

## Response to a Transportation Accident Involving Radioactive Material Simplified

Ella B. McNeil, Manager  
Transportation Emergency Preparedness Program  
Office of Transportation, U.S. Department of Energy  
Washington, DC 20585

Tom Clawson, Ken Keaton  
Technical Resources Group, Inc.  
3825 Wanda Street  
Idaho Falls, ID 83406

### **ABSTRACT**

This paper describes the efforts by the Department of Energy to assist states and tribes along transportation corridors to prepare for an incident involving the transportation of radioactive materials and wastes. To address responder concerns, the Department of Energy retooled its approach to emergency preparedness and implemented the more simplified and responder-friendly Transportation Emergency Preparedness Program (TEPP).

### **INTRODUCTION**

It is estimated there are approximately three million radioactive material shipments made in the United States on an annual basis. The Department of Energy, Office of Environmental Management (EM), is responsible for approximately 20,000 of these shipments per year.

In 1989, the Department of Energy (DOE) established EM to mitigate the risks and hazards posed by the legacy of nuclear weapons production and research. The most ambitious and far ranging of these missions is dealing with the environmental legacy of the Cold War. Many problems posed by its operations are unique, and include the transportation of unprecedented amounts of contaminated waste, water, and soil, and a vast number of contaminated structures that will remain radioactive for thousands of years. Radioactive material has also become an integral part of our lives and is transported everyday for use in medicine, agriculture, and industry. As the transportation of radioactive material increases, so does the possibility that first responders will encounter a transportation incident involving radioactive material. The challenge facing emergency managers and responders across the country is to conduct proper planning and training to ensure that responders have the appropriate knowledge and skills to respond safely and effectively to transportation accidents involving radioactive material.

### **Transportation Emergency Preparedness Program**

In an effort to address responder concerns, the Department retooled its approach to emergency responder preparedness and implemented the more simplified and responder-friendly Transportation Emergency Preparedness Program (TEPP). TEPP is a component of the overall comprehensive emergency management system established by DOE Order (DOE O) 151.1, Comprehensive Emergency Management System. TEPP integrates a basic approach to transportation emergency planning and preparedness activities under a single program with the

goal to ensure DOE, its operating contractors, and state, tribal, and local emergency responders are prepared to respond promptly, efficiently, and effectively to accidents involving DOE shipments of radioactive material. TEPP is designed and implemented using an approach to ensure that initial responders to a radiological transportation accident have the necessary knowledge and skills needed to effectively and safely mitigate the accident.

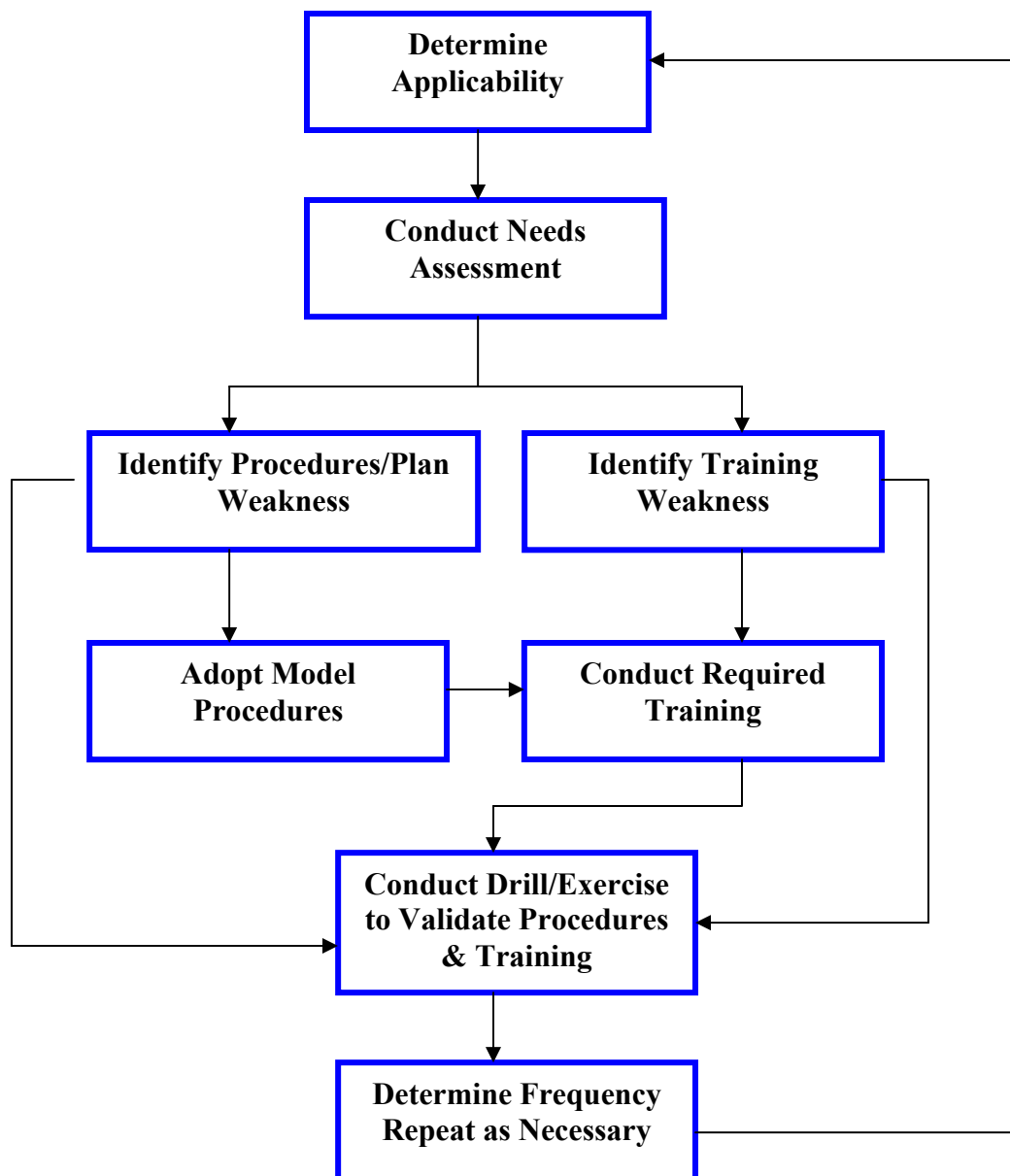
TEPP is a national program managed at a headquarters level and implemented through a regional approach. TEPP uses the eight DOE Regional Coordinating Offices with Regional TEPP Coordinators to establish a structure that works directly with the responder communities in their region to determine responder needs, provide technical assistance in development of plans and guides to improve existing emergency plans, and provide training and conduct exercises. TEPP Coordinators and contract support personnel are responsible for implementing the TEPP goals and mission; coordinating transportation related emergency response elements; ensuring TEPP planning is incorporated in transportation plans and procedures; and ensuring coordination occurs with state emergency response organizations for routine and high visibility shipping campaigns.

The TEPP mission is to ensure that federal, state, tribal, and local responders have access to the plans, training, and technical assistance necessary to safely, efficiently, and effectively respond to transportation accidents involving DOE-owned radioactive materials. To accomplish this mission, a suite of tools have been developed to aid the response jurisdictions in their readiness activities. All of the tools are readily available and can be accessed on the TEPP web site at [www.em.doe.gov/otem](http://www.em.doe.gov/otem).

While many jurisdictions are eager to train, TEPP recommends that the planning tools are reviewed and implemented prior to initiating training. The flow chart (Figure 1) provides an example of implementation using the TEPP suite of tools.

The first step in the process is to determine applicability by using the Needs Assessment. To implement the Model Needs Assessment, an official from the jurisdiction will conduct a self-assessment by answering various questions designed to determine strengths and identify improvement areas. To support the assessment process and any proposed recommendations for improvement, TEPP has developed planning and training tools. The Needs Assessment has been automated so it can be completed online. The online application will automatically generate the report for the response jurisdiction.

The Needs Assessment is divided into two sections, planning and training and the flow chart follows the path of each. Even if the assessment reveals adequate planning and training, the conduct of a drill or exercise can be used to validate the assessment results. If the assessment reveals improvements areas, the model plans and procedures and training provided should be implemented.



**Fig. 1. Flow diagram for TEPP Implementation**

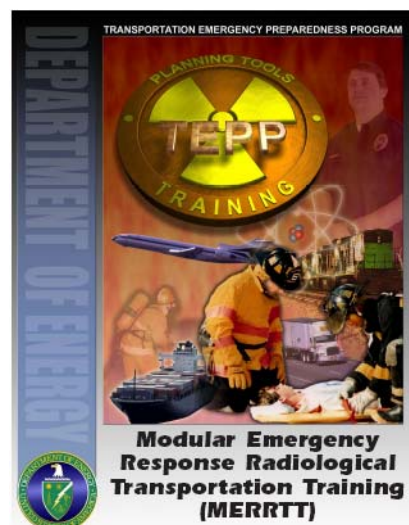
TEPP model procedures have been developed to assist the responder jurisdiction in modifying their existing emergency plans and procedures to address a radiological transportation accident. The procedures are not all-inclusive, but were developed to meet the minimum national guidance for responding to a radiological transportation accident. The procedures are designed for use by trained and qualified emergency responders, and additional procedural requirements may be implemented according to appropriate state, tribal, or local requirements. There are six procedures that can be incorporated into existing standard operating procedures:

- Hazardous Materials Incident Response
- Model First Responder Procedure for Transportation Accidents Involving Radiological Materials

- Emergency Medical Services for Properly Handling and Packaging Potentially Radiologically Contaminated Patients
- Medical Examiner/Coroner on the Handling of a Body/Human Remains that are Potentially Radiologically Contaminated Procedure
- Radioactive Material and Multiple Hazardous Materials Decontamination
- Model Recovery Procedure

In addition to the procedures, TEPP has developed the Model Planning Annex, which provides a basic structure and annotated guidance for preparing a transportation addendum to an existing emergency plan.

Once the jurisdiction has completed their plans and procedures, they will need to address any gaps in training. TEPP has developed the Modular Emergency Response Radiological Transportation Training (MERRTT) program. Over the past seven years, TEPP has successfully assisted stakeholders from state, tribal, and local emergency response organizations to prepare for responding to transportation accidents involving radioactive material. During these seven years, ten states have adopted the DOE TEPP training -- Modular Emergency Radiological Response Transportation Training (MERRTT) -- for use as their basic program to train responders. During this same time period, TEPP has worked with state, tribal, and local officials to conduct over six hundred train-the-trainer and direct delivery training sessions. Over 5,000 fire, law enforcement, emergency medical, emergency management, and 911 center operators have been trained.



**Fig. 2. MERRTT Training**

DOE developed the Modular Emergency Response Radiological Transportation Training (MERRTT) through various forums and the Transportation External Coordination Working Group (TEC), Training and Medical Issues Topic Group. DOE formed TEC to improve coordination with external groups interested in transportation activities. TEC members represent national and regional state, tribal and local government organizations, as well as labor, industry and professional groups. On March 2, 2005, the Department of Homeland Security approved MERRTT and included the program into the listing of federal courses available for State Administrative Agencies to employ consistent with state strategies.

MERRTT provides fundamental knowledge for responding to transportation incidents involving radioactive material and builds on training in existing hazardous materials curricula. MERRTT satisfies the training requirements outlined in the Waste Isolation Pilot Plant (WIPP) Land Withdrawal Act. MERRTT is used for training responders along the WIPP corridors.

MERRTT has a modular design, consisting of 18 concise, easy to understand modules and 4 hands-on practical exercises. This design allows a jurisdiction to integrate the modules into existing hazardous material training. MERRTT addresses the training concerns of states, tribes, and local jurisdictions and provides fundamental knowledge for responding to transportation incidents involving radioactive material and builds on training in existing hazardous materials



**Fig. 3. Go-Kit used in TEPP Training**

curricula. The material is designed to meet the training needs of persons serving in fire service, law enforcement, emergency medical service, emergency management, public works, or on a hazardous materials team.

The MERRTT program is flexible and allows instructor delivered programs or student paced self-study. Designed in modular format, the materials include student manuals, instructor guides and overheads to facilitate delivery. A MERRTT “Go-Kit” provides training aids to enhance MERRTT training and contains a radiation detection device, miscellaneous radiation sources (e.g. smoke detector), the inner container from a Type A, radiation labels and placards, and a copy of the Emergency Response Guidebook. Also, MERRTT has been approved by the Continuing Education Coordinating Board of Emergency Medical Services for

Continuing Education Hours (CEH). CEHs are awarded for each module completed and for the Practical Exercises.

TEPP also conducts train-the-trainer classes for qualified instructors. Upon completion of the train-the-trainer class, instructors are provided with a CD-ROM containing everything they need to conduct a class -- the instructor manual, student manual, tests, and practical exercises. Once an instructor teaches their first class, they are then awarded a TEPP instructor patch.

MERRTT also includes four hands-on practical exercises to reinforce material presented in during the training. These exercises include instrument use, patient handling, package integrity, and contamination survey.

To receive a course completion certificate from the DOE, instructors must document the completion of the training in the National MERRTT Certificate and Student Database located on the TEPP web site. An instructor can access the National MERRTT Certificate and Student Database at the TEPP website. The database fields match with the fields in the Student Information Form used during the class. Certificates can be retrieved and printed any time by entering the date of the class and the state where training was conducted.

To validate jurisdictions plans and procedures and training, TEPP has assisted state, tribal, and local officials in conducting over 24 drills. The transportation-based drills help measure responder abilities and identified recommendations to improve response capabilities. TEPP has developed the Drills-In-A-Box, which provides seven scenarios and materials for preparing and conducting tabletops, drills, and exercises for radiological transportation accidents.



**Fig. 4. TEPP exercise in Barnwell, SC**

WM '07 Conference, February 25 – March 1, 2007, Tucson, AZ

The TEPP web site -- [www.em.doe.gov/otem](http://www.em.doe.gov/otem) -- provides one-stop shopping for a myriad of tools and information dealing with radiological transportation. By clicking on the TEPP menu, you can access:

- MERRTT Training Schedule. This provides a listing of all classes scheduled throughout the country, along with contact information. If someone is interested in taking a class, they can choose a location that fits their need, and contact the TEPP Coordinator to register.
- 24-Hour Points of Contact. Through this data base, you can identify the contact in state for emergencies or daily business. The information is updated twice a year.
- Case Histories. This site is used to share information on real radiological transportation incidents. The case history contains the description of the events, photos and videos (if available), lessons learned, and a contact.
- TEPP Coordinators. Identifies the TEPP Coordinator for each of the 8 regions, and includes their contact information.

Through the implementation of TEPP, state, tribal, and local stakeholder needs and request for assistance for planning and training for response to transportation accidents has been very successful. Stakeholders using TEPP have provided positive feedback about the usefulness, effectiveness and availability of the planning tools and training program. This support has been shown by several states adopting elements of TEPP. The use of the training program and planning tools are strong indicators that TEPP has been and will continue to be a very useful DOE program to emergency responders at all levels across the nation.