

U.S. NUCLEAR REGULATORY COMMISSION  
REGION I

Report No. 50-271/88-02

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 Nuclear Power Station

Inspection At: Vernon, Vermont

Inspection Conducted: February 1-5, 1988

Inspectors: *Robert M. Loesch* 2/22/88  
R.Loesch, Radiation Specialist date

Approved by: *M. Shanbaky* 2/26/88  
M.M.Shanbaky, Chief, Facilities Radiation date  
Protection Section

Inspection Summary: Inspection conducted on February 1-5, 1988 (Report No. 50-271/88-02)

Areas Inspected: Routine, unannounced inspection of radiological controls including: control of radioactive materials, respiratory protection, and external exposure controls.

Results: No violations or deviations were identified in the review.

## DETAILS

### 1.0 Personnel Contacted

#### 1.1 Licensee Personnel

* J. Pelletier	Plant Manager
* B. Wanczyk	Operations Superintendent
* B. Leach	Radiation Protection Supervisor
* R. Morrisette	Plant Health Physicist
* J. McCarthy	ALARA Engineer
M. Ball	Mechanical Engineer
R. McCullough	Assessment Coordinator

#### 1.2 NRC Personnel

G. Grant	Senior Resident Inspector
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\* denotes attendance at the exit interview on February 5, 1988.

### 2.0 Status of Previously Identified Items

- 2.1 (Closed) 85-25-03 (Inspector Follow-up). Perform a PRM-6/NaI survey of the owner controlled area.

The licensee performed a survey of the North and South 40 areas utilizing a PRM-6 portable count rate meter equipped with a NaI detector. No areas of contamination were identified. This was documented as part of the 1986 Annual Site Survey. This item is closed.

- 2.2 (Closed) 86-22-03 (Unresolved). NRC to determine if a follow-up review of drywell work practices is warranted.

The licensee's radiological practices pertaining to outage activities and ALARA were reviewed during the 1987 refueling outage as described in Inspection Report 87-15. Tours of the facility and discussions with licensee personnel indicated that health physics practices, particularly controls applied to the drywell, were consistent with accepted ALARA concepts. This item is closed.

- 2.3 (Closed) 87-15-02 (Unresolved). Allegation of contamination outside of the radiologically controlled area (RCA).

The licensee performed an extensive investigation of the allegation which verified the existence of the contamination, determined the root cause, and established both short-term and long-term corrective

actions (see Section 3.0 of this inspection report for details). This item is closed.

### 3.0 Control of Radioactive Materials

The inspector reviewed the posting, labeling and control of radioactive material with respect to criteria contained in 10 CFR 20, "Standards for Protection Against Radiation."

The evaluation of the licensee's performance in this area was based upon:

- observations by the inspector during tours of the facility;
- discussions with cognizant personnel;
- independent radiation surveys performed by the inspector;
- review of licensee's report "Summary of Investigation into Contamination Found Outside of the Radwaste Building on 8/12/87", dated September 21, 1987;
- review of the 1986 and 1987 Annual Site Surveys; and
- review of licensee memo, "Trash Removal from the Radiation Control Area", dated September 29, 1987.

The NRC received an allegation on August 10, 1987, concerning contaminated radioactive material outside the radiologically controlled area. This allegation was discussed in NRC Inspection Report No. 271/87-15 (section 5.0). The licensee's investigation into the allegation was performed by individuals not associated with the plant Radiation Protection Program and appeared adequate and complete. The investigation team made the following six recommendations:

1. RP Management should reexamine their philosophy regarding actions that need to be taken when contamination is found outside of the RCA to ensure future discoveries receive more immediate attention.
2. VY Management should assess the area outside of the cask room to determine the need for additional controls/confinement necessary to preclude the migration of contamination from the RCA.
3. RP should evaluate high background areas that do not receive attention during the annual site survey. RP should consider development of special monitoring techniques/procedures to incorporate such areas into the annual site survey.
4. RP/Chemistry should perform a radiological survey of the internals of the adjacent storm sewer.
5. Evaluate future contracts to ensure high technical experience and minimize turnover of HP technicians.
6. Develop a mechanism to ensure that all RP contractors are trained on the desired sequence of reporting problems, in order to provide VY Management an opportunity to address concerns prior to elevating a problem to the NRC.

Item 5 was contract related and was not reviewed by the inspector. All of the remaining five items are complete with the exception of evaluating a technique to survey areas with high backgrounds (Recommendation No. 3). This is scheduled to be completed by April 1, 1988.

The root cause identified by the licensee was contaminated water from the cask room exiting the building under the doors around the railroad track penetrations and its subsequent draining into the exposed soil. In addition, high backgrounds in that area prevented its timely detection. The licensee has taken corrective actions to contain the wash water and prevent reoccurrence. The contaminated area was excavated, backfilled, and sealed with asphalt. The contaminated soil has been placed into drums for shipment to a burial site. Additional long-term measures were recommended and are under evaluation. The inspector noted that a programmatic breakdown resulted in an Incident Report not being generated and a lack of aggressive follow-up by RP management. The licensee stated that due to misapplied priorities initial actions were delayed. The generation of an incident report would have resulted in a more timely resolution of the problem. The licensee has reemphasized Procedure OP-0529, "Incident Reports" to all RP departmental personnel.

Due to past incidents where radioactive materials were discovered outside the RCA mixed in with clean trash, the licensee has implemented, by memo, a new policy for trash removal from the radiologically controlled area. All trash is surveyed in a low background area (less than 300 cpm) and trash measuring less than 100 cpm over background is considered clean. Certain items typically used in contaminated areas (those yellow in color for example) are automatically considered contaminated. Clean material is bagged, appropriately tagged and placed in a locked plywood box located in the Turbine Bay. This prevents the accidental placement of contaminated objects with trash previously surveyed and determined to be clean. Bags from the Turbine Bay box are later checked for proper tagging, and again surveyed in a low background area (less than 100 cpm). This new methodology should be effective in preventing the recurrence of previous incidents where contaminated material was discovered mixed with clean trash. The licensee has yet to formally incorporate this policy into procedure. This will be reviewed in a future inspection (88-02-01).

#### 4.0 Respiratory Protection

The licensee's program for respiratory protection was reviewed against criteria contained in the following:

- 10 CFR 20.103, "Exposure of individuals to concentrations of radioactive materials in air in restricted areas";
- NUREG-0041, "Manual of Respiratory Protection Against Airborne Radioactive Materials"; and
- Licensee procedure AP-0505, Rev. 15, "Respiratory Protection",

dated November 19, 1987.

Evaluation of licensee performance in this area was based upon the following:

- Discussions with cognizant personnel;
- Review of training lesson plans for respiratory protection;
- Review of personnel training records; and
- Tour of the fit testing facility.

During the previous outage, the licensee's aerosol booth used for quantitative fit testing of respiratory protection devices became inoperable and was supplemented by equipment from an outside contractor. Recently, due to the inability to obtain repair parts for the fit booth, the licensee purchased two units which perform quantitative tests utilizing the particles and concentrations that occur in ambient air rather than with the generation of a controlled aerosol.

The new units have been incorporated into the Respiratory Protection Program and are currently operational. The inspector noted, however, that the equipment has not been adequately tested onsite nor has the licensee obtained and evaluated other tests which would document the ability of the units to effectively replace the current industry standard aerosol booth. The inspector informed the licensee of an existing U.S. Army test report. The licensee ordered a halt on the use of the new equipment until such assurances are obtained. This matter will be reviewed in a future inspection (88-02-02).

## 5.0 External Exposure Controls

The licensee's radiological controls for access to and work in the drywell during spent (irradiated) fuel movement was evaluated against criteria contained in the following:

- General Electric (GE) Operating Experience Report (OER) No. 78, "Radiation Levels and Shielding Recommendations for the Upper Drywell Area During Fuel Transfer", dated May 31, 1973;
- GE Service Information Letter (SIL) No. 354, "Potential Radiation Levels in Upper Drywell Areas During Fuel Movement Activities - AID No. 55", dated February 18, 1981; and
- NRC Temporary Instruction 2500/23, "Evaluate BWR Licensee Radiological Controls for Drywell During Spent Fuel Movements", dated March 13, 1987.

Evaluation of the licensee's performance in this area was based upon the following:

- Discussions with cognizant personnel;
- Review of licensee report, "Dropped Fuel Bundle Dose Calculations",

dated August 17, 1987; and

- Review of licensee's procedure OP-1101, "Fuel Assembly Movement", Rev. 13, dated December 2, 1987 and proposed draft of Rev. 14.

The licensee has installed, prior to the first refueling outage, additional shielding ("cattle chute") comprised of 5" of lead and a total of 1 1/2" of stainless steel which effectively reduces dose rates in the upper drywell region to manageable levels.

The licensee currently allows workers in the drywell during fuel movement. Although the current revision of procedure OP-1101, "Fuel Assembly Movement", does not address the necessary radiological precautions, the new draft incorporates the following three additional requirements:

- two dedicated lines of communications between the refueling operation and the drywell control point;
- immediate notification of the drywell control point upon a fuel mishap or reduction in reactor vessel water level; and
- contacting Radiation Protection (RP) management prior to commencement of fuel movements.

The inspector noted the following weaknesses in the operations procedure:

- notification of RP management alone may not ensure that the appropriate individuals at the drywell control point are made aware of impending fuel operations; and
- resumption of fuel movements after a temporary halt in operations (minor equipment malfunction) may not necessarily require that all procedural prerequisites (i.e. notification of RP personnel) are satisfied prior to restarting fuel movements.

In addition, no specific RP procedures exist which document requirements and controls necessary when allowing work within the drywell during fuel movements. Instead, the licensee plans to utilize the outage surveillance system to generate memos detailing the applicable radiation safety precautions. These memos will then be placed in each outage manual. The inspector questioned the effectiveness of a memo as compared to a formally implemented and approved procedure. The licensee stated that the appropriateness of using the outage manual to document the drywell radiological controls would be evaluated.

Specific training, as specified in TI 2500/23, to provide affected workers with an understanding of the drywell hazards has not been fully implemented. This training should clearly define worker actions and responsibilities during normal and emergency operations associated with fuel movement. The licensee indicated that training improvements would be implemented prior to the next scheduled refueling outage.

Licensee actions in this area will be reviewed in a future inspection (88-02-03).

#### 6.0 Exit Meeting

The inspector met with licensee personnel denoted in Section 1.1 at the conclusion of the inspection on February 5, 1988. The scope and findings of the inspection were discussed at that time.