



EM Environmental Management

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DOE Packaging Certification Program

**Safety Evaluation Report for
Request to Amend Certificate of Compliance Number 9979
to Increase Tc-99 Limit**

Docket No. 19-41-9979

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Date:

4/4/19

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04/01/2019

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This Safety Evaluation Report (SER) documents the U.S. Department of Energy (DOE) Packaging Certification Program (PCP) independent technical review of the application submitted for the Savannah River Operations Office (SR) to amend DOE Certificate of Compliance (CoC) Number 9979 to increase the limit for Tc-99.

Evaluation

By letter ^[1] dated February 20, 2019, the Savannah River National Laboratory (SRNL) submitted a request and supporting page changes ^[2] to the current Safety Analysis Report for Packaging (SARP) on behalf of SR to amend DOE CoC 9979 to increase the Tc-99 mass limit from 1.00E-06 gram to 4.00E+00 grams in CoC Table 4 – *Content Envelope Limits for LEU Metal Waste*.

The submittal (i.e., application) included SRNL's a chapter-by-chapter assessment of the Tc-99 mass increase and page changes to Revision 5 of the Safety Analysis Report for Packaging (SARP) to implement this change. The mass increase of Tc-99 does not affect the performance of the package or require a change to the packaging design or analysis results reported in the SARP or a change to package operations.

PCP staff reviewed the SARP page changes and performed a confirmatory evaluation. The Tc-99 mass increase in SARP Table 1.4/CoC Table 4 is inconsequential because the total activity limit of one A₂ and the total content mass limit of 90 kg do not change. The total decay heat for this content envelope increased from 5.16 milliwatts to 5.20 milliwatts, but is still significantly below the maximum content heat load of 3.5 watts for the package design. There are no shielding issues for increasing the Tc-99 mass limit to 4.00E+00g because the contribution of Tc-99 to the dose rate is insignificant, since it decays by beta decay with a weak gamma emission (<0.001% yield).

Based on the statements and representations in the application, and PCP staff's confirmatory evaluation, this content change to increase the Tc-99 mass limit is acceptable and will provide reasonable assurance that the regulatory requirements of 10 CFR Part 71 have been met.

Condition of Approval

The 9979 certificate revision was changed from Revision 10, to Revision 11, with the following changes:

- Section 5(b)(2), Table 4: revised Tc-99 from 1.00 E-06 to 4.00 E+00.
- Section 5(e), added (12) Safety Analysis Report for Packaging – Model 9979 Type AF-96, S-SARP-G-00006, Revision 5, Pages-changes: Pages 1-11, 3-7, 5-7, Appendix 4.1-3, and Appendix 5.2-ii, February 20, 2019

Conclusion

Based on the statements and representations in the application, and PCP staff's confirmatory evaluation, staff finds that this change does not affect the performance of the package and will provide reasonable assurance that the regulatory requirements of 10 CFR Part 71 have been met, subject to the conditions above.

References

- [1] *Application for 9979 Package CoC Amendment: Tc-99 Mass Limit Increase for LEU Content Envelope ($\leq 1.25\%$ U-235), SRNL-L4500-2019-00009, Revision 0, Letter from Robert Watkins to James Shuler, February 20, 2019.*
- [2] *Safety Analysis Report for Packaging – Model 9979 Type AF-96, S-SARP-G-00006, Revision 5, Pages-changes: Pages 1-11, 3-7, 5-7, Appendix 4.1-3, and Appendix 5.2-ii, February 20, 2019*