

WIPP Transportation Fact Sheet



WESTERN
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ASSOCIATION

Western States Committed to Radioactive Waste Transport Safety

In 2017 the federal government will resume shipping radioactive waste by truck to the Waste Isolation Pilot Plant (WIPP), a deep geologic disposal site in southeastern New Mexico. Shipments were halted in 2014 after a chemical reaction caused a waste drum to burst, contaminating portions of the WIPP underground. Considerable work has been done to restore the facility, including enhanced safety management programs, as well as changes in operating procedures and waste disposal criteria designed to prevent a reoccurrence of such an event.

The U.S. Department of Energy (DOE) and its contract carriers bear primary responsibility for the safety of shipments of radioactive waste. Western states also play a critical role in protecting their residents and the environment. The waste being disposed at WIPP comes from environmental cleanups at former nuclear weapons production sites throughout the country. Transporting this waste to WIPP and disposing of it 2,150 feet underground helps protect people and the environment.

In 1989, the Western Governors' Association established a Technical Advisory Group, consisting of representatives from western states located along the transportation corridor, to address issues that would help ensure the "safe and uneventful" movement of the waste. To achieve this objective, the Technical Advisory Group worked cooperatively with the DOE to develop a comprehensive transportation safety program, which contains stringent protocols, principles and procedures. This program has been fully implemented nationwide by the DOE and by each of the 12 states represented on the Technical Advisory Group (Arizona, California, Colorado, Idaho, Oregon, Nebraska, Nevada, New Mexico, Texas, Utah, Washington and Wyoming). Each element of the transportation safety program is reviewed biennially and updated and changed as necessary, to reflect best practices and ongoing needs.

The Waste

The waste disposed of at the WIPP is transuranic waste. Because transuranic waste will remain radioactive for thousands of years, U.S. policy is to isolate this waste deep underground in a geologic repository.

Transuranic waste consists of protective clothing, tools, glove boxes, glassware, equipment, soils, sludge, air filters, and solidified waste contaminated with small amounts of plutonium and certain other radioactive materials. Transuranic waste is produced during nuclear weapons research, production and cleanup.

Prior to 1970, transuranic waste was buried at DOE sites in shallow landfills. Since then, newly generated transuranic waste has been stored in metal drums and other temporary storage containers in anticipation of its eventual shipment to the permanent disposal site.

Ninety-six percent of the transuranic waste identified for disposal at the WIPP is classified as "contact-handled," which means the radiation it emits is not very penetrating and does not require heavy shielding. But, if inhaled or ingested into the body – even in very small quantities – certain contact-handled transuranic materials can deliver significant internal radiation doses.



A truck with three TRUPACT-II casks.

The remaining four percent of the waste is called “remote-handled.” The radiation that this waste emits is very penetrating and requires heavy shielding. The transportation safety plan described in this fact sheet was initially developed for contact-handled waste shipments and has since been updated to incorporate the necessary planning and training for remote-handled shipments to the WIPP.

The Disposal Site

The disposal site at the WIPP is an underground repository located about 30 miles southeast of Carlsbad in southeastern New Mexico. Radioactive waste is permanently disposed 2,150 feet below the surface in an ancient salt formation, which provides a geologically stable, moisture-free environment. The WIPP was constructed as a research and development facility to demonstrate the safe disposal of transuranic waste.

DOE facilities in the West that have shipped transuranic waste to the WIPP are the Idaho National Laboratory; Los Alamos and Sandia National Laboratories in New Mexico; Rocky Flats Environmental Technology Site in Colorado; the Hanford Site in Washington State; Lawrence Livermore and Lawrence Berkeley National Laboratories and GE Vallecitos Nuclear Center, all in California; and the Nevada Test Site.

Cask Safety

This fact sheet describes the transport safety program developed jointly by the Technical Advisory Group and DOE. This program builds on the safety that already exists due to the robustness of the shipping containers that are called casks.

All contact-handled waste is transported to the WIPP in one of three types of sturdy, reusable casks. The Transuranic Package Transporter (TRUPACT-II) is the primary shipping container. Inside the TRUPACT-II, transuranic waste is sealed in 55-gallon steel drums or steel boxes. Each TRUPACT-II holds up to fourteen 55-gallon drums or two boxes. Heavier waste materials are transported in a shorter version of the TRUPACT-II, called the HalfPACT, which can hold up to seven 55-gallon drums. Typically, a full shipment consists of three casks, although some shipments may only consist of one or two casks.

The TRUPACT-III is used to transport larger types of contact-handled waste and is shipped as a single package per trailer.

In order to transport radioactive materials, the casks must be certified and approved by the U.S. Nuclear Regulatory Commission (NRC) for the cask’s ability to meet safety



Each TRUPACT-II holds up to fourteen 55-gallon drums.

standards. These standards were set to minimize damage to casks in the case of a severe accident. Unlike most radioactive-material shipping containers previously certified by the NRC, the TRUPACT-II and HalfPACT are flexible rather than rigid packages. The surfaces were designed to absorb the energy of an impact and yet survive major accidents without losing their contents. The TRUPACT-III, which has a large rectangular shape, is a rigid package.

NRC regulations do not require actual testing of a full-scale cask to prove it can withstand extreme conditions. In most instances, the NRC accepts the results of computer simulations and physical tests on scale models. At the urging of the WGA Technical Advisory Group, DOE agreed that full-scale testing of TRUPACT-II prototypes was necessary because of the unique shape of the cask. The full-scale tests were designed to demonstrate the casks’ ability to survive high-speed crashes and punctures followed by fires. Computer modeling was performed to satisfy NRC requirements for submersion in water. The State of New Mexico, the host state for the WIPP, helped in the design and review of the tests. The test program identified several shortcomings in the original design, which were corrected before the cask was used for transportation. Full-scale tests were also conducted on the TRUPACT-III.

Remote-handled transuranic waste is shipped in the RH-TRU-72-B cask. Unlike the casks used for contact-handled waste, the RH-TRU-72B contains heavy lead shielding to contain the penetrating radiation. Because of the heavy shielding, the amount of waste that can be shipped in one of these casks is limited to the equivalent of three 55 gallon drums.

Accident Prevention and Emergency Preparedness

The WIPP transportation program takes a preventative approach to transportation safety by using highly skilled and trained drivers, high-quality equipment and avoiding hazardous road and weather conditions.

The accident prevention portion of the transportation safety program is based on this common-sense philosophy. The DOE, recognizing the unique hazards posed by radioactive materials and a heightened public interest in radioactive material shipments, and at the insistence of the western states, agreed to go beyond minimum federal requirements for many elements of the WIPP transportation program.

However, even with these precautions, an accident may occur. Therefore, an effective emergency preparedness program is necessary and was developed by the Technical Advisory Group as part of the overall program. The transportation safety program is described below.

High-Quality Drivers and Carrier Compliance

The U.S. Department of Transportation sets standards for drivers of trucks that carry hazardous cargo. The DOE adopted rigorous driver and carrier performance requirements to ensure that only high-quality drivers and vehicles are used for WIPP shipments.

All drivers must have extensive, accident-free experience and are tested for drug and alcohol abuse. Regular safety audits are conducted by DOE and/or the carrier's host state to ensure that drivers and carriers are in compliance with all regulations and contract requirements.

Safety Inspections

All transuranic waste shipments are inspected by state personnel using standardized enhanced truck safety inspection requirements. These inspections take place before the trucks leave the DOE sites and periodically along the route to ensure that the trucks are consistently in top working condition. The comprehensive inspection includes brakes, tires, lights, turn signals, cask tie-downs and many other mechanical items. Drivers' logs are checked to ensure they have not been behind the wheel for a longer period than allowed. Radiation surveys of the shipping containers are taken to ensure radiological standards are met. The state inspectors conducting these surveys are trained and certified by the Commercial Vehicle Safety Alliance, a North American organization of



Shipments are inspected before trucks leave DOE sites and periodically along the route.

commercial vehicle inspection agencies. The inspection requirements for WIPP shipments are more stringent than for most other hazardous material shipments. Any defects that are discovered must be repaired before the truck can depart or resume its trip.

Bad Weather and Road Conditions

The states and DOE have agreed on procedures to monitor weather and road conditions so transuranic shipments can avoid particularly hazardous driving conditions. Shipments do not depart DOE facilities if they are likely to encounter severe weather. If any of more than a dozen National Weather Service "warnings" or certain "advisories" are in effect, such as a Blizzard Warning or a Dense Fog Advisory, the shipments do not depart – even though the freeway may be open and other truck traffic is moving. Shipping schedules also avoid places and times where there is heavy traffic, such as a rush hour, major metropolitan areas and holiday weekends.

Safe Parking

If shipments encounter unexpected bad weather or road conditions, the drivers either proceed to a pre-selected safe parking area or select a safe parking area based upon criteria developed by the states. Some states have identified specific safe parking areas, such as ports-of-entry and state highway department facilities. The U.S. Department of Defense also has a memorandum of understanding with DOE, which allows federal military facilities along the routes to be used as safe parking areas.

Advance Notice of Shipments/ Access to Shipment Status

All transuranic waste shipments are monitored and tracked through a satellite-based tracking system. States have constant and direct access to this system. The system displays schedules of upcoming shipments and provides near real-time tracking and status updates for shipments

in transit and contains immediate emergency response guidance information. It also supports two-way satellite communication between the drivers, the carrier and DOE.

Highway Routing

The routes used are predominantly Interstate highways. Shipments use beltways around urban areas, when available. The DOE selected routes early in the process and committed to directing the WIPP carrier to use these routes. This early route selection allowed states to focus their training efforts along those routes. States may also designate alternate routes, when they believe they are necessary to avoid construction, accident scenes, catastrophic weather events or if they are otherwise necessary to enhance the safety and security of shipments.

Security Plan

Since the events of September 11, 2001, the Technical Advisory Group has worked with the DOE to develop and implement enhanced security protocols that help ensure shipments are better protected from terrorist attack.

Emergency Response Plans and Procedures

A well organized, coordinated effort is needed to make response to an accident swift and effective. Plans and procedures have been developed that are specifically designed to deal with transportation incidents involving the WIPP shipments.

Emergency Responder Training

The DOE and states provide training to state and local emergency response and medical personnel along the WIPP shipping routes. Those trained include: firefighters, police, emergency medical staff, highway crews and other potential first responders. Training is supplemented with drills and exercises. These events enable both the DOE and the states to continually assess and improve emergency preparedness.

To Learn More

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Emergency Response Equipment

Radiation detection and personnel protective equipment have been provided to emergency responders and hospitals along the shipping routes to allow for an adequate response and assessment in the case of an incident. Training is also provided by DOE and the states on the operation and use of such equipment.

Medical Preparedness

Emergency medical personnel along the routes also have received training. This includes emergency medical technicians and paramedics who may respond to an accident scene and hospital emergency room personnel who may be required to treat accident victims. Accordingly, hospital radiological plans and procedures have also been developed and refined. Emergency medical personnel also participate in the drills and exercises previously described.

Program Evaluation

The states conduct a comprehensive review of the effectiveness of the entire transportation safety program every two years. The most recent review, which was completed in 2013, concluded that the system "continues to be a successful system for safely transporting transuranic waste to WIPP." No evaluations were conducted while shipments were on hold due to the radiation release at the WIPP facility.

Proven Safety Program

More than 11,800 shipments of transuranic waste have been transported safely to New Mexico from 12 DOE sites. There have been a few minor accidents involving these shipments, but no accident that resulted in a release of radioactive materials. That's not to say more serious accidents can't or won't happen, but the safety record of the shipments to date for this campaign demonstrates that the stringent protocols, principles, and procedures developed and implemented under the program have been followed. Both the states and DOE are committed to ensuring these protocols, principles, and procedures will continue to be adhered to throughout the entire campaign.

The Western Governors' Association represents the Governors of 19 Western states and 3 U.S.-flag islands. The association is an instrument of the Governors for bipartisan policy development, information exchange and collective action on issues of critical importance to the Western United States.

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