Design and Construction of LPG Installations

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Foreword

This standard provides minimum requirements for the design and construction of installations for the storage and handling of liquefied petroleum gas (LPG) at marine and pipeline terminals, natural gas processing plants, refineries, petrochemical plants, and tank farms. This standard takes into consideration the specialized training and experience of operating personnel in the type of installation discussed. In certain instances, exception to standard practices are noted and alternative methods are described.

This standard does not include information on the production or use of liquefied petroleum gas.

It is not intended that this standard be retroactive or that it take precedence over contractual agreements. Wherever practicable, existing codes and manuals have been used in the preparation of this standard.

This standard requires the purchaser to specify certain details and features. Although it is recognized that the purchaser may desire to modify, delete, or amplify sections of the standard, it is strongly recommended that such modifications, deletions, and amplifications be made by supplementing this standard rather than by rewriting or incorporating sections of this standard into another complete standard.

As used in this standard, “shall” denotes a minimum requirement to conform to the specification. “Should” denotes a recommendation or that which is advised but not required to conform to the specification. “Shall consider” directly before a design or construction factor (such as a force or safety) indicates that the factor’s effects and significance shall be evaluated using good engineering judgment-through an examination or test if appropriate-and the design may or may not be adjusted accordingly.

Suggested revisions are invited and should be submitted to API, Standards Department, 200 Massachusetts Avenue, NW, Suite 1100, Washington, DC 20001, standards@api.org.

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Design and Construction of LPG Installations

1 Scope

1.1 General

This standard covers the design, construction, and location of liquefied petroleum gas (LPG) installations at marine and pipeline terminals, natural gas processing plants, refineries, petrochemical plants, or tank farms. It also addresses the use of storage vessels, loading and unloading systems, piping, and related equipment.

1.2 Refrigerated Storage

Design and construction considerations specific to refrigerated storage are covered in Section 11 of this standard.

1.3 Pressurized Storage

Design and construction considerations specific to pressure vessel storage are covered in Section 4 of this standard.

1.4 Numerical Units Used

In this standard, numerical values are presented in the U.S. Customary (USC) units.

1.5 Excluded Items

1.5.1 This standard does not apply to the design, construction, or relocation of frozen earth pits, underground storage caverns or wells, and underground or mounded storage tanks.

1.5.2 This standard does not apply to the following installations.

a) Those covered by NFPA 58 and NFPA 59.

b) U.S. Department of Transportation (DoT) containers.

c) Gas utility company facilities; refinery process equipment; refinery and gas plant processing equipment; and transfer systems from process equipment before upstream LPG storage.

d) Those tanks with less than 2000 gallons of storage capacity.

1.6 Retroactivity

The provisions of this standard are intended for application to new installations. This standard can be used to review and evaluate existing storage facilities. However, the feasibility of applying this standard to facilities, equipment, structures, or installations that were already in place or that were in the process of construction or installation before the date of this publication, must be evaluated on a case-by-case basis considering individual circumstances and sites.

1.7 Characteristics of LPG

LPG is customarily handled in a liquid state achieved by its liquefaction under moderate pressure or refrigeration. Upon release of the pressure or warming of the refrigerated liquid, LPG is readily converted into the gaseous phase at normal ambient temperature.