July 19, 2005

Mr. Michael Kansler
President
Entergy Nuclear Operations, Inc.
440 Hamilton Avenue
White Plains, NY 10601

SUBJECT: SAFETY EVALUATION OF REQUEST TO AMEND PREVIOUS APPROVALS GRANTED PURSUANT TO 10 CFR 20.2002 - VERMONT YANKEE NUCLEAR POWER STATION (TAC NO. MC5104)

Dear Mr. Kansler:

By letter dated October 4, 2004, as supplemented on January 17, 2005, Entergy Nuclear Operations, Inc. (Entergy) submitted a request to the Nuclear Regulatory Commission (NRC) to modify previous approvals granted pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Section 20.2002 (previously 10 CFR 20.302(a)), for on-site disposal of slightly contaminated material at Vermont Yankee Nuclear Power Station. Specifically, Entergy requested an increase of the current approved annual volume limit of 28.3 cubic meters of soil/sand to a new annual volume limit of 150 cubic meters of soil/sand. In addition, Entergy has requested a one-time approval for on-site disposal of the current backlog inventory of approximately 528 cubic meters of soil/sand.

The NRC staff has completed its review of the request and has determined that the proposed changes are acceptable as documented in the enclosed Safety Evaluation.

Pursuant to the provisions of 10 CFR Part 51, the NRC has published an Environmental Assessment and Finding of No Significant Impact in the Federal Register on July 19, 2005 (70 FR 41440).

Sincerely,

/RA/

Richard B. Ennis, Senior Project Manager, Section 2
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-271

Enclosure: As stated

cc w/encl: See next page

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Vermont Yankee Nuclear Power Station

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

ENTERGY NUCLEAR OPERATIONS, INC.

VERMONT YANKEE NUCLEAR POWER STATION

DOCKET NO. 50-271

1.0 INTRODUCTION

By letter dated October 4, 2004, as supplemented on January 17, 2005, Entergy Nuclear Operations, Inc. (Entergy or the licensee) submitted a request to the Nuclear Regulatory Commission (NRC) to modify previous approvals granted pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Section 20.2002 (previously 10 CFR 20.302(a)), for on-site disposal of slightly contaminated material at Vermont Yankee Nuclear Power Station (VYNPS). Specifically, Entergy requested an increase of the current approved annual volume limit of 28.3 cubic meters of soil/sand to a new annual volume limit of 150 cubic meters of soil/sand. In addition, Entergy has requested a one-time approval for on-site disposal of the current backlog inventory of approximately 528 cubic meters of soil/sand.

2.0 REGULATORY EVALUATION

As described in 10 CFR 20.2002, "Method for obtaining approval of proposed disposal procedures," licensees are required to obtain NRC approval of proposed procedures, not otherwise authorized in the regulations, to dispose of licensed material generated in the licensee's activities.

Previous NRC approval for VYNPS on-site disposal of various slightly contaminated waste materials is documented in letters dated August 30, 1989, March 4, 1996, June 18, 1997, June 15, 2000, and June 26, 2001. Based on these previous approvals, the licensee is currently authorized to dispose, in designated on-site areas, the following materials: (1) septic waste; (2) cooling tower silt; (3) soil/sand generated from the annual winter spreading on roads and walkways; and (4) soil resulting from on-site construction-related activities. Disposal of septic waste and cooling tower silt material is not limited by an annual volume, but by a total dose impact related to the radiological content of the material and the concentration of radioactivity contained within it. The combination of the soil/sand generated from the annual winter spreading on roads and walkways and the soil resulting from on-site construction-related activities is currently subject to an annual volume limit of 28.3 cubic meters. The licensee's application dated October 4, 2004, proposed to increase this annual volume limit for the same materials (i.e., soil/sand) to 150 cubic meters. In addition, the application proposed a one-time disposal of the current backlog inventory of approximately 528 cubic meters of soil/sand.

The current restrictions on the annual volume of slightly contaminated soil/sand that can be disposed on-site coupled with several plant facility projects in recent years, has resulted in the

accumulation of a backlog of low-level contaminated earthen material that is awaiting disposal by land spreading on previously-approved on-site disposal areas. The current approved annual volume limit of 28.3 cubic meters of soil/sand for disposal was based on licensee estimates of soil and sand collected from road and walkway sweepings inside the Protected Area following each year's winter cleanup (i.e., current annual limit does not account for future site excavation and construction activities).

3.0 TECHNICAL EVALUATION

The licensee proposes to dispose of the current backlog inventory of soil/sand and the future soil/sand material using a land spreading technique consistent with the current commitments for on-site disposal of slightly contaminated material previously approved by the NRC. The licensee will continue to use designated areas of its 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;

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; and

5. dose calculations or maximum allowable accumulated activity determinations required to demonstrate that the dose values have not been exceeded.

The licensee's application states that the existing NRC-approved bounding dose conditions for the proposed on-site disposals will continue to be applied without change. 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 millirem (mrem) (during the period the licensee has active control over the disposal sites, i.e., during the current operating license period);

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 (following the period the licensee has active control over the disposal sites); and

3. disposal operations will be at an approved on-site location.

To ensure that the addition of new waste material will not exceed the bounding dose conditions for each new spreading operation, the licensee's total radioactivity and dose calculation will include all past disposals of septic waste, cooling tower silt, soil and soil/sand material on the

designated disposal plots. 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.

VYNPS is currently authorized to dispose of licensed material, pursuant to 10 CFR 20.2002, in two designated locations both within the site boundary security fence. The South field (approximately 1.9 acres in size) is centered approximately 1500 feet south of the reactor building. The North field (approximately 10 acres in size) is centered approximately 2000 feet northwest of the reactor building. The South field has been the only field utilized for disposal of licensed material to date. The licensee's application states that it is anticipated that future disposal operations will also use the South field since sufficient margin in comparison to the approved dose limit criteria still exists for anticipated waste disposal of the existing backlog of material now in storage, plus all expected future disposals of material, assuming the same observed generation rates.

The licensee performed an evaluation of the radiological impact of all past, accumulated storage inventory, and projected future waste spreading operations on the South field. 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 Regulatory Guide 1.109, Revision 1.

Table 26 in the attachment to the licensee's October 4, 2004, application provides the calculated maximum organ and whole-body doses, at the end of the current plant license period, based on the combination of all past disposal of waste materials, disposal of the current backlog inventory of waste material and projected annual disposal of waste materials. The results are summarized as follows:

	Individual Organ Dose (mrem/year)	Individual Whole Body Dose (mrem/year)	Intruder Organ Dose (mrem/year)	Intruder Whole Body Dose (mrem/year)
Total Dose	0.253	0.074	1.05	0.468
Dose Limit	1	1	5	5
% of Dose Limit	25.3%	7.4%	21.1%	9.4%

Based on the above calculated dose rates, the NRC staff concludes that the proposed increase of the current approved annual volume limit of 28.3 cubic meters of soil/sand to a new annual volume limit of 150 cubic meters of soil/sand and a one-time approval for on-site disposal of the current backlog inventory of approximately 528 cubic meters of soil/sand would result in dose rates within the bounding dose conditions for on-site disposal previously approved by the NRC.

4.0 CONCLUSION

The NRC staff finds the licensee's request for disposal of a new annual volume limit of 150 cubic meters of soil/sand and a one-time approval for on-site disposal of the current backlog inventory of approximately 528 cubic meters of soil/sand, 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.

Principal Contributors: S. Klementowicz
R. Ennis

Date: July 19, 2005