

U. S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-271/92-17

Docket No. 50-271

License No. DPR-28

Licensee: Vermont Yankee Nuclear Power Corporation
Brattleboro, Vermont 05301

Facility Name: Vermont Yankee Nuclear Power Station

Inspection At: Vernon, Vermont

Inspection Conducted: August 3 - 7 1992

Inspectors:

D. Chawaga
D. Chawaga, Radiation Specialist
FRPS, FRSSB, DRSS

8-28-92
Date

Approved by:

W. Pasciak
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8-28-92
Date

Areas Inspected: This was an unannounced inspection of the radiological controls program while the reactor was at full power. Areas inspected included previously identified NRC items, observation of in-plant controls and activities, and final review of ALARA performance during the 1991-92 Refueling Outage. Industrial safety concerns during CO₂ blasting in the decontamination booth were discussed.

Results: Posting of radiological hazards within the RCA was well performed. Housekeeping was excellent. The inspector's concerns regarding safe operation of the decontamination booth were adequately addressed by the licensee. Three previously identified NRC items were closed.

DETAILS

1.0 Personnel Contacted

1.1 Licensee Personnel

- * J. Geyster, Plant Health Physicist
- * R. Grippardi, Quality Assurance Supervisor
- * S. Jefferson, Assistant to the Plant Manager
- * E. Lindamood, Radiation Protection Manager
- * R. Lopriore, Maintenance Manager
- * T. McCarthy, ALARA Engineer
- * R. Pagodini, Technical Services Superintendent
- * S. Ralz, Quality Assurance Engineer
- D. Tkatch, Radiation Protection Supervisor
- * R. Wanczyk, Operations Superintendent

1.2 NRC Personnel

- P. Harris, Resident Inspector
- * R. Lorson, Reactor Engineer

* Denotes those present at the exit meeting on April 17, 1992.

2.0 Purpose

This inspection was an unannounced inspection of the licensee's radiological controls program during full power reactor operation. Areas targeted in the review included previously identified NRC items, observation of in-plant controls and activities, operation of the decontamination booth and final review of ALARA performance during the 1991-92 Refueling Outage.

3.0 Status of Previously Identified Items

3.1 (Closed) 50-271/92-08-01, Violation.

During a prior inspection, three instances where personnel had failed to adhere to the respiratory protection procedures were noted. These noncompliances, in the aggregate, constituted a violation of Technical Specifications (TS) 6.5.B. The following paragraphs provide a short description of each noncompliance item and describe licensee actions taken to prevent recurrence.

- 1) The contract Senior Radiation Protection Technician (SRPT) who performed maintenance on respiratory protection did not have documented training in this subject area as required by station Procedure AP-0505, "Respiratory Protection Program".

According to licensee personnel the SRPT did receive some "one on one" respirator maintenance training from the Vermont Yankee Respiratory Protection Supervisor (VYRPS). The SRPT had a significant amount of respiratory protection experience but had little power reactor experience and did not fully appreciate station management's expectations regarding strict procedure compliance. The NRC radiation specialist inspector interviewed the SRPT and found him to be familiar with the operation of respirator testing equipment and respirator repair procedures.

Licensee personnel acknowledged that this training was not documented in accordance with AP-0505. Documentation of the SRPT's training was completed and filed immediately after the NRC's Senior Resident Inspector identified the noncompliance. The SRPT's respirator repair skills were reviewed through direct observation by the VYRPS and no weaknesses were noted in the course of that review. As a result, licensee personnel concluded that previously performed repair tasks were completed properly. Management personnel adequately emphasized the station's commitment to verbatim compliance with station procedures during counseling sessions with the VYRPS and the SRPT.

- 2) The second noncompliance involved the operation of respirator filter test equipment. The PortaCount filter testing device was not being operated in the "fit test" mode described in AP-0505. A faster analysis of filter integrity was being performed in a "count" mode of operation which was not described in any station procedures. The new testing procedure had not been fully evaluated by the licensee and a standard criteria for testing had not been established.

The "count" mode of operation was immediately discontinued after inspector identification of these concerns. Respiratory protection filter testing was resumed in the "fit test" mode while an evaluation of the "count" mode was being performed. The VYRPS and the SRPT were instructed by management to conduct respiratory protection activities in accordance with existing procedures. In addition, management personnel ensured that the VYRPS and SRPT were knowledgeable of the proper process to initiate procedure revision.

- 3) The licensee was not in compliance with station procedure DP-0539, "Radiation Protection Department Contractor Training Program" when contract personnel were allowed to perform work on respiratory protection equipment prior to receiving either an oral or written examination covering such tasks. The inspector interviewed personnel performing filter tests and found weaknesses in their understanding of the test equipment's basic operating principles.

Contractor training and documentation requirements are now more clearly stated in DP-0539. The procedure now lists the required training for RP contractors. In particular, "On the Job Training" is now required for respirator decon/inspection, respirator repair, and respirator fit testing. Procedure DP-0539 also requires training on procedure AP-0505, "respiratory Protection".

Licensee personnel concluded that the predominate cause of these noncompliances was inadequate implementation of existing plant procedures and some imprecise language in existing procedures. These weaknesses were attributed to a lack of attention to detail by front line supervisors. In all cases, personnel involved were counseled on the importance of compliance with procedures. Procedures were modified as the licensee deemed necessary. In addition, the Radiation Protection Department initiated a self-audit process with the goal of improving procedure compliance and "attention to detail". Each functional area of the station's health physics program was scheduled to receive an in-depth, performance-based review. Audit results and details of this violation were incorporated into plans for the 1992 Radiation Protection Continuing Training Program.

This item is closed.

3.2 (Closed) 50-271/92-08-02, IFI.

Licensee personnel identified an administrative overexposure of a contract worker on March 3, 1992. The incident occurred during work on a motor operated valve (RD-18) on the Reactor Water Clean-Up (RWCU) room mezzanine. The mezzanine was posted and controlled as a High Radiation Area. The worker was badged as a "visitor" and was assigned an administrative whole body dose limit of 250 mrem. After two entries to the RWCU room, the worker's whole body TLD exposure totaled 297 mrem.

The inspector interviewed personnel and reviewed records and found no indication that a similar incident had occurred before or after this incident. Station Procedure DP-4502, "Control of Radiological Survey Equipment" was modified to include steps for the issuing and resetting alarming dosimeters which stated:

"Check the most current Dose Report and the worker's current self indicating pocket dosimeter reading to ensure that an adequate dose margin is available for the task to be performed. NOTE: A minimum margin of 250 mrem to the quarterly limit is required to enter a High Radiation Area."

According to RP management personnel, station policy would restrict visitors from entering High Radiation Areas. Licensee personnel were in the process of planning for a major upgrade in the access control process for entering and exiting the RCA. These program changes, when fully implemented, were expected to result in substantial program improvement.

The inspector completed a final review of corrective actions during the current inspection. Overall, licensee actions taken in response to this event were considered to be timely, comprehensive and well executed.

This item is closed.

3.3 (Closed) 50-271/92-08-03, IFI.

During the last radiological control inspection, the inspector noted that Radiation Area postings, at times, did not clearly indicate sources of exposure and dose gradients. In addition some posting practices could be misleading to workers in the field (see NRC Inspection Report 50-271/92-08). Recent changes have resulted in the clear definition of discrete Radiation Area boundaries and more effectively communicate dose gradients to workers. Licensee personnel evaluated exposure rates throughout the facility and identified Radiation Areas which could be effectively separated from lower dose rate areas and posted as discrete areas. Radiation Area boundaries were then roughly defined using a conspicuous adhesive tape on the floor. The "Radiation Area" posting required by 10 CFR 20.202 were placed on stantions within the taped boundary.

Floor tape was used instead of boundary rope because it would be less likely to impede work. After talking with plant workers and observing workers in the plant, the inspector determined that the new practice encouraged personnel to avoid and minimize time in the taped off Radiation Areas. This passive crowd control measure was expected to promote good ALARA practices by workers who, in the past, did not discriminate between Radiation Areas and other areas where, in comparison, dose rates were much lower.

Licensee personnel developed a temporary "Standing Order" which provided guidance on the new Radiation Area posting practices. A more detailed procedure was being developed. The procedure would incorporate lessons learned during the early phases of the implementation. A memo was sent to all RP Department personnel describing the new posting requirements. This issue has been included in the 1992 RP Technician Continuing Training.

Overall, the licensee's posting practices clearly alerted workers to the presence of radiation dose gradients within the facility. The inspector noted that the licensee continued to effectively use "ALARA Alert" and "ALARA Caution" in conjunction with the postings required by 10 CFR 20. Licensee personnel were continuing their evaluation on the benefits associated with the implementation of these new posting practices.

This item is closed.

4.0 Observations During Plant Tours

Radiological housekeeping was determined to be excellent in all areas toured during the inspection. Contaminated area boundaries were neat, organized and well posted. Radiological postings were obvious, unobstructed and clearly indicated the radiological hazards present. Survey data posted on maps at the Control Point accurately reflected the radiological conditions measured by the inspector in the field. Those workers interviewed in the field were working in compliance with their respective RWP requirements. RP Technicians, at the control point and in the field, were found to be well versed on radiological conditions and aware of work in progress.

5.0 Areas Locked by Radiation Protection

The inspector performed an inventory on the keys for areas locked by the RP Department and challenged many of the doors to these areas while on tours of the plant. All keys were properly controlled and all areas were secured in accordance with Technical Specifications and station procedures. The inspector reviewed the proposed changes to station procedure OP 0532, "High Radiation Area Door Key Control." These changes increase surveillance requirements and personnel accountability for key use. Such changes should strengthen the control exerted by the RP Department over entry to locked areas and were viewed as a program improvement.

6.0 Decontamination Booth

The licensee had recently purchased a large, versatile and highly effective Decontamination (Decon) Booth. The availability of this resource has significantly increased the licensee's ability to perform thorough, efficient and radiologically safe decontamination of materials. However, a few industrial safety concerns were noted during a review of CO₂ blasting operations within the booth. Specifically, standard guidance had not been developed, documented and disseminated to personnel regarding rescue entries to the booth. For example, no guidance existed on the use of protective clothing or respiratory protection. As a result, there was some confusion among personnel regarding how the proper balance between radiation risk and CO₂ inhalation might best be achieved.

The booth was normally ventilated by a HEPA ventilation system and was continuously monitored for CO₂ concentration during CO₂ blasting efforts. Personnel observed in the booth were wearing a hooded suit, fed by station air, which serves as an atmosphere supplying respirator. A rescue person was stationed at a view window where he could monitor activities taking place within the booth.

Personnel interviewed did not consistently agree on the steps to be taken if a problem would arise within the booth. One individual indicated that he would don protective clothing (PC) prior to attempting to rescue a worker from the booth and did not believe that a Self Contained Breathing Apparatus (SCBA) would be needed. Management personnel indicated to the inspector PCs would not be used for entry to a contaminated area during rescue of an individual from a potentially life threatening situation. Licensee personnel had not fully evaluated the need for SCBA use during rescue.

Licensee personnel decided to discontinue CO₂ blasting until adequate rescue entry procedures could be developed. A Standing Order entitled "Emergency Action Plans - Decon Booth Operation" was developed shortly after these concerns were discussed. The plan described actions to be taken when an operator goes down in the booth with a life threatening injury, if power is lost and if the booth's CO₂ monitor alarms. The Low Level Alarm provides warning at a CO₂ concentration of 4 percent. The High Level Alarm is set at 5 percent CO₂.

The licensee's Standing Order adequately addressed the inspector's concerns. The inspector had no further questions in this area.

7.0 1992 Outage Performance

The licensee released the RP Department's *1992 Refueling and Maintenance Outage Report* since the NRC's last radiological control inspection. Outage sixteen began on March 6, 1992. Most radiological activities were completed by April 19, 1992 and the reactor was removed from sub-criticality at that time. Vermont Yankee achieved 100% power on April 25, 1992. The report summarized performance on the 31 jobs which exceeded 1 person-rem.

The 1992 outage exposure estimate of 179 person-rem was exceeded by 89 person-rem. Generally dose rates within the plant were not above expected values for the outage. The increased exposures were attributable to a larger population of workers and work hours above estimated values. The 1992 outage exceeded the 1990 outage by 24,000 Radiation Work Permit (RWP) hours. The station's historical value of approximately 0.004 rem/RWP hour multiplied by the 24,000 RWP hours equals approximately 96 rem. This amount roughly approximated the difference between the 1992 outage and more typical outages at Vermont Yankee.

Although more exposure than anticipated was expended, several major changes resulted in improved RP program performance. RWP support work was done in advance and 90 percent of the outage RWP packages were completed prior to the outage. Prefabrication and testing of components was performed outside of the RCA for Torus modification work. Drain piping was hydrolased to reduce area dose rates. Many stored materials were removed from the spent fuel pool and the pool water was maintained at a low specific activity through

the effective use of underwater filters. Remote cameras were used on several jobs; Shielding was observed to be effective on several jobs and several plant modifications were completed which will support future ALARA initiatives.

The outage report summarized recommendations for improvement for each of the 31 work packages performed. The following recommendations common to all jobs were being evaluated:

- 1) implementation of the access control system prior to the 1993 outage;
- 2) institution of a contractor to RF Technician ratio which is not to exceed ten to one;
- 3) planning Security and Training Indoctrination further in advance to ensure timely arrival of personnel;
- 4) keeping the Drywell Equipment Hatch open for the outage to relieve congestion at the personnel hatch;
- 5) consider minimizing the population of badged workers;
- 6) and, optimizing the location of satellite control points.

Overall, no weaknesses were observed in the licensee's review of outage activities. The inspector will continue to monitor ALARA performance during future inspections.

8.0 Exit Meeting

The inspector met with the licensee representatives listed in Section 1.0 of this report at the conclusion of the inspection on August 7, 1992. The inspector summarized inspection findings during that meeting.