

pressure indicator located where the cargo transfer is controlled.

Subpart 39.3000—Vapor Collection Operations During Cargo Transfer**§ 39.3001 Operational requirements for vapor control systems during cargo transfer—TB/ALL.**

(a) Vapor from a tank vessel may not be transferred to a facility in the United States, or vapor from a facility storage tank may not be transferred to a tank vessel, unless the facility's marine vapor control system (VCS) is certified by a certifying entity as meeting the requirements of 33 CFR part 154, subpart P and the facility's facility operations manual is marked by the local Coast Guard Captain of the Port (COTP) as required by 33 CFR 154.325(d).

(b) Vapor from a tank vessel may not be transferred to a vessel that does not have its certificate of inspection or certificate of compliance endorsed as meeting the requirements of this part and for controlling vapor of the cargo being transferred.

(c) For each cargo transferred using a vapor collection system, the pressure drop through the vapor collection system from the most remote cargo tank to the vessel vapor connection, including vapor hoses if used by the vessel, must be—

(1) Calculated at the maximum transfer rate and at lesser transfer rates;

(2) Calculated using a density estimate for the cargo vapor and air mixture, or vapor and inert gas mixture, based on a partial pressure (partial molar volumes) method for the mixture, assuming ideal gas law conditions;

(3) Calculated using a vapor growth rate as stated in 46 CFR 39.2011(d) for the cargo being transferred; and

(4) Included in the vessel's transfer procedures as a table or graph, showing the liquid transfer rate versus the pressure drop.

(d) The rate of cargo transfer must not exceed the maximum allowable transfer rate as determined by the lesser of the following:

(1) Eighty percent of the total venting capacity of the pressure relief

valves in the cargo tank venting system when relieving at the set pressure.

(2) The total vacuum relieving capacity of the vacuum relief valves in the cargo tank venting system when relieving at the set pressure.

(3) For a given pressure at the facility vapor connection, or if vessel-to-vessel transfer at the vapor connection of the service vessel, then the rate based on pressure drop calculations at which the pressure in any cargo tank connected to the vapor collection system exceeds 80 percent of the setting of any pressure relief valve in the cargo tank venting system.

(e) Cargo tanks must not be filled higher than—

(1) 98.5 percent of the cargo tank volume; or

(2) The level at which an overfill alarm complying with 46 CFR 39.2007 or 39.2009(a)(2) is set.

(f) A cargo tank should remain sealed from the atmosphere during cargo transfer operations. The cargo tank may only be opened temporarily for gauging or sampling while the tank vessel is connected to a VCS as long as the following conditions are met:

(1) The cargo tank is not being filled or no vapor is being transferred into the cargo tank;

(2) For cargo loading, any pressure in the cargo tank vapor space is first reduced to atmospheric pressure by the VCS, except when the tank is inerted;

(3) The cargo is not required to be closed or restricted gauged by 46 CFR part 151, Table 151.05 or part 153, Table 1; and

(4) For static accumulating cargo, all metallic equipment used in sampling or gauging must be electrically bonded to the vessel and remain bonded to the vessel until it is removed from the tank, and if the tank is not inerted, 30 minutes must have elapsed after any cargo transfer to the tank is stopped, before the equipment is put into the tank.

(g) For static accumulating cargo, the initial transfer rate must be controlled in accordance with OCIMF ISGOTT Section 11.1.7 (incorporated by reference, see 46 CFR 39.1005), in order to minimize the development of a static electrical charge.

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(h) If cargo vapor is collected by a facility that requires the vapor from the vessel to be inerted in accordance with 33 CFR 154.2105, the oxygen content in the vapor space of each cargo tank connected to the vapor collection system must not exceed 60 percent by volume of the cargo's minimum oxygen concentration for combustion (MOCC), or 8 percent by volume for vapor of crude oil, gasoline blends, or benzene, at the start of cargo transfer. The oxygen content of each tank, or each area of a tank formed by each partial bulkhead, must be measured at a point 1.0 meter (3.28 feet) below the tank top and at a point equal to one-half of the ullage.

(i) If the vessel is equipped with an inert gas system, the isolation valve required by 46 CFR 39.2001(e) must remain closed during vapor transfer.

(j) Unless equipped with an automatic self-test and circuit-monitoring feature, each high-level alarm and tank overfill alarm on a cargo tank being loaded, required by 46 CFR 39.2007 or 39.2009, must be tested at the tank for proper operation within 24 hours prior to the start of cargo transfer.

Subpart 39.4000—Vessel-to-Vessel Transfers Using Vapor Balancing**§39.4001 General requirements for vapor balancing—TB/ALL.**

(a) Vessels using vapor balancing while conducting a vessel-to-vessel transfer operation, directly or through a shore loop, must meet the requirements of this subpart in addition to the requirements of 46 CFR part 39, subparts 39.1000, 39.2000, and 39.3000. Arrangements other than vapor balancing used to control vapor emissions during a vessel-to-vessel transfer operation must receive approval from the Commandant.

(b) A vapor balancing operation must receive approval from the Commandant to use a compressor or blower to assist vapor transfer.

(c) Vapor balancing is prohibited when the cargo tanks on a vessel discharging cargo are inerted and the cargo tanks on a vessel receiving cargo are not inerted.

(d) A vessel that intends to collect vapors (during a vessel-to-vessel transfer operation) from cargoes not pre-

viously approved must receive specific approval from the Commandant before beginning transfer operations.

§39.4003 Design and equipment for vapor balancing—TB/ALL.

(a) During transfer operations, if the cargo tanks are inerted on a vessel discharging cargo to a receiving vessel with inerted cargo tanks, the service vessel must—

(1) Inert the vapor transfer hose prior to transferring cargo vapor; and

(2) Have an oxygen analyzer with a sensor or sampling connection fitted within 3 meters (9.74 feet) of the vessel vapor connection that—

(i) Activates a visible and an audible alarm on the service vessel where cargo transfer is controlled when the oxygen content in the vapor collection system exceeds 60 percent by volume of the cargo's minimum oxygen concentration for combustion (MOCC), or 8 percent by volume for vapor of crude oil, gasoline blends, or benzene;

(ii) Has an oxygen concentration indicator located on the service vessel where the cargo transfer is controlled; and

(iii) Has a connection for injecting a span gas of known concentration for calibration and testing of the oxygen analyzer.

(b) If the cargo tanks are not inerted on a vessel discharging cargo during transfer operations, and the cargo is flammable or combustible, the vapor collection line on the service vessel must be fitted with a detonation arrester that meets the requirements of 33 CFR 154.2106, and be located within 3 meters (9.74 feet) of the vessel vapor connection.

(c) An electrical insulating flange or one length of non-conductive hose must be provided between the vessel vapor connection on each vessel operating a vessel-to-vessel cargo transfer.

§39.4005 Operational requirements for vapor balancing—TB/ALL.

(a) During a vessel-to-vessel transfer operation, each cargo tank being loaded must be connected by the vapor collection system to a cargo tank that is being discharged.

(b) If the cargo tanks on both the vessel discharging cargo and the vessel