December 17, 2010

Richard W. Boyle, Chief
Radioactive Materials Branch
Office of Hazardous Materials
Technology
U.S. Department of Transportation
1200 New Jersey Ave., S.E.
Washington, D.C. 20590

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION FOR REVALIDATION OF MODEL MFC-1 (JAPANESE COMPETENT AUTHORITY CERTIFICATE J/105/AF-96, REV. 2)

Dear Mr. Boyle:

This letter is in response to your letter, dated April 29, 2010, in which you requested our assistance in evaluating the Model No. MFC-1 package authorized by Japanese Competent Authority Certificate of Approval No. J/105/AF-96, Rev. 2.

To assist with our review, the U.S. Nuclear Regulatory commission (NRC) staff needs the information identified in the enclosure to this letter. This information is required to determine if Model No. MFC-1 package meets the IAEA TS-R-1 requirements. The applicant should notify the Department of Transportation when the requested information can be provided. If the applicant is unable to provide a response within sixty days, our review will be delayed.

Please reference Docket No. 71-3043 and TAC No. L24445 in future correspondence related to this revalidation action. If you have any questions regarding this matter, feel free to contact me at (301) 492-3148.

Sincerely,

/RA/
William C. Allen, Project Manager
Licensing Branch
Division of Spent Fuel Storage and Transportation
Office of Nuclear Material Safety
and Safeguards

Docket No. 71-3043
TAC No. L24445

Enclosure: Request for Additional Information

Please reference Docket No. 71-3043 and TAC No. L24445 in future correspondence related to this revalidation action. If you have any questions regarding this matter, feel free to contact me at (301) 492-3148.

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Enclosure: Request for Additional Information

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Request for Additional Information
Docket No. 71-3043
Competent Authority Certificate No. J/105/AF-96, Rev. 2
Model No. MFC-1 Package

By application dated April 29, 2010, as supplemented on August 5, 2010, Department of Transportation requested revalidation of Model No. MFC-1 package (Japanese Competent Authority Certificate J/105/AF-95, Rev. 2). This request for additional information (RAI) identifies information needed by staff in connection with its review of the application.

Each individual RAI describes information needed by the NRC staff for it to complete its review of the application to determine whether the applicant has demonstrated compliance with IAEA regulatory requirements.

General Description Review

G1 – Clarify the fuel assembly enrichment for which the package is licensed.

The enrichment information provided by the applicant in paragraph (2) of Section I-B "Classification of Package" does not agree with the enrichment information provided by the applicant on page Summary-2 and in both Table 1-A.1 and paragraph D.7.

The information is needed to determine if the requirements of paragraph 807(a) in TS-R-1 are satisfied.

G2 – Clarify the diameter of the lower container.

The lower container diameter shown on Figure I-C.6 provided by the applicant does not agree with the diameter stated in paragraph C.2.1(2).

This information is needed to determine if the requirements of paragraph 807(b) in TS-R-1 are satisfied.

Materials Review

M1 – Manufacturing directions are not provided in the Competent Authority Certificate.

The Competent Authority Certificate issued for use of Model No. MFC-1 package does not reference drawings and bills of materials. Unless this information is referenced in the Competent Authority Certificate, limitations on the materials used or construction methods are not imposed.

Limitations on manufacturing practices are not required per the IAEA regulations, but it is required for Certificates of Compliance issued by the NRC per paragraph 71.107 in 10 CFR Part 71. Therefore, the NRC respectfully requests the following Safety Analysis Report figures and data for the Model No. MFC-1 package be included by reference either

in the Competent Authority Certificate or be specified as a condition of approval by the DOT Certificate of Compliance: Figure III-A-1, -4, -6 & -7 and Table 1-C.

Thermal Review

T1 – Perform HAC thermal analysis using appropriate coefficients or prove that the analytical approach employed in the application submittal is at least as conservative as that required by the regulations.

The applicant performed a HAC thermal analysis of the package exposed to a fire, and indicated in the SAR that a value of 0.9 was used as the flame emissivity and 0.8 was used as the surface absorptivity coefficient. During a conference call, the applicant stated that a configuration factor was calculated using the values of 0.9 for the flame emissivity and 0.8 for the surface absorptivity coefficient. The configuration factor calculated, and subsequently used in the TRUMP code to determine the maximum package temperatures, was 0.735. This value of 0.735 is considered by the staff to be non-conservative irregardless if it is used as either an emissivity or an absorptivity coefficient. In addition, the SAR does not show that using this configuration factor provides analytical results which are at least as conservative as those which would be obtained if either a flame emissivity coefficient of 0.9 or a surface absorptivity coefficient of 0.8 were employed.

Also, the applicant specified in the SAR that natural convection heat transfer from the surface of the package was employed instead of forced convection during the 30-minute HAC fire. The applicant also specified that natural convection and radiation heat transfer were used in the HAC analysis during the cooldown period. Although the staff finds the use of natural convection and radiation heat transfer appropriate during the cooldown period, the staff considers using a natural convection heat transfer coefficient during the HAC 30-minute fire a non-conservative boundary condition because the differences in the convective coefficient between natural convection and forced convection are not negligible.

This information is needed to for the staff to determine if the thermal design of the MFC-1 meets the requirements of paragraph 728(a) in TS-R-1.

T2 – Correct the temperature range of the package in the specification of the component section.

The applicant reported the temperature range of the package in the specification of the components section of the SAR II-B.3, specifically under the relief valve portion of the section. This temperature range is inconsistent with the previously specified temperature range for the package. The temperature range that was shown in the discussion is -20°C and -73°C (SAR page II-B-7) when the correct temperature range for the package is between -20°C and +73°C (SAR page II-B-9). The applicant is required to correct the sign of the temperature range of the package.

This information is needed to for the staff to determine if the thermal design of the MFC-1 meets the requirements of IAEA TS-R-1.

Operating Procedures & Maintenance Review

P1 – Provide instructions for securing packaging during transport.

Paragraph (10) of Section A.1.2 “Loading Procedures” does not provide guidance for preventing the packaging from shifting during transit.

This information is needed to determine if the requirements of paragraph 807(d) in TS-R-1 are satisfied.

P2 – Provide torque values for securing fuel assemblies within the package.

Paragraphs (7)(e) and (7)(f) of Section A.1.2 “Loading Procedures” direct that bolts be tightened, and the flow chart “Fuel Assembly Loading Flow” shown in Figure IV-A.2 directs personnel to “Check the given torque of the clamping frame retainer plates”. However, torque values are not specified within Section A.1.2 for any operation associated with loading fuel assemblies and no torque values were found in the Section I, “Package Description”.

This information is needed to determine if the requirements of paragraph 807(d) in TS-R-1 are satisfied.

P3 – Clarify the method used to secure tightening bolts (Figure IV-A.5) in paragraph (8)(c) of Section A.1.2 “Loading Procedures”.

Neither Figures IV-A.5 and IV-A.6 nor the instructions in paragraph (8)(c) of Section A.1.2 clearly indicate what prevents the tightening bolts from being inadvertently removed during transit.

This information is needed to determine if the requirements of paragraph 807(d) in TS-R-1 are satisfied.