CGA P-8.4-2013

SAFE OPERATION OF REBOILERS/CONDENSERS IN AIR SEPARATION UNITS

THIRD EDITION



PREFACE

Recognizing the need for a standard on reboilers/condensers in air separation units, the European Industrial Gases Association (EIGA), with the participation of the Compressed Gas Association (CGA), has produced CGA P-8.4—2013, *Safe Operation of Reboilers/Condensers in Air Separation Units*. This standard is intended as a joint EIGA/CGA international harmonized standard for the use and application of all members of EIGA and CGA worldwide.

Other than the removal of the working group members and their respective companies, this is an exact duplication of EIGA Doc 65, *Safe Operation of Reboilers/Condensers in Air Separation Units*.

PLEASE NOTE:

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This document is subject to periodic review, and users are cautioned to obtain the latest edition. The Association invites comments and suggestions for consideration. In connection with such review, any such comments or suggestions will be fully reviewed by the Association after giving the party, upon request, a reasonable opportunity to be heard. Proposed changes may be submitted via the Internet at our web site, www.cganet.com.

This document should not be confused with federal, state, provincial, or municipal specifications or regulations; insurance requirements; or national safety codes. While the Association recommends reference to or use of this document by government agencies and others, this document is purely voluntary and not binding unless adopted by reference in regulations.

A listing of all publications, audiovisual programs, safety and technical bulletins, and safety posters is available via the Internet at our website at <u>www.cganet.com</u>. For more information contact CGA at Phone: 703-788-2700, ext. 799. E-mail: <u>customerservice@cganet.com</u>.

Work Item 10-011 Atmospheric Gases and Equipment Committee

NOTE—Technical changes from the previous edition are underlined.

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1 Introduction

This publication has been prepared by member associations of the International Harmonization Council, under the lead of EIGA and is intended for the worldwide use and application by all members of the International Harmonization Council. The International Harmonization Council is composed of members from the Asia Industrial Gases Association (AIGA), Compressed Gas Association (CGA), European Industrial Gases Association (EIGA), and the Japan Industrial and Medical Gases Association (JIMGA). Regional editions may use non SI units and refer to national, and/or regional legislation.

Industrial cryogenic air separation technology used to produce oxygen, nitrogen, argon, and rare gases has an extremely good safety record. However, as with many present-day production processes, it has inherent potential hazards that shall be recognized and addressed by design and operating practice.

2 Scope and purpose

2.1 Scope

This publication addresses the operation of the reboilers of air separation plants. It contains a summary of current knowledge and industrial practices used in their safe application. It specifically applies to the main reboiler and oxygen product reboilers in which the oxygen concentration is above 75% in the liquid phase. Its guiding principles may be used for other reboilers within air separation plants, including auxiliary vaporizers, guard adsorber vaporizers, argon condensers, and the main reboilers in nitrogen generators.

Reboilers feeding krypton/xenon columns and the krypton/xenon distillation system are excluded from the scope of this publication. These systems and their methods of dealing with hydrocarbon accumulation vary widely. Reboiler operation and safety for plants with these units should be discussed with the supplier on a plant-specific basis.

2.2 Purpose

The purpose of this publication is to describe the design and operating practices that <u>shall</u> be followed in the reboiler sections of cryogenic air separation plants. In particular, the potential hazard introduced by hydrocarbons or other contaminants that might be present in the ambient atmosphere is addressed. The thought is that this has been the prime cause of the majority of reported reboiler incidents.

This publication is based upon the experimental data, operating experience, and design practices of major producers and operators of air separation plants. It is recognized that legislation or regulation can impose more stringent requirements for plant design and operation.

3 Definitions

For the purpose of this publication, the following definitions apply.

3.1 <u>Terminology</u>

Shall is used only when procedure is mandatory. Used wherever criterion for conformance to specific recommendation allows no deviation. Shall can be used in text of voluntary compliance standards.

Should is used only when a procedure is recommended.

May and Need Not are used only when procedure is optional.

Will is used only to indicate the future, not a degree of requirement.

Can is used to indicate a possibility or ability.