

March 10,2006

Alice C. Carson
Licensing Manager
Yankee Atomic Electric Company
49 Yankee Road
Rowe, MA 01367

SUBJECT: APPROVAL OF REVISED DISPOSAL PROCEDURES IN ACCORDANCE WITH
10 CFR PART 20.2002

Dear Mr. Rollins:

By letter dated June 6, 2005, as supplemented by letter dated October 31, 2005, Yankee Atomic Electric Company (YAEC, or the licensee) requested U.S. Nuclear Regulatory Commission (NRC) approval of disposal procedures which would allow the continued use of concrete blocks containing radioactive materials as a retaining wall at an off-site location in Vermont. The request for approval is submitted pursuant to 10 CFR Part 20.2002, "Method of Obtaining Approval of Proposed Disposal Procedures". We have completed our review of your request and have enclosed our safety evaluation. We determined that your proposed disposal of concrete blocks by retention as a retaining wall on private property in Readsboro, VT, is acceptable.

In accordance with 10 CFR Part 30.11, ". . . the Commission may, upon application by an interested person or upon its own initiative, grant such exemptions from the requirements of the regulations . . . as it determines are authorized by law and will not endanger life or property or the common defense and security and are otherwise in the public interest." To the extent that the material authorized for disposal in this Part 20.2002 authorization is otherwise licensable, the NRC concludes that the site authorized for disposal of this material is exempt from further Atomic Energy Act and NRC licensing requirements. The enclosed safety evaluation report concludes that the exemption is authorized by law and will not endanger life or property or the common defense and security and is otherwise in the public interest. The NRC also evaluated the environmental impacts of the disposal procedures and the exemption and determined that granting this authorization and exemption would not result in any significant impacts. For this action, an Environmental Assessment and Finding of No Significant Impact was prepared and published in the Federal Register (71 FR 12220).

A. Carson

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Accordingly, pursuant to 10 CFR Part 30.11, the exemption is granted and effective immediately.

If you have any questions regarding this matter, do not hesitate to contact John Hickman, of my staff, by phone at (301) 415-3017, or by e-mail at jbh@nrc.gov.

Sincerely,

/RA/

Daniel M. Gillen, Deputy Director
Decommissioning Directorate
Division of Waste Management
and Environmental Protection
Office of Nuclear Material Safety
and Safeguards

Docket No.: 50-029

Enclosure:
Safety Evaluation Report

cc w/encls: Yankee Service List

Ms. Carla A. White
Vermont Department of Health
108 Cherry St.
P.O. Box 70 Burlington, VT 05402

A. Carson

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Ms. Carla A. White
Vermont Department of Health
108 Cherry St.
P.O. Box 70 Burlington, VT 05402

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OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS

SAFETY EVALUATION

RELATED TO A REQUEST TO AUTHORIZE DISPOSAL PURSUANT TO

10 CFR PART 20.2002

YANKEE ATOMIC ELECTRIC COMPANY

YANKEE NUCLEAR POWER STATION

DOCKET NO.: 50-029

1.0 BACKGROUND

By letter dated June 6, 2005, as supplemented by letter dated October 31, 2005, Yankee Atomic Electric Company (YAEC, the licensee) requested U.S. Nuclear Regulatory Commission (NRC) approval of disposal procedures which would allow the continued use of concrete blocks containing radioactive materials as a retaining wall at an off-site location in Vermont. The request for approval is submitted pursuant to 10 CFR Part 20.2002, "Method of Obtaining Approval of Proposed Disposal Procedures." The proposed disposal would exempt the disposal site from Atomic Energy Act (AEA) and NRC licensing requirements for possession of the radioactive materials contained in the retaining wall.

During 1999, concrete shield blocks from within the reactor support structure (RSS) that had been removed, sand blasted, and surveyed were released from radiological controls. Forty (40) of the shield blocks from the steam generator cubicles were removed from the site under an approved Massachusetts Department of Environmental Protection Beneficial Use Determination (BUD) and used to construct a retaining wall at a private residence in Vermont. The remainder of the blocks approved under the BUD were used for various purposes, both inside and outside of the industrial area of the Yankee Rowe site. No additional concrete blocks approved under the BUD have been, or will be, released from the Yankee Rowe site.

At the time of the shield block release, analyses of the radionuclide content of concrete within the reactor support structure indicated values less than the minimum detectable activity. Based on these results and surface contamination surveys, the shield blocks were determined to be free of detectable licensed radioactive material. These analyses were performed to the specified levels for 10 CFR Part 61 waste classification requirements.

In 2004, as part of preparation for demolition and plans to retain RSS concrete on-site, further volumetric sampling and analysis of radionuclides were performed. A lower limit of detection of 10 picocuries (pCi) per gram (g) for H-3 was established for the additional volumetric sampling, based upon the concrete derived concentration guideline limits and the requirements of the License Termination Plan (LTP). This analysis identified the presence of H-3 in essentially all concrete within the RSS. Levels of H-3 from samples taken in the proximity of the former location of the steam generator shield blocks indicated H-3 levels averaging approximately 200 pCi/g.

Enclosure

Subsequently, based upon the results of samples of RSS concrete, samples from the released shield blocks in Readsboro were analyzed for the suite of radionuclides listed in the LTP, using detection limits consistent with the requirements of the LTP. The results indicated only detectable levels of H-3 and C-14.

2.0 TECHNICAL EVALUATION

2.1 SOURCE TERM

The licensee has provided data associated with recent characterization efforts for the concrete which remains onsite as well as the concrete which is proposed to remain offsite, spanning the period of October 2004, to September 2005. The results of analyses of the concrete indicate detectable levels of contamination for only H-3 and C-14, in the quantities described as follows:

Concentrations of H-3 in RSS concrete ranged from no detectable to approximately 432 pCi/g, with an average concentration for the detectable samples of 89.5 pCi/g.

Concentrations of H-3 in the Readsboro block concrete ranged from no detectable to approximately 95.6 pCi/g, with an average concentration for the detectable samples of 38.5 pCi/g.

Concentrations of C-14 in the RSS concrete ranged from no detectable to 170 pCi/g, with an average of 13.9 pCi/g.

Concentrations of C-14 in the Readsboro block concrete ranged from no detectable to approximately 606 pCi/g, with an average of 162 pCi/g.

At the request of NRC Region I staff, the Environmental Survey and Site Assessment Program of the Oak Ridge Institute for Science and Education performed liquid scintillation analysis of two concrete samples from the site. The analysis did not find radionuclides other than H-3 and C-14 in concentrations greater than the minimum detectable concentrations. The H-3 concentration averaged 23.9 ± 4.1 pCi/g, and the C-14 concentration averaged 63.1 ± 3.2 pCi/g. Based on these confirmatory measurements, the staff determined the radionuclide concentrations as measured by the licensee to be reasonable and appropriate for the material.

2.2 DOSE ANALYSIS

To demonstrate that it will meet a "few millirem" per year criteria, YAEC calculated the dose to members of the public using approved derived concentration guideline levels (DCGLs) for subsurface partial structures from the Yankee LTP. The calculation associated with this DCGL assumes that the contaminants move out of the concrete into the groundwater, and the dose is incurred by subsequent use of this groundwater. For the purposes of calculating an associated dose, the licensee used the higher average value of the average concentration for H-3 and C-14 (either from the RSS samples or the Readsboro samples), specifically 89.5 pCi/g for H-3 and 162 pCi/g for C-14.

The licensee proposed that the subsurface partial structure DCGL was conservative for use in assessing the Vermont blocks for the following reasons:

- * The calculation assumes a form of concrete (monoliths) and contamination similar to that found in the area in question.
- * The amount of contaminated concrete assumed to exist in the calculation bounds the amount contained in the blocks in Vermont.
- * The DCGL is based on an assumption that the subject person's entire diet (fruits, vegetables, grains, meat, fish, and milk) has been grown in the affected area, an activity which cannot be accomplished on the available area in question.
- * Due to the height of the wall in relation to the stream, water flow would be towards the adjacent stream. No wells currently exist on the property where the blocks are located and none can be drilled between the blocks and the stream.

Using this methodology the licensee calculated doses of 0.331 mrem/yr for H-3 and 0.035 mrem/yr for C-14, with a combined dose of 0.366 mrem/yr.

With the material already in place and intended to remain, the only scenario that needs to be considered is potential dose to a member of the public. Therefore, the staff finds this scenario to be adequate and reasonable for the assessments required for compliance with 10 CFR Part 20.2002.

The licensee used the higher average value of the average concentration for H-3 and C-14 either from the RSS samples or the Readsboro samples as the source term for the dose calculation. These values are comparable to the values measured by the staff's contractor analysis and are appropriate for the scenarios being modeled. Therefore, the staff finds that the source term chosen by the licensee is adequately conservative for the analysis.

The DCGLs used by the licensee for the dose assessment were previously reviewed and approved by the staff as part of the LTP review, as documented in safety evaluation associated with Amendment No. 158 to the Yankee Nuclear Power Station license, issued on July 28, 2005. The staff has reviewed the licensee's application of the DCGLs to this situation and agrees that the analysis would be conservative and bounding. Therefore, the staff finds the use of the previously approved DCGLs for this dose assessment to be acceptable.

No sensitivity or uncertainty calculations were performed by the licensee. These are not needed if the analyses are reasonably bounding as they are in this case.

3.0 CONCLUSIONS

The staff's review finds the licensee's proposal to be adequate and reasonable to demonstrate that the dose will be below the NRC policy limit of "a few mrem." The licensee used an appropriate scenario and analysis methodology to bound the exposure. Therefore, we have determined that the proposed disposal of concrete blocks by retention as a retaining wall on private property in Readsboro, VT, is acceptable.

Further, in accordance with 10 CFR Part 30.11, "the Commission may, upon application by an

interested person or upon its own initiative, grant such exemptions from the requirements of the regulations. . .as it determines are authorized by law and will not endanger life or property or the common defense and security and are otherwise in the public interest." Based on the above analyses, this material authorized for disposal poses no danger to public health and safety, does not involve information or activities that could potentially impact the common defense and security of the United States, and it is in the public interest not to remove the concrete blocks containing the radioactive material. Therefore, to the extent that this material authorized for disposal in this Part 20.2002 authorization is otherwise licensable, the staff concludes that the site authorized for disposal is exempt from further AEA and NRC licensing requirements.

Docket No.: 050-029
License No.: DPR-003

Principal Contributor: John B. Hickman

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301-415-3017

