Distribution:
WM File WM81
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APR 23 1985

WM81/TLJ/4/22/84/2

Mitsubishi International Corporation
655 15th Street, NW
Suite 860
Washington, DC 20005

ATTENTION Gordon Epstein

Dear Mr. Epstein:

Draft comments have been prepared on your topical report entitled, "High Integrity Container for Disposal of Low-Level Radioactive Wastes." These comments are being supplied to you at this time, for your information only. They have also been transmitted to the Office of State Programs (OSP), to be sent to the particpating Agreement States. According to the present procedures, the state authorities will have 45 days to review our draft comments. Following receipt of any comments received through OSP, they will be incorporated into an information request that you will receive via a letter of transmittal from our office.

As you will note, we have separated the comments on the non-proprietary document from those on the proprietary one. During the actual information request, we would appreciate your assistance in identifying the information in our questions that Chichibu truly considers to be proprietary.

If you have any questions, please contact me at (301) 427-4540.

Sincerely,

Original signed by

Thomas L. Jungling
Engineering Branch
Division of Waste Management

cc: LBHigginbotham
DNussbaumer, OSP
KSchneider, OSP

Enclosure:
As stated

WM Record File
WM Project 81
Docket No.
PDR
LPDR
Distribution:
(Return to WM, 623-SS)

8505170180 850423
PDR WASTE
WM-81 PDR

OFC	:WMEG	:WMEG	:	:	:	:	:
NAME	:TJungling:gh	:TCJohnson	:	:	:	:	:
DATE	:04/23/85	:04/23/85	:	:	:	:	:

COMMENTS ON CHICHIBU SFPIC HIC
(Non-Proprietary Version)
(Revised February 1985)

1. Chapter 2, page 4, paragraph 3.

The empty weights of the HICs are given as 157 kg for the 200 l and 324 kg for the 400 l. Do these figures include the weight of the steel drum?

2. Chapter 2, page 5, last line.

Chichibu has stated that the proposed HIC will be used for "ion exchange media, etc." For what specific wastes does Chichibu intend to qualify the HIC?

3. Chapter 3, page 11, paragraph 3.

The last sentence states that the impregnation with polymer is expected to extend the life of the concrete by a factor of three or more over normal concrete. What is the basis of this ascertion?

4. Chapter 3, page 12, paragraph 3.

Although the dimensional configuration of the steel drum is compatible with handling equipment, could a fully loaded SFPIC HIC exceed weight limitations for the equipment?

5. Chapter 3, page 13, last bullet.

Note that ASTM C39 is appropriate for compressive strength testing, but not for bending strength testing.

6. Chapter 3, page 14, 2nd bullet.

Could a placing pattern of 45% produce greater stresses and therefore a more critical configuration than the two patterns examined?

7. Chapter 5, page 20, paragraph 2.

If the epoxy resin is applied manually to the HIC excessive worker doses could result. Therefore the remote epoxy application equipment should be an integral component of the process system, both at the generator and the disposal site.

8. Chapter 6, page 23, paragraph 3. (Chemical Attack)

The compression strength result for the chemical attack test with 2% H_2SO_4 was 770 kg/cm^2. Although this strength is greater than the stress resulting from burial, it shows a significant decrease in strength from the initial values and is also below the 900kg/cm^2 conservative limit described on page 13.

Note that the 50 psi value recommended in the Technical Position on Waste Form applies to solidified wastes and is inappropriate as a design value for HICs.

9. Chapter 6, page 24, paragraph 2. (Mechanical Strength).

It is stated that, "...the Modulus of Elasticity and the Poisson's ratio indicate that the material has a low rate of deformation." Since these properties do not reflect time responses of materials, they should not be used to draw conclusions about strain rates.

10. Chapter 6, page 26, paragraph 1. (Creep Characteristics).

It is not clear from the discussion provided, as to how compressive strength and modulus of elasticity values are obtained from a creep test performed with a constant load.

11. Chapter 6, page 26, paragraph 3. (Fatigue Test).

The third sentence should be clarified. It is not clear what limit is used to obtain a load of between 12% and 80%. Is the limit value that of the compressive strength and if so, what is that value?

12. Chapter 6, page 27, paragraph 1. (Thermal Cycling).

Has consideration been given to the differences in the coefficients of thermal expansion between the carbon steel drum and the SFPIC? Could stresses build-up in the SFPIC (e.g., hoop stresses)?

13. Chapter 6, page 28. (Radiation Resistance)

The NRC limit of flammability is indicated in the discussion of gas generation. The reference for this limit should be stated. In addition, it is unclear how the gas generation rate at 100 days was obtained from Figure 6-2-b. The units of g-moles/ft^3 do not represent a generation

rate. Does this value correspond to the volume of PIC or total drum volume?

In the absence of a passive venting system, it is necessary to evaluate the gas pressure increase resulting from the contained waste in addition to that from the PIC material. That is, some wastes which may be proposed for disposal in the SFPIC HIC may generate substantial quantities of gas, which combined with the gas generated by the PIC material may, in 300 years, produce an internal pressure which exceeds the pressure reported in the leak tightness test, therefore, resulting in failure of the HIC.

14. Table 7-1, page 34, footnote.

It is unclear as to which Section 3 calculations are being references in the footnote.

15. Chapter 7, page 36, paragraph 2. (Free Drop Test).

The State of South Carolina (Barnwell site) has recently instituted a requirement for a free drop test similar to the State of Washington. (See attachment). The South Carolina test requires a drop at four orientations (full bottom, sides, bottom corner and top corner) only the last three have been performed. The full bottom and top orientation should also be tested, or justification should be presented to indicate that the previously performed tests are the more critical.

16. Chapter 7, page 37, 1st full paragraph

What was the basis for stating that the 400 l container appeared to have less resistance to the corner drop tests? It is suggested that minor word changes be made which explicitly indicate that the 34° drop angle corresponds to the center of gravity and that this represents the most conservative drop test.

17. Chapter 7, page 37, last paragraph.

Did the cracking of the SFPIC liner as a result of the drop testing penetrate the SFPIC liner? What were the sizes of these cracks? The water leak tests following drop testing should be explained in more detail.

18. Chapter 7, page 39, last paragraph.

What were the sizes of the cracks observed in the fire test? Did they penetrate the SFPIC liner?

19. Chapter 9, page 41, paragraph 1.

The intrusion of carbonic gases is mentioned as a possible degradation process for plain concrete. What is the origin of carbonic gases?

20. Chapter 9, page 45, BTP C.4.a.

A description of the dewatering system to include test results should be included.

21. Chapter 9, page 46, BTP C.4.b.

Chemical compatibility regarding wastes and the trench environment should be discussed. We suggest addressing the chemical compositions in trench sump liquids provided in NUREG/CR-1289 and NUREG/CR-3993.

22. Chapter 9, page 49, BTP C.4.k.

It states that the HIC lid can be filled with mortar after sealing to eliminate the accumulation of water. A procedure to accomplish this should be described in Chapter 5 or another appropriate location.

23. Chapter 9, page 50, BTP C.4.l.

The inspection procedure should be provided for our review.

24. Chapter 9, page 51, BTP C.4.n.

The quality assurance program should be provided for our review.

South Carolina Department of Health and Environmental Control

Enclosure 3

2600 Bull Street
Columbia, S.C. 29201

Commissioner
Robert S. Jackson, M.D.

July 18, 1984

Mrs. Kathleen Schneider
State Agreements Program
Office of State Programs
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mrs. Schneider:

This is in reference to your recent telephone conversation with Mr. Virgil Autry concerning your request for the Department's requirements for prototype drop tests of high integrity containers.

Please be advised that the following general criteria is acceptable to satisfy drop tests requirements.

1. The prototype high integrity containers shall be filled with dewatered resins or a media with an equivalent density such as wet sand.

2. A series of drops shall be made from a height of 20-25ft. onto a surface of compacted clay or its equivalent.

3. The series of tests shall consist of a drop on the full bottom, sides, bottom corner, and top corner of a container. The applicant has the option to use the same container or four separate containers.

4. The container(s) shall retain all its contents. Minor deformation of the container due to the drop impact is acceptable as long as its integrity is maintained.

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Other specific drop tests may be required depending on the container material (i.e. fiberglass). These requirements will be specified on a case-by-case basis during our review and approval process unless the NRC has required the applicant to evaluate potential failures of the materials.

Should you have any questions, please do not hesitate to contact Mr. Autry.

Very truly yours,

Heyward G. Shealy

Heyward G. Shealy, Chief
Bureau of Radiological Health

HGS:kn