

U.S. NUCLEAR REGULATORY COMMISSION

Region I

Report No. 82-01

Docket No. 50-271

License No. DPR-28 Priority -- Category C

Licensee: Vermont Yankee Nuclear Power Corporation
1671 Worcester Road
Framingham, Massachusetts 01701

Facility Name: Vermont Yankee

Inspection at: Vernon, Vermont

Inspection conducted: January 5-February 1, 1982

Inspectors: William J. Raymond 3/10/82
W. J. Raymond, Senior Resident Inspector date signed

S. J. Collins 3/10/82
S. J. Collins, Resident Inspector date signed

Approved by: Robert M. Gallo 3/18/82
R. M. Gallo, Chief, Reactor Projects date signed
Section 1A, Projects Branch #1

Inspection Summary:

Inspection on January 5-February 1, 1982 (Report No. 50-271/82-01)

Areas Inspected: Routine announced inspection on regular and backshifts by Resident Inspectors of: actions taken on previous inspection findings; IE Bulletins Followup; IE Circular Followup; review of shift logs and operating records; plant tours; observations of physical security; surveillance testing; observations of annual indoctrination and medical emergency exercise; Inspector followup of events; review of licensee event report 81-36; review of NUREG 0737 TMI Action Plan requirements; a review of non-licensed operator training; and, a review of piping insulation on systems inside the drywell. The inspection involved 153 inspector hours onsite by two resident inspectors.

Results: Of the thirteen areas inspected, no violations were identified in eleven areas; three apparent items were identified in two areas as discussed in paragraphs 6.b.(2), 10.a.(2), and 10.b.(2) of this report.

DETAILS

1. Persons Contacted

The below listed technical and supervisory level personnel were among those contacted:

Vermont Yankee Nuclear Power Corporation

Mr. R. Branch, Operations Supervisor
Mr. F. Burger, Quality Assurance Coordinator
Mr. P. Donnelly, Instrument and Control Supervisor
*Mr. R. Kenny, Engineer, Assessment Coordinator
Mr. D. Girroir, Mechanical Engineer
Mr. L. Goldthwaite, Instrument and Control Foreman
Mr. B. Leach, Health Physicist
*Mr. M. Lyster, Operations Superintendent
*Mr. W. Murphy, Plant Manager
Mr. J. Pelletier, Assistant Plant Manager
Mr. D. Reid, Engineering Support Supervisor

*denotes those present at the exit interview on March 10, 1982.

State of New Hampshire

Mr. N. Hobbs, Technical Assistant, New Hampshire Civil Defense (telecon 1/22)
Mr. M. Powers, Staff Assistant, Governor Gallen's Office (telecon 1/21)

2. Action Taken On Previous Inspection Findings

- a. (Closed) Unresolved Item (50-271/78-05-05): Decontamination Procedure. Procedure AP 0620, Solvents and Chemicals for Cleaning Solutions, was issued on November 11, 1981. Requirements in AP 0620 satisfy concerns addressed in NRC:Region I Inspection Report 50-271/81-13. This item is closed.
- b. (Closed) Unresolved Item (50-271/78-16-03): Containment Integrated Leak Rate Testing. Successful completion of the Type A Integrated Leak Rate Test on December 21, 1980 constituted the second of two consecutive successful periodic tests required by III.A.6 (b) of Appendix J. This item is closed.
- c. (Closed) Unresolved Item (50-271/78-27-05): Installation of guard piping around exposed fuel oil supply line to the diesel driven fire pump, (Vermont Yankee Technical Specification Amendment 43, Table 3.1, Item 3.1.18 Control of Combustibles). Vermont Yankee Letter WVY 79-81, dated June 11, 1979, D. E. Moody to T. A. Ippolito confirming agreement to install a curb in the diesel fire pump area to contain any oil spill from a line break. The inspector verified by observation that the subject curb had been installed. This item is closed.

- d. (Closed) Unresolved Item (50-271/80-13-02): Review construction of wall for shielding at 252 and 280 foot elevations. The inspector verified that the radiation levels of concern had been reduced by flushing of the lines such that the "Hot Spots" were reduced from 1.2 R/hr to 200-250 mR/hr and from 300 mR/hr to 40 mR/hr at a distance of 18 inches. The inspector confirmed that the licensee's posting was accurate by conducting independent surveys. This item is closed.
- e. (Open) Unresolved Item (50-271/81-05-08): Implementation of Item I.C.6. Further discussions with the Engineering Support Supervisor clarified the intended division of responsibility between the Shift Supervisor and the Control Authority. Based on this clarification, no conflict exists between AP 0025 and AP 0140 in regard to independent verification of operating activities. The shift supervisor is responsible for independent verification per AP 0025, but as in other verifications required by this same procedure, he will be cognizant of the activity but not necessarily directly involved in the verification. The Control Authority will conduct the verification with permission from the shift supervisor. This issue is considered resolved.

A second issue in this same item was resolved by Revision 5 to AP 0140. VY APF 0140.04 now provides the means to document independent verification activities associated with Switching and Tagging Orders.

VY intends to clarify existing procedural requirements that provide the allowable dose for the conduct of independent verification activities. The clarification will indicate that the 20 mRem limit applies to a single component (e.g., one valve in a switching order involving several valves). This item remains open pending either completion of required procedure changes and/or licensee personnel training in regard to application of the dose limit.

3. IE Bulletin Review and Followup

Licensee responses and actions taken for the IE Bulletin listed below were reviewed to verify that:

- the bulletin was received onsite and reviewed for applicability to the facility;
- bulletin action items, if applicable, and identified problems were appropriately dispositioned;
- corrective actions taken, or planned, were appropriate; and,

- responses to the NRC were accurate and within the time period specified in the bulletin.

Inspector followup on selected bulletins is summarized below. The inspector had no further comment on the subject bulletin, except as indicated below.

a. IE Bulletin 80-06, Engineered Safety Features (ESF) Reset Controls, dated March 13, 1980

Vermont Yankee responded to the bulletin by letter WVY 80-80 dated June 13, 1980. Vermont Yankee review of ESF actuation signals at the schematic level determined that all safety related equipment remains in the emergency mode upon reset of any ESF actuation signal, with two exceptions. Suction supply valves SB-1A and 1B for the standby gas treatment system would close upon PCIS reset. This action is as intended to provide better venting of the HPCI condenser gland exhauster. Secondly, the HPCI gland seal condenser blower remains in operation following PCIS reset until the gland seal condenser has vented. No further actions were planned by Vermont Yankee to modify SB 1A/1B or the HPCI condenser blower operation.

The licensee's June 13, 1980 letter stated that testing to verify ESF equipment will remain in the emergency mode following reset will be completed by December 31, 1980. Discussions with the Instrument and Control Supervisor indicated that the testing of ESF functions in the manner described above was accomplished using existing surveillance procedures, in accordance with the following listing:

<u>System</u>	<u>Procedure</u>
PCIS	OP 4334
RWCU	OP 4334
RHR	OP 4354, 4355
HPCI	OP 4360, 4361, 4362
CS	OP 4349, 4350
RCIC	OP 4100
SBGTS	OP 4332, 4333
ADS	OP 4343, 4344

The inspector determined by a review of surveillance records that the above tests were satisfactorily performed during the period from November 19, 1980 to December 8, 1980. The inspector reviewed OP 4334, 4332 and 4333 in conjunction with the respective control drawings (191301 series) to confirm that the tests demonstrated the stated ESF functions upon reset. No inadequacies were identified.

NRC review of Item 2 of IEB 80-06 is considered complete. NRC review of Vermont Yankee responses to Bulletin items 1 and 3 is still in progress and will be addressed on a subsequent inspection.

4. IE Circular Followup

The following IE Circular was reviewed to determine whether the actions listed below were taken by the licensee:

- corporate management forwarded the Circular to the facility for review;
 - a review for applicability was performed; and,
 - appropriate corrective actions have been taken or are scheduled to be taken by the licensee.
- a. IE Circular 81-03, Inoperable Seismic Monitoring Instrumentation, dated March 2, 1981

The inspector verified by discussions with the licensee's Assessment Coordinator Engineer that the subject IEC was received by Vermont Yankee and forwarded to the responsible department, Instrument and Control, on March 6, 1981. As of January 18, 1982, the Assessment Coordinator had received no response or recommended action based on an in-plant review of IEC 81-03. This item remains open, and is further discussed in paragraph 10.a.(1) of this report.

5. Shift Logs and Operating Records

- a. The inspector utilized the following plant procedures to determine the licensee established administrative requirements in this area in preparation for review of various logs and records.
- AP 0831, Plant Procedures, Revision 9, dated January 19, 1982
 - AP 0150, Responsibility and Authority of Operations Department Personnel, Revision 17, dated December 18, 1981
 - AP 0153, Operations Department Communications and Log Maintenance, Revision 9, dated August 17, 1981
 - AP 0140, VY Local Control Switching Rules, Revision 5, dated October 16, 1981
 - AP 0020, Lifted Lead/Installed Jumper Request Procedure, Revision 4, dated October 16, 1980

- AP 0021, Maintenance Requests, Revision 10, dated December 30, 1981
- AP 0030, Plant Operations Review Committee, Revision 6, dated January 7, 1980

The above procedures, Technical Specifications, ANSI N18.7-1972 "Quality Assurance Requirements for Nuclear Power Plants" and 10 CFR 50.59 were used by the inspector to determine the acceptability of the logs and records reviewed.

- b. Shift logs and operating records were reviewed to verify that:
 - Control Room logs and surveillance sheets are properly completed and that selected Technical Specification limits were met.
 - Control Room log entries involving abnormal conditions provide sufficient detail to communicate equipment status, lockout status, correction and restoration.
 - Log Book reviews are being conducted by the staff.
 - Operating and Special Orders do not conflict with Technical Specifications requirements.
 - Jumper (Bypass) log does not contain bypassing discrepancies with Technical Specification requirements and that jumpers are properly approved prior to installation.
- c. The following plant logs and operating records were reviewed periodically during the period of January 5-February 1, 1982:
 - Control Room Log
 - Night Order Book Entries
 - CR Information Book
 - Jumper/Lifted Lead Log Book
 - Safety Related Maintenance Requests
 - Control Room Operator Round Sheet
 - Auxiliary Operator Rounds Sheet
 - Communications Log

- Control Room Chemistry Log Sheets
- Shift Turnover Checklist

No items of noncompliance were identified.

6. Plant Tour

The inspector conducted a tour of accessible areas of the plant, including the Control Room Building, Turbine Building, Reactor Building, Diesel Rooms, Intake Structure, Security Gate House 2 and Alarm Station, Radwaste Building and Control Point Areas.

a. Monitoring Control Room Panels

Routinely during the inspection period, the inspectors conducted reviews of the control room panels. The following items were reviewed to determine the licensee's adherence to Licensee Technical Specification - Limiting Conditions for Operation and to verify the licensee's adherence to approved procedures.

- Switch and valve positions required to satisfy LCO's, where applicable, personnel knowledge of recent changes to procedures, facility configuration and existing plant conditions.
- Alarms or absence of alarms. Acknowledged alarms were reviewed with on shift licensed personnel as to cause and corrective actions being taken where applicable.
- Review of "pulled alarm cards" with on shift personnel.
- Meter indications and recorder values.
- Status lights and power available lights.
- Front panel bypasses.
- Computer printouts.
- Comparison of redundant readings.

No items of noncompliance were identified.

b. Radiological Controls

Radiation controls established by the licensee, including: posting of radiation areas, radiological surveys, condition of step-off-pads, and disposal of protective clothing were observed for conformance with the requirements of 10 CFR 20 and AP 0503, Establishing and Posting Controlled Areas, OP 4530, Dose Rate Radiation Surveys, OP 4531, Radioactive Contamination Surveys, AP 0504, Shipment and Receipt of Radioactive Materials.

Confirmatory surveys were conducted in the following areas to verify licensee posted results: Reactor Building general areas - all elevations.

Periodically, Radiation Work Permits were reviewed by the inspector to verify conformance with licensee procedure AP 0502, Radiation Work Permits.

Except as noted below, the inspector had no further questions in this area.

- (1) During a routine plant tour on January 5, 1982, the inspector noted a licensee contractor employee removing a section of plywood from a wooden wall which constituted a radiation/contaminated area boundary. The 4 ft. X 4 ft. plywood section was subsequently cut up by the contractor and utilized for the construction of a staging platform. The inspector established that the controlled area within the boundary was posted as a Radiation and Contaminated Area with general area dose rate up to 100 mRem/hr. and contamination levels up to $25E4$ dpm/100 cm². Work in progress within the controlled area was authorized by Radiation Work Permit 01109 to decontaminate reactor plant parts.

The inspector notified the contractor personnel that the plywood section should be considered potentially contaminated until surveyed and that entry into the controlled area technically required a radiation work permit authorization per VYAP 0502, Radiation Work Permits. Health Physics personnel subsequently surveyed the material, no contamination was found and the integrity of the boundary was reestablished. Licensee management was informed of the finding and the contractor worker was reinstructed.

Based on the above corrective actions, the inspector had no further questions.

- (2) During a routine site area tour on January 5, 1982, at approximately 3:50 P.M., the inspector noted an unlabeled wooden shipping box which had been wrapped in plastic, banded and placed in an unrestricted area outside the rad-waste compacting room adjacent to the intake structure. Surveys of the box taken by the inspector with a NRC issued instrument and confirmed with licensee Eberline PIC-6A instrument number 2594 indicated radiation levels up to 35 mRem/hr. on contact with the box and up to 8 mRem/hr. at 18 inches. The inspector notified licensee Health Physics personnel who took immediate action to survey the

box, attach appropriate labels and move the box into a controlled area.

Based on the above, the failure to maintain proper labeling for a radiation area is contrary to the requirement of 10 CFR 20, section 20.202, and is considered a violation (50-271/82-01-01).

In order to establish licensee controls over nonradiation workers who frequent areas where radwaste is stored while being made ready for transportation, the inspector reviewed VY Training Lesson Plan SAF IV, Revision 1 dated March 1981. The inspector determined that the nonradiation workers are given training in recognition of radiation controlled area postings, including use of mock signs and barrier rope, and instructions on requirements for entry into a radiation controlled area. The inspector suggested that a sample 'LSA' label be added to the demonstration aids and the licensee noted the comment. The inspector had no further questions in this area.

- (3) During a routine Turbine Building tour on January 21, 1982, the inspector noted work in progress inside a controlled area located over the condensate demineralizers. The inspector noted that the controlled area was labeled as a contamination area but general loose surface contamination levels were not indicated as required by VYAP 0503, Establishing and Posting Controlled Areas. The inspector noted this finding to the licensee control point personnel who instructed the contractor Health Physics technician to perform a survey. Results of the survey indicated contamination levels greater than 10,000 dpm/100cm² and the controlled area was subsequently posted as "RWP required for entry" per VYAP 0503, section 6.a. The inspector verified that an approved RWP was issued for work in progress and appropriate controls were in place.

The inspector reviewed documentation of the contractor HP Technician's education, previous work experience and VY specific training. Information presented on the individual's NRC Form - 4 and a resume dated October 14, 1981 showed four years of HP related experience and technical training, which exceeds the minimum qualification requirements of ANSI N18.1 for the position. The plant Health Physicist stated that the individual had also received site specific training on plant procedures and administrative requirements. The inspector had no further questions in this area.

c. Plant Housekeeping and Fire Prevention

Plant housekeeping conditions, including general cleanliness and storage of materials to prevent fire hazards were observed in all areas toured for conformance with AP 0042, Plant Fire Prevention and AP 6024, Plant Housekeeping.

No inadequacies were identified.

d. Fluid Leaks and Piping Vibrations

Systems and equipment in all areas toured were observed for the existence of fluid leaks and abnormal piping vibrations.

No inadequacies were identified.

e. Pipe Hangers/Seismic Restraints

During routine tours of the plant, pipe hangers and restraints installed on various piping systems were observed for proper installation, tension, and condition.

No inadequacies were identified.

f. Control Room Manning/Shift Turnover

Control Room Manning was reviewed for conformance with the requirements of 10 CFR 50.54 (k), Technical Specifications, AP 0152, Shift Turnover, AP 0150, Responsibility and Authority of Operations Department Personnel and AP 0036, Shift Staffing. The inspector verified, during the inspection, that appropriate licensed operators were on shift. Manning requirements were met at all times. Several shift turnovers were observed during the course of the inspection. All were noted to be thorough and orderly.

No items of noncompliance were identified.

g. Equipment Tagout and Controls

Tagging and controls of equipment released from service were reviewed during the inspection tours to verify equipment was controlled in accordance with AP 0140, VY Local Control Switching Rules.

No inadequacies were identified.

h. Analyses of Process Liquids and Gases

Analyses results from samples of process liquids and gases were reviewed periodically during the inspection to verify conformance with regulatory requirements. The results of isotopic analyses from

reactor coolant, off-gas and stack samples were reviewed routinely from the "Daily Plant Status Report" to verify that Technical Specification Limits were not exceeded and that no adverse trends were apparent.

No inadequacies were identified.

7. Observations of Physical Security

The inspector made observations, witnessed and/or verified during regular and offshift hours that selected aspects of plant physical security were in accordance with regulatory requirements, the physical security plan and approved procedures.

a. Physical Protection Security Organization

- observations indicated that a full time member of the security organization with authority to direct physical security actions was present as required.
- manning of all shifts on various days was observed to be as required.

b. Access Control

- identification, authorization and badging.
- access control searches, including, when applicable, the use of compensatory measures during periods when equipment was inoperable, including guard force actions resulting from performance of OP 4127, Security Lighting Diesel Generator Surveillance on January 5, 1982.
- escorting.

c. Physical Barriers

- selected barriers in the protected areas and vital areas were observed and random monitoring of isolation zones was performed. Observation of vehicle searches were made.
- inspector tours of gate house 2, the Central and Secondary Alarm Stations were conducted at random periods.

No items of noncompliance were identified.

8. Surveillance Testing

The inspector observed or reviewed portions of the following surveillance tests to verify that testing was performed in accordance with procedures, that results were in conformance with Technical Specifications and procedure requirements, that test instrumentation was calibrated, that redundant system(s) or component(s) were available for service, that work was being performed by qualified personnel, and that activities were in compliance with RP 4000, Surveillance Testing Control.

- Security Lighting Diesel Generator Surveillance per OP 4127, January 1982
- RCI System Monthly Surveillance per OP 4121, December 18, 1981
- Strong Motion Accelerograph Functional Test, RP 4396, January 11, 1982
- MSIV Closure Surveillance, per OP 4113, January 25, 1982

Except as noted in paragraph 10.a. of this report, the inspector had no further comments.

9. Annual Indoctrination and Medical Emergency Exercise

The inspector attended the VY Site Annual Training and Indoctrination classes held on January 14, 1982 for members of the Green Mountain Security Force. The training included video-tape presentations and lectures on the subjects of plant safety, health physics practices, respiratory protection, fire protection and emergency procedures. The classes included an examination on the material presented. No inadequacies were identified.

On January 20, 1982, the inspectors observed the annual Medical Emergency conducted per VY OP 3505, Emergency Preparedness Exercises and Drills. The inspectors monitored control room response and medical/radiological actions at the drill site. Comments were forwarded to licensee drill observers for presentation at the critique. The inspectors had no further questions in this area.

10. Inspector Followup of Events

The inspector responded to events that occurred during the inspection period to verify continued safe operation of the reactor in accordance with the Technical Specifications and regulatory requirements. The following items, as applicable, were considered during the inspector's review of operational events:

- observations of plant parameters and systems important to safety to confirm operation within approved operational limits;

- description of event, including cause, systems involved, safety significance, facility status and status of engineered safety features equipment;
 - details relating to personnel injury, release of radioactive material and exposure to radioactive material;
 - verification of correct operation of automatic equipment;
 - verification of proper manual actions by plant personnel; and,
 - verification of adherence to approved plant procedures.
- a. Seismic Event of January 9, 1982 Followup

During the weekend of January 9-10, 1982, a seismic event centering in Newfoundland, Canada, was felt in various points within the Vermont state area. As a part of routine followup of the event, the inspector established the following findings:

- (1) The inspector questioned plant personnel on the morning of January 11, 1982, if ground motion had been felt onsite or if the on-site seismic instrument had been tripped. Plant personnel reported no ground motion was observed on-site and the inspector verified that the Auxiliary Operator had monitored the strong motion accelerograph trip indicator once per shift per VYAPF 0150.01, and verified by observation that the monitor had not tripped.

Upon further investigation of the on-site seismic instrument, the inspector noted that the Kinometrics, Model SMA-1, Serial No. 102, Strong Motion Accelerograph installed at Vermont Yankee was the subject of IE Circular No. 81-03, Inoperable Seismic Monitoring, dated March 2, 1982, which questioned the reliability of the instrument and recommended the surveillance testing and calibration programs for the instrument be reviewed and revised to limit the potential for having the seismic monitoring system inoperable during all plant modes of operation. The inspector noted to plant personnel that the concerns of IEC No. 81-03 had not been addressed by the licensee (see paragraph 4.a. of this report).

- (2) On January 11, 1982, the licensee performed RP 4396, Strong Motion Accelerograph Functional Test, Revision 5, dated October 16, 1980, to verify seismic instrument operability; data was recorded on VYRPF 4396.01 and instrument response was recorded on film and sent off-site for developing.

The inspector reviewed Kinemetric SMA-1 Technical Manual dated December, 1979 and noted that the instrument trip point is factory set at .01G. The instrument is required to record motion in three directions, longitudinal, vertical and transverse as illustrated in Figure 4, Typical Calibration Record Showing Normal Positions of Traces, of the T/M. Also provided with each instrument is the actual sensitivity and natural frequency of each acceleration channel; the Vermont Yankee instrument factory calibration data #102 dated February 28, 1970 shows the three required channel responses for a satisfactory calibration.

On January 15, 1982, the inspector reviewed VYRPF 4396.01, Strong Motion Accelerograph Functional Test dated January 11, 1982, and noted all steps had been completed, final conditions signed off and no discrepancies noted in the applicable form section. The inspector also reviewed the film record of the January 11th calibration and noted that the instrument was recording in two directions only, longitudinal and vertical with no transverse response indicated. The acceptance criteria of RP 4396, Strong Motion Accelerograph Functional Test states the developed film must indicate excitation of X-Y and Z accelerometers.

A subsequent review of previous RP 4396 calibration film revealed that a satisfactory calibration of the installed strong-motion seismograph had not been achieved since December 16, 1980, and contrary to approved procedure AP 4000, Surveillance Testing Control, special testing as a result of the component failure had not been initiated.

Failure to adhere to procedure AP 4000 is contrary to Technical Specification 6.5.A. and is considered a violation (50-271/82-01-02).

- (3) The inspector reviewed the adequacy of the installed seismic instrumentation and established the following criteria for required seismic instrumentation at Vermont Yankee:
- + 10 CFR 100. Reactor Site Criteria, Appendix A, section VI.(3), Required Seismic Instrumentation, states in part, "Suitable instrumentation shall be provided so that the seismic response of nuclear power plant features important to safety can be determined promptly to permit comparison of such response with that used as the design basis."
 - + FSAR Amendment 16, dated October 23, 1970, states in part, "A strong-motion accelerograph will be installed

on the ground floor of the control room building. The unit is designed to provide continuous monitoring for earthquakes by means of a seismic-trigger device, which senses the vertical component of the initial earthquake ground motion and actuates the full unit. The actuating level for the seismic-trigger is adjustable from 0.005g to 0.05g (0.01g is nominal).

Once triggered the unit will continue to sense and record a single earthquake or a sequence of earthquakes and aftershocks for as long as the seismic trigger detects ground motion, up to a maximum lapsed time of 25 minutes.

Maintenance of the unit and interpretation of any data recorded will be the responsibility of site personnel in conjunction with the Seismology Division of the U. S. Coast and Geodetic Survey. The primary function of the strong-motion accelerograph will be to provide data which will be of value in assessing the condition of the plant subsequent to an earthquake."

- + Safety Evaluation by the Division of Reactor Licensing, U.S. AEC, in the Matter of Vermont Yankee Nuclear Power Company, Vermont Yankee Nuclear Power Station, Docket No. 50-271, dated June 1, 1971, section 3.4, Geology and Seismology, states in part, "We require the applicant to install a strong-motion seismograph in the facility to record data related to ground motion in the event of a seismic event at or near this site. These data would be employed in subsequently evaluating the effects of the seismic event on continued safe operation of the facility.

Vermont Yankee Technical Specifications currently do not contain Surveillance requirements nor LCO's for seismic instrumentation. A single passive strong motion recording instrument is utilized along with licensee developed testing procedures. BWR Standard Technical Specification 3.3.6.2 requires that seismic monitoring instrumentation be operable and provides for various system surveillances at specified frequencies.

The adequacy of the installed instrumentation and existing operability requirements will be referred to NRC Staff for review. (UNR 50-271/82-01-03)

b. Unusual Event

During the evening of January 18, 1982, a seismic event occurred centered 8 miles west of Laconia, New Hampshire, approximately

110 km (68 miles) from the site. The quake was estimated at 4.8 on the Richter scale, Type ML Wave, a deep quake 4 to 6 miles down, and centered at Latitude 43.50, Longitude 71.60.

The licensee reported feeling vibrations which shook the plant at 7:20 P.M. and at 7:34 P.M. declared an Unusual Event per AP 3125, Emergency Plan Classification and Action Level Scheme. The licensee initiated actions per OP 3500, Unusual Event, and at 7:43 P.M. secured from the event after noting conditions normal and finding no damage due to the earthquake. At 8:00 P.M. all inspections by on-site personnel were reported complete with no damage noted to the plant or surrounding areas.

Inspector review of this event established the following findings:

- (1) At the time of the seismic event, the strong-motion accelerograph was not installed due to instrument malfunctions identified in paragraph 10.a. of this report. The instrument malfunction was subsequently corrected and a bench test performed by 10:00 A.M. on January 19, 1982. An evaluation of the film resulting from the January 19th bench test was inconclusive due to suspected turbine induced vibrations and an in-place functional test was performed per RP 4396 on January 20, 1982. An evaluation of the functional test data on January 22, 1982, revealed a film trace similar to Kinematic SMA-1 factory calibration data and established the instrument was capable of recording channel responses in the required three directions.
- (2) Vermont Yankee procedure OP 3021, Natural Disaster, Revision 9, provides guidelines to be followed in the event a natural disaster is imminent or has occurred. A symptom of a natural disaster as described in OP 3021 is "Detection of ground motion or indication of same on the seismic accelerometer. Although the strong-motion accelerograph was not installed at the time of the event, the Shift Supervisor Log entry of January 18, 1982, 7:20 P.M. notes that on-site personnel felt an earthquake which shook the plant. An Auxiliary Operator was dispatched to inspect the plant for damage and this inspection was completed at 8:00 P.M. as noted in the Log with no damage found to the plant or surrounding areas. The inspector also conducted a complete tour of Reactor Building and Turbine Building structures on the morning of January 19, 1982. The inspector subsequently reviewed operator actions and noted no reference to performance of OP 3021, section 3, actions to take if an earthquake has been experienced. Upon questioning, the Operations Supervisor established that the required actions of OP 3021, section 3, steps a. through f. were not performed. These steps verify control rod position and operability, check for indications of leaks, verify building air samples, specify visual inspection areas, and verify upstream and downstream dam integrity.

Failure to adhere to procedure OP 3021 is contrary to Technical Specification 6.5.A. and is considered a violation (50-271/82-01-04).

- (3) Licensee evaluation of the seismic event of January 18, 1982, utilizing Weston Lab data as analyzed by Yankee Atomic Nuclear Services Division resulted in a conservative on-site acceleration of .02-.03g. This compares with Vermont Yankee FSAR section 12.2 design criteria such that a safe shutdown can be made during or following a horizontal acceleration of 0.14g,
- (4) During performance of off-site notifications as required by OP 3500, Unusual Event, operators noted that the normal communications path between New Hampshire State Police and the control room via the Nuclear Alert System was inoperable. Per OP 3500, notification to the New Hampshire State Police dispatcher was alternately made utilizing commercial phone lines; this action was logged as complete at 7:43 P.M. on January 18, 1982. Subsequent to these actions, it was determined that New Hampshire State Civil Defense officials were not notified of the Unusual Event by the State Police dispatcher. A review of the circumstances contributing to this notification failure revealed the following:
 - (a) A call was made to the New Hampshire State Police Dispatcher using commercial telephone lines on January 18, 1982. The inspector reviewed a tape recording of the call provided by the New Hampshire State Police. During the conversation, which lasted about 1 minute, the licensee representative identified himself as calling from the VY control room and stated that an unusual event had occurred and that no recommendations for protective actions were being made. This information covered the salient information required to be transmitted by the "Initial Notification" messages in OP 3500. However, there was no repetition of the Initial Notification message, with an identification of VYNPS as the caller and the declaration of the Unusual Event emergency classification. There was also no request made by VY that the Dispatcher acknowledge the notification.

This item was discussed with the Plant Manager in a meeting on January 22, 1982. The inspector stated that future Emergency Plan notifications should be made verbatim (if necessary) from the EIPs (emergency plan implementing procedures) and that licensee personnel should ensure emergency notifications are acknowledged. The licensee acknowledged the above. Instructions regarding EP notifications were subsequently entered in the Night Order Book for Operations Department review.

- (b) During discussions with the Operations Superintendent, it was noted that trouble with the Nuclear Alert System link with New Hampshire had been an outstanding problem previously noted by the licensee. The New Hampshire link had reportedly failed monthly surveillance tests in November and December, due to a malfunction in a microwave repeater located on a mountaintop in New Hampshire. Upon discovery of each failure, VY contacted the outside organization who owns the repeater and is responsible for its upkeep and repair. However, the repair requests were not followed up by VY and no repairs were effected. The inspector expressed his concern that the degraded communication link had not received management attention to ensure timely resolution of the malfunction.

Repairs on the New Hampshire link were reported as complete on January 22, 1982. Additionally, the licensee instituted changes to certain procedures for dealing with system problems. These changes include: (i) dealing directly with repair crews when problems arise; and (ii) operational test of the communication link when repairs are reported complete. By letter dated January 22, 1982, the New Hampshire State Police instituted an agreement with the licensee to conduct a daily communication check.

Based on the above corrective actions, the inspector had no further comments on these items.

c. Plant Shutdown for Main Steam Drain Line Repair

Operations personnel noted evidence of leakage from the "C" Moisture Separator Drain Line during routine tours in the Turbine Building. The leakage initially appeared as wetted insulation on the drain line. By January 25, 1982, the leakage had increased to the point where minor wisps of steam were blowing from the piping/insulation immediately under the moisture separator. Since the moisture separator area is a high radiation area during normal plant operations, the licensee decided to shut the plant down on January 25, 1982, to allow access, inspection and repair of the leak. Shutdown from 100% full power was started at 9:00 P.M. on January 25, 1982, and the plant entered the cold shutdown condition at 9:45 A.M. on January 26, 1982. The reactor was taken critical again, following the repairs described below, at 3:40 A.M. on January 27, 1982.

Upon removal of the "C" moisture separator drain line insulation, a crack and a through wall defect was found in a 6 inch diameter section of the drain line, just upstream of the 24 inch diameter

expansion volume HD-11C. Ultrasonic examination of the line also showed extensive wall thinning around its circumference. Ultrasonic examination of adjacent /adjoining lines showed that only the 6 inch diameter section was affected. The affected piping was A106, schedule 40, grade B carbon steel. The pipe section was cut out and replaced with schedule 80 carbon steel piping. Visual examination of the cut out section confirmed the extensive internal corrosion/erosion showed by ultrasonic examination. The pinhole defect was located at a point of minimum wall thickness; the second crack was located in the heat affected zone of a gusset support welded to the exterior of the pipe section. The licensee has postulated that the erosion was caused by steam cutting associated with the two-phase fluid that flows from the moisture separator to the expansion header.

Based on the examination results for the "C" moisture separator, the licensee examined the drain piping for the other three moisture separators. No evidence of erosion was found on the "B" and "D" units. Some wall thinning was found on the "A" drain line and the affected piping on it was also replaced. On both moisture separators where erosion was found, the affected piping was schedule 40 carbon steel instead of the schedule 80 piping called for the moisture separator specifications. Further laboratory analysis of the schedule 40 piping is planned by the licensee to determine the material properties of the affected sections.

The repairs completed on the moisture separators were inspected, which included a review of affected piping, ultrasonic examination results, health physics controls applied to the repair area under RWPs 1056 and 1059, and a review of radiological conditions caused by the leak. No increase in airborne activity was detected in the Turbine Building. No measurable increase in radioactive emissions offsite occurred.

Further evaluation of the moisture separator drain line erosion is planned by the licensee. Additionally, the licensee is considering including the drain piping in a surveillance program to monitor internal wall erosion. This area will be examined on a subsequent inspection following completion of the licensee's evaluations (IFI 50-271/82-01-05).

No items of noncompliance were identified.

d. Replacement of SRV 71D

During the plant shutdown from January 25-27, 1982, to repair the moisture separator drain lines, actions were also completed to replace the three-stage Target-Rock relief valve on the "D" main steam

line. This action was taken due to indications of leakage observed on the valve installed on the line during the 1981 refueling outage.

Following startup from the 1981 refueling outage, the tailpipe temperature of the D SRV increased from a normal reading of 150°F on December 11, 1981 to a value of 216°F. The tailpipe temperature stayed roughly constant at 216°F until the plant was shutdown on January 25, 1982. A licensee evaluation of the elevated temperatures, in consultation with GE, concluded that pilot valve leakage was the most probable cause for the SRV leakage. A program was started to monitor the valve for increasing leakage trends. Operations shift crews re-reviewed actions required to be taken per OP 3105 (RV Stuck Open) and administrative limits were established for operator actions to be taken in the event the tailpipe temperature exceeded preset limits. A spare relief valve was sent to an offsite laboratory to reset its lift pressure in preparation for installation on the SRV 71D line. Following replacement of the valve, a lift test was conducted during the plant startup on January 27, 1982, to ensure proper valve operation. Tailpipe temperatures on SRV 71D and the other SRVs stayed within the normal operating range during subsequent plant operations.

On January 26, 1982, the inspector reviewed licensee documentation detailing Wyle Laboratories repair and reset of TRM SRV Model 67F, Serial No. 67HH12 Target Rock Three Stage Pilot-Operated Safety Relief Valve. This valve was subsequently used as a replacement on the 'D' main steamline. The inspector reviewed Receipt Inspection Checklist VYAPF 0801.01 dated January 25, 1982 and Certification Test Report No. 45990-1, Wyle Laboratories dated January 20, 1982. Final set pressure for the RV was within the range of 1070 + 4 - 0 psig.

No items of noncompliance were identified.

11. Review of Licensee Event Report (LER) 81-36

LER 81-36 was submitted to the NRC by letter VYV 82-42 dated January 16, 1982, and concerned the failure of RWCU valve 15 to seat properly during surveillance testing on December 17, 1981. The event report was reviewed in-office to determine whether: the information provided clearly described the event; the appropriate safety significance was identified; the event cause was identified and the corrective actions (taken or planned) was appropriate; and, the report satisfied NUREG 0161 and Technical Specification 6.7 criteria. The event report was further reviewed in conjunction with facility records to verify that corrective actions were completed and that Technical Specification 3.7.D.2 limiting conditions for operation were met.

No inadequacies were identified.

12. Review of NUREG 0737 TMI Action Plan Requirements

Implementation of NUREG 0737 - TMI Action Plan Requirements was reviewed to determine the status of those items with a due date of January 1, 1982. The review consisted of establishing a licensee commitment to fulfill a requirement and a followup inspection to determine its completion status. References used for this review are listed below.

- (i) NUREG 0737, Clarification of TMI Action Plan Requirements, October 31, 1980
- (ii) Letter WVY 80-175, Item II.K.3.13
- (iii) NRC Letter to R. L. Smith dated October 7, 1981 (Item II.K.3.15)
- (iv) Letter FVY 81-162, Item II.K.3.15
- (v) Letter FVY 81-111, Item II.K.3.15
- (vi) Letter FVY 82-1, Item II.K.3.13
- (vii) NRC:Region I Inspection Report 50-271/81-18

a. Item II.K.3.15, HPCI/RCIC Break Detection Logic Modifications

(1) Requirements: References (i) and (iii)

Modify the pipe break detection circuitry on the HPCI and RCIC systems to minimize spurious isolations during system startups.

(2) Licensee Commitments: References (iv) and (v)

Design changes will be made to the respective systems.

(3) Inspection Findings: Reference (vii)

Design changes made for the HPCI system on October 30, 1981, were reviewed using PDCR 81-03 and its associated Installation and Test Procedure. The modifications involved changes to the EGR hydraulic system which supply oil at 80 psig to the governor valve for control during system startup. The idle point in the control circuit ramp generator was adjusted to cause the valve to close down during startup and thus reduce the steam admission transient. The slope of the ramp generator output was increased to balance the effects of the lower idle point. The inspector

reviewed recorder tracings of the ramp generator output, governor valve position and steam flow made during tests on December 18, 1981. No inadequacies were identified. Additional HPCI testing was scheduled for completion during the week of February 8, 1982.

Modifications made to the RCIC control logic were reviewed using EDCR 80-54, Job Order File No. 81-23, OP 4368 (Revision 11) and the associated EDCR installation procedure. Previous trip relays 13A-K7 and 13A-K31 were replaced with time delay units set at five seconds. The acceptable range allowed by the Technical Specifications is from 3 to 7 seconds. The results of RCIC testing conducted at 150 psig on December 3, 1981, and at 1000 psig on December 18, 1981 were reviewed and found acceptable.

The inspector had no further questions on this item.

b. Item II.K.3.13, RCIC Automatic Reset

(1) Requirements: Reference (i)

Modify the RCIC control logic to allow remote reset and restart on low reactor vessel water level.

(2) Licensee Commitment: References (ii) and (vi)

RCIC starting logic would be modified to allow restart without reliance on manual reset at the turbine. Due to equipment delivery problems, the modifications would be completed in January 1982.

(3) Inspection Findings: Reference (vii)

Modification completed in accordance with PDCR 80-05 and its associated installation and test procedure were reviewed. Changes to the starting controls and system operability testing were complete by January 20, 1982. A motor operator was added to the Turbine Trip/Throttle valve to open it when valve V13-131 closes. V13-131 now receives the close signal from the vessel high water level trip logic. The inspector also reviewed associated changes made to surveillance and operating procedures 4368, 2121, 4121 and 3140. Changes to these procedures were also found in the Night Order Book for Operator review. A control room operator interviewed by the inspector was knowledgeable of the system changes.

No inadequacies were identified.

13. Non-Licensed Operator Training

Auxiliary operator (AO) training was addressed in Item 2.a.(2) (g) of the Management Appraisal Inspection Report No. 50-271/81-3 (PAS). The inspector reviewed the licensee's responses to the item contained in letter FVY 81-138 dated September 15, 1981 and held discussions with members of the Operations and Training Department Staffs to determine what actions were being taken in this area.

A revision is being prepared to Department Procedure DP 0160 that will augment existing AO training requirements. For initial training programs, new-hires will spend a two month indoctrination period with the Training Department to attend formal classroom lectures on plant system designs, as well as job specific topics. Existing retraining requirements in DP 0160 will be upgraded to require AO attendance at classroom lectures, which will include attendance at operator retraining lectures when no AO job specific lectures are running. Revision of DP 0160 to incorporate the above is expected by March 1, 1982 with implementation to occur by July 1, 1982. This item will be reviewed during a subsequent inspection pending revision of DP 0160 and implementation of the augmented training requirements (50-271-01-06).

The inspector reviewed attendance records for 5 recently hired Auxiliary Operators, who attended lectures given during the period from December 7, 1981 - January 13, 1982. Topics covered during these lectures included BWR plant systems. During discussions with the Operator Training Supervisor, it was noted that the Training Staff's capability to meet the proposed DP 0160 requirements, was contingent upon the hiring of an additional instructor in the Training Department. Posting of a new position and personnel recruiting was expected to occur in February 1982. This item was discussed with the Assistant Plant Manager to verify that management attention would be given to this area to ensure timely implementation of DP 0160 requirements.

14. Piping Insulation on Systems Inside the Drywell

The inspector reviewed the FSAR section 4.3.4. and interviewed Maintenance Department personnel to determine whether rock-wool insulation was used on piping systems located inside the Drywell. The review was conducted to address concerns identified at other facilities, which indicated that the rock-wool type insulation has the potential for breaking apart in the post-accident environment and blocking suction screens for ECCS equipment.

Although asbestos and all-metal type insulation are both used on drywell piping systems, the all-metal "mirror" insulation is the predominant type used at VY (estimated at 99%). Non-metallic insulation

is used principally on small diameter (2 inch) service cooling water lines. Additionally, the four safety relief valves are covered with a blanketed fiberglass insulation jacket; metal wire is used to hold the blanket in place. The extent and use of both types of insulation were noted during an inspection tour of the drywell on January 27, 1982.

Based on the above information, the concerns identified at other facilities do not appear applicable to VY. No inadequacies were identified.

15. Unresolved Items

Unresolved items are items about which more information is required to ascertain whether they are acceptable items, items of noncompliance, or deviations. Unresolved items are discussed in Details 10.a.(3).

16. Management Meetings

During the period of the inspection, licensee management was periodically notified of the preliminary findings by the resident inspectors. A summary was also provided at the conclusion of the inspection and prior to report issuance. The Plant Manager noted the items of noncompliance during a meeting on January 25, 1982.

Additionally, the resident inspectors attended the entrance and exit interview on January 12 and 15, 1982, respectively, conducted by region based inspectors in regard to a review of the plant security program.