

Improving Preparedness For Radiological Transportation Events Through Exercises

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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 by partnering with communities to conduct radiological transportation drills and exercises.

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.

As the use of radioactive material increases, so does the possibility that first responders will encounter a transportation incident involving radioactive material. To ensure responders have the appropriate knowledge and skills to respond safely and effectively to transportation accidents involving radioactive material, the Department of Energy's Transportation Emergency Preparedness Program (TEPP) actively pursues opportunities to partner with local jurisdictions to conduct exercises involving both high- and low-level radioactive waste transportation scenarios. Using a comprehensive approach to prepare for exercises, hundreds of responders have been given the opportunity to participate in TEPP-sponsored radiological transportation exercises. A community approach is always used during the exercise development process. All potential responder agencies are invited to participate, including hospitals, law enforcement, fire departments, emergency management agencies, community aid agencies such as the Red Cross, and state and federal emergency management and radiological response assets.

After participants for an exercise have been determined, each agency is strongly encouraged to complete the TEPP Needs Assessment, answering a series of questions designed to identify possible procedural, training, and/or equipment gaps that could affect the agency's ability to successfully respond to a radiological transportation accident. 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 (see Figure 1) follows the path of each. Even if the TEPP Needs Assessment reveals adequate planning and training, the conduct of a drill or exercise can be used to validate the jurisdiction's planning and training. If the assessment reveals needed improvement areas, TEPP has model plans and procedures and training that the jurisdiction can implement.

A suite of tools has 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.

TEPP model procedures have been developed to assist the response 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. TEPP has developed six procedures that can be incorporated into a jurisdiction's existing standard operating procedures:

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

In addition to the procedures listed above, 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.

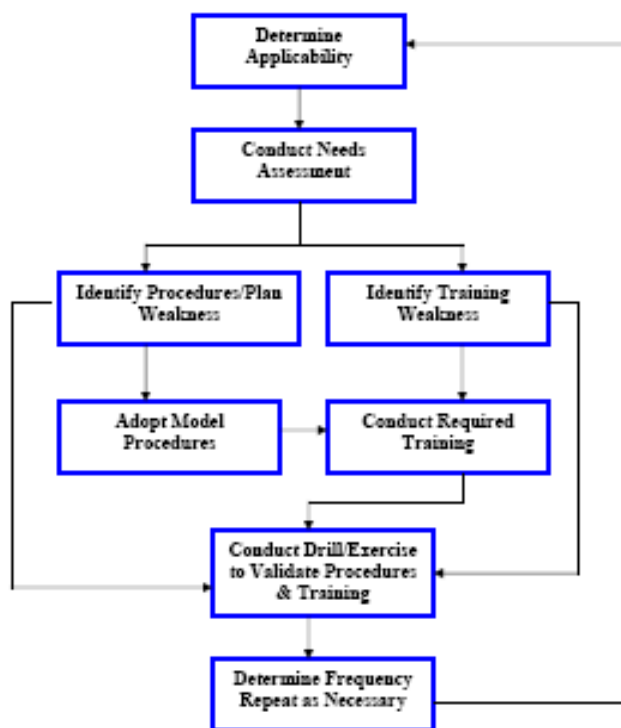


Figure 1 – Flow chart showing TEPP Needs Assessment process.

Once the jurisdiction has addressed weaknesses that were identified in their plans and procedures, they will need to address any gaps in training. To assist agencies with responder training, TEPP developed the Modular Emergency Response Radiological Transportation Training (MERRTT) program. MERRTT has a modular design, consisting of 16 concise, easy-to-understand modules, four textbook exercises, and five 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 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 viewgraphs 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), a Type A package and inner container, radiation labels and placards, and a copy of the Emergency Response Guidebook. MERRTT has also been approved by the Continuing Education Coordinating Board of Emergency Medical Services for Continuing Education Hours (CEH). Medical CEHs are awarded for each module completed.

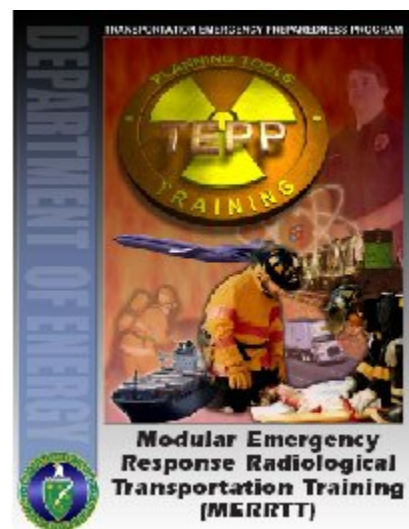


Figure 2 – Cover of MERRTT Student Study Guide

Once a jurisdiction addresses all of its identified planning and training weaknesses, an exercise is conducted to validate the planning and training. To assist in validating a jurisdiction’s planning and training, TEPP uses the Department of Homeland Security Exercise and Evaluation Program (HSEEP) process in preparing its drills and exercises. To begin the exercise process, an initial planning meeting is held with participating agencies where exercise objectives are agreed upon, and Department of Homeland Security (DHS)-sanctioned activities and criteria are chosen. Next, a mid-term planning meeting is conducted to review and finalize the exercise scenario package. Scenario planners also coordinate details such as selection of realistic props, including: wrecked vehicles; smoke generators or propane-generated fire props; moulage supplies for victim role-players; positioning of roadblocks to ensure unwanted traffic stays out of the exercise scene; and purchasing of lunches for players during the after-action debriefing. Before the exercises are conducted, TEPP-sponsored controller/evaluator training is offered, and briefings are conducted for both controllers/evaluators and players.

In some cases, first responders participate in coached and walk-through drills prior to full-scale exercises that enable them to perform specific response functions with hands-on use of equipment while receiving step-by-step guidance from qualified controllers/instructors on proper response actions and techniques. These drills include: scene size-up and hazards assessment; set-up and operation of a decontamination corridor; scene surveys and mapping; and the packaging and transfer of a contaminated patient. Tabletop exercises are sometimes conducted in advance

of the evaluated exercise to give participating agencies an opportunity to discuss their procedural response steps and communication protocols in a no-fault environment.

In the past 18 months, TEPP has sponsored HSEEP compliant tabletops, drills, and exercises in four communities, including:

- one tabletop, three drills, and a full-scale exercise in North Platte, Nebraska
- one drill in Zachary, Louisiana
- two drills and a full-scale exercise in Groton, Connecticut
- three drills in Topeka, Kansas



Figure 3 – Responders at a TEPP exercise extinguish a simulated transportation fire involving radiological materials.

In addition, in March 2010, three training drills and a full-scale exercise will be conducted in Lincoln, Nebraska; in April 2010, three tabletop exercises have been scheduled in Winston-Salem, North Carolina; and in July 2010, one full-scale exercise has been schedule in Storrs, Connecticut.

After TEPP conducts an exercise, players are given an opportunity to self-identify problems, after which controllers and evaluators meet to review and evaluate all objectives, activities, and criteria. TEPP assists communities in the development of an After-Action Report (AAR) in accordance with DHS criteria. While TEPP personnel can make recommendations on the best way to correct identified findings, the final corrective action report is the responsibility of the host jurisdiction. Lessons learned are shared with other jurisdictions through the DHS process.

For communities that would like to conduct exercises without the direct involvement and planning assistance offered by DOE, TEPP provides Drill-In-A-Box scenario manuals online that cover a variety of high- and low-level waste accident scenarios. These scenarios, which are streamlined for easy implementation, are currently being modified to incorporate DHS-compliant objectives, activities, and criteria.

While exercises help measure how well prepared a community is to respond to a radiological accident, the true test of preparedness has been experienced several times by agencies called upon to respond to actual radiological transportation accidents. In May 2009, twenty-six firefighters from the Beckley, West Virginia Fire Department participated in two-day MERRTT classes. Only three months later, in August 2009, these same firefighters responded to a tractor-trailer fire involving 36,000 pounds of uranium



Figure 4 – Fire Department responders from Beckley, WV were glad they went through MERRTT training before responding to an actual event involving uranium hexafluoride.

hexafluoride being transported by the DOE. Afterwards, an officer for the fire department credited TEPP training for helping his department respond calmly, quickly determine that no release of material had occurred using survey instrumentation, and stop an unnecessary evacuation that had been ordered for a nearby town. In 2008, response agencies in Indiana responded to a transportation accident involving a radiography source after participating in TEPP training. Later the same year, hazmat teams in Idaho responded to a radiological incident and release of contamination at a fixed facility after participating in a TEPP exercise. The Idaho Regional Hazmat Team also credited the TEPP training and exercise program for helping them respond successfully.

CONCLUSION

The overall goal of TEPP is to address the emergency response needs of state, tribal, and local governments. This is accomplished by meeting emergency first responders' training and knowledge needs, and by reducing the concerns of first responders about responding to any accident or incident involving DOE radiological materials shipments. One highly successful method of achieving this goal is by partnering with communities to conduct drills and exercises. Preparing to conduct an exercise is a comprehensive process that can be as useful as the conduct of the exercise itself. The preparation process involves conducting a Needs Assessment, improving procedures, conducting MERRTT training for response agencies, and may also include conducting hands-on coached drills for specific field response activities, and/or tabletop drills that focus on multiple agency interaction. The conduct of an exercise validates the training and procedures, and gives responders an opportunity to respond to a realistic simulation. The post-exercise process identifies areas for improvement, and corrective actions that will help agencies improve their response to radiological transportation accidents. Stakeholders participating in TEPP training, drills and exercises have provided positive feedback, even writing letters of thanks to DOE head quarters citing the effectiveness of the TEPP process. TEPP exercises, as the culmination of a comprehensive training approach, will continue to be a useful DOE tool to help prepare emergency responders at all levels across the nation.