

IS3218: 2009

Overview

A.I.R.M. September 2009.

Comment

The information contained in this presentation is an overview of the new standard and is not intended as a definitive interpretation.

It is a guidance document and it is strongly recommended that the full content of the standard be read and understood by each individual.

Programme

- **Session 1**
 - Title, Status & Structure
 - Definitions
 - Design
 - Limitation of False Alarms
- **Session 2**
 - Installation & Commissioning
 - Handover
 - User Responsibilities
 - Certification
 - Annexes

Session 1 - Content

- Title, Status & Structure
- Definitions
- Design
- Limitation of False Alarms

Title & Status

- **I.S. 3218:2009 - FIRE DETECTION AND ALARM SYSTEMS FOR BUILDINGS – SYSTEM DESIGN, INSTALLATION SERVICE AND MAINTENANCE**
- Now a **STANDARD**
 - 1989 version was **Code of Practise**
- **“SHALL”** replaces **“SHOULD”**
 - ≈95%

Release

- **Effective Date: 8th May 2009**
- **I.S. 3218:1989 Status**
 - Revoked as of 8th May 2009
 - No “Phase in” period

Structure of I.S.3218:2009

1. Scope
2. Normative references
3. Terms and Definitions
4. System Design Overview
5. Design Considerations
6. Limitation of False Alarms : **NEW**
7. Workmanship, Installation, Commissioning
8. User Responsibilities
9. Residential Buildings: **NEW**
Annexes

Other Equivalent Standards

- **UK**

- **BS 5839:Part 1-2002 Rev 2004**
 - Harmonised as far as practicable

- **EU**

- **prEN54-14**
 - Mentioned in Tech Doc B
 - Now defunct (July 2006)
 - Under review
 - Unlikely to appear in near future

Definitions

- **Greatly Expanded**
 - 121 Terms/ Definitions
 - Will require continuous Update
- **Consistency**
 - Extracted from existing Documents e.g.
 - Fire Services Act
 - Health Safety and Welfare at Work Act
 - Building Regulations
 - etc

Definitions - Selected Examples

- **3.19 Building**
- **3.27 Competent Person**
- **3.37 Escape route**
- **3.88 Premises**
- **3.90 Protocol**
- **3.118 Void**

Design - Content

- Design Overview
- Design Process
- Design Detail
 - Designer
 - System Categories
 - Selected significant changes.
 - Residential
 - Limitation of False Alarms

Design : Overview

- **Emphasis is on the Design Process**
 - Concept to Completion
 - Single party responsible
- **Consultation Paramount**
 - Mandatory “All party” review and sign off
- **Designer Responsibilities**
 - Clarified & Enhanced
 - Detailed in Annex H (Normative)

Design : Process

- **Single party responsibility**
 - Design to Handover
- **Take Account of Fire Safety Strategy**
- **System Layout**
- **Issue System Specification**
- **Post System Supplier Appointment**
 - Co-ordinate meeting: Installer & Supplier
 - Agree Design, Installation & Commissioning procedures
- **Issue Certificate of Design – Annex C1**

Design Detail : Designer

- **Competence**

- Chartered Engineer Or
- Fire Systems Engineer Or
- Other Competent person

- **Single Party responsibility**

- Ideally System designer
- Project Supervisor Design Process (PSDP)

Design Detail: System Categories

- **“Type”** changed to **“Category”**
- **Retained**
 - Category M : Manual System
 - Category L1: Life Protection – full cover
 - Category L2: Life Protection – Augmented L3 or L4
 - Category L3: Life Protection – Escape Routes +
 - Category L4: Life Protection – Escape routes
- **Deleted**
 - Category P1: Property Protection – Full cover
 - Category P2: Property Protection – Selected area

Clarification Category “L2”

- **Statement**

- “No such category as L2 without L3 or L4 qualifier.”
- i.e. Must be : L2/L3 or L2/L4

- **L2 Clarified as**

- “A category L3 or L4 system in the entire premises augmented by additional protection in specified areas.”

Design Detail: System Categories

- **System Specifications**
 - Category “Shall always be included..”
 - Areas protected “Shall include details of..”
- **Certificate of Design & Commissioning**
 - As for Specification above
- **Buildings with mixed categories**
 - Specification and certification to Clearly identify category per area.

Design Detail – Selected Changes

- Circuits
- Control and Indication Equipment
- Battery Capacity
- Detectors
- Remote Indicators
- Manual Call Points
- Alarm Devices
- Cabling

Changes :Circuit Design

- **Detector removal**
 - Must not isolate Call Point/ sounder
 - Impact → Mainly System Hardware
- **2 Simultaneous circuit faults**
 - Max 4000 m² isolated
 - Previously 10,000m²

Changes: Control Equipment (CIE)

- **Unrestricted Access to CIE**
- **Max/ Min CIE heights specified**
 - Desktop : 890mm
 - Wall : 1.4m to 1.8m
- **Multi-occupancy**
 - Access to CIE by all occupants
- **External indication of CIE location** **NB**
 - Audio/ Visual External Indication
 - **Red** Colour Marked FIRE ALARM
 - Unmanned : Auto silence of Audio – 30 minutes

Changes: Control Equipment

- **Internal indication of CIE Location**
 - Notice at Entrance
- OR
- strobe at location visible from Entrance
- **Repeaters at multiple Normal Entrances**
 - Must have control facilities
- **Campus buildings**
 - CIE or repeater at each building entrance

Changes: Battery Capacity

- **Supervised Buildings**
 - 24 Hours standby + 30 Min Alarm
 - Supervision interval max 12 Hour
 - **OR** Auto report of mains failure.
- **Unsupervised buildings**
 - 48 Hours standby + 30 Min Alarm

Changes: Detector - Max Heights

Device	Old (m)	New (m)
Heat Detector Grade 1	9.0	
Heat Detector Grade 2	7.5	
Heat Detector Grade 3	6.0	
Heat detector Class A1 (Equiv Grade1)		9.0
Heat detector – All others		7.5
Point Smoke Sensor	15.0	10.5
Point Carbon Monoxide Sensor		10.5
Beam detector	30.0	25.0
Air Sampling Normal Sensitivity		10.5
Air Sampling Enhanced Sensitivity		12.0
Air Sampling High sensitivity		15.0

Changes: Detection – WC's

- **Bathrooms**

- Risk Assessment required

- **Toilets**

- Direct open to escape route
 - Protect
- Air lock < 1m²
 - Exclude if toilet protected & no risk
- Totally enclosed cubicle
 - Protect: unless void above protected

Changes :Detection in Voids

- **Protect all voids > 800mm**
 - All Categories L1 to L4 now included
- **Above/ Below/Adjoining Escape routes**

Exception

 - If Void < 800mm *and*
 - No Access points or openings *and*
 - No significant fire load within the space *and*
 - Barrier between void and escape route has equal fire rating as the route structure

Changes :Detection in Lift Shafts

- **Lift shafts**
 - Now Recommends aspirating detector
- **Multi-lift lobbies**
 - Detector coverage 25m²/ detector

Changes: Perforated Ceilings

- **Area below ceiling is protected if**
 - Penetration is even across ceiling
 - Penetration > 40% of ceiling surface
 - Dimension of perforations > 10mm in any direction
 - Thickness of ceiling < 3 times minimum perforation dimension

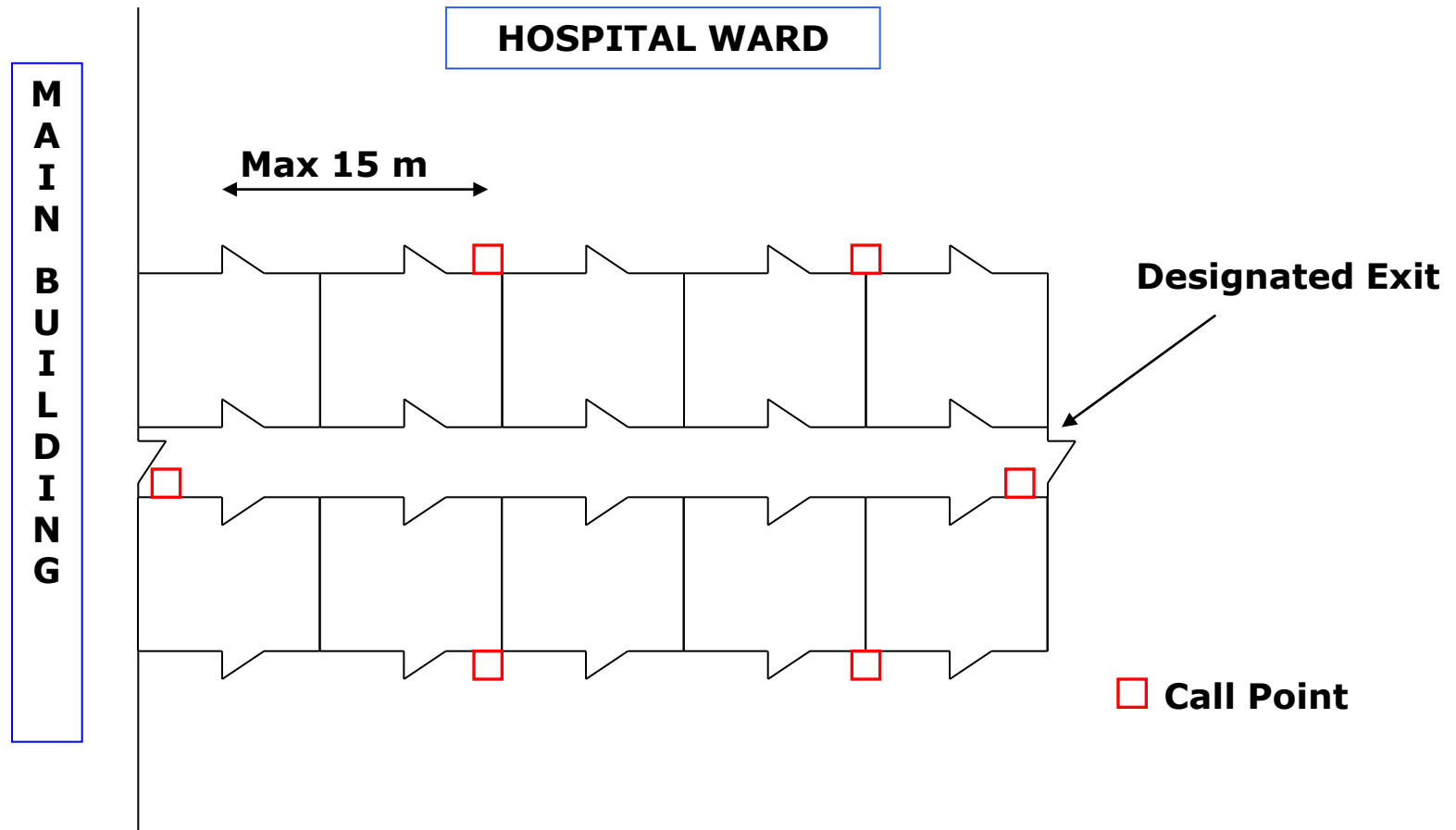
Changes: Remote indicators

- **Desirable** for all concealed devices
- Should be labelled
- **Optional** for Addressable systems
- **Mandatory** for Conventional Systems
- Residential (Apartments)
 - **Mandatory** outside entrance door
 - **Addressable** or **Conventional**

Changes: Manual Call Points

- **Multiple Exits to open air**
 - Relaxation of unit at “Every Exit”
 - Subject to conditions
- **Dual Action**
 - Accepted for Vandalism Reasons
 - Note as Variation on Certification
- **Max response time 3 Seconds**
 - prEN54-14 accepted 10 seconds

Example of Multi Exits



Changes: Alarm Devices

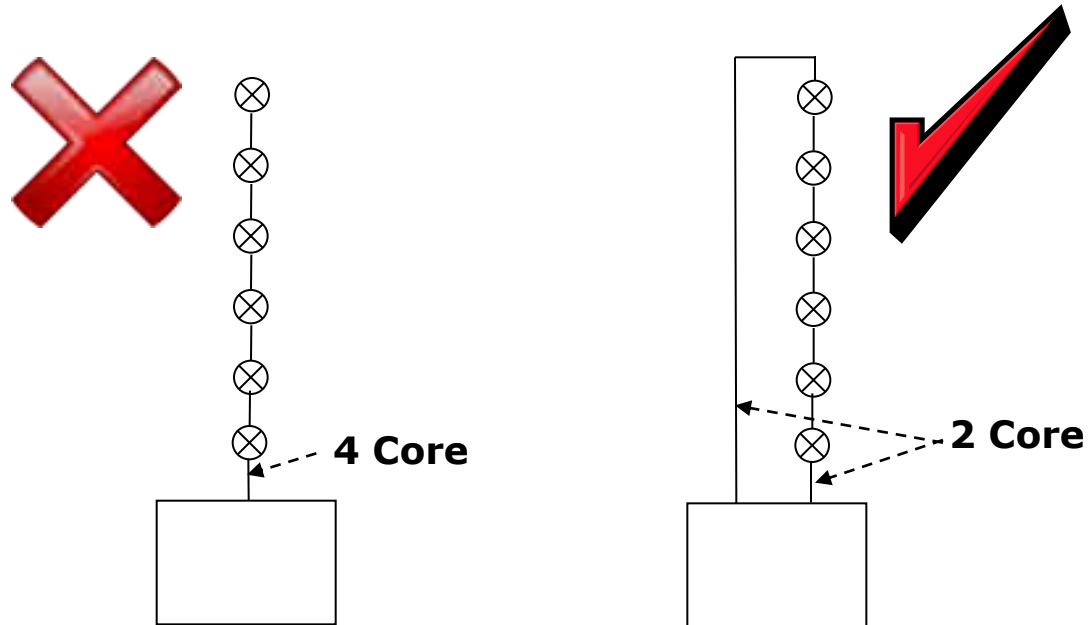
- **Now Includes additionally to Audible**
 - Visual
 - Tactile
- **Max single sounder 120 Db**
- **Minimum 2 sounder circuits**
- **Voice/ Public address**
 - Expanded
 - BS5839: Part 8 reference included.

Changes: Cabling

- **Fire resistant** cable throughout (PH120)
- **Minimum 1 sq mm**
- **Fixings defined** (No plastic Ties/ P Clips)
 - Non combustible fixings
- **Common colour required**
 - Different to other services
 - Preference **RED** or **ORANGE**
- **Joints**
 - Not permitted
 - Where unavoidable = Ceramic connectors

Changes : Cabling

- **Four core cable for loop prohibited**



Changes: Residential

- **New Section 9**
- **Set out in Building Regs Tech Doc B**
 - Relevant Sections 1.4 & 1.5
- **Based on BS5839 Part 6 2004**
 - LD1 and LD2 allowed
 - LD3 not used in Tech Doc B

Residential: Individual Dwellings

- **Includes**
 - Private House, Apartments, Maisonettes
- **Minimum Grade “D”**
 - Detectors Mains powered + Battery backup
 - Interconnected for sound activation
- **Minimum Category “LD2”**
 - Circulation areas forming part of escape route
 - All high risk areas
- **> 3 Stories = LD1**

Residential: Apartments

- **Grouped Dwellings unconnected by escape routes**
 - Grade “D” Category “LD2”
 - Must also be :Suitably fire separated
 - *And* : Each opening to place of Safety

Note: If common car park (naturally ventilated or not) below the group dwelling then car park to be a minimum of L4.

Residential: Apartments

- **Dwellings connected by covered escape routes and/ or access stairways.**
 - Apartments to Grade “D” “LD1” or “LD2”
 - Common Areas L3 (suffix X required) L3X
 - Heat Detector inside final Exit + remote lamp
 - Sounder inside final exit
 - 75 dB(A) at each bed-head from L3X system
- **Designer to produce**
 - Pre-planned fire Strategy
 - Response procedure (agreed with residents)

Residential :Apartment – Car parks

- If dwellings **connected by covered escape** routes and/ or access stairway are connected by stairways/ lift to basement or lower floor covered car park and the car park is not protected by sprinklers: then
 - Car Park must be protected by heat detectors
 - Escape routes protected to L3
 - Car park system interconnected to Apt system
- Dwellings **unconnected by covered escape**
 - Car Park to L4

Limitation of False Alarms

- **New Section 6**
- **Objective** – Minimise False Alarms
- **Designer** Accepts major responsibility
- **Duties**
 - Risk analysis to select correct detectors
 - Judge likely frequency
 - Consultation with User
- **Certificate of Design**
 - “Shall record” measures taken for Limitation

END SESSION 1
QUESTIONS ?

Session 2

- Installation
- Commissioning
- Handover
- User Responsibilities
 - Outline Service and Maintenance
- Certification
- Annexes

Installer Responsibility

- **Wiring & Equipment installation**
- **As Installed drawings** : to show
 - Equipment Location, Cable route, Mains
- **Prior to Commissioning**
 - As installed drawings
 - Cable test results
 - Certification of Installation : Annex C2
- **System Protection until handover**

Commissioning Process

- Extent
- Inspection Process
- Testing Process

Commissioning - Extent

- **New Systems**

- Total Commissioning + Certification

- **Major Modifications**

- Total Commissioning + recertification

- **Exceptions**

- Network Systems

- May be Limited to Satellite system
 - Must agree extent prior to works
 - Must guarantee impact on total system

Commissioning - Inspection

- **Visual only**
 - Siting and location of Equipment
 - Spacing of devices
 - Heights
 - Coverage
 - Application
 - Search Distances for MCP's
 - Wiring - Reasonably accessible works
 - Acceptable standard
 - Compliance with IS3218

Commissioning - Testing

- **Engineer Competence**
 - Measurement within 2 years
- **Process**
 - Test **Every** Device
 - Test **All** Functions + Displays
 - Measure/ record sound levels
 - Test/ Record Battery standby capability
 - Test remote communications

Handover

- Co-ordination
- Documents
- Process

Handover Co-ordination

- **Ideally by Designer/ Specifier**
 - Project Supervisor Design Process (PSDP)
- **Single Party to co-ordinate**
- **Responsible for full process**
- **Certificates to be presented to User**
 - Certificate of Design
 - Certificate of Installation
 - Certificate of Commissioning

Handover Documents

- **Listed on certificate – Checkbox style**
 - Record of Variations from IS3218
 - Certificates received
 - O & M manuals received
 - As Installed Drawings received
 - Cause and Effect configuration received
 - Zone and address listing received
 - Log Book received
 - Service Contract proposal received

Handover Process

- **User Inspection/ Demonstration**
 - Confirmation that works are satisfactory
 - Confirmation system functions as required
 - Confirmation Documentation received
 - Confirmation Training received
- **User made aware of**
 - General Responsibilities
 - Responsibility for Limitation of False alarms
 - Responsibility for Service and Maintenance

User Responsibility

- **Appoint Responsible Person**
- **Set up Procedures**
- **Users Trained**
- **Freedom from Obstruction**
- **Maintain Records and Drawings**
- **Maintain Log Book**
 - False Alarm Register
- **Control Contractors/ Works**
- **Service & Maintenance**
 - Daily & Weekly Checks

User Responsibility - Additional

- **Responsibility for Limitation of False alarms highlighted**
- **Actions to be taken following**
 - Fire
 - Fault
 - Pre Alarm
- **Test Methodology for Devices outlined**

Service/ Maintenance

- **Service**

- Test and Report

- **Maintenance**

- Undertaking works
 - Remedial or Otherwise

- **Providers**

- In House acceptable
 - Competence assurance by User

Service/ Maintenance

- **Spare Parts Availability**
 - User Responsible
 - Stock
 - Agree with Service/ Maintenance provider

Service Records

- **Mandatory**
- **Located adjacent to Panel**
- **Details – Annex D2**
 - Providers details
 - Protected Area
 - Inspection frequency (separate slide)
 - Next Inspection date
 - Engineer Name

Service Frequency

- **Clarified**

- Each device tested once Annually
- Record to prove attention

- **Periods**

- Acceptable to increase frequency
 - Weekly, Monthly quarterly etc.

- **Exception**

- Non residential < 20 devices = 6 Monthly

Service - False Alarms

- **Requires Annual Analysis**
 - Report by Service provider
- **Record/ Log by user**
 - New section in model log book Annex E3
- **Limits**
 - Max frequency per system
 - 1 per year per 20 devices
 - Max frequency per device
 - 1 per 2 year any one device

Certification

- **Not a Four Part Certificate**
 - Each Part stands alone
 - CERTIFICATE OF DESIGN
 - CERTIFICATE OF INSTALLATION
 - CERTIFICATE OF COMMISSIONING
 - Each on Supplier Headed Paper
 - Declaration of COMPETENCE
 - Each Supplier self certifies
- **Must contain information on Model Certificates**
 - Can contain extra

Certificate of Design

- **Scope of Works Identified**
 - New System or Modification
- **Two Page document**
- **Declarations**
 - System Compliance with IS3218:2009
 - Competence to Design
 - Measures were taken to Limit False Alarms
 - Impact of Modification/ Extensions considered

Certificate of Installation

- **Scope of Works Identified**
 - New System or Modification
- **Declarations**
 - Installed to Specification & drawings
 - Competence to undertake the work
 - Impact of modifications considered
 - As installed Drawings
 - Installation Certificates supplied

Certificate of Commissioning

- **Three Types**

- Final Certificate – Annex C3
- Modifications – Annex C4
- Early handover – Annex C5

- **Declarations**

- Commissioning to standard
- System compliance with standard
- Competence to commission

Certificates - Variations

- **Acceptable if**
 - Part of Strategy
 - Fire Engineering Solutions
- **Essential on Certificates**
- **Encouraged on Certificates**
 - Viewed as “ENHANCEMENT” not denigration.

Annex's

- **Now Mainly Normative**
 - Form part of the standard
- **8 Normative**
 - B,C,D,E,F,H,K,L
- **4 Informative**
 - For Information
 - A,G,I,J

QUESTIONS ?