

EnergySolutions's September 15, 2011, Request for NRC Interpretation

Request

EnergySolutions is requesting an interpretation from the U.S. Nuclear Regulatory Commission (NRC) with respect to the definition of Special Nuclear Material (SNM). EnergySolutions proposes that, with respect to uranium-235, waste must be enriched before SNM limitations apply.

Background

Clive is authorized to dispose of Class A radioactive waste in accordance with Utah radioactive material license UT2300249 (RML). As specified by NRC Order, Docket 40-8989, dated January 14, 2003, Clive is exempt from the licensing requirements in 10 CFR 70 and may possess SNM within its restricted area that does not exceed a concentration-based limit (pCi/g), at receipt.

When radioactive waste arrives at Clive, a comprehensive review of the shipment is performed that includes, but not limited to:

- DOT contamination and radiation surveys
- Review of the shipment manifest with respect to its approved waste profile
- Classification check
- Receipt of associated SNM Exemption certification, if applicable
- Review of DOE/NRC Form 741, if applicable
- Manifest reviewed for consistency with waste profiles, isotopes, concentrations, comparison to the SNM Exemption certification and other RML requirements
- If applicable, sampling of waste to check manifested isotopes, waste classification, and compliance with SNM Exemption

With respect to U-235 and its applicability to the RML SNM requirements, the trigger point that starts this process is the determination of enrichment (definitions below). If the U-235 weight percent within a container of radioactive waste is less than or equal to 0.711, then the material is not SNM and the U-235 SNM concentrations within the RML do not apply. The methods used to determine the U-235 enrichment are, but not limited to:

- Designated as SNM on radioactive manifest and/or DOE/NRC Form 741
- Comparison of activity ratios of U-235/234 to U-238 by gamma spectroscopy or alpha spectroscopy
- Weight percent of U-235 by ICP/MS

Supplemented with the above explanation, Clive uses the following regulatory definitions and guidance to support our evaluation.

1. Title 10 CFR 71.4 provides the following definitions for Natural, Depleted and Enriched uranium:
 - *Natural uranium* means uranium with the naturally occurring distribution of uranium isotopes (approximately 0.711 weight percent uranium-235 and the remainder by weight essentially uranium-238).

- *Depleted uranium* means uranium containing less uranium-235 than the naturally occurring distribution of uranium isotopes. (less than 0.711 % uranium-235)
 - *Enriched uranium* means uranium containing more uranium-235 than the naturally occurring distribution of uranium isotopes. (greater than 0.711 % uranium-235)
2. Title 10 CFR 70.4 provides the following definition for Special Nuclear Material:
- Special nuclear material means:* (1) Plutonium, uranium 233, uranium enriched in the isotope 233 or in the isotope 235, and any other material which the commission, pursuant to the provisions of section 51 of the Act, determines to be special nuclear material, but does not include source material; or (2) any material artificially enriched by any of the foregoing but does not include source material.
3. NUREG/BR-006, rev. 7, Instructions for Completing Nuclear Material Transaction Reports and NUREG/BR-007, rev. 6, Instructions for the Preparation and Distribution of Material Status Reports - These documents provide requirements to account for and change status of SNM; specifically, the processing of enriched uranium to normal uranium or depleted uranium. At which time, this processed material is no longer considered SNM but source material.

References

1. NUREG/BR-006, rev. 7, Instructions for Completing Nuclear Material Transaction Reports
2. NUREG/BR-007, rev. 6, Instructions for the Preparation and Distribution of Material Status Reports
3. Utah radioactive material license UT 2300249, amendment 11
4. 10 CFR 70, Domestic Licensing of Special Nuclear Material
5. 10 CFR 71, Packaging and Transportation of Radioactive Material