Information Bulletin

Response and Mitigation of Overturned MC-331 Specification Tank Trucks

In response to recent motor vehicle accidents involving the overturning of MC-331 Tank Trucks in NYS and surrounding States, this bulletin includes guidance and recommendations for the damage assessment, up righting, and movement of these US DOT specification tank trucks.

MC-331 is a specification for the construction of tank trucks designed to carry liquefied gases and high vapor pressure materials regulated by the US Department of Transportation [i]. These tanks must remain under pressure in order to maintain the gases in the liquid state. The two most common products transported in an MC-331 are Anhydrous Ammonia and Liquefied Petroleum Gas (Propane/Butane). Compared to the more common MC306/DOT406 specification truck used to haul gasoline and other flammable low-pressure liquids, MC-331 tanks are made of steel versus the aluminum of the MC306/DOT406. With the construction of this specification, the tank itself is the chassis/frame. Subframes on both ends hold the two rear axles and the fifth wheel plate to the tank. Due to their steel construction, under certain conditions these trailers can be up righted after an overturn accident. To avoid additional damage and/or a release of product, a **qualified individual** [ii, iii], (i.e. cargo truck specialist) should perform a damage assessment of the tank prior to up righting or any movement of the tank truck.

Damage assessment is an extremely important step that must occur prior to any movement of the tank truck. There are many items that need to be evaluated before an educated decision can be made as to whether the overturned tank truck could be up righted or towed down the highway. Some of these items include:

- QT vs NQT Steels
- Dents
- Scores
- Gouges
- Cracks
- Corrosion
- Flame impingement
- Heating of the steel from friction

An MC-331 exhibiting any of the following damage should be left in place and off-loaded. [iv, v]:

- Dents that are at least 1" in depth in general or 0.5" depth for dents that include a weld.
- Locations where it appears that metal thickness has been diminished, thinned, or stretched.
- Gouges, especially if they cross a weld.
- Areas of steel that have been affected by heat due to friction or flame impingement
- Any cracks
- A leak of product

Once a complete damage assessment has been performed and a decision to up right has been made, coordinate with the tow truck/crane operator to pause once the tank is off the ground so that the qualified individual can assess the side that was not visible while the tank was on the ground. If suspect damage is found, the re-righting process should stop, and the tank should be laid back down.

MC-331 tank trucks that have been determined to be damaged severely enough by the qualified individual or which display any of the damage described above, are susceptible to catastrophic failure of the tank at any time, especially if moved or jostled. Internal and external cracking can develop under stress at speeds approaching the speed of sound [vi].

Even if you have successfully uprighted the tank truck, the vehicle is still susceptible to catastrophic failure, and should only be moved a minimal distance for safe off-loading as soon as possible [vii].

If the MC-331 contains a flammable gas (including Anhydrous Ammonia) the containers and other system components should be properly bonded and grounded prior to the transfer or flaring of any product occurs. Air monitoring of safe atmospheric conditions is a must prior to and during any actions described above.

For additional training and information on this subject, please consider OFPC's Cargo Truck Specialist class offered at the New York State Academy of Fire Science (course catalog and additional information can be found at www.dhses.ny.gov/ofpc/training/index.cfm).

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[i] Kronenberger, 2013, *Hazardous Materials Technician* pg. 457 (M. Sturzenbecker Ed.) Oklahoma City, Fire Protection Publications, Oklahoma State University.

[ii] National Fire Protection Association. (2017 Ed.) Standard for Hazardous Materials/Weapons of Mass Destruction Emergency Response Personnel Professional Qualifications (NFPA 1072 Chapter 7, § 7.2.3)

[iii] National Fire Protection Association. (2018 Ed.) Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents (NFPA 472 Chapter 13 §13.2.1[3][4], §13.2.2[4][5])

[iv] Title 49 C.F.R. Subpart E Qualification and maintenance of cargo trucks §180.411

[v] Emergency Services Training Institute. (2015). NFPA 472 Hazardous Materials Transportation Specialist Training: Participant Manual. Pg. 6-4 to 6-7. College Station, TX: Texas A&M Engineering Extension Service.

[vi] Emergency Services Training Institute. (2015). NFPA 472 Hazardous Materials Transportation Specialist Training: Participant Manual. Pg. 6-4. College Station, TX: Texas A&M Engineering Extension Service.

[vii] Title 49 C.F.R. §177.823 Movement of motor vehicles in emergency situations.