

NRR 4

April 15, 2005

MEMORANDUM TO: Allen G. Howe, Chief  
 Project Directorate I-2  
 Division of Licensing Project Management  
 Office of Nuclear Reactor Regulation

FROM: Stephen P. Klementowicz, Team Leader /RA/  
 Health Physics Team  
 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 Health Physics Team has completed its review of the Vermont Yankee Nuclear Power Corporation application, dated October 4, 2004, as supplemented on January 17, 2005, to amend an approved 10 CFR 20.2002 application. The licensee requested NRC approval to increase the current allowed annual volume limit of 28.3 cubic meters of soil to a new annual volume limit of 150 cubic meters of soil, septic waste, cooling tower silt, and earthen material for on-site disposal. In addition, the licensee has requested a one time approval to dispose of approximately 528 cubic meters of existing accumulated backlog of soil/sand/earthen material.

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. MC5104.

Docket No. 50-271

Attachment: Safety Evaluation

CONTACT: Stephen Klementowicz, NRR/DIPM  
 (301) 415-1084

6/42

April 15, 2005

MEMORANDUM TO: Allen G. Howe, Chief  
Project Directorate I-2  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

FROM: Stephen P. Klementowicz, Team Leader  
Health Physics Team  
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 Health Physics Team has completed its review of the Vermont Yankee Nuclear Power Corporation application, dated October 4, 2004, as supplemented on January 17, 2005, to amend an approved 10 CFR 20.2002 application. The licensee requested NRC approval to increase the current allowed annual volume limit of 28.3 cubic meters of soil to a new annual volume limit of 150 cubic meters of soil, septic waste, cooling tower silt, and earthen material for on-site disposal. In addition, the licensee has requested a one time approval to dispose of approximately 528 cubic meters of existing accumulated backlog of soil/sand/earthen material.

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. MC5104.

Docket No. 50-271

Attachment: Safety Evaluation

CONTACT: Stephen Klementowicz, NRR/DIPM  
(301) 415-1084

Accession Number: ML051040526

OFFICE	NRR/DIPM/IPSB		
NAME	SKlementowicz		
DATE	4/15/05	/ /05	/ /05

OFFICIAL RECORD COPY

SAFETY EVALUATION BY THE HEALTH PHYSICS TEAM

OFFICE OF NUCLEAR REACTOR REGULATION

VERMONT YANKEE NUCLEAR STATION

DOCKET NO. 50-271

**1.0 Introduction**

By letter dated, dated October 4, 2004, as supplemented on January 17, 2005, Entergy Nuclear Operations, Inc. (the licensee) requested an amendment to a previously approved 10 CFR 20.2002 application (ML010850353). The licensee requested NRC approval to increase the current allowed annual volume limit of 28.3 cubic meters of soil to a new annual volume limit of 150 cubic meters of soil, septic waste, cooling tower silt, and earthen material for on-site disposal until the end of the plant's operating license in 2013. In addition, the licensee has requested a one time approval to dispose of approximately 528 cubic meters of existing accumulated backlog of soil/sand/earthen material for on-site disposal.

**2.0 Regulatory Evaluation**

NRC regulation 20.2002, Method for obtaining approval of proposed disposal procedures, requires a licensee to obtain NRC approval for disposal of licensed radioactive material in a manner not otherwise authorized in the regulations. The licensee must provide a description of the waste, including the physical and chemical properties important to the risk evaluation, and the proposed manner and conditions of the waste disposal, including the disposal site, potentially affected facilities, and maintain doses as low as reasonably achievable (ALARA). The staff finds that the licensee provided adequate information, pursuant to 20.2002, to support its application.

**3.0 Technical Evaluation**

The licensee performed an evaluation based on the increased annual volume limit of 150 cubic meters of soil, septic waste, cooling tower silt, and earthen material for on-site disposal until the end of the plant's operating license in 2013 and the one time disposal of approximately 528 cubic meters of accumulated soil/sand/earthen material.

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 waste material. The dose models are based on the guidance in U.S. NRC Regulatory Guide 1.109, Revision 1 (1977).

The licensee will dispose of the soil/sand/earthen material using a land spreading technique consistent with the current commitments for on-site disposal of septic waste and cooling tower silt previously approved by the NRC. The licensee will continue to use designated areas of their property approved for this waste material. 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 applications.

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 of land on which the material was applied.
5. Dose calculations or maximum allowable accumulated activity determinations required to demonstrate that the dose values 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 will 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 will be less than 5 mrem.
3. Disposal operations will be at an approved on-site location.

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.

#### **4.0 Conclusion**

The staff finds the licensee's proposal to amend their previously approved application (ML010850353) to dispose of increased amounts of soil, septic waste, cooling tower silt, and earthen material which contains very low levels of licensed radioactive material, pursuant to 10 CFR 20.2002, in the same manner, location, and within the bounding dose conditions as previously approved by the NRC, to be acceptable.