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MEMORANDUM FOR: Joseph O. Bunting, Chief
Policy and Program Control Branch
Division of Waste Management

FROM: Lake H. Barrett, Chief
Engineering Branch
Division of Waste Management

SUBJECT: COMMENTS ON DOE DRAFT DOCUMENT ENTITLED "AN EVALUATION OF
COMMERCIAL REPOSITORY CAPACITY FOR THE DISPOSAL OF DEFENSE
HIGH LEVEL WASTE"

Enclosed as per your request of August 17, 1984 is the Engineering Branches'
comments on the document "An Evaluation of Commercial Repository Capacity for
the Disposal of Defense High-Level Waste."

Lake H. Barrett, Chief
Engineering Branch
Division of Waste Management

Enclosure:
As stated

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Comments on:

"An Evaluation of Commercial Repository Capacity for the Disposal of Defense High-Level Waste"

1) Section 2.2, P 2-5

It is mentioned that in an augmented repository, Defense High Level Waste, Commercial High Level Waste, Remote Handled Commercial TRU Waste, and Commercial spent fuel will be placed into boreholes drilled into the floor of the geologic repository rooms. Also contact handled commercial TRU will be placed on the floor of the rooms. The characteristics of these various waste packages, shown in Table 1-2, shows that the canisters are of various weights and sizes.

- a) What consideration was made in this study for the retrieval of waste packages as stated in 10 CFR 60.111?
- b) What considerations were made in the study for the effects on costs of using different size canisters (e.g. the need for different transport equipment for different wastes, different size vertical borehole may necessitate different types of drills, waste handling logistical problem, etc.)?
- c) How will rooms containing contact handled TRU on the floors be backfilled and sealed at permanent closure?

2) Section 2.3.1, Page 2-12, Table 2-1

The costs for shafts for Augmented repository are incorrect. It seems that the numbers in line 6 and 7 should be switched.

3) Section 2.3.1, Page 2-7, Geologic Media

"Basalt, granite, and tuff are considered hard rock media. Sites comprised of these geologic media are currently being considered for nomination for site characterization. Information about tuff was used as a surrogate for the high end of repository estimates."

Basalt should be chosen as a surrogate for the high end of repository cost estimates (based on cost estimates for different geologic media in the DOE Mission Plan) .

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4) Section 2.3.1, Pages 2-12 and 2-13, Tables 2-1 and 2-2

There is an inconsistency in some major cost estimates for salt and hard rock repositories. The capital costs for shafts in hard rock (for all options) should be higher than the cost for shafts in salt (based on experience in mining industry and with WIPP project). The costs of underground workings/rock handling are shown higher for hard rock than for salt which is correct.

5) Section 2.3.2.1, P 2-25

"Although the heat output of the reference commercial waste package assumed in this study is greater than that of the defense waste package, the repository design can be developed so that containment performance of both packages remains acceptable"

If the spacing of waste packages is changed for DHLW to provide the same areal heating load as commercial spent fuel, what effect will the spacing have on the stability of openings to maintain the retrievability option?

6) Section 2.3, P 2-37 Paragraph 2

"A summary of those sections of 10 CFR 60 most pertinent to comparing the two disposal options in assuring compliance with the proposed standard is presented in Table 2-12".

The performance objective 10 CFR 60.111 (retrievability) should be considered as part of the analysis of the two disposal options as well as 10 CFR 60.112, "Overall system performance objective for the geologic repository after permanent closure".

7) Section 2.3.3, P 2-47, Paragraph 2

10 CFR 60.102 (e)(1) is misquoted, it should read ... "When radiation and thermal levels are high and uncertainties in assessing repository performance are large".

8) Section 3.3.1, Page 3-6, Table 3-1

The capital costs for shafts in hard rock should be higher than the costs for shafts in salt. (compare with costs for underground workings/rock handling). See comment No. 4 above.

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Section 2.3.1

- 9) The cost of overpacks for Defense High Level Waste Packages is estimated to be higher in a defense-only repository than in a commercial geologic repository (Tables 2-1, 2-2, 3-1, 3-2).

The reason for the higher estimated cost should be given because the temperature of the overpack should be lower in the defense-only repository. The service conditions, therefore, are less severe and the cost of the overpack should be no higher than for the commercial repository.

- A) Calculation for Computing Estimated Costs of overpacks in DOE/DP-0020

Table 3-2 SUMMARY OF COSTS FOR DISPOSAL OF DEFENSE HIGH-LEVEL WASTE IN A DEFENSE ONLY REPOSITORY UNDER VARIOUS OPTIONS

The cost of overpacks are $\frac{(810 \times 10^6)}{20,000} = \$40,500$ in salt
 $\frac{(439 \times 10^6)}{20,000} = \$24,560$ hard rock

Table 2.1 Augmented Commercial Salt Repository Cost

Shows an increased cost for waste package components of (1287 - 574) \$713 million when overpacks are used. These include allowances for design engineering, project management and contingency.

Thus, the cost of overpacks for each of the 20,000 defense waste packages is

$$\frac{\$ 713 \times 10^6}{20,000} = 356.5 \times 10^2 = \$35,650$$

Table 2.2 Augmented Commercial Hard Rock Repository

Shows an increase of \$428 million when overpacks are used for the 20,000 Defense Waste Packages.

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Thus, the cost for each overpack is

$$\frac{\$428 \times 10^6}{20,000} = \$214 \times 10^2 = \$21,400$$

- 10) Page 2.25 lines 14-17 states that the containment life of defense waste packages without overpacks is assumed to be no greater for separate disposal than for co-disposal in a commercial waste repository.

This is a highly questionable assumption because the temperature is lower for separate disposal and containment life should be longer.

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Lake H. Barrett, Chief
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Enclosure:
As stated

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