March 10, 2006

Mr. Thomas K. Fidler, Deputy Secretary
Pennsylvania Department of Environmental Protection
P.O. Box 2063
Harrisburg, Pennsylvania 17105

SUBJECT: U.S. NUCLEAR REGULATORY COMMISSION RESPONSE TO PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION LETTER ON DISPOSAL AND LICENSING OF TRITIUM EXIT SIGNS

Dear Mr. Fidler:

On behalf of the U.S. Nuclear Regulatory Commission (NRC), I am responding to your January 17, 2006 letter to Chairman Diaz, in which you expressed concerns regarding the disposal and licensing of tritium exit signs. Your concerns were based on a report prepared for the Pennsylvania Department of Environmental Protection by Civil & Environmental Consultants, Inc., dated October 3, 2005. That report states that tritium was detected in the leachate of over 90 percent of the landfills sampled, and over 50 percent of the samples contained tritium concentrations above the U.S Environmental Protection Agency's (EPA) drinking water Maximum Contaminant Level. Your letter also stated that you searched the Nuclear Material Events Database (NMED), and found approximately 390 tritium exit signs have been reported as lost, missing, stolen, or improperly disposed, between 2000 and 2006, and that the tritium in Pennsylvania landfills was caused by improper disposal of these generally licensed devices. Your letter stated that the applicable dose limits in 10 CFR Part 32 could be exceeded under reasonable leachate discharge exposure scenarios. You recommended that the NRC reevaluate the conditions of use for tritium exit signs as a generally licensed device, improve the labeling requirements to include a greater emphasis on proper disposal, and issue orders that require all generally licensed users of tritium exit signs to conduct annual inventorying and reporting.

During the five year period discussed in your report, the NRC implemented improvements to the general license regulations. As you are aware, NRC amended its regulations concerning generally licensed devices beginning in the 1990s and published the final rule on December 18, 2000 (65 FR 79188). The revised requirements in Title 10, *Code of Federal Regulations* (10 CFR) 31.5 became effective on February 16, 2001, for NRC licensees. Agreement State regulations were to be made compatible by February 16, 2004. The final rule requires annual registration for certain radionuclides; however, because the quantity and radiological properties of tritium present lower risk significance than the other radionuclides selected for annual registration, tritium was not included in the list of radionuclides. The rule continued the requirement for manufacturers of generally licensed devices to provide users of generally licensed devices with a copy of the regulations in 10 CFR 31.5. The rule also requires that the general licensee appoint an individual to be responsible for knowing what regulatory requirements are applicable to them, to have authority to take required actions to comply with the regulations, and through whom the general licensee can carry out its regulatory responsibilities. The rule also added provisions that limit the amount of time a general licensee

can keep an unused device, that allow transfer of generally licensed devices to specifically-licensed waste brokers, and that require notifying the NRC of address changes.

During the public comment period on the July 26, 1999, proposed rule (64 FR 40295), stakeholders submitted several comments related to tritium exit signs. Some stakeholders believed that tritium exit signs should be exempt products (similar to smoke detectors) pursuant to 10 CFR Part 32. Others believed that the additional requirements for generally licensed devices should not apply to tritium exit signs. Another stakeholder believed that exit signs should be handled differently because they are more likely to be disposed of improperly. In responding to these comments in the Statements of Consideration (65 FR 79168-79183), the NRC stated that it did not believe it would be appropriate to exempt exit signs, which would have allowed them to be placed in normal trash. The NRC noted that users of exit signs generally had the lowest awareness of the regulations, but that the additional requirements in the rule would increase awareness of regulatory responsibilities and accountability for all general licensees, including users of exit signs. The NRC believed that the requirement for providing the primary applicable regulations and additional information to customers before sale, together with the requirements for general licensees to appoint a “responsible individual,” would significantly improve general licensee awareness of, and ultimate compliance with, regulatory requirements. Furthermore, the NRC did not believe that adding an inventory requirement for all generally licensed devices was appropriate, and, the annual inventory requirement was limited to higher-risk devices.

Concerning the large number of tritium exit signs in use, those few involved in incidents of mishandling, loss, or breakage, constitute a low potential risk to public health and safety, particularly when viewed against the higher potential impacts that could be caused by devices requiring registration. NRC NUREG-1717, “Systematic Radiological Assessment of Exemptions for Source and Byproduct Materials,” dated June 2001, contains a dose assessment for tritium gun-sight disposal at landfills. Table 2.14.3, of the NUREG describes a dose assessment for an annual hypothetical landfill disposal of 3,000 Curies (Ci) of tritium gun sights. This methodology can be used to estimate the impacts of any improperly disposed exit signs. Considering the 390 tritium exit signs NMED reported lost, abandoned, or stolen, for the five year period 2000 to 2006, and assuming that each sign contains a maximum of 20 Ci, approximately 1,560 Ci of tritium annually could hypothetically have been improperly disposed in landfills. By using a scaling comparison with the NUREG-1717 values, the individual annual effective dose equivalent for the exit signs would be 0.0005 mrem for the waste collector. The dose to any member of the general public would be considered to be less than the waste collector due to less exposure to the material. Even considering the possibility that the reported number of lost, abandoned, or stolen tritium exit signs may be underestimated by the NMED data, the results would still be much less than the Column I, 1 mrem annual limit, in the 10 CFR 32.24, Table of organ doses. In addition, and as noted in the Pennsylvania report, all the leachate tritium activity concentrations measured by this sampling campaign are below the NRC effluent and sewer concentration limits in 10 CFR 20.2001(a)(3). Also, as noted in the Pennsylvania report, the landfill leachate, through treatment by a Pennsylvania Publicly Owned Treatment Works, is diluted by factors of 1.4 to 546, with resulting effluent concentrations of tritium being less than the EPA drinking water limit of 20,000 pCi/L, before release to the environment.

In conclusion, we believe that the current regulatory program provides requirements that promote safe disposal of generally licensed devices, including tritium exit signs. The incidents of mishandling, loss or breakage that have occurred constitute a low potential risk to public health and safety. We thank you for sharing your concerns and we will consider the issues you have raised as we continue to monitor the effectiveness of our general license program.

Sincerely,

/RA/

Jack R. Strosnider, Director
Office of Nuclear Material Safety
and Safeguards

In conclusion, we believe that the current regulatory program provides requirements that promote safe disposal of generally licensed devices, including tritium exit signs. The incidents of mishandling, loss or breakage that have occurred constitute a low potential risk to public health and safety. We thank you for sharing your concerns and we will consider the issues you have raised as we continue to monitor the effectiveness of our general license program.

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Jack R. Strosnider, Director
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