Don Lowman Project Manager, Low-Level Waste Branch Environmental Protection and Performance Assessment Directorate Division of Waste Management and Environmental Protection Office of Federal and State Materials and Environmental Management Programs Two White Flint North MS-T8F5 11545 Rockville Pike Rockville, MD 20852-2738

Dear Mr. Lowman:

This letter is in response to your questions to me by your e-mail dated March 16th 2012. Your questions and the EPRI response follow.

1. Your letter states the following:

Because cartridge filters do not present a gamma dose hazard, cartridge filters should be considered homogenous. The absence of long-lived gamma activity in filters results in cartridge filters not posing any more of a carry away hazard than other metal items in DAW which could be unearthed.

In Appendix I: Impact of Concentration Averaging Low-Level Radioactive Waste Volume Projections to DOE/LLW-1141 (<u>http://www.osti.gov/bridge/servlets/purl/132668-</u> <u>E2nmhe/webviewable/132668.pdf</u>), it is reported that cartridge filters have the potential of being classified as GTCC due to TRU {where plants have operated with failed fuel}, Cs-137, Sr-90, and Ni-63. Assuming filters were considered homogenous, how would filters that would normally be classified as GTCC be handled?

Response:

In the course of the cartridge filter discussion, the staff's concern related to considering cartridge filters homogenous seemed to be mostly about metal housed cartridge filters retaining their shape and posing a hazard (more specifically a gamma dose hazard) to an inadvertent intruder if unearthed. To this point, EPRI's current technical understanding is: 1) filter media will break down, become soil like and disperse and 2) all of activity in all of the filters disposed over four years when averaged was a fraction of class A.

While acknowledging that a breakdown of the filter media may occur, the staff remained concerned that the activity on the media would primarily remain within the metal housing in the disposal cell and thus present a "hot spot." The comment above reflected the results of EPRI's analysis, which determined that long-lived gamma emitters are primarily soluble and therefore are not present in any significant quantity on cartridge filters designed to remove only insoluble contaminants. The disposal history supports this analysis. Long lived beta emitters and TRU nuclides were not a direct exposure concern to the staff in the cartridge filter carry away scenario as discussed in the August 2011 meeting in Albuquerque.

In addition to TRU nuclides and Cs-137, Sr-90, and Ni-63 stated in Question 1, cartridge filter waste classification could also theoretically be driven by any 10 CFR Part 61.55

Table 1 or Table 2 nuclide(s) present in an insoluble form. Generally with fuel clad performance far better today than it was in 1991 (issue date of referenced INEL report) currently cartridge filter waste classification is most often driven by the long-lived beta emitters Ni-63 or C-14. If filters were considered homogenous, they could be classified on a batch basis using the actual waste volume and the actual waste weight with a dose rate to curie method such as Dry Active Waste and resins can be classified today. It is possible that cartridge filters when evaluated individually as being above a class limit could be averaged with filters below a class limit such that the overall package classification would be of the lower class; however, that condition already exists in the averaging guidance and it has been proposed to be expanded upon. Therefore, the treatment of filters classified as GTCC in this method would be no different than it is today except that far less physical and administrative effort would be incurred managing filters as individual items.

In general there continues to be more concern placed on the source term in cartridge filters as compared to other homogenous wastes such that filters are required to be managed in the same fashion as activated hardware (i.e., on an individual basis). This concern is not commensurate with the source term hazard in the historical LLW waste stream where approximately 81% of the total activity is in activated hardware, 14% is in resin, only 4% is in filters and <1% is in DAW. In this same waste stream sampling >90% of the Nb-94 is contained in activated hardware and >95% of the Cs-137 and >84% of the TRUs are contained in resin. Considering the proportions of the nuclides of concern in the various waste types and the higher risk that resins (already considered a homogenous waste type) present in the disposal site; cartridge filters would be more appropriately treated as homogenous waste rather than as individual items such as activated hardware components.

2. Your letter states the following:

This cartridge filter restriction in the BTP creates an unnecessary burden on sampling, characterization and packaging and results in additional dose to actual people.

If filters were considered homogenous, please detail how filters would be classified/averaged and how sampling, characterization and packaging would be less burdensome. Also, please provide how dose will be reduced.

Response:

There are many ways to satisfy the sampling and characterization requirements for waste in accordance with established guidance and regulations. Currently licensees are mandated to characterize cartridge filters individually. Sampling programs may consist of sampling individual filters, sampling a representative filter from time to time (at least annually for class B and C waste streams), surrogate filtration of the liquid stream and analysis, or other methods. The emphasis on the individual characterization of filters often dictates the emphasis on individual sampling of filters. By using a dose rate to curie method on a liner of filters based on a surrogate sampling method (instead of individual characterization of filters), the need for unnecessary filter handling during survey and sampling can be eliminated and reduce dose to personnel in the process. By using the described method, the work associated with characterizing a liner of cartridge filters on an individual filter basis and the documentation associated with the individual characterization is eliminated, Licensees would still be required to maintain an

inventory of filters in a liner and fractionally associate Part 61 samples with quantities of individual filters in a liner for dose rate to curie modeling, but this is simpler and less dose intensive than the current practice.

I hope this clarifies EPRI's comments to NRC Staff regarding a revision to the Concentration Averaging Branch Technical Position and cartridge filters.

Best Regards,

Lisa Edwards

cc: Jim Kennedy USNRC Neil Wilmshurst EPRI Christine King EPRI Dave Perkins EPRI Billy Cox EPRI

| From: | Edwards, Lisa |
|--------------|---|
| To: | Kennedy, James; Lowman, Donald |
| Cc: | Wilmshurst, Neil; King, Christine; Perkins, David; Cox, Billy |
| Subject: | Follow Up to questins on BTP |
| Date: | Monday, April 02, 2012 6:14:54 PM |
| Attachments: | Don Lowman response finalr2.docx |

Don,

Thank you for providing EPRI an opportunity to clarify some of our earlier comments on the BTP. Please find attached our response for the public record. As always, if you have any questions, need clarifying information, or would like to discuss, please feel free to contact me (contact info below). It continues to be a pleasure to engage with you and the rest of the NRC on this very important topic.

If this needs to be submitted via another channel, please let me know and I will make arrangements.

Thank you, Lisa M. Edwards Sr. Program Manager Nuclear Chemistry, Low Level Waste & Radiation Management Group Science & Technology Division Electric Power Research Institute 3420 Hillview Avenue | Palo Alto, CA 94304 Tel: 469-586-7468 Email: ledwards@epri.com www.epri.com Together...Shaping the Future of Electricity