

A. N. SHINPOCH

Secretary



Schnuder

STATE OF WASHINGTON

DEPARTMENT OF SOCIAL AND HEALTH SERVICES

Olympia, Washington 98504-0095

October 3, 1985

Donald A. Nussbaumer
Assistant Director for State Agreement Programs
Office of State Programs
U. S. Nuclear Regulatory Commission
Washington, DC 20555

Dear Mr. Nussbaumer:

In your letter dated May 6, 1985, you requested our comments on the Topical Report entitled: "High Integrity Container for Disposal of Low-level Radioactive Wastes", submitted by Chichibu Cement Company, LTD. We have reviewed the topical report against criteria established for stabilization of radioactive waste as outlined in the NRC Branch Technical Position (BTP). After completing our review of this report, we are in concurrence with all comments generated by your staff.

While reviewing the data presented in the topical report, we had specific concerns with the lack of test results addressing the guidance on HIC's provided in the BTP. This report, more than any other, contained unsubstantiated information which was not appropriate for meaningful review. The discrepancy between the NRC version and our version can only allow us to guess what information which was provided to NRC. The department requests a non-proprietary version of the report which contains test data and analyses specific to the requirements of the BTP as well as addresses the concerns of the NRC.

It appears that additional information is needed on chemical compatibility between waste streams, packages, and burial environments, especially with regard to the steel reinforcing fibers' ability to maintain structural integrity over 300 years. Will the package be suitable for wastes other than those generated by power plants? What is the ability of the epoxy sealant to retain the lid if the package is buried in other than an upright position? Will a vent be required by NRC? Will the package be suitable for Class B/C concentrations of tritium and C-14?

Thank you for your patience with our package reviews.

Sincerely,

Nancy P. Kirner

Nancy P. Kirner, Supervisor
Waste Management Unit

8510290291 851007
PDR WASTE PDR
WM-B1

NPK:Pm

cc: Bob Fukano

Chichibu Cement

STABILITY CHECKLIST FOR ACCEPTANCE OF CLASS B & C WASTES

Yes	Don't Know	No
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STABILITY BY SOLIDIFICATION

- | | | | |
|---|-------------------------------------|---|--------------------------|
| 1. Compressive strength 50 psi (in accordance with ASTM C39, D1074 for bituminous products). | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Compressive strength 50 psi after exposure to 10 ⁶ rads per C39 or ASTM D1672 (or at the expected maximum dose if 10 ⁶ rads is exceeded)? | <input type="checkbox"/> | <input checked="" type="checkbox"/> (See NRC comment B) | <input type="checkbox"/> |
| 3. Are process control parameters developed to maximize practical compressive strengths? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Compressive strength 50 psi after testing for biodegradation (in accordance with ASTM G21 and ASTM C39 or D1074)? | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 5. Are polymeric or bitumen products involved? If so additional testing should be performed on samples with visible culture growths. See BTP for details. | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 6. Is the leachability index greater than 6 after a 90 day leach period (per ANS 16.1), which of the following liquids was used: a) demineralized water, b) synthesized seawater, c) other? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 7. Compressive strength 50 psi after a 90 day immersion period? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

Yes Don't Know No

8. Compressive strength 50 psi after thermal cycling (30 cycles of - 40 C to 60 C; sections 5.4.1 through 5.4.4 of ASTM B553)?

— ✓ (See NRC comment 12) —

9. Does full scale testing confirm sample results?

— ✓ —

STABILITY BY USE OF A HIGH INTEGRITY CONTAINER

10. Less than 0.5% free standing liquid by volume. Is the pH of any liquid between 4 and 11? (Reference: ANS 55.1) Is there a process control system?

— ✓ —

11. Will the waste form maintain its gross physical properties for a period of 300 years?

— ✓ (See T.R. pg 40) —

12. Are the void spaces minimized (less than 10% void space)?

n/a — —

13. Is the waste classified properly?

n/a — —

14. Have corrosion and chemical testing been confirmed as compatible with candidate waste forms?

n/a — —

15. Is there sufficient mechanical strength to withstand horizontal and vertical loads on the package at a burial depth of 50 ft (120 lbs/ft soil density assume 50 psi vertical load)? Is mechanical strength sufficient for stresses due to waste contents, waste preparation, waste transportation, disposal site operations, trench compaction procedures?

— ✓ (see NRC comment 9) —

Yes	Don't Know	No
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16. If polymeric materials: is creep test data provided?

___ ✓ (See NRC comment 10)

17. Can container withstand thermal cycling?

___ ✓ (See NRC comment 12)

Ra-226 and TRU sources with concentrations of 10 to 100 nCi/g averaged over and stabilized in a structural concrete matrix will pass items 1-9. The checklist for packaging requirements should be checked as well as the following items for these Ra-226 and TRU sealed sources.

Yes	Don't Know	No
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A. Is the matrix of structural concrete (compressive strength greater than 2000 psi).

n/a ___ ___

B. Was the concrete protected from temperature extremes (below 40 F or above 100 F) for a 28 day cure period?

n/a ___ ___

C. If a source, is it geometrically centered in the concrete matrix (the sealed source should also be inside another container, 2 R or pig etc.)?

n/a ___ ___

D. Does the package meet the DOT test criteria at the gross weight of the package (Mound report or other test data)?

n/a ___ ___