

HEAVY FREIGHT & PASSENGER TRAIN RAILROAD RESPONSE

PURPOSE

A. The purpose of this guideline is to provide emergency responders information for safe and effective response to and mitigation of incidents occurring on railroads. This guideline addresses response to both Freight Service and Amtrak passenger on rail lines. Information contained in this document is a guideline. Due to the numerous possibilities that may be found at these incidents, not all information is contained here in. Not all incidents will present exactly the same scenario.

B. This information is for situations that do not involve hazardous materials. It is a general safety and awareness guideline and was developed in conjunction with the railroad industry.

I. GENERAL

Refer to the D.O.T. response guidebook when responding to a hazardous materials incident involving a railroad. Additional hazardous material information is contained within the Hazardous Materials Response Plan. Safety awareness is the responsibility of each member responding to railroad incidents.

II. OPERATIONS

A. Response

District familiarization, company drills and pre-fire surveys will prepare companies for response to incidents along railroad right-of-ways. The following information may be valuable when responding to such incidents.

Identify which railroad line runs through your response area. Burlington Northern-Santa Fe and Union Pacific Railroad are the two major railroads in the Portland area. Portland & Western Railroad runs the Highway 30 corridor.

Identify apparatus access points to right-of-ways. Normal response routes may be unavailable.

Can apparatus safely reach and transverse right-of-ways during inclement weather conditions?

Provide adequate lighting for operations at night.

Access to water supplies and/or the need for water tenders.

Access to elevated or below grade railroad right-of ways.

Alternate access points to bridges, trestles, and tunnels.

Locked gates or the need for special keys.

B. Basic Safety Considerations

Expect train or rail equipment to move on a track from either direction at any time.

Steps to help ensure the safety for all responders:

Inform dispatch of all emergencies (i.e. stalled vehicles, grass fires, structural fires, and medical emergencies) near or on railroad tracks.

Contact the railroad dispatch center via fire dispatch to report emergencies and request train traffic to be stopped.

Traffic must be stopped on all right-of-ways containing more than one mainline. The presence of another set of tracks at the location is indication of another possibly active line.

Use railroad-highway crossings or railroad mileposts as reference points.

When responding to any rail emergency, remember that rail equipment is very large and extends beyond the edge of the track. Always park apparatus at least 25 feet from the edge of any track.

C. Basic Rules to Ensure Personnel Safety

To prevent slipping or tripping, step over the rail.

Look in both directions before approaching or stepping across the tracks.

NEVER ATTEMPT TO REACH THE OTHER SIDE OF A CAR BY CRAWLING UNDER CAR. If it is necessary to climb onto rail equipment, remember to maintain three points of contact at all times. Face the train and use rail equipment ladders and walkways provided at the ends of cars to cross over the coupler.

Long pike poles or ground ladders may be used to access locomotive compartment doors or rail equipment that do not have on-board ladder systems.

If at a derailment scene, be aware of tipped and leaning equipment, scattered wheel sets and car appliances. Be especially aware of bent and stressed rail, which can suddenly move and lash out.

Stay 30 feet from the ends of standing rail equipment.

Never place anything on or across tracks unless rail traffic is stopped and verified with the train conductor on site or railroad dispatcher.

Designate one lookout at the scene to watch for approaching trains in either direction.

III. HEAVY FREIGHT RAILROAD & PASSENGER TRAIN HAZARDS

A. Locomotive Hazards

1. A modern locomotive weighs in excess of 200 tons when fueled and ready for operation. A six-axle locomotive is approximately 70 feet long and 16 feet high. The diesel fuel tank capacity varies from 2,000 gallons to 6000 gallons. There are three emergency fuel cut-off locations used to shut down a running locomotive engine. These buttons are located outside on either side of the side frame above the fuel tank and inside on the back wall of the cab. These are large red buttons labeled "EMERGENCY FUEL CUT-OFF".
2. Due to high voltage located in locomotives, do not use water. The best response for fire fighting is to shut off the fuel to stop the engine. Enter the cab and open the battery knife switch (found on the back wall of the cab behind a door marked "Battery Switch"). Extinguish any fire utilizing dry chemical or CO₂ extinguishers. For some fires, such as a crankcase explosion or turbo fire, there is not much action that can be taken beyond isolating the unit and waiting until the fire consumes itself.
3. Be aware that locomotives have limited space in the cab, on the walkways, and inside access panels. Responders wearing full personal protective equipment may have difficulty gaining access to many areas.
4. Freight and passenger locomotives are equipped with air pressure lines and electrical connections between cars. Locomotives typically produce 480-volt AC or DC power to supply cars and can store 3000 volts DC indefinitely in capacitors. In addition there are pin style cable connections between cars. Firefighters should not attempt to connect or disconnect any of these connections. The electrical system must be taken off-line by the engineer in the cab for safe connection or disconnection. Electrical current may still be present due to the on-board battery back up system. Refer to railroad personnel for assistance.

B. Conductors & Engineers

1. At all incidents, the contact person should be the train conductor (who controls the movement of the train). The normal crew will be two members; the conductor and engineer. The conductor will provide all train documents or passenger manifests. Because the train manifest can be very lengthy and difficult to decipher, keep the conductor or engineer with you. Representatives from the railroad normally have direct contact via radio to any number of resources at the local rail yard.

C. Freight Railroads

1. Freight railroads transport both hazardous and non-hazardous products in many differently designed cars. Products may be shipped in boxcars, tank cars, hopper cars, gondolas, and refrigerated cars. Additionally shipments contained in trailers on the train (piggy back service) and intermodal box design containers are found on flat cars.

Non-Insulated Boxcar

Cars are readily identifiable, and contain car numbers, specifications, and owner's name on sides. Car doors are on sides of cars.

Insulated Boxcar and Refrigerated Cars

1. Cars contain above information. Design of door may be of the style described above or newer "Plug Door" design. A plug style door has the appearance of being recessed into the car door opening, and gives the car side a smooth surface appearance. Refrigerated cars contain a diesel fuel tank with approximately 150 gallons of diesel. The generator and compressor are at the front of car.
2. Fires inside these cars must be handled with caution. The following are some points to remember.

Have hose lines in place and reliable water supply secured.

Resist opening door and attacking fire.

Check for placards indicating hazardous materials presence

Spot apparatus in area not subject to a passing train on an adjacent track.

Make absolutely certain train traffic at the incident location is stopped. Have fire dispatch contact the railroad affected; check with the conductor of the train; or with yard personnel at a yard location.

3. Following are railroad industry recommendations when suppressing fires in boxcars:

Have minimum of two hose lines in place and ready for attack.

Wet down outside of car and observe hot area indicated by boiling water and rapid evaporation of applied water indicating the location of the fire inside the car.

Ladder car top for access with ground ladders; use two ladders, one on each side or end.

Cut a hole over fire location with rotary saw large enough to operate hose line or water distribution device. More than one hole in top of car may be needed.

Insulated car tops normally consist of 1/8” to 3/16” steel skin and four inches of insulating material (rock wool, perlite, ridged foam, etc.). The interior is normally finished with 3/4” plywood.

Cut at least four inches deep to reach car interior. Use a rotary saw on exterior and reciprocating saw for the insulation and interior wood lining.

To ensure extinguishment, wait approximately one hour before opening the car door.

Watch for falling debris or freight when opening car door.

The car door is a weak spot of construction. It may fall outward or downward, if exposed to shifting contents or fire damage.

4. Fire suppression methods from car tops may not be possible due to access issues. Suppression can be carried out using a hole placed high up on sidewall of car, intermodal container, or trailer. Due to railcar design, it may not be possible to open end doors on trailer containers or intermodal shipping containers. These units may have to be off-loaded at a rail yard facility for complete extinguishment, overhaul and investigation.
5. Refrigerated rail cars and like containers often have fires associated with the generator and compressor assembly. To shut down the generator or refrigeration unit, place switches in the “off” position, or pull out on the T-style handle at control location. Crews should not attempt restart refrigeration or generator units once they have been shut down. This task is to be handled by shipper’s representative or railroad personnel.

D. Amtrak

Amtrak passenger rail service operates two rail transport trains. The Talgo passenger commuter train and the Amtrak Superliner.

Talgo Train

1. Talgo passenger trains are one level containing no provisions for sleeping or overnight services. Passenger trains are divided into distinct cars: coach, business class, bistro, dining car, power car and control cab car. Passengers may walk the entire length of the train interior except for the baggage car area, power car and control cab car. Cars cannot be isolated by uncoupling the train. Only the locomotive can be uncoupled from this vehicle. The locomotive provides 480-volt DC electric service to all cars. The power car has an onboard diesel generator with approximately 450 gallon diesel fuel tank should the 480 volt DC system fail. The generator must be manually started.
2. On board each Talgo train is a specially trained car technician. This person is in charge of all systems aboard this train. This technician will be the greatest asset for the responder and answer all technical questions about the vehicle.

3. The conductor will have a passenger manifest of all persons aboard. The conductor is the contact person for emergency responders., and can be a key player especially in mass casualty incidents where accountability of passengers is a concern. Keep the conductor and a copy of the passenger manifest with you.
4. Passenger self-rescue instructions are posted conspicuously aboard each car.
5. Emergency responders' familiarization with these self-rescue and evacuation techniques will help evacuate the most people in the shortest time frame. The following are preferences listed in the passenger evacuation guide:

Move to the next car forward or back of your location in an emergency.
Exit through side entry, exit door.
Use Emergency Window Exit.

6. Emergency exiting through the marked windows may be the best alternative. Fire departments with experience extricating victims have encountered tool breakage and failure. Failure of hydraulic rescue tools should be anticipated. These tools may have serious limitations during cutting or prying operations, due to the heavy railroad grade construction of cars and components. Having a predetermined, reliable resource for heavy cutting of railroad rated steel parts and components should be planned for. Contractors or railroad resources need to be identified and dispatched when needed. Other fire departments conducting rescues have determined that cutting torches are a valuable tool for accessing victims.
7. Insert a standard blade large screwdriver into the exterior rubber window gasket or molding and removing window glass. Trapped but ambulatory persons can be instructed to pull the red ring or handle at emergency window exit and remove the window. The window weighs approximately 77 pounds. Windows may be broken with a pick headed fire axe at identified window locations on exterior of cars.
8. The exterior passenger doors have several very secure locking points and hardware. If a door needs to be forced, force the door towards the locomotive end. The interior door glass between cars is tempered. A red breaking hammer is provided at the bulkhead location near door.
9. Exterior car skin and supporting members may have to be cut at the window locations for victim access. Use the rotary saw or a reciprocating saw to perform a "Window Cut". The components of Talgo cars are many times be made of aluminum for reduced weight and may be easily cut.
10. Always avoid cutting the center portion of the car top. This area contains the 480volt DC and 110volt electric supply lines. In addition this area contains the main high-pressure airlines for brakes and other utilities. **DO NOT CUT IN THE CENTER OF THE CAR TOP.** Cut in the curved roof area to the floor line. Avoid

cutting near the corners of the cars. Heating, ventilation, and air conditioning units may be located in these areas.

Superliner Cars

1. Amtrak Superliner cars differ in the respect that they are used for longer distance travel and include sleeping cars. These cars are a two-story design. In the upper level, passengers can walk the length of the train interior. Lower level movements are restricted to that specific car. Upper levels are accessed via the interior stairwell. Cars have many different designs and interior layouts. Sleeping cars may be configured by movable interior partitions to provide desired sleeping cabin arrangements.
2. Electrical power to the cars is delivered from the locomotive generated 480volt DC power supply. Emergency power is derived from onboard lead acid storage batteries. Precautions regarding the disconnection of 480volt DC-produced source are covered previously.
3. Superliner cars, especially the dining cars, are equipped with refrigeration, compressor, and heating equipment. Refrigeration equipment aboard these cars can partially be accessed from the exterior. The conductor or assistant conductor will be a helpful resource for the responder in case of a serious problem.
4. Information from car attendants or service personnel aboard the train may be useful. These types of cars can be uncoupled, and isolated if the incident dictates.
5. Superliner cars are of a heavier design and duty rating than Talgo railcars. Many cars are designed to travel 100 mile per hour. Heavy-duty car body design makes rescue difficult, with standard fire service tools.
6. Use of the hydraulic rescue tools or prying tools should be attempted at the end doors of cars for forcing entry. Side passenger loading doors contain hydraulic assist and closing mechanisms and could be difficult to force. Rescue operations aboard these vehicles will need the use of ground ladders placed on the exterior of cars to reach the roof or upper level windows. Cars on their side will need some type of ladder lowered into a removed window to rapidly access passenger compartment while end doors are being forced.
7. Accidents, collisions or derailments can rapidly escalate into large scale, MCI events. Several hundred patients may be aboard the train. Rapid triage of victims will be critical. Removal of walking wounded, ambulatory patients will be easiest task but remember to check with conductor for manifest of passengers to account for all onboard train at time of emergency event.

IV. SUMMARY

- A. Emergency response personnel can successfully handle railroad emergencies of all types either within yard facilities or on mainlines. Observance of basic safety rules and application of knowledge gained by pre-planning is critical. Railroad access or special conditions in your response area should be identified prior to the incident. Mitigation of large incidents will strain all of the available resources and related emergency service providers. Drills with other departments or responders need to be carried out before an incident happens. Knowledge of railroad practices and procedures during training will greatly enhance your safety while working around this equipment. Set up drills or contact your local rail representative. Ask about their policies and procedures. Awareness of some of the following points is critical to ensure everyone stays safe at these incidents.
- B. Trains and railcars can and do move, any direction, on any rail line, at any time.
- C. Always contact the railroad company to stop traffic in your location. Emergency Contact numbers are located on or near every crossing. Always notify the railroad every time you are on their right of way.
- D. Place personnel and apparatus in locations that will not be vulnerable should a passing train approach that did not receive the stop traffic notification.
- E. Contact and retain the conductor on board, or freight yard representative.
- F. There are no contents aboard freight rail cars worth death or permanent injury to any firefighter.
- G. Assisting the railroad personnel is your function. Use their expertise and technical knowledge to form an incident action plan.
- H. Recovery of deceased or morbidly injured passengers is not an emergency. Rapid effective triage of patients can be carried out by firefighters entering a removed window. Forcible entry can continue while triage is carried out.
- I. Call for additional resources early. They can be returned if not needed.
- J. Use undamaged available passenger cars for triage or shelter in place quarters while awaiting transport to medical facility.
- K. Consider weather or environmental conditions effecting both rescuers and victims.
- L. Have specialized resources identified through the operating railroad or its contractors.