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Chapter A III C
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Technical regulation on
occupational health in ships

CHAPTER III

Physical occupational health effects

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CHAPTER III

Physical occupational health effects

Part C Work in an atmosphere presenting an explosion hazard

Regulation 1 Application

- 1 The provisions of this part stipulate the minimum requirements for the health and safety of employees who may be exposed to a hazard from an explosive atmosphere as defined in regulation 2.
- 2 These provisions shall not apply to:
 - .1 Areas used directly in connection with and during medical treatment of patients;
 - .2 the use of gas apparatuses in accordance with the technical regulation on liquefied petroleum gas (LPG) installations and spirit or kerosene cookers on board ships;
 - .3 the manufacture, handling, use, storage and transport of explosives or chemically unstable substances;
 - .4 extractive industries covered by Directives 92/91/EEC or 92/104/EEC; and
 - .5 the use of means of transport by water to which the pertinent provisions of international conventions and agreements apply.

Means of transport intended for use in a potentially explosive atmosphere shall not be excluded.
- 3 The technical regulation contains provisions drafted on the basis of Directive 1999/92/EC of the European Parliament and of the Council of 16 December 1999 on minimum requirements for improving the safety and health protection of workers potentially at risk from explosive atmospheres (15th individual Directive within the meaning of Article 16(1) of Directive 89/391/EEC).

Regulation 2 Definitions

“Explosive atmosphere” shall mean a mixture, under atmospheric conditions, of air and flammable substances in the form of gases, vapours, mists or dusts in which, after ignition has occurred, combustion spreads to the entire flammable mixture.

Regulation 3 Assessment of explosion risks

- 1 An employer who has work carried out that is covered by these provisions shall ensure that a written workplace assessment is drawn up of the conditions of health and safety at the workplace, cf. regulations 4 and 6 of chapter I, part A on the performance of work. Places that are or can be connected via openings to other places in which explosive atmospheres may occur shall also be included in the assessment.
- 2 The workplace assessment shall contain a mapping and assessment of the risks arising from explosive atmospheres, taking special account of the following:

- .1 the likelihood that explosive atmospheres will occur and their persistence;
 - .2 the likelihood that ignition sources, including electrostatic discharges, will be present and become active and be a potential source of ignition;
 - .3 the installations, the substances used, the processes and their possible interactions;
 - .4 the scale of the anticipated consequences.
- 3 Furthermore, the assessment shall show what measures have been taken or must be observed to prevent special risks. In addition, the assessment shall contain an indication of the areas that have been classified into zones, cf. annex I.
- 4 At the workplace, the assessment shall be available to everybody employed there.
- 5 The assessment shall be updated when changes are made to the work, working methods and processes, etc. of importance to the occupational health in the workplace and after serious accidents at the workplace, but every third years, at the latest.

Regulation 4 Prevention of and protection against explosions

- 1 During the performance of the work, it shall be ensured that technical or administrative measures or a combination of both are taken to the extent necessary for the nature of the work in question, in order of priority and on the basis of the following general principles:
- .1 the prevention of the formation of explosive atmospheres, or where the nature of the activity does not allow that;
 - .2 the avoidance of the ignition of explosive atmospheres; and
 - .3 the mitigation of the detrimental effects of an explosion so as to ensure the health and safety of workers.
- 2 The measures cf. subparagraph 1 shall be combined and, if necessary, be supplemented with measures against the propagation of explosions.
- 3 The measures shall be reviewed regularly and, in any event, whenever significant changes occur.

Regulation 5 General obligations

Working environments where explosive atmospheres may arise in such quantities as to endanger the safety and health of workers or others

- .1 shall be arranged so that the work can be performed without a risk;
- .2 shall be provided with suitable surveillance during the use of technical aids.

Regulation 6 Duty of coordination

- 1 If workers from one or more foreign undertakings carry out work on board the ship, it shall be laid down in addition to the assessment in regulation 3 how the cooperation on health and safety shall be organised. This includes ensuring that the safety measures are coordinated and, if necessary, the laying down of joint work regulations and measures. Furthermore, the

emergency, evacuation and drill plans under regulation 5 of chapter I, part A, on the performance of work shall be coordinated to the extent necessary.

- 2 In addition to the assessment, such information about the arrangement and operation of the workplace shall be provided that the foreign employers are able to arrange and carry out the work while observing their duties in accordance with these provisions and general labour legislation.

Regulation 7 Places where explosive atmospheres may occur

- 1 The employer shall classify places where explosive atmospheres may occur into zones in accordance with annex I.
- 2 The employer shall ensure that the minimum requirements laid down in annex 2 are applied to the places covered by subparagraph 1.
- 3 Where necessary, places where explosive atmospheres may occur in such quantities as to endanger the health and safety of workers shall be marked with signs at their points of entry in accordance with chapter VIII on safety signs, etc.

Regulation 8 Special requirements on technical aids and workplaces

- 1 Technical aids for use in places where explosive atmospheres may occur
 - .1 which are already in use or are made available for the first time in the undertaking or establishment before 30 June 2003 shall comply from that date with the minimum requirements laid down in annex 1, part A;
 - .2 which are made available for the first time in the undertaking or establishment after 30 June 2003 shall comply with the minimum requirements laid down in annex II.
- 2 Workplaces which contain places where explosive atmospheres may occur
 - .1 which are used for the first time after 30 June 2003 shall comply with the minimum requirements laid down in these provisions;
 - .2 which are already in use before 30 June 2003 shall comply with the minimum requirements laid down in these provisions no later than three years after that date.
- 3 If, after 30 June 2003, any modification, extension or restructuring is undertaken in workplaces containing places where explosive atmospheres may occur, the employer shall take the necessary steps to ensure that the modification, extension or restructuring complies with the minimum requirements laid down in these provisions.

A N N E X 1

Classification of places where explosive atmospheres may occur

- 1 The classification system shall apply to places where special safety measures shall be taken in accordance with regulations 3 and 4.
- 2 Places that represent an explosion hazard shall be classified into zones on the basis of the frequency, duration and occurrence of an explosive atmosphere. This classification is decisive for the extent of the measures to be taken in accordance with annex 2, part A.
- 3 The classification shall be made as follows:
 - Zone O** – A place in which an explosive atmosphere consisting of a mixture with air of flammable substances in the form of gas, vapours or mist is present continuously, for long periods or frequently.
 - Zone 1** – A place in which an explosive atmosphere consisting of a mixture with air of flammable substances in the form of gas, vapour or mist is likely to occur in normal operation occasionally.
 - Zone 2** – A place in which an explosive atmosphere consisting of a mixture with air of flammable substances in the form of gas, vapour or mist is not likely to occur in normal operation but, if it does occur, will persist for a short period only.
 - Zone 20** – A place in which an explosive atmosphere in the form of a cloud of combustible dust in air is present continuously, for long periods or frequently.
 - Zone 21** – A place in which an explosive atmosphere in the form of a cloud of combustible dust in air is likely to occur in normal operation occasionally.
 - Zone 22** – A place in which an explosive atmosphere in the form of a cloud of combustible dust in air is not likely to occur in normal operation but, if it does occur, will persist for a short period only.

Remarks:

- 1 Layers, deposits and heaps of combustible dust shall be considered as any other source which can form an explosive atmosphere.
- 2 Normal operations means the situation when an installation is used within its designed area of application.

ANNEX 2

Workplaces and technical aids

The requirements of this annex shall apply to:

- 1 places classified as hazardous in accordance with annex 1 whenever required by the features of workplaces, workstations, the equipment used, and
- 2 technical aids in places not representing an explosion hazard but necessary for or contributing to the safe operation of technical aids in places representing an explosion hazard.

A Minimum requirements for the improvement of the health and safety of workers who may be exposed to hazards from explosive atmospheres

1 Administrative measures

- .1 The employer shall ensure that the employees working in places where explosive atmospheres may occur are provided with sufficient and appropriate training with regard to explosion protection.
- .2 If required by the workplace assessment, cf. regulation 3:
 - .1 work in places presenting an explosion hazard shall be carried out in accordance with written instructions issued by the employer;
 - .2 a system of permits to work shall be applied for carrying out both hazardous activities and activities which may interact with other work to cause hazards. Permits to work shall be issued by a person with separate responsibility for this function prior to the commencement of work.

2 Explosion protection measures

- .1 Any escape and/or release, whether or not intentional, of flammable gases, vapours, mists or combustible dusts which may give rise to explosions shall be suitably diverted or removed to a safe place or, if that is not practicable, safely contained or rendered safe by some other suitable method.
- .2 If an explosive atmosphere contains several types of flammable and/or combustible gases, vapours, mists or dusts, the protective measures shall be appropriate to the greatest potential risk.
- .3 Prevention of ignition hazards in accordance with regulation 4 shall also take account of any ignition caused by electrostatic discharges where workers or the working environment act as charge carrier or charge producer. The workers shall be provided with appropriate personal protective equipment that shall consist of materials which cannot give rise to electrostatic discharges that can ignite explosive atmospheres.
- .4 Plant, equipment, protective systems and any associated connecting devices may only be brought into service if the workplace assessment, cf. regulation 3, indicates that they can be safely used in an explosive atmosphere. This applies also to technical aids and associated connecting devices which are not regarded as equipment or protective systems

within the meaning of the above if their incorporation into an installation can in itself give rise to an ignition hazard. Necessary measures shall be taken to prevent confusion between connecting devices.

- .5 All necessary measures should be taken to ensure that the workplace, work equipment and any associated connecting device made available to workers have been designed, constructed, assembled and installed and are maintained and operated, in such a way as to minimise the risks of explosion and, if an explosion does occur, to control or minimise its propagation within that workplace and/or work equipment. For such workplaces appropriate measures shall be taken to minimise the risk of injuries caused by the physical effects of an explosion.
- .6 Where necessary, workers shall be given optical and/or acoustic warnings and leave the workplace before the explosion conditions have been reached.
- .7 Where required by the explosion protection document, escape facilities shall be provided and maintained to ensure that, in the event of danger, workers can leave endangered places promptly and safely.
- .8 Before workplaces containing places where explosive atmospheres may occur are used for the first time, their overall explosion safety shall be verified. Any conditions necessary for ensuring explosion protection shall be maintained. Such verification shall be carried out by persons competent in the field of explosion protection as a result of their experience and/or professional training.
- .9 Where the workplace assessment shows it is necessary:
 - .1 it shall be possible, where power failure can give rise to new hazards, to maintain equipment and protective systems in a safe state of operation independently of the rest of the installation in the event of power failure;
 - .2 manual override shall be possible in order to shut down the equipment and protective systems if deviations from the normal operating conditions occur, provided that this does not compromise safety. Only workers competent to do so may take such action;
 - .3 on operation of the emergency shutdown, accumulated energy shall be dissipated as quickly and as safely as possible or isolated so that it no longer constitutes a hazard.

B Criteria for the selection of technical aids and protective systems

Technical aids and protective systems in all areas where an explosive atmosphere may occur shall comply with the relevant IEC standards based on an assessment of the conditions.

By analogy, CE-marked technical aids may be used in accordance with the following, provided they are suitable for gases, vapours or mists and/or dusts as appropriate.

- 1 In zone 0 or zone 20, category 1 equipment;
- 2 In zone 1 or zone 21, category 1 or 2 equipment;
- 3 In zone 2 or zone 22, category 1, 2 or 3 equipment.