

U. S. Nuclear Regulatory Commission
Region I

Docket/Report: 50-271/92-14 License: DPR-28

Licensee: Vermont Yankee Nuclear Power Corporation
RD 5, Box 169
Ferry Road
Brattleboro, Vermont 05301

Facility Name: Vermont Yankee Nuclear Power Station

Inspection: June 29 - July 2, 1992

Inspection At: Brattleboro and Vernon, Vermont

Inspectors: Lonny Eckert 7/30/92
L. Eckert, Emergency Preparedness Section date
J. Lusher, Emergency Preparedness Section
D. Schultz, Contractor, COMEX Corporation

Approved: E. C. McCabe 8/17/92
E. McCabe, Chief, Emergency Preparedness Section date
Division of Radiation Safety and Safeguards

Areas Inspected

Vermont Yankee Nuclear Power Station emergency preparedness (EP) program changes, emergency facilities, equipment and supplies, organization and management control, emergency response organization (ERO) training, staff knowledge and performance, and independent reviews/audits.

Results

The EP program was appropriately administered and maintained. A question was raised about the interface between Emergency Preparedness and other site and corporate departments. In addition, the inspectors noted opportunities for improvement of the Vermont Yankee Emergency Action Level scheme. These matters were referred to the licensee for consideration.

DETAILS

1.0 Persons Contacted

The following individuals were contacted during the inspection.

- J. Babbitt, Technical Training Supervisor
- * G. Bristol, Community Relations Coordinator
- * T. Burda, EP Specialist, Stone and Webster
- * R. Grippardi, QA Supervisor, YNSD
- * E. Harris, Operations Training Supervisor
- * S. Jefferson, Assistant to Plant Manager
- G. Lowe, Director, Vermont Emergency Management Agency
- * J. Meyer, Project Engineer
- W. Murphy, Senior Vice-President, Operations
- * M. Palionis, Senior Operations Engineer
- * E. Porter, Emergency Planning Coordinator
- * R. Pagodin, Technical Services Superintendent
- * D. Reid, Plant Manager
- D. Rodham, Director, Massachusetts Emergency Management Agency
- * E. Salomon, EP Specialist, YNSD
- * J. Sinclair, Director of External Affairs
- * D. Stafford, Technical Training Supervisor
- * D. Weyman, Senior Environmental Projects Manager

The inspectors also interviewed and/or observed the actions of other licensee personnel.

- * Attended the exit meeting.

2.0 Operational Status of the Emergency Preparedness (EP) Program

2.1 Changes to the EP Program

The inspectors reviewed changes made to the emergency plan and its implementing procedures (EPIPs) since the last EP inspection to determine if they adversely affected EP and whether the changes had been properly reviewed, approved, and distributed. That review concluded that these changes have not decreased program effectiveness.

Program enhancements since the last inspection included: a new paging system with wider coverage, the ability to drive the Emergency Response Facility Information System (ERFIS) with the simulator, and the placement of additional power-fail phones in the emergency response facilities (ERFs).

The 1990 census results were being evaluated to determine if changes in Evacuation Time Estimates are necessary. A licensee task force was created to evaluate the new revision to EPA-

520, Manual Of Protective Action Guides And Protective Actions For Nuclear Incidents. The licensee was evaluating the siren system receiver/decoders for replacement.

Letters of Agreement were reviewed and found current. One change involved the lapse of a YNSD agreement with Brigham & Women's Hospital; a compensatory agreement with the Commonwealth of Massachusetts Nuclear Incident Advisory Team (NIAT) was then established.

A decision on how to best incorporate the evaluation of cumulative effective dose equivalent (CEDE) to off-site emergency workers was in progress. YNSD was evaluating whether this new document will require modifications to the current dose assessment model.

This program area was assessed as being effectively implemented.

2.2 Facilities

The inspectors toured the Control Room (CR), Operations Support Center (OSC), Technical Support Center (TSC), and Emergency Operations Facility (EOF) to assess whether these facilities, equipment, supplies, and procedures were adequately maintained. Communications equipment, computer terminals, and survey equipment were reviewed for operability and calibration on a sampling basis. All equipment was functional and calibrated. Several downwind survey kits were inspected and found to be fully stocked; equipment in these kits was operational and calibrated. Review of the licensee's facility surveillance reports and discrepancy corrective action reports for 1991 found them effective. Discrepancies were resolved promptly. Overall, emergency response facility maintenance was assessed as effective.

The inspectors walked down the ventilation system for the control room and for the administration building (the air supply system for the TSC). These ventilation systems were standard industrial-type supply and exhaust systems. The CR was provided with six self-contained breathing apparatus units, and the TSC filtration system consisted of roughing filters. No HEPA filters or charcoal adsorption beds were present. In this case, NRC acceptance of certain control room habitability provisions was identified (Letter from NRC Division of Licensing dated 2/24/82). However, the inspectors identified CR and TSC ventilation as an item for further NRC consideration (IFI 50-271/92-14-01).

2.3 Organization and Management Control

The inspectors reviewed the ERO and management control of the EP program to assess conformance with the Emergency Plan. Separate discussions were held with the Senior Vice President, Operations and the Director, External Affairs. These individuals were familiar with their EP responsibilities, either through program support or through maintaining qualification in the ERO. The Emergency Planning Coordinator (EPC) continued to report to the Director, External Affairs. The External Affairs Director reported to the President and Corporate Executive Officer of the Vermont Yankee Nuclear Power Corporation.

The EPC was supported by a full-time staff member with the responsibility of community relations and off-site training. One contractor with a meteorological background has been on staff since the last inspection. The Yankee Nuclear Services Division (YNSD) has assigned, upon request, EP staff to the site or has addressed problems at their Bolton, Massachusetts office. Operations input needed to develop scenarios was provided by members of the Scenario Development Committee (simulator instructors). During 1991, YNSD provided about 5700 hours of support to EP for Ames Hill siren signal transmitter maintenance, scenario development, off-site assistance, and drill/exercise participation.

The ERO was fully staffed with a minimum of three qualified individuals in each position. The inspectors reviewed qualification/training records and found that all personnel had received their annual training with the exception of most of the Security Department. Other than new hires, the training dates for Security ranged from 1/13/91 to 2/14/91 for the general EP overview and 2/28/91 to 3/13/91 for the air sample survey training. The Security Department had not received its annual EP training because it was in the middle of new weapon training and certification. The EPC was not aware of this circumstance. To resolve this matter, the licensee rescheduled annual Security EP training to July 2, 9, and 16, 1992. This was assessed as an appropriate compensatory measure.

Annual training requirement limits had not been defined in the Emergency Plan or in the Training Department instructions for EP. On 7/2/92, a Departmental Instruction was implemented defining annual EP training as 12 months plus or minus three months. Subsequently, OP-3712 "Emergency Plan Training," was revised (Revision 11) to similarly define annual training. These actions were assessed as appropriate.

The inspectors noted that EDCR 90-406, Torus Vent System (TVS), was installed and made operational before startup from the refueling outage in March 1992. The modification was made in response to NRC Generic Letter 89-16 that requested all Mark I BWRs to install a hardened wetwell vent for mitigating an accident resulting in overpressure of the containment. The Vermont Yankee TVS is a passive system with a rupture disc installed in the direct torus vent line to the plant stack with a setpoint (59 ± 3 psig) such that the Primary Containment Pressure Limit (PCPL) will not be exceeded under "beyond design basis accident conditions." A normally open, downstream (of the rupture disk) motor-operated gate valve (MOV) was also installed to allow isolating this vent line. The limitations on containment pressure imposed by this modification were not specifically reflected in the EAL scheme procedure (AP-3125) or the PAR procedure (OP-3511). During the inspection, discussion with the modification project engineer identified no review, by that individual, of associated emergency plan and implementing procedure implications. Post-inspection discussion with the licensee EPC and Operations Support Manager provided information that the operators had been trained on the TVS before post-installation plant operation, that the TVS was designed to prevent containment overpressure during long-term cooling not involving over 1% power, that the licensee had evaluated associated EAL and PAR provisions and found them still valid, and that shutting of the TVS isolation valve was prohibited except upon direction of the TSC. The inspectors had no further questions on this matter.

Based upon the above annual security training and plant modification findings, and Operations training (see Report Detail 2.4), the interface between the EP and other site and corporate departments will be further evaluated (IFI 50-271/92-14-02).

This program area was assessed as good.

2.4 Knowledge and Performance of Duties (Training)

The inspectors reviewed Emergency Plan Section 12.2, "Training," the Emergency Response Training Program Description (TPD); OP 3712, "Emergency Plan Training," and selected training records, lesson plans, and interviews to determine if 10 CFR 50.47(b)(15) and 10 CFR 50, Appendix E, Section F, "Training," had been met.

EP lesson plans were reviewed and approved by the EPC, and were reviewed by the Training Department annually or prior to instruction. Inspector review found selected lesson plans current. The inspectors selected training deficiencies found during the licensee's practice drills and found that lessons-learned had led to revisions to the appropriate lesson plans.

In 1991, the training department conducted five walk-through drills (mini-drills) in which all of the principal ERO personnel were required to attend and participate as players, observers, or controllers (annually) by OP 3712. Two licensee walk-through drills were held for dose assessors. Another two were held for key TSC/OSC responders and a fifth drill was held for key EOF staff. Non-principal ERO personnel were requested to attend and participate. This walk-through drill program was assessed as an EP program strength.

Six qualified TSC Coordinators and four qualified Plant Emergency Directors (PEDs) were interviewed. Each interview lasted approximately forty-five minutes, and was attended by a licensee representative. The interviews were open-book, and focused on the adequacy of emergency plan implementing procedures and how individuals were trained on EALs and PARs. It was recognized that individual interviews provide an environment that is substantially different from the conditions under which EAL and PAR criteria are actually applied. Also, because actual EAL declarations and PARs are a team effort, individual interviews cannot measure overall licensee ability to classify events and make PARs. (That capability has been found acceptable during actual events and periodic emergency exercises.) Overall, the interviews indicated acceptable individual knowledge. The interviews did, however, provide indicators that merit licensee consideration from the viewpoint of determining whether EP training (and/or associated tests) should be strengthened or re-oriented to better assure maintenance of the overall ability to classify events and make PARs. Specific such indicators were:

- One of six TSC Coordinators could not correlate Site Area Emergency (SAE) and General Emergency (GE) classifications with the associated potential for radiological impact on the public (e.g., significant for a GE and insignificant for a SAE). It was also noted that the Emergency Plan does not specify this relationship but that AP-3125,

Emergency Plan Classification and Action Level Scheme, does. This indicated an individual lack of familiarity with AP-3125.

- One of four PEDs could not formulate a PAR for a hypothetical GE based on described severe accident plant conditions. This indicated an individual lack of practice in use of the related procedure.
- One of six TSC coordinators was able to develop PARs based on dose projections but was unable to develop a PAR based solely on plant conditions. This indicated an individual lack of knowledge of development of initial PARs, which should be based on plant conditions which may lead to a radiation release.

NRC review concluded that, overall, personnel were able to implement EP procedures as intended. However, licensee analysis of the above indicators was identified as a matter for subsequent NRC review (IFI 50-271/92-14-03).

The inspectors also reviewed four Licensed Operator Requalification (LOR) scenarios used in the simulator to retrain operators. No questions were raised about three of these scenarios. The fourth scenario, SEG-12, Revision 1, 4/92, included the following event sequence.

- Inadvertent RCIC (Reactor Core Isolation Cooling System) initiation
- Fuel Clad failure
- ATWS (Anticipated Transient Without Scram)
- RCIC steam line break
- High radiation levels in the Reactor Building

SEG-12 contained, as a critical task, operator classification of a GE when the scenario conditions reached that level. It did not, however, specifically require determining whether lower level EALs were properly recognized and implemented (e.g., declaring an Alert or SAE as the scenario developed to meet the associated criteria). Because all operating shifts regularly receive LOR training, requiring specific LOR scenario checks of proper classification at each EAL reached could strengthen the assurance of proper operator classification of events. This consideration will be further reviewed after licensee assessment (NRC follow-up on this matter will be coordinated with the follow-up identified in Detail 2.3).

Overall, this program area was assessed as good.

2.5 Independent Reviews/Audits

An independent licensee review including an evaluation of the adequacy of the off-site interface is required once every 12 months by 10 CFR 50.54(t). Section 12.1.9 of the Emergency Plan, "Emergency Plan Audit," required an annual audit which met 10 CFR 50.54(t) requirements. To determine if these requirements were met, the inspector reviewed the licensee's Emergency

Plan and Operational Quality Assurance (OQA) Procedures, interviewed the OQA auditors, reviewed the Audit Plan and audit checklists, and reviewed OQA audit and surveillance reports.

The licensee's audit was conducted by YNSD OQA Department members, meeting the requirement of independence in 10 CFR 50.54(t). To avoid duplication of resources, the annual audit and 10 CFR 50.54(t) review were combined. OQA-XVIII-2, Revision 24, "Audit Program," was used to delineate administrative controls for the scheduling, preparation, conduct, and reporting of EP audits. OQA-X-1, Revision 14, 2/3/92, "Quality Assurance Surveillances," was used to delineate administrative control for planning, implementing, reporting, and resolving discrepancies concerning surveillances of EP.

OQA characterized audits findings by four classifications per OQA-XVIII. There were Level One (violation of a requirement) and Level Two (procedural non-compliance) deficiencies. There were Level One (warning that continued conduct will result in non-compliance) and Level Two (recommendation) observations. Monthly reports on the status of open items were sent from YNSD OQA to the Plant Manager for review. The on-site Quality Services group was responsible for open item close-out.

The inspectors reviewed the 1992 audit plan and checklist and found it comprehensive. Inspector review of OQA Audit Report VY-91-14 found that it conformed to OQA procedures. The licensee used individuals from other Yankee utilities to audit the technical aspects of emergency preparedness. Licensee walk-throughs were conducted by the EP technical expert with Plant Emergency Directors (Shift Supervisors); that was assessed as an audit program strength. No deficiencies were identified by OQA. Licensee audit effectiveness was indicated by a finding that the corrective action process was not effective (see Report Detail 2.6).

The inspectors reviewed surveillances conducted by OQA and concluded that they conformed to OQA procedures. Surveillances conducted in 1991 included an assessment of the effectiveness of the emergency plan equipment check and inventory program, an assessment of the quality of contractor siren maintenance, and an assessment of the effectiveness of emergency plan training for off-site personnel. No audit deficiencies were found. Several Level One observations were made. The inspectors found these surveillance audits effective in augmenting the annual audit/review.

VY-91-14 was sent to the EPC, licensee management, the State of Vermont, the State of New Hampshire, and the Commonwealth of Massachusetts governments as required.

This program area was assessed as being effectively implemented.

2.6 Commitment Tracking

The inspectors reviewed the system by which corrective actions were tracked. Items requiring corrective actions were maintained on the site commitment tracking system. Items were maintained in accordance with AP 0028, Revision 14, 6/27/91, "Operating Experience Review

and Assessment/Commitment Tracking." The Technical Programs Supervisor was responsible for program oversight. The Operations Experience Coordinator maintained the system.

One change was noted in OP 3505, "Emergency Preparedness Exercises and Drills," in that NRC exercise areas for improvement no longer need plant operations review committee (PORC) approval prior to being evaluated under AP 0028. That was in response to a 1991 audit finding concerning untimely discrepancy resolution.

Corrective action for selected items was reviewed for areas for improvement from the licensee's 1990 and 1991 annual exercise and dress rehearsal drill. The inspectors determined that these selected items were properly reviewed and had received appropriate corrective action.

This program area was assessed as being effectively implemented.

2.7 Drill and Exercise Program

The inspectors reviewed Section 12 of the Emergency Plan, Revision 14, 10/25/91, "Maintaining Emergency Preparedness;" OP-3505, Revision 15, 10/3/91, "Emergency Preparedness Exercises and Drills;" selected training records, drill scenarios, scenario development committee agenda, critique notes, and final drill reports to determine if 10 CFR 50.47(b)(14) and 10 CFR 50, Appendix E, Section F "Training," had been met.

Section 12.1.2, "Communication Tests," of the Emergency Plan and OP-3506, "Emergency Equipment Readiness Check," established guidance and responsibilities for communications tests. The inspectors reviewed documentation of the conduct and results of these tests and concluded that these activities conform to the above noted documents.

Section 12 of the Emergency Plan required that an Exercise Coordinator be appointed by the Exercise Planning Committee. The Exercise Coordinator was to be cognizant of the development, coordination, and conduct of drills and exercises. The Emergency Plan required that Vermont Yankee conduct the annual exercise and the following drills: medical emergency (annual), radiation emergency (annual), health physics (semi-annual), and effluent monitoring (annual). The EPC maintained a rolling six-year objective matrix to ensure that all sixteen planning standards of NUREG-0654 were being tested in accordance with OP-3505.

Two full station drills/exercises were conducted in 1991, which met requirements. The Emergency Plan required drills were incorporated into the two full station drills/exercises. Additional practical experience for key ERO members was gained through Training Department walk-throughs (see Report Detail 2.4). The inspectors reviewed the drill/exercise scenario development process for the drills and exercises conducted in 1991. The EP group relied heavily on YNSD and the Training Department for scenario development. Previous concerns received emphasis through inclusion in drill/exercise objectives. Drills and exercises conducted met Emergency Plan requirements for 1991. Drills/exercises were approved by senior

management. Drill/exercise records were reviewed and found complete. Drill reports were timely and widely distributed to management.

This program area was assessed as good.

2.8 Public Information and Off-site Interface

The inspectors interviewed the Community Relations Coordinator (CRC) to determine how information was disseminated to the general public. Annually, the licensee distributed calendars and information brochures which were tailored to the States of Vermont and New Hampshire and the Commonwealth of Massachusetts. The calendar information was transferred to cassette tapes and then distributed to libraries and civil defense directors for use by the visually impaired. The licensee implemented a public outreach program through a technical expert Speakers Bureau which conducted on-location seminars for community organizations. The licensee funded three emergency planning contractors for the Commonwealth of Massachusetts and provided a new system to enhance the Commonwealth of Massachusetts document control process. A drill was conducted with the Commonwealth of Massachusetts to provide additional training for the new Massachusetts Emergency Management Agency Director. EAL training and a simulator demonstration were conducted on 9/1/91 for off-site officials.

Licensee management was kept apprised of off-site issues through weekly reports to the Director of External Affairs. The guidelines for the report was delineated in the External Affairs Department Guidelines. Both the EPC and the CRC were responsible for providing reports.

Officials from the Vermont Emergency Management Agency and the Massachusetts Emergency Management Agency were interviewed and expressed satisfaction of the support that they have received from the Vermont Yankee Nuclear Power Corporation.

This program area was assessed as being effectively implemented.

2.9 Emergency Action Levels (EALs)

Emergency Plan Classification and Action Level Scheme Procedure AP-3125, Revision 10, 8/15/91, was reviewed, on a sampling basis, for the preparation of the interviews conducted with Plant Emergency Directors and TSC Coordinators. The following were noted:

- NUREG-0654 Alert Initiating Condition IC-11 is:
Failure of reactor protection system (RPS) to initiate and complete a scram which brings the reactor subcritical

The corresponding licensee Alert IC is:

- Failure of RPS to initiate or accomplish a required scram:
- a. Automatic or Manual scram signal is present,
- AND

- b. Not all control rods are fully inserted at or beyond position 02,
AND
- c. Reactor power remains above 2%.

NUREG-0654 Site Area Emergency (SAE) IC-9 is:

Transient requiring operation of shutdown systems with failure to scram (continued power generation but no core damage immediately evident).

The corresponding licensee SAE IC is:

Failure of RPS to initiate or accomplish a required scram with the Main Condenser unavailable:

- a. Automatic or Manual scram signal is present,
AND
- b. Not all control rods are fully inserted at or beyond position 02,
AND
- c. Reactor power remains above 2%,
AND
- d. Main Condenser not available as a heat sink.

Discussion: The NUREG-0654 Alert IC for a failure to scram is one with continued reactor criticality; the SAE initiating condition is a failure to scram with continued power generation. The corresponding VY EALs for Alert and SAE both allow criticality in the power range, with the discrimination between the two being availability of the main condenser.

• NUREG-0654 Alert IC-13 is:

Fire potentially affecting safety systems.

The corresponding licensee Alert IC is:

Any in-plant fire which affects or will likely affect a safety system function.

NUREG-0654 SAE IC-11 is:

Fire compromising the functions of safety systems.

The corresponding licensee SAE IC is:

Reactor pressure is above 150 psig and an in-plant fire disables ALL of the following: HPCI, RCIC, and Relief Valves

OR

The plant is not in Cold Shutdown and an in Cold Shut-plant fire disables ALL of the following: LPCI Subsystem "A", LPCI Subsystem "B", Core Spray Subsystem "A", and Core Spray Subsystem "B"

Discussion: A potential need to better define "safety system function" was evident for the VY Alert IC. The licensee was requested to evaluate their SAE IC for additional combinations of systems which would warrant declaration of a SAE.

- NUREG-0654 General Emergency (GE) IC - 2 is:
Loss of two of three fission product barriers with the potential loss of the third barrier, (e.g., loss of primary coolant boundary, clad failure, and high potential for loss of containment).
The corresponding licensee GE IC is:
Loss of two of three fission product barriers with the potential loss of the third as evidenced by any two of the following:
 - a. Loss of significant amount of the fuel clad as evident by containment radiation monitors reading $> 10,000$ R/Hr.
 - b. Failure of the primary coolant boundary as evident by loss of coolant.
 - c. Failure of the primary containment as evident by failure of two in series containment isolation valves, observed structural damage, or high reactor building radiation levels detected indicating containment failure.

Discussion: The licensee was requested to evaluate this GE IC for additional indicators of fission product barrier integrity. For example, the containment integrity indicator did not include "containment pressure approaching design," or "oxygen/hydrogen mixture approaching combustible/explosive mixtures."

- NUREG-0654 Alert IC - 5 is:
Primary coolant leak rate greater than 50 gpm.
The corresponding licensee Alert IC is:
Total primary containment leakage greater than 50 gpm.

Discussion: Interviews with Plant Emergency Directors and TSC Coordinators found that plant personnel understood the intent of this EAL as being a primary coolant leakage limit. This EAL could, however, be clarified. As currently written, this EAL might mislead individuals who have not been trained on its intent (e.g., Emergency Directors, per AP-3125, are directed to provide a basis of declaration for notifications of an event).

In summary, some potential EAL improvements were noted (IFI 50-271/92-14-04).

4.0 Exit Meeting

The inspectors met with the licensee personnel denoted in Section 1 at the conclusion of the inspection to discuss the inspection scope and findings. The licensee acknowledged the findings.

POST-INSPECTION COVER SHEET

DATE SUBMITTED: 7/31, 19 92

FROM: LL Eckert (Reporting Inspector) RE: 50-247/92-14 (Inspection No.) on 6/29-7/2/92 (Dates of Inspection)

TO: EC McCabe (Reporting Inspector's Supervisor) Vermont Yankee (Facility Identification)

- /✓ The facility resident/senior resident inspector has been informed of the inspection results.
- /✓ The facility project section chief has been informed of the inspection results.
- /✓ Lead inspector's section chief has been informed of the inspection results.
- /✓ Feeder Reports have been completed and are attached - List:

1. Contractor Report
2. _____
3. _____

- /✓ Inspection Report is completed and ATTACHED.
- / / ~~Documentation letter or Region I Form 29 is completed and attached (a standard form with new or modified paragraphs desired).~~
- / / ~~List of updated outstanding items (Region I Form 6) completed. For Materials, license folder attached (list will be with it).~~
- / / ~~Statistical Data Sheet (766) completed and ATTACHED.~~
- /✓ Inspection Plan (Region I Form 1) as corrected, ATTACHED for Branch Files.
- / / ~~SALP input submitted for Division files.~~

Additional Comments: IFS Sheet attached

Long Eilat
(Reporting Inspector)

File:
Reporting Inspector's Branch

NOTE: Cross out and initial sections not applicable.