Coast Guard, DHS § 154.514

§ 154.500 Cargo and process piping standards.

The cargo liquid and vapor piping and process piping systems must meet the requirements in §§154.503 through 154.562, Subparts 56.01 through 56.35, §§56.50–20 and 56.50–105, and Subparts 56.60 through 56.97 of this chapter.

§ 154.503 Piping and piping system components: Protection from movement.

Where thermal movement and movements of the cargo tank and the hull structure may cause stresses that exceed the design stresses, the piping and piping system components and cargo tanks must be protected from movement by:

(a) Offsets;
(b) Loops;
(c) Bends;
(d) Mechanical expansion joints including:
   (1) Bellows;
   (2) Slip joints;
   (3) Ball joints; or
(e) Other means specially approved by the Commandant (CG–ENG).

§ 154.506 Mechanical expansion joint: Limits in a piping system.

Mechanical expansion joints in a piping system outside of a cargo tank:

(a) May be installed only if offsets, loops or bends cannot be installed due to limited space or piping arrangement;
(b) Must be a bellows type; and
(c) Must not have insulation or a cover unless necessary to prevent damage.

§ 154.512 Piping: Thermal isolation.

Low temperature piping must be thermally isolated from any adjacent hull structure to prevent the temperature of that structure from dropping below the minimum temperature for the hull material under §154.170.

§ 154.514 Piping: Electrical bonding.

(a) Cargo tanks or piping that are separated from the hull structure by
§ 154.516  Piping: Hull protection.

A vessel's hull must be protected from low temperature liquid leakage by a drip pan, or other means specially approved by the Commandant (CG–ENG), at:

(a) Each piping connection dismantled on a routine basis;
(b) Cargo discharge and loading manifolds; and
(c) Pump seals.


§ 154.517  Piping: Liquid pressure relief.

The cargo loading and discharge crossover headers, cargo hoses, and cargo loading arms must have means to relieve cargo pressure and to remove liquid cargo.

§ 154.519  Piping relief valves.

(a) The liquid relief valve that protects the cargo piping system must discharge into:
(1) A cargo tank; or
(2) A cargo vent mast if that vent mast has a means for the detection and removal of the liquid cargo that is specially approved by the Commandant (CG–ENG).

(b) A relief valve on a cargo pump that protects the cargo piping system must discharge into the pump suction.


§ 154.520  Piping calculations.

A piping system must be designed to meet the allowable stress values under §56.07–10 of this chapter and, if the design temperature is −110 °C (−166 °F) or lower, the stress analysis must be specially approved by the Commandant (CG–ENG) and must include:

(a) Pipe weight loads;
(b) Acceleration loads;
(c) Internal pressure loads;
(d) Thermal loads; and
(e) Loads from the hull.


§ 154.522  Materials for piping.

(a) The materials for piping systems must meet §154.625 for the minimum design temperature of the piping, except the material for open ended vent piping may be specially approved by the Commandant (CG–ENG) if:

(1) The temperature of the cargo at the pressure relief valve setting is −55 °C (−67 °F) or warmer; and
(2) Liquid can not discharge to the vent piping.

(b) Materials for piping outside the cargo tanks must have a melting point of at least 925 °C (1697 °F), except for short lengths of pipes with fire resisting insulation that are attached to the cargo tanks.

§ 154.524  Piping joints: Welded and screwed couplings.

Pipe lengths without flanges must be joined by one of the following:

(a) A butt welded joint with complete penetration at the weld root except that for design temperatures colder than −10 °C (14 °F) the butt weld must be double welded or must be welded using:

(1) A backing ring that for design pressures greater than 979 kPa gauge (142 psig) must be removed after the weld is completed;
(2) A consumable insert; or