

Memorandum



Date: November 5, 2002

To: Enforcement Services Division

From: **DEPARTMENT OF CALIFORNIA HIGHWAY PATROL**
Commercial Vehicle Section

File No.: 62.A10006.A12626.2-1016

Subject: RADIOACTIVE MATERIALS ESCORT ISSUE PAPER

Introduction

The intent of this paper is to explore the issues relative to the California Highway Patrol (CHP) providing escort for shipments of radioactive materials (RAM) including Transuranic (TRU) Waste, Highway Route Controlled Quantities (HRCQ) of radioactive materials, Classified Nuclear Materials and Domestic and Foreign Spent Nuclear Fuel.

Background

In 1992, Commissioner Helmick, signed a Memorandum of Understanding (MOU) with the U.S. Department of Energy (DOE) and stated California will escort the initial shipments of TRU waste going to the Waste Isolation Pilot Plant (WIPP) near Carlsbad, New Mexico and Yucca Mountain in Nevada if/when approved (see attachment 1). All of these shipments must use a specified route negotiated between states, the Department of Transportation (DOT) and the DOE.

Currently, spent nuclear fuel shipments are escorted through all urban areas by the CHP. In addition, every shipment of foreign research reactor spent fuel is escorted by CHP personnel for its entire journey through California, pursuant to Title 10, Code of Federal Regulations, the transportation safety plan prepared by the DOE, and established CHP policies. The Nuclear Regulatory Commission (NRC) regulations and the DOE requirements prohibit unauthorized disclosure of safeguards and security information regarding the shipments, such as shipment schedules and exact routes. When received by Enforcement Services Division's Commercial Vehicle Section, the information is hand-carried to the Office of the Commissioner.

Armed federal agents escort each shipment of Classified Nuclear Materials and are trained to protect and defend shipments from any attack. (See attachments Tables I and II requirements for escorting, inspection of vehicles and transporting RAM). The trailers used to transport materials are specially designed and incorporate safeguards to prevent unauthorized removal of the cargo. The DOE monitors, tracks and provides two-way communication with every convoy on the road.

TRU wastes are discarded materials that have been generated since the 1940s from nuclear weapons production, research and development. This waste generally consists of protective clothing, tools, rubber gloves, glassware, air filters and sludge contaminated with man-made radioactive radioisotopes with atomic numbers greater than uranium, such as plutonium, americium and curium. Some of these wastes contain hazardous chemical constituents (e.g. carbon tetrachloride, lead, toluene, xylene), and are referred to as "mixed" TRU waste.

The DOE oversees the clean-up and nuclear waste transportation activities at federal defense facilities throughout the nation. The DOE's nuclear weapons research and development program, and environmental cleanup, require the transportation of large amounts of radioactive materials. In FY 1995, there were 6,878 shipments of radioactive waste nationwide which were moved from one facility to another, placed in holding and awaiting transportation to the WIPP. (See attachment Table III for total WIPP shipments to date). Over the next several decades, the numbers and volumes of the DOE radioactive material shipments will increase dramatically as a result of cleanup activities at the nuclear weapons complexes and the storage and/or disposal of spent reactor fuel and high-level wastes.

Discussion

Since September 11, 2001, the public's perception of a terrorist threat to the United States and the need for added protections has changed. The CHP has been tasked with many endeavors to ensure the safety of the people of California. The question arises as to what level of protection ought to be afforded to radioactive shipments traversing California highways. Escorting all shipments of radioactive materials would place an extreme burden on departmental resources. Shipments going to the WIPP will be TRU wastes and would be of little, if any, value for weapons use since the package only contains equipment contaminated with radioactive isotopes.

Recent contacts with other states (Oregon, Colorado, Wyoming, Idaho and New Mexico) who have, and continue to have, shipments traversing their highways, reveals they do not regularly escort shipments of radioactive materials. While Nevada has previously stated they will escort any shipment traveling through their state, at the present time only the state of Washington escorts these shipments, primarily due to the fact the route through their state is only about 45 miles.

The benefits desired from escorting RAM shipments are to provide security, alleviate public and political concerns, provide immediate communication in the event of an unplanned circumstance and enhance safety by immediately isolating an incident scene until trained personnel with proper monitoring devices are able to respond.

Experts on RAM agree that as long as shipping containers remain intact, there is no danger in the transportation of RAM. They also agree that the possibility of an accidental release from a shipping container under any circumstance is extremely remote.

The WIPP facility is expected to have an operational life of 35 years. During this time, it is expected there will be over 37,000 shipments of TRU waste material shipped to the repository, originating from 10 major DOE sites as well as several smaller ones located in the U.S., with approximately 90 percent of these shipments originating from DOE facilities located east of Nevada. A major portion of these shipments is being routed over a longer distance into California only to backtrack into Nevada for disposal at the Nevada Test Site (NTS).

Last year, the DOE began shipping over 200 shipments of low-level radioactive waste shipments to the NTS. In addition, the number of shipments (incoming low-level radioactive waste and outgoing WIPP shipments) planned by the DOE has increased to over 3,000 projected shipments per year over the next 30 years. This increase, combined with the possibility that the DOE plans tens of thousands of spent fuel shipments to Yucca Mountain, will lead to a significant impact to the CHP's budget.

The costs associated for actual vehicle inspection and escorting responsibilities are not currently specially funded, therefore, unless a funding source is identified, the costs will come directly from the CHP's baseline budget. CHP personnel will be required to travel to the remote location, inspect the transport vehicles, escort the shipments and then return to their assigned area. This will result in personnel and other associated travel costs estimated to be up to \$2,300 per trip. This estimation is based on a single escort involving two patrol vehicles with a single officer per vehicle. If multiple transport vehicles arrive in the state at staggered intervals (the DOE plans three to five shipments per day), or in the event of stand-by time due to equipment failure or adverse weather or road conditions, associated personnel costs could substantially increase. The projected cost for WIPP shipment escorts alone, estimated to be 3,000 annually, is expected to be \$6,900,000 each year.

Issues

1. For which types of RAM, if any, should CHP provide escort?
2. What level of security should be provided to shipments designated as requiring escort?

Alternatives

Type of RAM to be Escorted:

1. Escort all RAM above a pre-determined minimum level of radioactivity.
2. Escort only those shipments which the DOE does not escort.
3. Escort RAM based upon a vulnerability-based assessment which includes the level of radioactivity, usefulness to terrorists and the declared Office of Homeland Security Executive Branch Alert Levels.
4. Do not escort any RAM, but provide the affected CHP Divisions/Areas with routing information.

When to Escort:

1. Escort shipments only through urban areas.
2. Begin escorting of shipments at the point of entry into the state for shipments originating outside California, and at the point of origin for shipments originating within the state.
3. Escort a predetermined percentage of total planned shipments on a random basis.

Type of Escort:

The following table outlines types of escort and the advantages and disadvantages of each.

Type of Escort	Advantage	Disadvantage
Marked patrol vehicle	Vehicles' high visibility may act as a deterrent to theft or attack.	Draws some attention to the load. Operating costs incurred with each shipment.
Unmarked patrol vehicle	Makes shipment less visible while still maintaining security.	Operating costs incurred with each shipment.
Air surveillance - shadowing	Makes shipment less visible while still maintaining security.	Operating costs incurred with each shipment.
Random escorts	Scheduling flexibility.	Shipments not receiving 100% protection.
No Escort	No cost involved. Shipment is less visible to the public.	Shipment is less secure.

Recommendations

Although the CHP committed to escorting all WIPP shipments, the projected significant increase in the volume of these shipments, the associated cost to the CHP for WIPP escorts, and the vulnerability of other more dangerous highways shipments of radioactive materials suggests one or more of the following:

1. The CHP continue to escort all WIPP shipments, regardless of volume or costs.
2. The CHP continue to escort all radioactive shipments, including those destined for WIPP, regardless of volume or costs.
3. The CHP's decision to escort shipments of radioactive materials should be made on a case-by-case basis using a vulnerability-based assessment that includes the current National threat level.
4. The CHP submit a Budget Change Proposal for all costs associated with radioactive shipments, including PYs and travel. California could then petition Department of Energy (DOE) for reimbursement, although DOE is not likely to comply.

A. R. JONES, Captain
Commander

Attachments

Table I

RADIOACTIVE MATERIALS ROUTING TABLE

SHIPMENT	PRE-NOTIFICATION	PRE-INSPECTION	ESCORT
HRCQ	Not Required	Not Required	Not Required *
Spent Nuclear Fuel	Required	Required	Required **
Transuranic Waste (TRU)	Not Required by law-CHP receives notification	Not Required by law-CHP will inspect ***	Not Required by law-CHP will escort ****
Rocket Fuel	Required	Not Required	Not Required
Low Level Radioactive Waste	Not Required	Not Required	Not Required

* - Escorts of HRCQ shipments are not required; however, the CHP will escort these shipments if requested. (No requests for escort have ever been received)

** - Only required for shipments going by truck. If shipment is by rail, CHP will "shadow" load until it reaches the state line.

*** - CHP will inspect vehicles prior to shipment leaving a site in California. CHP will also inspect any vehicles entering California from another state.

**** - CHP will escort a shipment only if going to the WIPP site in New Mexico, originating in California to the California state line. CHP will also escort any vehicle entering California to its California destination.

Table II

RADIOACTIVE MATERIALS TRANSPORT SECURITY TABLE

SHIPMENT	MODE OF TRANSPORTATION	TYPE OF PACKAGE	CONSEQUENCES OF RELEASE	SAFEGUARDS IN PLACE
Transuranic Waste (TRU)	Truck Rail	Steel drums or boxes inside steel casks (TRUPACT-II and Halfpac).	Normally low probability event and low to high consequences dependent upon content and size of shipment.	CHP pre-notification, pre-inspection and escort. Local, state and federal radiological emergency response plans in place, although only a portion of the proposed WIPP shipment routes in California have had emergency response preparation, e.g., training not yet provided along LLNL shipment routes.
Spent Nuclear Fuel (Foreign and Domestic)	Truck Rail Ship	Heavily shielded stainless steel casks; Type B package designed to withstand severe truck/rail accidents.	Area of contamination dependent on size of load. High consequence, low probability.	Shipments escorted through all urban areas by armed guards, often by state enforcement personnel; for rail shipments, advance track, signal and operating inspections; CHP pre-notification, pre-inspection and escort. Local, state and federal radiological emergency response plans in place and training has been provided along foreign spent fuel shipment routes.
“National Security Shipments”	Truck primarily.	Varies with type of Shipment.	Low to high, depending upon contents of shipment.	Heavily armed escorts; Department of Energy “Safe Secure Transporters.”
Misc. HRCQ * Shipments. e.g., Cobalt-60, Cesium	Rail car Truck Ship	Varies with type of shipment.	Large area of contamination depending on size of load.	Local, state and federal radiological emergency response plans in place.

* HRCQ - Highway Route Controlled Quantity as defined in Title 49 Code of Federal Regulations.

TABLE III

WIPP Shipment Figures

March 26, 1999 to January 27, 2003

WIPP has received 1,475 transuranic waste shipments

Originating Site	Shipments	Miles
Argonne National Laboratory	0	0
Hanford Site	13	23,505
Idaho National Engineering and Environmental Laboratory	564	783,696
Los Alamos National Laboratory	31	10,602
Lawrence Livermore National Laboratory	0	0
Mound Plant	0	0
Nevada Test Site	0	0
Oak Ridge National Laboratory	0	0
Rocky Flats Environmental Technology Site	809	572,064
Savannah River Site	58	89,320
Small Quantity Sites	0	0
Total to WIPP	1,475	1,479,186