May 2, 2000

MEMORANDUM TO: James W. Clifford, Chief
Section 2
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

FROM: Edwin F. Fox Jr., Acting Chief **\RA**
Emergency Preparedness and
Health Physics Section
Operator Licensing, Human Performance,
and Plant Support Branch
Division of Inspection Program Management
Office of Nuclear Reactor Regulation

SUBJECT: SAFETY EVALUATION FOR AN AMENDMENT TO AN APPROVED 10 CFR 20.2002 APPLICATION FOR THE VERMONT YANKEE NUCLEAR POWER STATION

The Emergency Preparedness and Health Physics Section has completed its review of the Vermont Yankee Nuclear Power Corporation application, dated June 23, 1999, as supplemented on January 4, 2000, to amend an approved 10 CFR 20.2002 (previously 10 CFR 20.302) application. The licensee requested NRC approval to allow the addition of slightly contaminated soil and soil/sand material to the list of already approved materials (i.e., septic waste and cooling tower silt) for on-site disposal. Based on our review, we find the proposed changes to be acceptable. The attachment to this memorandum provides our evaluation of the licensee's application.

This completes our review under TAC No. MA5950.

Docket No. 50-271

Attachment: Safety Evaluation

CONTACT: Stephen Klementowicz, NRR/DIPM/IOLB/EP&HP
(301) 415-1084

SAFETY EVALUATION BY THE EMERGENCY PREPAREDNESS

AND HEALTH PHYSICS SECTION

OFFICE OF NUCLEAR REACTOR REGULATION

VERMONT YANKEE NUCLEAR STATION

DOCKET NO. 50-271

1.0 Introduction

By letter dated June 23, 1999, as supplemented on January 4, 2000, Vermont Yankee Nuclear Power Corporation (the licensee), submitted a request to amend a previous approved application granted by the NRC pursuant to 10 CFR 20.2002 (previously 10CFR 20.302) to allow the addition of slightly contaminated soil and soil/sand material to the list of already approved materials (i.e., septic waste and cooling tower silt) for on-site disposal via land spreading on designated fields.

In 1989, pursuant to 10 CFR 20.302 (current 10 CFR 20.2002), the licensee received approval from the NRC to routinely dispose of contaminated septic waste in designated on-site areas. In 1997, the NRC amended the approved on-site disposal application to also include contaminated cooling tower silt material.

In this 10 CFR 20.2002 application amendment, the licensee identified 25.5 cubic meters of soil to be disposed of on-site immediately, and approximately 28.3 cubic meters of soil/sand material on an annual basis until the end of the plant's operating license in 2013. The 25.5 cubic meters of contaminated soil was generated as a result of on-site construction activities. The anticipated 28.3 cubic meters of soil/sand material will be generated from the annual winter spreading of sand on roads and walkways at the plant site. The licensee has performed a comprehensive radiological evaluation which includes all of the anticipated materials (i.e., current 25.5 cubic meters and 28.3 cubic meters annually thereafter) which shows that the soil/sand can be managed on-site in the same manner as the septic waste and cooling tower silt (i.e., land spreading on designated fields).

2.0 Evaluation

The licensee will dispose of the soil and future soil/sand material using a land spreading technique consistent with the current commitments for on-site disposal of septic waste and cooling tower silts previously approved by the NRC. The licensee will continue to use the designated and approved areas of their property (approximately 1.9 acres in size) which

currently receives the septic waste and cooling tower silts. Determination of the radiological dose impact of the new material has been made based on the same dose assessment models and pathway assumptions used in the previously approved submittals.

The licensee will procedurally control and maintain records of all disposals. The following information will be recorded:

1. The radionuclide concentrations detected in the material (measured to radiation levels consistent with the licensee's radiological environmental monitoring program).

2. The total volume of material disposed.

3. The total radioactivity in the disposal operation as well as the total radioactivity accumulated on each disposal plot at the time of spreading.

4. The plot on which the material was applied.

5. Dose calculations or maximum allowable accumulated activity determinations required to demonstrate that the dose condition values imposed (i.e., imposed by this 10 CFR 20.2002 application) on the land spreading operation have not been exceeded.

The bounding dose conditions for the on-site disposals are as follows:

1. The annual dose to the whole body or any organ of a hypothetical maximally exposed individual must be less than 1.0 mrem.

2. Annual doses to the whole body and any organ of an inadvertent intruder from the probable pathways of exposure must be less than 5 mrem.

3. Disposal operations must be at one of the approved on-site locations.

To ensure that the addition of new material containing low levels of radioactivity will not exceed the bounding dose conditions, for each new spreading operation the licensee will calculate an estimate of the total radioactivity that includes all past disposals of septic waste, cooling tower silt, soil and soil/sand material on the designated disposal plots. This will be compared with the bounding dose condition value or equivalent radioactivity value on a per acre basis. In addition, concentration limits will be applied to the disposed material to restrict the placement of small volumes of material that may have relatively high radioactivity concentrations.

The licensee assessed the dose that may be received by the maximally exposed individual during the period of plant control over the property, and to an inadvertent intruder after plant access control ends using the same pathway modeling, assumptions, and dose calculation methods that were previously approved by the NRC for the septic waste and cooling tower silt disposals. The dose models are based on the guidance in U.S. NRC Regulatory Guide 1.109, Revision 1 (1977).

The licensee's dose assessment is as follows:

1. Total annual doses to the whole body and critical organ of the hypothetically maximally exposed individual were estimated to be 0.115 mrem and 0.403 mrem respectively. These values are less than the prescribed annual dose condition value of 1.0 mrem for the time period of active site control.

2. Total annual doses to the whole body and critical organ of an inadvertent intruder from the probable pathways of exposure were estimated to be 0.757 mrem and 1.17 mrem. These values are less than the prescribed annual dose condition value of 5.0 mrem for the time period after active site control.

3. The dose calculations are based on projecting the maximum potential impact, of all disposals (past and future) on the designated disposal plot of land.

3.0 Conclusion

The staff finds the licensee's proposal to dispose of the low-level radioactive soil and soil/sand material, pursuant to 10 CFR 20.2002, in the same manner, location, and within the bounding dose conditions as the materials (i.e., septic waste and cooling tower silt) previously approved by the NRC to be acceptable.

The licensee has committed to permanently incorporate this modification into their Offsite Dose Calculation Manual.

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Operator Licensing, Human Performance,
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Division of Inspection Program Management
Office of Nuclear Reactor Regulation

SUBJECT: SAFETY EVALUATION FOR AN AMENDMENT TO AN APPROVED 10 CFR 20.302 APPLICATION FOR THE VERMONT YANKEE NUCLEAR POWER STATION (TAC NO. MA5950)

The Emergency Preparedness and Health Physics Section has completed its review of the Vermont Yankee Nuclear Power Corporation application, dated June 23, 1999, as supplemented on January 4, 2000, to amend an approved 10 CFR 20.2002 (previously 10 CFR 20.302) application. The licensee requested NRC approval to allow the addition of slightly contaminated soil and soil/sand material to the list of already approved materials (i.e., septic waste and cooling tower silt) for on-site disposal. Based on our review, we find the proposed changes to be acceptable. The attachment to this memorandum provides our evaluation of the licensee's application.

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