YANKEE ATOMIC ELECTRIC COMPANY

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October 31, 2005
BYR 2005-093

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D C 20555

References: (1) License No. DPR-3 (Docket 50-29)
(2) BYR 2005-037, "Request for Approval of Proposed Procedures in Accordance with 10 CFR 20.2002."

Subject: Request for Approval of Revised Proposed Procedures in Accordance with 10 CFR 20.2002

Yankee Atomic Electric Company (YAEC) herewith requests NRC approval of the proposed continued use of concrete blocks, containing very low concentrations of H-3 and C-14, as a retaining wall at an off-site location in accordance with the provisions of 10 CFR 20.2002. This submittal supersedes the previous request submitted as Reference 2, based upon additional information gathered since that submittal.

Attachment 1 is a description of the retaining walls containing licensed material (H-3 and C-14). This description includes the radiological and physical properties identified as being important to the risk evaluation to allow the shield blocks to remain in place. In addition, YAEC has performed a radiological assessment of the shield blocks and determined that allowing the shield blocks to remain in place results in essentially no dose to members of the public.

Should you have any questions regarding this submittal, please contact the undersigned at (301) 916-3995.

Sincerely,

YANKEE ATOMIC ELECTRIC COMPANY

Alice C. Carson
Licensing Manager

NMSS01

Attachments:

(1) Description of Retaining Wall Constructed from Reactor Support Structure Shield Blocks Containing H-3 and C-14
(2) Pictures of the Retaining Wall

cc: S. Collins, NRC Region I Administrator
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Docket No. 50-29
BYR 2005-093

Attachment 1

Yankee Nuclear Power Station

Description of Retaining Wall Constructed from Concrete Shield Blocks Containing H-3 & C-14

Yankee Nuclear Power Station
Description of Retaining Wall Constructed from
Concrete Shield Blocks Containing H-3 & C-14

1.0 INTRODUCTION

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 site under an approved MADEP 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 was 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 pCi/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 per gram.

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, albeit in small quantities.

Due to the presence of the low levels of H-3 and C-14 in the concrete shield blocks and the inherent personnel safety risks in removal of the retaining wall, a specific exemption to allow the shield blocks to remain in place is being requested under 10CFR20.2002.

2.0 WALL DESCRIPTION

The retaining wall was built by the property owner atop a previously poured concrete retaining wall, approximately 8 feet high along a stream. It consists of 35 interlocking

blocks stacked 2 high with a nominal length of 250 feet. Gravel and soil have been back filled to the top of new retaining wall. To preclude a fall hazard, the property owner added a chain link fence along the top of the wall. Thus, the majority of the surfaces of the blocks (all but a 1.5' wide strip at the top) in the wall are inaccessible.

Five (5) other blocks were used for general retaining walls, two at the far end of the retaining wall, two on one side of the property's building structure and one on the opposite side of the structure. The blocks near the building structure have the greatest accessibility.

The 40 blocks used at the off-site location varied from approximately 5 feet to over 10 feet in length, 2 feet to 3 feet thick, and 3 feet high. The total weight of these blocks is 259 tons or 2.35E+8 grams. In addition, there were four (4) smaller blocks which were used as weights for crane testing and (1) concrete slab from the Turbine Building, which were released and also sent to this off-site location. However, these (5) concrete blocks are not included in this request for alternate disposal, because of the lack of detectable contamination in these blocks.

3.0 RADIOLOGICAL CHARACTERIZATION OF BLOCKS

The data associated with recent characterization efforts for the onsite and offsite concrete, spanning the period of October 2004 to September 2005, were compiled and evaluated. 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.

A soil sample was taken at the base of one block, and no H-3 or C-14 was detected in the sample.

4.0 RADIOLOGICAL ASSESSMENTS

The dose to members of the public was calculated using approved derived concentration guideline levels (DCGLs) for subsurface partial structures from the License Termination

Plan (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. The subsurface partial structure DCGL is 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.

For the purposes of calculating an associated dose, the higher average value of the average concentration for H-3 and C-14 (either from the RSS samples or the Readsboro samples) was used, that is 89.5 pCi/g for H-3 and 162 pCi/g for C-14.

Radionuclide	Subsurface Structure DCGL Representing 0.5 mrem/y (pCi/g)	Maximum Average Concentration (pCi/g)	Dose (mrem/yr)
H-3	1.35E+02	8.95E+01	3.31E-01
C-14	2.34E+03	1.62E+02	3.46E-02
		Total (mrem/yr)	3.66E-01

As can be seen in the previous table, the total dose due to the H-3 and C-14 contamination in the blocks in Readsboro VT is conservatively estimated to be less than one mrem/yr.

5.0 CONCLUSIONS

Based upon the small estimated dose to the public, the non-radiological safety risks associated with removing and returning the shield blocks back to the Yankee Rowe site, and the preference of the property owner to keep the wall intact, the shield blocks should be allowed to remain in place. Exposures to members of the public, associated with the H-3 and C-14 contained in the shield blocks, has been conservatively estimated to be less than one (1) mrem/yr.

Attachment 2

Pictures of the Retaining Wall

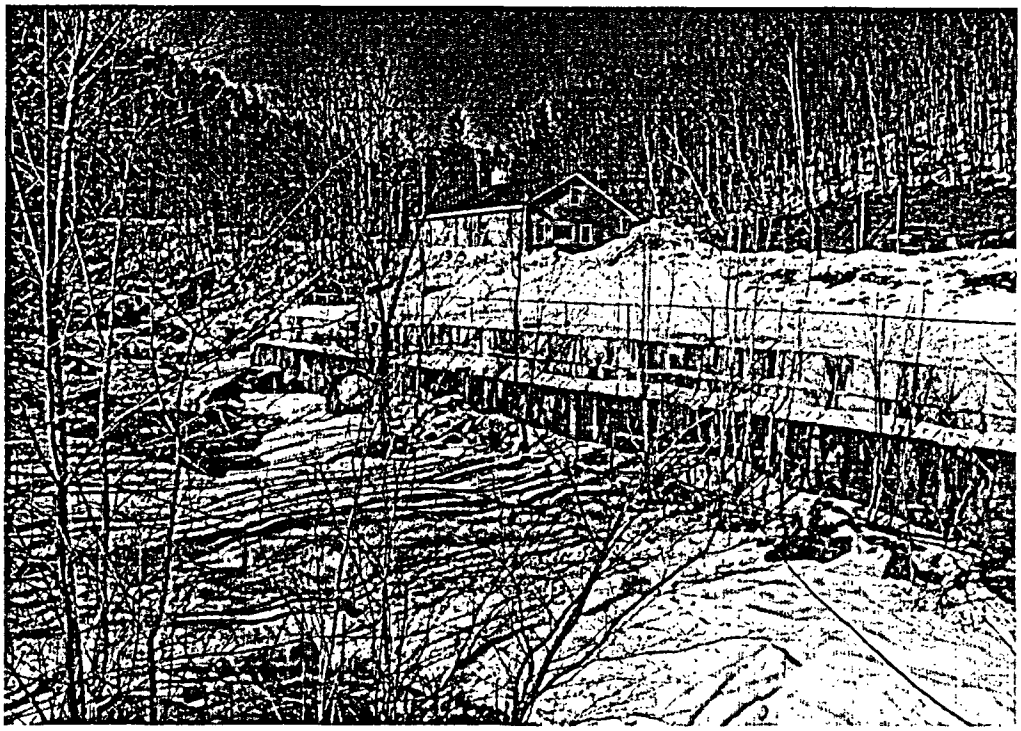

Figure 1 - View of retaining wall

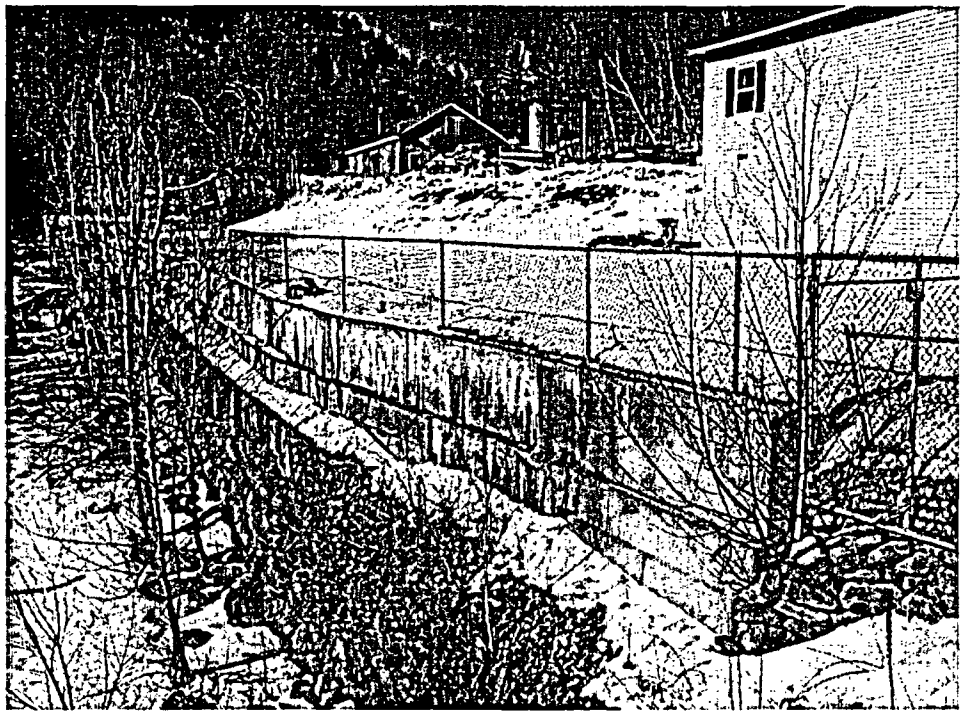

Figure 2 - Close up of retaining wall

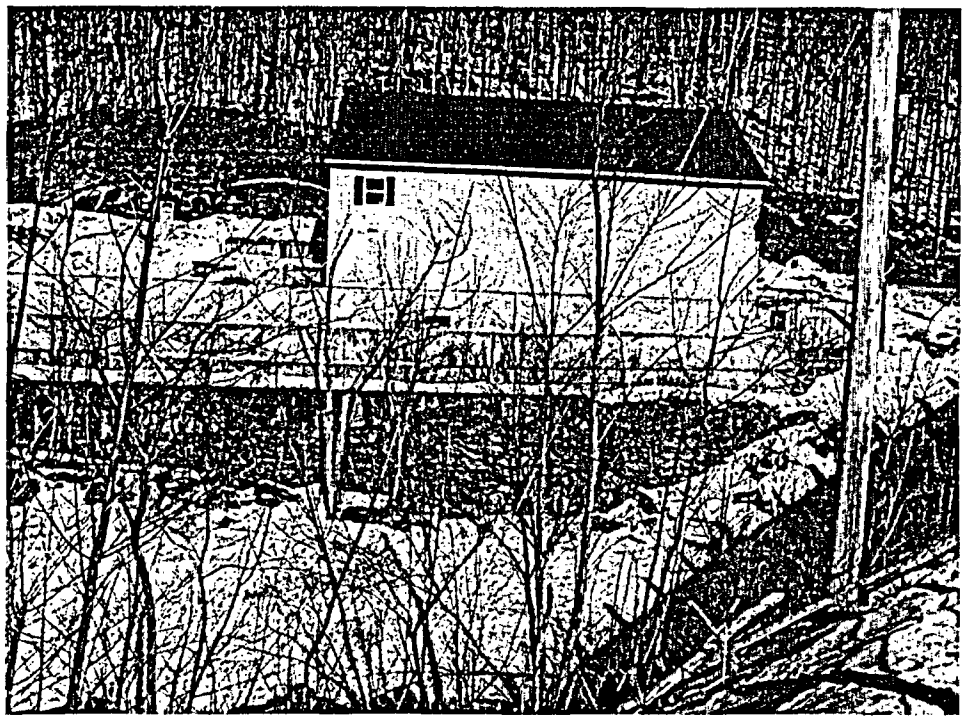

Figure 3 - Owner's structure adjacent to retaining wall, two blocks visible at left of structure

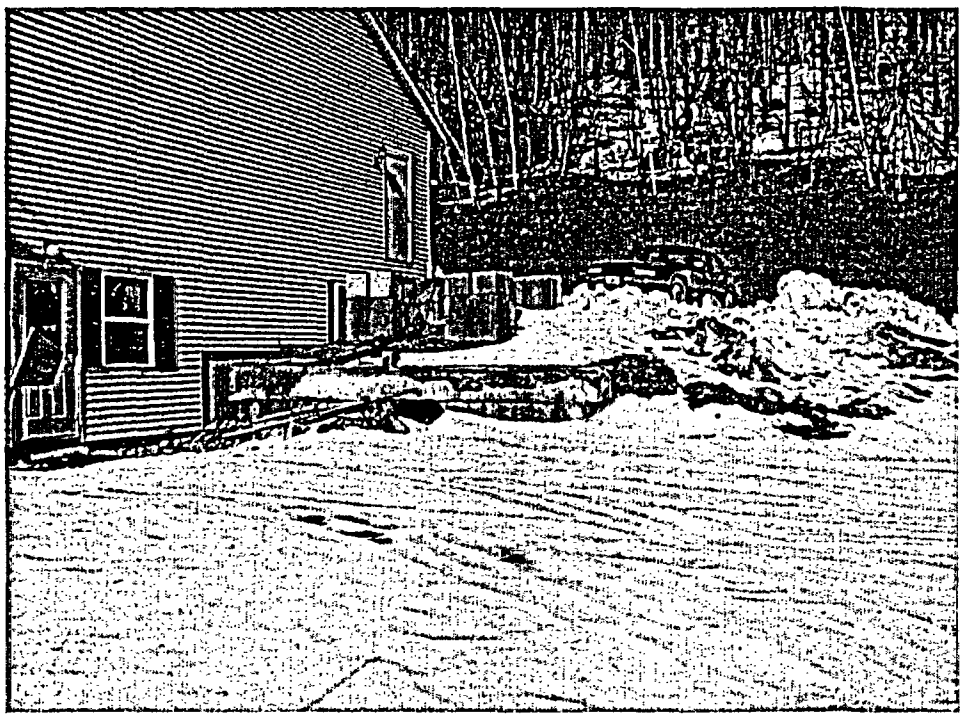

Figure 4 - Single block used at right of structure (lower wall portion)

Figure 5 - Closer view of two blocks by side of structure