## Foreword

This recommended practice is a modification of IEC 79-10, *Electrical Apparatus for Explosive Gas Atmospheres*, Part 10: Classification of Hazardous Areas, normalized as an American National Standard, with additional material added as appendices specifically for the classification of locations for electrical installations classified as Class I, Zone 0, Zone 1, or Zone 2 Classification of hazardous areas. U.S. National Deviations are shown by ~~strikeout~~ through text deleted and underline under text added. There are five annexes in this recommended practice. All annexes are Informative and are not considered part of this recommended practice.

# 1 General

### 1.1 Scope

~~This part of~~ ~~IEC 79~~ ISA-TR12.24.01 is concerned with the classification of hazardous areas where flammable gas or vapor risks may arise, in order to permit the proper selection and installation of apparatus for use in such hazardous areas (see Notes 1 and 4).

It is intended to be applied where there may be a risk of ignition due to the presence of flammable gas or vapor, mixed with air under normal atmospheric conditions (see Note 2), but it does not apply to:

a) mines susceptible to firedamp;

b) the processing and manufacture of explosives;

c) areas where a risk may arise due to the presence of ignitable dusts or fibers;

d) catastrophic failures which are beyond the concept of abnormality dealt with in this ~~standard~~ recommended practice (see Note 3);

e) rooms used for medical purposes;

f) areas where the presence of flammable mist may give rise to an unpredictable risk and which require special consideration (see Note 5).

This ~~standard~~ recommended practice does not take into account the effects of consequential damage.

Definitions and explanations of terms are given together with the main principles and procedures relating to hazardous area classification.

For detailed recommendations regarding the extent of the hazardous areas in specific industries or applications, reference may be made to the codes, standards, or recommended practices relating to those industries or applications.

**NOTE 1 —** For the purpose of this ~~standard~~ recommended practice, an area is a three-dimensional region or space.

**NOTE 2 —** Atmospheric conditions include variations above and below reference levels of 101.3 kPa (1.013 mbar) and 20 °C (293 K), provided that the variations have a negligible effect on the explosion properties of the flammable materials.

**NOTE 3 —** Catastrophic failure in this context is applied, for example, to the rupture of a process vessel or pipeline, and such other events that are not predictable.

**NOTE 4 —** In any ~~process plant~~ facility , irrespective of size, there may be numerous sources of ignition apart from those associated with electrical apparatus. Appropriate precautions will be necessary to ensure safety in this context. This ~~standard~~ recommended practice may be used with judgment for other ignition sources.

**NOTE 5 —** Mists may form or be present at the same time as flammable vapors. This may affect the way flammable material disperses and the extent of any hazardous areas. The strict application of area classification for gases and vapors may not be appropriate because the flammability characteristics of mists are not always predictable. Whilst it can be difficult to decide upon the type and extent of zones, the criteria applicable to gases and vapors will, in most cases, give a safe result. However, special consideration should always be given to the danger of ignition of flammable mists.

## 1.2 ~~Normative~~ References

The following ~~normative~~ documents contain provisions which, through reference in this text, constitute provisions of this ~~part of IEC 79~~ recommended practice. At the time of publication, the editions indicated were valid. All ~~normative~~ documents are subject to revision, and parties to agreements based on this ~~part of IEC 79~~ recommended practice are encouraged to investigate the possibility of applying the most recent editions of the ~~normative~~ documents indicated below. Members of IEC and ISO maintain registers of currently valid International Standards. ANSI maintains registers of currently valid American National Standards.

ANSI/ISA-S12.13, *Part I, Performance Requirements, Combustible Gas Detectors*

ANSI/ISA- RP12.13, *Part II, Installation Operation and Maintenance of Combustible Gas Detection Instruments*

IEC 50(426): ~~1990,~~ *International Electrotechnical Vocabulary (IEV) - Chapter 426.- Electrical apparatus for explosive atmospheres*

IEC 79-1A: *Construction and Verification Tests of Flameproof Enclosures of Electrical Apparatus*

IEC 79-3: *Spark-Test Apparatus For Intrinsically Safe Circuits*

IEC 79-4: ~~1975,~~ *Electrical apparatus for explosive gas atmospheres - Part 4: Method of test for ignition temperature*

IEC 79-4A: ~~1970,~~ *First supplement to IEC 79-4 ~~(1966)~~*

IEC 79-12: *Classification of Mixtures of Gases or Vapours With Air According To Their Maximum Experimental Safe Gaps and Minimum Igniting Currents*

ANSI/API RP 14F: *Recommended Practice for Design and Installation of Electrical Systems for Offshore Production Platforms*

API RP 505: *Recommended Practice for Classification of Locations for Electrical Installations at Petroleum Facilities Classified as Class I, Zone 0, Zone 1, or Zone 2*

ASTM E-659: *Test for Autoignition Temperature of Liquid Chemicals*

IP 15, Institute of Petroleum: *Area Classification Code for Petroleum Installations – Part 15*

NFPA 30: *Flammable and Combustible Liquids Code*

NFPA 70: *National Electrical Code®*

NFPA 325M: *Guide to Fire Hazard Properties of Flammable Liquids, Gases, and Volatile Solids*

NFPA 497: *Classification of Flammable Liquids, Gases, or Vapors and of Hazardous (Classified) Locations For Electrical Installations In Chemical Process Areas*