

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

Region I

Report No. 50-271/79-14

Docket No. 50-271

License No. DPR-28 Priority -- Category C

Licensee: Vermont Yankee Nuclear Power Corporation

25 Research Drive

Westborough, Massachusetts 01581

Facility Name: Vermont Yankee Nuclear Station

Inspection at: Vernon, Vermont

Inspection conducted: October 1-4, 1979

Inspectors: *L. H. Thonus*
L. H. Thonus, Radiation Specialist

3/21/80
date signed

date signed

Approved by: *P. J. Knapp*
P. J. Knapp, Chief, Radiation Support
Section, FF&MS Branch

date signed
3/21/80
date signed

Inspection Summary:

Inspection on October 1-4, 1979 (Report No. 50-271/79-14)

Areas Inspected: Routine, unannounced inspection by a regional based inspector of radiation protection during refueling, including licensee action on IE Circulars, procedures, advance planning and preparation, training, exposure control, respiratory protection, posting and control, surveys, and radioactive material control. Upon arrival, a tour was conducted of the radiation control area to observe radiation safety practices on jobs in progress. The inspection involved 33 inspector hours on site by one NRC regional based inspector.

Results: Of the nine areas inspected, one item of noncompliance was found in each of two areas (infraction - failure to adhere to RWP procedure - Paragraph 3; infraction - failure to perform surveys - Paragraph 9).

DETAILS

1. Persons Contacted

Mr. L. W. Anson, Training and Document Control Supervisor
*Mr. W. F. Conway, Plant Superintendent
*Mr. P. J. Donnelly, I&C Supervisor
Mr. H. H. Fitzroy, Shift Supervisor
*Mr. D. C. Girroir, Technical Assistant
*Mr. B. N. Leach, Health Physicist
*Mr. W. P. Murphy, Assistant Plant Superintendent
Mr. P. P. Polaski, Chemistry and Health Physics Assistant
Mr. D. S. Tolin, Chemistry and Health Physics Assistant
*Mr. G. D. Weyman, Chemistry and Health Physics Supervisor

The inspector also interviewed several other licensee and contractor personnel during the course of the inspection. They included personnel from chemistry and health physics, maintenance, operations, and security.

*Denotes those present at the exit interview.

2. Licensee Action on IE Circulars

The inspector observed licensee respiratory protection equipment and interviewed licensee personnel regarding IE Circulars 79-09 and 79-15.

79-09: Occurrences of split or punctured regulator diaphragms in certain self-contained breathing apparatus. This item was previously reviewed in another inspection (50-271/79-10). The licensee procedure requiring periodic examinations of the regulator diaphragms has been implemented. This item is closed.

79-15: Bursting of high pressure hose and malfunction of relief valve and O"-ring in certain self-contained breathing apparatus. The licensee does not use the type of respirator referenced in the bulletin. This item is closed.

The inspector had no further questions in this area.

3. Procedures

Technical Specification 6.5.A requires detailed written procedures be prepared, approved and adhered to.

The inspector reviewed the following licensee administrative procedures (AP), routine procedures (RP), and departmental procedures (DP) which had been revised:

- DP 4541, "Calibration of PIC-6A", Revision 4;
- DP 4544, "Calibration of Victoreen Model 444", Revision 4;
- RP 1620, "Fuel Shipping", Revision 5.

The above administrative and routine procedures had been reviewed and approved by the Plant Operations Review Committee (PORC) and the station superintendent in accordance with the licensee's Technical Specifications and Administrative Procedures. The above departmental procedure had been reviewed by the department head and station superintendent in accordance with Administrative Procedure 0001. The inspector made field observations to verify the licensee's compliance with procedures AP 0502, AP 0506, RP 1620 and AP 1000.

Technical Specification 6.5.B requires, in part, that "radiation control standards and procedures shall be prepared, approved and maintained..." Procedure AP 0502 "Radiation Work Permits" states that Radiation Work Permits (RWP) are divided into two distinct classes as follows:

1. Standard RWP's - those permits issued to cover the performance of one specific, nonroutine job in the RCA (radiation control area).
2. Routine RWP's - those permits issued to cover the performance of routine type work in the RCA over an extended period of time (not to exceed one month).

AP 0502 further states, "it is the responsibility of the Duty Chemistry and Health Physics Assistant to review the RWP to insure that the proper surveys are conducted and to verify that the proper HP coverage and protective equipment is specified..." In section 2.F of AP 0502 it is stated that a health physics supervisor "Enters all pertinent results of the radiological survey on the RWP".

While touring the RCA on October 2, 1979, the inspector examined work being conducted on the refueling floor of the reactor building and the RWP's associated with the work. The inspector observed that individuals were hydrolasing inside the reactor vessel under RWP #79-1007-R, a routine RWP. The inspector noted that hydrolasing the reactor vessel was not a routine operation and that it posed a set of radiological hazards peculiar to that operation. Thus a job specific RWP was required by AP 0502.

The inspector further noted that RWP #79-1007-R denoted contamination levels in the vessel area of 3,000-5000 dpm/100 cm² and radiation levels of 10-35 mR/hr, and the inspector also noted that other licensee survey data indicated contamination levels in the vessel area in excess of 1,000,000 dpm/100 cm² and radiation levels in excess of 3 R/hr.

When this discrepancy was brought to the licensee's attention, the hydro-lasing operation was stopped, a job specific RWP, with job specific radiological data and controls, was issued.

The inspector stated that use of a routine RWP for nonroutine work and failure to enter appropriate radiological data on the RWP represented noncompliance with procedure AP 0502. (50-271/79-14-01)

4. Advanced Planning and Preparation

a. Staffing

The licensee increased the plant radiation protection staff for the outage with the addition of 20 contractor radiation protection technicians. The inspector interviewed several senior contractor radiation protection technicians who were in responsible positions.

The inspector also reviewed resumes that indicated the qualifications of these Technicians. The training given to contractor technicians was also reviewed.

b. Supplies and Equipment

The inspector observed the licensee's supply and availability of the following items which come into increased usage during a refueling outage:

- Anti-contamination clothing
- survey instruments
- respiratory protection equipment
- temporary shielding
- posting, labeling and barricading materials

The inspector observed that portable instruments capable of measuring beta radiation were in short supply.

This was due to a combination of factors including:

- small excess of instruments when all were operational
- higher than usual rate of instrument malfunction
- instruments being calibrated
- difficulty/delays in obtaining new instruments and repair parts

At one point in the inspection, only one survey instrument with beta measurement capability was operational and calibrated. This area is further discussed in paragraph 8.

No items of noncompliance were identified.

5. Training

The inspector attended a course given to workers to fulfill the requirements of 10 CFR 19.12, "Instructions to Workers." The course consisted of video tapes punctuated by brief lectures and question and answer periods. A written examination was then administered. The training records and examinations of 12 individuals who had worked in the RCA were examined.

No items of noncompliance were identified.

6. Exposure Control

The inspector reviewed the licensee's method of complying with 10 CFR 20.202(a) which requires the licensee to provide personnel monitoring equipment to and require the use of such equipment by certain classes of personnel. The licensee routinely issues and requires the use of thermoluminescent dosimeters (TLD's) and self-reading dosimeters (SRD) by all personnel entering the radiation control area (RCA).

The licensee is required by 10 CFR 20.102 to obtain exposure data of their current calendar quarter exposures from all incoming employees and contractors prior to their first entry into the restricted area if the employee is likely to exceed 25% of the 10 CFR 20.101(a) exposure limits. The inspector examined the exposure data of contractors who had entered the licensee's RCA during the current refueling outage.

Whole body exposures of individuals are limited to 1.25 rems per calendar quarter by 10 CFR 20.101(a) unless the requirements of 10 CFR 20.101(b) and 10 CFR 20.102 are fulfilled. These include limiting

exposure to 3 rems per quarter, limiting lifetime exposure, and determining previous exposure on Form NRC-4 or equivalent. At the time of the inspection, no individuals had exceeded either the 10 CFR 20.101(a) or 20.101(b) limits. Several individuals had completed the requirements of 10 CFR 20.101(b) and 20.102 and were authorized exposures of 2 rem/quarter on the licensee's administrative control system.

No items of noncompliance were identified.

7. Respiratory Protection

a. Use of Engineering Controls

The licensee utilized a variety of engineering controls to keep airborne activity concentrations below the values in 10 CFR 20, Appendix B, Table I, Column I and "as low as practicable". They included fuel integrity, keeping the steam dryer and moisture separator wet during transfer (use of spray misters and underwater transfer), use of portable charcoal and HEPA filter trains, and use of the reactor water cleanup system.

b. Bioassay

The licensee maintains a chair type whole body counter onsite which has a 3" NaI crystal for counting the whole body and a 1" by 1½" NaI crystal for counting the thyroid. A multi-channel analyzer and computer are used for peak search and isotopic analysis. The inspector reviewed the calibration of the whole body counter and observed the phantoms used.

Whole body count results of several individuals were reviewed including individuals involved in hydrofasing in the reactor vessel. No body burdens were observed which would exceed 2% of the 10 CFR 20.103(a)(1) limits.

c. Airborne Activity Surveys

The inspector reviewed the results of several licensee particulate and iodine airborne activity surveys. The majority of the surveys were from the time period October 1-3, 1979 in the reactor vessel, refuel floor, reactor water cleanup (RWCU) cubicles and inside and outside the torus. Air surveys taken on September 23, 1979 on the 345 ft. elevation of the reactor building were also reviewed.

d. Respiratory Protection Fitting and Training

The inspector observed the licensee's respiratory protection fitting and training of several individuals. The fitting included a man-fit test in a NaCl aerosol test booth which gives quantitative data on challenge atmosphere penetration. The fitting and training records of 14 individuals who had been assigned respirators were examined.

e. Respirator Maintenance and Control

The inspector observed the licensee's cleaning, decontamination, disinfection, survey and inspection of respirators. This function is performed by the chemistry and health physics staff. Upon completion, the respirators are bagged and labeled to denote their readiness for reuse.

No items of noncompliance were identified.

8. Posting and Control

The inspector examined posting and control of radiation areas, high radiation areas, contaminated areas, and radioactive material areas against the criteria in Technical Specification (TS) 6.5.B, 10 CFR 20.203 and licensee procedures.

Administrative control of keys to certain high radiation areas is required by TS 6.5.B. The inspector examined the keys under the control of the shift supervisor and the health physics staff. Contamination control equipment (step off pads, plastic wrapping, etc.) and survey instruments were examined. The inspector observed the licensee's administrative controls on personnel access to the refueling floor and drywell.

No items of noncompliance were identified.

9. Surveys

The inspector examined many licensee surveys taken during the period October 1-3, 1979 against the criteria in licensee procedures and 10 CFR 20.201. These surveys included the drywell, torus, area outside the torus, RWCU cubicles, refuel floor, and reactor cavity.

It is required in 10 CFR 20.201 that, "Each licensee shall make or cause to be made such surveys as may be necessary for him to comply with the regulations in this part."

A survey is defined as "an evaluation of the radiation hazards incident to the production, use, release, disposal, or presence of radioactive materials or other sources of radiation under a specific set of conditions. When appropriate, such evaluation includes a physical survey of the location of materials and equipment, and measurements of levels of radiation or concentrations of radioactive material present."

A review of surveys taken in the reactor vessel indicated that no beta surveys had been taken during this outage and prior to hydrolasing. Such surveys were required to evaluate compliance with the 10 CFR 20.101(a) limits on exposure to the skin of the whole body and lens of the eye. Beta radiation fields were measured at 1.75 rad/hr in certain areas which had not been decontaminated by hydrolasing. No data is available on the first areas to be hydrolased in that they were decontaminated (by hydrolasing) prior to beta measurements being taken.

Discussions with the plant health physicist and chemistry and health physics assistant indicated that the plant health physicist directed that such measurements be made. The senior health physics technician on the refuel floor stated that the survey was not performed because no instrument capable of measuring beta was available on the refuel floor. The inspector identified the above failure to perform beta surveys as noncompliance with 10 CFR 20.201. (50-271/79-14-02)

10. Radioactive Material Control

Radioactive material labeling and identification was examined against the criteria in 10 CFR 20.203(f) and licensee procedures. Bagging, wrapping, marking and storage of contaminated items were observed to be in accordance with licensee procedures. Housekeeping, posting and temporary storage of protective clothing going to and from the licensee's onsite laundry facility and of baleable waste awaiting compaction were examined.

No items of noncompliance were identified.

11. Exit Interview

The inspector met with licensee management representatives (denoted in Paragraph 1) at the conclusion of the inspection on October 4, 1979. The inspector summarized the purpose and scope of the inspection and the inspection findings.