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USA



Pennsylvania Department of Environmental Protection

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January 17, 2006

Office of Waste, Air and Radiation Management

717-772-2724

Nils J. Diaz, Ph.D.
Chairman
United States Nuclear Regulatory Commission
Washington, DC 20555-0001

CHAIRMAN REC'D
06 JAN 23 AM 10:25

Re: Disposal and licensing of tritium exit signs

Dear Chairman Diaz:

The Commonwealth of Pennsylvania's Department of Environmental Protection (Department) would like to bring to your attention our concern regarding the improper disposal of generally licensed tritium exit signs in landfills within our state, as well as the rest of the United States. It is my understanding that on a regular basis, NRC receives official reports related to tritium exit signs being (presumably) inadvertently disposed of in RCRA Subtitle D landfills. For example, on December 23, 2005, the state of Wisconsin reported to the NRC (in Event Report No. 42225) that 56 tritium exit signs were lost, containing up to 1,680 curies (Ci) of tritium. This report concludes "...it appears they were sent to a landfill with the general trash." This is a very large quantity of radioactive material improperly disposed of in a landfill. The Department conducted a query of your event-reporting database (NMED) and found that there were roughly 390 such devices reported either lost, missing, stolen, or improperly disposed of between the years 2000 and 2006. However, considering the hundreds of thousands of these devices in use, we suspect the number of reported lost tritium exit signs grossly underestimates those actually lost and disposed of improperly.

Several years ago we promulgated solid waste regulations that required landfills to monitor incoming solid waste for radioactive material and that they develop site-specific response action plans. This very successful program has prevented many generally licensed and orphan gamma-emitting sources from being improperly disposed of in our 50-plus active landfills. However, given the beta decay emission involved, we knew tritium exit signs would not be detected in such monitoring. We, therefore, provided guidance to these facilities regarding recovery of tritium exit signs, should they be discovered visually. This new active radiation monitoring program at our landfills has also prompted us to perform a landfill leachate survey with subsequent radiological analysis of samples in late 2004. The radiological analysis of the collected leachate samples was comprehensive and included tritium.



Enclosed for your reference is a copy of a report our support contractor provided to us in October 2005. This report is also available on our Department's Bureau of Radiation Protection web site at <http://www.depweb.state.pa.us>, Keyword: "Radiation," go to the Radiation Control Division, and the sub-page on "Monitoring of Radioactive Materials in Solid Waste." A review of the data in this report indicates that radioactive materials normally occurring in the environment (i.e., natural and residual fallout) will account for all the gross radioactivity results except for tritium. As you will note from the first graphic in Attachment A of the report, tritium concentrations ranged from background to nearly 100,000 picocuries per liter (pCi/L). In the fall of 2004, over 90% of the landfill leachate samples had detectable tritium, with over 50% having levels above the U.S. Environmental Protection Agency's (EPA) community water systems Maximum Contaminant Level (MCL) of 20,000 pCi/L (40 CFR Chapter 1 Part 141.66). Another round of landfill leachate sampling and analysis was performed in late 2005 for tritium only, with similar preliminary results and one landfill above 180,000 pCi/L.

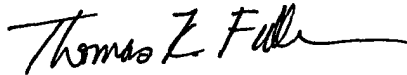
In view of the amount of tritium that is being detected by our Pennsylvania landfill leachate monitoring program, it is apparent to us that many licensees possessing tritium exit signs are not returning the devices to the manufacturer or otherwise providing for proper disposal. This conclusion is based on the fact that there is no other source of tritium in the private sector that could be causing such levels of tritium in leachate. That is, each exit sign can contain up to 20 Ci of tritium, or 20,000,000,000,000 pCi, thus, one improperly disposed of exit sign can easily cause the tritium in leachate concentrations we're observing. Further, it is our understanding that other states and countries outside the U.S. have seen similar tritium levels in landfill leachate. In fact, the EPA recently high lighted tritium exit signs as a disposal problem in its October 2004 training CD-ROM "Identifying Radioactive Sources at the Demolition Site."

In light of the fact that there are alternative methods available for emergency lighting, we feel that the NRC should re-evaluate the conditions of use for tritium exit signs as a generally licensed source. Specifically, an immediate evaluation of the safety criteria presented by manufacturers of these tritium exit signs would be prudent, as we believe the data in our report indicates the condition in 10 CFR32.23(a) may not be met, and the related dose limit in the organ dose table in 10 CFR32.24 (Column I) could be exceeded under reasonable leachate discharge exposure scenarios. It is also our opinion that the labeling requirements for these devices are inadequate to alert the licensee's personnel that it contains radioactive tritium, and the device requires proper disposal. The Department believes it would be reasonable for the NRC to issue a condition by order to all generally licensed users of tritium exit signs, indicating that they inventory and report to the NRC, on an annual basis, the number and location of tritium exit signs in their possession. It is apparent from the results of our landfill leachate survey report that the NRC's current regulatory program for these tritium exit signs is not adequate to prevent the improper disposal of these devices. Thus, with all due respect, we recommend the NRC promptly re-evaluate the regulatory and licensing aspects of these tritium exit signs.

January 17, 2006

Should you or your staff have any questions about our landfill leachate study, or other radiation protection matters in the Commonwealth, please contact me by e-mail at tfidler@state.pa.us or at the telephone number above, or contact Mr. David Allard, Director of the Bureau of Radiation Protection, by e-mail at djallard@state.pa.us or by telephone at 717-787-2480. Thank you for your consideration of our recommendations.

Sincerely,



Thomas K. Fidler
Deputy Secretary

Enclosure

cc: (with no enclosure)
Secretary McGinty
David J. Allard, BRP
Samuel J. Collins, NRC, Region I
George Pangburn, NRC, Region I
Robert Bores, NRC, Region I
Janet M. Schleuter, NRC, STP
Stephen L. Johnson, EPA Administrator
Donald Welsh, EPA, Region 3