

## Information and Training Web Links

N.D. Radiation Control Program

<http://www.health.state.nd.us/ndhd/environ/ee/rad/rad.htm>

U.S. Nuclear Regulatory Commission

<http://www.nrc.gov/>

EPA Office of Air and Radiation

<http://www.epa.gov/oar/>

Canadian Nuclear Safety Commission

<http://www.nuclearsafety.gc.ca/eng/index.cfm>

U.S. Department of Energy

<http://www.energy.gov/security/index.html>

Transportation Emergency Preparedness Program (TEPP)

<http://www.em.doe.gov/otem/program.html>

U.S. Department of Transportation: HAZMAT SAFETY

<http://hazmat.dot.gov/>

Guidance for Radiation Accident Management

<http://www.orau.gov/reacts/manage.htm>

Food & Drug Administration: Center for Devices and Radiological Health

<http://www.fda.gov/cdrh/index.html>

Center for Disease Control Radiation Emergency Response Information

<http://www.cdc.gov/nceh/radiation/response.htm>

Department of Homeland Security

<http://www.whitehouse.gov/homeland/>

Module Emergency Response Radiological Transportation Training

(MERRTT) CD-ROM is available from: [noelle.kostecki@ch.doe.gov](mailto:noelle.kostecki@ch.doe.gov)

# North Dakota's Radiation Control Program



DIVISION OF EMERGENCY MANAGEMENT WORKSHOP – 2003

**NORTH DAKOTA DEPARTMENT OF HEALTH  
DIVISION OF AIR QUALITY**

1200 Missouri Ave, PO Box 5520  
Bismarck, ND 58506-5520  
701.328.5188

## Notes:

### ***What should people do if in the vicinity of a dirty bomb explosion?***

First of all, there would probably be no immediate way for the public to distinguish a dirty bomb from a regular explosion. The NRC and experts cited by the federal Council on Foreign Affairs advise people to stay inside or get inside some sort of sheltered area away from the blast, and then listen to the radio or television for further instructions from emergency officials.

Emergency officials will arrange medical treatment for those injured by the blast and, if necessary, evacuate people from the affected area, perform radiation surveys, decontaminate those who are contaminated, and assess internal and external radiation exposures.

### **How to Contact the Radiation Control Program**

In the event of an accident or incident involving radioactive material, the North Dakota Department of Health's Radiation Control Program is available for direct technical support and assistance with respect to radiation safety.

#### **For direct radiological emergency technical assistance call:**

**Weekdays (7:30am – 5:00pm)**

**1.701.328.5188**

**All other times (State Radio)**

**1.800.472.2121 (Within ND)  
or  
1.701.328.9921 (Out of State)**

The phone numbers above do not replace your existing emergency response telephone numbers and should be used to obtain direct technical support and assistance with respect to radiation safety.

This booklet is not intended to replace your existing emergency response procedures.



*If you have any questions with regards to the information in this booklet, need information on radiation safety training, or have concerns about radiation safety in general, please contact Justin M. Griffin, P.E. at 701.328.5188 or send email to [jgriffin@state.nd.us](mailto:jgriffin@state.nd.us).*

Very severe accidents involving highly radioactive Type B shipments are improbable, but not impossible. Such an accident might require an extensive response **if the package were severely damaged and involved a release of significant fraction of its contents.**

If a radioactive material package has been badly damaged, or if you suspect that it is leaking, do not panic. The steps to take are simple:

- Stay away from the package and do not touch it
- Keep other people away from the area (upwind and uphill)
- Tell anyone who may have touched the package to wash and remain on-hand to be checked by radiation protection specialists
- If you touched the package or objects near it, wash your hands
- Prohibit eating, drinking and smoking in the area
- Maintain control until arrival of radiation protection specialists

### **The Terrorist Threat**

The most likely use of radioactive material as a terrorist weapon will be in the form of a radiological dispersal device (a.k.a. Dirty Bomb). A dirty bomb is a conventional explosive packaged with radioactive material that scatters when the bomb goes off. Basically, the explosives are used to spread radioactive contamination.

A dirty bomb is not a nuclear bomb and does not involve a nuclear explosion or nuclear chain reaction. Any type of radioactive material could be used in a dirty bomb. It is possible, but unlikely, that these devices would cause immediate serious health effects beyond those caused by the detonation of the dynamite, TNT or other conventional explosive material.

#### ***Does the U.S. government have a plan to respond to a dirty bomb?***

The Federal Emergency Response Plan, drawn up in 1996 and rehearsed regularly, covers many scenarios related to the release of radiation. The Federal Emergency Management Agency would coordinate a response by several civilian and military entities. After dealing with the initial blast casualties, the top priorities would be the treatment of any radiation sickness, the containment and monitoring of radioactive fallout, evacuation and decontamination.

The President's Department of Homeland Security also has a division to respond to nuclear, radiological, biological and chemical threats.

### **Introduction**

The Radiation Control Program monitors the development and use of ionizing radiation sources to protect the health and safety of North Dakotans and the environment. The program licenses radioactive material users and registers x-ray facilities. Staff members track 61 radioactive material licenses, more than 700 x-ray registrants, and perform periodic inspections of both types of radiation users within the state.

The North Dakota Department of Health (NDDoH) also has responsibility for response to hazardous material (hazmat) incidents involving radioactive material (RAM). Personnel assigned to the Radiation Control Program in the Division of Air Quality are available to assess the human exposure potential and environmental impact of incidents or accidents involving RAM.

### **Jurisdiction over Radioactive Material**

Radioactive material is regulated by the NDDoH. Depending on the radionuclide, quantity, and the form; a license is required in order to manufacture, produce, transfer, receive, acquire, own, possess, store, or use RAM. The U.S. Nuclear Regulatory Commission (NRC) is authorized to enter into agreements with the Governor of any State providing for the discontinuance of the regulatory authority of the NRC within that State. Under this agreement, the State assumes regulatory authority for the use of RAM. The State of North Dakota entered into such an agreement with the NRC on September 1, 1969, and is known as an Agreement State. Minnesota, South Dakota and Montana are among the states in our area which remain under the jurisdiction of the NRC and are not considered Agreement States.

### **Personnel**

Radiation Control Program staff located at 1200 Missouri Avenue in Bismarck includes:

#### **X-Ray Machine & Mammography staff**

Warren Freier, RT(RT)(R)(T)(QM)

James Lawson, RT(R)

#### **Radioactive Material Licensing & Inspection staff**

Jim Killingbeck

Justin Griffin, P.E.

### **Management**

State Health Officer – Dr. Terry Dwelle, M.D.  
Environmental Health Section Chief – David Glatt  
Director, Division of Air Quality – Terry O’Clair, P.E.  
Radiation Control Program Manager – Ken Wangler, P.E.

State employees (such as laboratory personnel) as well as licensed personnel and trained volunteers may also become involved in a response to a radiological incident.

### **Capabilities**

Staff personnel are trained in radiation physics, radiation safety and protection, radiation biology, transportation of radioactive material, use of detection instruments, mathematics pertaining to the use and measurement of radioactivity, and radiological emergency response procedures.

The program maintains a number of calibrated portable radiation detection instruments for use during inspections and incident response. These instruments can be used to locate lost sources of radiation and determine levels of ambient radiation and/or contamination at the scene of an incident.

Other agencies such as the main laboratory of the Chemistry Division, and universities such as NDSU and UND have agreed to work in cooperation with the Radiation Control Program (RCP) to provide analysis of samples to verify the presence or absence of radioactive contamination in the event of an accident or emergency.

The RCP will also consult with and obtain support from federal agencies such as the NRC, U.S. Environmental Protection Agency (EPA), U.S. Department of Energy (DOE), U.S. Department of Transportation (DOT), Federal Emergency Management Agency (FEMA), and the new Department of Homeland Security as needed.

### **Licenseses in North Dakota**

North Dakota currently has 61 specifically licensed companies using or storing radioactive material at various locations within the state.

A list of companies in your area licensed to possess RAM may be obtained by sending a written request to the Radiation Control Program at the address on the cover of this booklet. Include your email address and describe which city or county your request for information involves.

### **On-Scene Accident Response**

The three main actions to be taken before the arrival of trained emergency response personnel are: Helping injured personnel, notifying the proper authorities, and isolation of the area.



Help for injured individuals should not be delayed out of concern for radiological hazards. The responder should perform life-saving rescues and provide emergency first aid to the extent qualified.

Using any form of communication available, an individual responding to an accident should notify the authorities of the incident. It is important to give the greatest amount of detail possible when calling for help.

Important information includes:

- The location and nature of the accident;
- The cargo (if easily identified by the placards or package labels);
- Your name and the phone number from where you are calling;
- The number of persons injured and the seriousness of injuries;
- The actions being taken at the time of the call.

Once injured individuals have been helped and the authorities have been notified, the accident scene should be isolated. This is needed to prevent the spread of low-level radioactive contamination and to prevent unnecessary radiation exposure to individuals.

Radioactive materials released at an accident site, even at low levels, can result in very small but still detectable levels of contamination being spread a great distance. The spread of contamination can be controlled by limiting access to and egress from the accident site. Any detectable amount of contamination, however insignificant, can prove to be of great concern to the public and the news media.

It is important to treat everything that has been near the accident as potentially contaminated until it has been verified by qualified radiation protection personnel to be free of contamination. Individuals who have contacted potentially contaminated material should remain on-hand until they have been checked by qualified personnel. **Only qualified personnel should attempt to clean up a spill of any hazardous material – radioactive or not.**

“RADIOACTIVE” inscribed in black. Vehicle placards can help a great deal following an accident, particularly for a closed vehicle where the packages have remained in the vehicle.



**Figure 7: Radioactive Placard**

Highway vehicles transporting larger specified quantities of radioactive material are required to have the previously described placard placed within a white square with a black border as shown below:



**Figure 8: Highway Route Controlled Placard**

Placards are used by emergency response personnel to determine the appropriate actions to be taken when first arriving at an accident scene. Emergency response actions such as fire fighting strategies, spill or leak confinement techniques, and first aid considerations are keyed by a given hazardous material placard just as they are by the proper shipping name and UN number on the package markings.

### **Shipping Papers**

A fourth source of information about a radioactive material shipment available at the scene of a transportation accident is shipping papers (or the bill of lading). With certain exceptions, shipping papers identifying hazardous material are required to be kept in the cab of a motor vehicle, in the possession of a train crew member, in a holder on the bridge of a sailing vessel or in the possession of an aircraft's pilot.

Shipping papers list all of the information provided by the package labels and markings. They also provide additional information including the physical and chemical form of the material, the name and address of the shipper, an emergency contact phone number, and emergency response information.

### **Most Probable Incidents**

Millions of packages of RAM are transported in the U.S. annually. Most shipments consist of medical and industrial products. Other shipments include nuclear power plant fuel, nuclear weapons and weapons material, and radioactive waste generated by hospitals, laboratories, reactors and military facilities.

Because of the sheer number of radioactive material shipments (2.8 million shipments in 1998), transportation accidents are the most common type of incident involving RAM. Despite their frequency, however, there have been no known serious radiation exposures resulting from transportation accidents. This is due largely to the nature of the radioactive material transported and the use of protective packaging commensurate with the degree of potential hazard of the RAM contained.

### **Response to Transportation Accidents Involving RAM**

First responders (i.e., fire-fighters, law enforcement, etc.) may not be aware that the accident involves RAM until they arrive at the scene. Information sources available at an accident scene which may indicate the presence of RAM include:

- Package labels
- Package markings
- Vehicle placards
- Shipping papers

### **Package Labels**

Nearly all packages containing RAM are required to be labeled “RADIOACTIVE.” There are three basic labels used to identify RAM packages. All of the labels bear the distinctive tri-blade symbol which is universal for the identification of radioactivity or radiation.



**Figure 1: Tri-Blade Symbol**

By looking at a package's label, one can determine the hazards associated with it without the aid of a radiation detection device.

The Radioactive White-I label is used on packages with a maximum dose rate of 0.5 mR/hr on any exterior surface.



**Figure 2: Radioactive White-I Label**

The Radioactive Yellow-II label is used on packages which have a maximum dose rate of 50 mR/hr on any exterior surface and a maximum of 1 mR/hr at one meter from the package.



**Figure 3: Radioactive Yellow-II Label**

The Radioactive Yellow-III label is used on packages with a maximum dose rate of 200 mR/hr at any exterior surface and a maximum of 10 mR/hr at one meter from the package.



**Figure 4: Radioactive Yellow-III Label**

In some very exceptional situations, the maximum dose rate permitted on a package may be up to 1000 mR/hr on contact with the exterior surfaces of the package.

The labels are white except for the upper half of the Yellow-II and Yellow-III labels which are yellow. Note that in all cases, the radiation

level at the surface of an unbroken package is no more than 1000 mR/hr. If the package integrity is broken, the hazard might be greater due to the loss of shielding provided by the packaging material or due to the possibility of a contamination hazard.

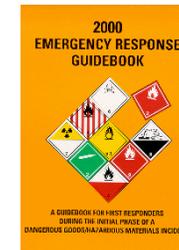
Radioactive labels also list the type of radioactive nuclide contained and the amount of activity. This additional information is valuable to radiation protection specialists in determining the degree of hazard present.

### Package Markings

Generally, every package labeled as radioactive will also have a marking showing a certain “proper shipping name” and a four digit UN identification number. With the proper shipping name or UN number, emergency responders can determine the proper response actions to be taken by referring to the Emergency Response Guidebook.



**Figure 5: Package Marking Example**



**Figure 6: Emergency Response Guidebook**

### Vehicle Placards

Just as labels and markings are used to show the quantity of radioactivity in a package, and to generally indicate the level of radiation emitted, placards are standard signs affixed to the exterior of a vehicle or freight container to identify hazards associated with the cargo.

Any vehicle carrying a Yellow-III label is required to bear the placard shown below. The radioactive placard must be yellow on the top half with the tri-blade symbol. The bottom half must be white with the word