

April 1, 2010

Mr. 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: FIRST REQUEST FOR ADDITIONAL INFORMATION FOR THE MODEL NO.
FCC-3 PACKAGE

Dear Mr. Boyle:

By letter dated November 18, 2009, the Department of Transportation submitted a request for review of the French Certificate of Approval No. F/347/AF-96, Revision Ci, for the Model No. FCC-3 package.

The NRC staff (staff) has reviewed the application and has determined that additional information is required to complete its detailed technical review. This partial Request for Additional Information (RAI) is being issued at this time as the staff cannot proceed with its detailed technical review in the related areas without the information requested below.

RAI No. 1

Provide test data for the neutron absorber resin which shows the physical and geometric integrity of the resin following the hypothetical accident condition (HAC) thermal test.

The staff performed a confirmatory analysis of the Model No. FCC-3 package (with PWR 17x17 fuel assemblies) to validate the thermal predictions provided by the applicant. The results of the confirmatory analysis indicate that the temperature of part of the resin can rise above 600°C and degrade the resin in an HAC thermal test.

The applicant has not provided any information, e.g., test data, temperature, melting point, etc., to support its contention that the resin will have some remaining efficacy after exposure to an HAC thermal test. The staff does not accept the argument that only a certain amount will char or that any geometry will be maintained. The amount of damage to the resin could change depending on a number of conditions, such as the orientation of the package, which was not addressed.

The applicant must provide test data showing the resin condition as a neutron poison after a fire exposure, and also show that it would be consistent over a number of such tests.

This information is required to determine if the Model No. FCC-3 package meets the requirements of paragraphs 501, 501(b), 501(c), and 502(a), of IAEA TS-R-1.

RAI No. 2

Revise the criticality analysis for the PWR 17 x 17 fuel assemblies in the Model No. FCC-3 package to:

- (i) Consider the condition of the neutron absorbing resin after the HAC thermal test specified in paragraph 728 of IAEA TS-R-1 (see RAI No.1), and
- (ii) Consider the complete loss of the neutron absorber resin in the thermal test.

The assumptions given in Section No. 4.2.2 of the Criticality Safety Study in Report FF/DC/00817, Rev. A, include a loss of 10% of the boron over the entire resin volume, and a loss of all hydrogen in the outer 1.0 centimeter of the resin.

The results of staff's confirmatory analyses of the thermal test specified in paragraph 728 of IAEA TS-R-1 indicate that much more of the resin could be lost in such a thermal exposure.

The criticality analysis should either conservatively account for the degraded condition of the resin after the thermal test, or should assume that it is entirely absent for evaluations of single packages and arrays of packages under HAC conditions of transport.

This information is required to ensure that single packages in isolation, and arrays of packages, under HAC conditions of transport, remain subcritical per the requirements of paragraphs 677 and 682 of IAEA TS-R-1.

RAI No. 3

Provide a technical justification for assuming the expansion of the array over the entire height of the 17 x 17 fuel assembly, and a pitch expansion to 1/3 of the length of the fuel assembly under a 9 meter drop for HAC conditions.

Provide a technical justification for allowing a total breach of the cladding material, resulting in an ejection of the fuel pellet for this scenario.

Also, provide Reference No. 9 mentioned on page 3/36 of the Appendix No. 12 of the Report FF/DC/00817, Rev. A. This information is necessary for the staff to facilitate the detailed review of the structural adequacy of the package.

The information is required to ensure compliance with the requirements of paragraphs 726 through 729 of IAEA TS-R-1.

The applicant should notify the Department of Transportation when it can provide the requested information. The technical review in these areas has ceased pending receipt of the requested information.

Please reference Docket No. 71-3083 and TAC No. L24394 in future correspondence related to this revalidation action. If you have any questions regarding this matter, you may contact me at (301) 492-3408.

Sincerely,

/RA/

Pierre M. Saverot, Project Manager
Licensing Branch
Division of Spent Fuel Storage and Transportation
Office of Nuclear Material Safety
and Safeguards

Docket No. 71-3083
TAC No. L24394

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