

U.S. NUCLEAR REGULATORY COMMISSION  
REGION I

REPORT/DOCKET NO.: 50-271/95-20

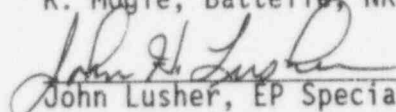
LICENSEE: Vermont Yankee Nuclear Power Corporation  
RD 5, Box 169  
Brattleboro, Vermont 05301-0169

FACILITY: Vermont Yankee Nuclear Power Station

INSPECTION AT: Brattleboro and Vernon, Vermont

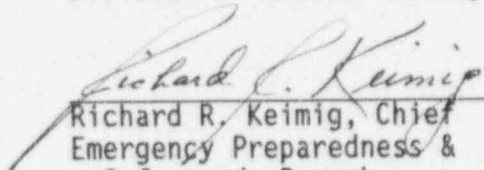
DATES: September 12-14, 1995

INSPECTORS: J. Lusher, Emergency Preparedness Specialist  
D. Silk, Senior Emergency Preparedness Specialist  
R. De Priest, Emergency Preparedness Specialist  
T. Shedlosky, Project Engineer, DRP3, RI  
R. Mogle, Battelle, NRC Contractor

  
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10/26/95  
Date

APPROVED BY:

  
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11-2-95  
Date

**Areas Inspected:** The licensee's full-participation, biennial, emergency preparedness exercise.

**Results:** Overall performance was good, no exercise weaknesses or strengths were identified, and no safety concerns or violations of regulatory requirements were observed. However, it was noted that the in-plant announcements for the declaration of Unusual Event, Alert, and Site Area Emergency were not timely. Additionally, there were no means in the Technical Support Center provided to maintain an up-to-date status of safety related equipment.

## DETAILS

### 1.0 PERSONNEL CONTACTED

#### Vermont Yankee Personnel

- \*# G. E. Bristol, Community Relations Coordinator for Emergency Planning
- # K. H. Bronson, Senior Control Room Operator
- # T. Burke, Emergency Planner, Stone and Webster
- # A. R. Chesley, Technical Support Training Supervisor
- \* J. J. Duffy, Licensing Engineer
- \* M. E. Goosekamp, Supervisor, Engineering and Maintenance Training
- # S. Jefferson, Plant Manager Assistant
- \* E. Lindamost, Technical Services Superintendent
- \* G. A. Maret, Operations Superintendent
- \*# M. L. Mervine, Training Manager
- # J. T. Meyer, Operations Support Department
- \*# G. L. Morgan, Security Manager
- \*# D. C. Porter, Operations Assistant
- \*# E. C. Porter, Emergency Preparedness Coordinator
- # D. A. Reid, Vice-President, Operations
- \*# E. H. Salomon, Senior Engineer, Yankee Atomic Electric Company
- \*# G. Sherer, Lead Security Controller
- # J. Sinclair, Director of Public Affairs
- \*# R. E. Sojka, Operations Support Manager
- \*# R. J. Wanczyk, Plant Manager

#### Nuclear Regulatory Commission Personnel

- R. E. DePriest, EP Specialist
- J. H. Lusher, EP Specialist
- J. T. Shedlosky, Project Engineer, RI
- D. M. Silk, Sr. EP Specialist
- R. D. Mogle, Battelle

- \* Denotes attendance at entrance meeting on September 12, 1995
- # Denotes attendance at exit meeting on September 14, 1995

The inspectors also interviewed other licensee and contractor personnel.

### 2.0 EMERGENCY EXERCISE

A full-participation, biennial emergency exercise was conducted at the Vermont Yankee Nuclear Power Station on September 13, 1995 from 8:00 am to 2:30 pm. The State of Vermont, New Hampshire, the Commonwealth of Massachusetts, and local communities participated. The Federal Emergency Management Agency evaluated the response by the States, Commonwealth, and other off-site agencies. The NRC evaluated the performance of the licensee's emergency response organization.

Exercise objectives were submitted to the NRC on June 13, 1995. The complete scenario package was submitted to the NRC on July 13, 1995. The NRC reviewers discussed the scenario with the licensee's emergency preparedness staff on August 17, 1995, and concluded that it provided adequate testing of the major portions of the Emergency Plan and Implementing Procedures.

On September 12, 1995, at 1:00 pm, the NRC inspectors attended a scenario briefing by the licensee. The licensee discussed those emergency response activities that would be simulated and stated that, since the plant was in operation, exercise controllers would intercede if any exercise activity had the potential to disrupt plant activities.

### 3.0 ACTIVITIES OBSERVED

The NRC inspection team observed the activation and augmentation of the emergency response facilities (ERFs) and the actions of the emergency response organization (ERO) staff. The following specific activities were observed:

- a. Selection and use of control room procedures.
- b. Detection, classification, and assessment of scenario events.
- c. Direction and coordination of emergency response.
- d. Notification of licensee personnel and off-site agencies.
- e. Communications/information flow, and record keeping.
- f. Assessment and projection of off-site radiological dose, and consideration of protective actions.
- g. Provisions for in-plant radiation protection.
- h. Provisions for communicating information to the public.
- i. Accident analysis and mitigation.
- j. Accountability of personnel.
- k. Post-exercise critique by the licensee.

### 4.0 EXERCISE FINDING CLASSIFICATIONS

Emergency preparedness (EP) exercise findings classifications are defined as follows:

**Exercise Strength:** a strong positive indicator of the licensee's ability to cope with abnormal plant conditions and implement the Emergency Plan.

**Exercise Weakness:** less than effective Emergency Plan implementation which did not, alone, constitute an overall response inadequacy.

### 5.0 EXERCISE OBSERVATIONS

Activation and utilization of the ERO and ERFs were generally consistent with the Emergency Plan (E-Plan) and Emergency Plan Implementing Procedures (EPIPs). The following sections of this report provide observations made by the inspection team in the various ERFs during the exercise.

## 6.0 SIMULATOR CONTROL ROOM (SCR)

The inspectors observed the licensee's performance in the SCR. Good communications existed among the SCR staff and between the SCR and the other ERFs. The Shift Supervisor (SS) and the crew maintained a broad perspective of plant conditions in addition to carrying out their EP duties. The crew demonstrated good teamwork and was well supported by frequent briefings from the SS.

Two emergency classification levels (ECLs) were declared by the SS. When one of two diesel generators (DGs) was lost due to a fire (the other was out-of-service due to a differential current relay problem), the SS declared an Unusual Event (UE) at 9:12 a.m. based upon the Emergency Action Level (EAL) for the unplanned loss of both DGs. The licensee (and the scenario) had anticipated the SS to declare an Alert based upon a fire which affects safety system equipment. The SS did not invoke that EAL because the fire affected only one of the DGs. The SS interpreted the Alert EAL to mean that both DGs had to be affected by a fire. The discrepancy between the SS's and licensee's interpretation of that EAL was indicative of a need for the licensee to provide further guidance and training to those who must implement the EALs. The SS's decision to declare a UE instead of an Alert was non-conservative. However, eight minutes following the UE declaration, the SS promptly directed a 10% per minute decrease in power to shutdown the plant. This demonstrated the SS's knowledge regarding the safety significance of the loss of both DGs. The inspectors, after considering the SS's misinterpretation of the EAL and his subsequent prompt decision to shutdown the plant, determined the UE declaration to be a minor issue to be followed up upon and resolved by the licensee. Shortly afterwards at 9:28 a.m., the SS declared an Alert based upon the general criteria for events in progress which warrant precautionary activation of the ERFs.

The UE and Alert notifications to the States were made within 13 and 11 minutes, respectively, following the declarations. The NRC was notified of the UE immediately following notification to the States. Following the Alert and subsequent staffing and activation of the other ERFs, the SS delegated the responsibility to notify the NRC to the TSC Coordinator and subsequently verified that he had made the notification.

One issue with respect to the SCR staff's performance was the untimely plant announcements for the UE, Alert, and Site Area Emergency declarations. The time lapse between each declaration and the in-plant announcement was 11, 17 and 24 minutes, respectively. Of particular concern is that when the Alert announcement is delayed, the activation of the ERO is delayed. The SCR staff did not promptly implement the immediate actions of procedures OP 3500, 3501 and 3502 that direct that in-plant announcements are to be made promptly. The inspectors recognized that a one to two minute time delay would be likely because when an announcement was decided upon in the SCR, it had to be relayed to an individual in the actual plant control room who would make the announcement over the plant public address system. (This capability is not available in the SCR.) This matter will be reviewed in future inspections. (IFI 50-271/95-20-01)

Based upon the overall performance of the SCR staff, the inspectors determined that its performance was satisfactory.

## 7.0 TECHNICAL SUPPORT CENTER (TSC)

The inspectors observed the emergency exercise activities in the TSC and the Engineering Support Center (ESC). Communications between the TSC and other emergency response facilities were very good, as were the verbal and written communications within the TSC.

The facility was activated promptly following the declaration of an Alert. The inspectors observed that personnel were performing their principal functions at 9:58 a.m. and the center was declared activated at 10:15 a.m. The TSC Coordinator's staff was augmented with additional managers that assisted with the telephonic notifications, and the completion of the facility startup checkoff list. This assistance had a positive effect on the performance of TSC personnel. The inspector discussed the availability of this augmented staffing with the licensee following the exercise. The licensee indicated that it expected to have an augmented staff available during an actual emergency to provide similar assistance.

As the emergency facilities were being activated, the TSC Coordinator clearly articulated changes in command and control, authority and responsibility, including those responsibilities retained in the TSC when the EOF was activated.

The briefings given to the engineering staff of the Engineering Support Center (ESC) by the Electrical and Mechanical Supervisors were very good. The engineering staff received good direction as to the priority and specific work that was needed. Work assignments were tracked on the ESC status board by specific individuals in both the station and the off-site Yankee Atomic Engineering Organization in Bolton, MA.

The TSC maintained a problem board, a chronological listing and a 15 minute plant parameter table. Engineering tasks were listed in the engineering support center. The TSC and ESC boards were maintained up-to-date and accurate. For example, the "A" emergency diesel generator (EDG) was initially recorded as affected by a lubricating oil fire. As clarifying information was received, TSC personnel quickly had the problem changed to a fuel oil fire. The status boards included priority identification and estimated repair, recovery or completion time. Completed activities were annotated. However, the inspector observed TSC personnel inquiring as to the status of operating emergency core cooling (ECCS) equipment. Additionally, the inspector noticed that there was no board that provided the operability status of ECCS and engineered safeguards features equipment, i.e., on/off/out-of-service. This was also noted by the licensee and will be followed up by the licensee. This will be followed up during a future inspection (IFI 50-271/95-20-02).

Although facility personnel were generally kept current on plant status, health physics personnel in the OSC and those monitoring the area radiation monitors in the TSC were apparently not informed of the reactor pressure vessel (RPV) venting to the condenser, through the main steam line drains. The venting process could have changed the radiological conditions within the plant and required actions to protect recovery personnel.

The ESC personnel had access to adequate technical information to work their tasks. The inspector observed that personnel quickly accessed appropriate drawings and other design information. This provided a constructive reference for problem solving. For example, good discussions were held to determine the preferred closure method for the torus vent, TVS-86, and also the post-replacement test method for the DG differential current relay.

## 8.0 OPERATIONAL SUPPORT CENTER (OSC)

The inspector observed the licensee's ability to execute OSC activities appropriately with respect to communications, command and control, health physics activities, and the organization and implementation of emergency work crews. The inspector also observed that the fire brigade's response to the simulated fire in diesel generator room "A".

The inspectors observed that the OSC was staffed in a timely manner, and was properly equipped to communicate with the other ERFs. Communications among OSC personnel with personnel in the other ERFs were good.

The Operations Support Center Coordinator's Assistant (OSCCA) maintained good command and control in the OSC. However, the role and responsibilities of the Operations Support Center Coordinator (OSCC) were not well demonstrated. The inspector noted that the OSCC had limited input for the TSC briefings he observed, and was not present for the 10:30 a.m. briefing. The OSCC also was not very proactive in remaining current on plant conditions; for example, he was not aware of the release that was in progress until after the General Emergency had been declared. The OSCCA was receiving good information directly from the TSC and the other ERFs through a speaker telephone and other telephone calls. The OSCCA also attended TSC briefings with the OSCC and coordinated the OSC activities well. Recovery team leaders conducted good briefings with their work crews and appropriately coordinated briefings with radiation protection prior to releasing recovery teams into the plant. The inspectors observed good control of the emergency recovery work teams and a proactive and conservative, parallel approach to repair the inoperable diesel generators; however, a less than well thought-out approach was planned for closing the TSV-86 valve, which was the simulated release path. This caused confusion between recovery team leaders, Radiation Protection Manager (RPM), and the OSCCA, during the planning for closure of the valve and caused the closing of the TSV-86 valve to be delayed.

The radiation protection staff maintained good control of the radiologically controlled area and used As-Low-As-Reasonably-Achievable concepts to reduce radiation exposure to the recovery teams when radiation levels became excessive in the reactor building. Radiation protection staff briefings were good, and activities to establish radiological plant conditions were well coordinated from the OSC. The OSC met the exercise objectives in a timely and appropriate manner.

The initiating event for the exercise - a simulated fire in the "A" Emergency Diesel Generator Room - was discovered by an Auxiliary Operator (AO) while on rounds in the diesel generator rooms. The AO responded correctly and notified the control room. The fire brigade's response was timely. However, there were several members of the fire brigade that responded to the scene wearing their hard hats and not their fire helmets and they were not equipped with radio communications capability. Therefore, communication between the fire brigade personnel and fire brigade leader was poor. The fire brigade leader did not receive information about the fire, such as size, location, and parts of the diesel affected by the fire, until the brigade members exited the diesel room. According to the fire brigade leader, radios are used during training to communicate essential fire information. It is possible that the pre-briefing for the fire brigade was not done well, resulting in its members not understanding their roles. This was assessed by the inspector as a drill artifact. However, the inspector determined that the fire brigade's response to the fire was adequate.

Based on these observations, the inspectors noted that the overall performance of the activities in the OSC were mixed, but no programmatic weaknesses were indicated.

## 9.0 EMERGENCY OPERATIONS FACILITY (EOF)

Overall, EOF management and control were good. Staffing and activation of the EOF went well and were accomplished in a timely and professional manner. The EOF was staffed within the 60 minute criteria (activation commenced at 9:28 a.m. and EOF relieved the TSC at 10:25a.m.). The late ALERT notification to the plant personnel resulted in a minor delay in their response to the EOF but did not significantly impact the timeliness of activation. This was assessed by the inspector as a drill artifact. The EOF staff referred to and used their procedures frequently. Congestion and noise levels in the main EOF area were kept low; however, within the Site Recovery Manager's (SRM) office, noise levels were very high at times.

The turnover from the TSC to EOF was done in a positive manner and was communicated appropriately and quickly. Appropriate notifications of the transfer of responsibilities were rapidly made to all concerned parties.

Briefings to the EOF staff outside of the SRM's office were timely and contained good information. However, periodic briefings and canvassing of the key personnel within the SRM's office for important issues did not occur on a routine basis. However, this did not significantly detract from the overall response. The EOF inter- and intra-center communications were adequate.

The EOF managers and staff performed accident assessments and event classifications adequately. EOF staff continuously evaluated plant conditions and compared those conditions to the current emergency action level to verify that the classification was correct. The EOF staff continuously monitored conditions that could bring them into the next higher classification.

Dose assessment personnel adequately performed "what if" calculations and closely monitored release point data prior to the release occurring. Dose Assessment personnel quickly recognized when the release occurred and demonstrated good knowledge of plant systems in determining that the release pathway was through the TSV-86 valve. Dose calculations were done adequately in support of protective action decision making. Field teams were dispatched and appropriately positioned prior to and during the release. Field measurements were taken and compared to projected values with good correlation. Several methods of calculations were demonstrated to include use of the METPAC computerized system, and hand and nomograph determinations were accomplished to check on the projections. The EOF habitability was monitored on a continuing basis.

Protective action decision making was good and onsite actions and offsite recommendations were made in a timely manner. Offsite officials were kept informed of protective action recommendations, classifications, and plant status in a timely manner.

Confusion resulted in the EOF because SCR personnel action was not clearly communicated to EOF personnel. Early in the scenario, the operators decided to do a rapid power decrease to shutdown the reactor. SCR controllers intervened and acknowledged the SCR staffs' decision to perform a rapid shutdown, but informed them, for the sake of the scenario, to simulate a rapid power decrease while actually decreasing power at a much lower rate. The SCR personnel communications to the other ERFs led them to believe that the reactor was going to be shutdown rapidly. Therefore, some time later, other ERF personnel did not understand why the reactor was still at a high power level. There was no adverse performance by licensee as a result of this confusion. This was assessed by the inspector as an exercise artifact.

## 10.0 LICENSEE CRITIQUE

The licensee's critique was presented by the exercise coordinator. The critique addressed the strengths, weaknesses, and areas for improvement for each ERF and identified most of the observations by the NRC inspection team. The inspectors determined the critique to be adequate.

## 11.0 EXIT MEETING

Following the critique, the inspectors met with the licensee's personnel listed in Section 1.0 of this report to discuss the inspection findings. The NRC team leader summarized the NRC's observations and licensee management acknowledged them.