS

1.0 SUMMARY OF FACILITY ACTIVITIES

Power operations continued throughout the inspection period. Offgas activity levels were consistently below 25,000 uCi/sec and analysis indicated the activity level was primary due to recoil effects. Reactor coolant conductivity exhibited an increasing trend during the inspection period and Vermont Yankee continued to investigate the root cause.

On December 14, 1990, Vermont Yankee reduced power to approximately 80 percent of rated thermal power due to inadequate relaying reliability on an offsite power distribution line (Vermont Yankee-Scobie Pond 379 line). On December 15, power was further reduced to approximately 50 percent of rated thermal power to perform the first Cycle 15 rod pattern exchange and conduct corrective maintenance on Main Steam Line area temperature switches, clean water box tube sheets, troubleshoot Feedwater Control system instabilities, and repair several steam leaks. On December 19, following corrective actions on the 379 line and second pass rod pattern adjustment, the reactor returned to 100 percent of rated thermal power. On December 23 and 24, extremely light load conditions on the power grid required brief power reductions to approximately 96 percent of rated thermal power. Support for additional offsite maintenance activities on the 379 line resulted in brief power reductions on December 24 and December 28, 1990.

On November 26, 1990, an inboard, air-operated, reactor building ventilation inlet isolation valve (SB-10) failed to close during maintenance activities and was declared inoperable. In order to meet Secondary Containment Technical Specifications, the Standby Gas Treatment (SBGT) system was placed in-service, and the Reactor Building Ventilation system removed from service (shut isolation valves: SB-9, SB-11, SB-12). Because the SBGT system has a much smaller air turnover rate than Reactor Building ventilation, the Reactor building was declared a Airborne Radioactivity Area on December 3, 1990 due to the buildup of noble gases. On December 7, SB-10 was repaired, declared operable and the Reactor Building ventilation system returned to service.

From November 26 to December 5, 1990, the process computer (GEPAC-4020) was disconnected and replaced. The Safety Parameter Display System (SPDS) was periodically disabled during this evolution.

On December 17, 1990, the USNRC:NRR issued Amendment Number 127 to Vermont Yankee's Facility Operating License Number DPR-28 changing the expiration date of the Facility Operating License from December 11, 2007 to March 21, 2012.

On December 20, 1990, Vermont Yankee management eliminated Pre-conditioning Interim Operating Management Recommendations (PCIOMR) restrictions for the Operating Cycle 15 barrier fuel.

On December 25, 1990, Vermont Yankee was notified of a potential security threat and took appropriate compensatory actions.

On December 28, 1990, a camera was installed in the turbine building to provide control room operators with continuous monitoring capability for a steam leak on the drain inlet to the 4B feedwater heater.

2.0 PLANT OPERATIONS (71707, 93702, 71710)

2.1 Inspection Activities

The inspectors verified that the facility was operated safely and in conformance with regulatory requirements. Management control was evaluated by direct observation of activities, tours of the facility, interviews and discussions with personnel, and independent verification. The inspectors performed 211 hours of normal and backshift inspections including deep backshift, weekend, and holiday inspections conducted on December 14, 1990, December 30, 1990 and January 1, 1991.

2.2 Inspection Findings and Significant Plant Events

A. Power Transients and Transmission System Operations

During the inspection period, Vermont Yankee was subjected to several unplanned power transients. These controlled power transients were requested by a regional power planning/control group (NEPEX or REMVEC), as a result of abnormal offsite transmission system operations.

On December 14, 1990, Vermont Yankee was informed by REMVEC of an emergency on the 379 line and directed to reduce power. Vermont Yankee reduced power to approximately 80 percent of rated thermal power due to inadequate relaying reliability on the Vermont Yankee-Scobie Pond 379 line. NEPEX studies indicate that if Vermont Yankee operates above 400 MWe (approximately 80 percent of rated thermal power) there is an increased risk of the unit tripping off-line during an additional line fault with a stuck breaker fault clearing.

On December 24 and 28, 1990, Vermont Yankee reduced power to support additional work on the 379 line. On December 24, 1990 work on the 379 line took approximately 3.5 hours. On December 28, 1990 REMVEC notified Vermont Yankee that 379 line work had been cancelled after operators had reduced power to approximately 82 percent of rated thermal power. The unit was returned to 100 percent of rated thermal power.

On December 23 and 24, 1990, Vermont Yankee was directed to reduce power to approximately 96 percent of rated thermal power due to extremely light load conditions on the power grid. The light load conditions occurred for brief periods of time (1 to 2.5 hours) between 1:00 a.m. and 5:00 a.m. These light load conditions were anticipated, but fell outside NEPEX pre-defined periods during which extremely light load conditions may occur.

Load reduction operations are described in NEPEX Operating Procedure No 14, "Action During Extremely Light Load Conditions." Nuclear generation is high on the priority hierarchy, and reduction in nuclear power generation is considered only after exhausting an extensive list of power reduction options. If necessary, nuclear generation reductions are shared by nuclear units based on an equal percentage of their current maximum capabilities, consistent with unit back-down capability and any temporary operating constraints.

The inspector considered the number of power transients during the inspection period to be unusual. The inspector concluded that offsite transmission line work could be more effectively planned and changes in work schedules more effectively communicated to Vermont Yankee and thus minimize unnecessary power transients. Vermont Yankee management recognized this concern and has initiated correspondence with NEPEX to clarify current and, if necessary, establish additional power reduction protocols.

B. APRM Miscalibration (LER 90-17)

On October 16, 1990, with the reactor operating at approximately 20 percent of rated thermal power, all six average power range monitors (APRMs) were miscalibrated low. Technical Specifications requires the APRM gains be adjusted or power distribution be changed when the ratio of core maximum fraction of limiting power density (CMFLPD) to the fraction of rated power is greater than 1.0. Should power inadvertently reach 100 percent of rated thermal power with the ratio maintained less than 1.0, then CMFLPD will remain below 1.0. Maintaining CMFLPD less than 1.0 helps ensure the fuel cladding incurs less than 1 percent plastic strain during operational transients and helps prevent the clad from failing. On two occasions, the APRM gains were not sufficiently raised to reduce the ratio less than 1.0 (actual ratios of 1.372 and 1.463). The APRMs remained out of specification for approximately 17 hours until the subsequent gain adjustment on October 17.

The licensee determined the root cause of this event to be personnel error. A subsequent review and verification of the data sheet on November 14, 1990 identified the miscalibration.

The inspector concluded that the root cause was properly determined and that the event was properly reported. The inspector noted the review process time was excessive and resulted in an approximately one month delay in identification of this reportable event. The inspector discussed this event with the Reactor and Computer Engineering (R&CE) Supervisor to determine the significance of the actual ratios (1.372 and 1.463) and to ascertain the reason for the delay in identification of this event. The actual calibrated ratios are not inconsistent with some between calibration ratio values. Depending on the rod pattern, core flow, and temperature, the ratio values drift between calibrations. The calibration is designed to bring this ratio to less than 1.0. The excessive delay in identification of this event was due, in part, to a backlog of work accumulated during the outage.

The adequacy of Vermont Yankee corrective actions and report content, the timeliness of technical supervisory review, and the evaluation of this event for potential limiting safety system setting violation warrants additional Vermont Yankee review. These issues remain unresolved (UNR 50-271/90-18-001).

C. Control Room and Plant Operational Observations

The inspectors conducted frequent control room observations of the control room equipment operating and status panels. The inspector routinely reviewed the Switching and Tagging Log, the Maintenance Request Log, the Shift Turnover Log, the Operations Department Night Orders Notebook, the Operating Log and preliminary Potential Reportable Occurrence reports. Control room operators consistently demonstrated an adequate level-of-knowledge regarding ongoing plant evolutions and equipment status.

The inspectors frequently toured the reactor and turbine buildings. The inspector accompanied an Auxiliary Operator during completion of his rounds which included tours of the intake structure, the relay control building, the Advanced Off-Gas building, the Condensate Storage Tank structure, and the security diesel building. In general, housekeeping was adequate, areas containing safety-related equipment were uncluttered, fire doors were functional and closed, and preparations for cold weather were adequate.

On December 17, 1990, the inspector noted that a tygon tubing drain line attached to the "A" Residual Heat Removal (RHR) pump was laying on the Northeast corner room floor. The tubing was labeled as internally contaminated. The inspector notified RP personnel and the tubing was routed to a floor drain sump. None of the water in this tubing spilled onto the corner room floor.

On December 21, 1990, the inspector noted an apparently inconsistent application of greases on some High Pressure Coolant Injection System valve stems. Vermont Yankee continued to evaluate this maintenance practice.

Also on December 21, 1990, the inspector noted that the end of a maintenance hose rested on some instrument sensing lines. The hose was appropriately repositioned.

On January 1, 1991, the inspector noted that a pipe hanger for the "B" RHR pump keep-fill line was broken. Maintenance Request 91-002 was generated and the hanger repaired. The system remained operable during repair of the hanger.

On January 2, 1991, the inspector determined that a mismatch existed between the Condensate Storage Tank (CST) level indication at the Reactor Core Isolation Cooling (RCIC) Alternate Shutdown Panel and the CST level indication in the Control Room. The CST level indication in the Control Room was approximately 7 percent higher than the level indication at the RCIC Alternate Shutdown Panel. Maintenance Request 90-015 was generated.

The inspector concluded that these events were of minor safety significance and immediate corrective actions by Vermont Yankee were effective.

D. (Closed) Violation 89-04-01: Inadequate Verification of Fire Suppression System Operability.

This violation was issued following an NRC determination that Vermont Yankee had not performed adequate post-installation testing (i.e., full discharge method test) of the CO2 fire suppression systems in the cable vault room and diesel fire pump fuel oil tank room. This item was discussed in USNRC Inspection Reports 50-271/89-07 and 50-271/89-21, Sections 3.9 and 3.7, respectively. Vermont Yankee conducted an alternate cable vault room enclosure integrity test based upon a test described in the 1989 edition of the National Fire Protection Association's publication 12A, "Standard on Halon 1301 Fire Extinguishing Systems." Vermont Yankee's final test report from tests conducted during the period of October 31 - November 2, 1989 was submitted with their letter (BVY 90-006) to the NRC on January 16, 1990.

By letter dated November 29, 1990, with accompanying safety evaluation, the NRC staff reviewed the alternate testing method report and supporting technical information and concluded that it was an acceptable alternative to a full discharge test for the cable vault room. This item is closed.

E. ESF Walkdown

The inspectors performed a walkdown of the accessible portions of the High Pressure Coolant Injection (HPCI) System using the Piping and Instrument Drawings (P&IDs) G-191169, Sheets 1 & 2 and G-191176 and the system valve lineup list. In addition, the inspectors also performed a walkdown of the Residual Heat Removal (RHR) System using P&ID G-191172 and the system valve lineup list. The inspectors noted all major valves to be properly aligned and positioned, in good material condition and properly labelled. Critical system instrumentation was properly calibrated and labelled.

Overall, no conditions were noted which would question the operability of either system. Housekeeping and radiological conditions in the vicinity of these systems were adequate.

3.0 RADIOLOGICAL CONTROLS (71707)

3.1 Inspection Activities

Compliance with the radiological protection program was verified on a periodic basis.

3.2 Inspection Findings and Review of Events

A. Outer Drywell Access Unlocked (LER 90-16)

On October 15, 1990, following a "hot closeout" inspection of the Drywell, maintenance workers installed the strongbacks on the inner Drywell airlock door and closed the outer airlock door. From October 15, 1990 to November 8, 1990 the outer Drywell airlock door was not locked; however entry to the drywell was blocked by the installation of the strongbacks on the inner Drywell door. The outer Drywell door was properly posted at all times. The reactor operated at approximately 100 percent of rated thermal power for a significant portion of the period.

On November 8, 1990, a Radiation Protection Assistant discovered the Drywell airlock outer door closed but not locked. The outer Drywell door was immediately locked. Vermont Yankee Technical Specifications 6.5.B.1 requires that high radiation areas in which the radiation intensity is greater than 1000 mR/hr shall have locked doors to prevent unauthorized entry. The drywell, at 100 percent rated thermal power, is a locked high radiation area.

Vermont Yankee determined the root cause of the event to be an incomplete procedure. The procedure for Drywell closeout requires that the airlock doors are shut and interlocked, but does not require the outer Drywell airlock door to be locked. Long-term corrective actions will revise this procedure (OP 2115, "Primary Containment") to ensure that the Radiation Protection Department chains and locks closed the outer Drywell airlock door.

The inspector reviewed survey information to determine radiation dose rates in the area between the outer Drywell airlock door and the inner Drywell airlock door. At 100 percent of rated thermal power, the highest extrapolated area dose rates between these doors were determined to be approximately 200 millirem/hr due to gamma radiation and 75 millirem/hr due to neutron radiation. The inspector concluded that although the outer door was not locked, strongbacks on the inner Drywell door would have prevented inadvertent entry into the Drywell. This event was of minor safety significance and the violation is not being cited because the criteria specified in Section V.A of the Enforcement Policy were satisfied (NCV 50-271/90-18-002).

B. Routine Inspection Findings

The inspector conducted frequent tours of the Radiological Controlled Area (RCA) and inspected many Radiation Work Permit areas. During these tours, the inspector assessed the effectiveness of the radiological housekeeping program, reviewed radiological posting requirements, and observed radiological work practices. In general, the inspector found workers adhering to established radiological work practices.

The inspector noted a reduction in the number of contaminated areas. Many previously contaminated areas have been decontaminated and Vermont Yankee is aggressively minimizing the number of contaminated areas.

Noble gases contributed to frequent personnel radiation monitoring equipment (PCM-1B) alarms during RCA exit whole body frisks. The sensitivity and operational characteristics of these monitors often resulted in inconsistent alarms when stepping from one monitor to another. Exit criteria have been established when a person alarms two successive monitors. The inspector questioned the frequency and inconsistency of these alarms, reviewed the manufacturer's technical manual, and spoke with NRC Region I health physics specialists. The inspector concluded that the enhanced sensitivity of these monitors and the management established RCA exit criteria provide adequate assurances that contamination will be detected prior to exiting the RCA.

On November 27, 1990, the inspector noted that the High Pressure Coolant Injection (HPCI) corner room was posted as a contaminated area. An Instrument and Control technician had been performing fire detector surveillances in the area and contamination was detected on both of his shoes. A Personnel Clothing Contamination Event Report was initiated.

The inspector identified one weakness concerning the HPCI corner room contamination event. Appropriate actions were taken to contain the contamination; however, the source of the contamination and the activities of the contaminated person were not thoroughly investigated. The inspector concluded that this type of information is essential to prevent recurrence of similar events.

On January 3, 1991, the inspector noted that a barrier at the access to a turbine building radiological work area near the Condensate Demineralizer Work Station was not properly established. The on-shift Radiological Protection Assistant was notified and the discrepancy corrected.

4.0 MAINTENANCE AND SURVEILLANCE (62703, 61726, 92700)

4.1 Maintenance Inspection Activity

The inspectors observed selected maintenance activities on safety related equipment to ascertain that these activities were conducted in accordance with approved procedures, Technical Specifications, and appropriate industry codes and standards.

4.2 Maintenance Observations

A. RUPS DC Generator Brush Replacement

On December 20 and 21, 1990 the inspector observed replacement of the brushes for the "A" Rotating Uninterruptable Power Supply (RUPS) DC generator. The RUPS provides power to essential Residual Heat Removal and Recirculation system valves to help ensure protection during a Loss of Coolant Accident. During the performance of the maintenance, operators entered Technical Specification required Limiting Condition for Operation action statements for the "A" RUPS and the "A" Low Pressure Coolant Injection.

The inspector reviewed the maintenance request (MR 90-3558), post-maintenance test requirements, and selected portions of the manufacturer's technical manual. The inspector determined that maintenance personnel were knowledgeable, proper radiological controls were implemented, appropriate housekeeping standards were followed, and Vermont Yankee maintenance procedures were adhered to.

The RUPSs were installed during the 1990 refueling outage and replacement of DC generator brushes for both RUPSs comes after approximately two months of operation. The short operating cycle for the DC brush was an anticipated operational limitation. Vermont Yankee will monitor wear characteristics for the newly installed brushes.

B. Repair of HVAC(SB)-10

On November 26, 1990 maintenance personnel determined that SB-10 would not close. Operations department personnel verified that SB-9, SB-11, SB-12 were shut and that secondary containment was maintained with SB-10 open and SBGT in service. These four valves (SB-9, SB-10, SB-11, and SB-12) close during Primary Containment Isolation System Group III isolations. Impact of these actions on facility activities is discussed in Section 1.0.

Corrective maintenance on SB-10 was conducted under MR 90-3455. Extensive corrective maintenance was performed. The valve was disassembled, the operator removed, and the air cylinder inspected. Maintenance personnel found water in the spring pack and pivot arm areas and in the cylinder. The valve operator unit was reassembled in a maintenance area and attached to a regulated air supply for testing. After successful stroke testing, the operator was installed on the valve and the valve reassembled.

The inspector concluded that maintenance activities associated with the repair of SB-10 were well coordinated. The inspector reviewed the completed maintenance request and determined that work documentation was adequate. SB-10 has failed to close on several other occasions and the Plant Operation Review Committee (PORC) recommended that the Maintenance Supervisor perform a root cause analysis on SB-10 failures. The Plant Manager accepted the recommendation.

The manufacturer for this valve is no longer in business and when pursuing an appropriate corrective process for this valve, Vermont Yankee experienced difficulty in obtaining parts replacement information and technical assistance. The inspector determined the recommendations to prevent recurrence of this equipment failure contained in the work documentation would be carefully considered.

4.3 Surveillance Inspection Activity

The inspectors performed detailed procedure reviews, witnessed in-progress surveillance testing, and reviewed completed surveillance packages. The inspectors verified that the surveillance tests were performed in accordance with Technical Specifications, approved procedures, and NRC regulations.

The surveillance testing activities inspected were effective with respect to meeting the safety objectives of the surveillance testing program.

4.4 Surveillance Observations

The inspectors observed the following surveillance tests in the control room and/or at the location of the equipment tested:

-- Main Steam Line High Flow Functional/Calibration (OP 4323, Rev. 18)

-- Drywell/Torus Differential Pressure Functional/Calibration (OP 4379, Rev. 9)

-- Average Power Range Monitor Calibration (OP 4308, Rev. 10)

-- Inservice Testing (IST) on all four Service Water Pumps (OP 0206.02)

-- Inservice Testing on both Reactor Building Closed Loop Cooling Water (RBCCW) Pumps (OP 4182, Revision 18)

The inspectors observed that the tests were well controlled by operators and by the instrumentation and controls technician. The surveillance tests were performed by qualified and knowledgeable personnel and were conducted using calibrated equipment. Overall, the conduct of testing was considered good.

The IST conducted on each of the Service Water and RBCCW pumps was conducted in accordance with the ASME Section XI Code. The results of the testing confirmed that one of the Service Water pumps ("B") remains in the Action Range for IST purposes due to elevated upper bearing vibration levels. The surveillance schedule for that pump has been adjusted accordingly and the IST data properly trended with no indication that the upper bearing vibration levels have increased. All other pumps operated satisfactorily with vibration readings near the reference values.

5.0 EMERGENCY PREPAREDNESS (71707)

5.1 Public Notification System Testing

On December 1, 1990 the Public Notification System sirens were tested in the towns of Colrain, MA; Northfield, MA; Hinsdale, NH; Winchester, NH; Brattleboro, VT; and Vernon, VT. In accordance with Federal Emergency Management Agency (FEMA) guidelines, the siren test is conducted annually for siren systems used in areas surrounding nuclear power plants. The sirens may also be used by local civil defense or emergency management personnel for any type of emergency requiring public notification. The tests were completed satisfactorily.

5.2 Medical Emergency Response Drill

On December 4, 1990 Vermont Yankee, Rescue, Inc. of Brattleboro, VT, and Brattleboro Memorial Hospital personnel participated in a medical emergency response drill. The annual drill, designed to determine the readiness of Brattleboro Memorial Hospital personnel to handle a radiological medical emergency, was evaluated by the FEMA and the Vermont Emergency Management Agency. Public notification systems were not activated during the drill. The preliminary evaluation by FEMA indicated the drill was successful and performance of participants satisfactory.

5.3 Communications Test: Emergency Call-In Method

On December 17, 1990 Vermont Yankee conducted an unannounced, off-hours, Communications Test as defined in OP-3531, "Emergency Call-In Method." This test is designed to demonstrate that Vermont Yankee can effectively augment the off-hours operational staff in the event of an actual emergency. Criteria utilized to measure adequate and timely staff response is contained in NUREG-0654, Table B-1.

Personnel response data were measured against required 30 and 60 minute responders identified in Table B-1. Vermont Yankee evaluation of these data indicated the required positions were able to be staffed within the appropriate time frame by personnel qualified and/or trained for those positions.

6.0 SECURITY (71707, 90712, 92700)

6.1 Observations of Physical Security

Compliance with the security program was verified on a periodic basis, including the adequacy of staffing, entry control, alarm stations, and physical boundaries.

6.2 Security Threat

On December 25 at 5:40 p.m., the Governor-elect for the State of Vermont received a telephone call from an unidentified male stating that the Vermont Yankee Nuclear Power Plant would be the target of an attack by foreign terrorist forces. The licensee was notified through the State and Local Police and, as a precautionary measure, increased the security posture at the facility. The licensee reported this event to the NRC, notified the Albany, New York Office of the Federal Bureau of Investigations (FBI), and local law enforcement agencies (LLEA).

The licensee contacted several other regional nuclear plants and determined that no threats had been received by those plants. Based on information received from the FBI and LLEA, the licensee concluded the security threat was not credible. The inspector determined the licensee response to this event was appropriate.

7.0 ENGINEERING AND TECHNICAL SUPPORT (71707)

7.1 (Closed) Unresolved Item 89-02-02: Licensee Review of Battery Cell Differential Temperature Limits.

During review of licensee battery surveillance testing documentation, the inspector noted that the five degree F battery cell temperature differential guidance established by IEEE Standard 484-1987 was exceeded on the UPS-1A and main station "B" battery banks. The concern was brought to the attention of the licensee and an engineering evaluation was initiated to assess acceptability of this condition.

The evaluation addressed specific temperature differentials in which the affected cells were greater than the five degree F criteria. This condition is unique to winter months and to the cells of the specific batteries which are located in close proximity to exterior walls. Lower temperatures cause the affected cells to have a lower internal resistance and a lower internal voltage than the warmer cells and therefore have the potential to affect the capacity of the battery. Battery surveillance procedure, OP 4210, in addition to establishing electrical performance parameters, specifically establishes minimum and average cell temperature acceptance criteria. Additionally, the station battery systems were designed consistent with IEEE 485 sizing calculations which provide design factors for minimum battery temperature and aging related performance degradation. The observed individual cell temperatures of concern were greater than the minimum design temperatures of 60 F for the main station batteries and 50 F for the UPS batteries. The licensee evaluation determined that individual cell temperatures cooler than the standard was an acceptable condition based on appropriate battery design and effective operational performance surveillance testing. The licensee discussed the evaluation with respective battery vendor representatives who agreed with the licensee conclusion.

The inspector concurred with the technical bases of the licensee evaluation and considered the concern to have been appropriately addressed. The inspector will continue to review battery surveillance activity during future inspections. This item is closed.

7.2 (Closed) TMI Action Plan Item II.E.4.1.3: Installation of Dedicated Containment Penetrations for Hydrogen Recombiners.

TMI Action Plant Item II.E.4.1.2 was reviewed in detail in NRC inspection report 86-22. The resolution of that item, which is directly related to item II.E.4.1.3, is well documented in that report. However, this issue was not administratively closed with that item due to an oversight. This item is considered closed

8.0 SAFETY ASSESSMENT AND QUALITY VERIFICATION

8.1 Engineering Department Reorganization

On December 17, 1990 Vermont Yankee announced the merging of the on-site Engineering Support Department and the Construction Department. The two departments will combine and their functions will be aligned under three new departments: Mechanical Engineering, Electrical/I&C Engineering, and Technical Programs. These three departments supervisors will report to the newly established position of Engineering Director. The Engineering Director reports directly to the Vice President, Engineering. The corporate engineering structure was also modified and the position of Engineering Projects Supervisor established.

The Engineering Director is a Superintendent level position and the person filling this position will be capable of performing duties as Plant Operation Review Committee (PORC) Vice Chairman and Outage Manager. The three new engineering department supervisors will likely serve as PORC members.

The inspectors met with the Vice President, Engineering to discuss the reorganization of Vermont Yankee engineering resources. One of the goals of this reorganization is to provide more efficient and effective engineering services. Responsibilities of each individual engineer will be expanded and the turnover of responsibilities throughout the life of a project should be minimized. While the total number of Vermont Yankee engineering personnel will remain approximately constant, efficiency and productivity of the organization is expected to increase. The organizational restructuring is expected to be functioning in early 1991. The inspector found these changes to be acceptable.

8.2 LER Reportability

LER 90-18, "Primary Containment Isolation System Spurious Actuation Due to an Inadequate Procedure," was reported to the NRC after Vermont Yankee was notified by USNRC Region I, through the Resident Inspector, that they disagreed with the initial non-reportability determination. Event reportability determinations are often based on engineering judgement and are therefore exposed to subjective interpretation. Differences in engineering judgement and interpretation, with regard to reportability determinations, are resolved through licensee reviews and discussions with the NRC.

In order to help achieve a consistent interpretation of 10 CFR 50.73 LER reportability determinations for similar events, the inspector consulted USNRC Region I and USNRC: AEOD personnel. Based on these discussions, the inspector concluded the following:

(1) The definition of system actuation should be consistently applied in reportability determinations (Actuation of multichannel Engineered Safety Feature (ESF) Actuation Systems is defined as actuation of enough channels to complete the minimum actuation logic).

(2) The term "properly removed fr[illegible]rvice" means removed from service in accordance with applicable Vermont Yankee p[illegible]s and controls and the removal from service of the ESF system should be appropriately [illegible]ted.

(3) Operation of an ESF as part of a planned test or operational evolution need not be reported. However, if during the test or evolution the ESF actuates in a way that is not part of the planned procedure, that actuation should be reported.

(4) The "intended function" of an ESF system should be derived from the system description and stated purpose in the Final Safety Analysis Report.

The inspector discussed these conclusions with plant management and determined that the term "properly removed from service" applied to equipment during refueling/maintenance outages may require additional clarification.

8.3 (Closed) Unresolved Item 90-09-02: Review Licensee's Basis for Concluding That No Unreviewed Safety Question Exists for Closure of Core Spray Valve Injection Valve CS-11B.

During Cycle XIV operations VY identified main coolant system leakage into low pressure core spray system piping past the closed core spray injection valve CS-12B. Subsequently, plant operators closed the upstream discharge isolation CS-11B valve. This valve is designed to automatically open in response to accident conditions. At a time subsequent to closing the valve, a 10 CFR 50.59 required safety evaluation (SE) was prepared. The adequacy of this SE was reviewed by the NRC during the Safety System Functional Inspection, which is documented in inspection report 50-271/90-80. The NRC review of this unresolved item identified that VY failed to recognize the in[illegible]ase in the probability of malfunction of adding one extra active component in the system that was required to work for proper functioning of the system to perform its safety function. This aspect of the SE was determined to be a violation of 10 CFR 50.59 requirements. Based upon NRC review and disposition of this matter, this unresolved item is closed.

8.4 Nuclear Safety Audit and Review Committee

On November 30, the inspector attended the semi-annual meeting of the Vermont Yankee Nuclear Safety Audit and Review Committee (NSARC). The NSARC's responsibilities are detailed in Vermont Yankee Technical Specifications Section 6.2 and include performing reviews of certain safety evaluations completed under the provisions of 10 CFR 50.59, conducting periodic audits of implementing procedures, investigating all reported instances of violations of Technical Specifications, and reviewing abnormal performance of plant equipment and other plant anomalies.

The inspector observed in-depth discussions on the unexpected turbine casing corrosion identified during the 1990 refueling outage and on the emergency diesel generator surveillance loading requirements. The later discussion highlighted the need for additional review to determine an optimal operability demonstration for the mechanical driver (diesel engine) and for the electrical generator. A recommendation from the NSARC addresses the concern for Vermont Yankee to consider demonstrating operability of the diesel engine and the generator at the maximum emergency loading not to exceed the continuous rating. In addition, NSARC recommended the emergency diesel generator operability demonstration surveillance criteria, developed to meet Technical Specification 4.10.A.1a requirements, be evaluated by an independent engineering consultant.

Based on inspector observations of the NSARC meeting, review of the November 30 NSARC meeting minutes, and review of Vermont Yankee Technical Specifications, the inspector concluded that the NSARC was adequately fulfilling its safety audit and review responsibilities.

9.0 LICENSEE EVENT REPORTS (LER), PERIODIC AND SPECIAL REPORTS, AND UNRESOLVED ITEM FOLLOWUP

9.1 LERs

The inspector reviewed the licensee event reports listed below and determined that, with respect to the general aspects of the events: (1) the report was submitted in a timely manner, (2) the description of the event was accurate, (3) a root cause analysis was performed, (4) safety implications were considered, and (5) corrective actions implemented or planned were sufficient to preclude recurrence of a similar event.

A. LER 90-15

"Reactor Scram Due to Turbine Trip Caused by a Malfunction in the Turbine Emergency Tripping System." (See USNRC inspection report 50-271/90-15, Section 2.2.C)

B. LER 90-16

"Failure to Lock Drywell Outer Access Airlock Door Due to Incomplete Procedure." (See Section 3.2.A)

C. LER 90-17

"APRM Miscalibration Due to Personnel Error." (See Section 2.2.B)

D. LER 90-18

"Primary Containment Isolation System Spurious Actuation Due to an Inadequate Procedure." (See Section 8.2 and USNRC Inspection Report 50-271/90-15, Section 4.4.A)

E. LER 9[illegible]

"Inadvertent Primary Containment Isolation System Actuation Due to Radiation Monitor Downscale Trips."

F. LER 89-26, Rev. 1

"Inadvertent Primary Containment Isolation System Actuations Due to Spikes on a Refuel Floor Radiation Monitor."

9.2 LER Recapitulation

The following LER was previously reviewed by the inspector and remained open because one of the five review elements stated in Section 9.1 required additional review.

LER 90-04 "Reactor Scram Due to Pressure Control System Failure and Primary Containment Isolation System Actuation."

This event was discussed in USNRC Inspection Report 50-271/90-02, Section 2.2.B. In this discussion the inspector stated that Vermont Yankee considered their root cause analysis incomplete pending receipt of the turbine vendor event analysis and results of future Mechanical-Hydraulic Control (MHC) system component inspections.

A detailed turbine vendor event analysis was not made available to Vermont Yankee. The results of MHC component inspections conducted during the 1990 refueling outage identified as-found control valve intercept points did not correspond to linkage adjustments specified on the control diagram. This may have resulted in demand for multiple valve disk motion against a large differential pressure. With only the Auxiliary oil pump supplying oil pressure, insufficient oil pressure was developed to lift the control valve main disks. Consequently steam admission to the turbine was primarily through the control valve pilot disks. Subsequent linkage adjustments ensured that the turbine roll occurred entirely on the No. 1 turbine control valve main disk.

Analysis of the turbine start-up data collected during turbine start up following the refueling outage indicated that Vermont Yankee corrective actions were effective. LER 90-04 is closed.

9.3 Periodic and Special Reports

The plant submitted the following periodic and special reports which were reviewed for accuracy and the adequacy of the evaluation:

-- Monthly Statistical Report 90-11 dated December 10, 1990.

9.4 Non-Cited Violation and Open Item Followup

Open items identify matters that require further review and analysis and include previously identified violations, deviations, and unresolved items. Non-cited violations and open items discussed in this inspection report are tabulated below for cross references purposes:

-- (Closed) UNR 50-271/89-02-002, Section 7.1
-- (Open) UNR 50-271/90-18-001, Section 2.2.B
-- (Closed) NCV 50-271/90-18-002, Section 3.2.A
-- (Closed) VIO 50-271/89-04-001, Section 2.2.D
-- (Closed) UNR 50-271/90-09-002, Section 8.3
-- (Closed) TMI Action Plan Item II.E.4.1.3, Section 7.2

10.0 MANAGEMENT MEETINGS (30703)

10.1 Preliminary Inspection Findings

At periodic intervals during this inspection, meetings were held with senior plant management to discuss preliminary inspections findings. A summary of findings for the report period was also discussed at the conclusion of the inspection and prior to report issuance. No proprietary information was identified as being included in the report.

10.2 Region Based Inspection Findings

One Region based inspection was conducted during this inspection period. Inspection findings were discussed with senior plant management at the conclusion of the inspection.

Date	Subject	Rpt. #	Inspector
12/11-16/90	Fitness For Duty	90-19	E. King