TECHNICAL REPORT

ISO/TR 7240-14

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Fire detection and alarm systems —

Part 14:

Guidelines for drafting codes of practice for design, installation and use of fire detection and fire alarm systems in and around buildings

Systèmes de détection d'incendie et d'alarme —

Partie 14: Lignes directrices pour la rédaction des codes de pratique pour la conception, l'installation et l'utilisation des systèmes de détection d'incendie et d'alarme à l'intérieur et autour des bâtiments

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

In exceptional circumstances, when a technical committee has collected data of a different kind from that which is normally published as an International Standard ("state of the art", for example), it may decide by a simple majority vote of its participating members to publish a Technical Report. A Technical Report is entirely informative in nature and does not have to be reviewed until the data it provides are considered to be no longer valid or useful.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO/TR 7240-14 was prepared by Technical Committee ISO/TC 21, *Equipment for fire protection and fire fighting*, Subcommittee SC 3, *Fire detection and alarm systems*.

ISO/TR 7240 consists of the following parts, under the general title *Fire detection and alarm systems*:

⎯ *Part 1: General and definitions*

⎯ *Part 2: Control and indicating equipment*

⎯ *Part 4: Power supply equipment*

⎯ *Part 5: Point-type heat detectors*

⎯ *Part 6: Point-type fire detectors for detection of carbon monoxide*

⎯ *Part 7: Point-type smoke detectors using scattered light, transmitted light or ionization*

⎯ *Part 11: Manual call points*

⎯ *Part 14: Guidelines for drafting codes of practice for design, installation and use of fire detection and fire alarm systems in and around buildings* [Technical Report]

⎯ *Part 15: Point-type multisensor (light and heat) fire detectors*

Compatibility assessment of system components and carbon monoxide point-type fire detectors using electrochemical cells are to form the subjects of future Parts 13 and 16.

Introduction

The installation of a fire detection and fire alarm system can only be successfully accomplished if the following conditions are fulfilled:

— materials are of a suitable quality;

— special knowledge in the field of fire detection;

— skilled personnel to carry out the work.

Although the quality of the material can be ensured by proper standards and quality audits, the overall effectiveness of an installation depends widely on the quality of work and the experience of the designer and installer.

The general purpose of a code of practice is to give recommendations that are the result of knowledge and experience in order to share the learning with other stakeholders.

From the objectives of a code of practice, it follows that it must be continuously adapted to incorporate new experiences, otherwise a code could block the progress or the introduction of new technologies.

In the past, most industrialized countries have developed codes of practice. However, they differ from each other because they reflect the experience made in the respective country. Due to these differences, it is not possible to write an international code of practice. Therefore, ISO/TC21/SC3 proposes to use these guidelines with the following objectives:

— development of national codes of practice in countries which do not yet have such a code;

— redraft existing codes using the proposed format in order for them to be more consistent.

The table of contents is structured in such a way that the different phases during the life of the fire detection and fire alarm system are dealt with in separate clauses starting with the planning phase. The importance of clear assignments of responsibilities and of documentation is emphasized by dedicated clauses.

It is not the intent of this document to restrict the content of any national code to those clauses given. However, since one of the intentions of this document is to allow easier comparison between codes from different countries, the clause numbering should generally be followed. Where a country has no requirements under the heading given in the document, then it is recommended that the clause be inserted with the comment "No requirements".

The object should be defined for each clause to avoid misinterpretations.

Fire detection and alarm systems —

Part 14:
Guidelines for drafting codes of practice for design, installation and use of fire detection and fire alarm systems in and around buildings

1   Scope

This Technical Report is intended to be used as a general guideline for the preparation of a code of practice for the design, installation and use of a fire detection and fire alarm system.

It describes the format, the table of contents and the objectives of the different clauses of the code of practice.

2   Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 7240-1, *Fire detection and alarm systems — Part 1: General and definitions*

3   Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 7240-1 and the following apply.

3.1
certification
written confirmation that a certain work or service has been carried out; the result of certification is a signed document (certificate) which may be counter-signed and can be used as testimony

3.2
configuration
arrangement of components of a fire detection and fire alarm system specified by number, type and topology, together with any necessary limits on the connecting links

3.3
detection concept
description of the design of the fire detection and fire alarm system with a justification of the choice of detectors, its sensitivity and its spacing; description of the alarm organization, i.e. all measures to be taken in case of an alarm

3.4
documentation
drawings and instructions necessary to understand and to operate the fire detection and fire alarm system

3.5
log
record of essential events relating to the fire detection and fire alarm system

3.6
planning
paper work, studies and analysis concerning the design of a fire detection and fire alarm system before starting wiring and hardware installation as e.g.:

— design considerations;

— detection concept;

— drawings;

— quotations

3.7
project plan
layout of the whole wiring plan including the indication of the location of all components of the fire detection and fire alarm system

3.8
service
inspection, testing, maintenance and repair

4   Content of code of practice

The code of practice should contain the following clause headings in accordance with Table 1.

Table 1 — Content of code of practice

Number	Clause	Subclause	sub subclause	Explanation or recommended text
1	Scope			This standard provides recommendations for the planning, design, installation, commissioning and servicing of manual and automatic fire detection and fire alarm systems in and around buildings. It also covers systems capable of providing signals to initiate the operation of ancillary technical services, such as fixed fire extinguishing systems and other precautions and actions.
2	Terms and definitions			Definitions for all technical terms that are used in this standard so far as they are needed for a clear understanding. Definitions of terms that are already defined in other standards for components of fire detection systems shall be used.
3	Normative references			An overview of all standards and relevant documents that have to be considered.
4	Design requirements			Allows for the introduction of national requirements for the general design of systems. Examples of subjects which could be covered are: — restrictions on the number of detectors to be connected to one circuit; — requirements for provisions for testing; — special requirements for circuits having both detectors and alarm devices; — special requirements for the combination of initiating and indicating circuits; — use of special installation material, e.g. shielded cable, conduits.
5	Planning			
5.1	Planning	Responsibilities		A written assignment of responsibilities for the whole phase of planning a fire detection and fire alarm system is recommended. A document shall be signed by a responsible person describing the field of responsibility in such detail that undefined areas and overlapping with other responsibilities are avoided.
5.2	Planning	Qualifications		Recommendations are given concerning the professional qualification of personnel responsible for the planning of a fire detection and fire alarm system, for example: — engineer with proven experience in the field of fire detection technology; — experienced consulting company; — experienced installer.

Table 1 (*continued*)

Number	Clause	Subclause	sub subclause	Explanation or recommended text
5.3	Planning	Documentation		Items of information necessary for the planning of a fire detection and fire alarm system are recommended, for example: — plans of the building; — description of the fire risk; — description of the environmental conditions such as: — temperature, — humidity, — corrosive atmosphere, — electromagnetic influences; — description of the infrastructure of the environment (e.g. traffic, communication, electricity, fire brigade, water supply)
5.4	Planning	System design		Recommendations of clearly describing the detection concept and the actions to be taken in the event of an alarm of fire. This document is the result of the whole planning phase and the basis for the selection of the components of the fire detection and fire alarm system.
5.5	Planning	System design	Detector selection	Recommendations concerning the proper choice of the detector principle. If available a detector classification or a suitable table should be requested. Depending on the fire risk, the environmental conditions inside the building and whether the detectors are primarily intended to protect property or life preference to a certain detector type may be given, for example: — automatic detectors: — smoke detectors; — heat detectors; — flame detectors; — special detectors; — manual call points.
5.6	Planning	System design	Detector sensitivity and response	Recommendations concerning the choice or adjustment of detector sensitivity and/or delayed response time in order to avoid unwanted alarms.
5.7	Planning	System design	Detector spacing	Recommendations concerning the spacing of the detectors depending on room geometry and risk, for example: — ceiling height; — ceiling structure; — furniture; — occupancy; — application (e.g. computer room).
5.8	Planning	System design	Detection zones	Recommendations concerning the size and location of detection zones for which a separate indication is foreseen at the control and indicating equipment.

Table 1 (*continued*)

Number	Clause	Subclause	sub subclause	Explanation or recommended text
5.9	Planning	System design	Alarm devices	Recommendations concerning the use of alarm devices, i.e. its distribution throughout the building.
5.10	Planning	System design	Fire fighting measures	Recommendations concerning fire extinguishing measures controlled and/or supervised by the fire detection and fire alarm system depending on the fire risk, for example: — gaseous suppression; — sprinkler systems. Reference should be made to other standards or codes.
5.11	Planning	System design	Smoke control	Recommendations concerning smoke control measures, for example: — shutters; — fire doors; — escape routes; — fan shut down. Reference documents should be mentioned.
5.12	Planning	System design	Ancillary devices	Recommendations concerning other ancillary technical services which could be needed to fulfil special tasks of a fire detection and fire alarm system, for example: — elevator call; — evacuation plan.
5.13	Planning	System design	Fire service	Recommendations concerning the transmission of alarm signals to fire fighting services.
5.14	Planning	System design	Documentation	Recommendations concerning the documentation which has to be produced during the planning phase, for example: — configuration; — wiring plans; — position of the detectors and other components of the fire detection and fire alarm system; — instruction manual of the control and indicating equipment. This documentation has to be handed over to the owner of the fire detection and fire alarm system after commissioning.
6	Equipment and material			
6.1	Equipment and material	Quality of components		Recommendations concerning quality requirements for components of a fire detection and fire alarm system, i.e. detectors, control and indicating equipment, alarm devices etc. The manufacturer should provide information about his quality assurance system.

Table 1 (*continued*)

Number	Clause	Subclause	sub subclause	Explanation or recommended text
6.2	Equipment and material	Standards		Recommended standards which have to be met in order to ensure satisfactory operation under normal conditions. It should be mentioned which kinds of application are not covered by the standard. Reference should be made to ISO 9000 for quality assurance systems.
6.3	Equipment and material	Additional requirements		Recommendations concerning additional requirements which have to be met in special cases, for example: — explosion-proof detectors; — intrinsically safe equipment; — special EMC requirements; — extreme climatic conditions.
6.4	Equipment and material	Control and indicating equipment optional functions		Recommendations concerning the use of optional equipment connected to the control and indicating equipment, for example: — remote terminals; — graphic displays; — voice communication systems.
6.5	Equipment and material	Installation materials		Recommendations concerning the quality of the used installation materials, for example: — cables, insulation and size; — connectors; — distribution boxes.
7	Systems compatibility			
7.1	Systems compatibility			Recommendations how to assess the compatibility of the installed components of a fire detection and fire alarm system. NOTE Even though all components of a fire detection and fire alarm system comply with standards, it is not sure that they will all work together satisfactorily. Therefore, during commissioning, a suitable check may be required in order to assess compatibility of all installed components.
7.2	Systems compatibility	Responsibility		Recommends a written assignment of the responsibility for the compatibility of all components of the fire detection and fire alarm system. This responsibility ends with commissioning, i.e. when the system is handed over to the customer.
7.3	Systems compatibility	Documentation		Recommends that a list of all installed components is produced of which the compatibility has been checked. Any changes of the fire detection and fire alarm system after commissioning should be clearly documented (version) and a new compatibility test should be carried out.
7.4	Systems compatibility	Certification		Recommends that the compatibility check is certified at least by the installer. If available this certificate should be issued by an approved testing authority.