



**ARCADIA FIRE DEPARTMENT  
STANDARD OPERATING GUIDELINE**

**RAILROAD FIRE INCIDENTS**

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**Approved:** \_\_\_\_\_  
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**PURPOSE**

The purpose of this Guideline is to assist Department members in the safe handling of fire incidents involving railroad locomotives, boxcars, tank cars, and passenger cars.

**RESPONSIBILITY**

Due to unified response, the possibility of railroad emergencies in other jurisdictions does exist, however these incidents are rare. It should be the endeavor of all members to anticipate potential hazards and efficiently resolve the incident with safety in mind at all times.

**PROCEDURE**

**SAFETY**

The minimum level of protection for ALL members is full protective clothing, and breathing apparatus according to Department Guideline # 101, Personal Protective Equipment.

As is true with any incident, decisions cannot be made until the problem is identified and evaluated. With railroad accidents, the potential for a serious problem is likely and decisions can be of grave importance to the safety of personnel and the public. The variety of products carried and their associated hazards stress the importance of an early identification of the commodities involved.

As you approach, observe the scene from a distance for indications of what is involved. The general type of car often provides a clue as to the form of product. Tank cars are for liquids; boxcars will carry anything that is packaged, baled, or otherwise contained. Gondolas will hold bulk solids while hoppers will carry solids in bulk, but of a smaller size such as grains or pellets. Any of these products can possess hazardous properties. The color of a tank car has no relation to the identity of the product carried. Approximately 40 products are required to have their name stenciled in 4-inch letters on the sides of cars. These include mostly flammable gasses.

**IDENTIFICATION**

**Placarding**

Products falling under Department of Transportation requirements for hazardous materials warning placards can be your next source of information. DOT placarding places materials into very general categories that relate to their most severe hazardous properties. A four digit numerical code used in conjunction with the placard will further categorize the products and when used in conjunction with DOT Emergency Response Guidebook, will give general information about the physical properties, hazards, and guidelines for handling the variety of situations you may encounter. Binoculars can provide an extra measure of safety as you approach the incident.

WARNING: DOT placards are not required for shipments that do not exceed 1000 pounds and are transported in trailers on flat cars (TOFC) or containers on flat cars (COFC). Commodities classified as ORM-D may not require placarding. ORM-D refers to Other Regulated Materials, Section D and speaks of certain consumer commodities or products packaged for consumer consumption. Use caution when identifying the contents of TOFC and COFC loads, waybills for these shipments are generated from trucking bills of lading, the trucking industry is not as strictly policed and mistakes regarding loads and placarding have been discovered. Hazardous materials that were not properly listed on shipping papers have been involved in accidents.

### Waybills

The best source of product identification is the waybill. The waybill is the shipping paper of the railroad. Each car's waybill is identified by the car's ID number located in the upper left hand corner of the waybill. Railcar ID numbers are stenciled on the sides and ends of the cars. Do not trust your memory; write down the car ID number. If one digit is wrong, you can receive information that is wrong and misleading. Waybills, for operating trains, are usually found in the locomotive or with the conductor. For cars located in yards or spotted at an industrial site, contact the Chief Railroad Dispatcher of the responsible railroad. Information on a waybill must include commodity name, hazard class, placard notation, placard endorsement and total quantity. Waybills will be distinctly labeled for hazardous materials other than combustible liquids. Explosives, radioactive, and poison gas products will be marked as such; all others will be marked DANGEROUS. Waybills will also identify the shipper, the destination and may include emergency phone numbers.

Included on the waybill is the Standard Transportation Commodity Code: The STCC (stick) code number is a seven-digit number and every product shipped has such a number. If the STCC number begins with the digits "49", the product is a hazardous material. This STCC number can be used to obtain hazardous materials information.

A train "Consist" (sometimes called wheel report) is a computer-generated list of cars beginning with the locomotive, listing each car in sequence by number to the end car. On this list, placarded cars will be indicated as such. The consist is found in the locomotive with the waybills and can be used to the advantage of first responders when car numbers are not readily apparent. In fire conditions, or in derailments, car numbers may be obscured. If the car, or cars, in question can be identified as being located between, or to the rear, or forward of known cars, use of the consist and waybills can ultimately provide the necessary information. Again, given enough information, railroad computers can provide the consist of the affected train.

### ASSISTANCE FROM RAILROAD

During railroad incidents, railroad personnel can be of great assistance. They can often provide that extra bit of information regarding the special operating features of their equipment. They can also provide the tools and heavy equipment necessary to handle such incidents.

### Train Crews

Locate and account for the train crew. Barring injuries, they will be your first source of information and help. Train crews are in radio contact with the railroad dispatcher and can request additional assistance.

### Notification

Contacting the right railroad company can save valuable time and bring assistance to the incident quicker. A railroad company name on the side of a car is of little value. Cars loaded by one railroad may pass through the hands of several railroads before the shipment has reached its final destination. It is the railroad that operates on that track that will provide information and assistance.

When requesting assistance from the railroad, you may have some confusion in identifying your location. Railroads determine their location on track by milepost markers, switch numbers and other means. Street names and addresses mean little to railroad personnel.

## FIREFIGHTING

### Locomotives

A primary concern with any locomotive fire will be with shutting down the engine and disconnecting electrical power. Three emergency fuel cut-off switches are available and are clearly marked. Two are located outside and adjacent to fuel fill openings on either side of the locomotive. A third is in the cab near the engineer's station at the electrical panel. Operation of any one switch will shut down the engine. Expect up to 30 seconds for the engine to stop.

With the engine stopped, all electrical systems will be off except for the 74 volt battery system. A double knife blade switch is located in a cabinet below the electrical panel in the cab. Operate this switch to disconnect the batteries after the engine has stopped. With everything off and de-energized, access to the engine and various other compartments is safely gained through numerous doors and panels. Firefighting now, becomes matter of gaining access and applying extinguishing agents.

### Tank Cars

When the decision has been made to initiate firefighting, approach and take positions that will avoid the domes and the ends of tank cars. The domes are where pressure relief devices will be located and the ends are considered a weak point if the tank fails. The position of the relief valve is important. Operation may cause liquid rather than vapor to be discharged if the tank is lying on its side. In this case, pressure will not be adequately relieved and liquid gases produce vapor volumes 300 to 500 times greater, compounding an already serious situation. Flame impingement on the vapor space of a closed container is the most dangerous.

A frost line will indicate the liquid level but will not always be present and is never present with insulated tanks. The vapor space is where water application is effective. At each point of flame contact, 500 GPM is considered minimum. Entry to close valves or plug leaks should only be attempted after establishing effective cooling. Safety devices, rupture discs or relief valves, are designed to operate at 75% of tested tank pressure. The operation of a pressure relief device does not ensure adequate pressure reductions to prevent tank rupture. Intermittent operation of a relief valve indicates that the combination of cooling and valve operation is controlling pressure build up. A lazy flame indicates a leak at the relief valve or reduced pressures at a rupture disc.

A vapor rich flame is characterized by a smoky yellow-orange flame. A nearly blue-red, snapping, smokeless flame indicates the tank is almost empty and cooling water at this point could reduce pressure and draw the flame inside the tank causing an explosion. An increase in audible pitch or volume of fire at a relief valve indicates that cooling is ineffective and the situation is deteriorating.

A BLEVE (Boiling Liquid Expanding Vapor Explosion) is preceded by a shrill, high pitched, scream at the relief valve. The shortest period of time recorded for a BLEVE to occur was 18 minutes after exposure to fire. Tanks have been known to rocket considerable distance. On take off they can pivot and change direction from original alignment. Fragments have gone in every direction and large sections have traveled as far as 2500 feet. Evacuation of 3000 feet in all directions is considered minimum.

### Box Cars

An Indirect attack is a method of fighting fires in railroad box cars containing cotton, dry express (unrefrigerated cargo), baggage and mail. When the decision is made to utilize the indirect method the procedures used shall include keeping the car doors closed, cutting a small hole in the roof of the car directly above the fire, and inserting a fine spray stream in this hole. The fire within the car is subsequently extinguished by reduction of the temperature below ignition point, smothering the fire and/or eliminating oxygen within the car below the point required to continue combustion.

In extinguishing the fire, car doors are to remain CLOSED at all times until the fire has been extinguished. Locate the seat of the fire within the car by visual observation of paint blistering, hand exploration of car, or by wetting down the car with water and observing the location of the fastest rate of evaporation. Once the fire location has been determined, cut a small hole in the car roof, directly above the fire, just large enough to insert and move a spray nozzle from side to side. This can be accomplished best with an axe. The roof material is usually metal, single thickness or double thickness separated by an insulating material, which can be penetrated easily with an axe. Water in a fine spray form should then be introduced through the hole into the car to cover the fire area. The car doors should not be opened until it is evident that the fire is extinguished.

To be certain extinguishment is complete a waiting period of ten minutes should elapse after smoke is no longer visible from the hole in the car roof before opening car doors. If the fire has already burned a hole in the floor of the car, this hole should be immediately plugged with a spray nozzle, if possible, while the indirect method is employed. This indirect method permits extinguishment with less exposure to products of combustion and a minimum of water damage, the fire is further confined to its exact area of origin, making it easier to determine the true cause of the fire.

### Passenger Cars

Firefighting can pose considerable problems with access. Most fires are extremely hot and difficult to reach. Removal of occupants and cutting electrical power are primary considerations. If an interior attack is attempted, firefighters will face severe conditions. Temperatures will be extremely hot and smoke will be heavy and acrid. An outside attack is the best initial action until conditions permit entry.

Every door should be opened and every window removed to improve access and vent the heat and smoke. Ladders will be necessary to reach the windows of some cars. No attempt should be made to cut through the roof or walls. This tactic is almost impossible and will waste valuable time.