Emergency Preparedness as Addressed by the WIPP Transportation System*

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INTRODUCTION

When the Department of Energy (DOE) developed the initial transportation program for the transport of transuranic (TRU) waste to the Waste Isolation Pilot Plant site, it was well aware that the system would be under close scrutiny, both internal and external. The DOE had to establish credibility not only in the safety of the transportation system, but also in its ability to effectively address any transportation emergency that might occur. The DOE has met and exceeded the challenge.

BACKGROUND

Starting in January 1987, the DOE began developing an integrated system to transport TRU waste from 10 widely dispersed generator sites to the WIPP. The system consisted of a type "B" Nuclear Regulatory Commission (NRC) certified packaging, a specially designed trailer and a lightweight tractor, the DOE "TRANSCOM" satellite-based vehicle tracking system, and uniquely qualified and highly trained drivers. The DOE chose to use a dedicated carrier to ensure captive use of the drivers and tractors. In June of 1989, the National Academy of Sciences (NAS) reviewed the transportation system (NAS 1989) and concluded that: "The system proposed for transportation of TRU waste to WIPP is safer than that employed for any other hazardous material in the United States today and will reduce risk to very low levels."

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Since that review, the DOE and Westinghouse Waste Isolation Division (WID), working closely with representatives of the TRU waste transportation corridor states, have made significant strides in addressing and improving emergency response preparedness. As the transportation system evolved, several potentially weak areas were identified that needed resolution. Did the drivers know what to do in the event of an accident? Could the drivers use radiation detection instruments? What could be done to enhance their driving skills? What will the carrier/DOE do if a TRUPACT-II separates from the trailer? What will the carrier do if a tractor has a mechanical breakdown? Can the driver find a safe place to park if needed? Who is going to actually do the cleanup if a spill occurs? What response will the DOE provide in the event of an accident? Each of these areas has been addressed.

The results of the preparation have enabled the carrier to achieve an enviable level of preparedness in the area of emergency response. The carrier has participated in numerous TRU waste transportation emergency response exercises referred to as either "TRANSAX" or "WIPPTREX." TRANSAX involves DOE participation from the headquarters level on down to the local field office level, along with state/tribal/local participants. WIPPTREX is a smaller scale in that it is primarily a state/tribal/local exercise and does not include DOE headquarters participation. In many cases, due to the drivers' extensive knowledge and experience, they have been intentionally "injured" to preclude them from providing too much assistance to the first responders.

Participation in these exercises with the first responders of the TRU waste corridor States and the achievement of the extensive safety record have earned the carrier, DOE, and WID the credibility of having developed a safe transportation system, prepared for any emergency.

DRIVER TRAINING

For a TRU waste transportation system driver, being a "safe driver" is not enough. They must also be prepared and must know what to do in the event of an accident or incident. All drivers must satisfactorily complete the WID First Responders Course, which is taught to emergency response forces along the TRU waste corridor States. These responders are mostly volunteer units from local communities that would be the "first to respond" to an incident.

To ensure that the drivers are proficient with the Ludlum 14C radiation detection instruments they carry in the cab of the tractor, drivers have attended the Interservice Nuclear Weapons School, at Kirtland Air Force Base, New Mexico. There, drivers are provided with classroom instruction on the use of the instruments and then participate in a field exercise which includes entry into a controlled area contaminated with Thorium sludge and with a strategically planted Cobalt-60 source. Drivers thus obtain practical experience with their instruments and get actual readings similar to those they might expect should they encounter actual radioactive contamination. This provides a much more realistic environment as opposed to taking readings from instrument check sources held under the instrument's probe. As an additional benefit, since their anticontamination

clothing is now contaminated from entering the site, they receive first-hand training and must process out through a "hot line." The hot line is the decontamination station the drivers must process through to check for, and remove, contamination they may have on their person. It is important to note, however, that the purpose of the training is to enable the drivers to proficiently determine the "presence or absence" of any radiation, not to be a health physicist. In other words, to make a "go/no-go" decision. Instruments carried in the tractor are also available for use by any qualified state official.

In an effort to increase driving skills to better prepare TRU waste drivers to take the right action during a crisis on the road to preclude the possibility of having a traffic accident, drivers are required to attend a decision driving course. There are two such courses for medium to heavy-duty truck drivers within the United States. Included are subjects such as braking control, skid control techniques, cornering, serpentine maneuvers, evasive action exercises, jackknife control and recovery, and factors affecting stopping distances. On a wet surface, drivers are evaluated on their ability to make "correct" defensive driving decisions when confronted with potential accident conditions. One graduate is quoted as saying: "You spend all day doing what you've tried all your life to avoid." Perhaps this course will contribute to precluding an emergency situation.

TRUPACT-II RECOVERY

Early in the development of the TRU waste transportation system, members of the Western Governors' Association (WGA) questioned how DOE and its drivers would respond should one or more TRUPACT-IIs become separated from the trailer. In response a TRUPACT-II Recovery Guide has been developed and tested in preparation for this unlikely event. A copy of the guide is carried with the tractor for each shipment and is also available at appropriate state emergency response offices as well as DOE Radiological Assistance Program regions. Members of the WGA were invited to witness a field exercise during which proposed methods of recovery of a TRUPACT-II were demonstrated. Drivers are trained in and can implement this guide. As part of the scenario for TRANSAX-92 (a TRU waste transportation accident exercises conducted in Idaho) two TRUPACT-IIs were "recovered" after having become separated from the trailer as a result of the staged accident.

TRACTOR REPLACEMENT

Another concern expressed by various stakeholders was the ability of resuming a shipment in minimal time should a TRU waste tractor experience mechanical difficulty. The TRU waste contract carrier is required to have a capability to replace an en route tractor within 8 hours and continue on with the shipment. On two occasions this was successfully demonstrated with no-notice exercises called by the Department of Energy when the carrier was returning from a TRU waste transportation Education and Transportation Outreach Program presentation. In both cases, tractor replacement was completed within 2 hours, including use of a wrecker to transport the "disabled" tractor. During TRANSAX 90, a major TRU waste transportation emergency response exercise in Colorado Springs, CO, the carrier's capability was challenged by the state of Colorado.

In response to a no-notice request by the state of Colorado, the DOE, knowing the importance of this issue, had the carrier send three replacement tractors. The first tractor arrived, after having passed a Colorado state vehicle inspection, within 1.75 hours. The second arrived within one 1.8 hours, and the third, all the way from Albuquerque, NM, also arrived within the required time frame. The tractor replacement capability question has been put to rest.

EMERGENCY RESPONSE ACTIONS

As lessons were learned from the first TRU waste transportation emergency response exercise, it became apparent that a separate policy for emergency response actions to TRU waste transportation accidents was evolving. The shear number, estimated at more than 20,000 from 10 widely dispersed TRU waste generator and storage sites located in 23 states, of proposed TRU waste shipments dictated a need for standardization. The Department of Energy, as the shipper, receiver, and using a dedicated contract carrier, needed to be responsive.

Guidance for the emergency response to a TRU transportation incident is outlined in a document (DOE/CAO-94-1039) by the DOE Carlsbad Area Office. Although this document recognizes many of the long standing responsibilities pertaining to a radioactive transportation incident, there are some notable exceptions. For all TRUPACT-II transportation incidents, the DOE Albuquerque Field Office Emergency Operations Center will be in charge, regardless of what DOE Radiological Assistance Program region the accident occurs in. Also, the DOE will not wait for a request for assistance from a State, response will be automatic. It is expected that the initial response to a TRU waste incident would be from the State, Tribal, or local emergency response agencies followed by the appropriate DOE Radiological Assistance Team (RAT) and the Regional Coordinating Officer (RCO). The RCO would be the first DOE representative to take control of the scene, eventually augmented by the CAO's Incident/Accident Response Team (IART). The IART would have been placed on stand-by while a TRU waste shipment is in progress. Included as members of the IART are the DOE, Carlsbad Area Office, National TRU Program Office Manager, Transportation; a DOE public affairs representative; and WID transportation and packaging engineers. The team can be dispatched using DOE chartered aircraft and will provide technical assistance to the senior DOE official and On-Scene Commander as defined in the Federal Radiological Emergency Response Plan (FRERP).

Under most scenarios for transportation incidents, it is unlikely that a release of radioactive material will occur. This is based on the containment capability of the TRUPACT-II, a Department of Transportation Type B container. Therefore, most TRU waste incidents will be evaluated by local law enforcement agencies and the carrier drivers. Upon their recommendation a staged response may be required.

The carrier is required to maintain a capability to restore an accident site to its original condition should the need arise. In the case of the TRU waste carrier, the WID requires the carrier to maintain a contract for a cleanup service in the unlikely event that an accident occurs which results in the release of the contents of a TRU waste package. Site remediation may result in the use of additional 55 gallon drums being filled by the subcontracted cleanup team and reloaded into a serviceable TRUPACT-II using the TRUPACT-II Mobile Loading Unit. The DOE has agreed to work closely with the states to ensure they are satisfied with the cleanup effort. Response actions will be coordinated with State officials, including State health officials, to ensure proper cleanup/decontamination requirements are met. Departure from an accident scene will be permitted only after approval from the proper state agency.

Should the need arise to find a safe place to park a TRU waste vehicle due to unanticipated adverse weather, road conditions, or mechanical repairs to the transporter the DOE formulated a three tiered approach. The first was to use a DOE facility if they are reasonably close to where the need arises. For the second choice the DOE entered into a joint DOE/DOD memorandum of agreement to enable the vehicle to park at any DOD installation along the TRU waste routes. The procedures implementing this agreement have been exercised at two installations in the state of Colorado. The third choice is to use the protocol developed by members of the Western Governors' Association to assist the carrier in selecting a safe parking location at other than DOE or DOD facilities.

SUMMARY

The TRU waste carrier has demonstrated this exceptional level of emergency response preparedness measures through their participation of numerous TRU waste transportation emergency response exercises. The proficiency level is such that the drivers find that the exercise scenario frequently calls for them to be "injured" or "incapacitated" by some means to preclude their offering too much assistance to local responders. To the credit of the DOE, the WID, and the TRU waste carrier, as well as the stakeholders, the credibility of the TRU waste emergency response preparedness is well established. Rather than ask "what if" questions about the emergency preparedness of the TRU waste system, stakeholders have recommended that the WIPP system be the standard for other hazardous material shipping programs to follow. Prior to initiation of shipments of waste in other than TRUPACT-II type B packagings, similar emergency preparedness measures will be developed and incorporated.

REFERENCES

National Academy of Sciences, *Review Comments on DOE Document DOE/WIPP 89-011: Draft Plan for the Waste Isolation Pilot Plant Test Phase: Performance Assessment and Operations Demonstration* (June 19, 1989)

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