July 18, 2005

Mr. Richard W. Boyle, Chief
Radioactive Materials Branch
Office of Hazards Material Technology
U.S. Department of Transportation
400 Seventh Street S.W.
Washington, D.C. 20590

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION

Dear Mr. Boyle:

This is in response to your letter dated February 4, 2005, requesting our assistance in evaluating the Model Nos. F-458/F-245, F-458/F-247, F-458/F-251, F-458/F-251 MK2, F-458/F-318, and F-458/F-448 transport packages, authorized by Canadian Certificate of Approval No. CDN/2078/B(U)-96.

In connection with our review, we need the information identified in the enclosure to this letter. To assist us in scheduling staff review of your response, we request that you provide this information by 60 days of the date of this letter. If you are unable to provide a response by that date, our review may be delayed.

If you have any questions regarding this matter, I may be contacted at (301) 415-8500.

Sincerely,

/RA/

Shawn A. Williams, Project Manager
Licensing Section
Spent Fuel Project Office
Office of Nuclear Material Safety
and Safeguards

Docket No. 71-3076
TAC No. L23814

Enclosure: Request for Additional Information

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Request for Additional Information
Docket No. 71-3076
Model Nos. F-458/F-245, F-458/F-247, F-458/F-251,
F-458/F-251 MK2, F-458/F-318, and F-458/F-448
Canadian Package Design
Certificate No. CDN/2078/B(U)-96

GENERAL INFORMATION

1. Describe the authorized contents of the F-458/F-251 MK2 configuration. Describe the difference between the F-251 and F-251 MK2 configurations.

   This information is needed to show compliance with IAEA No. TS-R-1, Section IV and paragraph 415.

STRUCTURAL

2. Clarify whether or not the lid was removed after the nine meter free drop reported in Appendix H of Appendix 4, or whether the lid was only removed after all four of the tests reported in Appendix H were completed. Describe this sequence of observations including what was actually visible after each test phase reported in Appendix H.

   Appendix H, F-458 Serial #5 Drop Test, of Appendix 4, F-458/F-251 Package Drop Test Report, in Section 3.2, pages H-2 and H-3, presents the photographs and text description of the nine meter free drop against the top of the specimen. The stated observations were as follows:

   "After the test, the F-458 stayed upside down as shown in Figure H-4. The damage to the top consisted of slight rolling and flattening of the top chime. The cover handles bent outside the OD of the flange. Several cover bolts touched the target. All bolts were intact."

   Section 3.4, pages H-5 through H-7, of the same Appendices, presents the photographs and text description of the one meter pin drop against the top of the specimen. The observations provided on page H-6 are as follows:

   "The cavity flange weld cracked when the lid handles bent on impact during the nine meter drop against the top. The crack extends from bolt #5 to bolt #4 as marked in Figure H-10. No foam was exposed." Clarify why this observation of the cracked cavity flange weld was not included in Section 3.2, page H-3.

   This information is needed to show compliance with IAEA No. TS-R-1, paragraph 716.

3. Provide the observations that are associated with the testing of Specimen #7 for the nine meter free-side drop that is shown in Figure J-8 and apparently Figure J-9 (not labeled).

   Appendix J, F-458 Serial #7 Drop Test, of Appendix 4, F-458/F-251 Package Drop Test Report, in Section 3.3, pages J-5 and J-6, provides no information on the post-drop observations while the associated figures show some deformation of the package.

   This information is needed to show compliance with IAEA No. TS-R-1, paragraph 716.

THERMAL

4. Describe the special stowage provisions, given that the package heat load exceeds 15 watts/square meter (W/m^2).

   Under the "Shipment" heading in the certificate, it is stated that supplementary arrangements must be made with the carrier to ensure adequate heat dissipation. Also, on page 19 of the Engineering Assessment, paragraph 565, it is mentioned that certain contents can cause the package to exceed the 15 W/m^2 limit. However, no description is provided to identify specifically what these arrangements must include.

   This information is needed to show compliance with IAEA No. TS-R-1, paragraph 565.

5. State the design restrictions on transport. For example, shipments of more than 25 watts of Ir-192 are prohibited for air transport because the surface temperature would exceed the 50 °C (refer to Appendix 7, Section 7.8). State under what circumstances the heat shield would be utilized.

   This information is needed to show compliance with IAEA No. TS-R-1, paragraph 617.

6. Provide information and drawings regarding inserts/shielding F-368, F-336, F-389, F-174, F-286, F-382 that are mentioned in the tables of Section 1.2 of the Engineering Assessment. Also, clarify if the inserts used for Ir-192 (i.e. F-368, F336) with the higher heat loads (>6 watts), have O-rings.

   No information is provided in the Engineering Assessment regarding these aforementioned inserts or shields other than by reference to them.

7. Justify the temperature limit of the O-ring in the leakproof insert as being 149 °C as stated in Appendix 11, Section 4.2.3. Considering the uncertainties in the calculational method, justify the conclusion that the O-ring is suitable for the Hypothetical Accident Condition fire.

   The calculated maximum temperature of the O-ring is 133 °C (refer to Section 7.2 of Addendum 11I). Appendix 2.1 drawings show the O-ring as neoprene. The 1992 edition of the Parker O-ring Handbook, page A3-35, shows the upper normal temperature range of a neoprene O-ring as 121 °C, with a short term temperature limit of 135 °C.

   This information is needed to show compliance with IAEA No. TS-R-1, paragraph 638.

8. Explain the how the fire test was performed in accordance with the requirements of IAEA TS-R-1, as stated in Appendix 11 Section 1, when the fire test did not consider any internal heat load and used a lower ambient temperature than the required 38 °C. Also, state how these omissions would impact the conclusions reached regarding the post fire condition of the lead and O-ring.

   This information is needed to show compliance with IAEA No. TS-R-1, paragraph 728.