[7590-01-P]

NUCLEAR REGULATORY COMMISSION

10 CFR Part 32

Docket No. PRM-32-6

[NRC-2009-0547]

Association of State and Territorial Solid Waste Management Officials

Denial of Petition for Rulemaking

AGENCY: Nuclear Regulatory Commission.

ACTION: Petition for rulemaking; denial.

SUMMARY: The U.S. Nuclear Regulatory Commission (NRC) is denying a petition for rulemaking (PRM-32-6) submitted by the Association of State and Territorial Solid Waste Management Officials (ASTSWMO or the petitioner). The ASTSWMO requested that the NRC amend its regulations to improve the labeling and accountability of tritium exit signs. The ASTSWMO believes the majority of unaccounted tritium exit signs are disposed of in solid waste landfills where they become potential sources of groundwater and surface water contamination. The ASTSWMO requested that the NRC revise its regulations or guidance to require that: the labeling be in several locations on the sign and printed with larger font; an expiration date should be distinctly legible to a fire or building inspector without taking down the sign; and the radiation trefoil should be displayed on the front and back of advertisements. Although not a specific request for rulemaking, the petitioner recommended that a national collection effort with

distinct milestones and goals be undertaken to consolidate all expired and disused tritium exit signs. The petitioner requested that the NRC organize a meeting with ASTSWMO and all interested stakeholders to set a new path forward on this issue. The NRC is denying PRM-32-6 for the reasons stated in this document.

DATES: The docket for PRM-32-6 is closed as of [**insert date of publication**].

ADDRESSES: You can access publicly available documents related to this petition for rulemaking using the following methods:

- **NRC'S Public Document Room (PDR):** The public may examine and have copied, for a fee, publicly available documents at the NRC's PDR, Room O1-F21, One White Flint North, 11555 Rockville Pike, Rockville, Maryland 20852.
- **NRC's Agencywide Document Access and Management System (ADAMS):** Publicly available documents created or received at the NRC are available online in the NRC Library at *http://www.nrc.gov/reading-rm/adams.html*. From this page, the public can gain entry into ADAMS, which provides text and image files of NRC's public documents. If you do not have access to ADAMS or if there are problems in accessing the documents located in ADAMS, contact the NRC's PDR reference staff at 1-800-397-4209, 301-415-4737, or by e-mail to *pdr.resource@nrc.gov*.
- **Federal Rulemaking Web Site:** Public comments and supporting materials related to this document can be found at *http://www.regulations.gov* by searching on Docket ID NRC-2009-0547. Address questions about NRC dockets to Carol Gallagher, telephone: 301-492-3668; e-mail: *Carol.Gallagher@nrc.gov*.

FOR FURTHER INFORMATION CONTACT: Gregory Trussell, Office of Federal and State Materials and Environmental Management Programs, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, telephone: 301-415-6445, e-mail: *Gregory.Trussell@nrc.gov*.

SUPPLEMENTARY INFORMATION:

The Petition

More than 2 million tritium exit signs are estimated to have been sold in the United States. Tritium powered self luminous exit signs do not require electricity or batteries, and are commonly installed in areas where electrical power is not conveniently accessible or its use may be hazardous. The tritium exit sign remains lit during power outages and thus serve their intended purposes in emergencies. As tritium exit signs age, they do not glow as brightly and at some point will not meet the luminosity requirement of applicable building or fire safety codes and are replaced. A self-luminous exit sign is a non-electrical product that uses radioactive tritium gas to produce light. Specifically, the signs contain light sources that consist of glass tubes, internally coated with phosphor, and filled with tritium gas. Tritium (H-3) is an isotope of hydrogen that emits low-energy beta radiation in the form of electrons. These electrons excite the phosphor, causing the glass tubes to continuously emit light. This low-energy beta radiation cannot penetrate the glass tube. If the tubes in the exit signs are severely damaged, tritium may escape and disperse by diffusion in the air.

On January 12, 2010 (75 FR 1559), the NRC published a notice of receipt of a petition for rulemaking filed by ASTSWMO. The ASTSWMO requested that the NRC amend its regulations to improve the labeling and accountability of tritium exit signs.

The ASTSWMO believes the majority of unaccounted for tritium exit signs are disposed of in solid waste landfills where they become potential sources of groundwater and surface

water contamination. The ASTSWMO specifically requested that the NRC revise its regulations or guidance to state that: the labeling should be in several locations on the sign and printed with larger font; an expiration date should be distinctly legible to a fire or building inspector without taking down the sign; and the radiation trefoil should be displayed on the front and back of advertisements. Also, the petitioner recommended that a national collection effort with distinct milestones and goals should be undertaken to consolidate all expired and disused tritium exit signs. The petitioner requested that the NRC organize a meeting with ASTSWMO and all interested stakeholders to set a new path forward on this issue. The petitioner stated that it would ideally like to see tritium exit sign technology immediately replaced by alternative technologies.

The ASTSWMO, after an evaluation of a case history of landfill leachate sampling, asserted that the majority of unaccounted for tritium exit signs are disposed in solid waste landfills where they become potential sources of groundwater and surface water contamination. The petitioner also claimed that a minority of tritium exit signs are returned to the manufacturer for recycling or disposed of as low-level radioactive waste.

The ASTSWMO also made the assertion that advances in photo-luminescent technology over the past decade have demonstrated that effective alternate technology exists for places without electricity, replacing the need for tritium self-luminescent exit signs.

Petitioner's Requests

The petitioner made several requests for rulemaking that would require revision to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 32, as well as requests that are outside the rulemaking process. The petitioner requested the following:

(1) Labeling should be in several locations on the sign with larger font. The basis for this request is the petitioner's belief that an increased number of labels on tritium exit signs will

improve the ability to recognize the signs, which in turn will improve the accountability of the signs.

(2) An expiration date should be distinctly legible to a fire or building inspector without taking down the sign. As with adding labels in several locations on the sign, the basis for this request is the petitioner's belief that an expiration date that is legible without the need to remove the sign from where it is installed will improve the ability to recognize tritium exit signs, which in turn, will improve the accountability of the signs.

(3) The radiation trefoil should be displayed on the front and back of advertisements. The petitioner communicated several concerns as the basis for this request: a) manufacturers do not always demonstrate accountability in distributing tritium exit signs to the proper recipients; b) recipients of signs are not informed of the proper ownership and regulatory requirements provided in NRC guidance documents and regulations (i.e., NUREG-1556, Vol. 16, Appendix L, and 10 CFR 31.5); and c) online vendors do not always highlight the fact that tritium is radioactive and has special general licensing requirements. The petitioner believes that requiring the display of the radiation trefoil in advertisements is a way to make potential customers fully aware that tritium in exit signs is radioactive material. The petitioner believes trefoils in advertisements would act as a safeguard against customers unknowingly acquiring exit signs that require regulatory controls.

(4) Replacement of tritium exit signs with an alternative technology. The petitioner believes that the state of current photo-luminescent technology and other alternatives can effectively replace tritium exit signs.

(5) A national collection effort to prevent the improper disposal of tritium exit signs.

(6) Organize a meeting with ASTSWMO and interested stakeholders outside of the rulemaking process. The petitioner offered to provide input to the NRC on approaches to cease this improper disposal of tritium exit signs.

Because item 4 is outside the NRC's regulatory authority and mission, and items 5 and 6 are not specific requests to change NRC regulations, comments on these proposals are not being addressed further in this response. The NRC will respond to the petitioner on these issues via separate correspondence.

Public Comments on the Petition

The notice of receipt of the petition for rulemaking (75 FR 1559) invited interested persons to submit comments. The petition was also shared with 37 Agreement States that regulate the manufacture and use of tritium exit signs within their States, under agreement with the NRC. The comment period closed on March 29, 2010. The NRC received responses from 13 commenters including 2 manufacturers, 6 Agreement States, 1 Federal agency, and other industry representatives. The following provides a summary of the comments received on the petition.

Public Comments on Petitioner Requests Involving Rulemaking

The petitioner requested improving the labeling of tritium exit signs by requiring the placement of labels in several locations on the sign, in larger font to improve recognition, and thus accountability. The majority of commenters agreed that labeling should be improved and no commenter specifically disagreed with this request.

The petitioner requested requiring the placement of an expiration date on tritium exit signs, and making the date distinctly legible to a fire or building inspector without the need to take down the sign. The rationale is that the fire or building inspector will be aware of an expired sign and request the replacement. Four commenters agreed. Two vendors commented

that their exit signs already clearly show the expiration date and further noted this issue does not fall under the jurisdiction of the NRC.

The petitioner requested placement of the radiation trefoil prominently on the front and back of advertisements for the exit signs to ensure that general licensees understand that these signs contain radioactive byproduct material and are subject to regulatory controls. Five commenters agreed with this request.

One commenter who disagreed questioned, in general, the effectiveness of this action. Another commenter stated that the assertion that customers are not properly sensitized to the fact that the signs contain radioactive material is "completely unwarranted." This commenter also stated that given that NRC regulations provide for the use of the trefoil where radioactive material is present, the placement of the trefoil in advertisements is inappropriate. Similarly, another commenter stated that placing the radiation trefoil on advertisements is not appropriate as advertisements do not contain radioactive material.

Public Comments on Petitioner's Claims Concerning

Tritium Exit Signs in Landfills

Three commenters disagreed with the petitioner's assertion that unaccounted for tritium exit signs disposed of in solid waste landfills are a potential source of groundwater and surface water contamination. One commenter stated it did not believe that the inadvertent disposal of tritium exit signs poses a significant public health and safety issue, even if the relatively large numbers suggested by ASTSWMO are accurate. Another commenter stated that while it is true that sampling of raw, untreated leachate from landfills in Pennsylvania and California confirmed above background levels of tritium, it has been determined that, considering the treatment,

dilution, and discharge processes to which this leachate is subjected, there is currently no risk to drinking water supplies or possible human exposure.

Reasons for Denial

After reviewing the information provided in the petition, and the comments received in response to the petition, the NRC has decided to deny PRM-32-6. In reaching this decision, the NRC reviewed the radiological risks presented by tritium exit signs and from the levels of tritium reported in landfill leachate and determined that there is a lack of significant radiological risk to the public health and safety related to the petitioner's assertions. The NRC determined that the existing NRC regulations adequately direct the proper methods of use, disposal, labeling, and information disclosure for tritium exit signs and that there is no significant risk to the public health and safety. However, the NRC believes that general licensee accountability may be strengthened by enhancing regulatory guidance and improving communications between the NRC (and Agreement States) and manufacturers. The NRC periodically revises its licensing guidance and will evaluate the need for additional guidance in areas raised by the petitioner during this process.

Users of tritium exit signs are regulated under the general license provisions in 10 CFR 31.5. The general license in 10 CFR 31.5 requires users: not to remove the labeling from the sign; to follow instructions and precautions on the label; not to abandon a sign; to properly dispose of signs by transferring them to a distributor or radioactive waste broker specifically licensed by the NRC or an Agreement State; to report any lost, stolen or broken sign(s) to the NRC; and not to give away or sell the sign to another individual, company, or institution unless it is to remain in use at a particular location, e.g., in a transfer of ownership of a building. In this latter case, under 10 CFR 31.5(c)(9)(i), the user of a tritium exit sign is

required to provide a copy of the regulatory requirements governing the use of such signs to the new user and must notify the NRC of the transfer. The user is also required to inform the NRC of a company name change or change of address; and to make certain other reports to the NRC.

The petitioner raised questions about the requirements placed on distributors related to whether users and others who come into contact with the sign are properly informed of the fact that the sign contains radioactive material and is subject to certain controls, in particular controls for disposal. Vendors of these products must obtain a license from the NRC or an Agreement State to distribute the signs to the general licensees, under 10 CFR 32.51 or equivalent provision of an Agreement State. The NRC and Agreement State regulations include requirements for labeling and safety instructions which require providing certain information to customers prior to transfer of the signs, including copies of applicable regulations and information on options for and estimated costs of disposal.

The petitioner stated that there needs to be multiple labels in several locations and that the labels need to be printed in larger font. The petitioner also requested that the expiration date be distinctly legible to a fire or building inspector without taking down the sign. To obtain a license to distribute tritium exit signs, an applicant must submit sufficient information related to its labeling of the exit signs. Specifically, under 10 CFR 32.51(a)(3), the applicant for a license to distribute tritium exit signs must ensure that the label on the signs be durable, legible, clearly visible, and include certain information including that use of the sign is subject to a general license and the regulations of the NRC or equivalent provisions of an Agreement State and that the label must be maintained in legible condition. The NRC or an Agreement State must approve the applicant's proposed labeling when authorizing distribution to users, at which time the regulator can address the appropriateness of fonts and proper placement on the sign. The expiration date (i.e., the date the sign should be replaced in order to meet fire safety standards),

is not a matter of NRC regulation because it focuses on the visibility of the sign, not the safe use of the radioactive material and is more appropriately addressed by other agencies responsible for fire safety.

The petitioner requested that the radiation trefoil be displayed on the front and back of advertisements. The NRC agrees with some of the commenters that the use of the trefoil on advertisements is not appropriate since use of the trefoil is utilized where radioactive material is actually present. The NRC has emphasized the importance of notifying end users of requirements for the use of generally licensed devices. For example, in an earlier NRC action related to misleading advertising, the NRC issued Information Notice (IN) 99-26, "Safety and Economic Consequences of Misleading Marketing Information," dated August 24, 1999. The IN 99-26 highlighted that misleading marketing information and inadequate explanation of end-user regulatory requirements can lead to mishandling of devices used under the general license and encouraged manufacturers and distributors to market to users of the general license in such a way that the radioactive nature of the product is clearly understood and the regulatory requirements associated with the product are clearly explained. Under 10 CFR 32.51a(a)–(c) or equivalent Agreement State regulation, distributors are required to supply to customers prior to the actual transfer of the sign(s), copies of relevant regulations, information on acceptable disposal options including estimated costs of disposal, and indication of the NRC's policy of issuing high civil penalties for improper disposal.

Prior to NRC receiving this petition, the State of Pennsylvania contacted the NRC in 2006, relaying its concerns regarding possible improper disposal of tritium exit signs. The Conference of Radiation Control Program Directors also brought this issue to the attention of the NRC, via a 2007 resolution.

The NRC has previously implemented several measures to address this issue. The NRC implemented regulations to improve accountability of devices used under a 10 CFR 31.5 general license or an equivalent Agreement State provision (65 FR 79162; December 18, 2000, as amended at 65 FR 80991; December 22, 2000). Although disposal by transfer to a properly authorized specific licensee was always required, the previous regulatory framework did not require NRC or Agreement State notification of the transfer and disposal of tritium exit signs. Under current regulations, NRC and Agreement States users or general licensees are required to report transfer or disposal of devices containing byproduct material.

The NRC, in an effort to improve compliance with the regulatory requirements for tritium exit signs, issued Regulatory Issue Summary (RIS) 2006-25, "Requirements for the Distribution and Possession of Tritium Exit Signs and the Requirements in 10 CFR 31.5 and 32.51a," dated December 7, 2006, which reiterated the requirements that distributors of tritium exit signs must follow when transferring them to general licensees. These requirements deal primarily with information that must be provided to customers. In addition, the RIS 2006-25 reiterated the requirements for general licensees regarding transfer and disposal of the tritium exit signs, with the intent of minimizing the chance that tritium exit signs will be disposed of incorrectly.

The NRC issued a Demand for Information (DFI) on January 16, 2009, which required that general licensees who possessed at least 500 tritium exit signs perform an inventory and report the results to the NRC. The results of the DFI demonstrated there is still some lack of awareness among users of tritium exit signs concerning their regulatory responsibilities which could, and in some cases did, result in the improper disposal of tritium exit signs. The NRC considered enforcement action against general licensees that were found not to have complied with the regulatory requirements. In one case in which one entity using the general licensee provisions failed to appoint an individual responsible for ensuring compliance with NRC requirements pertaining to tritium exit signs and improperly transferred signs, the NRC

determined that a civil penalty of $369,300 could be appropriate for improper transfer or disposal of large numbers of tritium exit signs.

In response to the DFI findings, the NRC contacted seven distributors of tritium exit signs in an effort to improve compliance with the reporting requirements of 10 CFR 32.52 and equivalent Agreement State provisions. The NRC initiated this contact with the goal of assisting distributors in their efforts to consistently provide the NRC with information that satisfies the reporting requirements in 10 CFR 32.52. This information reported under 10 CFR 32.52 pertains to the general licensees to whom distributors have transferred signs.

The petitioner asserted that "the majority" of unaccounted for tritium exit signs are disposed in solid waste landfills where they may become potential sources of groundwater and surface water contamination. The NRC concludes that the petitioner did not demonstrate that the excess tritium being found in landfill leachate, even if resulting from improper disposal of tritium exit signs, could result in hazardous levels of tritium in drinking water. Published reports such as "Radiological Investigation Results for Pennsylvania Landfill Leachate: 2009 Tritium Update," Safety and Ecology Corporation, Knoxville, TN, March 31, 2010, support this conclusion. The study incorporated the use of site-specific dilution factors based on factors such as discharge rates and known distances between leachate effluent release points and downstream water supply intakes to convert observed leachate tritium concentrations into diluted tritium concentrations assumed to be available for human consumption. The report concluded not only that the resulting concentrations of tritium were well below the U.S. Environmental Protection Agency (EPA) maximum contaminant level (MCL) of 20,000 pCi/L for tritium in drinking water, but that "average drinking water intake tritium concentrations…were more than 200 times less than the EPA 20,000 pCi/L MCL, ranging from 0 – 99 pCi/L."

The petitioner also expressed concern that samples collected from leachate collection systems exceeded 20,000 pCi/L. It should be noted that 20,000 pCi/L is the EPA's MCL for

tritium in drinking water and not leachate. Landfill monitoring reports show that despite high tritium concentrations in leachate, drinking water samples collected downstream of landfills maintain tritium concentrations well below the EPA's MCL. For example, the "Radiological Investigation Results for Pennsylvania Landfill Leachate: 2009 Tritium Update" report, referenced above, shows that "maximum drinking water [tritium] intake concentrations were over 100 times less than the EPA 20,000 pCi/L MCL ranging from 0 to 146 pCi/L."

While the NRC does not regulate solid waste landfills, the NRC staff also concluded that current landfill practices would mitigate the impacts from tritium released from any exit signs that may be disposed in landfills. These include: cover systems that minimize rainfall penetration and limit the migration of tritium due to erosion or interaction with animals; cell liners that prevent leachate from leaking into the groundwater; gaseous extraction wells that remove gases building up within the landfill; and leachate collection systems that collect, process, and treat leachate.

In addition to reviewing these previously published reports and comparing tritium concentrations measured in leachate and drinking water to regulatory standards, the NRC reviewed the possible risks to landfill workers and the general public from exposure to tritium associated with landfill disposals. The NRC determined that tritium contamination involves such low levels of tritium that it would not pose a health and safety threat to the landfill worker or the general public.

Conclusion

The NRC is denying the petition for rulemaking because the NRC's current regulations in this area are adequate to protect public health and safety. In conclusion, the petitioner has not submitted any new information that indicates a health and safety issue that warrants rulemaking or calls into question the existing regulatory requirements. Existing NRC regulations provide reasonable assurance that public health and safety are adequately protected. For the reasons cited in this document, the NRC denies the petition.

Dated at Rockville, Maryland, this 2nd day of December, 2011.

For the Nuclear Regulatory Commission.

/RA/

Annette L. Vietti-Cook,
Secretary of the Commission.