

EMERGENCY PREPAREDNESS FOR RADIOACTIVE MATERIALS TRANSPORT -THERE IS MORE AVAILABLE THAN MEETS THE EYE

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ABSTRACT

Shipments of radioactive waste in the United States are increasing. The Federal government must certify a package design before radioactive materials are allowed to be shipped in the actual package or cask. The certification process and the package provides the first line of defense in assuring that radioactive material will not be released in a transportation accident. If a transportation accident occurs, State, Tribal and local governments have the responsibility to protect the health and safety of the public. If those resources are not sufficient, the DOE maintains a network of trained personnel and state-of-the-art equipment to supplement State, Tribal and local resources.

INTRODUCTION

An important transportation safety issue today is the assurance that adequate resources are available to expeditiously respond to transportation emergencies involving radioactive material. In July of 1986, the Department of Transportation (DOT) and the Federal Emergency Management Agency (FEMA) sent Congress a report entitled Hazardous Materials Training, Planning and Preparedness (1). They found that "considerable progress has been made in upgrading state and local government preparedness capabilities [but] the public perceives that the risk of these incidents occurring has increased." In spite of the existence of a multitude of Federal government capabilities to respond to such incidents, the Federal Radiological Preparedness Coordinating Committee (FRPCC) Training and Exercise Subcommittee stated in a December 1987 report to the full FRPCC that, "[there is] a need to expand [the] awareness program to assure a better understanding of Federal responsibilities, roles, and capabilities to support State and local radiological emergency preparedness and response activities." (2) Clearly, substantial capabilities exist within the Federal government; however, most first responders and the majority of the public at-large are unaware of these capabilities. As the number of radioactive waste shipments increase, the Federal government and private industry must ensure that the public understands that the probability of a release from a package transporting a large quantity of radioactive material is minimal, and that if accidents do occur, mechanisms exist to quickly respond.

PACKAGE SAFETY

All radioactive material must be transported in an "approved" package, or shipping cask. As the quantity and type of material in each package increases, so do the requirements for Federal approval of that package design. Packages used for the transportation of large amounts of radioactive material, such as spent fuel, must meet stringent design and testing requirements before it is "certified" by the United States Nuclear Regulatory Commission as capable of safely transporting radioactive materials. Packages must undergo drop, puncture, fire, and immersion tests without exceeding a very low leak rate. Only after a package is certified, can it be used to ship large quantities of radioactive material. The package is the first line of defense in assuring that radioactive material will not be released in a

transportation accident.

EMERGENCY PREPAREDNESS

The Federal, State, Tribal and local governments maintain capabilities to respond to all types of radiological emergencies. This presentation will focus on the capabilities of the Department of Energy (DOE) because of: (1) their assigned role for dealing with radiological monitoring and assessment activities and (2) their significant involvement in the operation of DOE nuclear research and production facilities and the transportation of radioactive materials.

It is important to understand that response is only half of the total emergency preparedness picture. Emergency preparedness consists of two distinct areas, planning and response. The Federal government, and in turn the DOE, is actively involved in both areas.

Planning Activities

The Federal government's role in planning for transportation accidents involving radioactive material is defined in 44 CFR Part 351 (3). The referenced regulation assigns Federal agencies responsibilities for assisting State and local governments in planning for radiological emergencies, specifically by the creation of the Federal Radiological Preparedness Coordinating Committee (FRPCC) and ten separate Regional Assistance Committees (RACs).

The FRPCC provides policy direction to the FEMA for its role in coordinating the program of Federal assistance to State and local governments in their radiological emergency planning and preparedness activities. In addition, the FRPCC has established subcommittees to aid in carrying out its functions. The Transportation Accident subcommittee has been charged with coordinating activities associated with transportation accidents involving radioactive materials. The DOE is a member agency of this subcommittee.

One of the major activities of the Transportation Accident subcommittee is maintenance of the document entitled, "Guidance for Developing State and Local Radiological Emergency Response Plans and Preparedness for Transportation Accidents," commonly referred to by its publishing designation "FEMA-REP-5." FEMA-REP-5 contains planning and preparedness guidance for transportation accidents involving radioactive materials. The guidance provides a basis for State, Tribal and local

governments to use in developing and enhancing their emergency capabilities for responding to transportation accidents involving radioactive materials. FEMA-REP-5 is provided to State, Tribal and local governments for their voluntary use. No Federal laws or regulations mandate emergency planning and preparedness for transportation accidents involving radioactive materials. Although the guidance provided in FEMA-REP-5 is tailored to transportation accidents, it is hoped that the emergency planning and preparedness that results from the use of the guidance will be closely integrated into generic emergency operating plans for all types of disasters and emergencies.

The RACs have been charged to assist State and local government officials in the development of their radiological emergency plans and to review these plans and observe exercises to evaluate adequacy of the plans. Each Federal agency member of the RACs becomes knowledgeable of Federal planning and guidance as it relates to State and local radiological emergency plans, organizational structure and the expertise of personnel, in order to assist in improving State and local government preparedness. In addition, each Federal agency member participates in RAC meetings. While there has been some Federal involvement in transportation emergency preparedness, the primary focus of the plan review and of the exercise observation has been on State and local government activities associated with the licensing of commercial nuclear power plants.

The DOE has been active in all ten RACs. Primary involvement has been in the area of radiological monitoring. In addition to providing assistance to State and local governments in reviewing their written plans and in evaluating demonstrated capabilities, these interactions afford the DOE an opportunity to establish the organizational framework which would be activated in the event of a major emergency where State organizations would request DOE radiological monitoring assistance. This also includes interacting with State emergency management and radiological health organizations for the purpose of providing them with general guidelines as to how the DOE would respond to varying levels of State requests for assistance.

In a demonstration of commitment to State governments, several of the DOE's eight Regional Coordinating Offices have formally acknowledged, through written agreements, that they would respond to a request for assistance with a variety of resources. Much of the impetus for these agreements was the radiological planning criteria that required State governments, having commercial power reactors within their boundaries, to formally identify available resources. These documents were negotiated with States containing commercial power reactors, as well as those without. The net result was a clearer understanding of the DOE's capabilities and its commitment to assist States in finding solutions to problems with any accident involving radioactive materials.

Response Activities

On November 5, 1985, the FEMA, with the concurrence of eleven other Federal agencies, issued the Federal Radiological Emergency Response Plan (50 FR 46542), also

known as the Federal Plan. The Federal Plan applies to the following peacetime emergency scenarios:

- Fixed nuclear facility, i.e., commercial reactor
- Transportation
- Nuclear weapons
- Other incidents, e.g., nuclear-powered satellite re-entry

The Federal Plan makes two basic assumptions about the Federal government's role in responding to radiological emergencies. Those assumptions are:

State and local governments have responsibility for protecting the health and safety of their citizens, and

The Federal government will respond only if requested by the State, except in situations where those Federal agencies have statutory or other authority. The availability of Federal resources is subject to prior statutory commitments to fulfill other operational requirements.

In order to meet their responsibility for protecting the health and safety of their citizens, State and local governments have developed capabilities for responding to radioactive material incidents. As a minimum, all States have generic emergency response plans. Some States have separate plans for responding to transportation incidents. The amount of resources depends on the types of industry located within the governmental boundaries. States with operating commercial reactors necessarily have more resources. States and localities on established radioactive material transportation routes have more experience in responding to all levels of inquiries and are thus more polished in their response. All States have functionally oriented radiological health and emergency management organizations. These organizations include trained staff and specialized equipment. Again, the equipment resources vary widely. Equipment ranges from portable field instruments to fixed laboratory analysis capabilities.

The Federal Plan is concerned primarily with Federal support to State and local governments beyond the immediate site of the emergency, i.e., "off site." For activities authorized or regulated by a Federal agency, the "on site" Federal support is the responsibility of that Federal agency. That lead Federal agency is referred to as the Cognizant Federal Agency (CFA). In most transportation accidents, except those involving nuclear weapons, the State or local government will define an area "on site" at the time of the accident and manage all actions within that area. In such accidents Federal agencies have no independent authority for defining the "on site" area.

During a transportation emergency where the DOE has been designated the CFA, DOE would have the following responsibilities:

- Notify appropriate Federal, State, and local agencies,
- Manage on-scene Federal response actions, including radiological monitoring,
- Assist State and local governments with protective

action measures, and

- Serve as the Federal source of technical information.

Embodied within the Federal Plan is the Federal Radiological Monitoring and Assessment Plan (FRMAP). The FRMAP assigns DOE as the lead Federal agency for radiological monitoring and assessment. Even though the Federal Plan recognizes that, "[a] transportation accident ... may represent much less of a radiological hazard or serious threat to the public, in most cases, State resources or a limited Federal response will suffice," the full complement of DOE resources are available.

Some examples follow of the types of resources the DOE might typically call upon to respond to a transportation emergency.

The DOE maintains round-the-clock notification points for the purpose of receiving requests for assistance. These resources reside in each of eight Regional Coordinating Offices (RCO) located across the United States. Within ready access of each RCO are specially trained radiological response personnel and state-of-the-art equipment that can be quickly dispatched to the scene of a transportation emergency.

Highway travel is the most practical means for transporting resources of the RCO. Many RCOs have also made arrangements with local charter air services to fly to the location of the emergency. At any rate, the arrival of the DOE's first responders depends on the time and day the request is received, weather conditions, and the proximity of the DOE team to the site of the emergency.

If additional resources are needed to supplement the DOE's initial response, several unique capabilities are available to support specific needs. For example:

Several mobile laboratories are available with highly sensitive measurement devices to evaluate air, foodstuff, water, and vegetation samples to assure there has been no release of radioactive material to the environment. Because this equipment is so sensitive, it must be shielded to prevent interference from the radioactivity naturally present in a person's body.

An Aerial Measurement Service (AMS) maintains helicopters and fixed-wing aircraft with sensitive radiation detectors mounted on board. These can be used to monitor large areas for the purpose of verifying that no radioactive material has been released and dispersed from the shipping package.

Finally, to assist the AMS to focus on a smaller area to monitor, a computer modeling capability is available. Referred to as the Atmospheric Release Advisory Capability, emergency responders can input data about terrain and meteorology in order to identify the area most likely to be contaminated if a release were suspected.

TRAINING

The DOE offers a number of training programs to supplement State, Tribal and local government's efforts to

train their personnel to properly respond to a radioactive materials transportation accident.

One such DOE course covers all applicable Federal regulations governing the packaging, shipping, and transport of all types of hazardous materials, including radioactive material. This DOE course provides an effective method of keeping State and local enforcement groups, private shippers and carriers, as well as emergency response and planning teams, informed of recent changes to the regulations. State and local agency personnel are also exposed to training ideas, methods and materials, which they in turn, may use in their own programs. DOE's training program contributes to a better informed shipping community, which provides a greater level of regulatory compliance.

In conjunction with the Waste Isolation Pilot Plant (WIPP) project in Carlsbad, NM, the DOE is offering emergency response training along the WIPP transportation corridors. Target audiences include first responders, emergency planners, decision makers in emergency operations centers and technical personnel involved in accident assessment.

Specialized courses that emphasize the role of the physician, nurse and other occupational health care personnel are also available. These courses teach protocol necessary for dealing with all types of radiation accidents.

FEMA and DOT also offer other courses for dealing with radiation accidents. Included in some of the curriculum are specific procedures for dealing with transportation accidents.

CONCLUSION

Shipments of radioactive materials on the nation's transportation system will be increasing. Due to the stringent testing program mandated for shipping containers, the safety of the package is embedded in the design, testing and certification for that package.

The DOE recognizes that the public has a right to know that their transportation corridors and communities are free of radioactive contamination following a transportation accident. DOE has a system of personnel and equipment to expeditiously respond to a transportation accident, evaluate it, and provide an accurate assessment. If a transportation accident occurs, the DOE is confident that the resources at the State, Tribal and local level, supplemented as needed by the DOE, are capable of ensuring the State, Tribal and local governments meet their responsibility to protect the health and safety of the public.

REFERENCES

1. Department of Transportation and Federal Emergency Management Agency, Hazardous Materials Training, Planning and Preparedness, July 1986.
2. Subcommittee on Training and Exercising to the Federal Radiological Preparedness Coordinating Committee, Training Options for Promoting a Better Understanding of Federal Responsibilities, Roles, and Capabilities to Support State and Local Radiological Emergency

Preparedness and Response Activities, December 8, 1987.
3. Part 351 "Radiological Emergency Planning and

Preparedness" Subchapter E, Chapter I of Title 44, Code of Federal Regulations.