

NUCLEAR REGULATORY COMMISSION

10 CFR Part 40

[Docket No. PRM-40-29]

Terrence O. Hee, Ion Technology; Denial of Petition for Rulemaking

AGENCY: U.S. Nuclear Regulatory Commission.

ACTION: Denial of petition for rulemaking.

SUMMARY: The U.S. Nuclear Regulatory Commission (NRC) is denying a petition for rulemaking (PRM-40-29) submitted by Terrence O. Hee, Ion Technology. The petitioner requested that the NRC amend its regulations regarding unimportant quantities of source material to exempt end users of a catalytic device containing thorium from the NRC's licensing requirements.

ADDRESSES: Publicly available documents related to this petition may be viewed electronically on the public computers located at the NRC's Public Document Room (PDR), O1-F21, One White Flint North, 11555 Rockville Pike, Rockville, Maryland. The PDR reproduction contractor will copy documents for a fee. Selected documents, including comments, may be viewed and downloaded electronically via the NRC rulemaking web site at: <http://ruleforum.llnl.gov>.

The NRC maintains an Agencywide Document Access and Management System (ADAMS), which provides text and image files of NRC's public documents. These documents may be accessed through the NRC's Public Electronic Reading Room on the Internet at <http://www.nrc.gov/reading-rm/adams.html>. If you do not have access to ADAMS or if there are problems in accessing the documents located in ADAMS, contact the NRC PDR Reference staff at: 1-800-397-4209, 301-415-4737, or by email to: pdr@nrc.gov.

FOR FURTHER INFORMATION CONTACT: Torre Taylor, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, telephone (301) 415-7900, e-mail: tmt@nrc.gov.

SUPPLEMENTARY INFORMATION:

The Petition

On October 15, 2003, (68 FR 59346), the NRC published a notice of receipt of a petition for rulemaking filed by Terrence O. Hee, Ion Technology. The petitioner requested that the NRC amend its regulations in 10 CFR 40.13, "Unimportant quantities of source material," to exempt end users from NRC's regulatory requirements to the extent that such person receives, possesses, uses or transfers, any patented catalytic device containing thorium.

The petitioner stated that the device is part of a "new technology for the reduction of air pollution chemicals" produced by mobile and industrial combustion processes and that granting his petition would contribute to the reduction in air pollution. Mr. Hee also identified his

monetary interest, as his company has secured distribution rights for this patented catalytic device in the United States.

The petitioner asserts that there are potentially millions of users for this device, and that obtaining “an individual license for each application would prove to be burdensome for the state agencies issuing the individual licenses and to those wishing to use the devices.” The petitioner requested an exemption in 10 CFR 40.13(c) for his product, a catalytic device containing thorium. Thorium is a type of source material licensed by the NRC. The exemptions in 10 CFR 40.13(c) apply to the end user, who is exempt from the licensing requirements set forth in Section 62 of the Atomic Energy Act. The petitioner suggested the following language be added to 10 CFR 40.13(c) for the requested exemption:

"Any patented catalyst used in the treatment of fuel, gas or air streams for combustion processes, or other processes provided that the thorium content does not exceed 6 percent by weight. The weight percentage to be calculated for either a homogeneous mixture or as a coating on a substrate base, with the base and the coating being considered the same as a homogeneous mixture, and the finished product is constructed in a manner that will prevent the exposure of the public to any radiation during the normal application and use of this technology."

The petitioner offered the following rationale in support of the petition: (1) The “environmental and quality of life benefits” derived from the application of this technology are “currently enjoyed by the citizens of Japan.” The petitioner stated that this technology is proposed for license in China as a way to reduce air pollution; (2) Implementation of these devices can reduce the cost of air emissions pollution control to U.S. industry over the cost of current methods, thus enhancing the ability of industry to meet strict air emission standards; (3) Workers involved with the devices will be protected from the low levels of radiation exposure by a metal housing encasing the thorium-bearing material; (4) The devices are manufactured in

Japan, so no U.S. workers will have direct contact with the thorium-bearing material; and (5) The long-term effect on the environment would be “reduced emissions of air pollutants from mobile and stationary combustion sources.” The petitioner also stated that the device “could also lead to a reduction in the volume of hydrocarbon fuels used.” In addition, the petitioner explained that the public is protected by housings shielding the radiation-emitting material, and that the housings are designed not to be “readily disassembled by the curious.”

The petitioner stated the product will have warning labels which instruct users in the proper disposal method, which is only by return of the product to the distributor. The petitioner anticipated that these labels would prevent long-term negative effects on the environment. The petitioner noted that disposal instructions would also be in the “Material Safety Data Sheet” delivered with each device. The petitioner projects the product to have a 30-year life cycle, and expected no short-term negative effects on the environment from disposal of the devices. The petitioner believes that the product is a safe and cost-effective method for contributing to the reduction of air pollution chemicals in the air in the United States and claims that it poses no adverse risk to the public or to workers involved in installing or removing the devices.

The petitioner stated that Honda Motor Company is currently installing the technology as a factory-installed device on their diesel-powered vehicles, and claims use of this technology in Japan has demonstrated a reduction of air pollution chemicals and a reduction in fuel consumption. The petitioner submitted test data showing reductions of soot emissions after installation of the device on diesel bus engines on the Okayama Bus Line company and a Caterpillar/Mitsubishi diesel-powered shovel. The petitioner also submitted data showing reductions in nitrogen oxides, carbon monoxide, and hydrocarbons for a 1989 gasoline-fueled Mercedes Benz, and similar data for a 1998 Mitsubishi van. The petitioner also presented “fuel usage reduction examples” comparing various makes and models of vehicles before and after installation of the catalytic device.

The petitioner believes that the proposed change to the Commission's regulations to allow the use of catalytic devices containing thorium in the United States is appropriate because it will benefit citizens by increasing the efficiency of combustion processes, reducing the use of hydrocarbon fuels, and lowering air pollutant emissions. The petitioner concludes that this technology poses no hazard to users or the public.

Public Comments on the Petition

The notice of receipt of the petition for rulemaking invited interested persons to submit comments. The comment period closed on December 29, 2003. NRC did not receive any comments on the petition.

Reasons for Denial

The petition is being denied because the petitioner did not submit information of sufficient scope and depth for NRC to find that authorizing this exemption would adequately ensure protection of public health and safety and the environment.

The NRC staff evaluated the technical merits of the petition for: (1) The appropriateness of this product for distribution to persons exempt from licensing and regulatory requirements; (2) Whether public health and safety would be adequately protected; and (3) The potential environmental impacts. After reviewing the petition, NRC has determined that there are unresolved questions related to technical aspects of the device, safety, and the potential impact to the environment. These questions would have to be resolved before the petition could be granted.

To fully evaluate a product designed for distribution to persons exempt from licensing and regulatory requirements, NRC needs for its review detailed descriptions and drawings that clearly illustrate the components of the product, materials of construction, dimensions, assembly methods, source containment and shielding, operation of the product and tamper resistance. NRC also needs to review prototype testing that demonstrates the integrity of the product during normal use and likely accident conditions (physical testing, engineering analysis, or operational history). A quality assurance program is also needed to ensure that the product will be manufactured and distributed in accordance with the information provided in the application.

This information was not provided by the petitioner, or was not of sufficient detail for NRC to conduct a thorough evaluation. For example, while the petitioner provided a description and drawings of the catalytic device, NRC could not determine the exact materials of construction, assembly methods, source containment and shielding, operation of the product and tamper resistance features. Prototype testing, both methodology and results, was not submitted. Additionally, the petition did not include any information regarding a quality assurance program.

The petition did not contain support for all uses of the device requested in the petition (i.e., buses and industrial facilities). NRC could not determine the actual isotope of thorium or the amount of thorium to be used in the device, as different percentages by weight concentrations were given in different sections of the information provided.

The petitioner provided statements on the benefit of catalytic converting devices to substantially reduce air pollution chemicals. However, there was no data to support the results provided. Additionally, there was not enough detailed information to support the claim that the metal housing enclosure which prevents access to radioactive material is sufficient protection from radiation exposure. There were statements that the device is designed for a 30 year

working life, with no repair. However, information was provided regarding 5, 10, and 15 year maintenance cycles with no description of what the maintenance involves.

The petitioner provided a description of the worst case scenario for an accident condition but did not include a description of other possible accident conditions during installation and normal use. There was a summary of radiological impacts under normal and accident conditions, but there was no description of how this information was obtained.

As part of the petitioner's request, the petitioner included language for the proposed amendment to the regulations that limited the exemption to "Any patented catalyst . . ." It is not NRC's practice to authorize exemptions that are limited to a certain patented device/product. If NRC determined that a catalytic device containing thorium was appropriate for distribution to persons exempt from licensing and regulatory requirements, the exemption would authorize distribution of such a device/product, regardless of the manufacturer or patent status. Therefore, anyone that developed a catalytic device that met the required criteria and any technical and licensing requirements for the exemption would be authorized to distribute that device/product.

Because the petitioner is requesting an amendment to add an exemption in 10 CFR 40.13(c), an environmental report is required in accordance with 10 CFR 51.68. Section 51.68, "Environmental report - rulemaking," requires petitioners for rulemaking requesting amendments of certain parts of the regulations concerning exemptions from licensing and regulatory requirements of any device, commodity or other product containing source material to submit with the petition a separate "Petitioner's Environmental Report." The purpose of an environmental review is to identify and evaluate the potential environmental impacts associated with a request. NRC's evaluation relies on information provided by the petitioner, as well as staff's own independent assessment. As part of the environmental review, several issues are evaluated: (1) Why is the action proposed and what need will it meet;

(2) How can the need be met; and (3) What aspects of the environment would be impacted?

Alternatives to a proposed action are also evaluated. Radiological and non-radiological impacts, as well as direct, indirect, and cumulative impacts are part of this environmental review. Staff requested an environmental report from the petitioner by letter dated May 12, 2004. The environmental report was submitted by the petitioner in January 2005.

This report failed to include detailed information related to: (1) Testing conditions and supporting data to evaluate the short-term and long-term impacts and benefits of the device; (2) Supporting data for accident analysis, such as accident rates, device failure rates and modes; (3) Supporting data for assumptions, such as market penetration and recovery rate; and (4) Data to support how the product would be more effective or efficient than alternative products. NRC must be able to independently assess the data submitted in support of a petition. NRC was not able to do this with the information submitted.

The petitioner also stated that there would be label warnings on the device that instruct any person who handles, uses or comes in contact with the product to dispose of it only by returning it to the distributor for safe disposal. Products that are distributed under an exemption must meet health and safety requirements without any regulatory requirements on the end user. Therefore, the petition must address the environmental aspects of disposal of the catalytic device presuming that none of the devices would be returned to the distributor for disposal.

In summary, the petitioner did not submit information of sufficient scope and depth for NRC to determine the adequacy of this product to be distributed to persons exempt from licensing and regulatory requirements. NRC could not ensure that the public health and safety,

and the environment, would be protected based on the information submitted in support of the petition.

For the reasons cited in this document, the NRC denies this petition.

Dated at Rockville, Maryland, this 18 day of August, 2006.

For the Nuclear Regulatory Commission.

/RA/
Luis A. Reyes,
Executive Director
for Operations.

and the environment, would be protected based on the information submitted in support of the petition.

For the reasons cited in this document, the NRC denies this petition.

Dated at Rockville, Maryland, this 18 day of August , 2006.

For the Nuclear Regulatory Commission.

 /RA/
 Luis A. Reyes,
 Executive Director
 for Operations.

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