

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-271/85-13

Docket No. 50-271

License No. DPR-28

Priority --

Category C

Licensee: Vermont Yankee Nuclear Power Corporation

RD 5, Box 169 - Ferry Road

Brattleboro, Vermont 05301

Facility Name: Vermont Yankee

Inspection At: Vernon, Vermont

Inspection Conducted: April 16-18, 1985

Inspectors:

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May 23, 1985
date

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5/23/85
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Inspection Summary: Inspection on April 16-18, 1985 (Report No. 50-271/85-13)

Areas Inspected: Routine, announced emergency preparedness inspection and observation of the annual full-scale exercise performed on April 17, 1985. The inspection involved 158 inspector hours by a team of six NRC Region I and NRC contractor personnel.

Results: No violations were identified. The licensee's emergency response actions for this exercise were adequate to provide protective measures for the health and safety of the public. However, several areas were identified as in need of improvement, and are discussed in detail in this report.

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DETAILS

1. Persons Contacted

The following licensee representatives attended the exit meeting on April 18, 1985 and other members not identified below from Vermont Yankee staff and Yankee Nuclear Service Division were also present.

S. Jefferson, Asst. to Plant Manager
J. McCarthy, Emergency Planning Coordinator
W. D. Murphy, Vice President and Manager of Operations
J. Pelletier, Plant Manager

2. Emergency Exercise

The Vermont Yankee full-scale exercise was conducted from 5:30 a.m. to 3:00 p.m. on April 17, 1985.

a. Pre-Exercise Activities

Prior to the emergency exercise, NRC Region 1 representatives had telephone discussions with licensee representatives to review the scope and content of the exercise scenario. Written comments on the scenario were also provided to the licensee.

In addition, NRC team observers attended a licensee briefing for licensee controllers and observers on April 16, 1985, and participated in the discussion of emergency response actions expected during the various phases of the scenario. The licensee identified the controllers and observers; specified the response activities that would be simulated, and outlined when controllers would intervene to prevent disturbing normal plant operations.

The exercise scenario included the following events:

- High iodine reactor coolant activity level (1.5 uCi/g);
- Severe local weather conditions;
- Lightning strikes the plant and disables a safety system, then a second lightning strike causes a Group I isolation and fails various power supply cards;
- Plant scram and safety relief valve sticks open;
- Reactor Transfer Fan venting to the environment through the stack;
- Release of radioactivity;

- Light precipitation followed by a wind shift;
- Hydrogen monitor reading excessively high concentrations in containment (~10%);
- Isolation of containment, release terminated;
- Sampling results of H₂ in torus prove negative and;
- De-escalation of the emergency status.

The above events caused the activation of the licensee's emergency facilities and also permitted the state and local government agencies to exercise their Emergency Plans.

b. Activities Observed

During the conduct of the licensee's exercise, NRC team members made detailed observations of the activation and augmentation of the emergency organization; activation of emergency response facilities; and actions of emergency response personnel during the operation of the emergency response facilities. The following activities were observed:

- Detection, classification, and assessment of the scenario events;
- Direction and coordination of the emergency response;
- Notification of licensee personnel and offsite agencies of pertinent information;
- Assembly and accountability of personnel;
- Medical Emergency;
- Assessment of radiological data and consideration of protective actions;
- Provisions for in-plant radiation protection;
- Performance of offsite, and in-plant radiological surveys;
- Maintenance of site security and access control;
- Performance of technical support;
- Discussion of repair and corrective actions;
- Communications/information flow, and record keeping; and

- Management of Recovery Operations.

c. Exercise Observations

The NRC team noted that the licensee's activation and augmentation of the emergency organization; activation of the emergency response facilities; and actions and use of the facilities were generally consistent with their emergency response plan and implementing procedures. The team also noted the following actions of the licensee emergency response organization that were indicative of their ability to cope with abnormal plant conditions.

- Technical Support Center (TSC) and NRC personnel were thoroughly briefed on plant conditions and planned actions.
- TSC logs were well maintained and included enough historical information to reconstruct events.
- The medical emergency team was knowledgeable and efficient in the rescue, stabilization and transport of the accident victim.
- Habitability surveys in the OSC were performed on a periodic basis.
- The Health Physics Technicians performed their duties professionally and promptly.
- The EOF/Recovery Center was activated in a timely manner.
- Both team members on the green team were very familiar with the area and easily responded to dispatcher instructions from the EOF staff.
- METPAC model operators were knowledgeable in their area and performed well at sorting out correct meteorological data from conflicting reports.

d. Open Items

The NRC team findings in areas for licensee improvement were as follows (the licensee also identified several of these areas in their critique of the exercise):

CONTROL ROOM

- (Open) 50-272/85-13-01: Control Room (CR) personnel took action independently and were slow to pass information to the TSC during the Alert and Site Area Emergency. It was not clear that the TSC coordinator was directing the response. At one point it took 5 minutes to inform TSC of stuck open safety relief valve.

- (Open) 50-271/85-13-02: Emergency Action Level (EAL) was not identified by licensee players for the ALERT. Command card issued after 20 minutes because operators did not classify an ALERT after the lighting damage.
- (Open) 50-271/85-13-03: Free-play was limited by the controller by stipulating that repairs could not occur until a preset time, discouraging attempts at corrective actions.
- (Open) 50-271/85-13-04: Communications between the CR and other Emergency Response Facilities (ERFs) was distracting due to use of the speaker phone; the high noise levels during an actual incident may hinder operations in trying to control the plant.

TECHNICAL SUPPORT CENTER

- (Open) 50-271/85-13-05: Overall direction of plant activities did not appear to be fully coordinated. For example, when the plume traversed back over the site, TSC recognized the problem, but did not ensure that all inplant locations were made aware to closely monitor habitability.
- (Open) 50-271/85-13-06: Excessive noise levels in the TSC due to inadequate space for all personnel; multiple ongoing discussions, poorly designed and maintained status boards, and open speaker-phone communications.
- (Open) 50-271/85-13-07: TSC did not aggressively follow-up and coordinate emergency activities to ensure proper and timely solutions. For example, requested samples (torus gas) were slow in coming and dissemination of sample information was incomplete and informal.
- (Open) 50-271/85-13-08: The technical review on the bypass of drywell high pressure instrumentation was inadequate in that a thorough review was not performed prior to the start of the corrective actions. Confusion existed over whether or not "jumpers" were necessary. The final conclusion was later found to be incorrect.

OPERATIONS SUPPORT CENTER

- (Open) 50-271/85-13-09: When the designated OSC coordinator left the OSC for briefings, there was no indication of who was in-charge.
- (Open) 50-271/85-13-10: The Health Physics supervisor did not consistently advise or provide any special HP precautions

(clothing, equipment or dosimetry) until requested by H. P. Technicians.

- (Open) 50-271/85-13-11: Personnel exposures were not effectively tracked; cumulative total exposure during the exercise was not being recorded. This item was previously identified by NRC inspectors.

EOF/RECOVERY CENTER

- (Open) 50-271/05-13-12: Provisions at the EOF for continuous accountability after initial accountability were not apparent. Also, the OSC does not maintain continuous accountability of personnel - O.P. 3503 requires only periodic accountability. No provisions for reporting results to Security are defined.
- (Open) 50-271/85-13-13: The licensee did not demonstrate that in the event of a prolonged emergency sufficient personnel would be available to support the emergency response.
- (Open) 50-271/85-13-14: Status boards in EOF/Recovery Center should include at least:
 - a) Chronology of significant events;
 - b) Current Emergency Classification;
 - c) Utility Protective Action Recommendation; and;
 - d) States Protective Action.

DOSE ASSESSMENT

- (Open) 50-271/85-13-15: The Radiological Assistant did not assume a management position; rather he became involved in details of various activities. No announcements of information of general interest in the area were made by the radiological assistant.
- (Open) 50-271/85-13-16: There did not appear to be clear, well defined delineation of responsibility and authority in radiological assessment. Specific functions were not delegated such as data collection, computer operation verification, documentation and dissemination of information. This slowed overall response; frequently, the 15 minute projections of plume position and dose rates weren't available until after that time frame had passed.
- (Open) 50-271/85-13-17: Dose assessment procedures O.P. 3513 and 3515 place emphasis on mechanical steps in executing models,

rather than objectives, obtaining pertinent information, establishing appropriate lines of communication, bottom line dose information, and weather forecast data needed by decision-makers.

- (Open) 50-271/85-18:

(a) Real-time instantaneous wind data was not available to the dispersion modelers in the EOF/Recovery Center.

(b) No topographic maps were available in the dose assessment area.

- (Open) 50-271/85-13-19:

(a) Dose assessment personnel only tracked the release, they were never more than 15 minutes ahead of the plume. Dose assessment personnel were not aware of, and decision-makers were never informed that the plume was transported back over the plant until the portal alarms indicated the situation.

(b) Actual dose projections, applying an approximate release duration were not evident in the EOF/Recovery Center. The observer noted that the first 1 to 2 hours of the exercise appeared to be an EOF assessment training period.

- (Open) 50-271/85-13-20: Information flow of radiological and meteorological data to the EOF was slow and only discrete values are provided, continuous dose assessment was not performed and there was a potential for delaying protective action recommendations.

OFFSITE FIELD MONITORING TEAMS

- (Open) 50-271/85-13-21: The check source in the green monitoring kit was not of sufficient strength (radioactivity) to verify the adequacy of response of the PIC-6 instrument.
- (Open) 50-271/85-13-22: Proper radiation units were omitted during a number of radio transmissions.
- (Open) 50-271/85-13-23: Team departure was delayed approximately 30 minutes due to the lack of radiation monitoring.
- (Open) 50-271/85-13-24: Monitoring procedure O.P. 3509 does not require window open/closed window measurements to assist in determining presence in the plume.
- (Open) 50-271/85-13-25: Monitoring procedures for determining air sample background correction factor do not adhere to

standard health physics practice. The licensee's method appears to be satisfactory for a rapid determination for protective action purposes. However, it does not appear to be acceptable for more precise calculations, e.g., dose assessment.

SCENARIO PROBLEMS/GENERAL COMMENTS

- (Open) 50-271/85-13-26: Scenario
 - (a) No data was provided to the TSC for area radiation monitors (ARMs) and/or possible alarm conditions when the plume shifted back over the plant.
 - (b) The method for providing hydrogen concentrations to the players led to excessive confusion.
 - (c) The controller limited free-play by stating that no actions to shut down the reactor transfer fan would be successful until 10:15. This inhibited TSC and other personnel from demonstrating accident mitigation.
 - (d) This scenario was quite difficult to adequately review because of the manner in which it was organized and presented. To follow the flow of the events required constant referring back and forth between the outline, the plant data, radiological data, command cards, cue cards and expected actions. The outline contains great detail on "expected actions" and the likely course of events. It is nearly impossible to establish from the outline which of the events are essential to the flow of the exercise and therefore, should be provided for by the controller messages.
- (Open) 50-271/85-13-27 General
 - (a) Continuous accountability procedures were not formalized (i.e., location of monitor, forms and communication methods).
 - (b) Status boards provided little useful information to participants, due to their size, location, and information displayed.
 - (c) Documentation of messages and data transmitted between ERFs did not always include time (sample/transmitted), method of collection (actual/projected/estimated from meter), source and the verifying individual.

e. Exercise Critique

The NRC team attended the licensee's post-exercise critique on April 18, 1985, during which the Exercise Coordinator presented the licensee's observations of the exercise. The coordinator highlighted areas for improvement which the licensee indicated

would be evaluated and appropriate action taken. Most of the significant areas were identified and the critique appeared to adequately cover the exercise.

3. Exit Meeting and NRC Critique

Following the licensee's self critique, the NRC team met with the licensee representatives listed in Section 1. The team leader summarized the observations made during the exercise.

The licensee was informed that no violations were observed, and although there were areas identified for improvement, the NRC team determined that within the scope and limitations of the scenario, the licensee's performance demonstrated that they could implement their Emergency Plan and Emergency Plan Implementing Procedures in a manner which would adequately provide protective measures for the health and safety of the public.

Licensee management acknowledged the findings and indicated that appropriate action would be taken regarding the identified improvement areas.

At no time during the inspection was written material provided to the licensee by the inspectors.