

# RAILWAY EMERGENCY AWARENESS GUIDE



## About the Railway Association of Canada

The Railway Association of Canada (RAC) represents more than 50 freight and passenger railway companies that move close to 82 million passengers and more than \$280 billion worth of goods in Canada each year. The RAC advocates on behalf of its members and associate members to ensure that the rail sector remains globally competitive, sustainable, and most importantly, safe. Learn more at [www.railcan.ca](http://www.railcan.ca).

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**1.0 INTRODUCTION**

This Emergency Response Guide has been developed to assist local Emergency Response Organizations in their efforts to plan for and respond to railway related incidents or emergencies. It is also designed to be a reference resource, and as a hand-out to supplement training programs presented by RAC to the emergency response community.

Because this guide is designed to augment local response plan(s), it is purposely brief and designed to cover only the key information needed by planners and response organizations in the event a Dangerous Goods incident involving the railway should occur.

This information may assist local planners to prepare for and respond to potential rail incidents or emergencies. This guide is also designed to provide responders with accurate and efficient access to the RAC's Dangerous Goods Team members, which may also assist in engaging local and/or private resources.

## 1.1 Prevention

Safe transportation of Dangerous Goods and incident prevention is a primary focus and challenge of the RAC's Dangerous Goods team, with the goal of minimizing risks and maximizing employee and transportation safety and protection of the environment. These goals are achieved through an effective program of employee training, first responder outreach training, inspections and regulatory compliance. In addition, the RAC actively engages with the shipper following rail incidents to identify factors given rise to the incident and minimize the potential of the incident reoccurring.

## 2.0 INCIDENT COMMAND SYSTEM

The Incident Command System (ICS) is a standardized on-site management system designed to enable effective, efficient incident management by integrating a combination of facilities, equipment, personnel, procedures, and communications operating within a common organizational structure.

The ICS is used to manage an incident or a non-emergency event, and can be used equally well for both small and large situations.

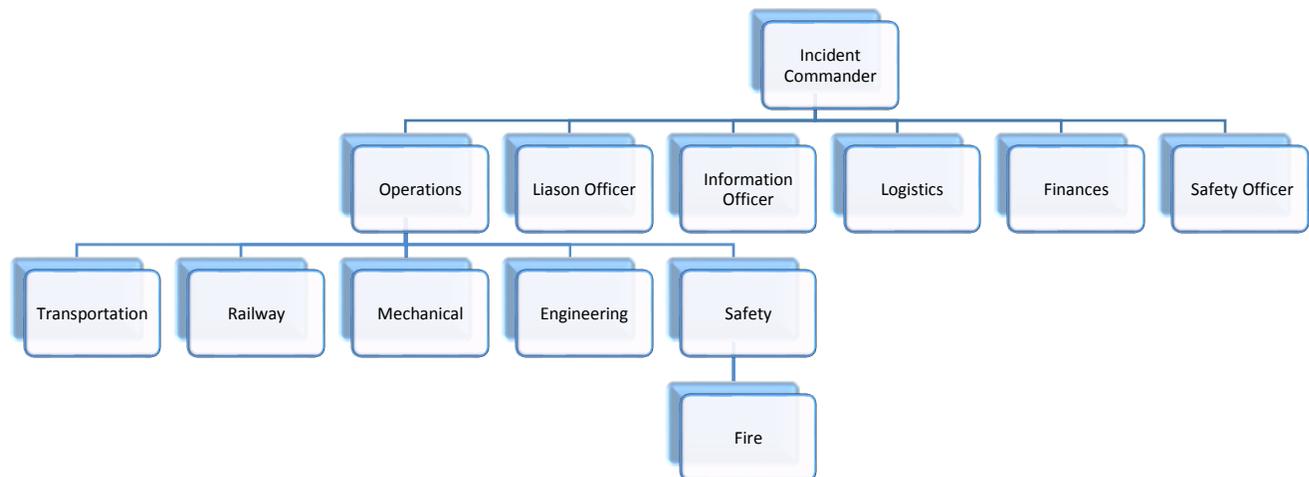
ICS helps to ensure:

1. The safety of responders and others.
2. The achievement of response objectives.
3. The efficient use of resources



**Note: Railways will never take over Incident Command: that is a function of the Authority Having Jurisdiction (AHJ). The Railway will work with the AHJ in a Unified Incident.**

## 2.1 Command Structure



**Transportation:** stops trains, provides power, calls crews, and re-schedules traffic.

**Railway:** establish its own sectors and “dove-tail” into the ICS structure.

**Mechanical:** wrecking operations, re-railing cars.

**Engineering:** track repairs, signals, ballast.

**Safety:** Dangerous Goods officers, safety, environment, claims, loss prevention and in most cases works closely with **Fire**.

**WARNING: STAGING BECOMES VERY IMPORTANT AT AN INCIDENT AS MANY PIECES OF HEAVY EQUIPMENT AND OTHER RESOURCES WILL BE ARRIVING ON SCENE VERY QUICKLY.**

## 2.2 Incident Scene Safety

1. Contact the Railway by using their emergency number and report your emergency. (see appendix D)
2. Advise if the train traffic needs to be stopped. **Know your location!!**
3. Beware of tipping and leaning equipment.
4. Be especially alert for bent and stressed rail, which can lash out suddenly.
5. Be aware of heavy equipment such as cranes, side booms, bulldozers, and excavators.
6. Never park emergency vehicles on or too close to the tracks.
7. Don't park too close to the scene, if DG's are involved!
8. Make contact with crew and obtain shipping papers.
9. Use closest railcar reporting marks to assess location on train.
10. Use visual clues (smell is not always the best!)
11. Before entering railroad property, make sure that the railroad has confirmed its understanding that you are there.
12. Before entering a rail yard, responders should be aware that some locomotives are not manned during switching operations and are controlled remotely. Just because you can see the cab of a locomotive that is running does not mean that it is occupied or that the operator can see you. The operator could be up to a half mile away from the locomotive. These remote control locomotives will have flashing red lights when being operated in "remote" mode. Exercise extreme caution and give yourself plenty of room when crossing tracks occupied by a remote control locomotive.

## 3.0 BASIC RAIL SAFETY

It is important for local emergency planners to familiarize themselves with the local rail lines to know the ownership of the line and potential access routes for emergency response vehicles. As part of its grade crossing safety program, railways should post a telephone contact number at each public crossing. This program allows people to report emergencies or other issues at grade crossings to the Railway, but can also be used by emergency responders to identify the proper rail line and location on that rail line in the event of a railroad incident.

### 3.1 Local Rail Line Response

Railways will respond to all known dangerous goods incidents that occur in the course of transportation over their system. The primary objectives at the scene of a dangerous goods incident are to:

1. Protect life and health;
2. Protect property
3. Environment



### 3.2 Personal Safety

1. Never step on the rail. Always step over the rail. The rail can be a slip or trip hazard.
2. Never stand between the rails.
3. If it is necessary to climb rail equipment, use three points of contact at all times. The ladders on rail equipment may curve around the car allowing little access for your feet. The first step on to rail equipment is typically some distance off the ground. When descending the ladder, do not jump from the last step.
4. If you use your own ladders, remember to block the feet and tie off at the top.
5. Locomotive steps are considered ladders. Always face the locomotive going up and coming down. Keep three points of contact.
6. Never climb or walk on the roof of a locomotive.

### 3.3 RESPONDING TO A RAILWAY EMERGENCY

1. Notify the Railway
2. Locate the train crew. The conductor will have the most complete list of the trains' consists immediately available on the scene.
3. If the train crew is unavailable, use the Railways emergency number to establish communication with the railroad. (see appendix D)
4. Ensure track protection; rail traffic is stopped.
5. Once in contact with the Railway / Rail Traffic Control Center (RTC) confirm your location. Look for mile posts or grade crossing numbers.
6. Secure the area. The incident may span a large distance and securing this area may require a large number of personnel.

**ASK - Is there Dangerous Goods involved?**

7. Establish the proper hazard zones.



8. Begin a site assessment from a safe distance, upwind and uphill.
9. Establish Incident Command structure.
10. Work with the railway, CANUTEC, CHEMTREC, chemical shippers and manufacturers to ensure you have all the information about the materials you may be dealing with.
11. Utilize **Railway Dangerous Goods Officers** when they arrive on scene. These railroad responders are personnel that have been specifically trained to respond to dangerous goods incidents involving railroad equipment.
12. Ensure proper notifications have been made to Environment (MOE) etc.
13. Be aware of utilities that commonly run next to or in the railroad right-of-way.
14. Use all the resources available to you to ensure a safe and efficient resolution to the response.

### 3.4 Railroad Safety for First Responders

1. *Fouling (obstructing) the track or dragging hoses across tracks:*
2. Never climb over, under, or through rail equipment unless railroad representatives inform you the area has been secured and is being protected by railroad personnel.
3. Position yourself or equipment at least 25 feet away from the nearest rail. If you and your equipment are within four feet of the nearest rail, there is immediate danger of being struck either by equipment or material carried by rail cars. If you find that you must obstruct the track, then you must contact the railway and receive positive verification from the railway that it is safe to do so before the track is obstructed. Bear in mind that rail equipment extends out over the outside limits of the rail.
4. Be careful when you must cross more than one track, parallel tracks may belong to two different companies or be under control of two different employees of the same company.
5. The walking surface (ballast) is comprised of rock and may be uneven. Care should be used when walking on ballast and all right-of-way. If possible, cross only at a grade crossing which provides a more level walking surface.
6. If you must cross tracks, stay at least 25 feet from the ends of railroad cars, locomotives or on-track equipment and look both ways; be sure no equipment is moving toward you. When near any track, expect a train to move in either direction at any time. Cross tracks at a right angle to maximize the field of vision within the fouling space.
7. Don't cross tracks near switches or any other movable track structure, and never step on rails or other parts of the structure, which may be slippery.
8. Beware of other hazards such as pipelines, buried utility cables, fiber optic cables, overhead power lines.
9. Ensure there is at least 50 feet of clearance between two pieces of standing cars, locomotives or on-track.

### 3.4.1 Stopping a train

1. Because of the weight of trains, stopping requires a long distance. To request a train to stop, contact the Railway.
2. The train may require more than one mile to stop. Plan and prepare in advance for adequate stopping distance. Never foul the tracks until the Railway acknowledges the train has stopped. Remember to provide lookouts in both directions along the track for protection.

### 3.4.2 Driving across tracks

1. Cross only at grade crossings, heed all crossing-warning devices.

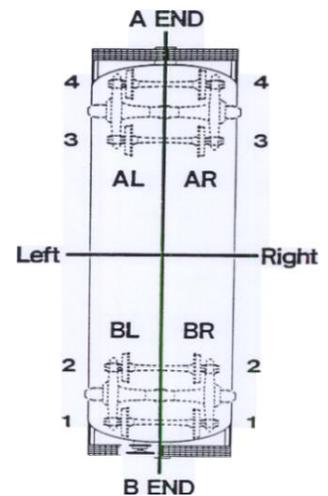
**WARNING: "EXPECT A TRAIN OR RAIL EQUIPMENT TO MOVE ON ANY TRACK FROM EITHER DIRECTION AT ANY TIME."**

## 4.0 TANK CAR SAFETY SYSTEMS

Tank cars are equipped with various safety system devices to protect the tank from damage during an accident or severe impact. Given the varying characteristics of the different commodities being shipped daily and the differing needs and uses, it is impossible to cover all of the various types of tank cars and fittings uses. The most common type safety devices and safety systems are discussed below.

### 4.1 Tank Car Anatomy

Always face the B-end (Brake end) when communicating Left or Right side of the tank car. Truck orientation (1-4) starts at the "B" End.

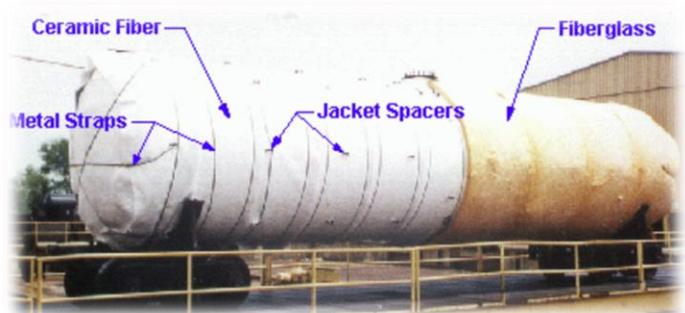


### 4.2 Thermal Protection

Thermal protection is required depending on the commodity being transported. Thermal protection is made of ceramic type fibre and is applied directly to the tank.

- Protects Tank Steel from Flame Impingement
- 100 minutes in a pool fire
- 30 minutes of torch flame impingement
- Slows the BLEVE affect

**Note: Can be sprayed on or wrapped**

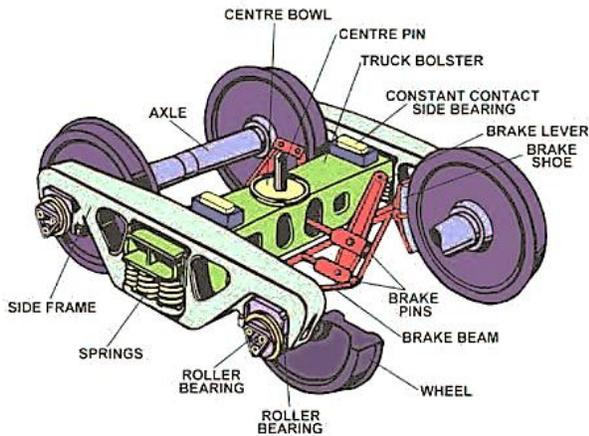


**SPY HILL SASKATCHEWAN, 40-60 HOURS OF FLAME IMPINGMENT**

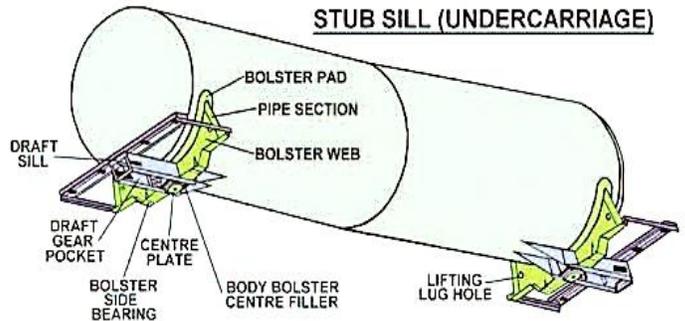


**4.3 Undercarriage Components**

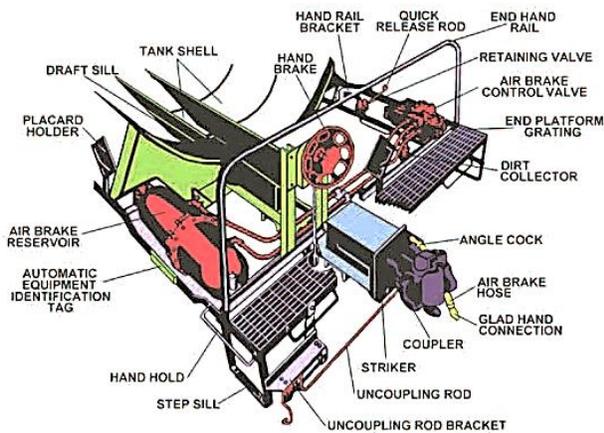
**TRUCK ASSEMBLY**



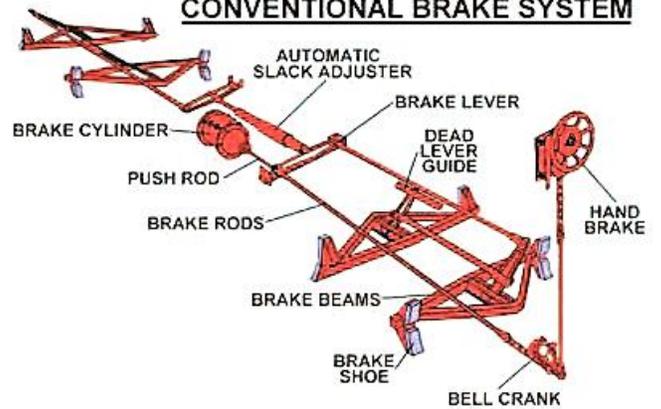
**STUB SILL (UNDERCARRIAGE)**



**DRAFT SILL AND "B" END ARRANGEMENT**

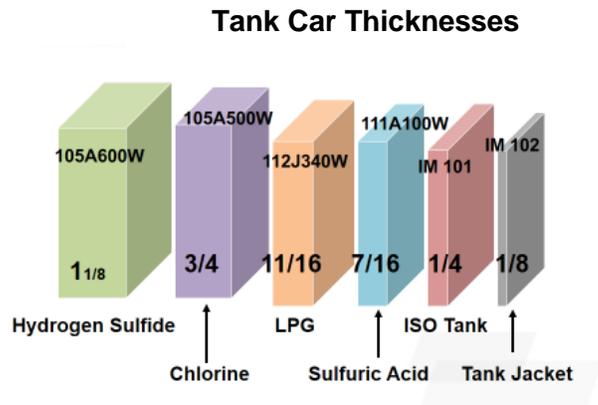


**CONVENTIONAL BRAKE SYSTEM**



## 4.4 Tank Car Thickness

A Jacket is applied over the ceramic fibre to protect against weather and commodity protection. The 1/8 inch jacket has no structural integrity.



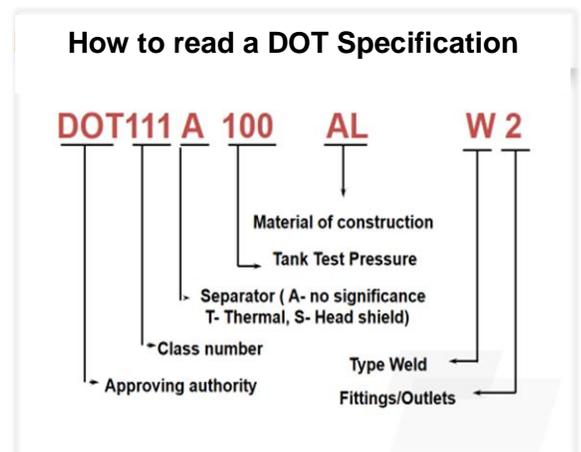
## 4.5 DOT Marking and Identification

A specification is a set of standards or regulations that specify how a car is to be designed and constructed. This includes the type of materials used for the tank, plate thickness, type of welding or plate connections and the vessel pressure ratings.

- If the tank car will carry hazardous materials, the car must meet US DOT or TC specifications.
- Non-Dangerous Goods tank cars must meet industry standards.
- The specification must be stenciled on all railroad tank cars and be visible and legible.

### 4.5.1 Delimiter

- A - No significance
- S - Head Shields
- T - Sprayed on Thermal Protection
- J - Jacketed Thermal Protection



## 4.5.2 Tank Car Specs and Classification

There are 310,000 tank cars (pressure and non-pressure) in today's fleet, of which 240,000 are DOT-111 tank cars. All DOT-111 tank cars operating today meet both current federal regulatory requirements and AAR-North American Tank Car Committee standards and continue to operate safely.

Tank cars are generally divided into two classifications:

- Low-Pressure (General Service) Cars: generally considered cars with a pressure test of 100 psi or less and a working pressure of ambient temperature.
- Pressure Cars: cars with a test pressure greater than 100 psi and working pressures above atmospheric pressure.

## 4.5.3 Low/Non-Pressure Tank Car Specifications

Low -pressure tank cars (also called general service tank cars) are used to transport a wide variety of regulated (hazardous materials/dangerous goods) as well as non- regulated commodities.

- DOT 111 (manway, protective cover and bottom outlet)
- DOT/ TC 117 **see appendix "F" of this document**
- DOT 113 Cryogenics (no exposed fittings) housed fittings
- DOT 115
- AAR 211 (non HM)



## 4.5.4 Pressure Tank Car Specifications:

- DOT 105
- DOT 112 (no bottom outlet, only protective housing)
- DOT 114
- DOT 120



## 5.0 GENERAL SERVICE TANK CARS

General-purpose tank cars have a tank test pressure range between 60 psi to 100 psi. This type of container is designed to transport liquid commodities. Materials in following hazard classes may be transported in general purpose tank cars.

Transporting such a wide variety of commodities requires a variety of features that may be found on a general purpose tank car. The following features may be found on a general purpose tank car depending on the commodity being transported:

- Typically 7/16-9/16 Thick
- Capacities from 6,000 gal – 33,500 gal
- Loaded Weight of 263,000 / 286,000 lbs
- Constructed of Carbon Steel, Stainless or Aluminum



### 5.1 Tank Car Features

- Bottom Outlets (see section 5.3)
- Top Unloading Valves
- Vacuum Relief Device
- Pressure Relief Device
- Safety Vents
- Manways
- Heater Coils
- Insulation
- Head Shields



Manways are an opening in the car with a lid used to enter the tank car. There are two styles of gaskets used for the final seal. Bolt patterns are either 6 or 8 bolts. A vacuum relief device may be mounted on the manway lid. **A vacuum relief device** allows air into the car to avoid an implosion of the tank car.

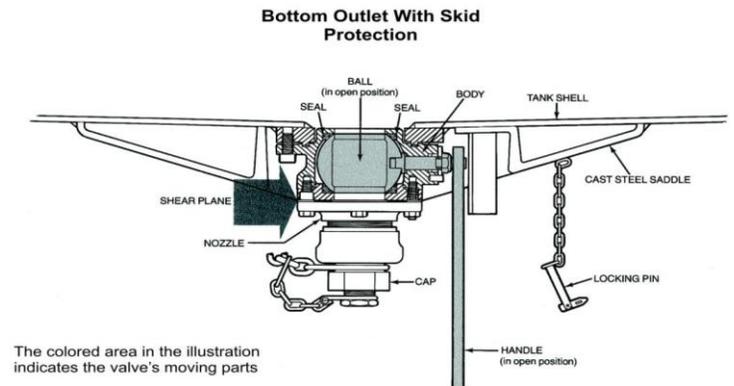


## 5.2 Types of Commodities

- ◆ Hazard Class 3 (Petroleum Products, Ethanol)
- ◆ Hazard Class 4 (Molten Sulphur)
- ◆ Hazard Class 5 (70% Hydrogen Peroxide)
- ◆ Hazard Class 6 (Molten Phenol)
- ◆ Hazard Class 8 (Sulphuric Acid, Sodium Hydroxide)
- ◆ Hazard Class 9 (Asphalt)

## 5.3 Bottom Skid Protection

- Skid Plates to Protect Valve Outlet
- Shear Protection
- Outlet is designed to fail below the valve



## 5.4 Rupture discs/safety vents

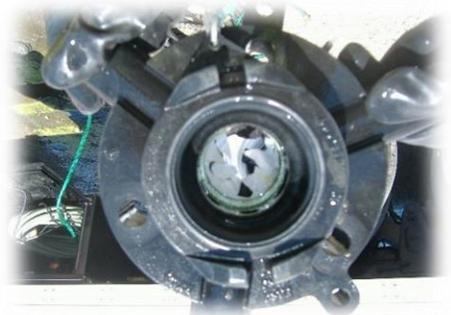
- Safety Vents Break Open at an engineered pressure (commonly 165 psi)
- Once open they do not close
- Tank cars carrying flammables must not be equipped with vents

Rupture Discs may break open:

- If the car over pressurizes
- If the car is overloaded
- If product surges

Rupture Discs may leak

- If corroded (not checked and replaced)
- If gasket is missing
- Improper size



## 6.0 PRESSURE CAR GENERAL DESIGN

Classes DOT-105, 109, 112, 114, and 120 are pressure tank cars used to transport liquefied compressed gases, poison/toxic inhalation hazard (PIH/TIH) materials, reactive materials, and/or corrosive materials requiring the additional protection afforded by a stronger car. There are no equivalent AAR type pressure tank car specifications.

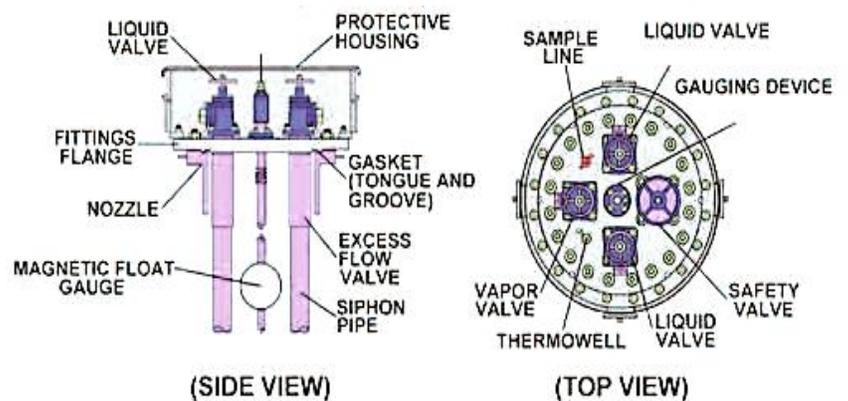
- Single Protective Housing, houses all the valves
- Pressure relief device fully activates at pre-determined pressures
- Tank shell is covered by a jacket 1/8 inch or (11 gauge steel)
- Thermal protection is located between the tank shell and the jacket
- In general, Tank shell thickness ranges from 5 / 8 inch to 11/16 inch for steel tanks (depending on tank diameter and tensile strength of plate used).



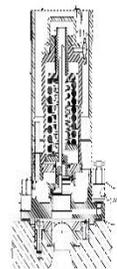
### 6.1 General Valve Configuration

- 2 Liquid Valves
- 1 Vapor Valve
- Pressure Relief Device
- Gauging Device
- Sample Line
- Thermometer Well

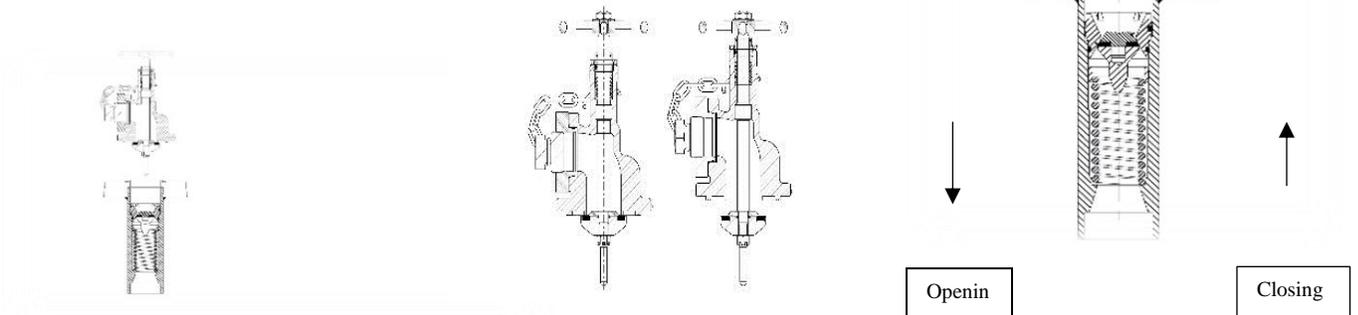
#### VALVES AND FITTINGS



Combination PRV/PRD



- 2 inch angle shear off valve



## 7.0 CRYOGENIC RAIL CARS

Classes DOT-113 and AAR-204 tank cars are designed as a vacuum-insulated inner container (tank) enclosed within an outer shell (tank, not jacket) and referred to as an outer jacket by the DOT to transport cryogenic liquids. (Refrigerated liquefied gases having a boiling point colder than minus 130 F at atmospheric pressure; e.g., liquid hydrogen, ethylene, oxygen, nitrogen and argon.) The annular space between the inner and outer tanks has a vacuum drawn and is equipped with an insulation system using granular perlite or an alternating wrap of multiple layers of aluminum foil and paper. These tank cars are frequently referred to as Thermos® bottle tank cars. The insulation system (designed for the commodity being transported and meeting specified performance standards) and vacuum controls the rate of heat input for normal transportation time periods. Specification DOT-113A60W tank cars have a design service temperature of minus 423 F, a minimum burst pressure of 240 psig, and a tank test pressure of 60 psig. Specification DOT-113C120W tank cars have a design service temperature of minus 260 F, a minimum burst pressure of 300 psig, and a tank test pressure of 120 psig.



### 7.1 Loading and Unloading Valves

The loading/unloading valves and other fittings are required to be enclosed within a protective housing (not to be confused with protective housings on pressure tank cars), which appears to be a box or cabinet. The protective housing(s) is located on both sides at one end or, in rare cases, on the top of the car. The housing(s) must be adequate to protect the fittings from direct solar radiation, mud, sand, adverse environmental exposure, and mechanical damage incident to normal operation. The protective housings for the fittings must be equipped with precautionary instructions for the safe operation of the equipment during storage and transfer operations, and must include a diagram of the tank and piping system with the various gauges, control valves, and PRDs clearly identified, and their location indicated. In addition, all valves and gauges must be clearly identified with corrosion-resistant nameplates.



**Note:** In addition to other stenciling, cryogenic liquid tank cars must be stenciled **DO NOT HUMP OR CUT OFF WHILE IN MOTION** and Vacuum Jacketed on both sides in lettering at least 1 ½ inches high.

## 8.0 INTERMODAL RAILCARS

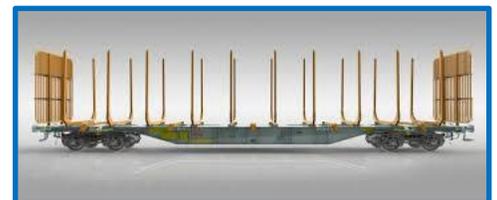
Intermodal containers are used in all modes of transportation and are interchanged between countries. Intermodal containers ship just about anything that will fit through the door. Typical sizes are 20, 40, and 53 feet. Dangerous goods are packaged in non-bulk containers prior to being loaded in the container.

Mixed commodities are common in the containers. **Use CAUTION when opening doors due to mixed loads.**



### 8.1 Various types of Freight Cars

- **Box cars**
  - ◆ Can contain many small items inside
- **Covered hopper cars**
  - ◆ Flour, grain, fertilizer(oxidizer), cement
- **Flat Cars**
  - ◆ Can transport lumber, pipe and machinery (fuels and battery hazards)
- **Automobile Carriers**
  - ◆ May contain 18 cars, fuel, acid, air bag and refrigerant hazards
- **Open hopper cars**
  - ◆ Stone, coal (seldom dangerous goods)
- **Refrigerator cars**
  - ◆ Fuel and battery hazards
- **Intermodal cars** (see section 8.0)
- **Well car**
  - ◆ Can contain many hazards as intermodal transportation



## 9.0 LOCOMOTIVE HAZARDS

- Engine Room
- Diesel Fuel Tank (2000-5000 gal)
- Batteries (2x37 gallon sulfuric acid)
- Water (380 gallons @ 200°F)
- 450 gallons of oil @ 210°F)



## 9.1 Emergency Fuel Shut off

- Both sides of the locomotive

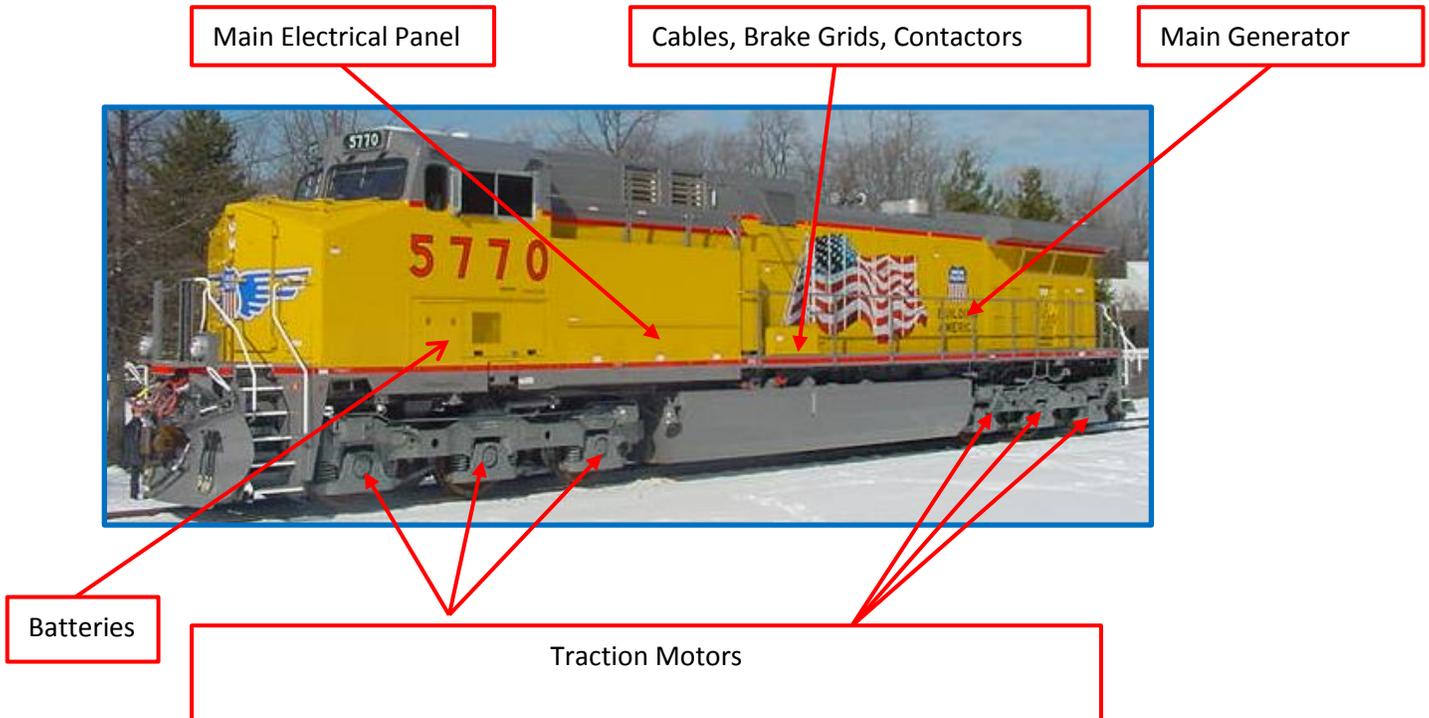


- Inside locomotive cab



## 9.2 High Voltage Locations for Locomotives

- **30,000 VOLTS – Amperage can equally match the voltage**
- Marked areas noted in the diagram can carry lethal voltage even with the unit shut down
- No need to be on top of locomotive at any time
- **FIRE FIGHTING WITH DRY CHEMICAL ONLY!**



If the locomotive has been involved in a derailment and the trucks have disengaged from the locomotive take caution of exposed cables. Lethal potential, if the capacitors have not discharged.

## 10.0 GOVERNING BODIES FOR RAILWAYS

- Federal & Provincial Regulations
- Canadian Rail Operating Rules (CROR)
- Railway Safety Act
- Transportation of Dangerous Goods Act and Regulations
- AAR Interchange Rules



## 11.0 DANGERS AT AN INCIDENT

Accidents involving tank cars must be evaluated and approached with great care due to the possible presence of hazardous materials/dangerous goods. Absence of visible hazard warning labels, markings, or placards is not a guarantee that commodities involved are harmless. Careful, thorough evaluation, assessment, and initial response to an accident may make the difference between emergency and disaster. It is possible that the scene of an accident involving hazardous materials/dangerous goods will present such a high degree of hazard that the only safe course is to evacuate ALL personnel from the area and allow the incident to run its own course without intervention. Furthermore, a severe situation may exist with or without the presence of fire, smoke, or fumes.

Other hazards may also be present:

- Tripping hazards
- Rail under tension
- Undetected leaks



## 12.0 PRESENCE AT THE SCENE

- Manufacturer / Shipper
- Railway Association of Canada
- Transport Canada / TSB
- E/R Contractors and/or TERSP's
- Wrecking Contractors
- Other Regulatory Agencies
- Media
- Expect many resources and Large Pieces of Equipment



## 13.0 PLACARDING AND HAZARD CLASSES

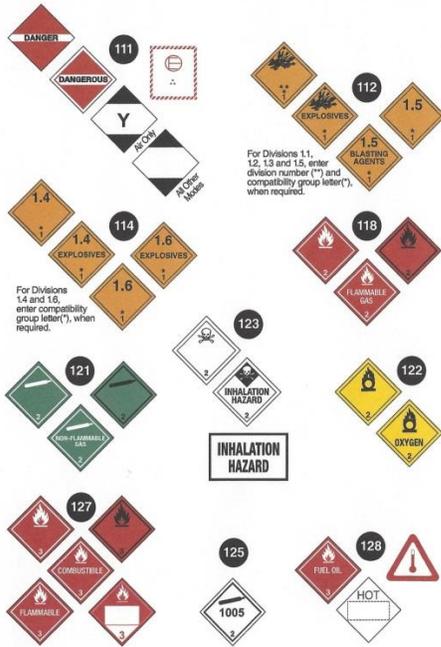
The Transportation of Dangerous Goods Regulations provide that square-on-point shaped placards must be placed on the outside of certain bulk container rail cars carrying dangerous goods, or residues of such materials. Placards must also be placed on the exterior of some intermodal containers carrying amounts of dangerous goods in excess of certain regulatory thresholds. Placards can tell the responder the UN hazard class involved and thus provide a general idea of the hazards present and preliminary response requirements. Keep in mind that many materials possess characteristics of more than one hazard class, and therefore hazard class information should generally not be used independently.

**Always refer to the Shipping Papers! (see Section 15.0)**

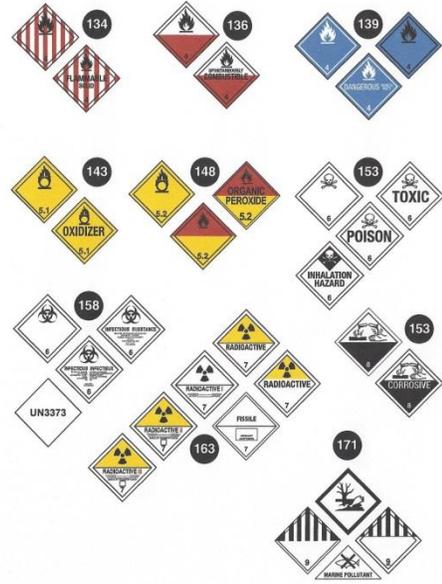
### 13.1 UN Hazard Classes

Dangerous goods are classified according to their chemical and/or physical properties. There are nine numeric classes, some of which are divided into divisions. A dangerous good is assigned to only one class, even if it meets the definition of more than one hazard class. The table below lists the hazard classes and divisions.

TABLE OF MARKINGS, LABELS, AND PLACARDS  
USE THIS TABLE ONLY IF MATERIALS CANNOT BE SPECIFICALLY IDENTIFIED BY



AND INITIAL RESPONSE GUIDE TO USE ON-SCENE  
USING THE SHIPPING DOCUMENT, NUMBERED PLACARD, OR ORANGE PANEL NUMBER



### Class 1 - Explosives

- Division 1.1 Explosives with a mass explosion hazard
- Division 1.2 Explosives with a projection hazard
- Division 1.3 Explosives with predominantly a fire hazard
- Division 1.4 Explosives with no significant blast hazard
- Division 1.5 Very insensitive explosives with a mass explosion hazard
- Division 1.6 Extremely insensitive articles

### Class 2 - Gases

- Division 2.1 Flammable gases
- Division 2.2 Non-flammable, non-toxic\* gases
- Division 2.3 Toxic\* gases

### Class 3 - Flammable liquids (and Combustible liquids [U.S.])

### Class 4 - Flammable solids; spontaneously combustible materials; and Dangerous when wet materials/Water-reactive substances

- Division 4.1 Flammable solids
- Division 4.2 Spontaneously combustible materials

Division 4.3 Water-reactive substances/Dangerous when wet materials

### **Class 5 - Oxidizing substances and Organic peroxides**

Division 5.1 Oxidizing substances

Division 5.2 Organic peroxides

### **Class 6 - Toxic\* substances and Infectious substances**

Division 6.1 Toxic\*substances

Division 6.2 Infectious substances

### **Class 7 - Radioactive materials**

### **Class 8 - Corrosive substances**

### **Class 9 - Miscellaneous hazardous materials / Products, Substances or Organisms**

## **14.0 EMERGENCY RESPONSE GUIDEBOOK**

The emergency guidebook is distributed every four years. Edition 2020.

The main sections are:

- Table of placards (pages 8-9)
- Railcar and Road Trailer Identification charts (pages 10-13)
- **YELLOW** section (ID numbers)
- **BLUE** section (names of material)
- **ORANGE** section (guide pages)
- **GREEN** section (initial isolation and protective action distances for highlighted substances)

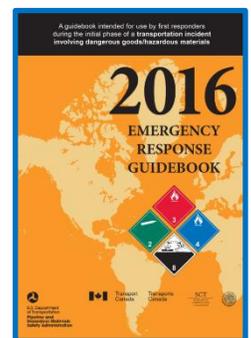
The new sections are

- **TABLE 3** - Initial Isolation and Protective Action Distances for Different Quantities of Six Common TIH Gases (pages 354-357)
- BLEVE - Boiling Liquid Expanding Vapour Explosion (pages 366- 369)
- Improvised Explosive Device - IED (page 374-375)

Other ERG2016 sections, not covered in the presentation, but suggested for reading:

- Shipping Documents (inside front page cover)
- Safety Precautions (page 4)
- Hazard Classification System (page 6)
- Hazard Identification Numbers Displayed on Some Intermodal Containers (pages 16-19)
- Pipeline Transportation (pages 20-25)

The *Emergency Response Guidebook 2016 (ERG2016)* is primarily a guide to aid first responders in quickly identifying the specific or generic hazards of the material(s) involved in the incident, and protecting themselves and the general public during the initial response phase of the incident.

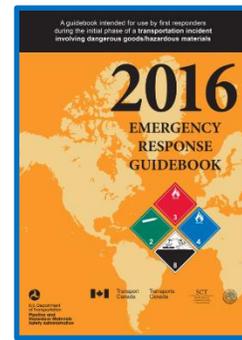


# Before an emergency – become familiar with this guidebook



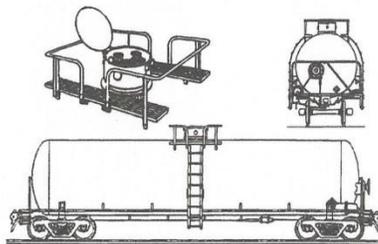
1-888-CANUTEC (226-8832) or 1-613-996-666  
or Cellular in Canada (star)\*666

Non-emergency information line  
613-992-4624 (24 hour)



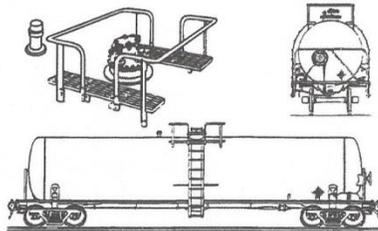
## RAIL CAR IDENTIFICATION CHART\*

### 117 Pressure tank car



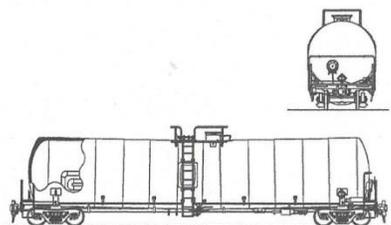
- For flammable, non-flammable, toxic and/or liquefied compressed gases
- Protective housing
- No bottom fittings
- Pressures usually above 40 psi

### 131 General service tank car (low pressure)



- For variety of hazardous and non-hazardous materials
- Fittings and valves normally visible at the top of the tank
- Some may have bottom outlet valve
- Pressures usually below 25 psi

### 128 Low pressure tank car (TC117, DOT117)

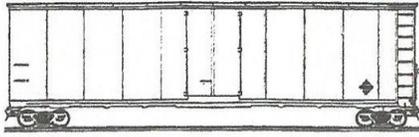


- For flammable liquids (e.g., Petroleum crude oil, ethanol)
- Protective housing separate from manway
- Bottom outlet valve
- Pressures usually below 25 psi

(Image provided as a courtesy of  
The Greenbrier Companies, Inc.)

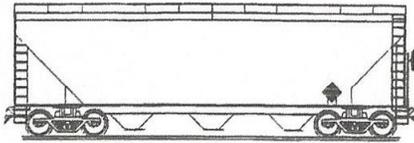
## RAIL CAR IDENTIFICATION CHART\*

### 111 Box car

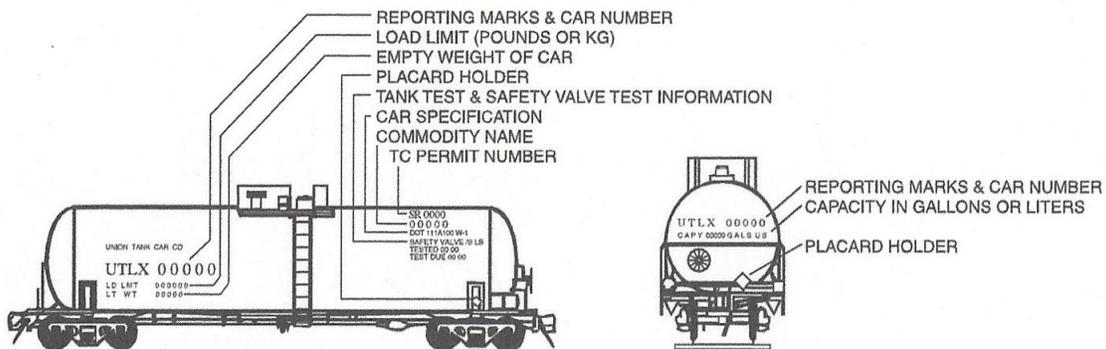


- For general freight that carry bulk or non-bulk packages
- May transport hazardous materials in small packages or "tote bins"
- Single or double sliding door

### 140 Hopper car



- For bulk commodities and bulk cargo (e.g., coal, ore, cement and solid granular materials)
- Bulk lading discharged by gravity through the hopper bottom doors when doors opened



**CAUTION:** Emergency response personnel must be aware that rail tank cars vary widely in construction, fittings and purpose. Tank cars could transport products that may be solids, liquids or gases. The products may be under pressure. It is essential that products be identified by consulting shipping documents or train consist or contacting dispatch centers before emergency response is initiated.

The information stenciled on the sides or ends of tank cars, as illustrated above, may be used to identify the product utilizing:

- the commodity name shown; or
- the other information shown, especially reporting marks and car number which, when supplied to a dispatch center, will facilitate the identification of the product.

\* **The recommended guides should be considered as last resort if the material cannot be identified by any other means.**

## 15.0 SHIPPING PAPERS

### Shipping Paper Information: **What They Tell You as an Emergency Responder!!**

<b><u>Car Initials and Numbers:</u></b>	One of the most important pieces of information to obtain in order to access information on the car's contents.
<b><u>Package Type:</u></b>	This will describe how the commodity is packaged. This could be a tank car, hopper car or in non-bulk package such as drums, totes and bags
<b><u>Quantity:</u></b>	The shipping paper will indicate how much product is being shipped, if loaded.
<b><u>Load or Empty:</u></b>	The shipping paper will indicate if the car is loaded or contains a residue. Placards no longer indicate load or residue status on rail cars.
<b><u>Shipper and Consignee:</u></b>	Shipper area will show who shipped the car and where it originated; Consignee area will show who is receiving the shipment and the destination.
<b><u>Identification Number:</u></b>	Indicates the four-digit UN (United Nations) or NA (North American) identification number.
<b><u>Proper Shipping Name:</u></b>	Name of the dangerous good.
<b><u>Hazard Class:</u></b>	Shows the appropriate hazard class or division number of the product. A secondary hazard class must be shown if required.
<b><u>Packing Group (PG):</u></b>	A grouping of dangerous goods indicating relative severity of a material within its hazard class. (PG) 1 or I shown using roman numerals, great danger; (PG) II or II, medium danger; (PG) III or III minor danger.
<b><u>Marine Pollutant:</u></b>	Release of the product into a waterway will harm the environment. Limited Quantity (LTD QTY) as required by TDG Regulations.
<b><u>Poison Inhalation Hazard Toxic Inhalation Hazard (PIH / TIH):</u></b>	Indicates certain gases or liquids that may cause health problems if inhaled.
<b><u>Reportable Quantity:</u></b>	The letters "RQ", where required indicate that the material is also classified as a hazardous substance and that a release of the dangerous good, over a specified amount, necessitates notifying the National Response Center.
<b><u>Emergency Response Phone Number:</u></b>	24-hour phone numbers supplied by the shipper.
<b><u>Emergency Response Assistance Plan (ERAP):</u></b>	24-hour phone numbers supplied by the shipper.
<b><u>Standard Transportation Commodity Code (STCC):</u></b>	A number assigned by railroads for the specific product being shipped. Dangerous goods STCC's begin with the numbers "49" or "48".
<b><u>Transport Canada Temporary Certificate:</u></b>	Permits an exception to Transport Canada dangerous goods regulations.

# 16.0 TRAIN CONSIST

Trains are listed from the locomotive to the rear of the train

Train number and station the train departed from

Summary box gives a quick view of the dangerous goods on the train

```

Train list contains Canadian dangerous goods shipping records
Cars in this train are counted from front to rear

TRAIN # < M 31251 04 > DEPARTING CLOBAR AB      generated 2009-06-03 AT 21:18
Train ID M EDMSYM1 04   Departing CLOBAR AB

*****
*                               S U M M A R Y                               *
*                               *                                           *
*   SPECIAL DANGEROUS - 1         DANGEROUS - 7         RESIDUE - 8         *
*   BAD ORDER - 0                DIMENSIONAL - 0        SPEED RESTRICTED - 2        *
*   POISONOUS INHALATION - 0      ESTOPPEL - 0          HEAVY AXLE LOAD - 0        *
*   ERAP - 7                      RSSM - 0                *
*                               *                                           *
*****

-----
Dir      Op      Dyn  Cuml
Locomotive  Fac  DP Code  HP  Avl HP Feet Ton Brk DU Axle  Fr Stn  To Stn
-----
CN  5646  F   N  LN  4300  4300  73  197 6EF N   6  MEMPHI  PADUCA
IC  1001  B   N  LN  4000  4000  73  197 6EF N  12  MEMPHI  PADUCA
Total
      8300  8300  146  394

-----
Seq      Car L      Online  GRS      S/O-2TS  DATE
Num Init Number Kind E Conten Destin RAJP TON LGT  CONSIGNEE S/O-STN  TIME
-----
Block DYERF Setout DYERSBURG TN
1 GPLX 75178 CSP  L PLASTC DYERSE TKEN 131 64 TENNKEN
2 FMLX 51578 CXG  L SODIUM DYERSE      129 58 SUNPRODUCTS
TLEX      * TRIP LEASED CONSIGNEE EMPTY MVMT PER OWNERS INSTRUCTIONS
3 CLSX 1402 CJG  L SALT  DYERSE      131 57 SUNPRODUCTS
4 CLSX 1072 CJG  L SALT  DYERSE      130 57 SUNPRODUCTS
5 CLSX 1205 CJG  L SALT  DYERSE      131 57 SUNPRODUCTS
6 CLSX 1229 CJG  L SALT  DYERSE      131 57 SUNPRODUCTS

12 SHPX 221584 T6I  L GASES JACKMS KCS 129 65 TPC
A2      HAZMAT-US TRAIN PLACEMENT GROUP 2
JC      CDN MARSHALLING GROUP C
JR      ERAP PULLBY REQUIRED (CANADA)
SP      SPD -SPECIAL COMMODITY-35MPH IN CANADA (SEE SUBD SPC INSTR)

TO/CONSIGNEE
PTNECHES TX
TPC GROUP INC
2701 SPUR 136
PORT NECHES TX 776514320

FROM/SHIPPER
FTSASKATC AB
DOW CHEMICAL CANADA ULC
HWY 15 PO BAG 16
FT SASKATCHEWAN AB T8L

1 TANK CAR / 161266 LB
UN1010
BUTADIENES, STABILIZED
CLASS 2.1
RQ (BUTADIENE)
EMERGENCY 24-HOUR NUMBER (613)996-6666
ERP 2-0011 TEL 989-636-4400
HAZMAT STCC 4905703
    
```

Locomotive Information

Information on car sequence, car kind and goods transported

Line # 12, loaded Dang. Goods

Consignee

Shipper

Shipping description  
**Emergency 24-Hour**  
**ERAP Number and phone number for assistance.**

# APPENDIX “A” RAILWAY ASSOCIATION OF CANADA

The Railway Association of Canada (RAC) promotes the efficient operation of the Canadian railway industry, and established a Dangerous Goods team in 1999 to serve the industry in the safe transportation of dangerous goods. This team is made up of Transportation of Dangerous Goods Specialists (TDGS) who are a resource to all RAC members, the shipping community, regulators and emergency services personnel.

## RAC Dangerous Goods Team Services

What does the RAC DG Team provide?

- Railway and Plant Inspections & Audits
- Training
- Emergency Response
- Consultation

## RAILWAY ASSOCIATION OF CANADA DG TEAM CONTACTS

<p><b>J.A. (Andy) ASH</b>  <b>Director, Dangerous Goods</b>  <b>Toronto, ON</b>  <b>(O) : (905) 953-8991</b>  <b>(C) : (647) 206-2896</b></p>	<p><b>J.P. (Jean-Pierre) COUTURE</b>  <b>TDG, Specialist, Eastern Canada</b>  <b>Montreal, QC</b>  <b>(O) : (450) 473-4459</b>  <b>(C) : (514) 891-8935</b></p>	<p><b>Curtis MYSON</b>  <b>TDG, Specialist, Western Canada</b>  <b>Edmonton, AB</b>  <b>(O) : (780) 992-8417</b>  <b>(C) : (780) 619-2763</b></p>
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## THE SAFETY TRAINING TANK CAR

- The Safety Training Tank Car (CCPX 911) is a general purpose railway tank car converted into a classroom on wheels. It is used by CIAC members and partners for training and orientation of employees, first responders, and for community outreach.
- RAC obtained ownership of CCPX 911 as of Jan 2015.
- For booking information Contact J.P. Couture for all Eastern bookings and Curtis Myson for all Western bookings.



## APPENDIX “B” CHEMICAL TERMS

### ACID

Any chemical, which undergoes dissociation in water with the formation of hydrogen ions. Acids have a corrosive effect on metals and may cause severe tissue burns. Acids turn litmus paper red and have a pH value of 0 to 6. Common examples are sodium hydroxide and sulfuric acid.

### ALKALI

Any chemical substance that in water solution is bitter and is irritating or caustic to skin and mucous membranes, turns litmus paper blue and has a pH value greater than 7.0. Alkalis are also referred to as bases. They may have a corrosive effect on metals and cause severe tissue burns.

### APPEARANCE

A description of a substance at normal room temperature and normal atmospheric conditions. Appearance includes the color, size, and appearance.

### AUTO-IGNITION TEMPERATURE

The temperature at which a closed or nearly closed container must be heated in order that a flammable liquid, when introduced into the container, will ignite spontaneously or burn.

### BONDING

The inter-connecting of two objects by means of a clamp and bare wire. Its purpose is to equalize the electrical potential between the objects to prevent a static discharge when transferring a flammable liquid or gas from one container to another. The conductive path is provided by the clamps which make contact with the charged object and a low resistance flexible cable which allows the charge to equalize.

### COMBUSTIBLE LIQUID

As defined by DOT as any liquid having a flash point at or above 141°F (60.5°C), but below 200°F (93°C), except any mixture having components with flash points of 200°F (93°C) or higher, the total volume of which makes up ninety-nine percent (99%) or more of the total volume of the mixture.

### CORROSIVE

As defined by DOT, a corrosive material is a liquid or solid that causes visible destruction or irreversible alterations in human skin tissue at the site of contact. In case of leakage from its packaging — a liquid that has a severe corrosive rate on steel.

### DANGEROUS GOODS

Dangerous goods are defined as a substance or material listed in the Transportation of Dangerous Goods Regulations Schedule 1 and determined to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce. The term "dangerous goods" includes hazardous substances, hazardous wastes, elevated temperature materials (HOT or MOLTEN), and marine pollutants.

### EXPLOSIVE

A chemical that causes a sudden, almost instantaneous release of pressure, gas, and heat when subjected to sudden shock, pressure or high temperature.

### FLAMMABLE LIQUID

As defined by DOT is any liquid having a flash point below 141°F (60.5°C), except any mixture having components with flash points of 100°F (37.8°C) or higher, the total of which make up ninety-nine percent (99%) or more of the total volume of the mixture.

### FLAMMABLE SOLID

A solid, other than a blasting agent or explosive, that is liable to cause fire through friction, absorption of moisture, spontaneous chemical change or retained heat from manufacturing processing, or which can be ignited readily and when ignited burns so vigorously and persistently as to create a serious hazard.

### FLASH POINT

The temperature at which a liquid will give off enough flammable vapor to ignite if an ignition source is present.

### IGNITABLE

Capable of being set afire.

### IMPERVIOUS

A material that does not allow another substance to pass through or penetrate it.

### INCOMPATIBLE

Materials, which could cause a dangerous reaction from direct contact with one another.

### INSULATION

A material used to maintain the temperature of the lading contain in a tank car. It may be made from fiberglass, rock wool, foam, cork, etc.

**LC50**

(Lethal Concentration - 50) is the concentration of a material in air, which causes the death of 50% (one-half) of a group of test animals. The material is inhaled over a set period of time, usually one or four hours and is usually measured in parts per million.

**LD50**

(Lethal Dose - 50) means a dose of a substance when ingested, injected, or applied to skin produces death in 50% (one half) of a population of experimental animals. It is usually expressed as milligrams per kilogram (mg/kg) of body weight.

**LOWER EXPLOSIVE LIMIT (LEL)**

Lowest concentration (percentage) of a gas or vapor in air capable of producing a flash of fire in presence of an ignition source (arc, flame, heat). Concentrations lower than LEL are "too lean" to burn. Also called lower flammable limit (LFL)

**ORGANIC PEROXIDE**

Any organic (carbon-containing) compound having two oxygen atoms joined together (-O-O-). Organic peroxides can be severe fire and explosion hazards.

**OXIDIZER**

A compound that spontaneously evolves oxygen either at room temperature or under slight heating. DOT defines it as a material that may, generally by yielding oxygen, cause or enhance the combustion of other materials. Chlorate, permanganate, and nitrate compounds are examples of oxidizers.

**POISON (TOXIC)**

A material that can cause short and/or long-term systemic health problems and possibly death, through inhalation, ingestion, or absorption.

**POISON INHALATION HAZARD (PIH) OR TOXIC INHALATION HAZARD (TIH)**

A DOT designation for gases and certain high vapor pressure liquids which, through the inhalation of small amounts, can cause severe health effects and even death.

**POLYMERIZATION**

Polymerization is a chemical reaction in which one or more small molecules combine to form larger molecules. Some materials are shipped with an inhibitor (or stabilizing agent) to delay polymerization and are limited in the amount of time they can be in transportation. A hazardous polymerization occurs when a reaction occurs (due to loss of inhibitor, contamination, or exposure to heat) at a rate which releases large amounts of energy in a confined space such as a tank car.

**PYROPHORIC**

Any liquid or solid that will spontaneously ignite in air at or below a temperature of 130°F (54.5°C).

**REACTIVITY**

The tendency of a substance to undergo chemical reaction with the release of energy. Undesirable effects —such as pressure buildup, heat, formation of noxious, toxic, corrosive, or flammable by-products may occur because of the reactivity of a substance to heating, burning, direct contact with other materials or conditions in use or storage.

**REDUCING AGENT**

A reducing agent is a chemical or substance, which combines with oxygen or loses electrons to the reaction. In a reduction reaction (which always occurs simultaneously with an oxidation reaction) the reducing agent is the chemical or substance which combines with oxygen or loses electrons in the reaction.

**SOLUBILITY IN WATER**

A term expressing the percentage of a material (by weight) that will dissolve in water at ambient temperature. Solubility information can be useful in determining spill cleanup methods and fire-extinguishing agents and methods for a material.

**SPECIFIC GRAVITY**

The weight of a material compared to the weight of an equal volume of water; an expression of the density of the material. Example: if a volume of a material weighs eight pounds, and an equal volume of water weighs ten pounds, the material is said to have a specific gravity of 0.8. Materials with a specific gravity of less than 1.0 will float on water. Materials with a specific gravity greater than 1.0 will sink to the bottom. Most (but not all) flammable liquids have a specific gravity of less than 1.0 and (if not soluble) will float on water.

**SPONTANEOUSLY COMBUSTIBLE**

A material that ignites as a result of retained heat from processing, or which will oxidize to generate heat and ignite, or which absorbs moisture to generate heat and ignite.

**TOXIC (POISON)**

A solid, liquid, paste, or semi-solid substance which is known (or presumed on the basis of animal testing) to be as toxic to humans as to afford a hazard to health during transportation. Exposure can cause short and/or long term systemic health problems and possibly death, through inhalation, ingestion, or absorption.

**UPPER EXPLOSIVE LIMIT (UEL)**

Highest concentration (percentage) of a gas or vapor in air capable of producing a flash of fire in presence of an ignition source (arc, flame, heat). Concentrations higher than UEL are 'too rich' to burn. Also called upper flammable limit (UFL).

**VAPOUR DENSITY**

The weight of a vapour or gas compared to the weight of an equal volume of air; an expression of the density of the vapour or gas. Materials lighter than air have vapour densities less than 1.0. Materials heavier than air have vapor densities greater than 1.0. The vapours from materials with vapor densities greater than 1.0 are likely to migrate to low lying areas — along or under floors, in sumps, sewers and manholes, in trenches and ditches — where they may create fire or health issues or displace oxygen.

**WATER REACTIVE**

A chemical that reacts with water to release a gas that is either flammable or presents a health hazard.

## APPENDIX “C” RAIL TERMS

**AAR** — the Association of American Railroads, a trade association comprised of North American railroads. The AAR, among other activities, issues specifications and rules regarding the interchange of railcars between the various railroads. The AAR’s requirements for tank cars are contained in the *AAR Manual of Standards and Recommended Practices* (MSRP) C-III, Specification M-1002.

**AAR Specification Tank Car** — a tank car built, altered, or converted in accordance with the tank car specifications of the Association of American Railroads.

**ACC-** American Chemistry Council, America’s oldest trade association of its kind, representing companies engaged in the business of chemistry.

**A-end** — the end of a railcar, opposite the end equipped with the hand brake (see B-end.)

**Ambient** — the temperature and barometric pressure of the local environment.

**B-end** — the end of a railcar on which the hand brake of a railcar is attached. If both ends of the railcar have a hand brake, the car will be stenciled A-END and B-END. When facing the B-end, the sides of the railcar are identified as the Right Side and Left Side, respectively.

**Body Bolster** — the structural members at each end of a car body that support the car on its truck assemblies. Otherwise known as a Tank Saddle.

**BOE-** Bureau of Explosives, federal law enforcement organization within the United States Department of Justice.

**Bottom Outlet Valve** — a valve located in the bottom of the tank for loading or unloading.

**Bottom Washout** — a plugged and flanged opening in the bottom of a tank to facilitate cleaning of a tank car that does not have a bottom outlet.

**Brake Rigging** — the assembly of cylinders, levers and/or rods under a railcar that provides and transmits brake action to the wheels.

**Breather Vent** — a device having an operating part that is a permeable disc or a disc having a breather hole or slit. Breather vents are typically applied to tank cars transporting hydrogen peroxide to allow vapors created by the commodities decomposition to be vented from the tank.

**BNSF-** Burlington Northern Santa Fe, one of North America’s leading freight transportation companies, with a rail network of 32,500 route miles in 28 states and two Canadian provinces.

**Burst Pressure (Disc)** — the value of the inlet static pressure at which a safety vent or breaking-pin device functions.

**Burst Pressure (Tank)** — the internal pressure at which a tank will theoretically burst. For a tank car tank, the minimum burst pressure is a function of the tanks inside diameter, welding joint efficiency, minimum tensile strength of the plate material, and the minimum thickness of the plate after forming.

**CAER-** Community Awareness and Emergency Response – **Community Awareness** - is the branch of **CAER** that keeps the community informed. **Emergency Response**, function that drove the formation of **CAER**, bringing municipal and industrial emergency responders together to identify potential risks associated with industrial operations and to develop emergency plans around them.

**CANUTEC** — acronym for the Canadian Transport Emergency Centre. CANUTEC is operated by the Transport of Dangerous Goods Directorate of Transport Canada and provides a national bilingual (English and French) advisory service, including emergency response advice for incidents involving dangerous goods. Call collect at 613-996-6666 (24hours) or \*666 cellular (Canada only). Call 613-992-4624 (24 hours) for nonemergency inquiries.

**Capacity/CAPY** — the volumetric capacity (stenciled in gallons and liters) of a tank car's tank head. The capacity may also be shown in imperial gallons.

**Center Sill** — the center longitudinal structural member of a car underframe that forms the backbone of the underframe and transmits most of the buffing shocks from one end of the car to the other (also see Stub Sill Tank Car).

**CFR- Code of Federal Regulations** - is an annual codification of the general and permanent rules published in the Federal Register by the executive departments and agencies of the Federal Government.

**CHEMTREC®** — acronym for the Chemical Transportation Emergency Center, a 24-hour emergency response service that provides assistance in the handling of incidents involving hazardous materials/dangerous goods. Call toll free at 800-424-9300 in the U.S. and Canada (outside calls: collect at 703-527-3887).

**C-Kit/Capping Kit** — a set of components used to cap (cover) and contain leakage from a fitting on a tank car. C-Kits are specifically designed for use on chlorine and sulfur dioxide tank cars. Tank cars built or altered after December 1, 2003, and used for the transportation of Class 2 or Poison-Inhalation Hazard/Toxic Inhalation Hazard materials must have a manway cover (or pressure plate) designed to accommodate capping kits. This requirement does not apply to tanks cars transporting carbon dioxide or Class DOT-113 and Class AAR-204W cryogenic liquid tank cars.

**Clad/Cladding** – the bonding of dissimilar metal sheets to form a composite material. The more corrosion-resistant metal acts as an interior protective coating after a tank car tank is fabricated.

**Class (Tank Car)** — a general designation of tank cars, usually including several specifications; e.g., Class DOT-111 or Class AAR-204. The word —Class is used if the designation embraces several specifications.

**CN-** Canadian National Railway

**Combination Pressure Relief Device** — a PRD that incorporates a non- reclosing device (breaking pin or rupture disc assembly) in conjunction with an outboard reclosing pressure relief valve.

**Commodity/Lading** — the product inside a tank car.

**Coupler Vertical Restraint System** — see Double-Shelf Coupler.

**CP** – Canadian Pacific Railroad

**Cryogenic Liquid Tank Car** — a vacuum-insulated tank car, consisting of an inner container (tank) enclosed within an outer steel shell (tank, not jacket), designed for the transportation of refrigerated liquefied gases having a boiling point colder than minus 130OF at atmospheric pressure, such as liquid hydrogen, oxygen, ethylene, nitrogen and argon. These cars are built to the specifications contained in Subpart F, Part 179, Title 49CFR or Chapter 3, AAR MSRP Section C-III, Specification M-1002.

**CSX-** CSX Transportation is a Class I railroad in the United States, railroad is headquartered in Jacksonville, Florida, and owns about 21,000 route miles.

**DHS-** Department of Homeland Security

**DOT** — acronym for the Department of Transportation, which is the governmental department that regulates the transportation of hazardous materials within the United States and Canada.

**DOT/TC Specification Tank Car** — the U. S. Department of Transportation or Transport Canada specification to which a tank car was built, altered, or converted.

**Double-Shelf Coupler/Coupler Vertical Restraint System** — a railcar coupler having top and bottom shelves designed to prevent vertical disengagement of mating couplers in the event of an excessive end-to-end impact. Double-shelf couplers are fully compatible with all other railcar couplers and required by DOT regulation on all DOT specification tank cars and any tank car transporting hazardous materials/dangerous goods.

**EC** – Environment Canada

**Eduction Line** — the combination of the eduction valve and eduction pipe.

**Eduction Pipe** — the pipe that runs from the eduction valve into the tank.

**Eduction Valve** — a valve used to load or unload liquid product or to introduce or remove vapor from a tank car tank.

**EMS** – Emergency Medical Services

**EPA** – Environmental Protection Agency (USA)

**ERAC** – Emergency Response Assistance Canada (Flammable Liquid ERAP Response Teams)

**ERAP** – Emergency Response Assistance Plan, Describes what is to be done in the event of a transportation accident involving certain higher risk dangerous goods that require special expertise and response equipment. Assisting local emergency responders by providing them with technical experts and specially trained and equipped emergency response personnel at the scene of an incident.

**Excess Flow Valve** — a device installed in a liquid, vapor, or sample line, or a gauging device rod designed to stop the outward flow of product in the event the fitting is removed during transportation, such as the device being sheared-off during an accident. When not in operation, the device allows the flow of liquid or vapor in two directions. Do not confuse this valve with a check valve, which is a device that allows the flow of liquid or vapor in only one direction.

**Expansion Dome (Dome)** — a cylindrical metal enclosure located on top of an obsolete non pressure tank car tank intended to function as the expansion area for the lading during transportation. Do not confuse an expansion dome with protective housing, which is found on pressure tank cars and some non- pressure tank cars.

**FEMA** – Federal Emergency Management Agency (USA)

**Fill Hole** — an opening in the manway cover, closed with a fill-hole cover, through which product may be loaded or unloaded. Typically found on tank cars in sulfuric or hydrochloric acid service.

**Flange** — a disc-shaped device that is part of a nozzle or fitting (valve, PRD), used to create a bolted attachment to the tank car. Also, it may be a solid disc (blind flange) or have a threaded hole for a plug or secondary valve bolted to the eduction valve to provide closure.

**Frangible Disc** — see Rupture Disc.

**FRA-** Federal Railroad Administration - was created by the DOT. It is one of ten agencies within the U.S. DOT concerned with intermodal transportation.

**Gasket** — material inserted in the joint between two mating surfaces to prevent leakage through the joint.

**Gauging Device** — a device used to measure the level of liquid or vapor space in a tank car tank, which may be a fixed gauge bar/outage scale or T-bar attached to the top of the tank (in non- pressure tank cars), or a magnetic-ball, fixed-length (telltale) tube, or an electronic device.

**Head** — one of the ellipsoidal ends of a tank car tank.

**Hand Brake** — A device mounted on railcars and locomotives to provide a means for applying brakes manually without air pressure. Common types include vertical wheel, horizontal wheel, and lever type, named because of the configuration or orientation of their operating handles.

**Head Shield** — A method of providing tank head puncture-resistance by mounting a metal shield on the end of a tank car to protect against punctures from the coupler of another railcar. Head shields may be separate attachments or may be incorporated into a tank's jacket.

**Heel** — common term used for the product or residue remaining in a tank car tank after it has been unloaded.

**ICS** – Incident Command System - systematic tool used for the **command**, control, and coordination of emergency response.

**Insulation** — a material, typically fiberglass or foam, enclosed within a metal jacket, used to maintain or moderate the temperature or aid in the unloading of the lading contained within a tank car. For cryogenic liquid tank cars, in addition to a vacuum and insulation system, perlite or an alternating wrap of multiple layers of aluminum foil and paper is used. Not all tank cars are insulated. Do not confuse insulation with thermal protection.

**Internal Valve** — a type of bottom outlet valve located inside a tank car tank to prevent damage in the event of an accident.

**Jacket** — a metal covering (minimal thickness of 11gauge) surrounding a tank car tank designed to protect and secure the insulation and/or thermal protection systems on a tank car. A jacket is not an outer tank.

**KCS** – Kansas City Southern Railway - transportation holding company that has railroad investments in the U.S., Mexico and Panama.

**Light Weight/LT WT** — empty weight or tare weight of cars or of the train. The light weight is stenciled in pounds and kilograms on every rail freight car and is abbreviated LT. WT.

**Liquid Education Line** — a pipe, equipped with a valve, cap, or blind flange closure that extends to the bottom of a tank car tank for the loading and unloading of the lading.

**Load Limit/LD LMT** — the maximum weight of lading that can be loaded in a railcar. Load limit is stenciled in pounds and kilograms on every rail freight car and is abbreviated LD. LMT.

**Manway** — a general term designating the circular shaped opening located at the top of a tank car tank to allow access into the tank's interior for maintenance, inspection, and loading or unloading. Depending upon a tank car's class or product service, the manway will be closed with either a hinged and bolted manway cover (typical for non-pressure tank cars) or a semi permanently bolted manway cover or pressure plate, typical for pressure and cryogenic liquid tank cars.

**MSDS/SDS** – Material Safety Data Sheet or Safety Data Sheet

**NA** – North America

**NIMS** – National Incident Management System, NIMS was developed for responders from different jurisdictions and disciplines to better work together to respond to natural disasters and other emergencies.

**Nitrogen Blanket/Nitrogen Pad** — nitrogen gas inserted into a tank car tank to provide an inert atmosphere for a lading that may react with air in order to protect the lading's purity or to prevent the entry of moisture.

**Non pressure or Low Pressure Tank Car** — a tank car with a tank test pressure of 60 or 100 psig, built to the specifications contained in Subpart D, Part 179, Title 49CFR or Chapter 3, AAR *Manual of Standards and Recommended Practices*, Section C-III, Specification M-1002. Non pressure tank cars are also referred to as general service or low-pressure tank cars.

**Nozzle** — a circular or oval-shaped attachment applied to openings in a tank for the application of a manway cover (or pressure plate), valves, pressure relief devices, and other fittings.

**NS** – Norfolk Southern Railway Company, Norfolk Southern operates 20,000 route miles in 22 states and D.C., supports international trade with service to every major Eastern seaport, 10 river ports, and nine lake ports, and operates the most extensive intermodal network in the East.

**NTSB** – National Transport Safety Board (USA)

**OSHA** – Occupational Safety and Health Administration

**OREIS** – Operation Response Emergency Information System

**Outage** — the vacant space left in a tank car tank after filling to allow for product expansion during transportation so it will not reach shell-full capacity (maximum volume of a tank). Governmental regulations prescribe minimum outages for hazardous materials/dangerous goods at specified reference temperatures. In addition to minimum outage by volume, tank cars may not be loaded-in by weight excess of their gross weight on rail limit as determined by their truck capacity. Another term for outage is ullage.

**Pressure Relief Device** — a fitting that opens at a predetermined setting to reduce the pressure within a tank car tank resulting from exposure to abnormal conditions. PRDs may be reclosing (spring-loaded) pressure relief valves, regulating valves, non- reclosing (frangible/rupture disc) vents, or combination PRDs (incorporating both a frangible disc/breaking pin and a reclosing pressure relief valve).

**Packing** — a general term denoting the various substances and devices used to prevent leakage of fluids or gases through openings (valve body and valve stem) that cannot be closed by ordinary contact of the parts concerned.

**Packing Gland** — the portion(s) of a device used to contain packing on a valve body or other fitting to prevent leakage.

**PHMSA** – Pipeline and Hazardous Materials Safety Administration

**PIH/TIH** (Poison/Toxic Inhalation Hazard) — a gas or liquid that meets the definition of a —material poisonous by inhalation as defined in §171.8, Title 49 CFR (see TIH).

**Pressure Plate** — on a pressure tank car, the circular shaped steel plate closing the manway nozzle to which the valves, pressure relief device(s), and other fittings are mounted. Some non -pressure tank cars may be equipped with a pressure plate assembly in lieu of a hinged and bolted manway cover.

**Pressure Relief Valve (PRV)** — a spring-loaded device, actuated by inlet static pressure, that relieves excess pressure and recloses after normal conditions are restored. Pressure relief valve has replaced the term safety relief valve.

**Pressure Tank Car** — a tank car with a tank test pressure of 100 to 500 psig built to the specifications contained in Subpart C, Part 179, Title 49CFR.

**Protective Housing** — on pressure and on some Non pressure tank cars, a heavy, circular steel housing that surrounds the fittings to protect them in the event of an accident and from unauthorized access. Non-pressure tank cars may be equipped with light gauge steel protective housings (referred to as combination housings, breadboxes or mailboxes) that provide weather and tamper protection. Do not confuse with an expansion dome as found on some (obsolete) non-pressure tank cars. The protective housings for cryogenic liquid tank cars are boxes or cabinets on the sides or end of the tank car.

**RAC**- Railway Association of Canada

**Regulating (Regulator) Valve** — a reclosing (spring loaded) pressure relief device applied to tank cars transporting certain refrigerated liquids (e.g., carbon dioxide and argon) to maintain internal pressure below a certain point. If the pressure exceeds a specific point, the valve will open, relieving vapor, which results in auto-refrigeration, lowering the product's temperature and pressure.

**Reporting Mark and Number** — the alphabetical initial stenciled (typically 2 or 4 letters ending with an X for non-railroad owned cars, followed by 2 to 6 numerals; e.g., BOEX 2010) on the sides and ends of every freight car to identify the railroad or private car line that owns the car. Reporting marks are assigned by the Association of American Railroads.

**Residue** — the amount of commodity remaining in a tank car after it has been unloaded to the maximum extent practicable (maximum 10% of the tank car liquid volume) also referred to as —the heel.

**RQ** – Reportable Quantity

**Rupture Disc** — the operating part of a safety vent, also called a frangible disc. When used in conjunction with a spring-loaded reclosing pressure relief valve, the device is called a combination pressure relief device.

**Safety Relief Valve** — See Pressure Relief Valve. Pressure relief valve has replaced the term safety relief valve.

**Safety Vent (Rupture Disc Device)** — a device consisting of a rupture disc and rupture disc holder. A non- reclosing pressure relief device actuated by static pressure and designed to function by the burst of a pressure-containing disc.

**Sample Line** — a pipe (typically 1/4 inch in diameter), equipped with a needle valve that extends to near the bottom of a tank car tank for drawing a sample of the lading.

**SCBA** – Self Contained Breathing Apparatus

**Service Equipment** — equipment used for filling, sampling, emptying, venting, vacuum relief, pressure relief, heating (if internal to the tank), lading temperature measurement, or measuring the amount of lading within the tank. Commonly referred to as valves and fittings.

**SETIQ** — acronym for the Mexican Emergency Transportation System for the Chemical Industry, a service of the National Association of Chemical Industries (ANIQ). Responders in the Mexican Republic can call SETIQ (24 hours) 01-800-00-214-00. In Mexico and the metropolitan area, call 5559-1588. Elsewhere call, I +52-55-5559-1588.

**Shell** — the cylindrical section of a tank car tank, without heads. Do not confuse with jacket. (See also Tank Car and Head.)

**Shipping Paper (Hazardous Materials/Dangerous Goods)** — a shipping order, bill of lading, manifest, or other shipping document serving a similar purpose and containing the information required by Governmental regulations.

**Skid Protection** — a device attached to the bottom of a tank car to protect the bottom outlet, washout and/or sump (referred to as bottom discontinuities) from damage in the event of a derailment.

**Specification** — the specific designation within a tank car class; e.g., DOT 111A100W2.

**STB** – Surface Transportation Board, The agency has jurisdiction over railroad rate and service issues and rail restructuring transactions, line construction, and line abandonments,

**STC Code or STCC** — abbreviation for Standard Transportation Commodity Code, which is a 7-digit freight description coding system used by the North American railroad industry. For hazardous materials/dangerous goods, the STCC is referred to as the Hazmat Code, and begins with 49 or 48 for hazardous wastes. The Hazmat Code may be found on shipping papers and may be used to access computer based emergency response information.

**Stenciling** — a term used to describe all forms of lettering on cars regardless of the actual method of application. Specific information that is required to be marked on the exterior surface of a tank car.

**Stub Sill Tank Car** — a tank car design with draft sills at each end of the tank instead of a continuous center sill that utilizes the tank as part of the car structure. (Also see Center Sill).

**Stuffing Box** — the portion of a top-operated bottom outlet valve assembly through which the valve operating rod passes to the exterior of the tank. The stuffing box contains packing that, when compressed by the packing gland nut, forms a seal around the rod to prevent leakage and keeps the rod from vibrating. The stuffing box cover, when removed and inverted, is used as a wrench to open and close the internal valve.

**Sump or Siphon Bowl** — a small depression located near the longitudinal center of a tank bottom where the liquid eduction line extends, thereby allowing the maximum amount of product to be removed from the tank.

**Surge Pressure Reduction Device** — a device designed to reduce the internal surge pressures of the pressure relief devices. These devices are primarily used on tank cars equipped with non- reclosing pressure relief devices (safety vents) and are intended to reduce pressure surges that can cause the rupture disc to fail.

**Tank Car/Tank Car Tank** — a railcar that has a tank for its body for transporting liquids, solids, and liquefied gases, consisting of a shell and heads together with connections welded directly to it. In accordance with AAR specifications, —tankll means —tank car tank. The head of a tank is one of the end closures. Tank cars may be pressure or non- pressure and are often equipped with special equipment to enhance their usefulness for handling specific commodities. For pressure class tank cars, the tank includes the manway nozzle as well.

**Tank Test Pressure** — the pressure (psig) at which a tank car tank is to be hydrostatically tested at the time of construction. Depending upon the specification, the tank test pressure varies from 20 percent to 40 percent of the minimum burst pressure. Tank test pressure is also known as service pressure.

**TC or Transport Canada** — the Governmental agency that regulates the Transportation of Dangerous Goods in Canada.

**Thermal Protection** — a material or system applied to certain tank cars to limit the transfer of heat to the tank in the event of exposure to pool or torch fires. It is intended to reduce the likelihood of tank failure under such conditions. Thermal protection is not the same as insulation, which is intended to maintain or moderate lading temperature under ambient conditions.

**Thermometer Well** — a small diameter pipe, usually 3/4 inch, filled with an antifreeze solution or oil that extends into the tank and is closed at the top with a removable cap. The temperature of the lading transfers to the liquid in the pipe. A thermometer or probe is lowered into the pipe to obtain the lading's temperature.

**TIH/PIH (Toxic/Poison Inhalation Hazard)** — a gas or liquid that meets the definition of a —material poisonous by inhalationll as defined in §171.8, Title 49 CFR (see TIH).

**TRANSCAER** – Transportation Community Awareness and Emergency Response, a voluntary national outreach effort that focuses on assisting communities to prepare for and to respond to a possible hazardous materials transportation incident. Representatives from the chemical manufacturing, transportation, distributor, and emergency response industries, as well as the government.

**Train Consist** — for purposes here, a document (also referred to as a Train List or Wheel Report) that sequentially lists the location of each railcar in a train. A consist may also serve as the shipping paper for a railcar containing hazardous materials/dangerous goods, provided it contains all of the information required by governmental regulations.

**Truck** — the assembly of wheels, axles, roller bearings, springs, side bearings, side frames, and bolster that supports each end of a railcar and enables it to move on the rails.

**TSB-** Transportation Safety Board (Canada)

**Type (Tank Car)** — for tank cars, designates the approving agency; e.g., AAR, DOT, and TC, which is the preferred form of designating.

**UN** – United Nations

**UP** – Union Pacific Railroad

**Vacuum Relief Valve** — a spring-loaded valve mounted at the top of some non- pressure tank cars, designed to open and allow air into the tank if an excessive vacuum is formed that may cause the tank to collapse. A vacuum relief valve should not be depressed to determine if there is pressure in the tank. Doing so may dislodge the sealing component causing the device to leak vapor or liquid.

**Vapor Line** — a pipe equipped with a valve, cap, or blind flange closure that extends to the top of the tank through which vapor is introduced or removed during loading or unloading. On a non- pressure tank car, this device is usually called an airline and is used to introduce compressed air or vapor, or an inert gas to unload the car.

**Vapor Space** — the space in a tank above the liquid; may also be referred to as outage.

**VIA** - Via Rail Canada is an independent crown corporation, subsidised by the Minister of Transport, to offer intercity passenger rail services in Canada.

## APPENDIX “D” RAIL CONTACT/EMERGENCY NUMBERS

RAIL COMPANY	CONTACT NUMBERS/EMERGENCY #
BNSF Railway	(800) 832-5452
Barrie-Collingwood Railway (ON)	(705) 734-1275
Battle River Railway (AB)	(780) 678-0327
Big Sky Rail (SK)	(306) 992-5920
Cape Breton & Central Nova Scotia Railway	(800) 890-2812
Carlton Trail Railway (SK)	(800) 533-9416
Central Maine & Quebec Railway	(866) 940-7774
CN Rail Police	(800) 465-9239
CP Rail Police	(800) 716-9132
Essex Terminal Railway	(519) 973-8222 ext. 228
Goderich Exeter Railway (QC)	(800) 890-2812
Great Sandhills Railway (SK)	(866) 938-4774
Great Western Railway (SK)	(306) 297-2777
Huron Central Railway (QC)	(888) 641-2177
Kettle Falls International Railway (BC)	(800) 533-9416
Knob Lake and Timmins Railway (QC)	(888) 641-2177
New Brunswick Southern Railway	(506) 632-4692
Norfolk Southern Railway (Virginia)	(800) 453-2530
Ontario Northland Railway	(800) 558-4129 ext. 141
Ottawa Valley Railway	(800) 890-2812
Quebec Gatineau Railway	(888) 641-2177
Saint-Lawrence & Atlantic Railway	(877) 414-7905
Southern Ontario Railway	(800) 890-2812
Southern Railway of British Columbia	(604) 521-4821
Stewart Southern Railway (SK)	(306) 722-7712
Trillium Railway (ON)	(800) 655-6268

## APPENDIX “E” REGULATORY AND PROVINCIAL EMERGENCY NUMBERS

REGULATORY/PROVINCIAL/TERRITORIAL AGENCIES	CONTACT NUMBERS
<b>CANUTEC</b>	<b>1-888-CANUTEC (226-8832) or 1-613-996-6666 or Cellular in Canada (star)*666 Non-emergency information line 613-992-4624 (24 hour)</b>
<b>CHEMTREC</b>	<b>1-800-424-9300</b>
<b>Alberta</b>	<b>Local police or 1-800-272-9600</b>
<b>British Columbia</b>	<b>Local police or 1-800-663-3456</b>
<b>Manitoba</b>	<b>Local Police or Fire(as appropriate) or Provincial Authority 204-945-4888</b>
<b>New Brunswick</b>	<b>Local Police or 1-800-565-1633 or 902-426-6030</b>
<b>Newfoundland and Labrador</b>	<b>Local Police or 709-772-2083</b>
<b>Northwest Territories</b>	<b>867-920-8130</b>
<b>Nova Scotia</b>	<b>Local Police or 1-800-565-1633 or 902-426-6030</b>
<b>Nunavut</b>	<b>Local Police or 867-920-8130 or 1-800-693-1666</b>
<b>Ontario</b>	<b>Local Police</b>
<b>Prince Edward Island</b>	<b>Local Police or 1-800-565-1633 or 902-426-6030</b>
<b>Quebec</b>	<b>Local Police</b>
<b>Saskatchewan</b>	<b>Local Police or 1-800-667-7525</b>
<b>Yukon Territory</b>	<b>867-667-7244</b>

# APPENDIX “F” INFOGRAPHIC OF NEW TC 117 TANK CAR



## ENHANCED SAFETY FEATURES

The new **TC-117 TANK CAR** standard includes several enhanced safety features to protect communities along Canada's railways



The new TC-117 tank car is required to be constructed as a thermally protected, jacketed tank car with steel that is 9/16<sup>th</sup> of an inch thick and full head shields. A jacket will be added as an outer cover on the exterior of the shell to keep insulation in place and provide additional strength and reinforcement. These features provide improved puncture resistance, structural strength and fracture resistance.

New mandatory top fitting protection will cover the valves on top of the tank car, guarding against damage in the event of an incident.

New full head shields will help protect the ends of the tank car from being punctured by equipment or collisions with adjacent rail cars in the event of excessive end impact or derailment. Previous standards of the class 111 tank cars did not require head shields in most cases.



Thermal protection increases the survivability of tank cars in the event of a fire. The new thermal protection required for the TC-117 must be able to withstand exposure to a 100-minute pool fire and a 30-minute jet fuel fire without rupturing.

New enhanced bottom outlet valve must remain closed and not leak during an incident.



