SCDF
The Life Saving Force
. . . for a safer Singapore

FSM Briefing 2023

Common Fire Safety Enforcement Findings

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Fire Safety Department
Singapore Civil Defence Force

Scope

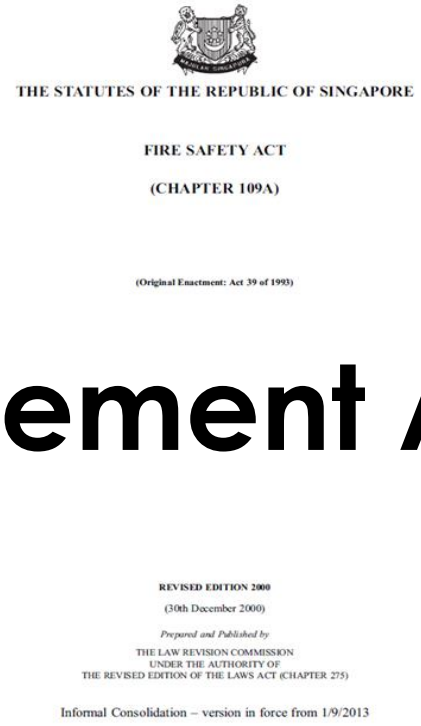
- Introduction
- Enforcement Workflow
- Common Fire Hazards & Fire Safety Offences
- Managing Fire Safety using Technology
- Conclusion

Introduction

- **SCDF regulates fire safety to attain a fire-safe built environment by:**
  - ✓ Formulating fire safety policies – E.g. Fire Safety Act (FSA), Code of Practice for Fire Precautions in Buildings (Fire Code)
  - ✓ Implementing fire safety requirements – E.g. Fire Safety Certificate (FSC), Petroleum and Flammable Materials License (P&FM), Temporary Permit
  - ✓ Partnering the industry players to improve on regulatory systems – E.g. Fire Safety Managers (FSM), Building Owners
  - ✓ Maintaining an effective regulatory regime – E.g. Regular Inspections, Enforcement Actions

Regulatory Regime

- **To create a fire-safe environment by enforcing the FSA and achieved through:**
  - ✓ Scheduled fire safety enforcement checks
  - ✓ Responding to public feedbacks
  - ✓ Concerted joint efforts by SCDF and building managements / owners / FSMs / CERTs



THE STATUTES OF THE REPUBLIC OF SINGAPORE

FIRE SAFETY ACT

(CHAPTER 109A)

(Original Enactment: Act 39 of 1993)

REVISED EDITION 2000

(30th December 2000)

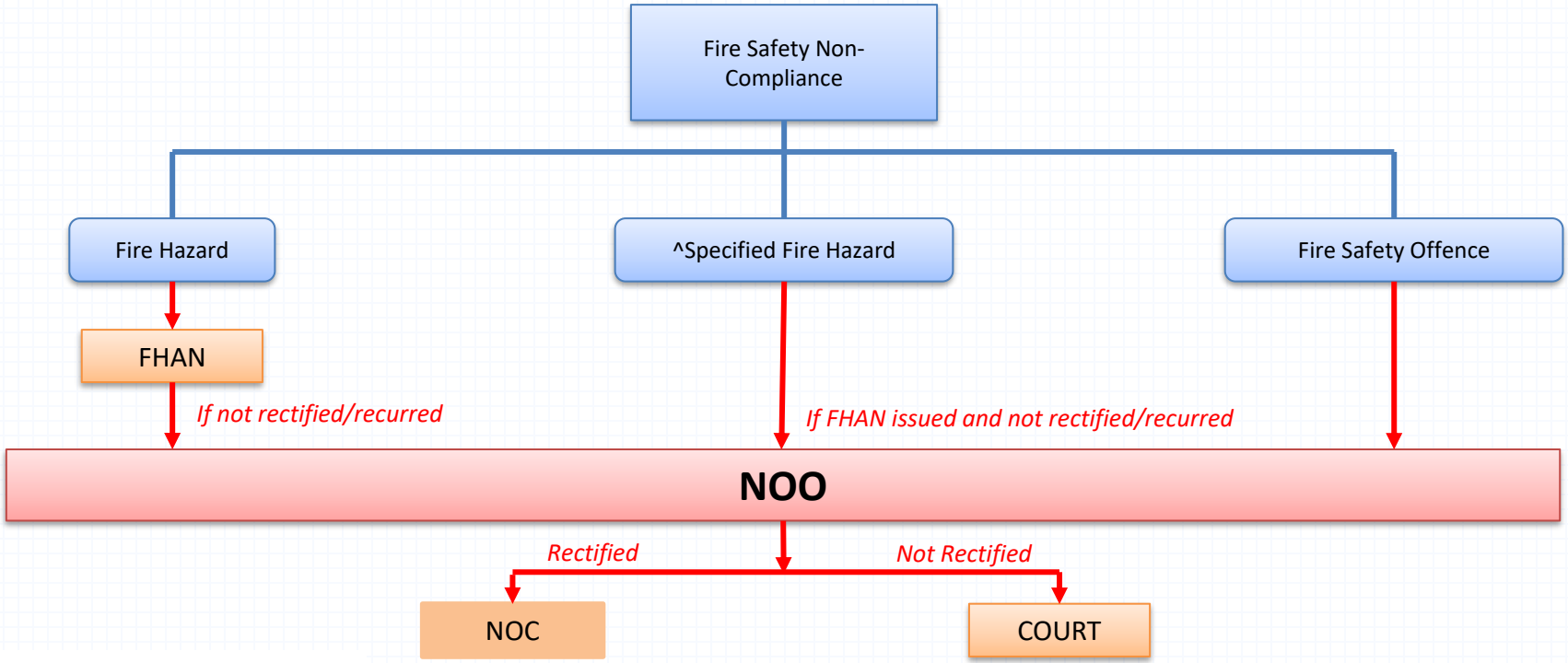
Prepared and Published by

THE LAW REVISION COMMISSION
UNDER THE AUTHORITY OF
THE REVISED EDITION OF THE LAWS ACT (CHAPTER 275)

Informal Consolidation – version in force from 1/9/2013

Enforcement Action

Enforcement Framework



FHAN: Fire Hazard Abatement Notice
NOO: Notice of Offence
NOC: Notice of Composition

^ such as
(i) Overcrowding
(ii) Fire safety measures not in order
(iii) Obstruction to escape route

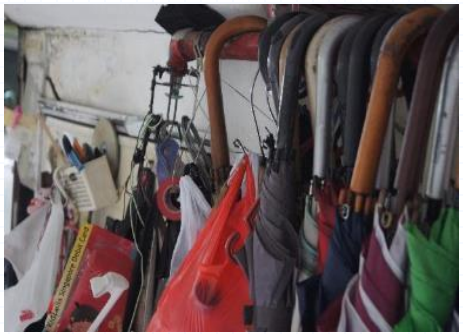
Common Fire Hazards

Fire Hazards

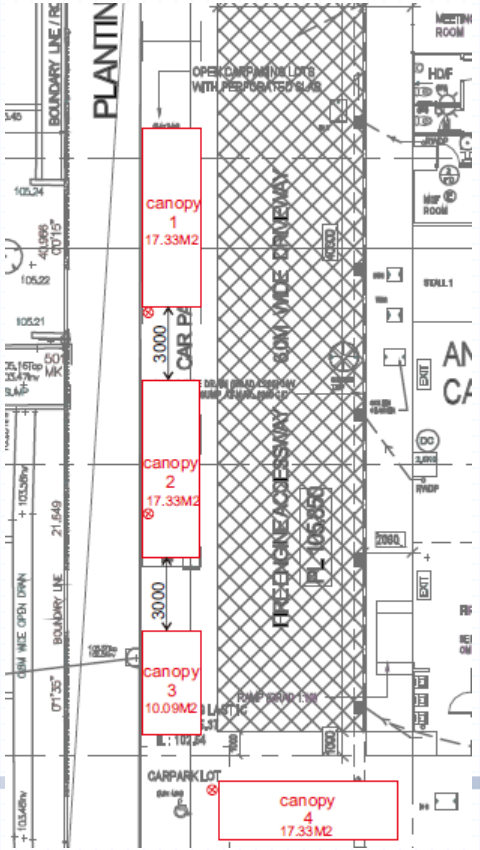
- Any matter or circumstances which materially increase the likelihood of fire or the danger to life or property that would result from the outbreak of fire which includes:
  - ✓ Obstruction to means of escape
  - ✓ Obstruction to fire safety measures
  - ✓ Non-maintenance of fire safety measures
  - ✓ Storage/placement of combustible material
  - ✓ Missing/removal of fire safety measures

Obstruction along Means of Escape

Obstruction to Fire Safety Measures



Obstruction to Fire Engine Access/Accessway



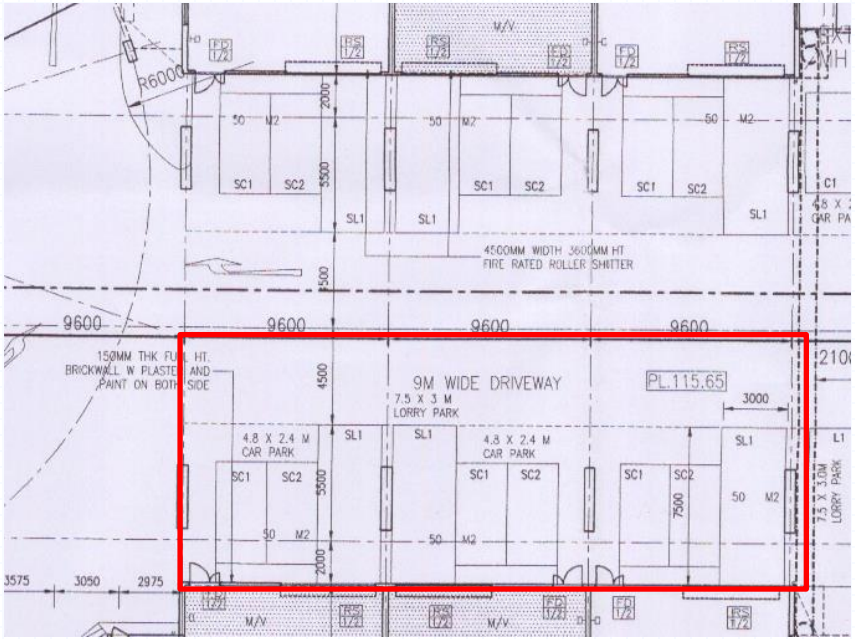
Fire Safety Measures Not in Efficient Working Order

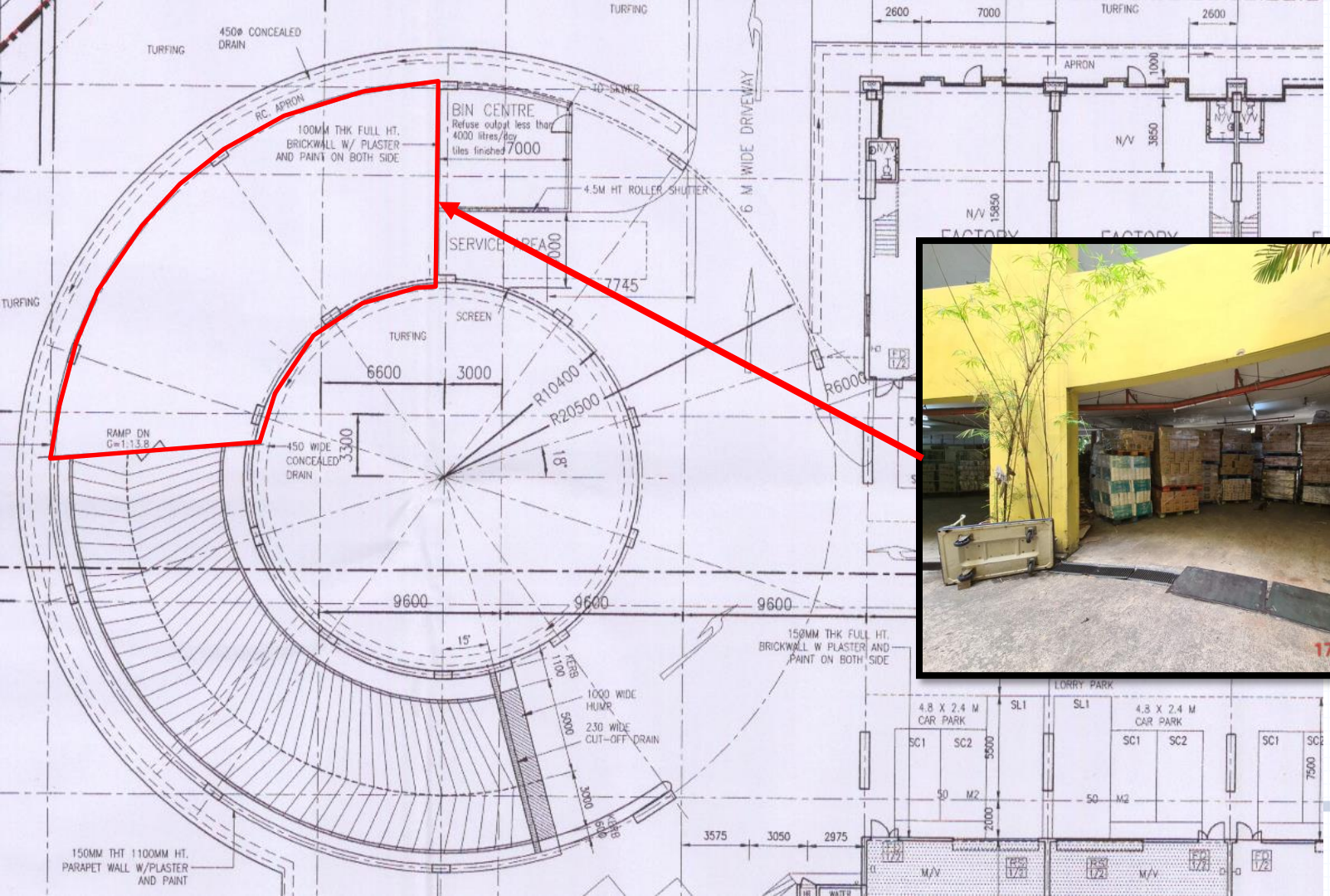
Common Fire Safety Offences

Fire Safety Offence

- Contravention to requirements in Fire Safety Act and its regulations such as:
  - ✓ Change of use of premises
  - ✓ Carrying out fire safety works without approval of plans
  - ✓ Storage of Petroleum and Flammable Material (P&FM) without a valid storage license

Unauthorised Change of Use




TURFING
450Ø CONCEALED DRAIN
RC APRON
100MM THK FULL HT. BRICKWALL W/ PLASTER AND PAINT ON BOTH SIDE
BIN CENTRE
Refuse output less than 4000 litres/day
tiles finished
7000
10" SEWER
4.5M HT ROLLER SHUTTER
SERVICE AREA
4000
7745
SCREEN
TURFING
6600
3000
R10400
R20500
18°
RAMP DN G=1:13.8
450 WIDE CONCEALED DRAIN
3300
9600
9600
9600
15°
KERB
1100
1000 WIDE HUMP
230 WIDE CUT-OFF DRAIN
5000
3000
150MM THT 1100MM HT. PARAPET WALL W/PLASTER AND PAINT
6 M WIDE DRIVEWAY
R6000
2600
7000
TURFING
2600
APRON
1000
N/V
3850
N/V
15850
FACTORY
FACTORY
150MM THK FULL HT. BRICKWALL W PLASTER AND PAINT ON BOTH SIDE
LORRY PARK
4.8 X 2.4 M CAR PARK
SL1
SL1
4.8 X 2.4 M CAR PARK
SC1
SC2
SC1
SC2
SC1
5500
50 M2
50 M2
7500
2000
3575
3050
2975
M/V
M/V
FD 1/2
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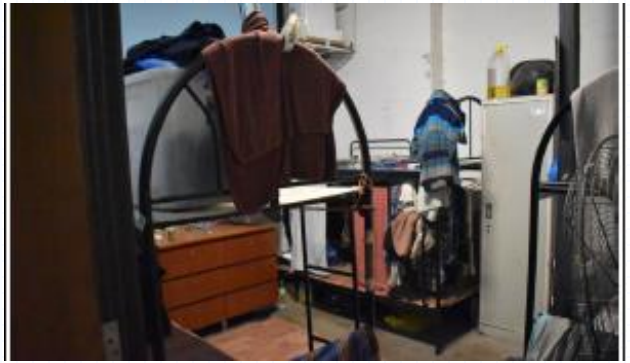
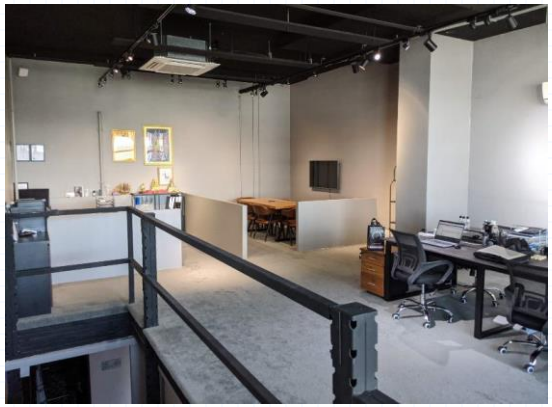
Unauthorised Change of Use to Dormitory

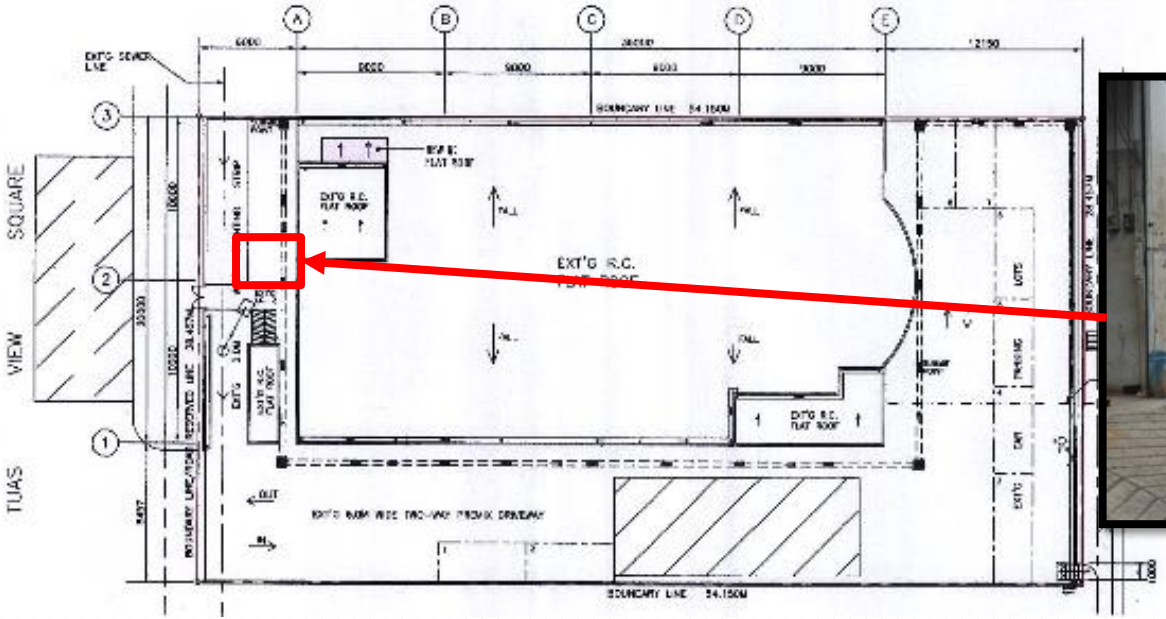


Unauthorised Fire Safety Works

Fire Safety Works (partition and mezzanine floor) without approval of plan



Unauthorised Fire Safety Works



Unauthorised Fire Safety Works

Fire Safety Works (LPG manifold system) without approval of plan

Unauthorised Fire Safety Works

Fire Safety Works (kitchen exhaust duct) without approval of plan

Storage of P&FM Without a Valid Storage Licence

- All storage of P&FM (Petroleum and Flammable Material), regardless of quantity stored, have to comply with the fire safety requirements.
- All storage of P&FM must be indicated in building plans submitted to SCDF for approval.
- Storage licence is required if the quantity stored is above the exemption quantity or if there is a **mixed state** (eg. 10kg acetylene (gas), 800 litres of diesel (liquid)) of P&FM in a factory.

P&FM Mixtures

Mixed storage or keeping of any petroleum and flammable material, or more than one flammable material, in separate containers or compartments within any premises shall be exempted from the requirement of a licence if:

i. Where all the substances are solids, their aggregate weight does not exceed 20 kg;

- Eg. If you store several kinds of petroleum/flammable materials of which all are solids, for instance, aluminum powder, calcium carbide and calcium silicate, you are required to have a storage licence if the overall quantity of all such solids together exceeds 20 kg.

ii. Where all the substances are liquids, their aggregate volume does not exceed 40 L;

- Eg. If you store several kinds of petroleum/flammable materials of which all are liquids, for instance, butanol, chlorobutane and acetone, you are required to have a storage licence if the overall quantity of all such liquids together exceeds 40 L.

iii. Where all the substances are gaseous, their aggregate weight does not exceed 10 kg; or

- Eg. If you store several kinds of petroleum/flammable materials of which all are gases, you are required to have a storage licence if the overall quantity of all such gases together exceeds 10 kg.

iv. Where the substances are in mixed states, their aggregate weight does not exceed 20 kg.

- Eg. If you store several kinds of petroleum/flammable materials of which consist of solids, liquids and gases, for instance, calcium carbide, acetone and acetylene, you are required to have a storage licence if the overall quantity of all such solids, liquids and gases together exceeds 20 kg.

Storage of P&FM Without a Valid Storage Licence

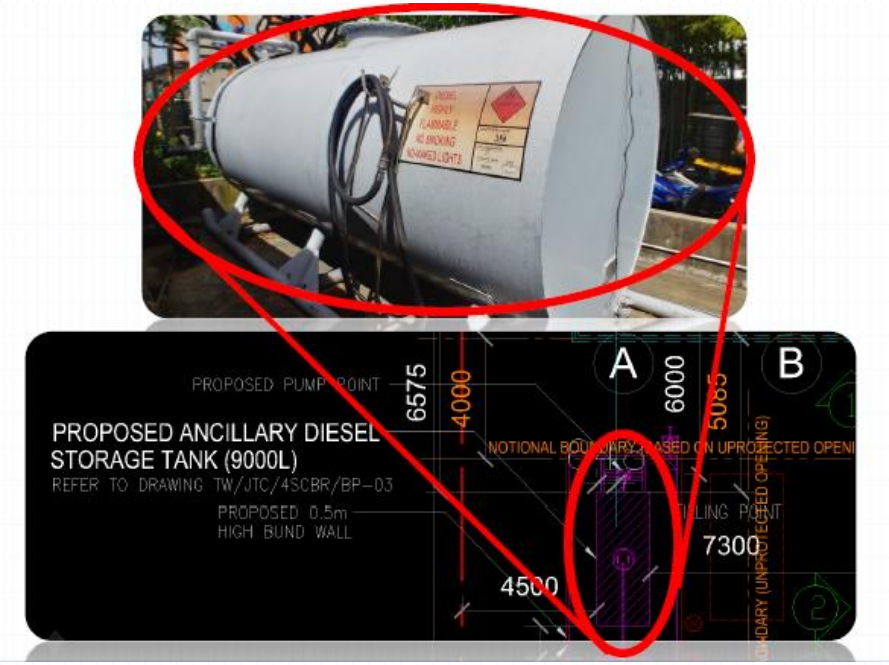
Flammable Materials

The exemption quantities for the 366 classes of Flammable Materials are in the following folder.

Click on the link to download the Exemption quantities for flammable materials. (58.50 KB)

Second Schedule (New)			
S/N	Flammable Materials	*General manufacturing, etc., purpose*	*Medical or laboratory purpose*
1	Acetal	20 L	20 L
2	Acetaldehyde diethylacetal	20 L	20 L
3	Acetoin (3-Hydroxybutanone)	20 L	20 L
4	Acetone	20 L	20 L
5	Acetyl chloride	20 L	20 L
6	Acetyl methyl carbinol (Butanolone)	20 L	20 L
7	Acetylene (gas)	10 kg	10 kg

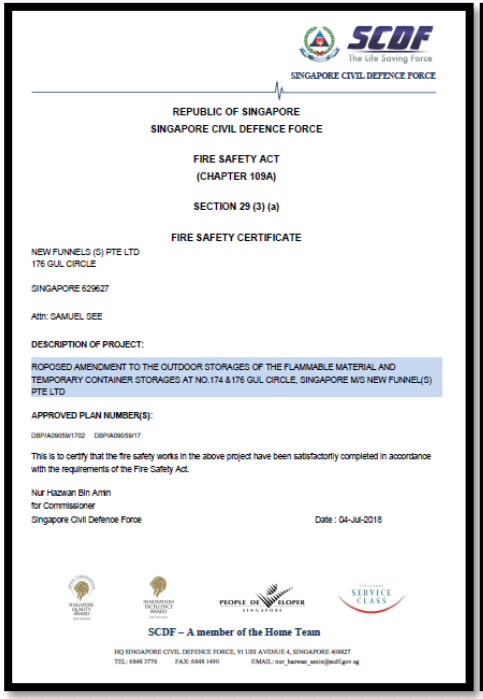
Storage of P&FM Without a Valid Storage Licence



Any Other Classes of Petroleum

Purpose	Exemption Quantity		
	Class I Petroleum	Class II Petroleum	Class III Petroleum
For private use in a private dwelling house or for use in any business other than in a factory	Not more than 20 L	Not more than 200 L	Not more than 1,500 L
For use in a factory	Not more than 400 L	Not more than 1,000 L	Not more than 1,500 L

Storage of P&FM Without a Valid Storage Licence



SCDF
The Life Saving Force
SINGAPORE CIVIL DEFENCE FORCE

REPUBLIC OF SINGAPORE
SINGAPORE CIVIL DEFENCE FORCE

FIRE SAFETY ACT
(CHAPTER 109A)

SECTION 29 (3) (a)

FIRE SAFETY CERTIFICATE

NEW FUNNELS (S) PTE LTD
176 GUL CIRCLE

SINGAPORE 629627

Attn: SAMUEL SEE

DESCRIPTION OF PROJECT:

ROPOSED AMENDMENT TO THE OUTDOOR STORAGES OF THE FLAMMABLE MATERIAL AND TEMPORARY CONTAINER STORAGES AT NO.174 &176 GUL CIRCLE, SINGAPORE M/S NEW FUNNEL(S) PTE LTD

APPROVED PLAN NUMBER(S):

DBP/A0605W1702 DBP/A0605W17

This is to certify that the fire safety works in the above project have been satisfactorily completed in accordance with the requirements of the Fire Safety Act.

Nur Hazwan Bin Amin
for Commissioner
Singapore Civil Defence Force

Date : 04-Jul-2018

SCDF – A member of the Home Team

HQ SINGAPORE CIVIL DEFENCE FORCE, 91 UBI AVENUE 4, SINGAPORE 408827
TEL: 6848 3776 FAX: 6848 1490 EMAIL: nur_hazwan_amin@scdf.gov.sg

File Ref No. : FMS/0251/18
Submission No. : SUB2018044734

Lic No : FS15852018

REPUBLIC OF SINGAPORE
SINGAPORE CIVIL DEFENCE FORCE

THE FIRE SAFETY ACT 1993
(PART VI)
CONTROL OF PETROLEUM AND FLAMMABLE MATERIALS

PETROLEUM & FLAMMABLE MATERIALS STORAGE LICENCE

Licensee (Name and Address)
NEW FUNNELS (S) PTE LTD
176 GUL CIRCLE

SINGAPORE 629627

Licence to store petroleum & flammable materials and respective quantity :
1. Flammable Materials (Gases) - 697 Kg
2. Petroleum - 1200 Litres

Premises authorised for storage of petroleum and flammable materials :
176 GUL CIRCLE SINGAPORE 629627

Period of Licence
17-JUL-2018 TO 30-JUN-2019

Licence fee
$518.0

This licence is granted subject to Act and the Regulations relating to the said purpose now and from time to time hereafter in force.

17-JUL-2018
Date of issue

Alice Sete Lai Chee
for COMMISSIONER
SINGAPORE CIVIL DEFENCE FORCE

**Please note that the licence will be revoked if serious non-compliance of technical requirements are found during subsequent inspections.

P&FM Storage Licence Application

1. Engage a Qualified Person (QP) to prepare and submit plan to SCDF

2. Submit plan(s) that incorporate with the fire safety works in accordance with the Fire Code and other accepted codes

3. A registered inspector (RI) will apply Fire Safety Certificate (FSC) after he has certified that fire safety works are completed and in accordance with the approved building plans.

4. The applicant can apply for P&FM storage licence on-line via GoBusiness Portal.

Managing Fire Safety

Managing Fire Safety

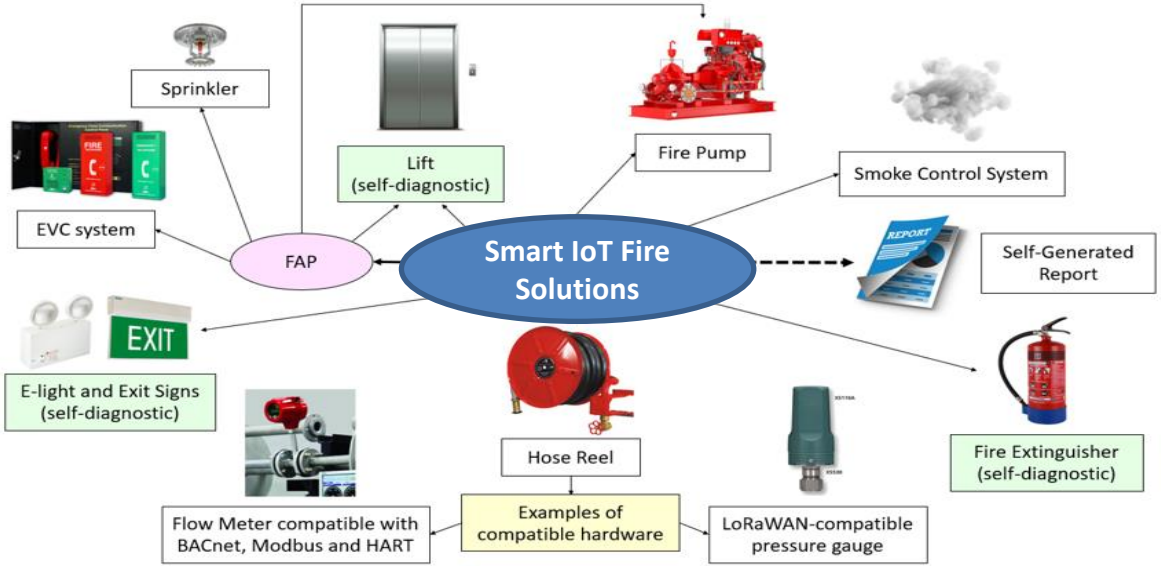
To manage fire safety, premises can leverage technology such as the Internet of Things (IoT) and Closed Circuit Television (CCTV) with video analytics.

These systems can provide automated monitoring and alerts to promptly detect and mitigate any fire safety concerns, such as malfunctioning fire safety measures or obstructed escape routes.

The technology is simple to understand and can be implemented professionally, allowing premises to effective manage fire safety.

IoT (Internet of Things)

For fire safety management, the Internet of Things (IoT) pertains to a network of physical devices, and other items that are equipped with sensors, software, and network connectivity. These features enable them to gather and exchange data, which can be analyzed and used to automate processes, enhance efficiency, and offer new insights into how things work.

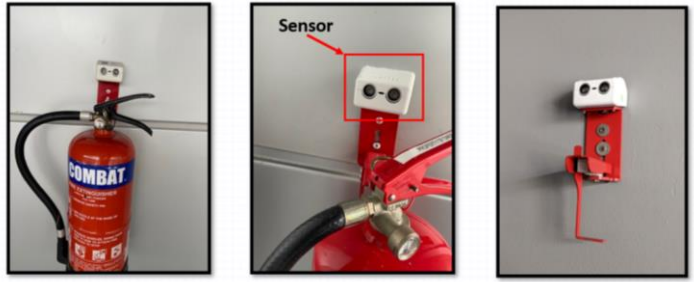


IoT (Internet of Things)

IoT sensors are compact, connected devices capable of monitoring a wide range of fire safety parameters, such as temperature, smoke, gas levels, water or air pressure leak, flow rate, and more. Additionally, they can detect tampering, removal, obstruction, and remote testing capability from a remote location.

One significant advantage of IoT sensors is their suitability for fire protection systems. Building owners and fire safety managers can opt for IoT sensors because they are easy to deploy within a reasonable timeframe, non-intrusive, require minimal maintenance. Furthermore, they can generate system operating status reports at a reasonable cost of implementation over the longer term.

Fire Node (Sensor) for Fire Extinguishers



Sensor for Emergency Light / Exit Sign

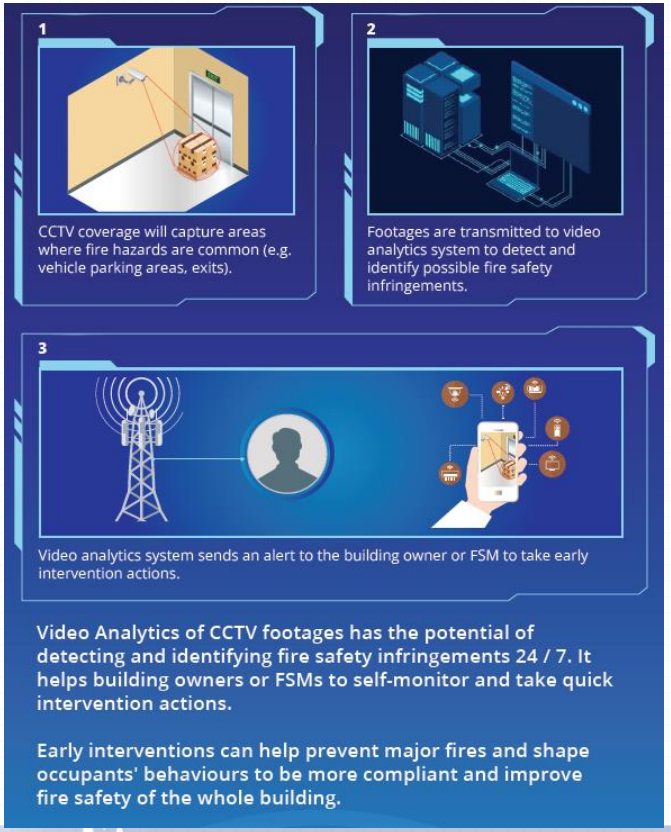
CCTV Video Analytic

Significant advancements in Artificial Intelligence (AI) have allowed for the automation and optimization of many functions and process of CCTV systems.

This technology goes beyond the basic features of real-time footage and recording playback to include video analytics.

The use of video analytics in conjunction with CCTV systems can aid premises in managing fire safety by detecting potential hazards early, monitoring risk and facilitating prompt mitigation.

Concept of Operations



CCTV using video analytics system can detect potential fire safety infringement such as obstructed exit doors.

Once detected, the system can send an alert to the building owner or Fire Safety Manager (FSM) for early intervention.

By actively monitoring and taking early intervention measures with the aid of CCTV video analytics system, fire safety infringement can be prevented from reaching a stage where tenants may be reluctant to take corrective actions.

Conclusion

Assisting the building owner in managing fire safety is a critical responsibility of Fire Safety Manager (FSM).

FSM must ensure that fire safety measures are in proper working order and, when any malfunction are identified. FSM should informed the nearest territorial Fire Station.

For non-compliances highlighted during our fire safety inspection, FSM should also update the case officer on the rectification progress.

Lastly, to explore the use of technology such IoT or CCTV VA to enhance your duties and better manage building fire safety.

Thank You