VERMONT YANKEE
NUCLEAR POWER CORPORATION

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BVY 91-001

REPLY TO:
ENGINEERING OFFICE
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BOLTON, MA 01740
(508) 779-6711

January 4, 1991

U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Attn: Document Control Desk

References:
a) License No. DPR-28 (Docket No. 50-271)
b) Letter, USNRC to VYNPC, Inspection Report 90-13, dated 12/5/90

Dear Sir:

Subject: **Response to Inspection Report 90-13, Notice of Violation**

During a routine unannounced radiological controls inspection conducted on October 1-5, 1990, a violation of NRC requirements and an unresolved item were identified. Our response to these items is provided below.

VIOLATION

10 CFR 20.201(b) specifies that each licensee shall make or cause to be made such surveys as 1) may be necessary for the licensee to comply with the regulations in this part, and 2) are reasonable under the circumstances to evaluate the extent of radiation hazards that may be present.

10 CFR 20.301 specifies, in part, that no licensee shall dispose of licensed material except:

a) by transfer to an authorized recipient as provided in the regulations; or
b) as authorized pursuant to 20.302 or Part 61 of this chapter; or
c) as provided in 20.303, 20.306 or 20.106.

Contrary to the above, on several occasions, including from February 1990 until October 1990, the licensee burned waste oil taken from controlled areas of the facility without adequately surveying the material. Specifically, the licensee did not establish a lower limit of detection (LLD) comparable with the Technical Specification Environmental LLD.

This is a Severity Level IV Violation (Supplement IV).

IE01

RESPONSE

Concerning the Severity Level IV Violation imposed as a result of burning "...waste oil taken from controlled areas of the plant without adequately surveying the material to ensure that it did not contain licensed material...", we respond, and take exception to this violation, as follows:

The regulations governing the disposal of licensed material are correctly stated in the violation however, there has been no previous official guidance from the NRC on what detection methods or limits of detection are to be used in this situation. Because of the lack of official guidance, Vermont Yankee established a program that it believed was proper, consistent with industry practice and adequately determined the presence or absence of licensed materials released from the controlled areas of the facility. This program has been in effect for years without previous NRC comment. This general release program was applied to the release of waste oil for burning when that process began in February 1990. We concluded that the level of detection used to clear oils from the controlled areas of the plant was reasonable under the circumstances to determine that there was no significant radiation hazard to the public because it was able to detect:

1. The 10CFR20 Appendix B, Table II, Column 2 levels for the most significant isotopes at the plant. These levels are designed to control exposure due to ingestion of drinking water. The oil is not released to the drinking water pathway.

2. Below the levels of 10CFR30.70, Exempt Concentrations for the most significant isotopes at the plant.

3. Below the levels exempted from the Vermont State Department of Health regulations.

It is not meant to imply that the above regulations are directly applicable to this situation, but they do provide guidance for an acceptable concentration of radioactive material to be released to the general public without a significant radiation hazard.

Additional guidance was provided in 1988 when the NRC issued Information Notice 88-22 concerning the limits of detection to be used for "Disposal of Sludge From Onsite Sewage Treatment Facilities". This notice was very specific to sewage sludge, but in an undocumented telecon with Mr. Wayne Meinke, of the NRC, on 5/10/89, Mr. Bob Leach, of our organization, questioned the application of this guidance to the release of hazardous materials. Mr. Leach was told that hazardous material was a separate issue and that it was not intended that we change our method of clearing those items from the controlled area.

Vermont Yankee exercised reasonable judgement and made a conscientious effort to determine that the oil in question did not contain licensed material that would cause a significant radiation hazard to the public.

Further, when the NRC informed Vermont Yankee,during the inspection, that a recent internal NRC memo had established monitoring LLD's, and that our monitoring program was not in compliance with that memo, the following actions were taken:

1. We immediately stopped burning waste oil released from the radiation control area of the plant and removed all of that oil from the burner storage tank.

2. We immediately halted the release of all liquids from the Radiation Control Area which could be contaminated with licensed material and are not otherwise addressed by the NRC. These liquids are being stored in the Radiation Control Area until the actions outlined in item 3 below are implemented.

3. We are, at this time, revising OP 2610, "Liquid Waste Disposal" to include methods for analyzing liquids proposed for release from the Radiation Control Area down to environmental lower limits of detection as described in Vermont Yankee Technical Specifications Table 4.9.3. Further, liquids found to contain licensed material in excess of the lower limits of detection listed in Table 4.9.3 will be treated as radioactive waste.

While we have taken steps to support the more conservative interpretation, we continue to believe that no regulation exists requiring specific monitoring levels, and consequently that a violation is inappropriate. We trust that you will review the above information, and will subsequently determine that this item does not warrant a violation, because of the lack of previous guidance and our immediate action to clarify and revise our practices once we were notified of your concern.

Unresolved Item
90-13-02

Upon review of the methodology used by the licensee in estimating the individual's intake, it was concluded that the licensee's bioassay program has weaknesses. Weaknesses in methodology that were identified consist of the following:

A. The licensee assumed that the deposition was due to an inhalation incident, not an ingestion incident, of radioactive material. The licensee also assumed that the intake occurred immediately prior to the whole body count. The licensee's evaluation concluded that the second assumption was conservative. However, this assumption is not conservative for inhalation incidents. Had the intake actually occurred several days prior to the whole body count, the intake estimate would be significantly lower.

B. The licensee evaluated the intake using a worker breathing rate of 1.0 E 8 cc/working day. This value is not consistent with current internal dosimetry methodology or with 10 CFR 20.103(a)(1) which specifies a total volume of air breathed in 520 hours at 6.3 E 8 cc or 9.7 E 6 cc/working day. Based on this correction, the licensee's evaluation of the intake was low by about a factor of ten.

C. The licensee's evaluation was based on the assumption that 63% of the intake was retained in the respiratory tract.

Although the percent deposition that was assumed is consistent with current internal dosimetry methodology for lung deposition, actual WBC data indicated no detectable lung deposition as the activity was

located in the GI tract. The licensee did not explain this anomaly. The percent of an intake present in the GI tract immediately after an inhalation intake is actually much smaller than 63%. Appropriate retention factors should have been evaluated in consideration of the WBC results and the activities of the individual.

D. The licensee has no proceduralized program for performing intake estimates in order to demonstrate compliance with 10 CFR 20.103(a)(3).

RESPONSE

For any positive bioassay occurrence, we compile and review data from air samples, contamination reports, incident reports and logbook entries along with the bioassay results. Screening analysis for intake and dose, using information in NUREG 4884, are normally done on-site for less significant intake events. Use of the YAEC Environmental Laboratory, and their capability of running the computer code INDOS, offers us the capability of independent evaluation and documentation of significant intake events.

After again reviewing the data associated with this event, we have found that our initial estimate is still valid. We also have asked the YAEC Environmental Laboratory to formally document the intake via the computer code INDOS. This documentation supports our initial estimate of the significance of the intake event.

A) While we believe this event was probably an ingestion event, for analysis, we assumed the intake event occurred via the inhalation pathway. All other assumptions being the same, an inhalation event will give a higher dose and intake than a direct ingestion, supporting our conclusion that the analysis performed was conservative. However, the contention that our process was not conservative rests on the question of when the intake occurred.

If it is assumed that the intake occurred greater than 1 day prior to the assay, the process used would not be conservative. However, because several body counts were taken over the period of 3 days, and the latter body counts showed no activity, the metabolic models applicable to intakes via inhalation indicate a recent intake.

Metabolically, the GI tract is characterized initially by rapid clearance of inhaled activity over the first couple of days, followed by a gradual decrease over periods of time after the intake that are much greater than 1 day. The rapid clearance that was observed in the individual's repetitive bioassay results can only be described by the inhalation model if the intake occurred no more than 1-2 days before the body counts.

Bioassay measurements showed up to 24 nCi of Co-60 activity in the GI tract, but no activity was measured in the lungs. Body count times greater than 2 days after an intake of 1 micron particles that yield a 24 nCi activity burden in the GI tract would also result in a lung burden, at the time of the body count, of approximately 200 nCi (18% MPOB, lung) which would have been detectable by the body counter. If inhalation of 10 micron particulate matter is assumed, the resultant lung burden would be about 1100 nCi at the time of the body count (85% MPOB, lung). It should be noted that our bioassay measurement techniques are capable of measuring activity burdens on the order of 1 nCi and that we saw nothing in the lung.

Thus, without any activity being measured in the lung, it is not reasonable to assume that an inhalation occurred more than 1-2 days prior to the initial measurements.

B) Radiation Protection Department personnel evaluate workers' intakes utilizing the results obtained from bioassay measurements, information in NUREG 4884, and reference man data from ICRP 23 and ICRP 30. The information referred to in item 4.4.B of the inspection report, was provided to the inspector in conjunction with air sample data, in an effort to explain our opinion, that it was virtually impossible for the air concentrations on the turbine deck to result in any significant inhalation intake. Therefore the point being made by the inspector is not relevant to the estimate of intake of this individual.

C) Excretion and retention data, the derivation of which are described in NUREG 4884, were used to estimate the inhalation intake from the individual's bioassay data. The information referred to in item C was provided to the inspector as described in item B. Therefore the point being made in item C is also not relevant to the estimate of intake of this individual.

D) We will review our program for making intake estimates, and will revise that program as deemed necessary.

We trust that this information is responsive to your request; however, should you have additional questions or desire additional information, please do not hesitate to contact us.

Very truly yours,

Vermont Yankee Nuclear Power Corporation

Warren P. Murphy
Senior Vice President, Operations

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cc: USNRC Regional Administrator, Region I
USNRC Resident Inspector, VYNPS
USNRC Project Manager, VYNPS