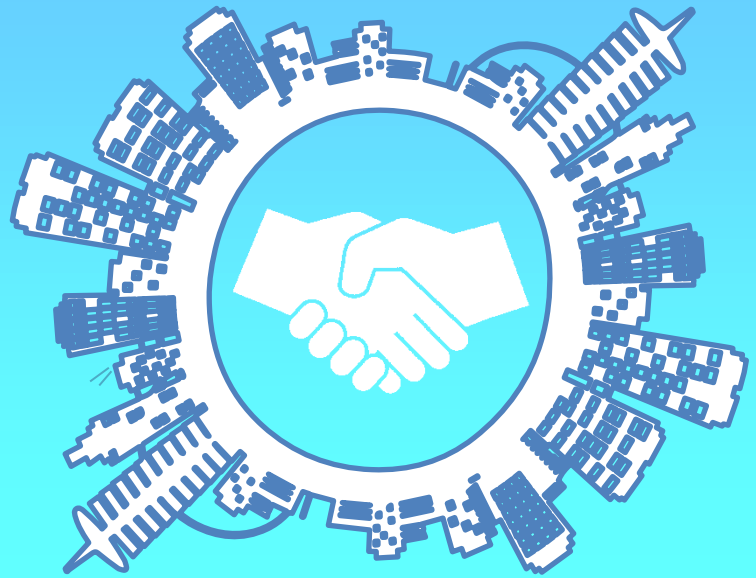


# FSD Connects with the Construction Industry

Experience sharing on

Acceptance Inspection of FSI and Fire Safety of Buildings

**12th November 2021**

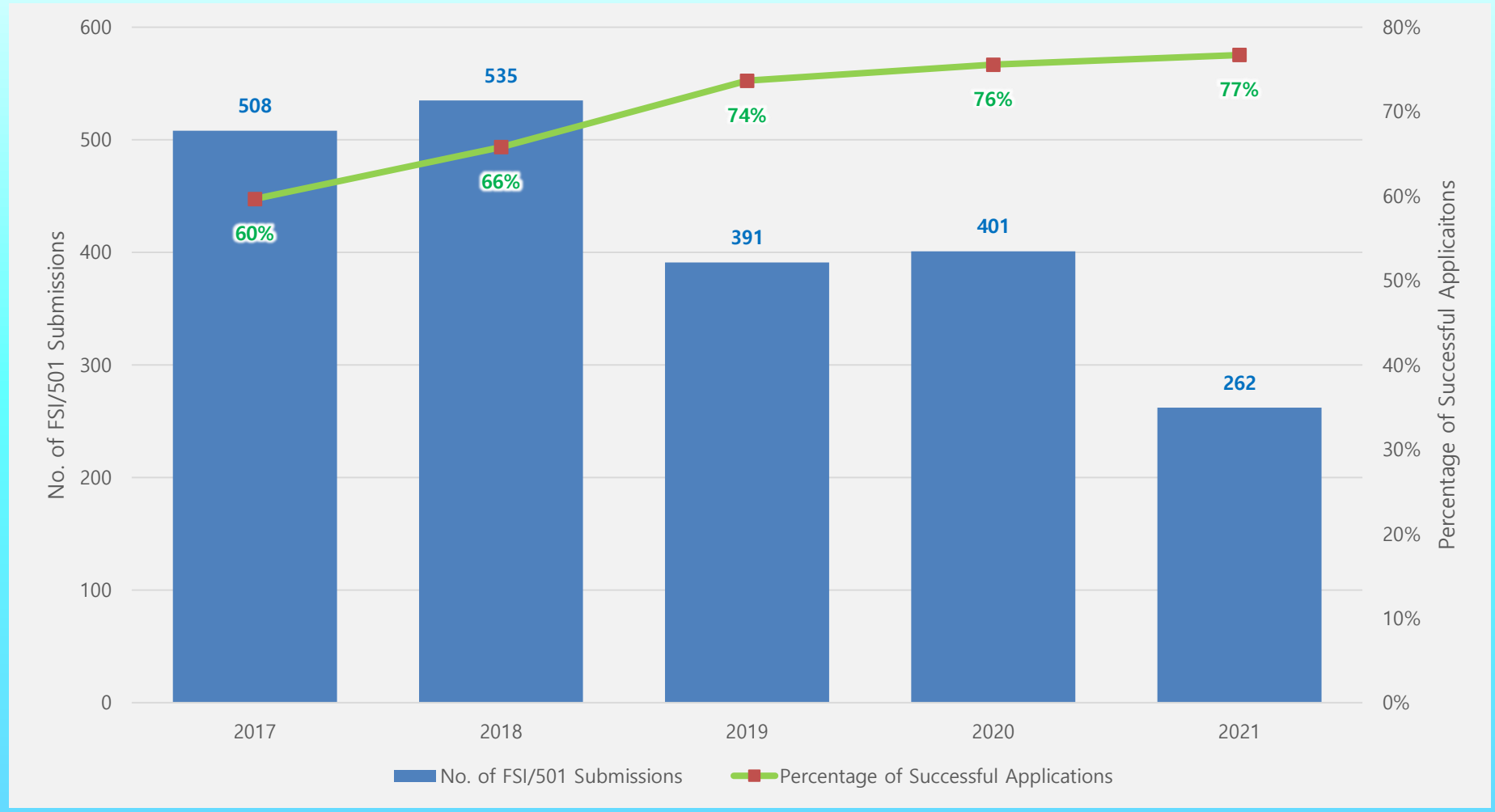
# Programme Rundown

| Session | Subject | Speaker |
|---|---|---|
| 1 | Good Practice on **FSI Acceptance Inspections** | Mr. TSANG Chiu-lok |
| 2 | Design Considerations on **In-rack Sprinkler System** | |
| 3 | Promulgation of FSD Circular Letter 8/2021 – Additional Requirements for **Staircases Pressurization** | Ir Dr. YIN Rumin |
| 4 | Clarification of Smoke Curtain for **Smoke Extraction System** | |
| 5 | Study on Limitations of **Unwanted Alarm** | Mr. CHIN Ka-ho |
| 6 | Legislative Amendments to **Dangerous Goods Ordinance** and its Subsidiary Legislation | Mr. LI Tsz-chun |
| 7 | Promotion of Wider Use of **Stand-alone Fire Detectors** in Hong Kong | Ir LAU Ying-kai |
| 8 | Voluntary Recognition Scheme for **FSI Technicians** | Mr. CHAN Kai-hang |
| 9 | Q & A Session | |

# Scope of FSD Connects

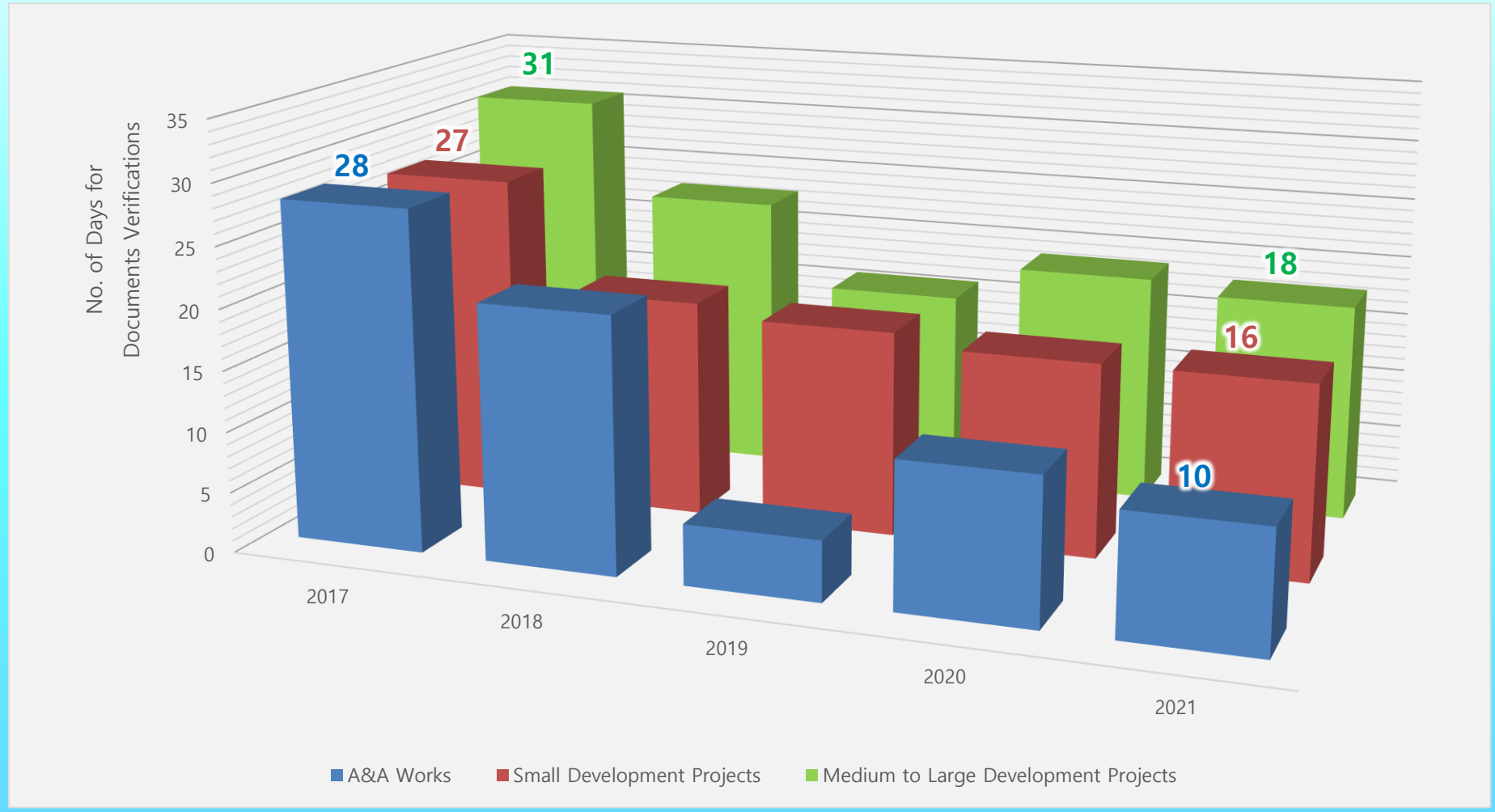
1. Enhancement Measures to FSI Acceptance Inspections
2. Fire Safety Standards and Technical Guidance
3. Enhancement Measures to FSI Maintenance
4. Legislations and Publicity of Fire Safety

# Effects of FSD Connects (1)




- Successful rate of FSI/501 submissions has been increasing steadily in the past four years from 60% in 2017 to 77% in 2021 (up to Sep).

# Effects of FSD Connects (2)




- Time for documents verification in 'Medium to Large Development Projects' has been decreasing in the past four years from 31 days in 2017 to 18 days in 2021 (up to Sep).

# Thank You

# Experience Sharing on FSI Acceptance Inspection

Senior Station **Officer** TSANG Chiu-lok
Fire Service Installations Division
Licensing and Certification Command

# Today's sharing

① Experience Sharing on FSI Acceptance Inspections

② Design Consideration on In-rack Sprinkler System







# Analysis :
# Project Success Rate

A Way to boost the efficiency of FSI acceptance inspection

FSI/501 case over 2021

Successful Rate: 77%

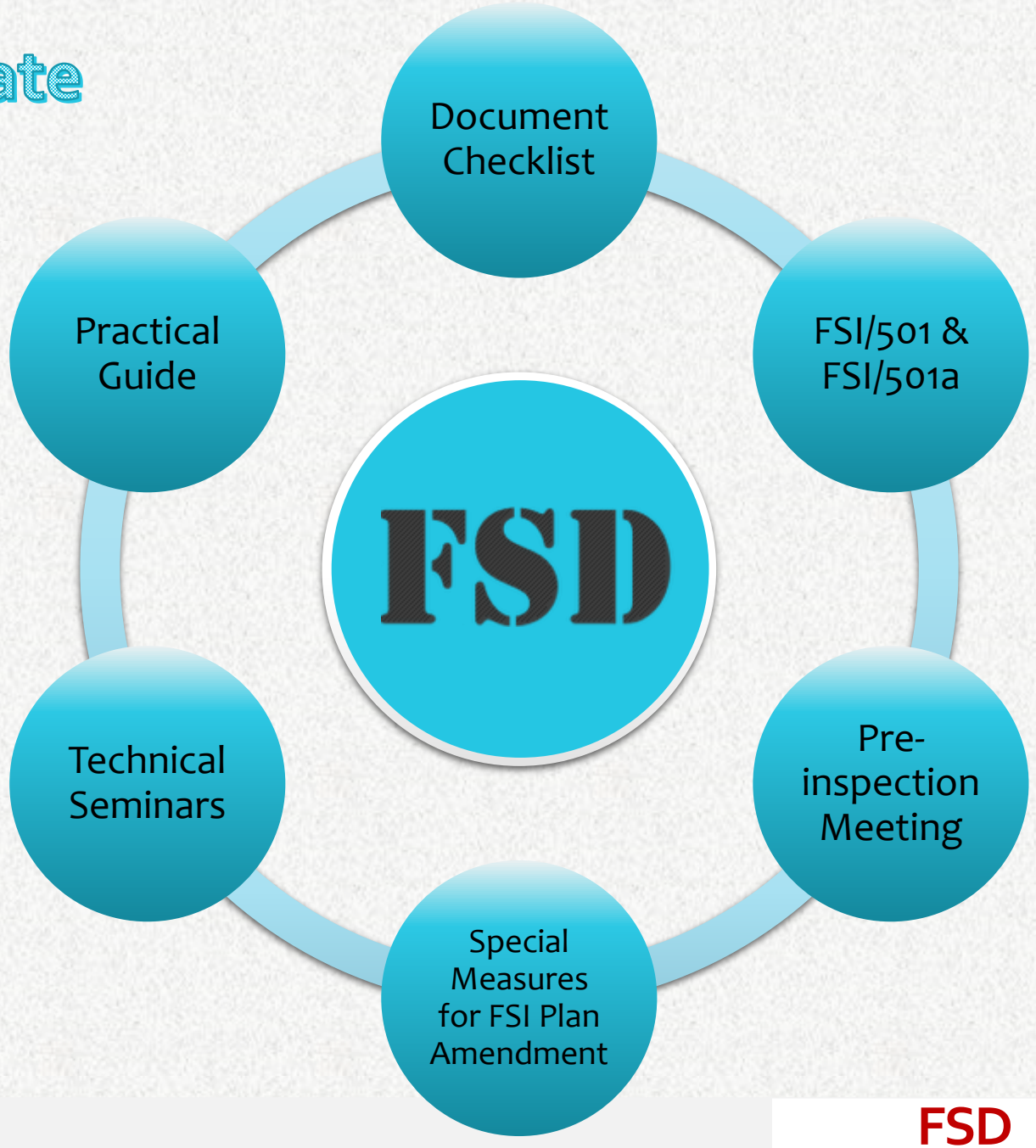
32 cases withdrawn

Average 13.5 workdays

56 workdays was the longest

FSD connects

# Analysis : Project Success Rate



# Analysis : Project Success Rate

| | | |
|---|---|---|
| Inspection area | GBP Amendment | Permanent Power Supply |
| EVA | As-fitted FSI tally with GBP | Approved FSMP |
| Change of AP | Accurate Documentation | FSI System Integrity |

**Smooth FSI Acceptance**

# High Hazard Storage

## In-rack Sprinkler System

# 1) Please allow sufficient time for submission

ii. For High Hazard Storage Category II (HHS 2)

a. For ceiling sprinkler inside ASRS (Automatic Storage & Retrieval System)

With reference to Table 5 of BS EN 12845: 2003

- Storage Configuration to be Palletized Rack (ST4)
- Goods to be Category II
- The vertical distance from the highest level of in-rack sprinklers to t 3.5m
- Design density to be 7.5 mm/min
- Area of operation (wet system) to be 260m2

r installation at ASRS Area at G/F and the in-rack sprinkler
azard Storage Category III (HHS 3).

sprinkler system and one 450m3 sprinkler water tank for HHS 3
shown on plan. The water capacity of sprinkler water tanks shall
iteria:

Full calculated will be used for the ceiling sprinkler installation (inside ASRS area). The minimum water capacity required for that ceiling sprinkler installation shall be calculated by 7.5mm/min x 260 square meter x 90 min = 175.5 cubic meters.

Due to F. S. direct telephone link will be provided for the HHS 3 sprinkler installation of the building, the water capacity required of the sprinkler tank for High Hazard Storage Category III (HHS 3) sprinkler system can be reduced to two/third. Therefore, the required water capacity for the HHS 3 sprinkler system will be 117 m3 (175.5 m3 x 2/3).

For the in-rack sprinkler at the ASRS and the in-rack sprinkler for the Manual Racking

In-rack sprinkler, flow rate (Q) = K x (P) 1/2
K = 80, P = 2 bar
Q = 80 x (2) 1/2 = 113.14 l/min

With reference to clause 7.2.3.3 of BS EN 12845: 2003, the rack aisles shall be less than 1.2m in width, three sprinkler heads at each level, total 3 levels and three racks are assumed to be involved. Hence, total number of sprinkler heads in operation in storage configuration of palletized rack (ST4) and goods category III shall be as follow:-

= 3 (per level) x 3 (levels) x 3 (racks) = 27

Referring to the clause 8.1.1 of BS EN 12845: 2003, the minimum operation duration of HHS 3 sprinkler system is 90min.

The minimum water capacity of the sprinkler tank for the in-rack sprinkler installation = 27 x 113.14 l/min x 90 min = 274930.2 l = 275m3.

*FS Note regarding the sprinkler system*

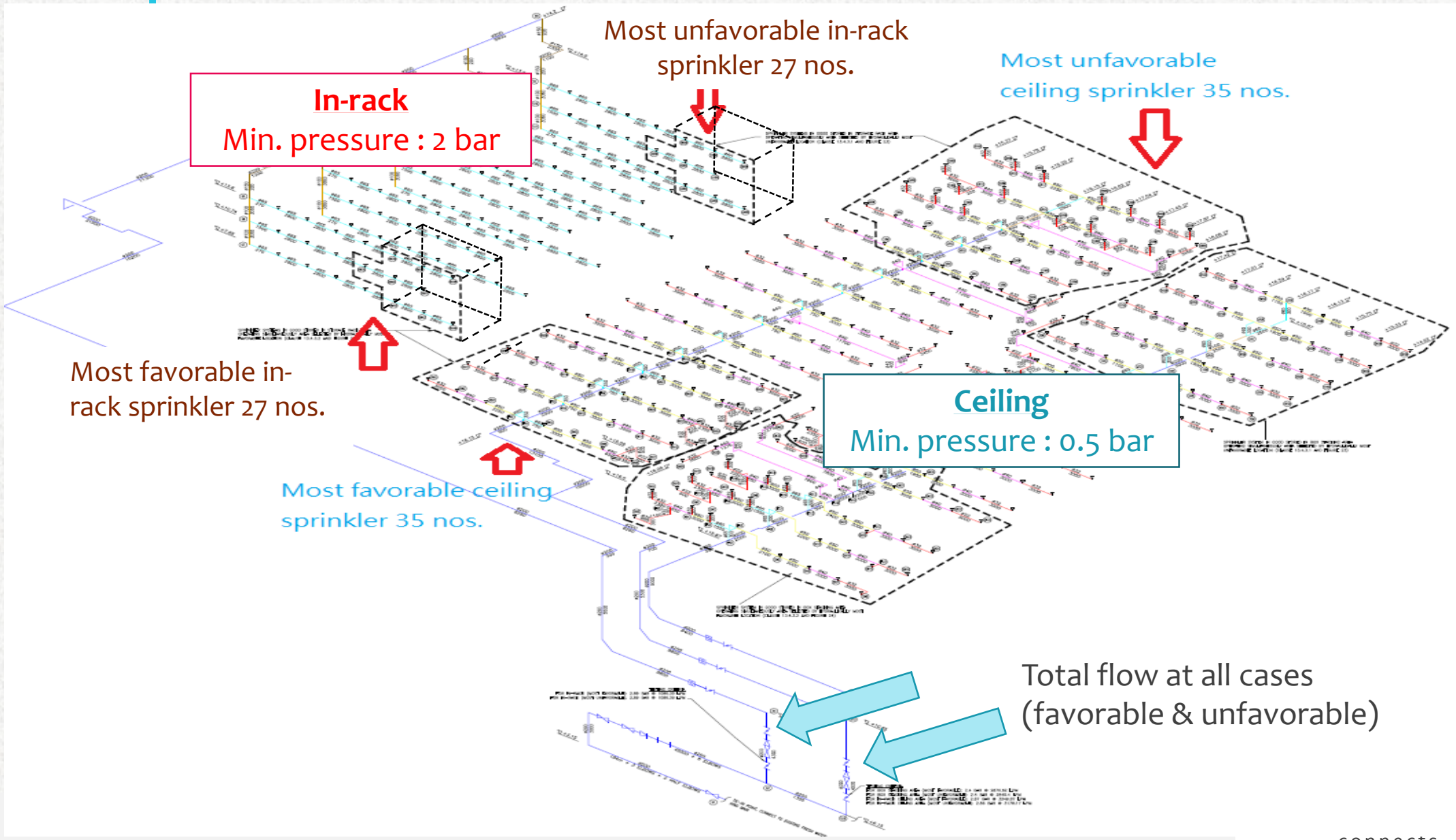
FSD connects

# 2) High Hazard Storage system = Fully Hydraulic Calculation?

| Design Characteristics | Reference |
|---|---|
| Hazard Classification | Clause 6.2.3 for high hazard system |
| Storage Category e.g. Type of materials | Annex C |
| Storage Configuration e.g. Free standing, block stacking, palletized racks etc. | clause 6.3.2 |
| Pre-calculated method | Without in-rack sprinkler is accepted |

*Remark: All clause and annex mentioned in this presentation should refer to BS EN 12845: 2003*

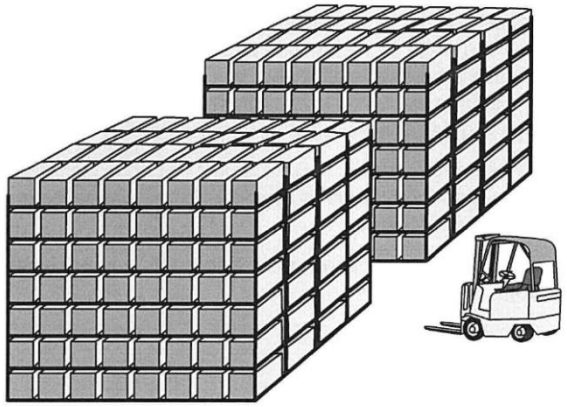
# Layout of sprinkler



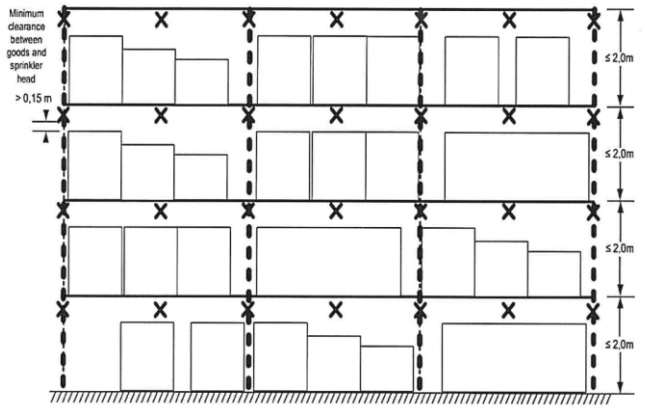
# 3) Local Application of LPC Rules for Automatic Sprinkler Installation 2015 Incorporating BS EN 12845


## TB234: 2015 High Hazard Storage

**Double deep pallet racking (ST8)**



**Solid or slatted shelving (ST15 and ST16)**




**TB234.5 Newly added storage configurations (Replaces BS EN 6.3.2)**

# Key points for acceptance criteria:

- Check the dimension of rack e.g. height of rack, width of aisle etc.
- Verify the location of critical sprinkler head at most unfavorable area
- Verify the pressure of the remote sprinkler (for both ceiling and in-rack sprinkler)
- Check the total system flow rate most favorable area
- Check flow pattern

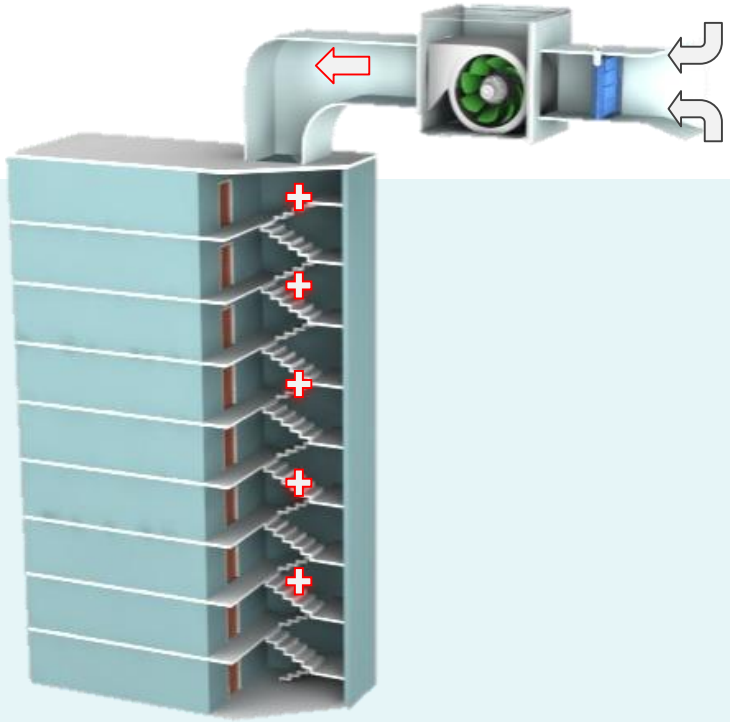
*Flow pattern of ceiling sprinkler and in-rack intermediate sprinkler*

# 1) Additional Requirements for SPS
# 2) Clarification of Smoke Curtain for SES

Ir Dr. YIN Rumin / Engr(FSI)
Fire Service Installations Division
Licensing and Certification Command

# Promulgation of FSD Circular Letter 8/2021 on 24 Sep 2021

## Additional Fire Safety Requirements for Staircase Pressurization System (SPS)

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電　　話 TEL. NO.: (852) 2733 7619


24 September 2021

To: Recipients of FSD Circular Letters

Dear Sir/Madam,

**FSD Circular Letter No. 8/2021**

**Additional Requirements for the Pressurization of Staircases**

This Circular Letter serves to announce the additional requirements for staircase pressurization systems (SPSs), supplementary to those stated in the Code of Practice for Minimum Fire Service Installations and Equipment (the FSI Code). To give firefighters a clear picture on the availability and operational status of SPS(s) at scenes of building fire and facilitate their formulation of operational strategies, provision of 'Notice Plate' as the additional requirements are to be put in place.

Currently, the design and installation of SPSs shall comply with relevant requirements set out in Section 5.21 of the FSI Code and the modifications for local application as stipulated in the FSD Circular Letter No. 2/2006. One of the requirements is the provision of indicator lights displaying the status of any pressure differential systems protecting the firefighting access and the means of escape in buildings at each fire service access point or supervisory panel located in F.S. control room. The additional requirements laid down in this letter serve to augment this clause.

Clear and accurate information of buildings, including location(s) of staircase(s) protected by SPS(s) and the operational status of the system(s), is crucial for firefighters at scene. In view of the increasing use of SPSs in recent developments, to make information about SPSs immediately available to firefighters, the FSD considers it necessary to impose additional requirements for SPS by the introduction of 'Notice Plate'. Its specifications and locations are as follows:

FSD connects

# Background of SPS

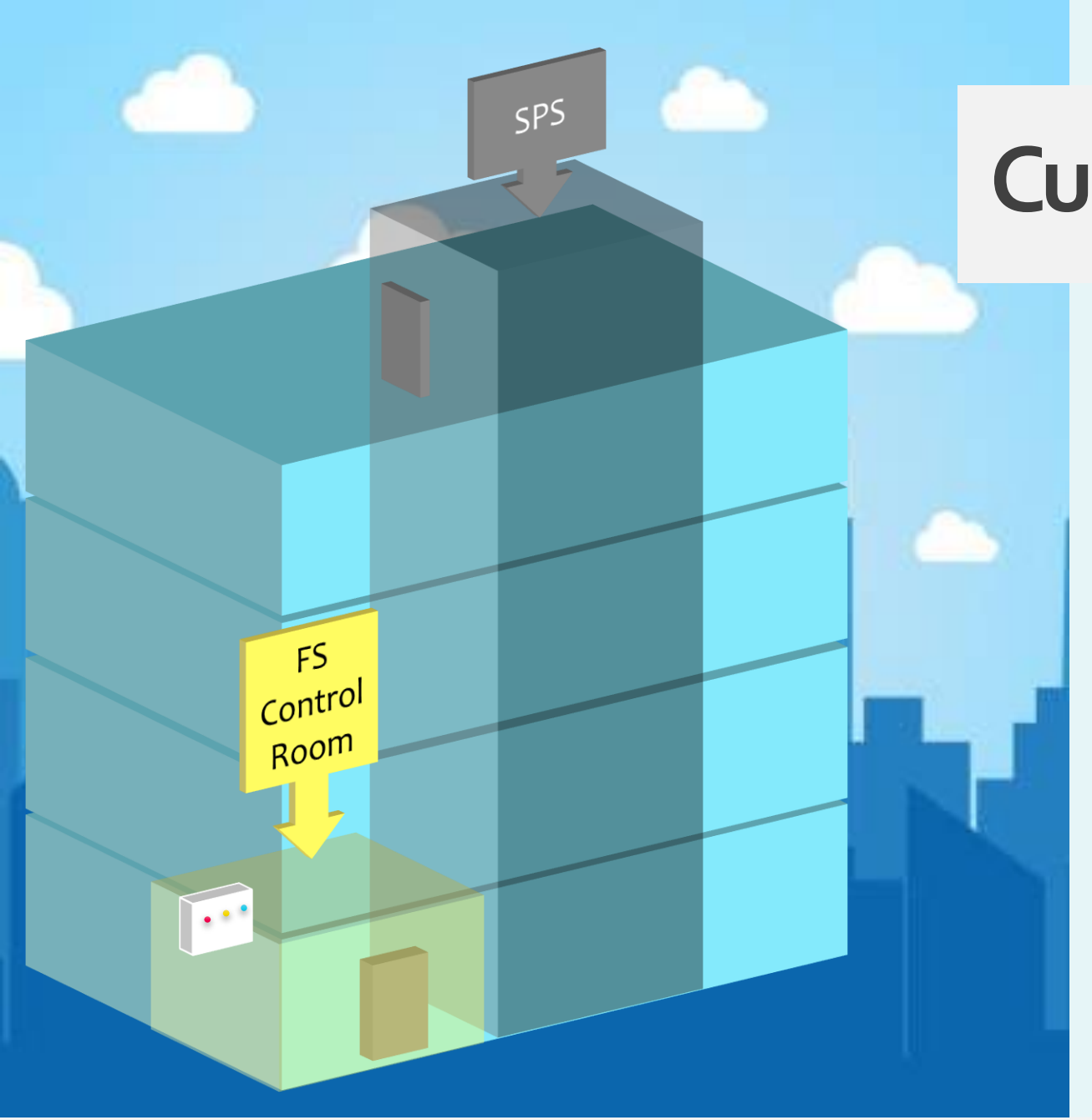
- More and more buildings are designed to install SPS
  - More than 200 buildings  has installed with SPS before 2020
  - In year 2020, 18 SPS acceptance applications were received
  - In year 2021,  15 SPS acceptance applications were received

- Building type had expanded to Basement, Industrial, Commercial, Institutional, Hotel and residential development

# Fire fighting strategy

Information immediate available to fire fighter at scene:

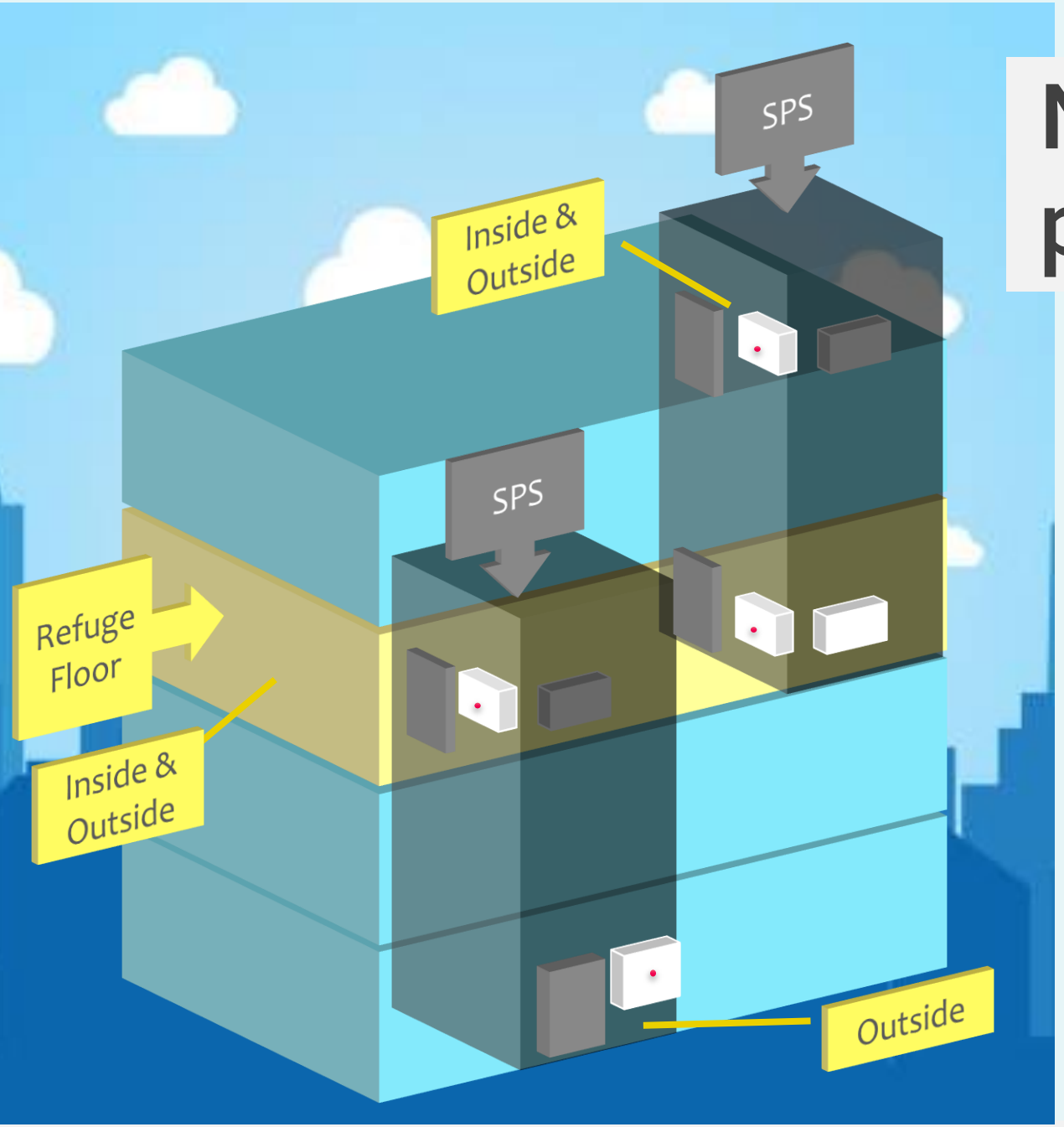
1. SPS location
2. SPS operational status




# Current SPS indication

- Indicator lights displaying the status of any pressure differential system should be located at each fire service access point or supervisory panel.

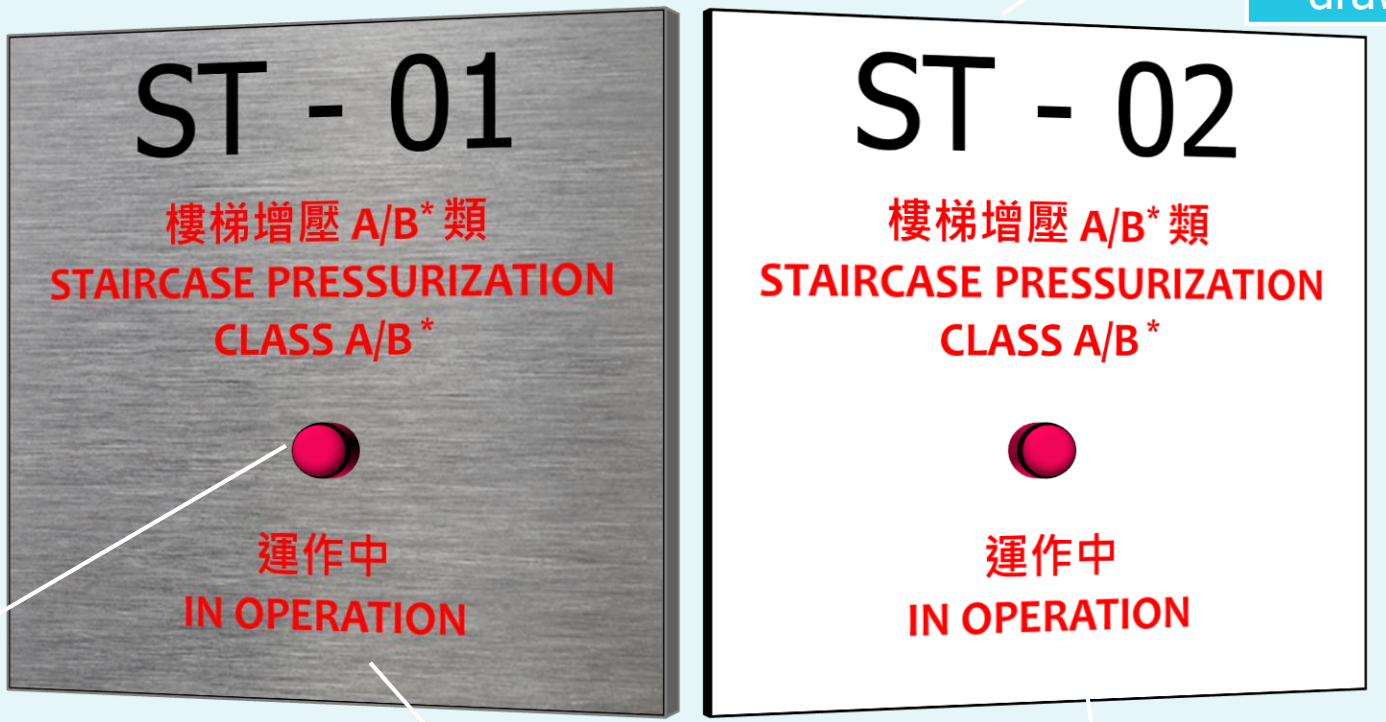
- Nearly all indicator light are installed at supervisory panel in F.S. control room




# New requirement of notice plate

1. Outside the final exit
2. Inside and outside the exit on the topmost floor, i.e. roof floor exit or refuge floor exit

# Notice Plate Specifications



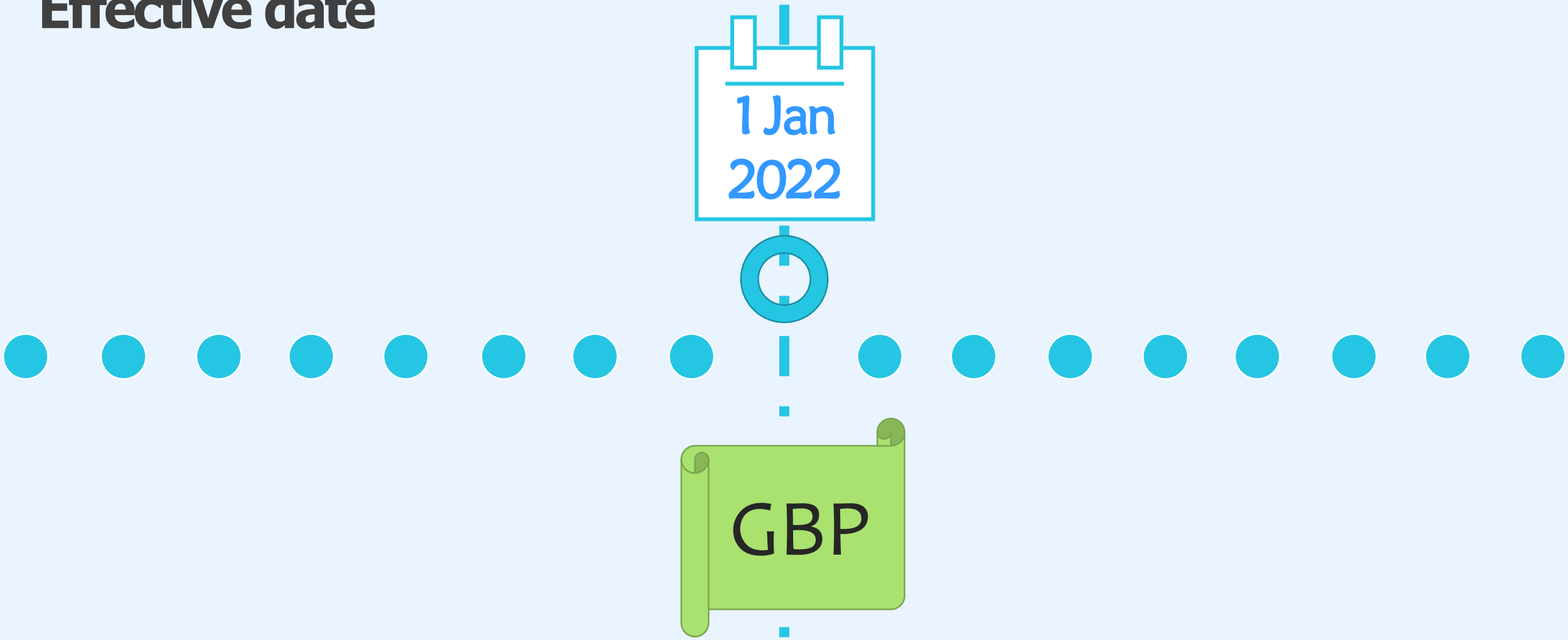

Staircase No. in SPS drawing

Red indicator

Characters shall be
1. >50mm high
2. in block letters
3. in red color

White / Stainless steel background

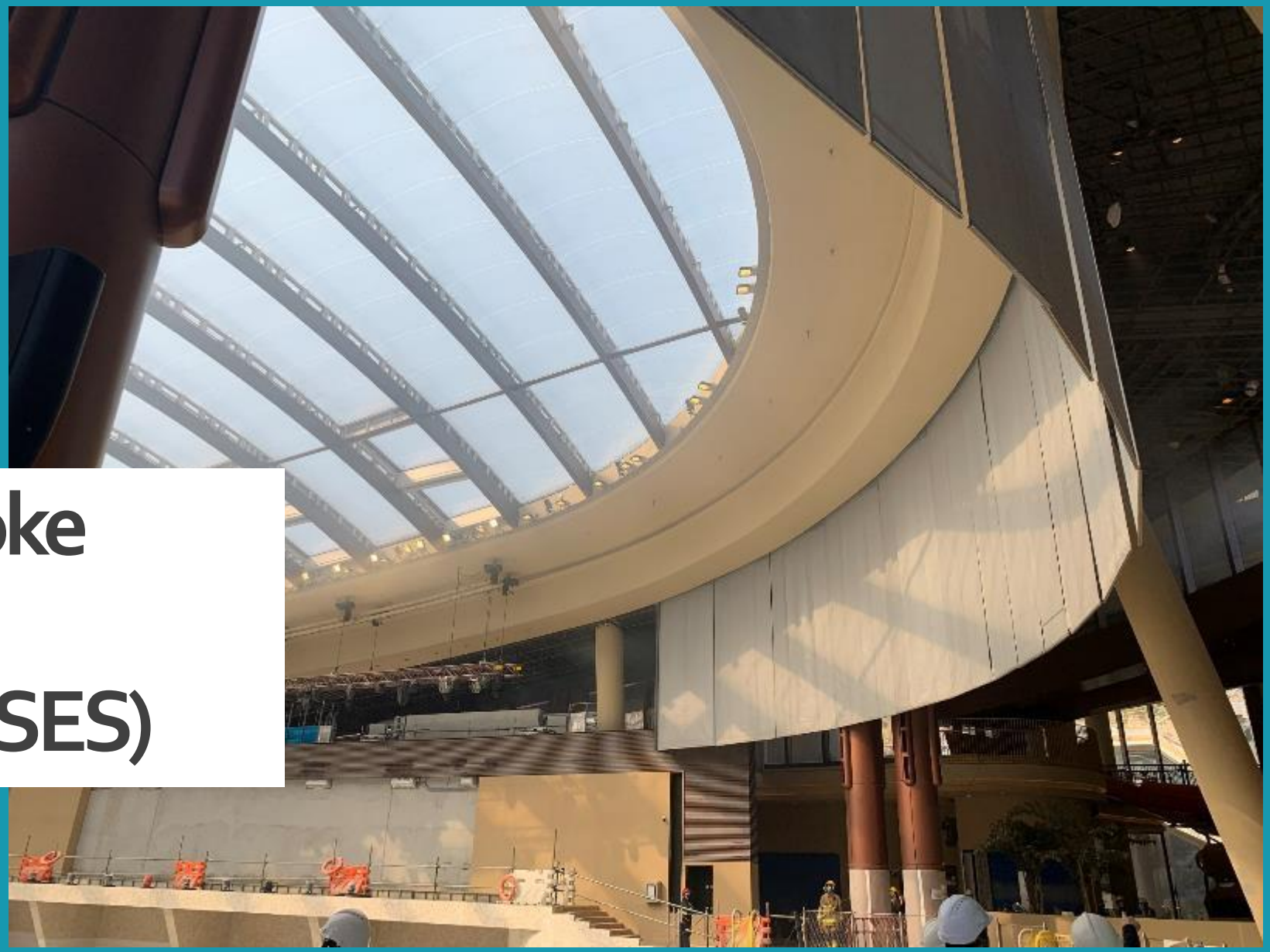
# Effective date




Encourage to adopt this new requirement

Effective on or after 1 January 2021

# Clarification of Smoke Curtain for smoke extraction system (SES)



# Function of smoke curtain

To prevent or retard smoke entry to another area or void

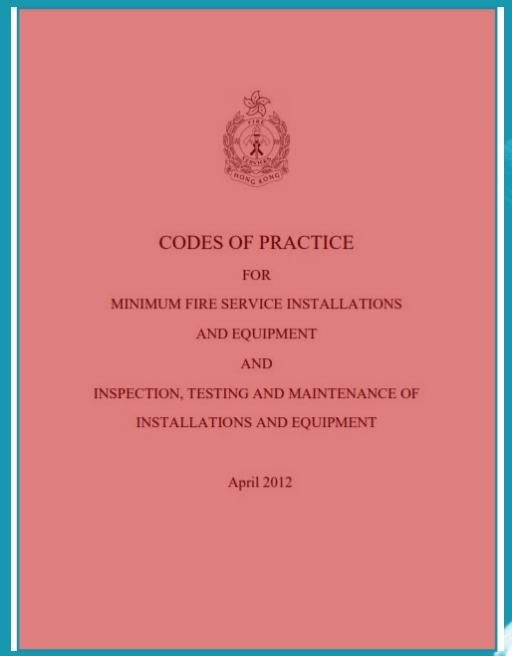
To create a smoke reservoir by containing and limiting the travel of the smoke

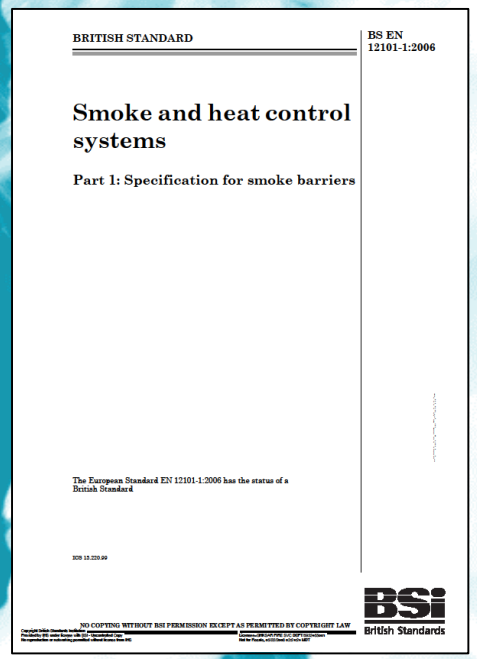
To channel smoke in a pre-determined direction

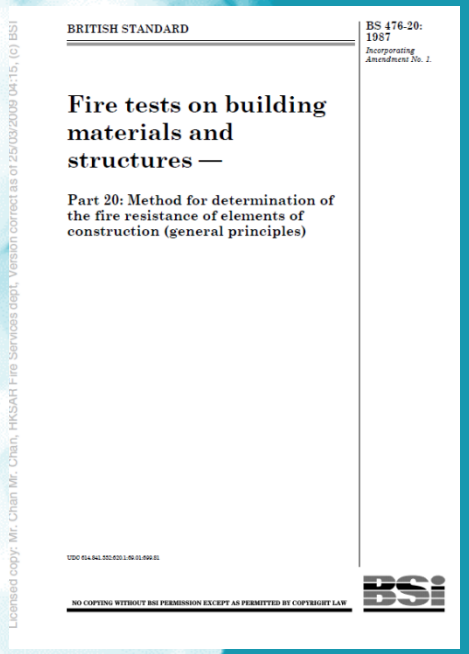
# Requirement of smoke curtain

1. Performance / Design Requirement
   - FS COP 5.23, FER

2. Material requirement
   - FSD Accepted type
   - BS 476 : Part 20
   - BS EN 12101 : Part 1




Both requirement shall be satisfied during the F.S. inspection

# Gaps and Deflection

Debate

Installed complying manufacturer's requirement

BS EN 12101 : Part 1 allows gaps and deflection on smoke curtain

# Clarification

**BS EN 12101-1 stated clearly in 5.5.3 Openings, gaps and/or perimeter spaces:**

- Smoke barriers which do not require functional tolerances shall have ***all gaps sealed*** to ***prevent smoke leakage***.

- Active smoke barriers shall be ***overlapped and conjoined*** where they are fixed in a straight line to prevent leakage. Where this cannot be achieved or if products are manufactured otherwise, the designer shall make ***allowances*** for increased leakage within his calculations.

- NOTE 4 Any gaps within a smoke barrier system should not ***prejudice the fitness for purpose of the system*** in accordance with the system design. Any gaps above or around the smoke barrier assembly in the smoke reservoir should be sealed or minimized.

**BS EN 12101-1 does not allow the gaps, deflection in active smoke barriers system. Just provide a method to aid the design for estimation of the deflection, if unavoidable.**

# Material acceptance criteria


(a) Single unit having maximum width of 5,555mm and a maximum drop of 1,970mm
(b) Multiple con-joined curtains with a minimum with 400mm overlap are allowed with no maximum number of units with the following limitations: Individual unit 5,543mm and a maximum drop of 2.820mm

Multiple con-joined curtains with minimum 212mm overlap and a maximum drop of 10m


# Conclusion

Installation of smoke curtain shall satisfy **design** requirement and **material** approved criteria

**Continuous, overlapped** and **conjoined** increase resistance to deflection and smoke leakage.

System designer shall take the gaps and deflection into his **consideration and design at beginning** if unavoidable**.**

# Study on Limitation of False Alarm

CHIN Ka-ho
Senior Station Officer
Fire Service Installations Task Force

# Agenda

1. False alarm
2. False alarm statistics
3. Measures taken by FSD
4. Multi-sensor Detector
5. Conclusion

# False Alarm

## Definition

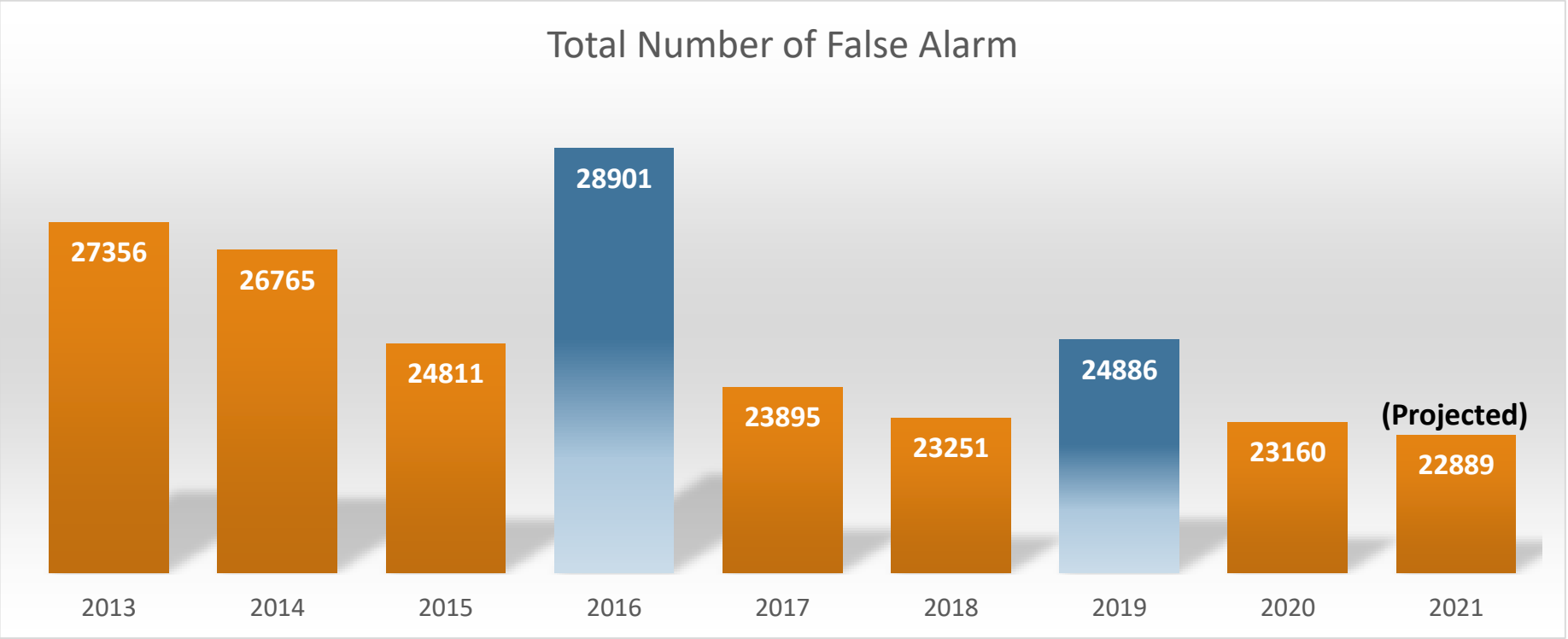
- A fire alarm activation resulting from a cause other than a fire

## Impact

- Lower responsiveness to actual alarm
- Lower occupants confidence
- Divert essential services from genuine incidents
- Disruption to business
- Nuisance to neighbourhood

# False Alarm Statistics

## Overall Fire Alarm Statistics (2013 – present)



# False Alarm Statistics

## Overall Fire Alarm Statistics (2013 – present)

- 2016 (28,901)
  - ***52 days with thunderstorms*** v. avg 38.6 days*
  - ***Total rainfall 3026mm*** v. avg 2389.5mm*
- 2019 (24,886)
  - ***59 days with thunderstorms*** v. avg 38.6 days*

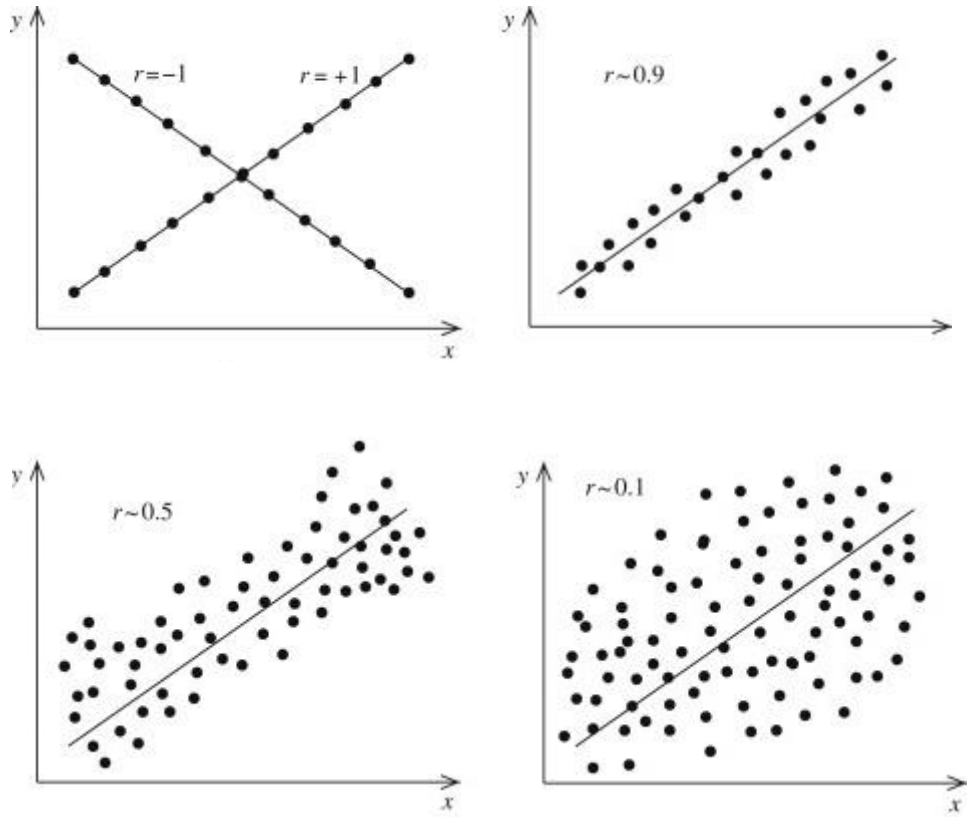
** Records from Hong Kong Observatory, the long term average (1981 – 2010)*

# False Alarm Statistics

## Correlation between False Alarm and Weather

*Correlation Coefficient is used to analyze the correlation between false alarms and weather. The correlation coefficient indicates how strongly two variables are related to each other.*

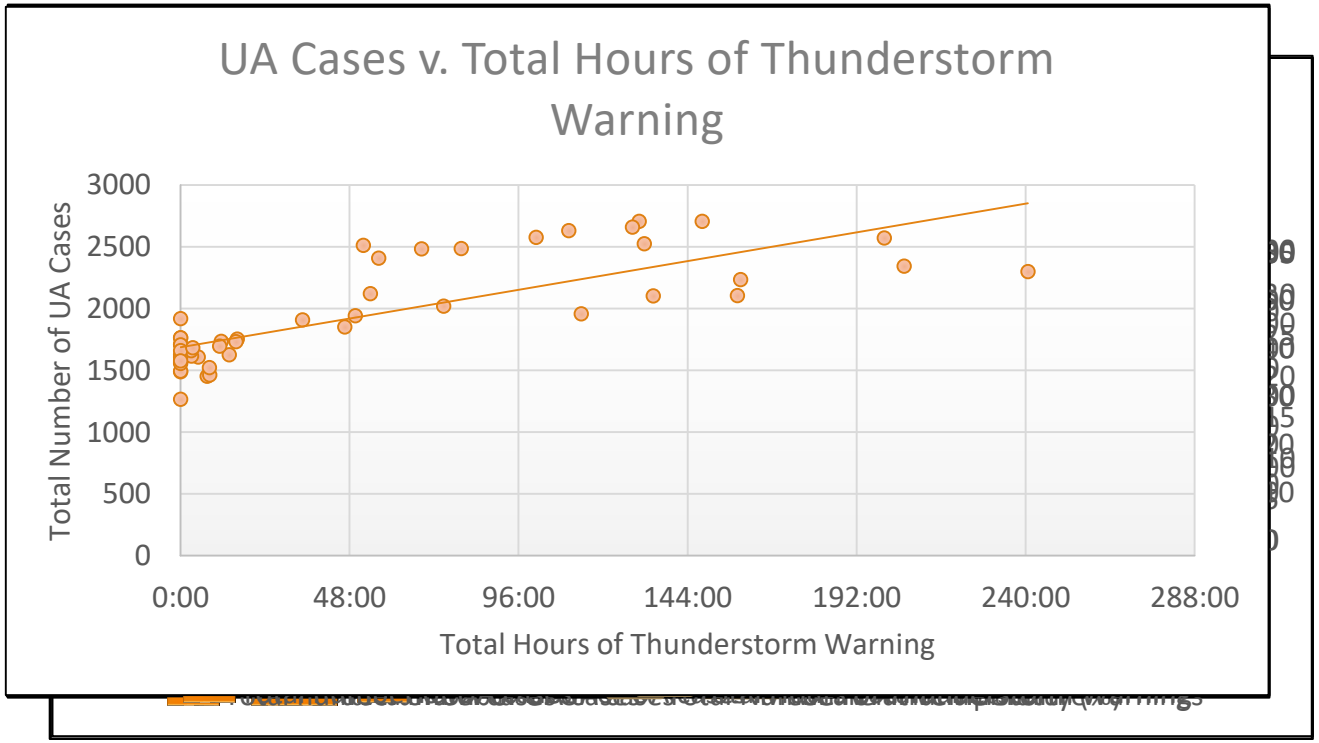
***+1 indicates a perfect positive correlation.***
***-1 indicates a perfect negative correlation.***
***0 indicates no correlation.***



# False Alarm Statistics

## Correlation between False Alarm and Weather (2017 – 2021)

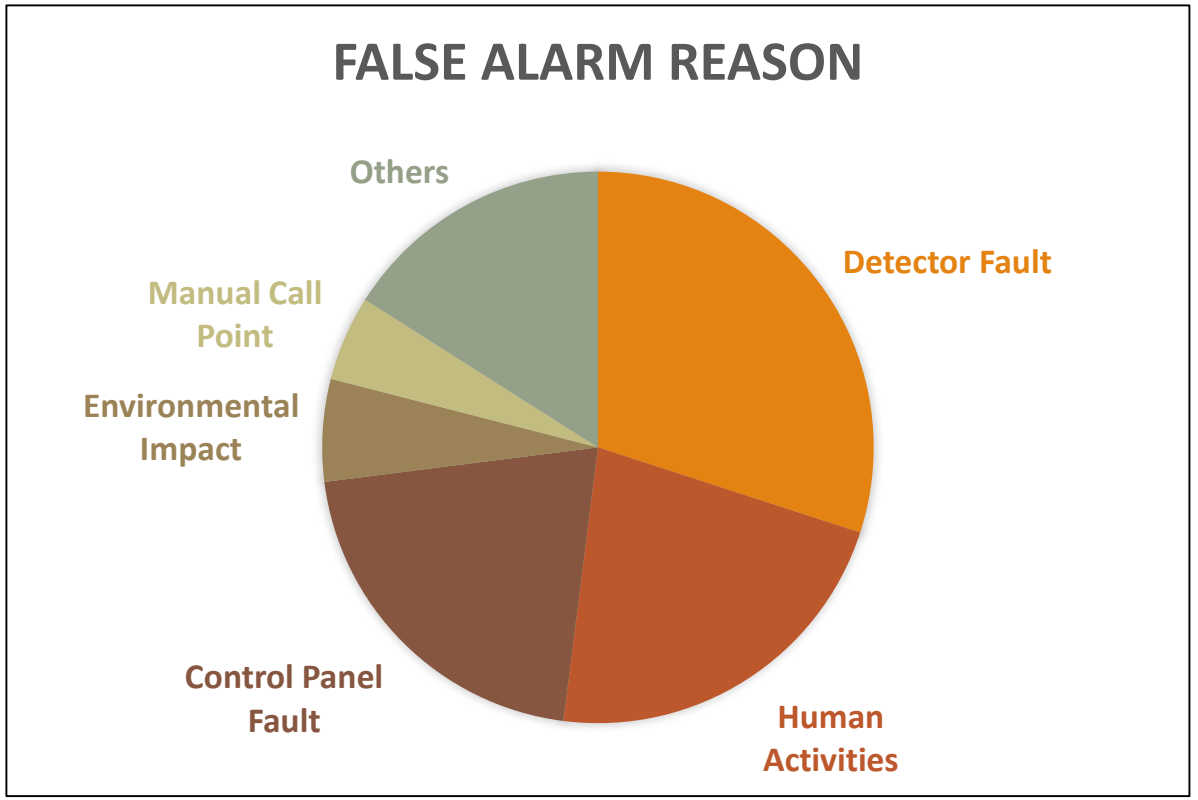
- Mean Relative Humidity
  - 0.53
- Mean Air Temperature
  - ***0.72***
- Total Rainfall
  - ***0.84***
- Total Number of Thunderstorm Warnings
  - ***0.83***
- Total Hours of Thunderstorm Warnings
  - ***0.79***



# False Alarm Statistics

**2017 - 2021**

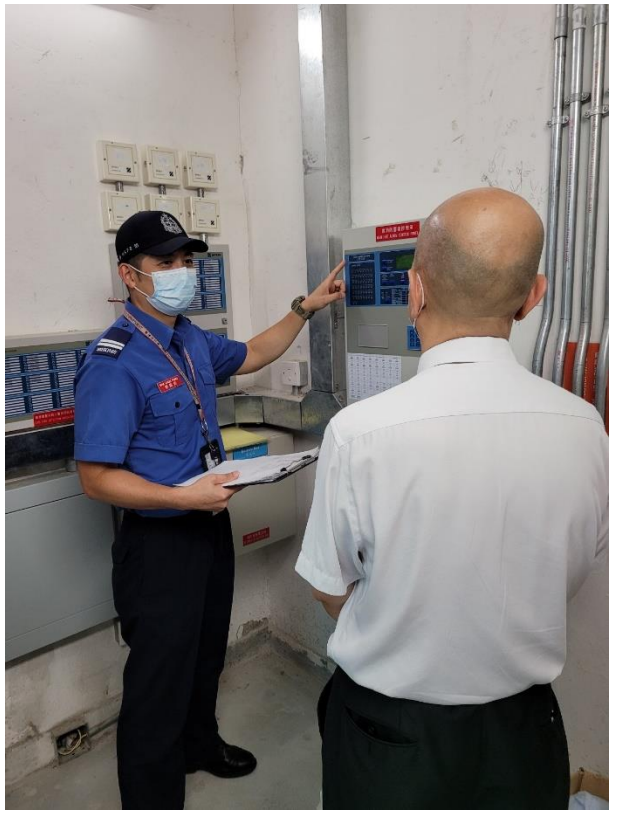
- False Alarm Causes:-
  - ***Detector Fault (30%)***
  - ***Human Activities (22%)***
  - ***Control Panel Fault (21%)***
  - ***Environmental Impact (6%)***
  - ***Manual Call Point (5%)***
  - ***Others (16%)***



# Measures taken by FSD

## Proactive Inspection

- ***1,950*** False Alarm Cases handled by this Department (2017-2021)
  - Over 10 nos. of False Alarms at same premises in 12 months
  - Over 3 nos. of False Alarms at same call points in 3 months



# Measures taken by FSD

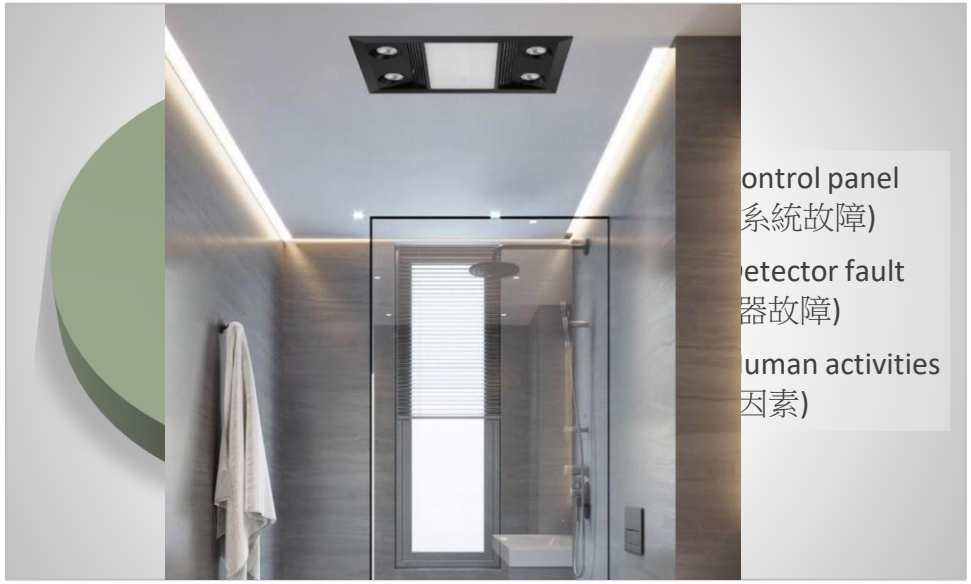
## Proactive Inspection

- Multi-sensor Detectors
- Upgrade of FS Control Panel
- Protective cover on MFA Call Point
- Isolation of FSI/ Suspension of DTL during renovation works
- Management measures (e.g. avoid steam generating activities below smoke detectors, giving advice to customer, etc.)

# Measures taken by FSD

## Proactive Inspection

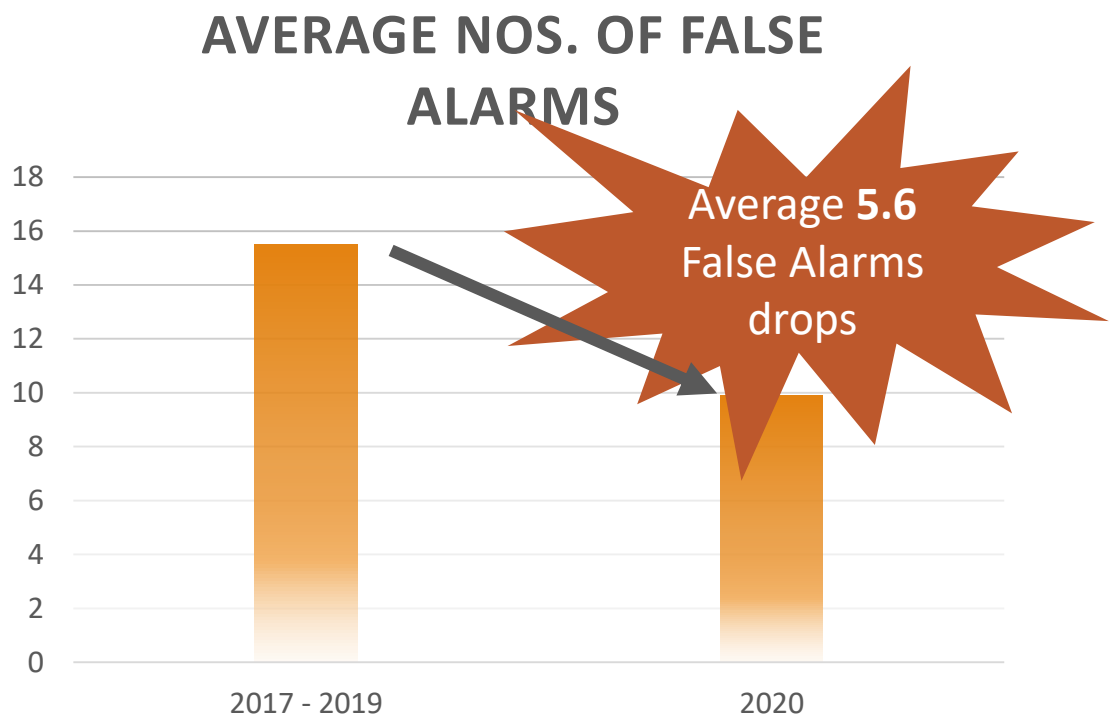
- **ABC Hotel, Mong Kok**
  - ***58*** nos. of false alarms in ***Jan – Jun 2021***
  - 47 nos. caused by Human Activities
  - Inspection revealed that most were caused by steam from shower room
  - RP was advised to:-
    - Use multi-sensors detectors
    - Relocation of smoke detectors
    - Modify power supplies of extraction fan and lighting to switch them on at the same time



# Measures taken by FSD

## Proactive Inspection

- In 2017 - 2019, FSD inspected 1,047 premises
  - ***15.5 nos. of false alarms***
- In 2020, the subject premises
  - ***9.9 nos. of false alarms***



# Multi-sensor Detectors

## Introduction

- *Combination of photoelectric and thermal sensing technologies*
- *Microprocessor in the detector head that processes alarm data, adjusts its sensitivity automatically*
- *Increase immunity to false alarms*

# Multi-sensor Detectors

## Successful Cases

- Multi-sensor Detectors


**Kowloon Hospital**


**Kwai Chung Hospital**


**Tai Po Hospital**


**North District Hospital**


**Lo Wu Correctional Institution**


**XYZ Hotel**


**Wong Tai Sin Hospital**


**Tung Wah Eastern Hospital**


**DEF Hotel**


**University - Hall**

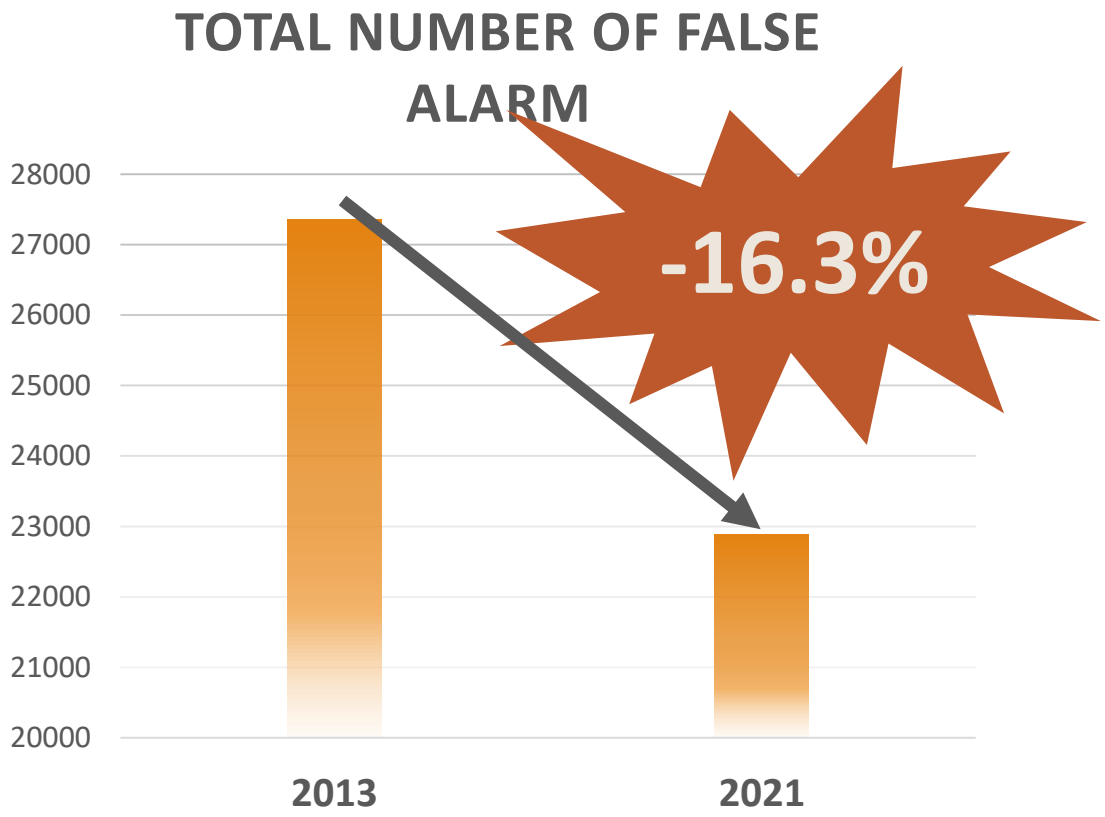

**University - Hall**


**HZMB Hong Kong Port Passenger Clearance Building**

# Conclusion

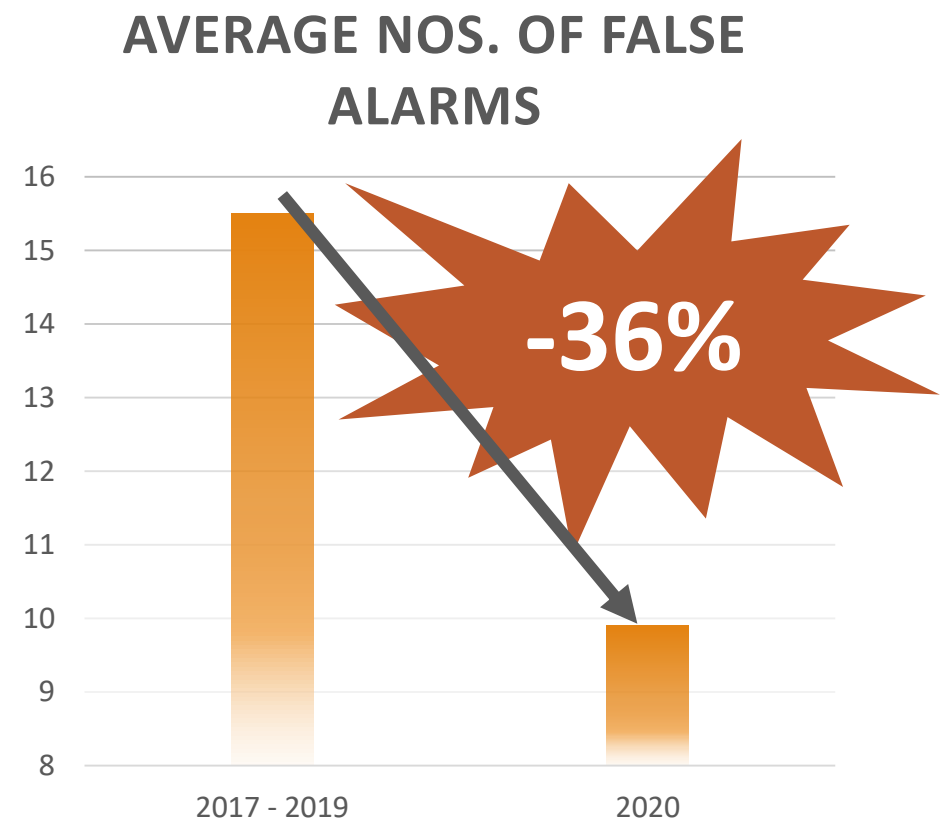
- False alarm
  - A fire alarm activation resulting from a cause other than a fire
- False alarm Statistics
  - 2013 to 2021

    Reduced by **16.3%**



# Conclusion

- Measures taken by FSD
  - 1,950 Proactive inspections
  - Reduced from **15.5** to **9.9**
- Multi-sensor detectors



# Thank you

# Legislative Amendments to Dangerous Goods Ordinance and its Subsidiary Legislation

# Regulatory Regime of Dangerous Goods Ordinance, Cap. 295

Manufacture

Store

Convey

Use



Packing, Marking and Labelling

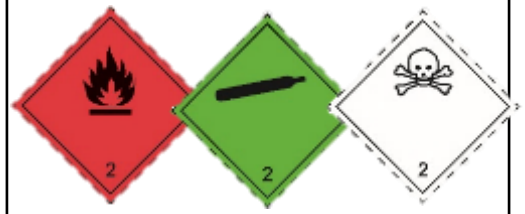
| 1956 | 2002 | 2012 | 2021 |
| --- | --- | --- | --- |
| Dangerous Goods Ordinance<br>《危險品條例》<br>(Cap. 295) | DG (Amendment) Ord. 2002<br>《2002年危險品(修訂)條例》<br>(Cap. 295) | | |
| DG (Application & Exemption) Regulations<br>《危險品(適用及豁免)規例》<br>(Cap. 295A) | | DG (A&E) Reg. 2012<br>《2012年危險品(適用及豁免)規例》<br>(Cap. 295E) | DG (A&E) 2012 (Amendment) Reg. 2021<br>《2021年〈2012年危險品(適用及豁免)規例〉(修訂)規例》<br>(Cap. 295E) |
| DG (General) Regulations<br>《危險品(一般)規例》<br>(Cap. 295B) | | | DG (Control) Regulation<br>《危險品(管制)規例》<br>(Cap. 295G) |
| DG (Shipping) Regulations<br>《危險品(船運)規例》<br>(Cap. 295C) | | DG (Shipping) Reg. 2012<br>《2012年危險品(船運)規例》<br>(Cap. 295F) | |
| DG (Government Explosives Depots) Regulations<br>《危險品(政府爆炸品倉庫)規例》<br>(Cap.295D) | | | |
| | | | DG(Miscellaneous Amendments) Bill 2021<br>《2021年危險品(雜項修訂)條例草案》 |

# Objectives


Aligning with International Standards
Promoting Public Safety
Facilitating Trades & Public

# 1. Aligning with International Standards

## Classification of DG

| DG | Label | Cat. | Class | Label | DG |
|---|---|---|---|---|---|
| Compressed gases |   | Cat. 2 | Cl. 2 |   | Gases |
| Giving off inflammable vapour |   | Cat. 5<br>Cl. 1/2 | Cl. 3 |   | Flammable liquids |
| Diesel oils, furnace oils and other fuel oils | | Cat. 5<br>Cl. 3 | Cl. 3A |   | Diesel oils, furnace oils and other fuel oils |

# 1. Aligning with International Standards

Packing

Marking

UN 1230

Methanol

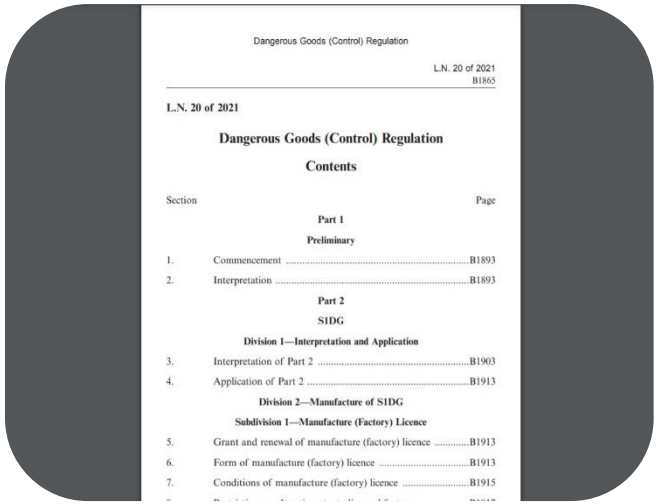
Labelling


*Independent from Licensing Requirements

# Objectives


Aligning with International Standards
Promoting Public Safety
Facilitating Trades & Public

# 2. Promoting Public Safety



Dangerous Goods (Control) Regulation

L.N. 20 of 2021
B1865

**L.N. 20 of 2021**

**Dangerous Goods (Control) Regulation**

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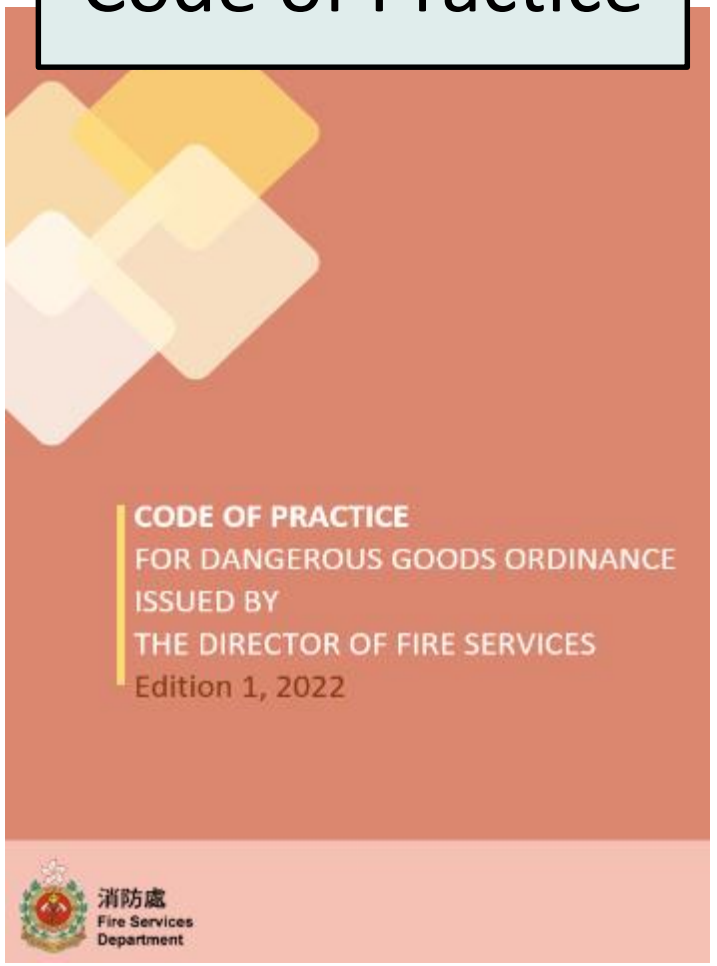
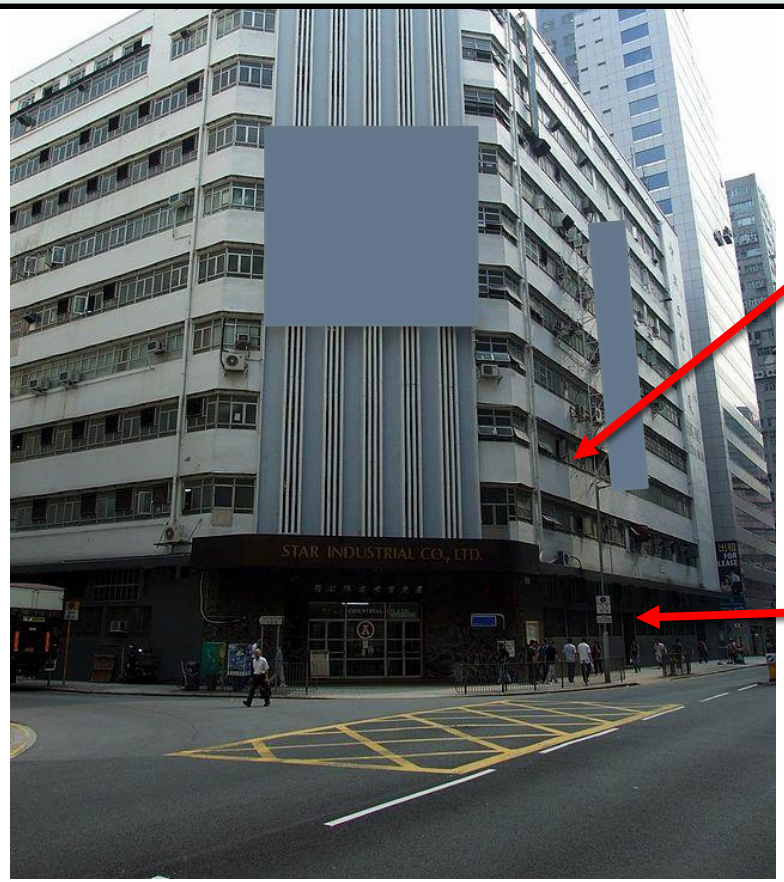
Code of Practice



# 2. Promoting Public Safety

Store and Use Licence




Use Area


DG Store

# 2. Promoting Public Safety

| | Class 3A DG<br>(Diesel or Fuel Oil or Furnace Oil) |
|---|---|
| General EQ | 500 L |
| Industrial EQ | 2,500 L |

- Approval mechanism for the storage and use of Class 3A DG (≤ 2,500 L) used as fuel for an emergency generator remains unchanged

# Objectives

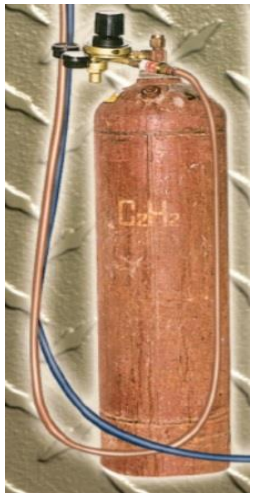

Aligning with International Standards
Promoting Public Safety
Facilitating Trades & Public

# 3. Facilitating Trades & Public

- Balanced between the public safety and the daily use of DG by the public
- Given a higher exempt quantity

Paint Materials(Class 3 and/or Class 8)

General EQ: 250L
Industrial EQ: 250L




Acetylene (Class 2.1)

General EQ: 150L
Industrial EQ: 300L

# 3. Facilitating Trades & Public

**Extant**

Mixed storage of DG of different categories is not permitted

**New**

Mixed storage of compatible Class 4 to 9 DG is permitted

# Transitional Period (24 Months)

## Renewal of Licence

- May choose to renew according to extant legislation
- Must comply with new FSR before the end of transitional period



To specify
Use Area and Hazardous Area

# Implementation Plan


Code of Practice


Application Guidebook


API

Website

Seminars


Pamphlets

# Thank you

Dangerous Goods Legislation Division / Mr. LI Tsz-chun / 2733 7590

# Hong Kong Fire Services Department

# Promotion of Wider Use of Stand-alone Fire Detectors in Hong Kong

# Strengthen the Public's Evacuation Awareness

Incipient Stage of Fire

Detection

Warning

Evacuation

**Untenable Conditions**

- Smoke lodged
- Toxicity
- Poor visibility
- High temperature

# Legislative Amendment of Cap. 95B - Fire Service (Installations and Equipment) Regulations

- Upon **one's volition** (not required by or pursuant to law ):

| | |
|---|---|
| Reg. 6(2) | Exempt to be **installed** by an RFSIC |
| Reg. 7(2) | Exempt to be **maintained, inspected** or **repaired** by an RFSIC |
| Reg. 8(1) | Owners of SFDs are exempted from the statutory duty to<br>(i) keep SFD in **efficient working order**; and<br>(ii) conduct **annual inspection** by an RFSIC |


With effect from 1 Sep 2021

# Public Education – General Guidelines

**Purchase** of stand-alone fire detector

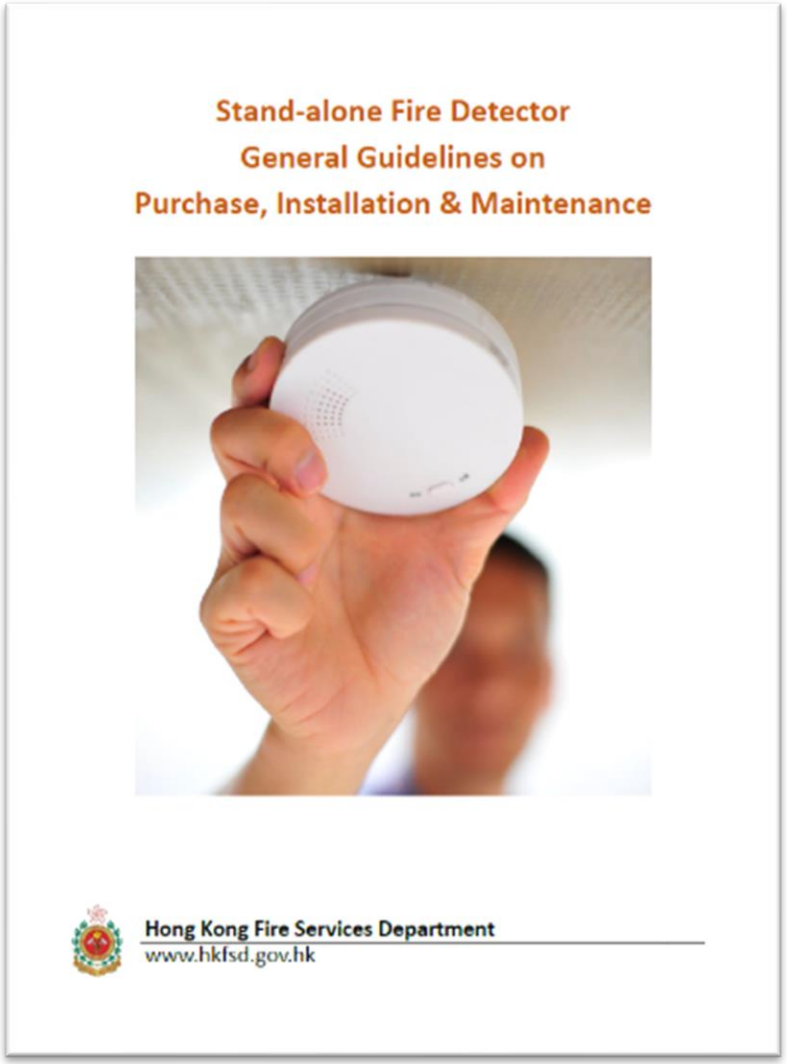
→ Types, standards, optional features (e.g. interconnection)

**Installation** of stand-alone fire detector

→ Where & how to install

**Maintenance** of stand-alone fire detector

→ Regular checking & testing



# Public Education - FSD's Website






Pamphlet


Poster

# Public Education – Promoting the Use of SFD


Promotional Video


TV Programme

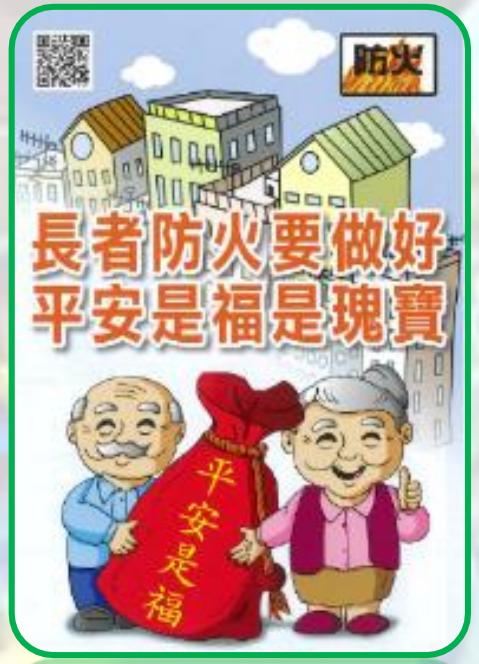
# Public Education - Ethnic Minorities

# Pilot Scheme – Home Fire Safety Visit

- **HKFSD Volunteer Team**
- **Target Group:**
  - Elderly living alone
  - Ethnic minorities
- **More than 30 units**

# Pilot Scheme – Home Fire Safety Visit








識滅火　識自救　識逃生

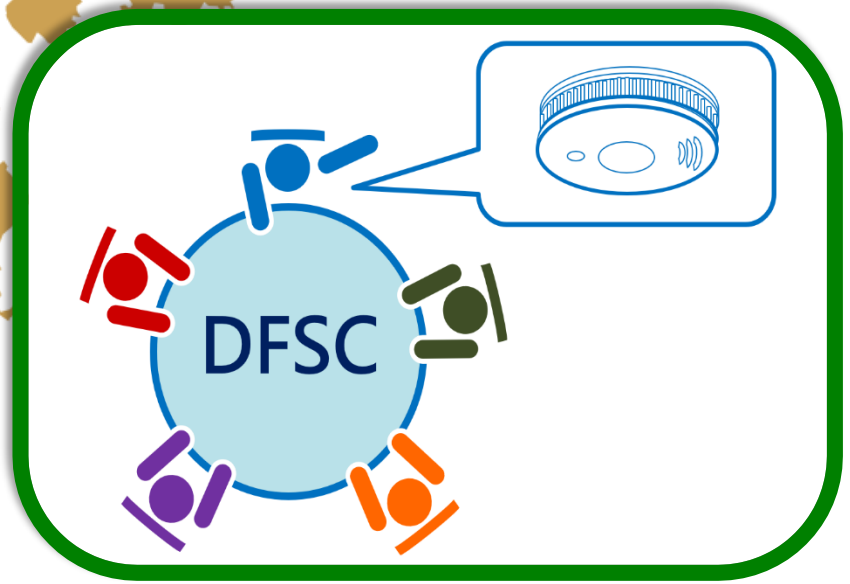
# Public Education – District Fire Safety Committee

*New Territories*
1 Islands District
2 Kwai Tsing District
3 North District
4 Sai Kung District
5 Sha Tin District
6 Tai Po District
7 Tsuen Wan District
8 Tuen Mun District
9 Yuen Long District

*Kowloon*
10 Kowloon City District
11 Kwun Tong District
12 Sham Shui Po District
13 Wong Tai Sin District
14 Yau Tsim Mong District

*Hong Kong Island*
15 Central & Western District
16 Eastern District
17 Southern District
18 Wan Chai District

**Promoting the Use of Stand-alone Fire Detectors**



# Thank you

# Voluntary Recognition Scheme for FSI Technicians

機電工程署 EMSD

建築署 Architectural Services Department

CityU 香港城市大學 City University of Hong Kong

FSICA

# Background

**Purpose:**

- enhance the professional standards among FSI practitioners responsible for FSI maintenance works
- uplift the installation and maintenance quality of building FSI

May 2021

# Establishment of Technical Advisory Committee (TAC)

機電工程署 EMSD

Chief Engineer (General Engineering Services)

建築署 Architectural Services Department

Chief Building Services Engineer

Assistant Director (Licensing and Certification)

CityU 香港城市大學 City University of Hong Kong

Chair Professor, Department of Architecture and Civil Engineering; cum Chief-of-Staff, Office of the President,

FSICA 香港註冊消防工程公司商會

Chairman, The Association of Registered Fire Service Installation Contractors of Hong Kong Ltd.

July 2021

# Approved Scheme Details (Phase 1)

| Type | Module | Subject | Organizers |
|---|---|---|---|
| Core Modules | Module 1 | Fundamental Technical Knowledge, Laws and Guidelines, Values and Integrity | FSD |
| | Module 2 | Introduction of Major FSIs | VTC |
| Selective Modules | Module 3 | FH/HR System | VTC |
| | Module 4 | Sprinkler System | |
| | Module 5 | Fire Alarm System | |
| | Module 6 | Fire Detection System | |
| | Module 7 | Smoke Extraction System | |
| | Module 8 | Staircase Pressurization System | |

Sep 2021

# Commencement of Trainings (Phase 1)

## Module 1
## Fundamental Technical Knowledge, Laws and Guidelines, Values and Integrity

Oct 2021

# Module 2
# Introduction of Major FSIs

## Oct 2021




## Module 3 FH/HR System



## Module 4 Sprinkler System

# Way Forward

**Development** of training modules for other major FSIs

**Expansion** of the Scheme to recognize more than 400 FSI Technicians in 2 years

**Promotion** of the Scheme to all FSI Owners

自願認證 專業本領

***Thank you***

# Q & A Session

Please type your questions

Select Icon
選圖案

Q & A Panel
『問與答』面板

“All Panelists”
選“所有答疑者”

Input Text
打字提問

# Thank You !