

DESIGN OF COMPONENTS AND BUILDINGS

§§ 193.2121–193.2153 [Reserved]

IMPOUNDMENT DESIGN AND CAPACITY

§ 193.2155 **Structural requirements.**

(a) The structural members of an impoundment system must be designed and constructed to prevent impairment of the system's performance reliability and structural integrity as a result of the following:

- (1) The imposed loading from—
  - (i) Full hydrostatic head of impounded LNG;
  - (ii) Hydrodynamic action, including the effect of any material injected into the system for spill control;
  - (iii) The impingement of the trajectory of an LNG jet discharged at any predictable angle; and
  - (iv) Anticipated hydraulic forces from a credible opening in the component or item served, assuming that the discharge pressure equals design pressure.
- (2) The erosive action from a spill, including jetting of spilling LNG, and any other anticipated erosive action including surface water runoff, ice formation, dislodgement of ice formation, and snow removal.
- (3) The effect of the temperature, any thermal gradient, and any other anticipated degradation resulting from sudden or localized contact with LNG.
- (4) Exposure to fire from impounded LNG or from sources other than impounded LNG.
- (5) If applicable, the potential impact and loading on the dike due to—
  - (i) Collapse of the component or item served or adjacent components; and
  - (ii) If the LNG facility adjoins the right-of-way of any highway or railroad, collision by or explosion of a train, tank car, or tank truck that could reasonably be expected to cause the most severe loading.
- (b) An LNG storage tank must not be located within a horizontal distance of one mile (1.6 km) from the ends, or ¼ mile (0.4 km) from the nearest point of a runway, whichever is longer. The height of LNG structures in the vicinity of an airport must also comply with

Federal Aviation Administration requirements in 14 CFR Section 1.1.

[45 FR 9203, Feb. 11, 1980, as amended by Amdt. 193-17, 65 FR 10959, Mar. 1, 2000]

§§ 193.2157–193.2159 [Reserved]

§ 193.2161 **Dikes, general.**

An outer wall of a component served by an impounding system may not be used as a dike unless the outer wall is constructed of concrete.

[Amdt. 193-17, 65 FR 10959, Mar. 1, 2000]

§§ 193.2163–193.2165 [Reserved]

§ 193.2167 **Covered systems.**

A covered impounding system is prohibited except for concrete wall designed tanks where the concrete wall is an outer wall serving as a dike.

[Amdt. 193-17, 65 FR 10959, Mar. 1, 2000]

§§ 193.2169–193.2171 [Reserved]

§ 193.2173 **Water removal.**

(a) Impoundment areas must be constructed such that all areas drain completely to prevent water collection. Drainage pumps and piping must be provided to remove water from collecting in the impoundment area. Alternative means of draining may be acceptable subject to the Administrator's approval.

(b) The water removal system must have adequate capacity to remove water at a rate equal to 25% of the maximum predictable collection rate from a storm of 10-year frequency and 1-hour duration, and other natural causes. For rainfall amounts, operators must use the "Rainfall Frequency Atlas of the United States" published by the National Weather Service of the U.S. Department of Commerce.

(c) Sump pumps for water removal must—

- (1) Be operated as necessary to keep the impounding space as dry as practical; and
- (2) If sump pumps are designed for automatic operation, have redundant automatic shutdown controls to prevent operation when LNG is present.

[45 FR 9203, Feb. 11, 1980, as amended by Amdt. 193-17, 65 FR 10959, Mar. 1, 2000]