NRC FORM 699 (9-2003) U.S. NUCLEAR REGULATORY COMMISSION

CONVERSATION RECORD

DATE: 12/01/2010

TIME: 5:00pm

NAME OF PERSON(S) CONTACTED OR IN CONTACT WITH YOU	TELEPHONE NO.
See Summary Section	888-970-4176

ORGANIZATION: NRC, Department of Transportation (DOT), Transnuclear (TN), Mitsubishi Nuclear Fuel (MNF)

SUBJECT: Revalidation of Model No. MFC-1 Request for Additional Information

TYPE OF CONVERSATION: ☐ VISIT ☐ CONFERENCE ☑ TELEPHONE ☑ INCOMING ☐ OUTGOING

SUMMARY *(Continue on Page 2)*

Conference Call Participants:
NRC: William "Chris" Allen, Robert Einziger, Jessica Colon, David Tang, Robert K. Johnson, Deborah Jackson
DOT: Michael Conroy
TN: Jayant Bondre, Don Shaw, Nicolas Guibert
MNF: Alex Corsten, Hode Suguru

Conference Call Text:
The conference call began shortly after 5 P.M. Nine RAIs were provided to the conference call participants prior to the start of the conference call. After introductions were made, discussion of the RAIs commenced.

The first RAI discussed had been raised by the Materials Technical Reviewer Robert Einziger. This RAI dealt with referencing manufacturer's drawings and bills of materials in the Japanese Competent Authority Certificate. After the participants discussed this RAI, it was agreed that the NRC would identify the Safety Analysis Report (SAR) figures to be referenced. In addition, the NRC would include in the Safety Evaluation Report provided to the DOT that revalidation of the Model MFC-1 packaging be conditional on the fact that the packaging was fabrica ted in accordance with the referenced SAR figures.

The next three RAIs discussed were provided by the Thermal Technical Reviewer Jessica Colon. The first RAI discussed dealt with a typographical error and generated no discussion. The second RAI d ealt with the use of natural convection heat transfer coefficients versus forced convection heat transfer coefficients. The ensuing discussion revealed that natural convection heat transfer coefficients had been employed in the thermal analysis code throughout because, although using forced convection heat transfer coefficients was more accurate, the thermal ana lysis code produced temperatures which were orders of magnitude higher than the actual temperatures recorded during the Hypothetical Accident Conditions (HAC) thermal test. Therefore, using the more forced convection heat transfer coeffi cient was unnecessary. When asked to provide

Continue on Page 2

ACTION REQUIRED

NRC: Identify and provide SAR figures for reference in the Japanese Competent Authority Certificate.

NAME OF PERSON DOCUMENTING CONVERSATION	SIGNATURE	DATE
Chris Allen	William C. Allen	January 20, 2011

ACTION TAKEN

TITLE OF PERSON TAKING ACTION	SIGNATURE OF PERSON TAKING ACTION	DATE

CONVERSATION RECORD (Continued)

SUMMARY *(Continue on Page 3)*

the actual HAC thermal test data, the NRC was provided the SAR pages containing this information. The third RAI dealt specifically with the use of emissivity and absorption coefficients in the thermal analysis code. It was explained that both the emissivity coefficient and the absorption coefficient were used to generate a configuration factor which was employed in the thermal analysis code. During the explanation, a verbal explanation was provided of how to calculate the configuration factor. When asked for references for the thermal analysis code, the NRC was directed to the references in the thermal section of the SAR. In addition, DOT identified an internet link from which additional information on the thermal analysis code could be obtained and sent the link to Chris Allen the Project Manager for the MFC-1 revalidation. After the conference call, this link was forwarded to both the Thermal Technical Reviewer and her Branch Chief.

The remaining five RAIs were generated by Chris Allen. The first two RAIs discussed dealt with typographical errors and generated no discussion. The third RAI discussed dealt with securing the packaging to a conveyance. After additional information was provided on how the packaging was actually secured for shipment, it was agreed that supplemental instructions on securing the packaging during transport would be added to the Loading Procedures section of the SAR. The remaining two RAIs dealt with a lack of information on bolt torques in the Loading Procedures section of the SAR. It was agreed that the requisite torque values would be incorporated into the Loading Procedures section of the SAR.

After all RAIs had been covered, the amount of time required to respond to the RAIs was discussed. It was agreed that responses to the RAIs, as well as revised SAR pages, could be provided within thirty days of receipt of the RAI. The meeting was adjourned at approximately 6:15 P.M.

Note: RAIs discussed during this conference call were either subsequently issued by formal letter (ML103540074) or modified during another conference call which occured on 12/14/2010.

Continue on Page 3

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 drawings, bills of materials, either be incorporated by reference into the Competent Authority Certificate for Model No. MFC-1 or be specified as a condition of approval by the DOT.

Thermal Review

T1 - Clarify the emissivity values used in the thermal analysis during fire for both HAC fire and its post-fire cooldown.

The applicant performed a HAC thermal analysis of the package exposed to a fire, and indicated in the SAR that two values for emissivity were used to perform the analysis. The applicant specified that a value of 0.9 was used as the flame emissivity and 0.8 as the absorptivity coefficient. However, since the staff is not familiar with the TRUMP code and only one emissivity is allowed for input in the computer codes, the applicant should explain what value was used to model the ambient and surface emissivity during fire in the thermal analysis under hypothetical conditions of transport. From previous experience with codes

commercially available in the United States, it is known that just one value can be entered in a code to model the emissivity.

The regulations (TS-R-1) require an emissivity 0.9 in ambient air and 0.8 at surface under HAC 30-min fire (and 0.8 for ambient air and surface in post-fire cooldown). The question is: How did the applicant simulate, convert, or create these conditions of HAC-fire and its post-fire cooldown in the model?

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

T2 - Clarify the types of convection used in the HAC 30-minute fire and when these convection types were used in the analysis.

On page II-B-15, in the middle of paragraph (2) of Section B.5.1.1 "Analysis Model", it is stated that convection was considered. However, the type of convection used in the analysis is not specified. In addition, it is unclear when both the convection type mentioned in the middle of paragraph (2) and natural convection specified later are applied in the HAC analysis.

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

T3 - Clarify 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 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.