TECH SHEET

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Bulk Fuel Loading

Bulk fuel loading operations can be conducted more safely if basic safety practices are implemented. These range from bonding and grounding requirements to vehicle location, and each is important to the operation of a safe bulk fuel facility. Each facility of this type is unique and should be evaluated according to guidelines outlined in NFPA®, ANSI® and local and regional codes and statutes. Bulk fuel facilities should implement the following safety practices, at a minimum.

Loading Location Relationship to Exposures

Tank trucks with Class I liquids should be parked at least 25 feet from above-ground tanks, warehouses, buildings and property lines, while tank trucks with Class II and Class III liquids should be parked at least 15 feet from the above entities. Open flames and smoking should not be allowed within 25 feet of fuel-transferring operations.

Self-Closing Loading Riser Valves

Self-closing loading riser valves should be used to control the flow of liquid when top-loading a tank vehicle with Class I or Class II liquids. These valves could be operated by either manual or automatic shutoff systems. Automatic shutoff systems should be provided with a manual shutoff valve located at a safe distance from the loading nozzle, in case the automatic system fails.

Fill Extensions

A fill extension downspout that extends to within 6 inches of the bottom of the tank should be used when filling open-dome vehicles in which a flammable range vapor/air mixture could exist.

Electrical Equipment

When Class I liquids are being handled, all electrical equipment within 3 feet of the fill connection should be Class 1 Group D, Division 1 rated. Division 2-rated electrical equipment should be used when Class I liquids are being handled between 3 and 15 feet of the fill connection. Wiring of this type is commonly referred to as "explosion proof" and uses ridged, threaded conduit. This type of wiring should be used for all lights, motors, switches, phones and other electrical equipment within the distance requirements.

Fire Prevention and Control

Precautions should be taken to prevent the ignition of flammable vapors. Ignition sources should be removed or strictly controlled within 25 feet of fuel transfer operations, while driving the vehicle or when making repairs. Bulk fuel plants and tank trucks should be equipped with fire extinguishers with a minimum rating of 40 B:C. No Smoking signs should be posted at the loading rack, unloading risers, tanks and at all access points throughout the plant.

Pumps, Piping and Switches

Pumping and piping equipment for each class of liquid should be separated to avoid cross-contamination. All switches and piping should be labeled or color-coded to indicate the type of product they contain or control.

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Vehicles and Drivers

Engines should be shut off and parking brakes should be set before any fuel transfer begins. All inspections, recordkeeping and testing should comply with Department of Transportation (DOT) guidelines. Motor vehicle records should be reviewed annually for all current drivers and before assigning newly hired personnel to driving positions.

Static Bonding and Grounding

Top Loading—Static electricity is created by a build-up of differently charged ions and occurs naturally when objects (including liquids and gases) move against one another. This type of build-up can take place when liquid products are top-loaded into tanks. The build-up can produce a static electrical spark between the loading nozzle and the tank opening or cover. If flammable vapors are present when the spark occurs, an explosion or fire can result. To minimize this risk, it is important to use a static bonding cable when flammable or combustible liquids in temperatures above the flash points of the liquids are transferred between containers. The purpose of the bonding cable is to equalize the static electrical charge and prevent a static spark. Before loading tank vehicles through open dome covers, make a bonding connection between the loading tank and the vehicle or tank before dome covers are raised. It should remain in place until filling is completed, and all dome covers have been closed and secured. The static bonding/grounding cable should be connected to the loading piping, tanks and a metal stake installed at least 7 feet into the earth.

Bottom Loading—An automatic shutoff system should be used when bottom loading a tank vehicle, to ensure that only a predetermined quantity of liquid is loaded and to also prevent overfilling. All connecting components between the loading rack and the tank vehicle must be functionally compatible. The loading hose or pipe and the truck should only be connected by a dry disconnect coupling.

Unloading Risers—All unloading risers should be equipped with backflow check valves to prevent the product from flowing out of the bulk plant. The unloading risers should have substantial support between the backflow check valve and the end of the riser that connects to the transport. This support should be able to withstand a "pull away" from a transport while the hose is still connected to the unloading riser.

Dike Impoundment

Tanks containing Class I or II liquids should be surrounded by a dike constructed of earth, steel, concrete or solid masonry, and designed to be liquid tight in order to withstand the full hydrostatic pressure of the liquid. The capacity of the dike should not be less than the capacity of the largest tank within the dike.

Liquid Containment

All tanks should have a means to contain liquid in the event of an emergency fire. This can be accomplished by having an actuated valve that snaps shut in the event of a fire, or by always keeping the valves and covers closed. Make sure all fire safety equipment is well-maintained and in working order.

For Additional Information

National Fire Protection Association: www.nfpa.org

- NFPA 30® – Flammable and Combustible Liquids Code

Independent Petroleum Association of America: www.ipaa.org

Department of Transportation: www.dot.gov

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