U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 83-33

Docket No. 50-271

License No. DPR-28 Priority - Category C

Licensee: Vermont Yankee Nuclear Power Corportion
1671 Worcester Road
Framingham, Massachusetts 01701

Facility Name: Vermont Yankee Nuclear Power Station

Inspection At: Vernon, VT

Inspection Conducted: Dec. 6-9, 1983

Inspectors: H. J. Bicehouse — 1/23/84
H. J. Bicehouse, Radiation Specialist — date

H. J. Bicehouse for — 1/23/84
M. McBride, Ph.D. Radiation Specialist — date

Approved by: M. Shanbaky — 1/23/84
M. Shanbaky, Ph.D. Chief — date
Facility Radiation Protection Section

Inspection Summary: Inspection on December 6-9, 1983
(Inspection Report 50-271/83-33)

Areas Inspected: Routine unannounced inspection of the licensee's implementation of programs relating to radiation protection including: procedure review and implementation, health physics staffing, exposure control, in-plant radiation protection program implementation, ALARA program and status of previously identified items. The inspection involved 58 hours onsite by two regionally based inspectors and the Chief, Facility Radiation Protection Section.

Results: Of the areas inspected, one violation was identified, i.e. failure to provide a procedure in accordance with Technical Specification 6.5, Details 4.

Details

1. Persons Contacted

During the course of this routine inspection the following personnel were contacted or interviewed:

*Mr. S. Jefferson, Operations Superintendent
Mr. D. Mohler, Health Physicist
*Mr. M. Prystupa, Chemist
*Mr. T. McCarthy, Emergency Plan Coordinator
Mr. D. Tolin, Whole Body & Respiratory Systems Engineer

Other licensee employees were also contacted or interviewed during this inspection.

*Attended the Exit Interview on December 9, 1983.

The Exit Interview was also attended by M. Shanbaky, Chief, Facilities Radiation Protection Section, NRC, Region 1.

2. Purpose

The purpose of this routine inspection was to review the licensee's radiation protection program with respect to the following elements:

-Status of Previously Identified Items
-Procedure Review and Implementation
-Health Physics Staffing during the Recent Outage
-Exposure Control
    -External
    -Internal
-In-Plant Radiation Protection Program Implementation
-ALARA Program

3.0 Status of Previously Identified Items

(Closed) Inspection Followup Item (80-14-01) Review Health Physics Appraisal items related to the internal dosimetry program (Findings A.1 through A.5). The commitments contained in the licensee's response letter, dated June 8, 1982, were reviewed during the inspection. The following licensee actions were completed at the time of the inspection:

-Procedure No. OP-0533, "Body Burden Counting, requires several activity levels in the range of 0.04 to 2.0 microcuries to be used during yearly efficiency calibrations of the whole body counter. The 1983 calibration data was reviewed and found to be acceptable.

-Health Physics management reviews all whole body count results.

-The supervisor in charge of the whole body counter has received additional training during a recent course in internal dosimetry sponsored by the Health Physics Society.

-An in-vitro bioassay program for nuclides which do not emit gamma rays is briefly discussed in Procedure No. OP-0533. The licensee stated that two vendor laboratories had been identified which could assay excreta samples for gross beta, tritium and gross alpha activity.

-The licensee is conducting acceptance testing on a new whole body counting system which employs intrinsic germanium detectors.

-The licensee stated that additional internal dosimetry program improvements will be instituted including establishing an action level of 2% Maximum Permissible Body Burden for further evaluation, reporting results in minimum detectable levels and calculated MPC-hour exposure levels as appropriate and inclusion of spectra for Ruthenium-Rhodium-106, Barium-Lanthanum-140 and Cerium-Praseodymium-144. These licensee actions satisfy significant Appraisal Findings, A.1, A.2, A.3, A.4 and A.5.

(Closed) Unresolved Item (83-11-01) Review licensee's evaluation of frisking policy. The licensee has instituted an acceptable frisking policy for personnel potentially-contaminated with licensed materials in Procedure No. DP-4532, "Personnel Contamination Surveys," Revision 6 (8/18/83).

(Open) Inspector Followup Item (83-20-01) Review Transuranic Analysis data for inplant smear and resin samples. Samples of smearable radioactive contamination from the Radwaste Building have been analyzed for Transuranic activity by two independent laboratories. The data suggest that if present, transuranic nuclides could cause an alpha activity equal to 1E-4 to 1E-3 times the gross beta-gamma activity in a sample. The licensee stated that additional gross activity assay data for in-plant removable contamination and air samples had been obtained which showed that gross alpha to gross beta-gamma activity ratios were typically 1E-6 to one. In no case had the measured gross alpha to beta-gamma activity ratio exceeded 1E-4. However, procedures and criteria for routine surveillance of gross alpha activity had not been established. The Health Physicist stated that criteria would be developed for surveillance of suspect plant areas (including removable contamination and air samples) for gross alpha activity by 1 July 1984.

4. Procedure Review And Implementation

The licensee's procedural review and implementation program for radiation

protection was reviewed against criteria in Technical Specification 6.5,"Plant Operating Procedures." Performance relative to this Technical Specification was determined by examination of 15 radiological control procedures used for surveillance and radiation exposure; direct observation of work in progess; and interviews of various Health Physics staff and technicians.

Within the scope of this review, the following violation was identified: Technical Specification 6.5 requires that radiation control procedures be prepared, approved and maintained and made available to all station personnel. These radiological safety procedures shall be consistent with the requirements of 10 CFR Part 20 and be reviewed and approved by the Plant Manager, or his designee and the Manager of Operations. The inspector examined the personnel whole body counting operation and determined that the procedures governing the operation of the van-mounted whole body counter had not been reviewed, approved, and made available to all station personnel. The personnel whole body counting is a radiological safety operation necessary for determining compliance with the regulations in 10 CFR Part 20. The van-mounted whole body counter was used by the licensee to assess possible internal deposition of radioactive materials from September 7, 1983 through December 9, 1983. Approximately 300 assessments of possible internal deposition were made by the licensee during this period. Licensee Procedure No. OP-0533, "Body Burden Counting," Revision 3 (8/19/81) described the use of sodium iodide detectors for assessment of possible internal deposition. Procedure No. OP-0533, Revision 3 was approved in accordance with Technical Specification 6.5 and made available to all station personnel by the licensee's procedures control process. The van-mounted whole body counting system employed intrinsic germanium crystals and was sufficiently different in operation to require a revision to Procedure No. OP-0533. Operation of the van-mounted intrinsic germanium crystal whole body counter was apparently governed by a memorandum to the file dated September 2, 1983 which was not approved in accordance with Technical Specification 6.5. This memorandum was not available to all station personnel as a controlled procedure. The licensee was informed that operation of the van-mounted intrinsic germanium crystal whole body counter without a revision to Procedure No. OP-0533 constituted an apparent violation of Technical Specification 6.5 (83-33-01)

5. Health Physics Staffing During The Recent Outage

The licensee's selection, qualification and training practices for temporary health physics staff members were reviewed against criteria contained in:

-Technical Specification 6.1, "Organization"
-Licensee's Procedure No. AP-0700, "Plant Staff Training"
-Licensee"s Procedure No. AP-0723, "Employee/Contractor Indoctrination Training"

The licensee's performance relative to these criteria was determined by discussions with the Health Physicist and examination of records for 25% of the temporary health physics staff used during the outage.

Within the scope of this review, no violations were noted.

6. Exposure Control

The licensee's exposure control program was evaluated against criteria contained in 10 CFR 20.101-104, 10 CFR 20.201-203 and 10 CFR 20.401.

6.1 External Dosimetry Control

The licensee's program in external dosimetry control was evaluated with regard to the criteria above and licensee's Procedure No. AP-0506, "Personnel Monitoring." Performance relative to these criteria was determined by interviews of the Health Physicist and certain members of his staff; review of external dosimetry records and summaries; and direct observation during plant tours.

Within the scope of this review, no violations were identified.

6.2 External Exposure Control

The licensee's program for external exposure control was reviewed against the criteria above and licensee's Procedure No. AP-0502, "Radiation Work Permits," and AP-0503, "Establishing and Posting Controlled Areas." Performance relative to these criteria was determined by examination of selected radiation work permits, surveys and logs from the recent outage; review of licensee's Procedure No. OP-4530, "Dose Rate Radiation Surveys," OP-4531, "Radioactive Contamination Surveys," and OP-4532, "Personnel Contamination Surveys"; and observation and measurements during plant tours.

Within the scope of this review, no violations were noted.

6.3 Internal Dosimetry Control

The licensee's program for internal dosimetry control was evaluated with regard to the criteria above and Regulatory Guide 8.9, "Acceptable Concepts, Models, Equations and Assumptions for a Bioassay Program." Performance relative to these criteria was determined by discussions with the Whole Body and Respiratory Systems Engineer; review of bioassay records; and examination of surveys made in support of 12 Radiation Work Permits during the recent outage.

Within the scope of this review, no violations were identified.

6.4 Internal Exposure Control

The licensee program for internal exposure control was reviewed against the criteria above and licensee's Procedure No. AP-0502 and AP-0503. Performance relative to these criteria was determined by review of selected radiation work permits and associated surveys; observations made during plant tours; and review of Procedure No. OP-4531 and OP-4533, "Airborne Radioactive Concentration Determination."

Within the scope of this review, no violations were noted.

7. In-Plant Radiation Protection Program Implementation

The licensee's program for in-plant radiation protection was reviewed against criteria contained in 10 CFR 19.11-12; 10 CFR 20; and Technical Specifications 6.5, "Plant Operating Procedures." Performance relative to these criteria was determined by:

- -review of selected radiation work permits;
- -interviews of Chemistry and Health Physics Technicians and radiation workers
- -review of selected procedures for radiation work permits, surveillance, posting and training; and
- -observations and measurements during plant tours.

Within the scope of this review, no violations were identified.

8. ALARA Program

The licensee's ALARA Program during the recent outage was reviewed against criteria contained in Regulatory Guide 8.8, "Information Relevant To Ensuring That Occupational Radiation Exposures At Nuclear Power Stations Will Be As Low As Is Reasonably Achievable," and Regulatory Guide 8.10, "Operating Philosophy For Maintaining Occupational Radiation Exposures As Low As Is Reasonably Achievable." The licensee's performance relative to these criteria was assessed by discussions with the Health Physicist; examination of summary man-rem data for major outage activities and plant/contractor groups; review of selected radiation work permits and procedures for specific ALARA input; and evaluation of the "ALARA Committee Charter."

The recorded man-rem totals for this licensee were lower than those recorded for other boiling water reactors of similar age, size and design. However, the ALARA program lacked the formalization noted in other ALARA programs. The licensee stated that ALARA concepts have been incorporated into plant operations to the point where formal administrative ALARA review procedures are unnecessary.

Although there was an apparent management commitment to an ALARA principle, the licensee was unable to identify a management policy statement providing a commitment to ALARA reflecting the guidance of Section C.1 of Regulatory Guide 8.8.

The ALARA Committee apparently has been designated as the functional unit for the ALARA program reflecting the guidance of Section C.1.b of Regulatory Guide 8.8. However, the Committee's charter does not clearly provide the responsibility and authority to the ALARA Committee as suggested in Regulatory Guide 8.8, Section C.1.b(1)(a-e). In addition, the charter fails to define the term "high radiation exposure jobs" which are within the ALARA Committee's purview.

Review of selected procedures showed that general ALARA guidance was provided. For example, Procedure No. AP-0501, "Radiation Protection Standards," indicated that exposures should be kept ALARA. Principles of ALARA were also discussed in the licensee's training program reflecting the guidance of Section C.1.c of Regulatory Guide 8.8.

The licensee stated that a manrem estimate is made for each task. Review of selected radiation work permits and the "ALARA Log" failed to provide documentation for these manrem estimates. The licensee also stated that at less than ten estimated manrem, Health Physics Assistants and Technicians provide ALARA instruction. The licensee was unable to identify procedures governing the ALARA instructions to be given by technicians.

The licensee was unable to identify procedures which address the guidance in Section C.3, "Radiation Protection Program," of Regulatory Guide 8.8 including preoperational briefings, use of engineering controls, practice in low radiation exposure areas and scheduling of tasks.

The Health Physics Appraisal (Inspection 50-271/80-14) suggested that the licensee develop, document and implement a formal ALARA Program conforming to the guidance in Section C of Regulatory Guide 8.8 and to Regulatory Guide 8.10. This finding remains open and will be reviewed during a subsequent inspection (83-33-02).

9. Exit Interview

The inspector met with the licensee's representatives (denoted in Section 1) at the conclusion of the inspection on December 9, 1983. The inspector summarized the purpose and scope of the inspection and identified findings as described in this report. The Chief, Facilities Radiation Protection Section, NRC Region 1, also attended the exit interview.

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