Safe Operation of Vacuum Trucks Handling Flammable and Combustible Liquids in Petroleum Service

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Introduction

Vacuum truck personnel working in petroleum facilities shall be trained in the safe operation of the vacuum equipment; familiar with the hazards of the products being handled; and aware of relevant facility permit requirements, safety procedures, and emergency response requirements. It is the responsibility of the vacuum truck owner and operator to comply with (1) applicable federal, state, and local regulations; (2) this RP; and (3) facility requirements regarding the safe operation of vacuum trucks, including, but not limited to, the following items:

— construction, inspection, maintenance, and certification of the vacuum tank;

— selection and safe operation of the vacuum truck, vacuum pump, hoses, and accessories;

— regulatory requirements for safe highway operation of the truck;

— proper transportation, handling, and disposal of hazardous materials;

— safe vacuum truck loading, unloading, and transport operations within the facility;

— training and qualification of operators and other assigned vacuum truck personnel.

Although the material contained in this document is intended to be consistent with regulatory requirements, API 2219 is not a compliance document. Each user or operator must ensure compliance with all applicable laws and regulations. The United States Department of Transportation (DOT) *Code of Federal Regulations*, 49 *CFR*, specifies the minimum requirements for the design, construction, maintenance, testing, and operation of vehicles used for handling and transporting hazardous materials within the United States. Criteria for minimum training and qualifications of drivers and operators are also found in 49 *CFR*. The Department of Labor, Occupational Safety, and Health Administration's (OSHA) requirements for safety, health, and hazard awareness applicable to operators and other personnel working with vacuum truck operations are found in the *Code of Federal Regulations*, 29 *CFR* 1910. U.S. Coast Guard regulations in 33 *CFR* 154 for bulk transfer of hazardous materials to and from vessels at marine facilities could include certain vacuum truck transfer operations.

The procedures contained herein are intended to apply to vacuum trucks, skids, and trailers used in flammable and combustible liquid service. These requirements include, but are not limited to, 49 *CFR* parts 178.345–178.348 as well as DOT 407 and DOT 412 (formerly designated MC307 and MC312) cargo tank trailers used in vacuum and transfer operations for handling and transporting flammable and combustible liquids and corrosive materials.

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Safe Operation of Vacuum Trucks in Petroleum Service

1 Scope

1.1 General

This fourth edition of Safe Operation of Vacuum Trucks in Petroleum Service provides information concerning the safe operation of vacuum trucks engaged in all aspects of handling flammable and combustible liquids, associated waste water, produced water, sour water, basic sediment and water (BS&W), caustics, spent acids, or other fluids stemming from petroleum operations, products, powders, and the hazard of dust explosions. This publication discusses the types of vacuum pumps and cargo tanks associated with vacuum truck operations, the common hazards associated with those vacuum truck operations, and representative safe work practices and precautions to help prevent accidents and injuries. Annex F provides brief descriptions of a variety of incidents involving vacuum trucks, including offloading into open areas. These may be useful in reviewing specific operating procedures or developing materials for safety meetings or pre-job briefings.

The scope of this Recommended Practice (RP) includes the use of vacuum/pressure trucks, skids, portable tanks, and trailers (herein referred to as vacuum trucks) to remove flammable and combustible liquids from tanks and equipment and to clean up liquid hydrocarbon spills. The scope includes movement of liquid mixtures (such as "produced water", BS&W, or tank bottoms) that may contain sufficient hydrocarbon material to present comparable hazards.

These safe practices also apply to the operation of portable vacuum tanks, skids, and trailers typically used in emergency flammable and combustible liquid spill cleanup activities. While not included in the specific scope of this standard, Annex E presents information related to pneumatic (air moving) trucks and hoppers, typically used in the petroleum industry for removal of dry materials such as catalysts, dusts, powders, or residue.

1.2 Applicability

Vacuum trucks are used in all segments of the petroleum industry with varied applications. Appropriate safe operating practices may vary because of different hazards associated with the materials to be moved and the facilities serviced. This RP seeks to assist in the development and implementation of practical and safe operating practices that will help identify hazards and reduce risks.

1.3 Basic Vacuum Operations

The two basic types of vacuum truck operations are as follows.

a) Vacuum loading and off-loading operations that eliminate or minimize the introduction of air into the system by:

   1) completely submerging the suction nozzle into the liquid during the transfer process, or

   2) directly connecting the transfer hose to the source or receiving tank, vessel, or container below the surface level of the liquid contained therein.

b) Vacuum truck operations that introduce air into the system during the transfer process, including:

   1) air conveying operations (Annex E) involving the incidental removal of solid materials when the suction hose is either partially submerged or not submerged (or, if submerged, when air is entrained or entrapped in the material) or the intentional removal of solids when used in a vacuum excavation system; or

   2) liquid transfer operations where the end of the hose is not directly connected to the source or receiving tank, container, or vessel or the nozzle is not submerged into the liquid within the tank, container, or vessel; or