Securing the operational readiness
of fire control systems

**CFPA-E Guideline No 23:2023 F**

New image needed!



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**The CFPA Europe develops and publishes common guidelines about fire safety, security, and natural hazards with the aim to achieve similar interpretation and to give examples of acceptable solutions, concepts, and models. The aim is to facilitate and support fire protection, security, and protection against natural hazards across Europe, and the whole world.**

**Today fire safety, security and protection against natural hazards form an integral part of a modern strategy for survival, sustainability, and competitiveness. Therefore, the market imposes new demands for quality.**

**These Guidelines are intended for all interested parties and the public. Interested parties includes plant owners, insurers, rescue services, consultants, safety companies and the like so that, in the course of their work, they may be able to help manage risk in society.**

**The Guidelines reflect best practice developed by the national members of CFPA Europe. Where these Guidelines and national requirements conflict, national requirements shall apply.**

**This Guideline has been compiled by the Guidelines Commission and is adopted by the members of CFPA Europe.**

**More information:** [**www.cfpa-e.eu**](http://www.cfpa-e.eu)



Zurich, November 2023 Cologne, November 2023
CFPA Europe Guidelines Commission

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Key words:

# Introduction

Fire detection systems and fire extinguishing systems must automatically identify any fire that may occur and to signal and alert all endangered persons and operational personnel. They can be used for activating and operating fire protection devices.

Owners and users of buildings and facilities are responsible for ensuring that appliances and equipment used for the structural, technical, and preventive aspects of fire protection systems and facilities are to be maintained and operational at all times in accordance with regulations. A general overview can be found in Guideline No 1 “Internal Fire Protection Control”.

The technical facilities for fire protection should be consistent with state-of-the-art technology and designed and maintained so that they are effective and operational at all times.

# Scope

This guideline is primarily intended for those responsible for safety in companies and organisations. It is also addressed to the rescue services, consultants, safety companies etc so that, in the course of their work, they may be able to help companies and organisations to increase the levels of fire safety.

It documents the operational readiness of fire control systems and regulates their design and control.

Additionally, an internal self-checking system must be implemented, that ensures the periodical checks of installations, which are relevant for fire protection. These checks are carried out more frequently than the control of fire control systems. The procedure of this self-checking system is not part of this document.

# Definitions

**Fire control systems (FCS):** Fire control systems are identified as those actuating devices of safety systems and/or safety components such as lift installations, venting systems, doors, fire dampers, etc, that are activated automatically or manually.

**Integral test:** An integral test is used to check all fire protection components, which are automatically activated and connected directly to the fire control system, and their interrelationship with one another. This includes their proper activation and function. Components that are activated via a follow-up control (e.g., fire dampers as a follow-up control of the ventilation) are not tested. This would have to be tested by means of individual tests as part of commissioning.

**Zone- / components plan (see Attachment 2 and 4):** The zone plan is a graphical representation of defined areas to show where elements are to be activated as well as to indicate and identify individual components.

**Matrix for fire control systems (see Attachments 3 and 5):** The matrix for fire control systems is in the form of a table showing all interrelationships between activated zones and those components to be activated.

**Action plan of the integral test (see Attachment 6):** The action plan is the documentary evidence on the procedure or protocol for testing fire control systems. This is based on specific concepts of established protection objectives.

**Periodic checks, function of activation:** Periodic checks are those tests on systems and components at specific time intervals. These include:

* Checking the correct functioning of individual components (ad hoc inspections),
* checking zone plans (conceptual),
* carrying out an integrated test (according to the action plan).

**Self-control:** A periodic internal check consists of a visual inspection and a status and function check of devices throughout the facility (e.g., emergency generator, fire doors, fire extinguishers, fire control system). Results of these checks should be documented.

**Documentation:** The integral test, internal controls, maintenance and all incidents must be documented (e.g., logbook).

# Key

FDS Fire detection system

SPS Sprinkler system

FCS Fire control system

FD Fire damper

SHES Smoke and heat exhaust system

FBCP Fire brigade control and indicator panel

# Strategy

Based on the fire protection strategy, a facility-specific, targeted solution for fire control systems is to be drawn up. The following describes the approach to planning and checking fire control systems:

1. Appointing personnel to be responsible for planning.

2. Creating / checking / adapting a fire protection concept.

3. Creating of the evacuation concept (Fire control system must be adapted to the evacuation concept).

4. Creating of an operating concept / utilization concept (Fire control system must be adapted to this concepts).

5. Creating / adapting zone plans and the matrix to reflect the fire protection concept.

6. Installing equipment and updating related documents.

7. Creating / customizing the action plan for integral testing.

8. Carrying out procedures for integral testing.

9. Rectifying faults, if any.

10. Determining periodic checks, function of activation, and time intervals.

11. Carrying out an integral test after any significant changes to the system.

12. Ongoing review of all fire protection related protection concepts and updating documents.

# Existing facilities

When extending fire protection measures and/or structural modifications, the documentation must be updated, and an integral test carried out on the area concerned.

An integral test must be carried out after adjustments to the system or after updating hardware or software.

# Frequency of integral tests

An integral test is to be carried out periodically, according to the national regulations, but at least every 2 to 6 years, preferably just before a periodic check of the fire protection system by the competent authorities. The periodic integral test should be carried out after maintenance and servicing. This results in fewer defects.

# Demands placed on the operator and resulting obligations

## Checks and maintenance work

The operator is responsible for ensuring that internal controls and maintenance work on the components is conducted according to a set schedule (according to manufacturer's specifications).

## Changes during operation

Documents are to be updated after any functional or structural change or significant modification to the actuating equipment. Depending on the scope of the modifications, the procedure described in Section 5 must be adhered to.

## Documentation and verification

All incidents relating to the operation of fire control systems must be documented (e.g., logbook).

# Required documentation

* Zone- / components plan of the building.
* Matrix of automatic fire control system with key.
* Action plan of integral test.
* Checklist for internal fire protection control.
* Verification of events and checks (e.g., logbook).

# Attachments of the annex

Examples are given in the annex (although not exhaustive, possible solutions), as a guide for full documentation. The extent and definitive illustration or labelling is notional only and can be freely selected.

Annex 1: Survey of documents, necessary planning documents

Annex 2: Zone- / components plans for fire control systems (collective activation)

Annex 3: List of fire control systems (collective activation)

Annex 4: Zone- / components plans of fire control systems (selective activation)

Annex 5: Matrix for fire control systems (selective activation)

Annex 6: Implementation of action plan

Annex 7: Periodic check of fire control systems

Annex 8: Key

# Annex 1: Summary of documents

|  |
| --- |
| Check-Plan for fire control systems:Consisting of:* Zone- components plans for fire control systems
* Matrix for fire control systems
* Control plans

(Action plans for integral test)for the approvalfor periodic check* Documents of internal fire protection control
 |
| Other fire protection documents with potential interfacesFire Brigade Intervention Plans and Fire Protection PlansConsisting of: * Access plan
* Situation plan
* Environment and hazard plans
* Floor plans
* Information sheets etc.
 |
| Plans for escape routes, orientation and evacuationConsisting of:* Evacuation and orientation plans
* Evacuation concept
* Leaflet "Behavior in case of fire"
 |



# Annex 2: Zone plans for fire control systems (collective activation)



# Annex 3: List of fire control systems (collective activation)



\*I: Internal alarm e.g. daytime operation

 E: External alarm to the fire brigade or activation by pushbutton

See Annex 8 for key.

# Annex 4: Zone plans for fire control systems (selective activation)



# Annex 5: Matrix of Fire Control Systems (selective activation)



\*I: Internal alarm e.g. daytime operation

 E: External alarm to the fire brigade or activation by pushbutton

See Annex 8 for key.

# Annex 6: Certification (Example for selective activation)

Certification for Automatic Fire Control Systems
Scenario Integrated Test

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3. List of deficiencies, action planning

3.1 Deficiencies

3.2 Improvements

1. Basic Principals

As part of building renovations, the fire and gas detection systems were modernized, and a personal alarm system was installed. The fire protection systems and all relevant actuating safety equipment and systems are to be checked for functionality and safe operation. An integral test with five scenarios is to be carried out to this end.

1.1 Participants

|  |  |  |  |
| --- | --- | --- | --- |
| **Company** | **Function** | **Name** | **present** |
| Company X | Owner | Mister A | yes |
| Company X | Chief technical service | Mister B | yes |
| Construction Inc. | Construction management | Mister C | yes |
| ... | ... | ... | ... |

1.2 Documents

For survey the following documents are given to all participants in advance:

* Fire protection plans and zone plans,
* …

For verification and gap analysis the following documents are essential and must be available at place:

|  |  |  |
| --- | --- | --- |
| **Updated documents** | **available** | **Comments** |
|  | **yes** | **no** |  |
| Construction plans, revised |  |  |  |
| Ventilation plans, revised |  |  | Not actual version, data for test okay |
| Sanitary plans |  |  |  |
| ... |  |  | ... |

1.3 Procedure for integral tests of fire control systems

|  |  |  |
| --- | --- | --- |
| **Time** | **Action** | **Responsible** |
| 08:00 - 08:15 | Welcome, presence control | Safety representative, company X |
| 08:15 - 08:30 | Document verification | Company XX |
| 08:30 - 09:00 | Meeting, fire scenario verification | All participants |
| ... | ... | ... |

2. Integral test of automatic fire control systems

The automatic activation of all security elements such as doors, fire doors, fire dampers, etc. is done periodically within specified time intervals by carrying out an integral test.

The test initially requires all elements to be put into operational readiness. According to the scenarios and action plan, security elements must assume the status for the particular emergency for which they were set. After resetting the alarm systems, the security devices must also be reset to their operating status either automatically or manually.

System functions are to be verified and documented throughout the entire installation. By its signature, the company responsible for the installation and its operation confirms that the safety devices are operating correctly, and that the information given is accurate.

2.1 Scenario 1, fire in the ex-zone production ground floor

Activation of a fire detector in production area; acknowledge of internal alarm within 3 minutes (daytime operation); activation of an external alarm by pressing a manual fire alarm button.

2.1.1 Test scenario 1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Pos.** | **Action** | **Responsible company** | **Function okay** | **Responsible person** |
|  |  |  | **yes** | **no** |  |
|  |  |  |  |  |  |
|  | **Preparations** |  |  |  |  |
| 1 | Control and indicating equipment: No alarms, failures etc. present | Company of fire detection systems |  |  | I. Isler |
| 2 | Access to all rooms ensured | Company X |  |  | B. Bodmer |
| 3 | Plants switched on | Company X |  |  | B. Bodmer |
| 4 | Closures opened, in operating position | Company X |  |  | B. Bodmer |
| 5 | Building services in operation | Company XX |  |  | E. Ebner |
|  | **Test scenario 1** |  |  |  |  |
| 6 | No activation of any fire control systems of other scenarios | all |  |  | E. Ebner |
| 7 | Activation of a pre-alarm of a smoke detector in delivery office | Company of fire detection systems |  |  | I. Isler |
| 8 | Approval of the transmission to the control and indicating equipment Acknowledge receipt of the alarm within 3 minutes | Company of fire detection systems |  |  | I. Isler |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Pos.** | **Action** | **Responsible company** | **Function okay** | **Responsible person** |
|  |  |  | **yes** | **no** |  |
| 9 | Closure of fire gates:Gate **(0003T)**Gate **(0010T)** | Company XX |  |  | E. Ebner |
| 10 | Elevator **(XX01A / XX02A)** displaces to ground floor and remains blocked. | Company XX |  |  | E. Ebner |
| 11 | Damper supply air **(0004R)** opens and fume and smoke exhaust ventilation **(0007R)** works. | Ventilation Inc. |  |  | Damper **(0004R)** doesn’t work.H.Hasler |
| 12 | Production line 1 **(0005E)** goes to a stable state and switched off. | System Inc. |  |  | M. Manser |
| 13 | Production line 2 **(0006E)** goes to a stable state and switched off. | System Inc. |  |  | M. Manser |
| 14 | Ventilation **(0008L)** is switched off | Ventilation Inc. |  |  | H. Hasler |
| 15 | Removal of the fuse for the illumination | Electrical Inc. |  |  | K. Kübler |
| 16 | Control of the emergency lighting | Electrical Inc. |  |  | K. Kübler |
|  | **Reconnection** |  |  |  |  |
| 17 | Reset of the control and indicating equipment, no alarms, failures etc. present. | Company of fire detection systems |  |  | I. Isler |
| 18 | Reset of Illumination Emergency lighting off | Electrical Inc. |  |  | K. Kübler |
| 19 | Reset and run up of all facilities; no alarms, failures etc. present. | All |  |  | E. Ebner |
| 20 | No other faults or effects on installations or facilities. | All |  |  | E. Ebner |

2.1.2 Remarks / information

11. Damper (0004R) receives no signal, respectively does not open.
H. Hasler: Clarification with J. Isler about the activation through control and indicating equipment.

2.2 Scenario 2 ff

Tests of further scenarios analogue to scenario 1

3. List of deficiencies, action planning

3.1 Deficiencies

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Pos.** | **Deficiency, error** | **Responsible / Name** | **Date** | **Completed: Date/Visa** |
| 1 | **Production ground floor:**Ventilation control:Malfunction of the activation **(0004R)** from control and indicating equipment.Clarification and elimination | Company of fire detection systems Mr. Isler | 28.10.07 |  |
| ... | ... | ... | ... | ... |

# Annex 7: Periodic check (example for selective control)

1. Integral test of fire control systems

The automatic activation of all security elements such as doors, fire doors, fire dampers, etc. is done periodically within specified time intervals by carrying out an integral test.

The test initially requires all elements to be put into operational readiness. According to the scenarios and action plan, security elements must assume the status for the particular emergency for which they were set. After resetting the alarm systems, the security devices must also be reset to their operating status either automatically or manually.

System functions are to be verified and documented throughout the entire installation. By its signature, the company responsible for the installation and its operation confirms that the safety devices are operating correctly, and that the information given is accurate.

1.1 Procedure for integral tests

|  |  |  |
| --- | --- | --- |
| **Time** | **Function** | **Responsible Person** |
| 1 week earlier | Information of employees | Safety representative |
| 08:00 - 08:15 | Document verification | Safety representative |
| 08:15 - 08:30 | Meeting, fire scenario verification | Safety representative, production manager, chief technical service |
| ... | ... |  |

2. Procedure for integral test

The procedure is based on the basic grid of the integral test for the implementation (see Annex 6).

2.1 Scenario 1ff

* ...
* ...

# Annex 8: Key



# European guidelines

*Fire (*[*https://cfpa-e.eu/category-guidelines/fire-prevention-and-protection/*](https://cfpa-e.eu/category-guidelines/fire-prevention-and-protection/)*)*

Guideline No 1 F - Internal fire protection control

Guideline No 2 F - Panic & emergency exit devices

Guideline No 3 F - Certification of thermographers

Guideline No 4 F - Introduction to qualitative fire risk assessment

Guideline No 5 F - Guidance signs, emergency lighting and general lighting

Guideline No 6 F - Fire safety in care homes

Guideline No 7 F - Safety distance between waste containers and buildings

*Guideline No 8 F - withdrawn*

Guideline No 9 F - Fire safety in restaurants

Guideline No 10 F - Smoke alarms in the home

Guideline No 11 F - Recommended numbers of fire protection trained staff

Guideline No 12 F - Fire safety basics for hot work operatives

Guideline No 13 F - Fire protection documentation

Guideline No 14 F - Fire protection in information technology facilities

Guideline No 15 F - Fire safety in guest harbours and marinas

Guideline No 16 F - Fire protection in offices

Guideline No 17 F - Fire safety in farm buildings

Guideline No 18 F - Fire protection on chemical manufacturing sites

Guideline No 19 F - Fire safety engineering concerning evacuation from buildings

Guideline No 20 F - Fire safety in camping sites

Guideline No 21 F - Fire prevention on construction sites

Guideline No 22 F - Wind turbines – Fire protection guideline

Guideline No 23 F - Securing the operational readiness of fire control system

Guideline No 24 F - Fire safe homes

Guideline No 25 F - Emergency plan

*Guideline No 26 F - withdrawn*

Guideline No 27 F - Fire safety in apartment buildings

Guideline No 28 F - Fire safety in laboratories

Guideline No 29 F - Protection of paintings: transports, exhibition and storage

Guideline No 30 F - Managing fire safety in historic buildings

Guideline No 31 F - Protection against self-ignition end explosions in handling and storage

of silage and fodder in farms

Guideline No 32 F - Treatment and storage of waste and combustible secondary raw

materials

Guideline No 33 F - Evacuation of people with disabilities

Guideline No 34 F - Fire safety measures with emergency power supply

Guideline No 35 F - Fire safety in warehouses

Guideline No 36 F - Fire prevention in large tents

Guideline No 37 F - Photovoltaic systems: recommendations on loss prevention

Guideline No 38 F - Fire safety recommendations for short-term rental accommodations

Guideline No 37 F - Fire protection in schools

Guideline No 38 F - Fire safety recommendations for short-term rental accommodations

Guideline No 39 F - Fire protection in schools

Guideline No 40 F - Procedure to certify CFPA-E Fire Safety Specialists in Building Design

Guideline No 41 F - Safety instructions for the use and charging of small and medium size lithium

ion powered devices

*Natural hazards* [*https://cfpa-e.eu/category-guidelines/natural-hazards/*](https://cfpa-e.eu/category-guidelines/natural-hazards/)*)*

Guideline No 1 N - Protection against flood

Guideline No 2 N - Business resilience – An introduction to protecting your business

Guideline No 3 N - Protection of buildings against wind damage

Guideline No 4 N - Lighting protection

Guideline No 5 N - Managing heavy snow loads on roofs

Guideline No 6 N - Forest fires

Guideline No 7 N - Demountable / Mobile flood protection systems

Guideline No 8 N - Ensuring supplies of firefighting water in extreme weather conditions

Guideline No 9 N - Protection against hail damage

Guideline No 10 N - Heavy rain and flash flood; Recommendations on flood prevention and
protection

*Security (*[*https://cfpa-e.eu/category-guidelines/security/*](https://cfpa-e.eu/category-guidelines/security/)*)*

Guideline No 1 S - Arson document

Guideline No 2 S - Protection of empty buildings

Guideline No 3 S - Security systems for empty buildings

Guideline No 4 S - Guidance on keyholder selections and duties

Guideline No 5 S - Security guidelines for museums and showrooms

Guideline No 6 S - Security guidelines emergency exit doors in non-residential premises

Guideline No 7 S - Developing evacuation and salvage plans for works of art and

heritage buildings

Guideline No 8 S - Security in schools

Guideline No 9 S - Recommendation for the control of metal theft

Guideline No 10 S - Protection of business intelligence

Guideline No 11 S - Cyber security for small and medium-sized enterprises

Guideline No 12 S - Security Guidelines for Businesses

Comments and corrective actions:



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