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Fire Safety System (FSS) and Smoke Extraction

The FSS has for objective to protect the people and the goods, to facilitate the intervention of fire brigades and to limit the distribution of the fire. It thus has to detect the fire and put automatically (or on human intervention) in safety a building or an establishment.

The FSS is composed of fire detecting system (FDS) and fire protection system (FPS).

1. Fire Detecting System (FDS)
The installation of a fire detecting system has the role of :

Revealing and indicating any beginning of fire as soon as possible and also implementing the possible safety equipments which are enslaved to it.

The fire detecting system includes necessarily :

a) Control and Indicating Equipment (CIE)

⊙ Receive the signals of the detectors which are connected to it
⊙ Determine if these signals correspond to a condition "of alarm fire "
⊙ Indicate this condition under visual and sound shape
⊙ Locate the place of the disaster
⊙ Record the information
⊙ Watch the correct functioning of the system and indicate any disturbance under visual and sound shape
⊙ Send a signal "of alarm fire"

b) The automatic detectors

Detectors are devices conceived to work when they are influenced by a physical or a chemical phenomena preceding or accompanying the beginning of the fire by causing immediate signs.

The various types of automatic detectors :
➡ The optical detectors of smokes : they react to the smokes generated by a fire
➡ The heat detectors : they react when the moderate temperature exceeds a specific threshold 70 °
➡ Optical-thermal detectors : They operate on the optical smoke mode coupled with a thermal sensor helping decision-making of the fire alarm

c) The manual triggers M.T

The manual triggers are fixed to 1.30 meters of the ground. They are implanted near the emergency exits of the building or near stairwells.

They must be activated by every person witness of the beginning of fire.

2. Fire Protection System (FPS)

The FPS is all the necessary equipments used to assure the implementation of the safety of people and the building in case of fire.
It is composed of CFSS (Central Fire Safety System), DCT (Device Control Terminal) and ADS (Actuated Device of Safety).

Security features allow :
➡ A fast and safe evacuation (smoke ejection)
➡ to avoid the distribution of the fire (compartmentalization)
➡ to facilitate the commitment of the help.

CFSS :
The Central Fire Safety System (CFSS) allows to analyze and to manage the implementation of security as well as manual and electric orders.

The CFSS consists of 4 parts :
UAM: Alarm Management Unit
CMUEE : Centralized Management Unit of Emergency Exits
SU : Signalization Unit

It is established by series of lights allowing us to check the position of the ADS (Actuated Device of Safety) and the defects of communication between the material power plant and the ADS.
We distinguish seeing those following lights :
green, yellow, and red.
CMCU : Centralized Manual Control Unit.

TCD :
The Terminal Commanded Device is established of :
➡ NF not Autonomous Sound Diffuser 61-936, NF S 32-001 and NF 54-3
➡ Autonomous Block of Sound Alarm NF (BAAS) C 48-150 and NF S 32-001
➡ Diffusers of Selective General Alarm NF (AGS) 61-936
➡ Engines of smoke ejection

ADS :
The Actuated Device of Safety is composed of :
➡ Fire damper, fire door
➡ Release, shutter, opening, casket of relaying for smoke extraction engine.

Smoke extraction
The smoke extraction consists in evacuating a part of smokes produced by the fire by creating a height of open air under the coat of smoke. The purpose is to :
➡ limit the distribution of the fire
➡ facilitate the evacuation of the occupants
➡ allow to fire brigades the access to premises

The evacuation of smokes also contributes to limit the increase of temperature inside premises and to avoid the generalized fire. The level of the fire risk in the building is reduced by limiting the temperature increase.

Indeed, at high temperature most of the building materials lose their mechanical resistance, what can cause a collapse of the building.