(d) When a vapor destruction unit shuts down or has a flame-out condition, the vapor destruction unit control system must—
(1) Activate and close the quick-closing stop valves required by paragraph (b)(2) of this section;
(2) Close the remotely operated cargo vapor shutoff valve required by 33 CFR 154.2101(a); and
(3) Automatically shut down any vapor-moving devices installed in the VCS.
(e) If a liquid seal is installed at the inlet to a vapor destruction unit, then—
(1) The liquid used in the liquid seal must be compatible with the vapors being controlled;
(2) For partially or totally soluble cargoes that can polymerize in solution, there must be an adequate amount of inhibitor in the liquid seal;
(3) The liquid seal must be compatible with the design of the VCS and must not contribute to the flammability of the vapor stream; and
(4) The liquid seal must have a low-level alarm and a low-low level shutdown.
§ 154.2110 Vapor balancing requirements.

Paragraphs (a)(2) and (4), (b), and (c) of this section apply only to facilities transferring vapors of flammable, combustible, or non-high flash point liquid cargoes.
(a) A vapor control system (VCS) that uses a vapor balancing system in which cargo vapor is transferred from a vessel cargo tank or facility storage tank through the facility vapor collection system to a facility storage tank or vessel cargo tank must—
(1) Have facility storage tank high-level alarm systems and facility storage tank overfill control systems, independent of the high-level alarm system, arranged to prevent the cargo from entering the vapor return line;
(2) Have a detonation arrester located within the storage tank containment area and a detonation arrester located as close as practicable to the facility vapor connection. The total pipe length between the detonation arrester and the facility vapor connection must not exceed 18 meters (59.1 feet) and the vapor piping between the detonation arrester and the facility vapor connection must be protected from any potential internal or external ignition source;
(3) Meet the overpressure and over-vacuum protection requirements of 33 CFR 154.2103; and
(4) As an alternative to paragraph (a)(2) of this section, inert cargo systems can meet the requirements of 33 CFR 2105(a)(1).
(b) A vapor balancing system, while in operation to transfer vapor to or from a vessel cargo tank and connected by way of the facility storage tank vent to a facility’s main VCS with a vapor destruction unit, must have—
(1) A means to prevent backflow of vapor from the facility’s main VCS to the marine vapor line; and
(2) Two fail-safe, quick-closing valves installed in the marine vapor line at the facility storage tank that automatically close when—
(i) Flame is detected on the facility storage tank; or
(ii) The temperature of the facility storage tank’s vapor space reaches 177 °C (350 °F) or 70 percent of the vapor’s auto-ignition temperature in degrees Celsius, whichever is lower.
(c) Transferring vapor from a non-inerted facility storage tank to a vessel cargo tank that is required to be inerted in accordance with 46 CFR 32.53, 153.500, or Table 151.05, is prohibited.
(d) A vapor balancing system that transfers vapor to a vessel cargo tank must not use a vapor-moving device to assist vapor transfer or inject inerting, enriching, or diluting gas into the vapor line without approval from the Commandant.
§ 154.2112 Vapors with potential to polymerize or freeze—Special requirements.

(a) A vapor control system (VCS) that controls vapors with the potential to polymerize at a normal ambient condition must—

(1) Be designed to prevent condensation of monomer vapor. Methods such as heat tracing and insulation are permitted if they do not result in an increased risk of polymerization;

(2) Be designed so that polymerization can be detected. Any points suspected of being sites for potential polymerization buildup must be equipped with inspection openings; and

(3) Include devices to measure the pressure drop across detonation arresters due to polymerization. The devices should activate an alarm on high pressure drop to warn of polymerization. Any device used for this purpose, including differential pressure monitors, must not have the capability of transmitting a detonation across the detonation arrester.

(b) A VCS that controls cargo vapors that potentially freeze at ambient temperature must have a design that prevents the freezing of vapors or condensate at ambient temperature or that detects and removes the liquid condensate and solids to prevent accumulation.

§ 154.2113 Alkylene oxides—Special requirements.

A vapor control system (VCS) that controls vapors of an alkylene oxide, except for carriage under 46 CFR part 151 (listed in Table 151.05 with “Pressure” entry in the “Cargo identification, Pressure, b” column), must comply with paragraphs (a) and (b) of this section.

(a)(1) The VCS’s equipment, hoses, piping, and all piping components, including valves, flanges, and fittings, must be of a type and constructed out of materials suitable for use with alkylene oxide;

(2) The VCS used for collecting an alkylene oxide vapor must not be used for collecting other vapors and must be separated from any other VCS, except as specified by paragraph (b) of this section;

(b) The VCS must be adequately cleaned in accordance with 33 CFR 154.2150(p) and either recertified by a certifying entity or approved by a marine chemist if—

(1) The VCS is used to control other vapors; or

(2) The VCS is returned to alkylene oxide service after being used to control other cargo vapors.

§ 154.2150 General requirements.

(a) No transfer operation using a vapor control system (VCS) may be conducted unless the facility operator has a copy of the facility operations