CGA

Compressed Gas Association

The Standard For Safety Since 1913

CGA P-31—2012

LIQUID OXYGEN, NITROGEN, AND ARGON CRYOGENIC TANKER LOADING SYSTEMS

THIRD EDITION

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Work Item 09-020
Atmospheric Gases and Equipment Committee

NOTE—Technical changes from the previous edition are underlined.

THIRD EDITION: 2012
SECOND EDITION: 2005
FIRST EDITION: 2000

Contents **Page**

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1 Introduction

This publication is compiled by the Compressed Gas Association, Inc. (CGA) in response to the demand for information relating to the loading of cryogenic liquid oxygen (LOX), nitrogen (LIN), and argon (LAR).

2 Scope and purpose

2.1 Scope

This publication describes requirements for installations designed and constructed after the publication date of this document used for the loading of oxygen, nitrogen, or argon as cryogenic liquids. This publication may be used for existing cryogenic LOX, LIN, and LAR loading systems. Application of this publication to existing installations is an individual company or storage system owner's decision.

This publication covers cryogenic LOX, LIN, and LAR tanker loading systems for loading by gravity, pressure, or pump filling. It covers the design of the tanker loading systems and the period of time and activities between when a tanker enters the filling area and when it departs from the filling area.

This publication focuses on the factors affecting the transfer of oxygen, nitrogen, and argon as cryogenic liquids between a source and appropriately designed tankers used for the transportation of these products. The source can be either a storage tank or directly from the plant.

For the appropriate design of tankers, refer to CGA-341, *Specification for Insulated Cargo Tank for Nonflammable Cryogenic Liquids*; *ASME Boiler & Pressure Vessel Code*, Section XII "Rules for the Construction & Continued Service of Transport Tanks"; ISO 20421-1, *Cryogenic vessels—Large transportable vacuum-insulated vessels—Part 1: Design, fabrication, inspection and testing*; Title 49 of the U.S. *Code of Federal Regulations* (49 CFR) Part 178.338; CSA B620, *Highway Tanks and TC Portable Tanks for the Transportation of Dangerous Goods*; and CSA B622, *Selection and Use of Highway Tanks, TC Portable Tanks, and Ton Containers for the Transportation of Dangerous Goods, Class 2* [1, 2, 3, 4, 5, 6].[1]

It does not cover cryogenic rail cars nor does it cover tankers unloading at a customer station or other user location.

2.2 Purpose

The purpose of this publication is to provide information regarding safety in the design, installation, operation, and maintenance of cryogenic LOX, LIN, and LAR tanker loading systems. The intent of this publication is to ensure that a uniform level of safety is provided throughout the industrial gas industry for the protection of the public and industry employees. The information presented does not replace but is intended to complement national, state, provincial/territorial, local, and insurance company safety requirements.

Through implementation of procedures, instrumentation, equipment inspection, testing, and system design criteria, this publication presents recommendations to reduce the potential for large releases of stored materials from storage systems or tankers. It emphasizes prevention of releases rather than mitigation of consequences following a release.

This publication is intended to facilitate proper decisions in the design, implementation, and modification of materials and equipment for the efficient handling of cryogenic LOX, LIN, and LAR in filling cryogenic tankers.

This publication is written for designers, owners, and operators of cryogenic liquid tanker loading systems.

[1] References are shown by bracketed numbers and are listed in order of appearance in the reference section.