metroSAFETY

Making compliance simple

Fire Safety:

Fire Alarm System Users Design and Management Considerations

False Alarms

Estimated to cost the UK > £1 billion per year

Concerted effort to reduce the burden:

- Government
- F&R services
- Fire alarm industry
- NHS

False Alarms

False Alarm:

A fire alarm activation caused by phenomena other than fire or smoke and which is not relayed beyond the premises.

Unwanted Fire Signal:

A fire alarm activation caused by phenomena other than fire or smoke and which is relayed to the fire service (UwFSs).

(Known by firefighters as ‘Micky’s)

False Alarms

2015 -16 England

214, 359 unwanted fire alarms

142,408 ‘due to apparatus’

Apparatus category subdivided into:

- Smoke, heat and flame detectors
- Other apparatus

False Alarms

Cause ↓ Item →	Smoke	Heat	Flame	Other apparatus	Total
Incorrect position	480	182	16	129	807
Unsuitable equipment	128	27	1	24	180
Poor maintenance	1,346	73	19	421	1562
Fault	26,926	862	249	10,716	**38,753**
Damaged device	346	14	9	319	688
Water ingression	926	72	33	584	1615
Other cause	1,777	171	42	1,277	3267
Total	30,329	1,401	369	13,470	46872

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False Alarms

2015-16 UK stats	529,000 turnouts	214,000 UwFSs
2015 LFB	97,833 turnouts	47,545 UwFSs
2015-16 Avon F&RS	15,000 turnouts	5,500 UwFSs
2014-15 Glasgow	14,800 turnouts	6,000 UwFSs

False Alarms

F&RS strategies for reducing UwFSs include:

- Call challenging
- Call back
- Promotion of third party accredited designers and engineers
- Business support units
- Enforcement through the FSO 2005
- Charging for attendance to false alarms

False Alarms

West Yorkshire charged £444,590
April 2014 - September 2016
Average £350 per UwFS

LFB ten UwFSs in twelve months
£326 +VAT per call

2014 London top ten offenders all hospitals
Charges applied = £177,000

Less than half the fees applied in 2014
were recovered

False Alarms

- **Partial distractions:**

  Work continues on original task but draws attention so task proceeds more slowly and less accurately.

- **Dominant interruptions:**

  Significantly distracts from original task. Largely occupies mind. Relegates original task to second or third priority.

- **Total interruptions:**

  Completely distracts from original task, fully occupies conscious mind.

False Alarms

- Pharmaceutical production line £15 - 20,000 per hour.
- Medium size supermarket peak time sales loses circa £40,000 per hour. £70 - 80,000 an hour Christmas.
- Investment bank trading floor £10 - 20,000 per minute, not including trading losses.

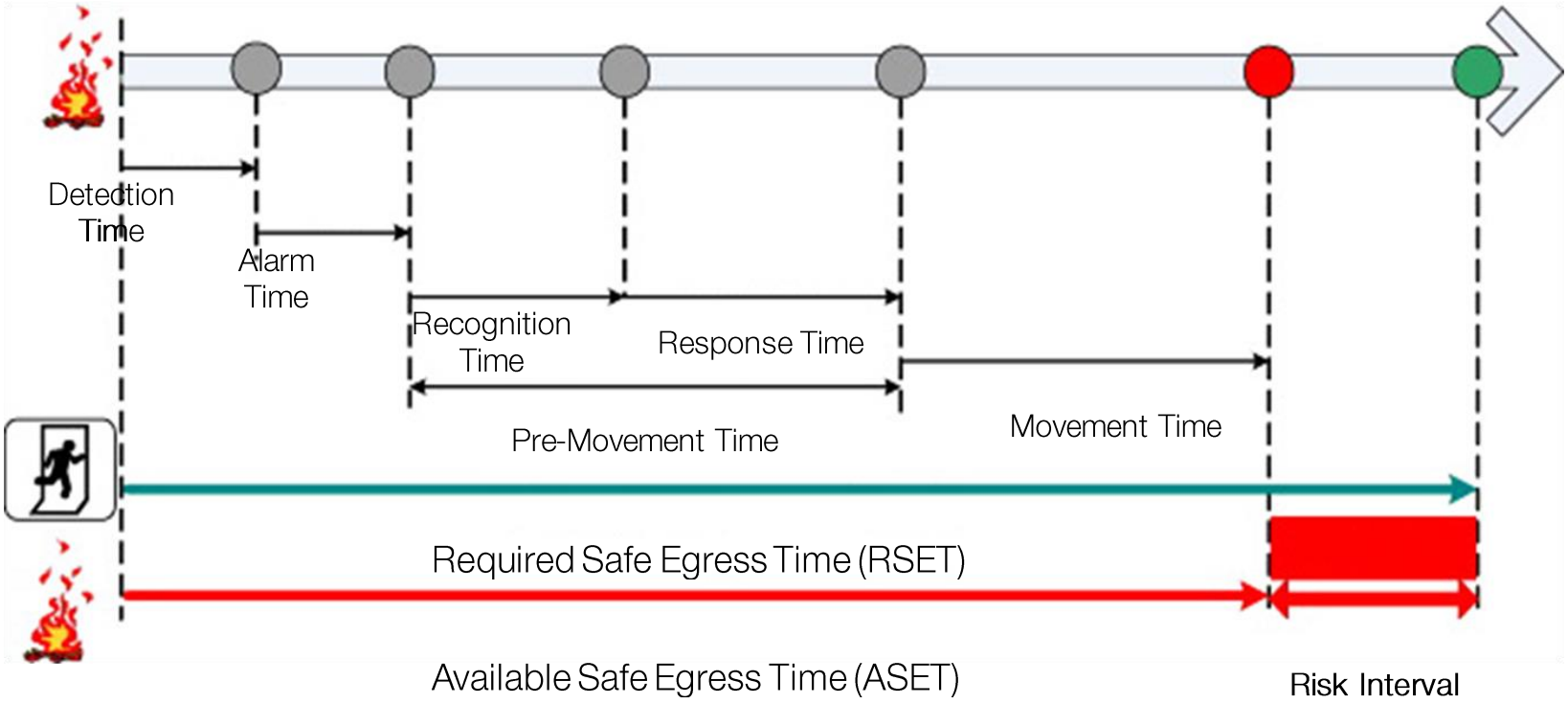
- Average cost per fire appliance £1,970.

False Alarms

- Repeated alarm activations diminish FAS credibility
- Negatively impact occupants response and perception of risk
- Significantly increase the occupant response time

False Alarms

ASET/RSET



False Alarms

- Repeated alarm activations diminish FAS credibility
- Negatively impact occupants response and perception of risk
- Significantly increase the occupant response time
- Constant FB attendance creates a negative impression amongst staff, occupants and neighbours
- Reflects poorly on organisations reputation, reliability and image

False Alarms

- Take control
- Implement tight system management controls
- Robustly investigate each false fire alarm activation
- Take / implement corrective action

False Alarms

- Implement tight management controls
- Fire alarm isolations (disablements) policy and procedures
- Procedures for reinstatement of disablements

False Alarms

Robustly investigate each false fire alarm activation.

Record:

- Date and time of activation
- Type, location and address/zone of alarmed device
- Activities in area immediately preceding the alarm
- Internal and external atmospheric and environmental conditions
- Location of nearby windows, doors, AC and ventilation grills
- People in the area at time of alarm

False Alarms

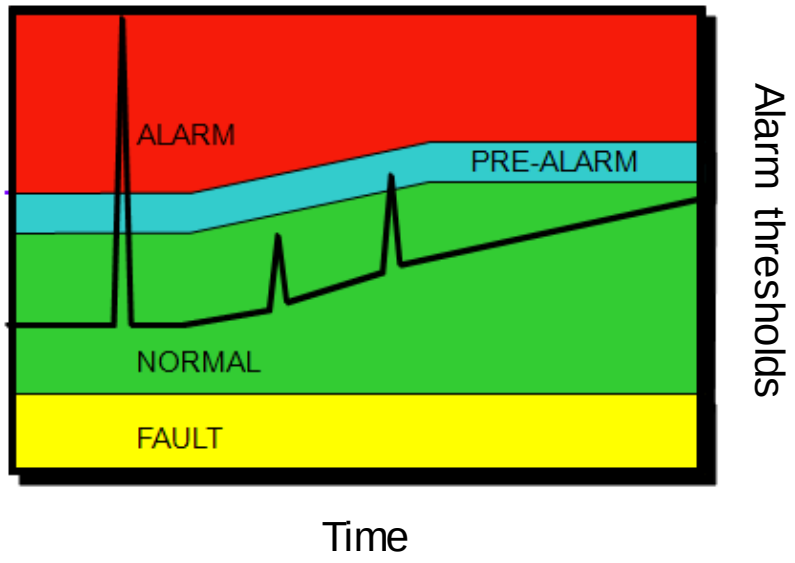
Take / implement corrective action:

- Replace alarmed point detectors
- Guard break glass units or other vulnerable components
- Review suitability or location of device
- Take action to reduce suspected atmospheric or environmental causations
- Review records looking for trends and patterns
- Review FAS design and cause and effects

Design Out False Alarms

Prior to making changes understand:

- Original design objectives of the fire alarm system
- The building evacuation strategy
- The fire alarm system cause and effects



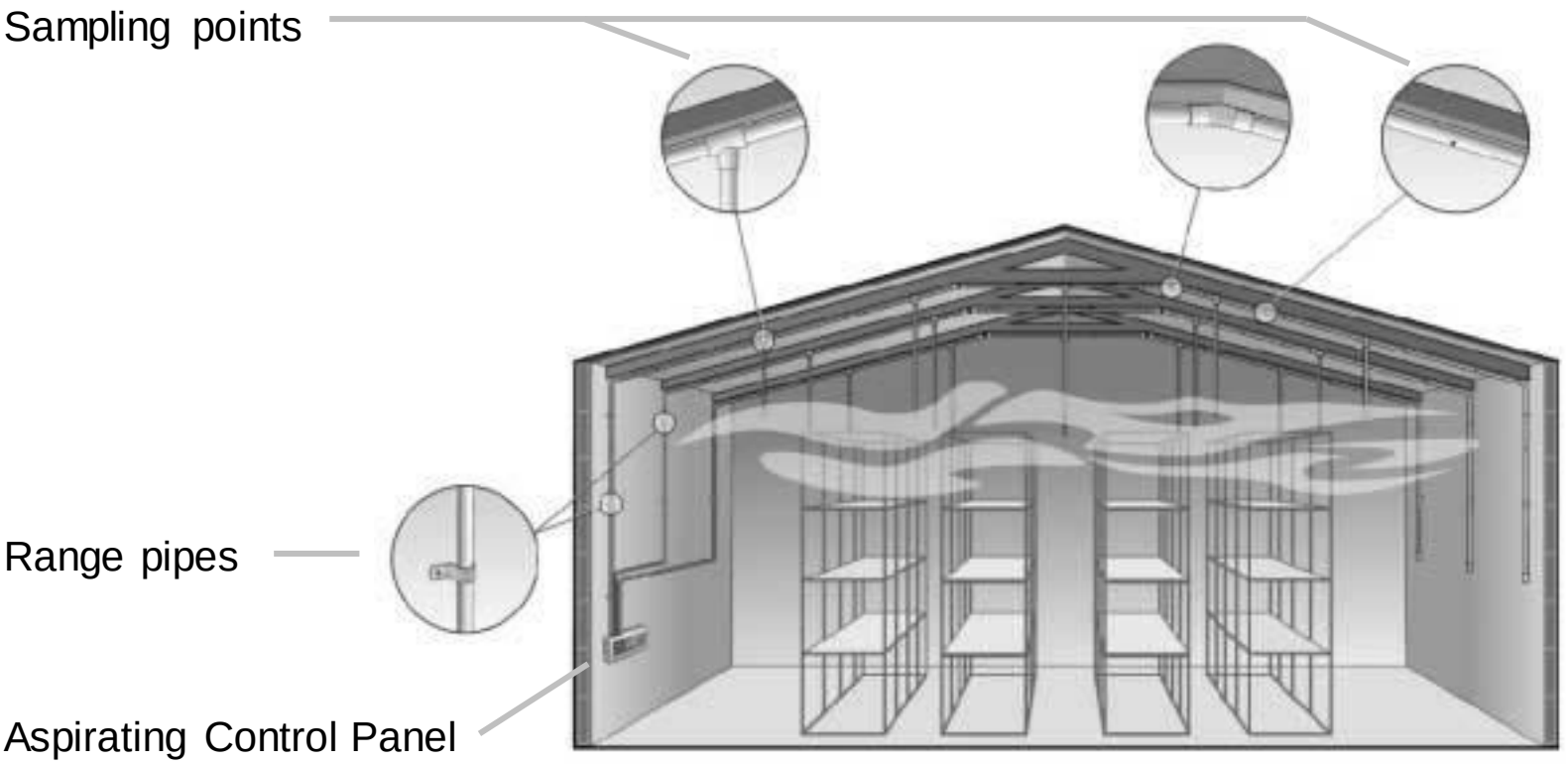
FAS Design Process

Main points to consider

- Understand the objectives of the fire alarm system
- Understand the evacuation strategy
- Understand how areas in the building will be used
- Establish category of system
- Consult with all interested parties

FAS Design Process

Main points to consider



FAS Design Process

Main points to consider

- Understand the objectives of the fire alarm system
- Understand the evacuation strategy
- Understand how areas in the building will be used
- Establish category of system
- Consult with all interested parties
- Confirm sounder types and coverage
- Decide on the type of alarm technology to be used
- Establish required cause and effects

FAS Design Process

Main points to consider

Cause → / Effect ↓	Any fire alarm call point activated	First automatic smoke detector activated	Single automatic heat detector activated	Second automatic smoke detector activated	Security Officer Alarm acknowledgment (thump button) activated	Timer one expires (Not more than sixty seconds. See notes)	Timer two expires (Circa ten minutes. See notes)
Alert signal broadcast into building (See notes)		✓					
Evacuate signal broadcast via fire alarm sounders (See notes)	✓		✓	✓		✓	✓
Security Officer Alarm acknowledgment thump button made live		✓					
Timer one initiated (See notes)		✓					
Timer one cancelled, timer two initiated (See notes)					✓		
Door holders release	✓	✓	✓	✓		✓	✓
Door locks release	✓		✓	✓		✓	✓
Fire Curtains deploy (See notes)	✓	✓	✓	✓		✓	✓
Fire fighting lift switches to fire fighting mode (car control)	✓	✓	✓	✓		✓	✓

FAS Design Process

Main points to consider

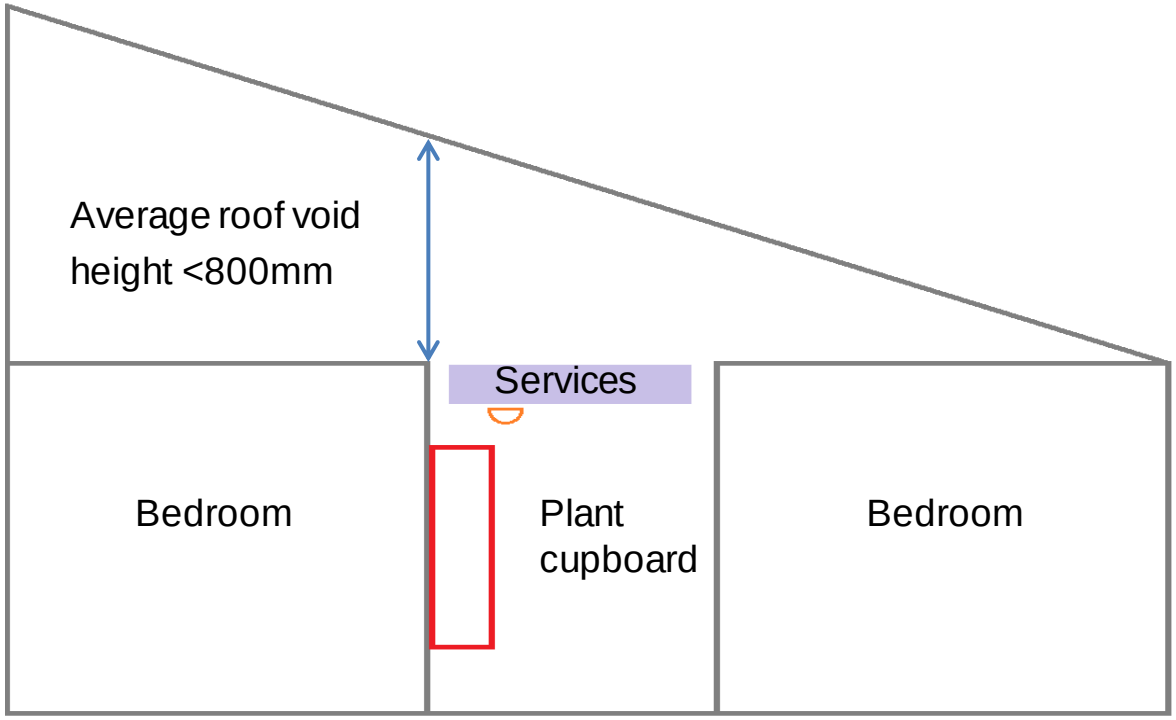
SP203-1

Registered Firm

- Plan type and position of system components
- Review design to minimize unwanted alarms
- Establish what 3rd party approvals are required:
  - Equipment = LPS1014 & CEI
  - Installation = BAFE SP203
- Select contractor for installation and commissioning
- Challenge deviations from standards

Challenge Deviations

- Terraced housing
- Third floor bedrooms
- Fire barriers in lofts V.E.d
- Detection required to compensate



Side elevation

FAS Design Process

Main points to consider

- Plan type and position of system components
- Review design to minimize unwanted alarms
- Establish what 3rd party approvals are required:

  - Equipment = LPS1014 & CEI
  - Installation = BAFE SP203

- Select contractor for installation and commissioning
- Challenge deviations from standards
- Make suitable arrangements for ongoing maintenance

Fire Detection and Alarm Standards

BS 5839:

Fire detection and fire alarm systems for buildings.
Code of practice for design, installation,
commissioning and maintenance of systems.

- **Part 1. 2013 Non-domestic premises**
- **Part 6. 2013 Domestic premises**

Fire Detection and Alarm Standards

BS 5839: Pt.6:

- House's, bungalows, individual flats, mobile homes, mansions, individual sheltered accommodation and associated common parts
- Certain NHS housing in the community
- Excluded: Hostels, caravans, boats (other than permanently moored) and communal parts of blocks or flats or maisonnettes

Fire Detection and Alarm Standards

Provides guidance on the planning, design, installation, commissioning and maintenance of fire detection and fire alarm systems in buildings.

Does not provide guidance on whether detection and alarms are required or category of systems required.

Fire Detection and Alarm Standards

Multiple guidance documents set out recommendations for appropriate categories of system for various situations.

- DCLG guides
- HTM guides
- LACoRS
- BB 100 B
- Building regulations

Additional guides for electrical apparatus in hazardous areas BS EN 60079-14 and 50281-1-2 (explosive).

Categories of Fire Alarm Part 1

M: Manual only

L5: Specific areas of risk

L4: Escape routes

L3: Escape routes and rooms off the escape route

L2: Escape routes and rooms off the escape route and areas of risk (plant)

L1: All areas

P Categories = Property protection

Categories of Fire Alarm Part 6

Two part classification made up of Grade and Category.

Grade = power supply and control and indicating equipment.

A = BS 5839 Part 1 system
B = Detectors and sounders using simpler specified equipment
C = Detectors and sounders or alarms with central control
D = Mains powered with battery or capacitor back up
E = Mains powered with no back up supply
F = Battery powered only

Categories of Fire Alarm Part 6

Two part classification made up of Grade and Category.

Category (detector locations).

LD1 = Throughout dwelling, escape routes, circulation areas, rooms in which fire could start

LD2 = Circulation areas forming escape routes high fire risk areas

LD3 = Circulation areas forming escape routes

Comparison of Fire Detector Coverage

Part 1 System Category (Non domestic premises)	Part 6 System Category (Domestic premises)
M system	N/A
L5 system	N/A
L4 system	LD4 system
L3 system	LD4 system
L2 system	LD2 system
L1 system	LD1 system

Thank you.