

Request for Additional Information
EnergySolutions
Docket No. 71-9168
Model No. 8-120B Package

By letter dated May 23, 2013, EnergySolutions (ES) submitted an application for revision to Certificate of Compliance (CoC) No. 9168 for the Model No. 8-120B package. In particular, ES requested the addition of a steel plate in the central hollow region of the lower impact limiter, to improve the shielding effectiveness of the package under normal conditions of transport (NCT), and provided a revised shielding evaluation.

This Request for Additional Information (RAI) identifies information needed by the staff in connection with its review of the Model No. 8-120B package amendment request to confirm whether the applicant has demonstrated compliance with regulatory requirements. The requested information is listed by chapter number and title in the package application. NUREG-1609, "Standard Review Plan for Transportation Packages for Radioactive Material," was used for this review.

CHAPTER 5 SHIELDING EVALUATION

5-1 Provide additional information on the radial thermal barrier.

Page 5-1 of the application states: "*The impact limiters and radial thermal barrier provide a small amount of additional shielding.*" From Drawing C-110-E-0007, Rev. 19, sheet 4, it does not appear that the radial thermal barrier goes around the entire circumference of the package.

Clarify this drawing and state what is present (if anything) where there is no thermal barrier. Regulations limiting dose rates apply to all points on the package. Justify that the shielding model is bounding for places where there is no thermal barrier.

This information is required by the staff to determine compliance with 10 CFR 71.47 and 10 CFR 71.51(a)(2).

5-2 List all differences between the shielding model for the previous revision of the CoC and the current application for both NCT and hypothetical accident conditions (HAC).

This information is required by the staff to determine compliance with 10 CFR 71.47 and 10 CFR 71.51(a)(2).

5-3 Refer to proprietary enclosure.

5-4 Refer to proprietary enclosure.

- 5-5** Explain why the dose rate response (i.e., mrem/hr per photon/s, calculated by MCNP) increases for some configurations.

Given the increase in shielding modeled all around the package for the calculations presented in the application, the staff expects, in every calculation, that the peak dose rate response (i.e., mrem/hr per photon/s, calculated by MCNP) would decrease from previous levels associated with Rev. 19 of the CoC. However, the review of Tables 9.3-1 through 9.3-11 in CALC NU-391, Rev. 6, and their comparison to the same tables in Rev. 5 of the same document, shows that, in some cases, this value increases for the lower energy gammas and ¹³⁷Cs. Discuss why this happens. If this is due to large uncertainties associated with calculating small dose rate responses, discuss the process used to ensure that the dose rate response used to control the source limit is an accurate or conservative value. See also RAI 5-4.

This information is required by the staff to determine compliance with 10 CFR 71.47 and 10 CFR 71.51(a)(2).

- 5-6** Discuss the effects of NCT on the thermal barrier and impact limiter models. Discuss the modeling of the impact limiter.

The comparison of the drawing C-110-E-0007, Rev. 19, with the drawing in Appendix 1 of CALC NU-391, shows that nominal dimensions of the impact limiter were used in the shielding calculation. Verify if this is correct.

Table 2-10 of the application indicates that there is some deformation of the impact limiter as a result of NCT drop tests. Discuss if the results of the NCT tests were included in the impact limiter models and justify if these are not. Discuss the result of the NCT tests on the thermal barrier and if these effects were included in the shielding models.

This information is required by the staff to determine compliance with 10 CFR 71.47 and 10 CFR 71.51(a)(2).

- 5-7** Provide additional information justifying that the MCNP calculations have converged properly.

The staff found, from the MCNP input files, that various computing time cut-off (ctme) values were specified. Describe the procedure used to ensure that the MCNP calculations have properly converged. This procedure should include a discussion on how the figure of merit (FOM) and 10 statistical checks were used to ensure the quality of the precision of the calculation and the steps taken when any checks have failed.

Provide the relative error (R value) for all calculations presented in Tables 9.3-1 through 9.3-11 in CALC NU-391, Rev. 6. The MCNP manual states that R values greater than 0.1 are not reliable. Justify the calculations for any R value greater than 0.1.

This information is required by the staff to determine compliance with 10 CFR 71.47 and 10 CFR 71.51(a)(2).

CHAPTER 7 OPERATING PROCEDURES

- 7-1 Modify the language in proposed revision to Operating Procedure 7.1.9B regarding the closure of the secondary system.

By letter dated July 3, 2013 (ADAMS Accession No. ML13189A107), ES proposed a revision to Condition 7 of Rev. 19 of the CoC by deleting this condition and adding step 7.1.9B to the Operating Procedures. The staff finds in principle that adding this step to the operating procedures (as opposed to being a CoC condition) is acceptable; however, the staff finds that the proposed language is ambiguous. Specifically: *“For shipments of payloads that have a potential for hot-particle migration (e.g., activated metals or radioactive sources)...”* could have multiple interpretations. Clarify this language and modify it to remove any ambiguity.

This information is required by the staff to determine compliance with 10 CFR 71.47 and 10 CFR 71.51(a)(2).