



MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
WASTE AND HAZARDOUS MATERIALS DIVISION

RADIOLOGICAL PROTECTION NOTICE 94-1:

Potential Radium Contamination From Aircraft Instruments, Instrument Faces (Dials), And Instrument Pointers.

Addressees:

All aircraft instrument warehouses, distributors, and repair facilities within Michigan.

Purpose:

This notice is to alert aircraft instrument handlers of a potential health hazard from exposure to radium, a radioactive material. It is expected that facilities will evaluate their own situation, contact the Waste and Hazardous Materials Division (WHMD), and act appropriately to reduce radiation exposure to personnel and prevent the spread of radioactive contamination.

Description of Circumstances:

In September 1994, the WHMD discovered a warehouse site previously operating as a mail-order distributor of old and new aircraft components, including old radioluminous aircraft gauges. The discovery occurred when WHMD staff were informed that a load of scrap metal was detected with unusually high radiation levels at a smelter in Arkansas. State of Arkansas investigators identified the radiation source as radioluminous aircraft gauges obtained from a Michigan warehouse. An on-site investigation at the Michigan warehouse found several thousand aircraft gauges containing radioluminous paint, many of which had been broken and were potential contamination hazards. Each gauge contained regulated quantities of radium-226. The existing site owner was not aware of the radiological characteristics of these gauges, which remained at the facility following his purchase of the property. Decontamination can be a very difficult process. Porous materials, such as wood or soil, often cannot be sufficiently decontaminated and must be properly disposed of as radioactive waste. General external radiation levels within the facility were about 1000 times higher than normal background levels.

In addition, this warehouse had recently sold several thousand gauges to another warehouse in Michigan. An investigation at the second warehouse revealed conditions similar to those found at the first location.

Discussion:

Radium is a naturally occurring radioactive material. One use for radium was in fluorescent paint for luminous aircraft instruments. The use of radium for this purpose generally ended several decades ago due to radiological safety considerations.

Radium has a half-life of about 1600 years. This means that after 1600 years, half the radium will have decayed into another material. Unfortunately, radium decays into other radioactive materials, one of which is radon, a radioactive gas. Radon is now considered by the U.S. Environmental Protection Agency to be a major indoor air pollution problem and a major cause of lung cancer deaths in the United States. When radon decays, it becomes radioactive bismuth, lead, and polonium. All three of these are radioactive solids and become part of the dust in the facility. Radium and most other radioactive materials are particularly hazardous if ingested or inhaled as dust.

Recommendations:

The WHMD is now recommending that each aircraft instrument warehouse, distributor, and repair facility do the following:

1. Evaluate its inventory of dials, pointers, and related parts to determine the extent of items potentially contaminated with radium.
2. If radium may be in your possession in old luminous dials, pointers and similar components, contact the WHMD at 517-335-2690 before proceeding to the next steps.

Jennifer M. Granholm, Governor

www.michigan.gov/deq

Steven E. Chester, Director

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3. With the assistance of the WHMD or a qualified radiation consultant, try to isolate radium-containing items. Use disposable gloves when handling the items. Items should be placed into plastic bags to reduce the chance of further contamination. **MINIMIZE CREATING ANY DUST.** Containers that were used to store radium-containing items should be considered contaminated. Items intended for decontamination should be stored separately in their own plastic bags to minimize exposure to anyone who may try to decontaminate them later.
4. Items containing radium or contaminated with radium should be stored, pending proper disposal, in a secure location away from personnel. Concrete blocks provide good shielding.
5. Personnel handling radium-bearing items should be encouraged to wash their hands often and especially thoroughly before eating. Ingestion pathways should be minimized. No food or beverages should be permitted within the premises until the facility is determined to be free of contamination.
6. Disposal of radioactive materials must be done following federal and state requirements. Disposal into municipal solid waste landfills is limited to very low radium concentrations only.
7. Persons possessing radium must register the material with the Michigan Department of Environmental Quality, WHMD.

Additional Item for Consideration:

Currently, there is no licensed radioactive waste disposal site in Michigan. Only one commercial disposal site currently will accept, under certain limitations, radium for disposal. Envirocare, in Clive, Utah, can accept radium for a relatively reasonable fee. There are several costs associated with the disposal. One cost is for the disposal itself. Another cost is for packaging and transportation. Another potential cost that may be incurred is for a laboratory analysis of the waste to determine the amount of radium present and to assure that there are no other hazards in the waste. These costs could be expensive. A facility with radium wastes may wish to merge its waste with waste from other facilities and then split the cost of a single laboratory analysis rather than each facility paying for its own analysis. A list of several companies offering radium disposal services is attached for your convenience.

Response:

Within fifteen (15) days, each aircraft instrument warehouse, distributor, and repair facility receiving this notice should contact the Department and indicate whether:

- (1) they have radium,
- (2) they may have radium and need assistance in making a determination, or
- (3) they definitely do not have radium.

If you have any questions, comments, or additional concerns regarding this matter, please contact us at:

Mailing Address	Contact	Telephone Numbers
RADIOLOGICAL PROTECTION SECTION WASTE & HAZARDOUS MATERIALS DIVISION MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY PO BOX 30241 LANSING MI 48909-7741	Radiological Protection Section	Telephone: 517-335-2690 FAX: 517-373-4797

Attachment (list of radium disposal services)

Environmental Assistance Center 1-800-662-9278

The Michigan Department of Environmental Quality (MDEQ) will not discriminate against any individual or group on the basis of race, sex, religion, age, national origin, color, marital status, disability, political beliefs, height, weight, genetic information or sexual orientation. Questions or concerns should be directed to the MDEQ Office of Human Resources, P.O. Box 30473, Lansing, MI 48909.