

5. Section 4.2.6.4 of the Supplement ER states that 60 fifty-five gallon drums per shipment are assumed in order to estimate that 19 to 23 low-level waste shipments will be needed annually. The LPES RADTRAN analysis (LPES, 2013) assumes only 8 drums per shipment for the solid waste shipments and only 4 drums for the “liquid waste” shipments. Why did the analysis only consider 8 or 4 drums per shipment when the Supplement ER assumed 60 per shipment? In addition the external dose rate used is for only one drum (instead of 60) at a distance of 2 meters rather than 1 meter. In this case, the drums would be fairly close to the side of the vehicle and the 1 m dose rate would be more appropriate. If the radionuclide inventory per drum as input to RADTRAN is truly representative, then the accident risk impacts will be notably underestimated if there are 60 drums per shipment. Explain why the external doses used were for one drum instead of 60 drums and why for 2 meters instead of 1 meter.

UUSA Response:

See attached response to RAI 5.

NRC Staff Response:

Similar to #3 above, the request for clarification is with respect to the external dose rate of the low-level waste shipments as it pertains to potential population risk. Transportation risks to both the crew and the public should be estimated in the same manner as originally done in NUREG-0170, *Final Environmental Statement on the Transportation of Radioactive Material By Air and Other Modes*. Note that both ER Rev. 20f and ER Rev. 21 state in Section 4.2.7 that “The dose equivalent to the public and worker for incident-free transportation has been conservatively calculated to illustrate the relative impact resulting from transporting radioactive material.” The use of external dose rate from one drum is certainly not conservative if sixty drums are on the shipment. Provide either:

- a) an estimate of the external dose rate at one meter from the side of the transportation vehicle (with 60 cylinders loaded in the intended configuration) or
- b) a rationale as stated in the clarification request for the apparent use of the external dose rate from one drum to estimate a conservative population risk when 60 drums are on the shipment.

Also provide the potential population accident risks for 60 drum low-level waste shipments.

UUSA Follow-up Response:

The request is for a dose rate at one meter from the side of the transportation vehicle.

The transportation model input dose rate at one meter from the side of the waste transportation vehicle was determined as follows:

The vehicle is assumed to be loaded with (60) 55 gallon waste drums. The expected shipping configuration of this type of shipment would be three close-packed rows of twenty drums each. This configuration would be centered side to side on the shipping trailer. A conservative assumption is that the edge of the outside drums is only one foot from the edge of the trailer bed. The standard dimensions of a 55 gallon drum are 36 inches in height and 24 inches in diameter.

The reference source data provided in Table 2-5 of "Risk Assessment for the Transport of Radioactive Materials for the Proposed URENCO USA Facility Capacity Expansion Lea County, New Mexico" August 2013, LPES, originated from Calc 32-2400525, which supported the original LES license application. This calculation provided a dose rate of 0.0042 mrem/hr, one meter from the drum surface, and an on contact dose rate of 0.0797 mrem/hr.

It was decided that this dose is too conservative and limiting for the potential waste dose rates from the facility. To account for future potential facility waste, an conservatively assumed one inch on contact dose rate of 2.0 mrem/hr was assigned to for a single 55 gallon drum.

Using this conservative on contact dose rate and assuming plane of 20 drums (3 rows of 20, lined up front to back), the requested dose rate estimated was determined using a geometric line source methodology. This methodology can be found in standard health physics manuals such as that found in chapter 10 of "Introduction to Health Physics", 1996, Herman, equation . The requested distance from the trailer, 40 inches, plus the one foot distance between the drum edge and trailer edge results in a 52 inch distance from the drums. The resulting dose rate at one meter from the trailer edge is 0.044 mrem/hr. This dose rate was supplied as the new input term for a revised RADTRAN analysis; see supplemental response to question 4 of this email.