

U. S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-271/91-27

Docket No. 50-271

License No. DPR-28

Category: C

Licensee: Vermont Yankee Nuclear Power Station
RD 5, Box 169
Ferry Road
Brattleboro, Vermont 05301

Facility Name: Vermont Yankee Nuclear Power Station

Inspection At: Vernon, Vermont

Inspection Period: November 30 - October 4, 1991

Inspector: D. Chawaga
D. Chawaga, Radiation Specialist,
Facilities Radiation Protection Section (FRPS)

10-14-91
Date

Approved by: W. Pasciak
W. Pasciak, Chief, FRPS

10-17-91
Date

Inspection Summary: Inspection from November 30 - October 4, 1991 (NRC Inspection Report No. 50-271/91-27)

Areas Inspected: The inspection was a routine, unannounced radiological controls inspection while the facility was operating at full reactor power. Areas reviewed included control of radioactive material, contamination control, housekeeping, radiological postings and boundaries, ALARA performance, and radwaste processing.

Results: Two non-cited violations were noted. ALARA performance was observed to be strong.

DETAILS

1.0 Persons Contacted

1.1 Vermont Yankee

- * R. Grippardi, Yankee Nuclear Services Division, QA Supervisor
- * R. Leach, Safety Coordinator
- * E. Lindamood, Radiation Protection Supervisor
- * J. McCarthy, ALARA Engineer
- * R. Pagodin, Technical Services Superintendent
- * D. Reid, Plant Manager
- M. Thornhill, Radiation Protection Assistant

1.2 NRC

- * H. Eichenholz, Senior Resident Inspector
- * W. Pasciak, Chief, Facilities Radiation Protection Section

* Denotes attendance at the Exit Meeting on October 4, 1991.

2.0 Purpose

The inspection was a routine, unannounced inspection of the licensee's radiological controls program during plant operation. Subject areas reviewed included contaminated material control, health physics control point management, control of radioactive material, housekeeping, radiological postings and boundaries, ALARA performance, and radwaste processing.

3.0 Previously Identified Items

(Closed) UNR 91-19-01

On July 11, 1991, a contaminated 55 gallon drum was discovered outside of the Radiologically Controlled Area (RCA) but within the Protected Area at the plant. The licensee's program required the barrel to be surveyed prior to removal from the RCA. The RCA release survey, if it was performed, failed to identify the contamination and prevent release of the barrel to the yard area of the plant. An additional survey is required by the licensee for materials as they are removed from the Protected Area to the outer Owner Controlled Area. It was this "backup" Protected Area release survey that identified the contaminated barrel. The barrel was stored on its side near the South Warehouse with approximately 160 other barrels when it was discovered to be contaminated. All of the other barrels were surveyed and found to be free of contamination.

According to licensee reports a few "hands full" of oil absorbing material containing ^{60}Co and ^{137}Cs were found to have contaminated the barrel. Low level contamination of similar isotopic content was also found on the ground near the barrel and in lesser quantities within the local storm drain system. The nearest storm drain was less than 10 feet away from the contaminated barrel and, of storm drain sediment trap samples taken, those nearest to the barrel's location displayed the highest contamination levels. Given these observations, it was determined that the storm drain contamination most probably originated from the contaminated barrel.

Licensee analysis indicated that radioactive material was not released to the Connecticut River via the storm drain system. This conclusion was based on the following observations. South Storm Drain contamination levels decreased with increasing distance from the barrel storage location and samples taken in sediment traps nearest to the storm drain discharge were found to be free of contamination. In addition, routine monthly storm drain effluent samples did not contain detectable contamination.

As a precautionary measure, licensee personnel promptly plugged the storm drain with an inflatable Oil Spill Prevention Bladder to prevent the contaminated from migrating out of the storm drain. The contaminated sediment was removed from the storm drain and the isolated system was thoroughly flushed with potable water. All flush waters and sediments were collected in 55 gallon drums and moved to the RCA where the Radwaste Coordinator was assigned responsibility for handling and disposal. All storm drains were decontaminated to levels far below the Environmental Lower Limits of Detection found in the facility's Technical Specifications. Decontamination was completed prior to removal of the inflatable bladder.

The sensitivity of plant survey equipment is such that any reasonable attempt to survey the contaminated barrel would have resulted in discovery of the contamination (approximately 12k dpm/100 cm²). Therefore, there was some probability that the barrel was never surveyed prior to removal from the RCA. However, the licensee's investigation indicated that the event was likely the result of a delay between the release survey and actual removal of the "clean" barrels from the RCA. In this interim period, contaminated material may have been placed in the barrel. In either case, NRC requirements for surveys, procedural adherence and posting of radioactive material containers were not met during the early stages of this incident. Technicians were counseled on the importance of expeditiously removing items from the RCA after a proper release survey is performed. A plan is under consideration for improving RCA release survey and material control practices. The plan, in part, includes color coding of barrels to assist with contamination control. For example, only yellow barrels would be allowed inside of the RCA and the use of yellow barrels outside of the RCA would be prohibited. The inspector will monitor progress in this area during future inspections.

Good performance was noted in response to this specific incident and a generally improving trend in the control of contaminated material has been observed during recent inspections. The licensee's program effectively identified the loss contamination control and, as a result, the event was of minor safety and environmental significance. Overall, corrective actions were comprehensive and timely. This event meets the NRC's criteria to be categorized as a non-cited violation.

4.9 License Restrictions on Use of Radioactive Material

Radioactive sample assay efforts unrelated to the operation of the Vermont Yankee Nuclear Power Station (VYNPS) had been performed at the station by a Vermont Yankee employee. These sample analysis activities were performed during "off hours" and without widespread knowledge of the plant's current management staff. According to licensee personnel, the samples mainly consisted of smears of sealed radioactive sources. At times, samples were found to contain low levels of detectable contamination.

Although these sample analysis activities presented little, if any, safety concern, NRC License DPR-28 makes no provision for receipt and use of radioactive material which does not support reactor operation. Specifically, DPR-28 states in part that, "the Commission hereby licenses the applicant pursuant to the Act and 10 CFR Parts 30, 40, and 70, to receive, possess, and use in amounts as required any byproduct, source, or special nuclear material without restriction to chemical or physical form, for sample analysis or instrument calibration or associated with radioactive apparatus or components". Support of other radioactive material users was not required for the operation of VYNPS, had not been considered in the licensing process, and was not authorized under the provisions of DPR-28.

The inspector found no indication that any individual attempted to willfully violate NRC requirements. Sample assay practices were immediately discontinued after NRC discussions with plant personnel. Due to the minor safety and environmental significance of the sampling activities and considering the appropriateness of corrective actions taken prior to the end of the inspection period, this noncompliance activity meets the criteria to be categorized as a non-cited violation.

5.0 ALARA

Worker radiation exposure totals have remained low at the VYNPS. In January of 1991, station personnel established an overall 1991 station exposure goal of 97.5 person-rem. The corporate goal for the station was set at 115 person-rem. According to plant personnel, the aggressive station goal of 97.5 person-rem still

appeared achievable at the time of this inspection. The inspector noted that radiation exposures were extremely well estimated during the year of 1991. In addition, planning and work control practices have been effective in reducing worker exposures. Overall, excellent ALARA performance was observed at Vermont Yankee.

6.0 Contamination Control

Enhancements to the contamination control program at the Radiation Protection (RP) Control Point were observed during the inspection. The licensee recognized the need to reduce commingling of frisked and unfrisked workers at this exit area for the RCA. A clean pathway was established from the exit of the contamination monitors. Access to the pathway was not available to workers who had not passed through the contamination monitors. In other words, monitored and unmonitored workers no longer shared the same floor space at the control point exit area. The potential for cross contamination of monitored workers by unmonitored workers was virtually eliminated by this program change. The establishment of the clean pathway reduced the area contained by the RCA and made control point personnel more accessible to personnel from outside of the RCA. Additional enhancements were being planned at the close of the inspection period.

The inspector reviewed contamination control practices for the collection of potentially contaminated water from the radiochemistry sample sinks. Use of the original sink drain piping was discontinued after leaks were discovered in that system. As a result, temporary collection receptacles were placed in the chemistry laboratory for collection of sink effluents. Recent personnel contamination records indicated that no personnel were contaminated as a result temporary drain use. The inspector found no significant contamination or worker exposure control concerns related to the use of temporary collection containers. Container radiation levels were measured by the inspector during recent inspections were found to contribute no appreciable exposure to workers in the laboratory. In addition, radiation protection personnel routinely survey and monitor dose rates and contamination control in the laboratory.

A permanent replacement drain line was installed to collect water from the most heavily used chemistry sink. The new drain line exited and returned to the RCA. The inspector noted that the potential for internal contamination was not indicated on the piping runs found outside of the RCA boundary. Licensee personnel determined that it would be prudent to post the piping as internally contaminated and did so expeditiously. The posting would alert personnel to contact RP if leaks were observed. In addition, the posting would remind RP Technicians to monitor the line during routine surveys. The inspector observed the drain piping connections outside of the RCA and found them to be free of leaks. No measurable dose rates were observed in contact with that drain line.

The decontamination shower located near the RP Control Point shared the original drain system with the chemistry sinks and was not available for use during the inspection. A temporary shower was available for use in the reactor building. Contamination control practices associated with use of this shower will be reviewed during future inspections.

A review of personnel contamination events indicates a positive trend. Contamination events to date totaled 346, 471 and 109 for the years 1989, 1990 and 1991 respectively. Licensee personnel attribute better performance in 1991 to an increased emphasis and responsibility placed on workers and their supervisors for proper contamination work control practices.

7.0 Radiological Postings, Barriers and Housekeeping

The inspector toured the facility several times during the inspection period. Radiological postings and boundaries were generally observed to be appropriate and well maintained. Housekeeping practices were observed to be better during past inspections, however, no significant degradation of radiological controls was observed as a result of housekeeping.

8.0 Radioactive Waste Processing

The implementation of new radioactive waste processing equipment should significantly improve the licensee's radiological control program for radwaste. The radwaste processing area was decontaminated and released from protective clothing requirements. Licensee personnel anticipate that the area will remain relatively free of contamination as a result of new processing methods. The use of permanent enclosed system piping will eliminate much of the personnel exposure and contamination control problems associated with filling radwaste liners. A potential crud trap was identified during the course of the inspection. The trap consisted of a dead leg for a purge line connection which taps off from below the midplane of a resin transfer line. The licensee had no intentions of using that connection and was investigating removal options. The inspector will continue to monitor progress in this area.

9.0 Exit Meeting

A meeting was held with licensee representatives at the end of the inspection period on October 4, 1991. Inspection findings were discussed in detail at that time.