



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

April 3, 2014

Ms. Tanya Sloma
Licensing, Nuclear Fuel Transport
Westinghouse Electric Company, LLC
5801 Bluff Road
Hopkins, SC 29061

SUBJECT: REVISION NO. 7 OF CERTIFICATE OF COMPLIANCE NO. 9297 FOR THE
MODEL NOS. TRAVELLER STD AND TRAVELLER XL PACKAGES (TAC NO.
L24871)

Dear Ms. Sloma:

As requested by your application dated December 19, 2013, and as supplemented January 16, 2014, enclosed is Certificate of Compliance No. 9297, Revision No. 7, for the Model Nos. Traveller STD and Traveller XL packages. Changes made to the enclosed certificate are indicated by vertical lines in the margin. The staff's safety evaluation report is also enclosed.

The approval constitutes authority to use the package for shipment of unirradiated fissile material and for the package to be shipped in accordance with the provisions of 49 CFR 173.471. Those on the attached list have been registered as users of the package under the general license provisions of 10 CFR 71.17 or 49 CFR 173.471.

If you have any questions regarding this certificate, please contact me or John Vera of my staff at (301) 287-9165.

Sincerely,

/RA/

Michele Sampson, Chief
Licensing Branch
Division of Spent Fuel Storage and Transportation
Office of Nuclear Material Safety
and Safeguards

Docket No. 71-9297
TAC Nos. L24871

Enclosures: 1. Certificate of Compliance
No. 9297, Rev. No. 7
2. Safety Evaluation Report
3. Registered Users

Upon removal of Enclosure 3, this
document is uncontrolled

cc w/encls 1 & 2: R. Boyle, Department of Transportation
J. Shuler, Department of Energy, c/o L. F. Gelder
Registered Users

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**SAFETY EVALUATION REPORT
Docket No. 71-9297
Model Nos. Traveller STD and Traveller XL
Certificate of Compliance No. 9297
Revision No. 7**

SUMMARY

By application dated December 19, 2013, and as supplemented January 16, 2014, Westinghouse Electric Company, LLC (Westinghouse or the applicant) requested an amendment to Certificate of Compliance (CoC) No. 9297 for the Model Nos. Traveller STD and Traveller XL packages. Westinghouse requested to revise the polyethylene packing material limit listed in the Safety Analysis Report, Section 1.2.3.2 *Maximum Quantity of Material per Package* by increasing the limit from 2 kg to 2.17 kg per package for fuel assemblies and from 2 kg to 8.49 kg per package for loose fuel rods.

Additionally, Westinghouse requested the package review include consideration of NUREG-1886, "Joint Canada – United States Guide for Approval of Type B(U) and Fissile Material Transportation Packages."

NRC staff reviewed the amendment application using the guidance in NUREG-1609, "Standard Review Plan for Transportation Packages for Radioactive Material," and NUREG-1886 "Joint Canada - United States Guide for Approval of Type B(U) and Fissile Material Transportation Packages." Based on the statements and representation in the application, as supplemented, and the conditions listed below, the staff finds that these changes do not affect the ability of the package to meet the requirements of 10 CFR Part 71. Staff reviewed the application against NUREG-1886, and finds the highlighted areas of emphasis have been appropriately addressed.

EVALUATION

By application dated December 19, 2013, and as supplemented January 16, 2014, Westinghouse Electric Company, LLC (Westinghouse or the applicant) requested an amendment to Certificate of Compliance (CoC) No. 9297 for the Model Nos. Traveller STD and Traveller XL packages.

The Traveller is a shipping package designed for the transport of a single unirradiated uranium PWR fuel assembly or a pipe containing either BWR or PWR loose rods with enrichments up to 5.0 weight percent U-235. The assembly or pipe of loose rods is packaged inside a Clamshell surrounded by an Outerpack. A detailed explanation can be found in the Safety Analysis Report.

Polyethylene is used as packing material in the shipping package to protect the fuel assembly or fuel rods during transport. The Traveller was previously evaluated in a safety analysis report, limiting the polyethylene to 2 kg per package. The applicant requested to increase the packing polyethylene limit per package within the fuel assembly contents to 2.17 kg, and within the loose rod contents to 8.49 kg.

The applicant provided a summary of criticality evaluations assessing the presence of polyethylene material for an array of Traveller packages containing fuel assemblies and loose rod contents. The calculations modeled the package under normal and hypothetical accident conditions of transport using SCALE 4.4 CSAS26 with the 44-group ENDF/B-V (44GROUPNDF5) cross-section library. The upper safety limit (USL) is 0.94, based on the criticality code benchmarking evaluation in the Traveller SAR. Under hypothetical conditions, the applicant performed calculations for the different configurations of polyethylene material as a wrap around the outside edge of a fuel assembly. Furthermore, the possibility of having all of the polyethylene melt and collect to the bottom of the package was also considered. The second sets of evaluations were performed for loose rod contents. Calculations were performed for single and array cases with a pitch of 1.5 cm and varying fuel pellet diameters. Models simulated polyethylene uniformly wrapped around each rod and collected melt (uniform wrap only for the infinite array case).

NRC staff performed confirmatory calculations using SCALE 6.1 with CSAS6 sequence and a continuous cross section library. The applicant's supplied SCALE 4.4 input files were changed to be compatible with SCALE6.1 and modified to use the continuous ENDF/B-VII.0 library. Staff's calculation results slightly exceed the applicant's calculated results, and also their calculated USL. The applicant's benchmarking results demonstrate a larger uncertainty in establishing the USL, which is lower than would be expected with SCALE 6.1 and ENDF/B-VII.0 cross-section data. Therefore, staff is able to confirm, with reasonable assurance, the applicant's conclusion that the package will continue to meet the criticality safety requirements of 10 CFR Part 71, with an increased packing polyethylene limit.

Based on review of the statements and representations in the amendment, the staff concludes that the nuclear criticality safety design has been adequately described and evaluated and that the package meets the criticality requirements of 10 CFR Part 71.

As part of the review against NUREG-1886, staff notes that the requirements stated in Sections 2.4.1, "Minimum Package Size," through 2.4.3, "Positive Closure," of NUREG-1886 are not demonstrated in the corresponding chapters in the Traveller SAR, but are found under Section 1.3, "General Requirements for All Packages," of the SAR. Staff also notes that additional Quality Assurance Program information, according to Chapter 9, "Quality Assurance," of NUREG-1886, should be furnished as part of a validation application in Canada. Such an application should also contain the technical information included in the amendment request dated December 19, 2013. Staff concludes that the guidance on format and content in NUREG-1886 has been met.

CONDITIONS

The following changes have been made to the certificate:

Condition No. 5(b)(1)(i) has been updated to correct a typographical error in the table for "Parameters for 14 x 14 Fuel Assemblies." The nominal clad outer diameter for CE-1/CE-2 has been corrected to 1.118 cm from the previously stated 1.016 cm.

Condition No. 5(b)(1)(iv), was updated to specify that materials with moderating effectiveness greater than full density water are not permitted, except for polyethylene packing materials, such as sleeves and dunnage, used to protect the fuel assemblies; limited to a maximum of 2.17 kg per package.

Condition No. 5(b)(2), "Loose Fuel Rods," was updated to specify that wrapping or sleeving materials with moderating effectiveness greater than full density of water are not permitted, except for polyethylene packing materials, such as sleeves and dunnage, used to protect the fuel rods; limited to a maximum of 8.49 kg per package.

Condition No. 9 was not revised at the applicant's request, in order to authorize use of Revision No. 5 of the CoC until March 31, 2015.

The references section has been updated to include this request.

CONCLUSION

Based on the statements and representations contained in the application, as supplemented, and the conditions listed above, the staff concludes that the design has been adequately described and evaluated, and the Model Nos. Traveller STD and Traveller XL packages meet the requirements of 10 CFR Part 71 and the guidance on format and content in NUREG-1886 for joint approval in Canada.

Issued with Certificate of Compliance No. 9297, Revision No. 7.