

Introducing the Intermodal Tank

by Lieutenant John C. Berna

Intermodal (IM) freight is defined as the shipment of goods involving two or more modes of transportation (sea, air, road and rail) from the product's origin to its final destination in a single shipping container. An intermodal is the container or vessel in which the product is shipped. There are two basic kinds of intermodals. The most common is the container or ISO, named because the dimensions have been defined by the International Standards Organization. Containers are usually eight feet wide by eight feet, six inches high and 20 or 40 feet long. They can be seen everyday throughout New York City, on cargo ships entering ports, as well as on highways and railways. They carry everything from food products and paper goods to appliances and hazardous materials. (See Photos #1 and #4.)

The less common kind of intermodal, but one that quickly is instigating a more frequent FDNY response, is the intermodal or ISO tank. There are five basic intermodal tanks that can carry hazardous materials:

- The IM-101 or Type 1 is a low-pressure tank.
- The IM-102 or Type 2 is considered a low-pressure tank, but can have working pressures up to 100 pounds per square inch gauge (psig). Both Types 1 and 2 tanks can carry hazardous and non-hazardous liquid and solid commodities.
- A Department of Transportation (DOT) Spec 51 or International Maritime Organization (IMO) Type 5 tank is a pressurized tank containing gases liquefied by pressure (LPG, ammonia, freon) or high-vapor pressure liquids. Working pressures in the Spec 51/IMO Type 5 range from 100-500 psig.
- The IMO Type 7 is a cryogenic tank container transporting gases liquefied by refrigeration (oxygen, helium).
- The final type is a tube module, which is distinguished by multiple tubes or cylinders that carry gases under high pressure (oxygen, nitrogen, hydrogen) with pressures up to 5000 psi.

Even though the external appearance of many of these tanks can be similar, construction materials, fittings, working pressures and internal linings will be different. They require closer examination to verify the specific type. The shells of the tanks are constructed from various kinds of steel. Some intermodal tanks are insulated with fiberglass, injected foam, ridged foam panels or cryogenic insulation that is *jacketed* by aluminum, stainless steel

or fiberglass on the exterior of the tank. All of these tanks are constructed with a metal frame built around the tank, providing support and protection and facilitating easier transfer between modes of transport. (See Photo #2.)

These tanks may be unfamiliar to many FDNY members. The ability to interpret markings will provide important information. Identifying both the tank type and product, both of which can be done with an effective size-up, is critical to FDNY firefighting operations when responding to an incident involving an intermodal tank. Much of the information needed to begin an assessment is displayed on the exterior of the tank. Intermodal tanks are a form of international commerce and must meet numerous requirements from various agencies, both in and outside of the United States.

Intermodal tanks must meet DOT and Association of American Railroads (AAR) standards. Each authority requires a tank that complies with its own specific regulations to be marked in a readily visible manner. Interpreting these markings on the tank can be time-consuming.

Responding to an intermodal tank incident/accident usually will require a hazardous materials response. Normal haz-mat response procedures should be implemented by first-arriving units. As stated in the Department's Hazardous Materials ERP, the first-due truck will be tasked with hazard identification and information resource. As in any hazardous materials response, responsibilities in conducting hazard identification include noting any visible markings, placards/labels and exterior container features and passing the information to the Incident Commander (IC) and resource members. Knowing what container markings provide useful information requires an understanding of *reading* the tank.

There is a vast array of information found on intermodal tanks, again due to the numerous agencies involved and the fact that they must meet specifications from many countries. Listed below is the more important information that will assist units until the arrival of a Hazardous Materials Technician Unit (HMTU).

Department of Transportation

The most familiar marking members will see is the DOT plac-

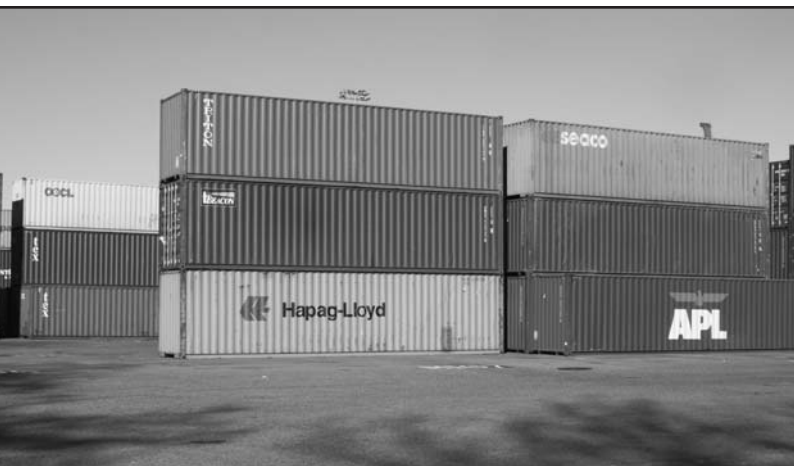


Photo #1--Stacked ISO containers at the Staten Island Terminal.



Photo #2--An intermodal Spec-51, containing refrigerant gas 134A.



Photo #3--Intermodal tank displays typical reporting marks and numbers.

ard, the same one used on vehicles. These placards will be found directly on the tank or affixed to the steel frame surrounding the tank. The only difference is that, frequently, an orange label with black numbering can be found near the DOT placard. The numbers on the upper portion of the label explain the product's hazard. The four-digit number on the lower half of the label provides the United Nations (UN) number of the tank's contents. It is common to find the label with just the UN number listed. This information is critical to the operation and can be found by looking on page 20 of the 2008 DOT ERG.

Reporting marks and numbers

These markings indicate tank ownership and individual tank serial number. (See Photo #3.) There will be four letters; the first three letters--(SNT) in this case--indicate the owner's name, followed by the letter U, indicating that it is an intermodal. The six digits following in the serial number identify the specific tank, similar to a license plate. A seventh number normally inside a square box is a check digit, used for quality control by the owner of the tank. These marks should be found on both sides and ends of the tank. Below this marking is the country of registry (LR) Liberia and the code numbers for tank size and designed pressure (2276). A second pressure marking, maximum allowable working pressure (MAWP), can be found at the ends of the tank and are recorded in psi or bars. This is the pressure the tank is subjected to during normal transportation and should not be exceeded at any time.

Specification markings

Specification markings (IM-101, Spec 51, etc.) indicate the standards used in building the tank. Usually, they are found below the reporting marks and numbers, the country of registry and tank dimensions. This information, if available, should be relayed to an HMTU (Squad, Haz-Mat 1, Rescue 5 or an HMTU engine). Attached to one end of the tank or the tank's frame will be the specification or data plate. The plate contains technical data, which can be helpful in size-up. The plate is constructed of stainless steel and the information is etched to prevent fading. Usually found near the spec plate is the document holder, which contains product information. If the intermodal tank is actively being transported, the operator must carry his/her own set of shipping papers in addition to the set placed in the document holder.



Photo #4--Rail car carrying an IM tank and an ISO container.

Container weights and capacities

Found at either end of the intermodal tank is the maximum gross weight, which is the weight of the tank when full of product. The tare weight displays the weight of the tank when empty. Both weights are marked in kilograms and pounds. Tank capacity is listed in gallons and liters and is found on the ends of the tank as well.

Miscellaneous markings

Not as critical to FDNY operations are the international markings that may be found on the tank, permitting certain forms of transportation, such as Transport Canada (TC), shipping on European rail (ADR) and RID, which informs members that it meets international regulations for rail transportation. AAR 600 is the U.S. designation for meeting Association of American Railroads specifications.

Conclusion

With increased use of IM tanks, the chance of responding to an incident will only increase. The information required to be posted on the tanks can be overwhelming and confusing. Understanding what information is important and what is not must be determined. The simplest solution is to gather as much information as possible and communicate that data to the Haz-Mat Battalion or Haz-Mat 1 via Battalion or Division cell phone, Nextel or radio via dispatchers. These units carry the resources and have the advance training in intermodal transportation to interpret the information and supply recommended tactics needed to mitigate the incident safely. The primary means of communicating to the Haz-Mat Group should be the Battalion 800MHz radio, as this will allow all responders to hear what is being discussed to gain situational awareness and possibly provide key information to the units on-scene.

About the Author...

Lieutenant John C. Berna is a 21-year veteran of the FDNY. He is assigned to Hazardous Materials Company 1 and currently detailed to the Center for Terrorism and Disaster Preparedness. Prior assignments include Ladder 142 and Squad 288 as a Firefighter and the Special Operations Command as a Lieutenant. He holds a BA degree from Dowling College. This is his first article for WNYF.

