



Tentative Interim Amendment

NFPA 59A

Standard for the Production, Storage, and Handling of Liquefied Natural Gas (LNG)

2009 Edition

Reference: 5.3.3.4, A.5.3.3.4 (New), 5.3.3.6, and A.5.2.3.4 (New)

TIA 09-1

(SC 08-7-37/TIA Log #926)

Note: Text of the TIA issued and incorporated into the text of 5.3.3.4, A.5.3.3.4 (New), 5.3.3.6, and A.5.2.3.4 (New) and therefore no separate publication is necessary.

1. Revise 5.3.3.4 (5.2.3.3 in the 2006 edition) to read:

5.3.3.4* The distances to the radiant heat flux levels of Table 5.3.3.2 shall be calculated in accordance with ~~one of the following:~~ **[ROP-1]**

- ~~(1) The Gas Research Institute's GRI Report 0176, "LNGFIRE: A Thermal Radiation Model for LNG Fires," which is also available as the "LNGFIRE III" computer model produced by GRI. **[ROP-27]**~~
- ~~(2) Alternative models that take into account the same physical factors and have been validated by experimental test data as follows: **[ROP-27]**~~
 - (1) Takes into account the physical phenomena observed in, and has been validated with the data obtained from, available experimental data, including the largest experimental LNG fire published in the literature
 - (2) Has been published in an archival, peer reviewed scientific journal in the related scientific/engineering disciplines including fluid dynamics, heat transfer, combustion, or fire science
 - (3) Provides details of the physics, analysis and execution process
 - (4) Has been approved

2. Add a new A.5.3.3.4 to read:

A.5.3.3.4 Several models are available to determine the thermal radiation distance required by 5.3.3.4. These include:

- (1) The Gas Research Institute's GRI Report 0176, "LNGFIRE: A Thermal Radiation Model for LNG Fires," which is also available as the "LNGFIRE III" computer model produced by GRI, or alternative models that take into account the same physical factors and have been validated by experimental test data as listed in 5.3.3.4.
- (2) The "Large Size LNG Pool Fire Model" described in the US DOT report "Spectrum of Fires in an LNG Facility Assessments, Models and Consideration in Risk Evaluations," developed under the US DOT Contract DTRS56-04-T-0005, December 2006 and the related computer code "Pool Fire Model Including Smoke Effects ("PoFMISE").

These references are for informational purposes only. The information concerning these softwares have not been independently verified nor have these softwares been endorsed or certified by the NFPA or any of its Technical Committees.

3. Revise 5.3.3.6 (5.2.3.4 in the 2006 edition) to read:

5.3.3.6* The spacing of an impoundment to the property line that can be built upon shall be such that, in the event of an LNG spill as specified in 5.3.3.7, an average concentration of methane in air equal to the lower flammability limit (LFL) does not extend beyond the property line that can be built upon, in accordance with ~~calculations using one of the following:~~

(1) ~~The model described in GRI Report 0242, "LNG Vapor Dispersion Prediction with the DEGADIS Dense Gas Dispersion Model"~~

(2) A model that is acceptable for use by the Authority Having Jurisdiction that has been evaluated by an independent body using the Model Evaluation Protocol facilities published by the NFPA Research "Foundation report", Evaluating Vapor Dispersion Models for Safety Analysis of LNG," 2007. **[ROP-36]**

(A) The computed distances shall include calculations based on one of the following:

- (1) The combination of wind speed and atmospheric stability that can occur simultaneously and result in the longest predictable downwind dispersion distance that is exceeded less than 10 percent of the time
- (2) The Pasquill-Gifford atmospheric stability, Category F, with a 4.5 mph (2 m/sec) wind speed

3a. (A) through (D), Unchanged, to be renumbered as (B) through (E).

4. Add a new A.5.3.3.6 to read:

A.5.3.3.6 One model that has been used to calculate methane concentrations in air is described in GRI Report 0242, "LNG Vapor Dispersion Prediction with the DEGADIS Dense Gas Dispersion Model."