January 31, 2005

Mr. Norman A. Kent
Manager Transport Licensing and
Regulatory Compliance
Westinghouse Electric Company, LLC
Nuclear Fuel
Columbia Fuel Site
P.O. Drawer R
Columbia, SC 29250

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION FOR THE REQUEST FOR AMENDMENT OF CERTIFICATE OF COMPLIANCE NO. USA/9292/AF-85 (TAC NO. L23770)

Dear Mr. Kent:

By letter dated September 16, 2004, Westinghouse Electric Company submitted a request for amendment of Certificate of Compliance (COC) No. 9292 for the Model No. Patriot Transportation package in accordance with Title 10 of the U.S. Code of Federal Regulations (CFR) Part 71 (10 CFR Part 71).

The staff has determined that further information is needed to complete its technical review. The information requested is listed in the enclosure. Additional information requested by this letter should be submitted in the form of revised pages. To assist us in scheduling staff review of your response, we request that you provide this information by March 15, 2005. If you are unable to provide a response by that date, you must notify us in writing, at least two weeks in advance, of your new submittal date and the reasons for the delay. The staff will then assess the impact of the new submittal date and notify you of a revised schedule.

In general, no changes or supplements to the applications should be submitted, except in response to a request for additional information.

Please reference Docket No. 71-9292 and TAC No. L23770 (amendment) in future correspondence related to the licensing actions. If you have any questions, please contact me at (301) 415-8580.

Sincerely,

/RA/

Amy M. Snyder, Project Manager
Spent Fuel Project Office
Office of Nuclear Material Safety
and Safeguards

Docket No. 71-9292

TAC No. L23770

Enclosure: Request for Additional Information

Please reference Docket No. 71-9292 and TAC No. L23770 (amendment) in future correspondence related to the licensing actions. If you have any questions, please contact me at (301) 415-8580.

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Docket No. 71-9292
TAC No. L23770
Enclosure: Request for Additional Information

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ENCLOSURE

Request for Additional Information
for the Amendment Request for
Certificate of Compliance No. USA/9292/AF-85
(TAC No. L23770)

By letter dated September 16, 2004, Westinghouse Electric Company submitted a request for renewal of Certificate of Compliance (COC) No. 9292 for the Model Patriot Transportation package in accordance with Title 10 of the U.S. Code of Federal Regulations (CFR) Part 71 (10 CFR Part 71).

This request describes information needed by the staff for it to complete its review of the FSAR and to determine whether the applicant has demonstrated compliance with regulatory requirements.

6-1. Justify the applicability of the bias used for the criticality analysis.

The applicant states the criticality analyses were performed using SCALE 4.4, CSAS25 and CSASX sequences and the 238-group ENDF/B-V library. The applicant also states that a bias and bias uncertainty ($\beta+\Delta\beta$) of 0.0123 is used for calculating the Upper Safety Limit (USL). However, this value appears to be for a 44-group library. Further, no description is provided regarding how this bias was determined nor of the benchmarks that were used.

The bias and its uncertainty should be established through a benchmark analysis performed by the applicant and not taken from other sources. This benchmark analysis and the bias determination should be described. The description should include discussion of the benchmark experiments used and justification of the benchmarks' applicability as well as discussion of any trends in the bias observed with respect to parameters such as pitch-to-rod diameter, H/U ratio, etc. The benchmarking should properly account for the computer code (including version), computer hardware, and cross-section library used to calculate the k-effective values in the package analysis. Also, the critical experiments used in the benchmark analysis should be those that most closely represent the characteristics of the package models analyzed, including solid neutron poisons, materials, configurations, and neutron spectra.

This information is needed to confirm compliance with 10 CFR 71.55(e) and 71.59.

6-2. Specify whether the actual shipping configuration for the proposed contents may include the use of plastic inserts.

The currently approved contents are/can be shipped with plastic inserts. However, the criticality analysis for the proposed contents does not include plastic inserts. The application states the inserts are not included in the calculations because the fuel is shipped in channels. However, it is not clear whether this statement means that plastic inserts may not be used to ship the proposed contents. If the inserts may be used, the criticality analysis needs to account for their influence on system reactivity. If the

proposed contents may not be shipped with inserts, describe how the actual shipping configuration will be verified to not include the inserts.

This information is needed to confirm compliance with 10 CFR 71.55(e) and 71.59.

6-3. Specify whether the fuel loadings contain partial length fuel rods or Gadolinia-Urania rods and the maximum number of each.

Figure 6A-4 in the application shows a typical 10x10 BWR fuel assembly. In the figure, several positions are identified as having rods of partial length (1/3 or 2/3 of full length). There is no discussion in the model or contents descriptions regarding partial rods; however, staff analysis indicates that the presence of partial rods in the proposed contents will affect system reactivity. Particularly, partial Gadolinia-Urania rods will result in increased system reactivity, the extent of which will depend upon the rod length(s), the number of partial rods, and the rod location(s). If the fuel loadings contain partial rods, the criticality analysis needs to account for their influence on system reactivity.

This information is needed to confirm compliance with 10 CFR 71.55(e) and 71.59.

6-4. Describe how Gadolinia is incorporated into the Gandolinia--Urania rods.

The criticality model assumes that the Gadolinia is homogeneously mixed with the UO_2 fuel. However, the application is not clear as to whether this model accurately describes the actual Gadolinia-Urania rods. It is known that these rods can be manufactured with the Gadolinia and fuel homogeneously mixed or with the Gadolinia placed on the pellet surface. If the rods in the model do not match the rods' actual form, provide a description of the actual form and justify how the analysis applies to and bounds this configuration.

This information is needed to confirm compliance with 10 CFR 71.55(e) and 71.59.

6-5. Justify neglecting the fuel assembly structures beyond the active fuel length in the criticality analysis.

The criticality analysis neglects the assembly structures beyond the active fuel length. At low moderator densities, leakage becomes a greater factor in system reactivity; however, the assembly structures beyond the active fuel length can act as reflectors and cause an increase in system reactivity. Therefore, the basis for neglecting these structures in the analysis should be explained and justified.

This information is needed to confirm compliance with 10 CFR 71.55(e) and 71.59.

6-6. Provide a calculation of the Gadolinium and Oxygen densities for the Gadolinia in the Gadolinia-Urania rods.

Based on the information given in the application, staff has performed calculations of the densities of the Gadolinium and Oxygen for the Gadolinia contained in the Gadolinia-Urania rods. However, results of these calculations differ from the densities used in the

applicant‘s criticality analysis. Thus, the description of the Gadolinia content in these rods and the content for which credit is taken in the analysis are not clear.

This information is needed to confirm compliance with 10 CFR 71.55(e) and 71.59.

6-7. Justify the partial flooding configuration in the criticality analysis as the most reactive configuration of internal moderation.

The partial flooding configuration used in the applicant’s analysis is shown in Figure 6A-11 of the application. In the applicant’s results, these partial flooding cases were the most reactive, compared to the fully flooded cases and inverted partially flooded cases. However, staff analysis indicates that this flooding configuration (for example, the preferential nature of the water levels inside and outside the basket) may not be the most reactive condition. The criticality analysis should be modified to determine the most reactive package configuration, including the most reactive partially flooded condition, whether preferential or uniform.

This information is needed to confirm compliance with 10 CFR 71.55(e) and 71.59.

6-8. Justify the following discrepancies in the model and between the model and the text:

A. Table 6A-3 lists the density of the oxygen for the Gadolinia in the Gadolinia-Urania rod as ten times the value used in the actual model.

B. The cell-data data card has water in the pellet-clad gap while the geometry data cards show the pellet-clad gap containing void.

This information is needed to confirm compliance with 10 CFR 71.55(e) and 71.59.