A Guide to Application for

Dangerous Goods Licence and Approval

(for Class 2 to Class 9A Dangerous Goods
Excluding Liquefied Petroleum Gas and Other Gases under
Gas Safety Ordinance, Cap. 51, Laws of Hong Kong)

Fire Services Department
02/2023

Preamble

"A Guide to Application for Dangerous Goods Licence and Approval", hereinafter referred to as "this Guide", is to provide general information to assist the public in their application in respect of dangerous goods (DG) under the Dangerous Goods Ordinance, Chapter 295, Laws of Hong Kong (Cap. 295) and its subsidiary legislation. It also aims to set out the application procedures and the general Fire Safety Requirements (FSR) for the issuance of DG store and use licence, manufacture licence, conveyance licence or granting approval of tank. Having considered the nature of DG (i.e. their physical and chemical properties) and the risk assessment for manufacturing, storing or conveying relevant DG, the Fire Services Department (FSD) will formulate specific FSR and issue to applicant for compliance during the processing of application, if applicable.

It is important to notice that the grant of licence (if any) by FSD under Cap. 295 does not relieve the applicant of any obligation to obtain the prior consent, approval, permission or licence from other government departments or agencies pursuant to other legislation in relation to the proposed manufacturing/storage/conveyance/use of DG. These departments or agencies may include but are not limited to the Buildings Department, Customs and Excise Department, Electrical and Mechanical Services Department (EMSD), Environmental Protection Department (EPD), Hospital Authority, Invest Hong Kong, Lands Department (LandsD), Planning Department (PlanD), and Transport Department.

Besides, the processing of an application or the granting / renewal of a licence / approval shall not be taken as a waiver of any terms in any leases or licences granted by the Government of the Hong Kong Special Administrative Region or any public officers. Nor will they in any way affect or modify any agreements or covenants relating to any premises or building to which the licence/approval relates.

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Abbreviations

AP	-	Approved Person
AP(GF)	-	Approved Person (Gas Free)
AP(PGI)	-	Approved Person (Piped Gas Installation)
AP(PR)	-	Approved Person (Pressure Receptacle)
BPVD	-	Boilers and Pressure Vessels Division
Cap. 295	-	Dangerous Goods Ordinance, Chapter 295, Laws of Hong Kong
Cap. 295E	-	Dangerous Goods (Application and Exemption) Regulation 2012, Chapter 295E, Laws of Hong Kong
Cap. 295G	-	Dangerous Goods (Control) Regulation, Chapter 295G, Laws of Hong Kong
CEDD	-	Civil Engineering and Development Department
CoP	-	Code of Practice for Control of Dangerous Goods on Land
DFS	-	Director of Fire Services
DG	-	Dangerous Goods
DGCD	-	Dangerous Goods Control Division
DGED	-	Dangerous Goods Enforcement Division
DGV	-	Dangerous Goods Vehicle
EMSD	-	Electrical and Mechanical Services Department
EPD	-	Environmental Protection Department
EQ	-	Exempt Quantity
FRR	-	Fire Resistance Rating
FSD	-	Fire Services Department
FSI	-	Fire Service Installation
FSR	-	Fire Safety Requirements
FTR	-	Fuel Tank Room
GEQ	-	General Exempt Quantity
HSC	-	Health and Safety Commission
IBC	-	Intermediate Bulk Container
IEQ	-	Industrial Exempt Quantity
IMDG Code	-	International Maritime Dangerous Goods Code

LD	-	Labour Department
LandsD	-	Lands Department
LPG	-	Liquefied Petroleum Gas
MD	-	Marine Department
Sch.	-	Schedule
SDS	-	Safety Data Sheet
PFS	-	Petrol Filling Station
PG	-	Packing Group
PHI	-	Potentially Hazardous Installation
PlanD	-	Planning Department
PML	-	Packing, Marking and Labelling
PSN	-	Proper Shipping Name
RFSIC	-	Registered Fire Service Installation Contractor
S2DG	-	Schedule 2 Dangerous Goods (under the Dangerous Goods (Application and Exemption) Regulation 2012, Chapter 295E, Laws of Hong Kong)
S3DG	-	Schedule 3 Dangerous Goods (under the Dangerous Goods (Application and Exemption) Regulation 2012, Chapter 295E, Laws of Hong Kong)
SEQ	-	Special Exempt Quantity
UPS	-	Uninterruptible Power Supply
VD	-	Ventilation Division
VIE	-	Vacuum Insulated Evaporator

Table of Contents

Part 1
General Information

Chapter 1.1 Dangerous Goods (DG) Classification

1.1.1 Legislation

1.1.1.1 As the regulatory authority of DG on land in Hong Kong, FSD regulates DG in accordance with the following ordinance and two pieces of subsidiary legislation which set out the powers, roles of the regulatory authority and the details of the regulatory regime of Schedule 2 Dangerous Goods (S2DG) and Schedule 3 Dangerous Goods (S3DG) (i.e. Class 9A DG) on land. S2DG and S3 DG are defined under the Dangerous Goods (Application and Exemption) Regulation 2012, Chapter 295E, Laws of Hong Kong (Cap. 295E).

Dangerous Goods Ordinance, Chapter 295, Laws of Hong Kong (Cap. 295)

1.1.1.2 Cap. 295 provides for the control of the manufacture, storage, conveyance, and use of DG.

1.1.1.3 For the purpose of providing practical guidance in respect of the requirements of Cap. 295 or of regulations made under Cap. 295, Director of Fire Services (DFS) has issued the Code of Practice for Control of Dangerous Goods on Land (CoP) pursuant to s. 5A of Cap. 295.

Cap. 295E

1.1.1.4 Cap. 295E sets out the list of DG to which Cap. 295 applies, the classification of these DG, as well as the circumstances under which certain DG is exempt from the control.

Dangerous Goods (Control) Regulation, Chapter 295G, Laws of Hong Kong (Cap. 295G)

1.1.1.5 Cap. 295G sets out the detailed licensing regime for the manufacture, storage, conveyance, and use of DG, as well as requirements for the packing, marking and labelling (PML) of DG.

1.1.2 Definition of DG and DG Regulated by FSD

1.1.2.1 Definition of DG

1.1.2.1.1 In Hong Kong, the local DG classification system and PML requirements have harmonised with commonly adopted international standards.

1.1.2.1.2 With effect from 31 March 2022, the local classifications of DG are as follows:

Class	Properties
Class 1	Explosives (The Authority is the Commissioner of Mines.)
Class 2	Class 2.1 – flammable gases; Class 2.2 – non-flammable and non-toxic gases; and Class 2.3 – toxic gases
Class 3	Flammable liquids
Class 3A	Diesel, fuel oil and furnace oil, having flashpoints exceeding 60°C (closed-cup test[1])
Class 4	Class 4.1 – flammable solids, self-reactive substances, solid desensitized explosives and polymerizing substances; Class 4.2 – substances liable to spontaneous combustion; and Class 4.3 – substances which, in contact with water, emit flammable gases
Class 5	Class 5.1 – oxidizing substances; and Class 5.2 – organic peroxides
Class 6.1	Toxic substances
Class 8	Corrosive substances
Class 9	Miscellaneous dangerous substance or material
Class 9A	Combustible goods

[1] See paragraph 2.2.3.1.3 of CoP.

1.1.2.2 DG Regulated by FSD

1.1.2.2.1 FSD is the regulatory authority for all S2DG and S3DG under Cap. 295E on land, except gases under the Gas Safety Ordinance (Cap. 51) which are regulated by EMSD. Civil Engineering and Development Department (CEDD) is the regulatory authority for Schedule 1 Dangerous Goods(S1DG). Marine Department (MD) is the regulatory authority for DG at sea and cargo terminals.

1.1.2.2.2 Parts 2 – 4 of Sch. 2 and Sch. 3 to Cap. 295E (DG Lists) set out the DG regulated by FSD. These DG are:

Part 2 of Sch. 2 to Cap. 295E

- Class 2.1/2.2/2.3 DG;
- Class 3 DG;
- Class 4.1/4.2/4.3 DG;
- Class 5.1/5.2 DG;
- Class 6.1 DG;
- Class 8 DG; and
- Class 9 DG

Part 3 of Sch. 2 to Cap. 295E

- Paint materials

Part 4 of Sch. 2 to Cap. 295E

- Class 3A DG

Sch. 3 to Cap. 295E

- Class 9A DG

1.1.2.2.3 The definition of each of the above Classes of DG is available at Chapter 2.2 of CoP.

1.1.2.2.4 To cope with the development of technology and the daily use of the public, the Government will update the DG Lists from time to time. Please refer to HKFSD DG Thematic Website[2], Cap. 295E and CoP for updates and details.

1.1.2.2.5 While the local DG classification system has harmonised with commonly adopted international standards, not all DG under these standards are regulated by FSD. The following examples of chemicals or substances, which are generally classified as DG internationally, are not subject to the regulation of FSD under the local DG regulatory system:

- Ammunition or bombs
- Batteries or fuel cells
- Elevated temperature substances
- Environmentally / health hazardous substances
- Fire extinguishers
- Gases regulated under the Gas Safety Ordinance, (Cap. 51)
- Infectious substances (Class 6.2 DG)
- Machine, equipment or articles containing DG
- Medicines, plants, animals or food
- Non-pressurized gases
- Pesticide/ Insecticide

[2] http://www.hkfsd.gov.hk/dg

- Radioactive materials (Class 7 DG)
- Substances giving off harmful substance when involved in fire

Chapter 1.2 Regulatory Regime

1.2.1 Types of Activities Regulated by FSD

1.2.1.1 Pursuant to s. 6 of Cap. 295, FSD regulates the manufacture, conveyance, storage and use of S2DG on land by way of licensing regime (see Part 2).

1.2.1.2 Pursuant to s. 114 of Cap. 295G, DFS may, on application, approve the use of a tank for containing Class 3A DG (see Chapter 2.2).

1.2.1.3 Unlike S2DG, the storage of Class 9A DG on land is regulated by way of notification regime. Instead of a licence, DFS may issue a Direction to the owner or occupier of the premises used for the storage of Class 9A DG (see Chapter 4.1).

1.2.1.4 Pursuant to s. 142 of Cap. 295G, a person must not store or convey, or cause or permit to be stored or conveyed, S2DG unless the PML requirements specified in Sch. 6 to Cap. 295G with technical details provided in Part III and Part IV of CoP are complied with. Being part of the packing requirement, a special packing requirement is introduced for pressure receptacle whereby each pressure receptacle for containing any Class 2 DG must be approved by DFS pursuant to s. 145 of Cap. 295G (see Chapter 3.2).

1.2.1.5 Under FSD's DG regulatory system, there are various types of works which must be conducted by a person approved by DFS (Approved Person) pursuant to s. 93, s. 105, s. 112, s. 137 & s. 145(1)(b) of Cap. 295G (see Chapter 3.1).

1.2.1.6 The types of DG Licence / Direction / Approval issued by FSD include:

(a) Manufacture Licence

(b) Conveyance Licence

(c) Store and Use Licence

(d) Direction for the Storage of Class 9A DG

(e) Approval of Tank for Class 3A DG

(f) Approval of Pressure Receptacle

(g) Approval of Approved Person (AP)

Manufacture of S2DG

1.2.1.7 Broadly speaking, a manufacture licence[3] is required for the manufacture of any amount of any DG as stipulated in Parts 2 to 4 of Sch. 2 to Cap. 295E.

1.2.1.8 Pursuant to s. 2 of Cap. 295, "manufacture":

(a) includes process, compress, liquefy or otherwise alter the nature or form of any substance;

(b) does not include assembling, mixing, compounding or installing for the preparation of materials within the meaning of pyrotechnic special effects material under the Entertainment Special Effects Ordinance (Cap. 560) if the process is authorised by a discharge permit issued under that Ordinance.

1.2.1.9 Pursuant to s. 92 of Cap. 295G, "manufacture" of Class 2 DG:

(a) includes the filling of a pressure receptacle (other than a boiler or a pressure vessel as defined by s. 2(1) of the Boilers and Pressure Vessels Ordinance (Cap. 56)) with any gas; but

(b) does not include the removal of a refrigerant from a refrigeration machine or equipment and storing the refrigerant in a container designed for storing it.

[3] A manufacture licence means a licence granted or renewed under s. 94(1) of Cap. 295G.

Conveyance of S2DG

1.2.1.10 In general, a conveyance licence[4] is required for the conveyance of Class 2/3/3A DG on land, when the quantity of one type of Class 2, Class 3 or Class 3A DG so conveyed exceeds its general exempt quantity (GEQ) or when the quantity of multiple types of Class 2, Class 3 or Class 3A DG so conveyed exceeds the aggregate exempt quantity (EQ) of the class / type of DG concerned. For details of aggregate EQ in respect of conveyance of Class 2/3/3A DG, please see paragraph 1.2.2.6 to 1.2.2.9 below for further information.

Storage / Storage and Use of S2DG

1.2.1.11 A store and use licence is required for the storage / storage and use of S2DG on land, when the quantity of one type of DG so stored / stored and used exceeds its GEQ, industrial exempt quantity (IEQ) or special exempt quantity (SEQ) (as the case may be) of that type of DG; or when the storage / storage and use of multiple types of DG exceed the aggregate EQ of the class / type of DG concerned. For details of GEQ, IEQ, SEQ and the aggregate EQ in respect of storage / storage and use of DG, please see paragraph 1.2.2.4 below for further information.

Storage of Class 9A DG

1.2.1.12 Class 9A DG under Sch. 3 to Cap. 295E are exempt from the licensing regime and PML requirements (i.e. exempt from the operation of s. 6 and 10 of Cap. 295). Although a licence is not required for the storage of Class 9A DG, it is required to notify DFS if such storage exceeds specified quantity (see Chapter 4.1).

[4] A conveyance licence means a licence granted or renewed under s. 117 of Cap. 295G.

Packing, Marking and Labelling Requirements of S2DG

1.2.1.13 PML requirements of S2DG are independent of the licensing requirement of S2DG. Pursuant to s. 142 of Cap. 295G, the PML requirements specified in Sch. 6 shall be complied with in relation to storage and conveyance of S2DG, regardless of its amount. Please see Part III and Part IV of CoP for detailed requirements.

Packing

1.2.1.14 Pursuant to s. 92 of Cap. 295G, a S2DG packaging means any receptacle (including a receptacle that forms part of pre-packed S2DG), tank or material for receiving, holding or enclosing S2DG, but does not include any freight container, aircraft container or vehicle. The details of packing requirements, e.g. the size and material of the S2DG packaging, are provided in Part III and Part IV of CoP.

Marking

1.2.1.15 Pursuant to s. 10 of Part 2 of Sch. 6 to Cap. 295G, the outer surface of an outermost S2DG packaging must be legibly marked with all of the following information:

(a) the UN number of each type of S2DG contained in the S2DG packaging and, in the case of Class 3A DG, the HK number;

(b) the proper shipping name or true name of each type of S2DG contained in the S2DG packaging, in either English or Chinese, as specified in Chapter 3.3 of CoP.

1.2.1.16 The information specified above must be marked in such a manner that the information is clearly identifiable despite any exposure to open air and water.

Labelling

1.2.1.17 Pursuant to s. 13 of Part 3 of Sch. 6 to Cap. 295G, for S2DG contained in an S2DG packaging, the outer surface of the outermost S2DG packaging must bear a label that is in the form of the Figures in Division 2 of Part 3 of Sch. 6 to Cap. 295G and meets the specifications specified in Division 3 of Part 3 of Sch. 6 to Cap. 295G. Reference shall be made to the specimen labels provided in paragraph 3.4.3.4 of CoP.

1.2.2 Exemptions

Exempt Quantity for DG in Packaged Form

1.2.2.1 The capacity of receptacle is crucial for determining the exemptions of DG from licensing control. EQ only applies to S2DG in packaged form which are contained in specified receptacles.

1.2.2.2 Pursuant to s. 2 of Cap. 295E, specified receptacle means –

(a) in relation to Class 2 DG, a receptacle with a water capacity not exceeding 150 litres;

(b) in relation to Class 3 DG, a receptacle with a water capacity not exceeding 450 litres;

(c) in relation to Class 3A DG, a receptacle with a water capacity not exceeding 500 litres; and

(d) in relation to Class 4 DG, Class 5 DG, Class 6.1 DG, Class 8 DG and Class 9 DG –

(i) if the DG are in liquid form, a receptacle with a water capacity not exceeding 450 litres; or

(ii) if the DG are in solid form, a receptacle with a volume not exceeding 0.45 m^3.

1.2.2.3 If a receptacle used to contain DG has a capacity greater than that of the specified receptacle as defined in paragraph 1.2.2.2 above, no exemption would be given for the storage, use and conveyance of such DG. The responsible person shall apply for a DG Licence to store, use and convey such DG.

1.2.2.4 The storage and use of a single type / multiple types of DG in packaged form have their respective exempt quantities, i.e. GEQ, IEQ and SEQ, and aggregate EQ. If the quantity for storage and use of DG does not exceed the respective EQ and aggregate EQ, it is not required to apply for a store and use licence from FSD.

1.2.2.5 The definitions of different types of EQ for DG in packaged form at specific premises are stipulated below for easy reference:

(a) GEQ, in relation to S2DG, means the quantity specified in column 5 of the table in Part 2, 3 or 4 of Sch. 2 to Cap. 295E. It applies to general premises, which means a building or any other place (whether or not an open space), not being industrial premises or special premises;

(b) IEQ, in relation to S2DG, means the quantity specified in column 6 of the table in Part 2, 3 or 4 of Sch. 2 to Cap. 295E. It applies to industrial premises, which means –

(i) a building the whole or any part of which –

(A) is intended for the use of an industrial undertaking as shown on the plan of the building approved by the Building Authority under the Buildings Ordinance (Cap. 123); and

(B) is used exclusively for the purposes of the industrial undertaking; or

(ii) a construction site.

It shall be noted that industrial undertaking includes –

(i) a godown;

(ii) any industry in which articles are manufactured, altered, cleaned, repaired, ornamented, finished, adapted for sale, broken up or demolished, or in which materials are transformed, including shipbuilding; and

(iii) the generation, transformation and transmission of electricity or motive power of any kind.

(c) SEQ, in relation to S2DG, means the quantity specified in column 7 of the table in Part 2, 3 or 4 of Sch. 2 to Cap. 295E. It applies to special premises, which means a laboratory or a medical establishment (See Interpretation in Part 1 of Cap. 295E).

1.2.2.6 For easy reference, the aggregate EQ for storage of multiple types of DG in packaged form are shown in the table below:

DG	**Aggregate EQ for**	
	General Premises / Special Premises (Units)	**Industrial Premises (Units)**
Class 2	300	450
Class 3	100	150
Class 4/ Class 5/ Class 6.1/ Class 8/ Class 9	(A) 100 (with the exception of special Class 5.1 DG, special Class 6.1 DG and special Class 8 DG); (B) 250 for special Class 5.1 DG, special Class 6.1 DG or special Class 8 DG.	1,000
Paint materials	250	250

Remarks:

Special Class 5.1 DG, means any S2DG with UN number: UN 1748, UN 2208, UN 2880, UN 3212, UN 3485, UN 3486 or UN 3487.

Special Class 6.1 DG, means any S2DG with UN number: UN 1671, UN 2022, UN 2076, UN 2312, UN 2821, UN 3430 or UN 3455.

Special Class 8 DG, means any S2DG with UN number: UN 1791 or UN 2693.

1.2.2.7 For the conveyance of a single type / multiple types of Class 2/3 DG in packaged form not exceeding their GEQ and aggregate EQ for conveyance as shown in the table below, it is not required to apply for conveyance licence(s) from FSD.

DG	**Aggregate EQ for Conveyance (Units)**
Class 2	300
Class 3	100
Paint materials	250

1.2.2.8 For the conveyance of Class 3A DG in packaged form not exceeding their GEQ for conveyance, it is not required to apply for conveyance licence from FSD.

1.2.2.9 For the EQ and control regime of UN 3065 Alcoholic beverages, please see paragraph 2.2.17.

Exemption for DG in Consumer Packs

1.2.2.10 As regards the exemption for Dangerous Goods in Consumer Packs[5] (DGCP), the maximum package size (MPS) for DGCP shall be observed. If the size of the receptacle does not exceed the quantity assigned for MPS in column 9 of the table in Part 2, 3 or 4 of Sch. 2 to Cap. 295E in relation to the DG, such DG could be treated as DGCP. If "NONE" is assigned for such DG in column 9, it means that the DG shall not be treated as DGCP. The EQ for the storage and use of a single type / multiple types of DGCP at uninhabited / warehouse compartment is / are as follows:

DG	**Consumer Pack Exempt Quantity (Units)** ***(Uninhabited Compartment)***	**Consumer Pack (Warehouse) Exempt Quantity (Units)** ***(Warehouse Compartment)***
Class 2	1,000	5,000
Class 3 (Packing Group[6] (PG) II)	300	1,500
Class 3 (PG III)	1,000	5,000
Class 4.1	1,000	5,000
Class 5.1	1,000	5,000
Class 6.1	1,000	5,000
Class 8	1,000	5,000
Class 9	1,000	5,000
Aggregate EQ	**1,000**	**5,000**

[5] "Consumer packs", in relation to Sch. 2 dangerous goods, means—

(a) for pre-packed Sch. 2 dangerous goods—the capacity of the receptacle forming part of the pre-packed Sch. 2 dangerous goods does not exceed the maximum package size (if any) specified in column 9 of the table in Part 2, 3 or 4 of Sch. 2 to Cap. 295E in relation to the dangerous goods; or

(b) for the dangerous goods that are contained directly without any form of intermediate containment in a receptacle—the capacity of the receptacle does not exceed the maximum package size (if any) specified in column 9 of the table in relation to the dangerous goods.

[6] Each type of DG (except those in Class 2, 3A, 5.2 and the self-reactive substances of Class 4.1 and those possessing some distinctive characteristics) will be given a Packing Group (PG) to represent the degree of danger they present: **PG I**: High Danger; **PG II**: Medium Danger; **PG III**: Low Danger.

Remarks

(a) *uninhabited compartment* means any part of a building that –

(i) is not a warehouse compartment;

(ii) is neither used nor constructed for human habitation;

(iii) does not provide sleeping accommodation; and

(iv) is separated by walls from any other parts of the building that –

(A) are used or constructed for human habitation; or

(B) provide sleeping accommodation;

(b) *warehouse compartment means* any part of an industrial building which is –

(i) physically separated from the adjoining parts of the building by walls, a floor and a ceiling, and each of the walls, floor and ceiling and each opening of that part of the building meets the standards of fire resisting construction required under regulation 90 of the Building (Construction) Regulations (Cap. 123 sub. Leg. B); and

(ii) used exclusively for the storage of goods.

1.2.2.11 When a person stores a single type / multiple types of DGCP in an uninhabited / warehouse compartment, application for a DG store and use licence is not required if the quantity of the DG so stored does not exceed the respective consumer pack EQ for the Class to which that type of DG belongs and the aggregate EQ.

Exemption from Manufacture Licence

1.2.2.12 There is no exemption for manufacture of S2DG. With regard to application for a manufacture licence, please see Chapter 2.2.

Exemption for Conveyance of Class 4/5/6.1/8/9 DG

1.2.2.13 Although a licence is not required for the conveyance of Class 4/5/6.1/8/9 DG on land, it is advised to observe the safety precaution when conveying these DG and legal requirements on the PML of S2DG pursuant to Sch. 6 to Cap. 295G. Please see paragraph 2.1.10.

Exemption for Conveyance of DGCP

1.2.2.14 To facilitate the daily use of DG, the conveyance of DGCP (in whatever quantity) is exempt from a conveyance licence.

Exemption for Conveyance of Class 2/3/3A DG in Packaged Form

1.2.2.15 The conveyance of single and multiple types of Classes 2/3/3A DG in packaged form is exempt from a conveyance licence if the quantity so conveyed does not exceed their GEQ and aggregate EQ.

Exemption from Notification for the Storage of Class 9A DG

1.2.2.16 If the storage of Class 9A DG in the premises does not exceed the specified quantity for that type of premises, it is not required to notify FSD for such storage. Please see Chapter 4.1 for details.

Exemption from PML Requirements

1.2.2.17 General Exemption from PML Requirements

To facilitate trade operation and the daily use of DG by the public, Cap. 295G has stated exemption for the following DG pursuant to s. 140 of Cap. 295G:

(a) S2DG in consumer packs;

(b) UN 3065 Alcoholic Beverages;

(c) Class 3A DG in an approved tank[7];

(d) S2DG that are –

(i) Contained in a receptacle that is permanently installed in and forming part of a machinery; and

(ii) Used or intended to be used for the proper functioning of the machinery.

Exemption on Marking and Labelling of S2DG

1.2.2.18 Pursuant to s. 141 of Cap. 295G, the marking and labelling requirements do not apply to S2DG in limited packs[7].

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[7] "Approved tank" means a tank approved under s. 114(1) of Cap. 295G.

[7] "Limited packs", in relation to S2DG, means—

(a) for pre-packed S2DG—the capacity of the receptacle forming part of the pre-packed S2DG does not exceed the limited quantity (if any) specified in column 8 of the table in Part 2, 3 or 4 of Sch. 2 of Cap. 295E in relation to the DG; or

(b) for the dangerous goods that are contained directly without any form of intermediate containment in a receptacle—the capacity of the receptacle does not exceed the limited quantity (if any) specified in column 8 of the table in relation to the DG.

Effect of Compliance with the International Maritime Dangerous Goods Code (IMDG Code)

1.2.2.19 Pursuant to s. 143(1) of Cap. 295G, if the S2DG are packed, marked and labelled in conformity with the IMDG Code, the PML requirements specified in Sch. 6 to Cap. 295G for storage or conveyance of the S2DG are regarded as having been complied with. However, s. 143(1) of Cap. 295G does not apply to the PML requirements for Class 3A DG and the special packing requirements for a pressure receptacle.

1.2.2.20 For the details of exemptions regarding the approval of pressure receptacle, please see paragraph 3.2.2.

1.2.3 Circumstances When Cap. 295 and Its Subsidiary Legislation are Not Applicable

1.2.3.1 Apart from the exemptions in paragraph 1.2.2, Cap. 295 and its subsidiary legislation do not apply to any DG on land if the DG concerned are:

(a) in the course of transit as cargo in any vessel, aircraft or vehicle; or

(b) being loaded into or discharged from any vessel licensed for that purpose under Cap. 295; or

(c) being loaded into or discharged from any aircraft or vehicle; or

(d) liquefied petroleum gas (LPG) and other gases within the meaning of the Gas Safety Ordinance (Cap. 51).

1.2.4 Regulatory Authority

1.2.4.1 FSD is the regulatory authority for Class 2, Class 3, Class 3A, Class 4, Class 5, Class 6.1, Class 8, Class 9 and Class 9A DG on land.

(a) Matters relating to the manufacture, storage or use of DG (other than Class 9A DG) could be directed to Dangerous Goods Control Division (DGCD) of FSD. The contact address, telephone number, fax number and email address are as follows:

Address: 4/F, Fire Services Department Kwai Chung Office Building,
86 Hing Shing Road, Kwai Chung, New Territories

Tel.: 2417 5757

Fax: 2413 0873

Email: hkfsd_dg_enq@hkfsd.gov.hk

(b) Matters relating to the conveyance of DG and storage of Class 9A DG could be directed to Dangerous Goods Enforcement Division (DGED) of FSD. The contact address, telephone number, fax number and email address are as follows:

Address: 2/F, Tsim Sha Tsui Fire Station Complex,
No.333 Canton Road, Kowloon

Tel.: 3850 8487

Fax: 3850 8450

Email: hkfsd_dg_enq@hkfsd.gov.hk

1.2.4.2 The Marine Department (MD) is the regulatory authority for DG at sea and cargo terminal. The contact address, telephone number and email address of MD are as follows:

Address: East Wing, 3/F, Harbour Building, 38 Pier Road, Central,
Hong Kong

Tel.: 2852 4913

Email: pfdg@mardep.gov.hk

1.2.4.3 The Commissioner of Mines, Mines Division, Geotechnical Engineering Office, CEDD is the regulatory authority for S1DG. The contact address, telephone number and email address are as follows:

Address: 6/F, South Tower, West Kowloon Government Offices,
11 Hoi Ting Road, Yau Ma Tei, Kowloon

Tel.: 3842 7212

Email: mines@cedd.gov.hk

1.2.4.4 The Gas Standards Office of EMSD is the regulatory authority of LPG and other gases governed by the Gas Safety Ordinance (Cap. 51). The contact address, telephone number and email address are as follows:

Address: 7/F, 3 Kai Shing Street, Kowloon

Tel.: 2808 3683

Email: info@emsd.gov.hk

1.2.5 Important Information

Performance Targets for Store and Use Licence / Manufacture Licence / Conveyance Licence for S2DG

1.2.5.1 FSD's performance targets for store and use licence / manufacture licence are as follows:

Processing Step	Performance Targets for Store and Use Licence/ Manufacture Licence
Inspection	• within 14 working days upon receipt of licence application • within 14 working days upon receipt of revised plan during licence application • within 14 working days upon receipt of alteration or licence renewal application
Issuance of FSR / Result of Inspection	• within 28 working days upon receipt of licence application • within 28 working days upon receipt of revised plan during licence application • within 28 working days upon receipt of alteration or licence renewal application
Compliance Inspection upon Receipt of Report of Compliance by:	
(i) DGCD	(i) within 7 working days
(ii) Ventilation Division (VD)	(ii) within 16 working days for the 1st and 2nd inspection, and within 21 working days for the 3rd inspection and onwards
Issuance of Licence / Letter of Compliance / Result of Compliance Inspection	• within 6 working days from the date of inspection

1.2.5.2 FSD's performance targets for Conveyance Licence are as follows:

Processing Step	Performance Targets for Conveyance Licence
Issuance of FSR	• within 6 working days upon receipt of licence application
Compliance Inspection upon Receipt of Report of Compliance	• within 7 working days
Issuance of Licence / Result of Compliance Inspection	• within 6 working days from the date of inspection

Collection of Personal Data in Connection with Application for DG Licence(s) or Approval(s) (In Accordance with the Personal Data (Privacy) Ordinance)

1.2.5.3 The personal data provided by means of DG application will be used by FSD for carrying out activities relating to the applications for the issue / renewal of DG licence(s) / approval(s) and facilitating communication among staff of FSD, other Government departments and the applicant. The provision of personal data by means of DG application is voluntary. However, if the applicant does not provide sufficient information, the application for licence(s) / approval(s) may not be processed.

1.2.5.4 The personal data provided by means of DG application may be disclosed to other Government departments and agencies in pursuance of the above-mentioned purposes.

1.2.5.5 The applicant has the right to access and correct with respect to personal data as provided for in accordance with the Personal Data (Privacy) Ordinance (Cap. 486). The right of access includes the right to obtain a copy of the personal data concerned. Enquiries concerning personal data collected by means of DG application, including the making of access and corrections, should be in writing to DFS via the respective licensing offices quoting the file reference of FSD .

General Enquiry

1.2.5.6 For enquiry concerning the manufacture, storage or use of DG (other than Class 9A DG), please contact:

Dangerous Goods Control Division

Address: 4/F, Fire Services Department Kwai Chung Office Building,
86 Hing Shing Road, Kwai Chung, New Territories

Tel.: 2417 5757

Fax: 2413 0873

Email: hkfsd_dg_enq@hkfsd.gov.hk

1.2.5.7 For enquiry concerning the conveyance of DG and storage of Class 9A DG, please contact:

Dangerous Goods Enforcement Division

Address: 2/F, Tsim Sha Tsui Fire Station Complex,
No. 333 Canton Road, Kowloon

Tel.: 3850 8487

Fax: 3850 8450

Email: hkfsd_dg_enq@hkfsd.gov.hk

Chapter 1.3 Transitional Provisions

1.3.1 Transitional Arrangement on Licensing Procedure

1.3.1.1 With effect from 31 March 2022, a transitional period of 24 months is given to the trades and the public to adapt to the new DG regulatory control.

For Person Holding a Valid Licence Issued under the Repealed Cap. 295B ("Cap. 295B licence")

1.3.1.2 Pursuant to s. 172, s. 173 and s. 174 of Cap. 295G, the existing licence under the repealed Cap. 295B remains in force during the transitional period.

1.3.1.3 Before the end of the validity period endorsed on the Cap. 295B licence, the licensee may:

(a) apply for the renewal of the licence in accordance with the repealed Cap. 295B; or

(b) apply under Cap. 295G for a manufacture licence / store and use licence / conveyance licence.

1.3.1.4 In both cases above, the licensee shall apply by completing the application form "Application for / Renewal of Dangerous Goods Licence (Manufacture Licence / Store and Use Licence)" or "Application for / Renewal of Dangerous Goods Licence (Conveyance Licence)". The application forms can be downloaded from the following link:

https://es.hkfsd.gov.hk/dg/en/licence/form/

1.3.1.5 DFS may renew the Cap. 295B licence under the repealed Cap. 295B during the transitional period for a specific period (but not beyond the end of the transitional period, i.e. 30 March 2024). After 30 March 2024, only manufacture licence / store and use licence / conveyance licence under Cap. 295G would be issued.

1.3.1.6 For the scenario in paragraph 1.3.1.3(a) above, the licence could be renewed subject to the continuous compliance with the previously issued FSR and payment of the prescribed fee.

1.3.1.7 For the scenario in paragraph 1.3.1.3(b) above, if there is no change of chemical substances and no structural alteration to the existing DG store, an addendum to the previously issued FSR setting out the safety standards required for the licensed factory / licensed store / licensed vehicle would be issued to the applicant for compliance. The updated requirements stipulated in the addendum mainly cover the display of new signs and notices at suitable locations and the provision of an operational manual for training and guidance to all operators of the factory / store / vehicle. A licence will be granted subject to the compliance with the previously issued FSR and the addendum as well as the payment of the prescribed fee.

For New Applicant

1.3.1.8 Applicant shall apply for a manufacture licence / store and use licence / conveyance licence under Cap. 295G and no new licence under the repealed Cap. 295B will be granted with effect from 31 March 2022.

1.3.1.9 Applicant shall apply by completing the application form “Application for / Renewal of Dangerous Goods Licence (Manufacture Licence / Store and Use Licence)” or “Application for / Renewal of Dangerous Goods Licence (Conveyance Licence)”. Please see Part 2 for the application procedure.

Part 2
Licensing and Approval of S2DG

Chapter 2.1 Application for Dangerous Goods (DG) Conveyance Licence

2.1.1 Introduction

2.1.1.1 S. 6 of Cap. 295 stipulates that no person shall manufacture, store, convey or use any DG without a licence granted under Cap. 295.

2.1.1.2 Generally, a person needs a licence for conveying Class 2/3/3A DG on land, except when the quantity is less than the EQ specified in Cap. 295E.

2.1.1.3 Licence is not required for conveying Classes 4 to 9 DG or Class 9A DG on land.

2.1.1.4 An individual or entity who has obtained a conveyance licence under s. 117 of Cap. 295G shall only convey the DG as specified in the licence.

2.1.2 Application Procedure

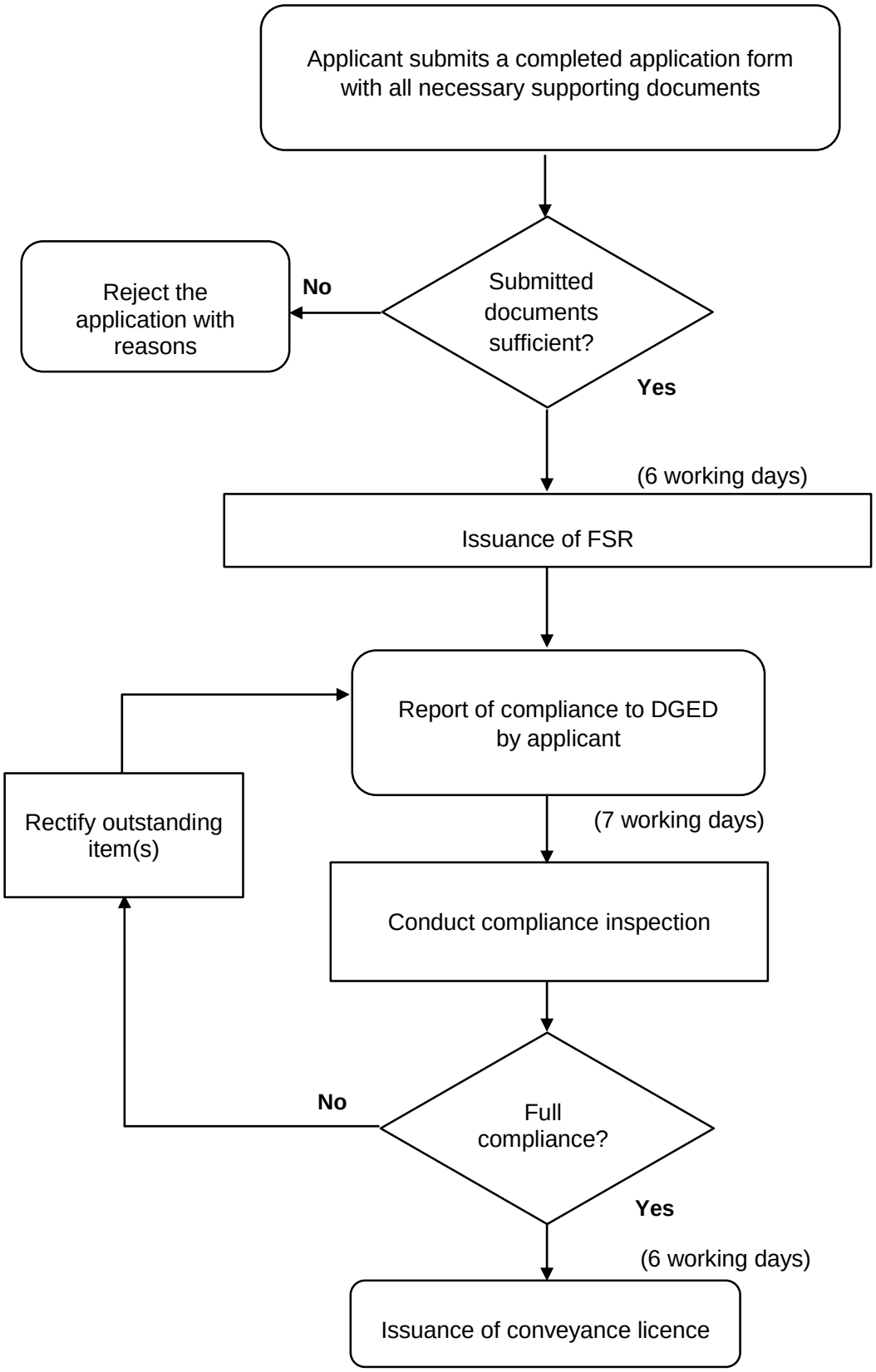
2.1.2.1 Applicant may make an application by himself / herself or any person authorised in writing by the applicant.

2.1.2.2 The application shall be made in writing to DGED of FSD with the following information:

(a) a completed application form. The form can be downloaded from the following link:
https://es.hkfsd.gov.hk/dg/en/licence/form/

(b) all supporting documents as required in the application form.

2.1.2.3 A flowchart showing the application procedure for a conveyance licence is shown below for reference:



2.1.3 Types of Dangerous Goods Vehicle (DGV)

2.1.3.1 Depending on the Class of DG (Class 2/3/3A DG) and the forms of container, DGVs are generally classified into 7 types with details as follows (Sample FSR are attached in respective Appendix):

Appendix	Type	Applicability
I	Type B	Tank Vehicle used for conveyance of Class 3/3A DG
II	Type C	Goods Vehicle used for conveyance of Class 2 DG (excluding chlorine and special gases)
III	Type D	Goods Vehicle used for conveyance of Class 3/3A DG
IV	Type F	Tank Vehicle used for conveyance of Class 2 DG (refrigerated liquefied gas only)
V	Type G	Motor Tractor or Freight Container Trailer used for conveyance of Class 2 DG (excluding chlorine and special gases) or Class 3/3A DG
VI	Type H	Goods Vehicle used for conveyance of Class 2 DG (chlorine only)
VII	Type P	Pantechnicon used for conveyance of Class 3/3A DG

2.1.3.2 For conveyance of special gases, please contact DGED for detailed information.

2.1.4 Fire Safety Requirements

2.1.4.1 After receiving a completed application form with all supporting documents, a set of FSR suitable for the type of DGV under application will be issued. Pursuant to s. 93 of Cap. 295G, DFS may from time to time issue or amend the FSR that sets out the safety standards required for a licensed vehicle.

2.1.4.2 The FSR issued for the licensed vehicle must be complied with at all times.

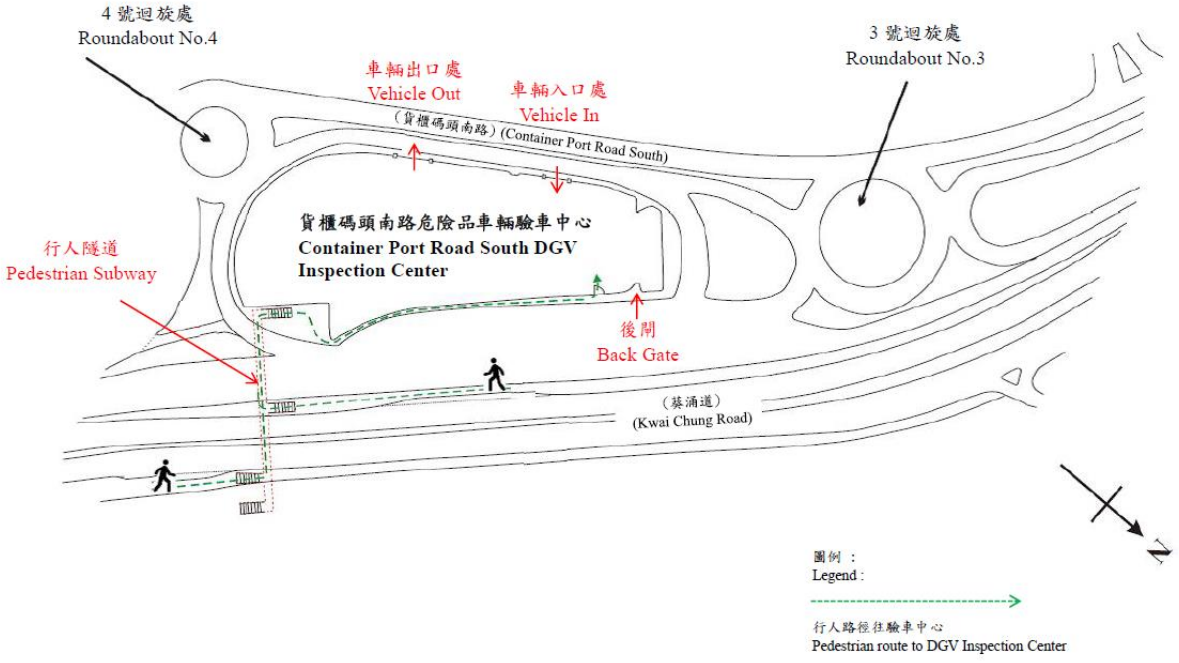
2.1.4.3 Samples of FSR are attached in Appendices I to VII for general reference only. They are not exhaustive and do not preclude FSD from issuing additional requirements as each application will be considered on its own merits.

2.1.5 Report of Compliance

2.1.5.1 When the vehicle is ready for compliance inspection, the applicant may make a booking by filling the online vehicle inspection booking form using the following link:

https://eform.hkfsd.gov.hk/checkclientconfig/jsp/checkClientConfig.jsp?language=en_us&applicationId=119

2.1.5.2 Upon receipt of an e-booking or a report of compliance, i.e. completion of FSR, a compliance inspection to the vehicle would be carried out at the Container Port Road South DGV Inspection Center (please find the following location map for reference) or any other location as specified by FSD:



地理資訊來源 : 運輸署
Geotechnical Information Source : Transport Department

2.1.5.3 During the compliance inspection, the applicant shall produce the originals of supporting documents including the Vehicle Registration Document (TD26), Certificate of Particulars of Vehicle (TD61C), Certificate of Roadworthiness (TD89) or Vehicle Examination Report (VE24) to the case officer for verification.

2.1.5.4 If non-compliance with any FSR is noted during the compliance inspection, a notification indicating the outstanding item(s) will be forwarded to the applicant. The applicant could make a booking by filling the online vehicle inspection booking form for arrangement of a re-inspection upon full compliance with the FSR.

2.1.6 Issuance of Licence and Prescribed Fee

2.1.6.1 Upon a compliance inspection with satisfactory result, the applicant will be notified in writing that a conveyance licence is available for collection at the designated shroff office upon payment of the licence fee.

2.1.6.2 Licence fees specified in Part 2 of Sch. 8 to Cap. 295G are summed up in the following table for easy reference:

Column 1	**Column 2**	**Column 3**	**Column 4**
Licence	Fee for grant or renewal $	Fee for duplicate or replacement of licences and identification discs[1] $	Fee for alteration or addition or endorsement of conditions $
A conveyance licence[2]	960	275	275

Remarks:

Note 1: Identification disc has the meaning given by s. 115 of Cap. 295G;

Note 2: For a licence specified in column 1 of the above table –

(a) The fee specified in column 2 corresponding to the licence is prescribed for the grant or renewal of the licence for 12 months;
(b) The fee specified in column 3 corresponding to the licence is prescribed for a duplicate or replacement of the licence and identification disc; and
(c) The fee specified in column 4 corresponding to the licence is prescribed for an alteration or addition to, or endorsement of conditions on, the licence and identification disc.

2.1.6.3 On granting or renewal of a conveyance licence, DFS will issue an identification disc to the licensee. A sample of identification disc is shown below:

2.1.7 Conditions of Licence and Other Restrictions

2.1.7.1 The conditions of a conveyance licence shall be continuously complied with in order to maintain the validity of such licence. Pursuant to s. 9B of Cap. 295, the breach of condition endorsed upon such licence shall constitute an offence which is liable on conviction to —

(a) for a first offence, a fine at level 5 and imprisonment not exceeding 1 month;
(b) for a subsequent offence, a fine at level 6 and imprisonment not exceeding 3 months.

2.1.7.2 DFS may impose any of the following conditions on a conveyance licence under s. 119 of Cap. 295G:

(a) the licence and the identification disc of the licensed vehicle must not be altered without the approval of DFS;
(b) the FSR issued for the vehicle must be complied with at all times;

(c) the vehicle (including any fittings or equipment in it) must be maintained in good order and condition at all times;

(d) adequate measures must be taken to ensure the safe operation of the vehicle, including the housekeeping, management, security, staff training, emergency preparedness and other control of the vehicle;

(e) the FSI or equipment for the vehicle must be kept in efficient working order;

(f) the FSI or equipment for the vehicle must not be obstructed by any thing on the vehicle in a way that may affect its operation;

(g) the vehicle must not be used for the conveyance of any thing other than the DG (Class 2/3/3A) specified in the licence (permitted DG), except—

  (i) any thing that is necessary to facilitate the conveyance of permitted DG; or

  (ii) an empty receptacle used for containing permitted DG;

(h) DG (Class 2/3/3A) must be carried in the cargo compartment of the vehicle;

(i) DG (Class 2/3/3A) must not be carried—

  (i) in a tank on the vehicle unless the tank is approved by DFS; or

  (ii) in a tank-container on the vehicle unless the construction of the tank-container is in conformity with the IMDG Code;

(j) the vehicle must only convey DG (Class 2/3/3A) in the area specified in the licence;

(k) if the vehicle is a motor tractor, it must be operated together with a trailer that is a licensed vehicle;

(l) if the vehicle is a trailer, it must be operated together with a motor tractor that is a licensed vehicle;

(m) DG (Class 2/3/3A) in packaged form must be secured by suitable means that is capable of restraining the DG in the vehicle in a manner that prevents, during the conveyance process, any movement that would cause the DG packaging to be damaged or result in any accidental release of the DG;

(n) if there is any incident of explosion or fire in, in the vicinity of or in connection with the vehicle, or any leak of DG (Class 2/3/3A) from the vehicle—

(i) the incident must be reported immediately to DFS; and

(ii) if loss of life or personal injury is caused by the incident—the loss or injury must also be reported immediately to DFS;

(o) any spill or leakage of DG (Class 2/3/3A) must be stemmed and handled promptly.

2.1.7.3 Notwithstanding the above, the licensee shall also observe that:

(a) the statutory restrictions and safety precautions in relation to a licensed vehicle as stipulated in s. 122 to s. 137 of Cap. 295G are complied with; and

(b) the DG so conveyed by the licensed vehicle are packed, marked and labelled in accordance with the requirements as stipulated in Sch. 6 to Cap. 295G. Failure to comply with the requirements may lead to an offence pursuant to s. 142(1) of Cap. 295G. For details of PML requirements, please refer to Part III and IV of CoP.

2.1.8 Renewal of Licence

2.1.8.1 A licence is valid:

(a) for 12 months with effect from the date of grant or renewal; or

(b) for such lesser period as may be specified in the licence.

2.1.8.2 If renewal of the licence is required, the licensee shall ensure that the licence is renewed before its expiry.

2.1.8.3 The application for renewal of licence shall be made in writing to DGED of FSD, and shall include a completed application form. The form can be downloaded from the following link:

https://es.hkfsd.gov.hk/dg/en/licence/form/

2.1.8.4 An application for renewal of licence shall be submitted:

(a) not less than 2 months before the expiry of the licence; and
(b) not more than 3 months before the expiry of the licence.

2.1.8.5 Licensees shall make sure that periodic inspections in relation to any equipment, electrical installation, tank, pipeline, FSI and equipment, etc., if any, are conducted before the renewal inspection.

2.1.8.6 Licensees shall make sure that the copies of supporting documents as required in the application form should be sent to DGED 7 working days before renewal inspection. The originals of these documents shall be available for verification at the time of renewal inspection.

2.1.8.7 The licence would only be renewed upon continuous compliance with the FSR and conditions and full payment of the licence fee (see paragraph 2.1.6.2 for details).

2.1.9 Revocation and Cancellation of Licence

2.1.9.1 Pursuant to s. 9(2) of Cap. 295, DFS may revoke a licence if there is sufficient proof that a licensee has committed an offence against Cap. 295 or breached any licence conditions.

2.1.9.2 Pursuant to s. 17 of Cap. 295, if the licensee is convicted on charges under Cap. 295 and its subsidiary legislation, the magistrate may, in addition to any other penalty, order that any licence issued under Cap. 295 held by such licensee shall be cancelled.

2.1.10 Points to Note for Conveyance of Classes 4 to 9 DG by Vehicle

2.1.10.1 Despite no licence is required for the conveyance of Classes 4 to 9 DG on land, service providers and operators must comply with the PML requirements as stipulated in Sch. 6 to Cap. 295G, and adhere to the best practices suggested below so that public safety can be guarded to its utmost standard.

PML Requirements Must be Complied with at All Times

2.1.10.2 PML requirements are independent of the licensing control and shall be complied with as stipulated in Sch. 6 to Cap. 295G. For details, please refer to Part III and IV of CoP.

Best Practices to be Observed by Service Providers and Operators

2.1.10.3 A vehicle owner / driver should observe the following best practices for the conveyance of Classes 4 to 9 DG by vehicle:

2.1.10.3.1 Vehicle's construction and strength shall comply with the Road Traffic (Construction and Maintenance of Vehicles) Regulations (Cap. 374A). The vehicle should be clean, in sound mechanical condition and roadworthiness. Enclosed cargo compartment is recommended. Interior of the vehicle, including doors and openings, should be free from sharp objects, combustibles, defects and projections which may cause damage to the packages of DG. The jib of the vehicle, if provided, should not be used to hold the load and should be in parking position when the vehicle is in motion.

2.1.10.3.2 The following should be readily available from the goods vehicle. Operators should be well-versed with operations wherever applicable below:

(a) One 4.5kg dry powder fire extinguisher in the driver's cabin;
(b) Suitable and adequate quantity of protective clothing, such as goggles, rubber gloves, rubber boots, etc. for loading and unloading of the DG;

(c) A copy of the relevant manifest of the DG, including the Safety Data Sheet (SDS), to facilitate firefighting and rescue operation of FSD; and

(d) A valid driving licence issued by the Transport Department.

2.1.10.3.3 The following should be observed in relation to stowage of DG:

(a) Do not install electric wiring / device in DG stowage area;

(b) Stow the DG in the cargo platform / compartment of the vehicle only;

(c) Stow the DG orderly to avoid damaging the outer packaging resulting from contacts with sharp objects, especially for DG in nonuniform shapes, or made of different materials. Outer packaging should be checked meticulously to make sure no rupture or damage on the packaging. Ensure that multiple types of DG are not packed together if they are incompatible according to CoP;

(d) Check and observe the permitted maximum loading weight, both gross vehicle weight and axle weight, to avoid overloading;

(e) When the DG are stowed on pallets, ensure that the pallets are in sound condition and free from projections to avoid damage to the packaging;

(f) Do not stow beyond the periphery of the vehicle;

(g) Do not stow to a height exceeding the full heights of the side board, tail board and head board of the vehicle; make sure that all the boards are secured;

(h) Stow all DG in upright position and provide suitable dunnage in between layers of the drums or containers. The stacking of drums and containers should follow the instructions marked on the package;

(i) Properly secure the load at all times in all kinds of packaging, e.g. drums, boxes, crates, wicker hampers, jerricans or bags, to ensure load stability and protection in any steering conditions, e.g. vehicle braking, acceleration and turning. For drums, use of racks or pallets for stowage are recommended;

(j) Use canvas to protect the DG from direct sunlight and adverse weather conditions (e.g. rainstorms, strong winds and wind shear) if they are transported in open cargo compartment;

(k) No smoking, eating and drinking on the vehicle and stowing area;

(l) Ensure that the vehicle is attended at all times when the vehicle is loaded or during loading with DG; and

(m) Operators should be fully aware of the characteristics of the DG under transport, and conversant with the emergency procedures stipulated below.

Emergency Procedures

2.1.10.4 A vehicle driver / attendant should be able to carry out the following procedures in case of emergency:

(a) Stop the vehicle at a spot away from the traffic and switch off the engines;

(b) Give warning to passers-by;

(c) Dial 999;

(d) When deemed safe to do so, use the fire extinguisher on board to put out the fire (not involving DG); and

(e) Provide information to emergency personnel at scene.

2.1.10.5 Given that different classes of DG pose different hazards, professional advice from agent or DG manufacturers may be necessary.

Chapter 2.2 Application for Store and Use Licence / Manufacture Licence / Approval of Tank

2.2.1 Introduction

2.2.1.1 S. 6 of Cap. 295 stipulates that no person shall manufacture, store, convey or use any DG without a licence granted under Cap. 295.

2.2.1.2 Generally, a person needs a licence for storing or using Class 2, 3, 3A, 4, 5, 6.1, 8 or 9 DG on land, except when the quantity is less than the EQ specified in Cap. 295E. A licence is required for manufacturing DG irrespective of quantity.

2.2.1.3 Licence is not required for storing or using Class 9A DG on land.

2.2.1.4 An individual or entity who has obtained a store and use licence under s. 94(2) of Cap. 295G shall only store the DG within the licensed store and use the DG at the location(s) (if applicable) as specified in the licence, or who has obtained a manufacture licence under s. 94(1) of Cap. 295G shall only manufacture the DG at the locations(s) as specified in the licence.

2.2.2 Application Procedure

2.2.2.1 Applicant may make an application by himself / herself or any person authorised in writing by the applicant.

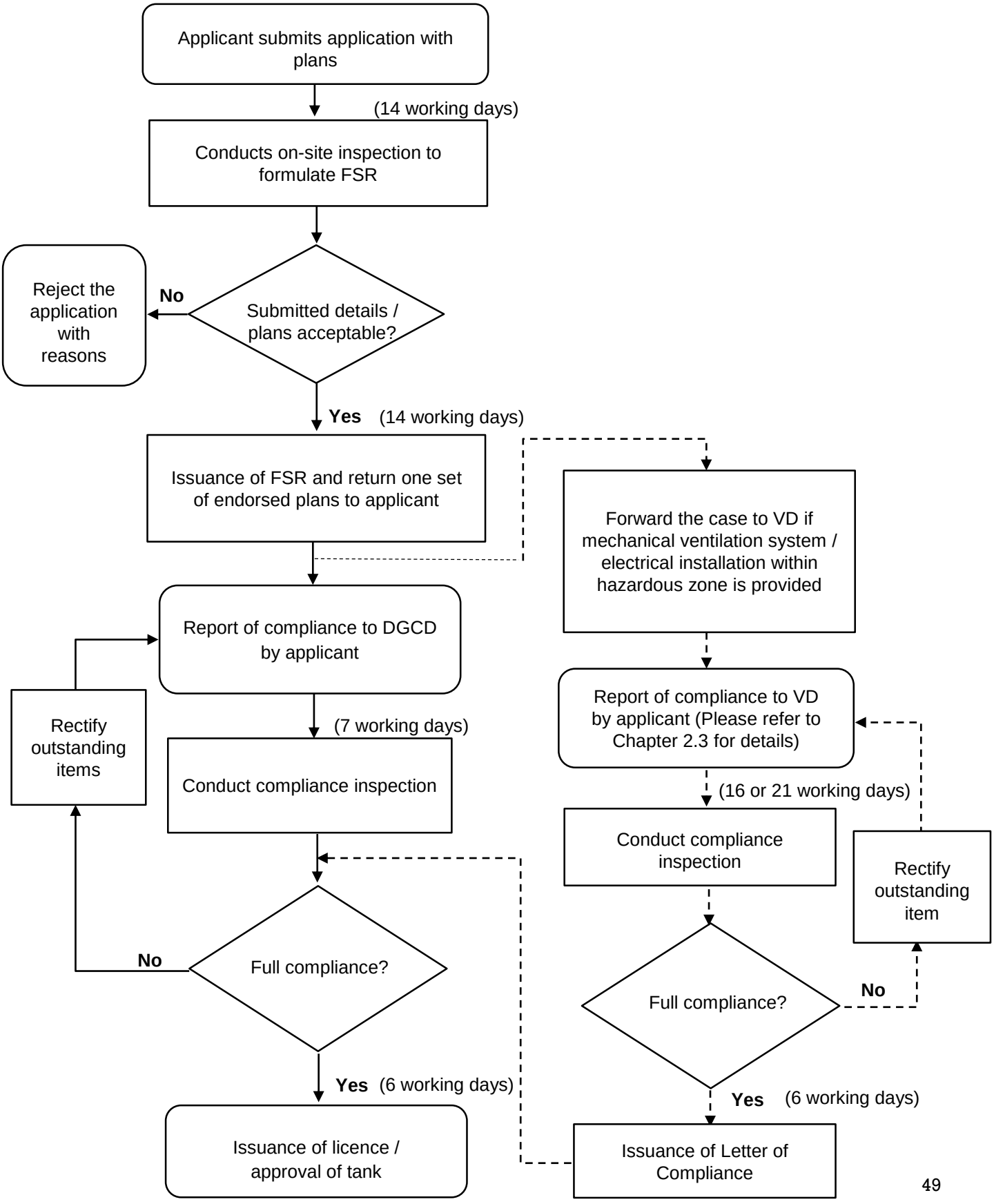
2.2.2.2 The application shall be made in writing to DGCD of FSD with the following information:

(a) a completed application form. The form can be downloaded from the following link:
https://es.hkfsd.gov.hk/dg/en/licence/form/

(b) all supporting documents as required in the application form; and

(c) 2 sets of plans (see paragraph 2.2.6 for details).

2.2.2.3 A flowchart showing the application procedure for a licence / approval of tank is shown as below for reference.



2.2.2.4 Considering the unique natures of the following applications, the applicant is advised to refer to the following paragraphs for details:

Paragraph 2.2.15: Points to Note for Fuel Tank Room
Paragraph 2.2.16: Points to Note for Store and Use Licence in Construction Site
Paragraph 2.2.17: Points to Note for UN 3065 Alcoholic Beverages

2.2.3 Construction of DG Store

2.2.3.1 Depending on the nature of DG, receptacles or tank containing the DG and space constraints in existing building or land development, a DG store could be constructed in various forms, which typically include:

(a) Class 2 DG –

Typical Form of Construction	Suitable for Storage of	Height Restriction
fire compartment within building	pressure receptacles other than tank	(Please refer to paragraph 2.2.4.1)

(b) Class 3 / 3A DG –

Typical Form of Construction	Suitable for Storage of	Height Restriction
fire compartment within building	Intermediate Bulk Containers (IBCs), drums, jerricans, etc.	(Please refer to paragraph 2.2.4.1)
fire compartment within building	aboveground tank	(Please refer to paragraph 2.2.4.1)
bunded area at open space	aboveground tank	N/A
open space	underground tank	N/A

(c) Classes 4 to 9 DG –

Typical Form of Construction	Suitable for Storage of	Height Restriction
fire compartment within building	IBCs, drums, jerricans, etc.	(Please refer to paragraph 2.2.4.1)
fire compartment within building	aboveground tank	(Please refer to paragraph 2.2.4.1)
bunded area at open space	aboveground tank	N/A

2.2.3.2 Paragraph 2.2.3.1 above only illustrates certain typical examples for general reference.

2.2.3.3 There are certain installations with complex design and layout completely different from the above examples, e.g. refrigerated liquid (or *cryogenic liquid*) Vacuum Insulated Evaporator (VIE) tank, Petrol Filling Stations (PFS), Marine Fuelling Stations, Oil Depots, Potential Hazardous Installations (PHIs), storage and use of special gases in microelectronics industry, etc. As different expertise and special design considerations are involved, the applicant should approach all relevant departments for prior approval / professional advice in the planning stage to avoid any undue delay in processing the relevant store and use licence.

2.2.4 General Siting Requirements

2.2.4.1 For DG store within a building –

2.2.4.1.1 Construction of a DG store may affect the safety of remaining parts of a building or involve alteration works to an existing building. In this connection, the applicant is strongly advised to submit the general building plans with the location of the proposed DG store to the Building Authority via the Centralised Processing System for approval prior to making a formal application for store and use licence.

2.2.4.1.2 In respect of general siting requirements, a proposed DG store within a building:

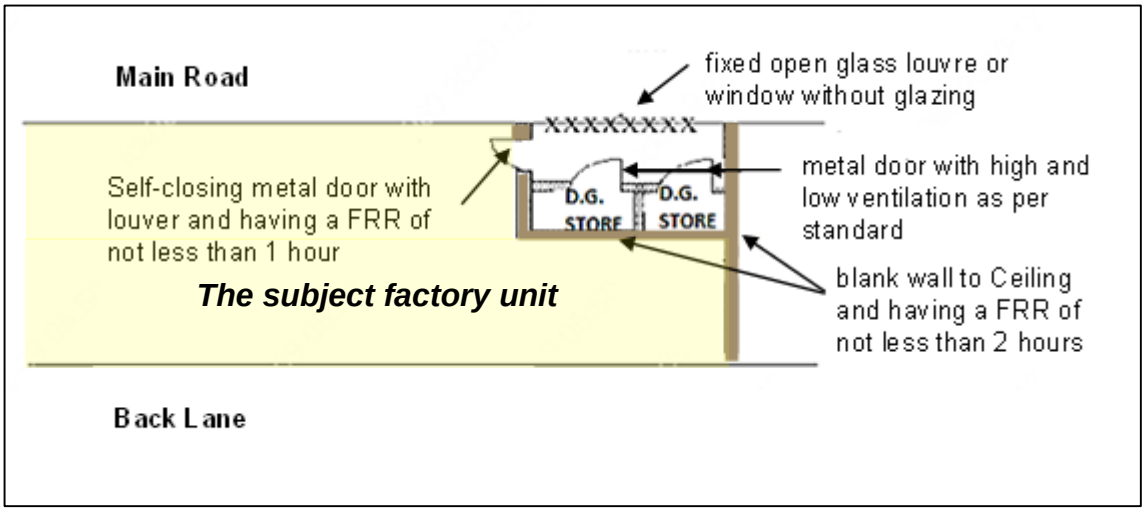
(a) should not be located at basement level;
(b) should be readily accessible from open air and located on ground floor of the building, unless otherwise as specified in the paragraph 2.2.4.1.3 below;
(c) should not be located directly under or above another DG store;
(d) should neither jeopardize any exit routes nor create undue exposure to hazards to the property of third party;
(e) should be enclosed in a fire compartment entirely separated from the remainder of the building having a fire resistance rating (FRR) of not less than two hours carried from floor to ceiling; and
(f) should be provided with adequate natural ventilation to open air; otherwise, be provided with mechanical ventilation system (see Chapter 2.3 for details).

2.2.4.1.3 Notwithstanding paragraph 2.2.4.1.2 above, a proposed DG store within an **industrial building**:

(a) could be located inside a factory unit on the upper floor not higher than 30 metres above the ground floor level;
(b) *if located on the upper floor*, should be sited close to the use area (see paragraph 2.2.8 for details);

(c) *if located on the upper floor*, should be constructed in such a way that the inside of it faces the main street when opened;

(d) *if located on the upper floor*, should be provided with an approaching lobby having a window opening with fixed open glass louvres or without glazing on the external wall. A sample plan is provided below for reference:



(e) could be freely accessed by fire appliances by taking into consideration including but not limited to the following factors:

- width, gradient and conditions of the road leading to the premises;
- gross weight , turning circle and length of fire appliances;
- overhead obstructions; and
- building projections.

(f) could be located on roof provided that the level is not higher than 30 metres above the ground floor level and the applicant's business occupies the top floor of the building.

2.2.4.1.4 The following salient points shall also be observed when planning the storage of DG in a proposed DG store within a building:

(a) The aggregate storage quantities on any upper floor (including the roof) should not exceed:

- Liquid: 2,500 litres for Class 3A DG; or
  1,350 litres for DG of other Classes
- Solid: 900 kg
- Gas: only to be considered on the merits of individual application

(b) The roof or floor loading on which the proposed DG store is located should be structurally capable of withstanding the envisaged storage load.

(c) Routing of the piping for distribution of DG, if any, should also be carefully pre-planned. Piping passing through any means of escape / common area is prohibited. Piping running inside building and passing through floors will generally not be accepted unless additional fire safety measures are imposed, which will be considered on a case-by-case basis.

2.2.4.2 For PFS, Oil Depots and PHIs –

2.2.4.2.1 For the siting of PFS, Oil Depots and PHIs, applicants are advised to seek prior approval from the LandsD, PlanD, EPD and other relevant departments where appropriate before submitting application for store and use licence.

2.2.4.2.2 The Hong Kong Planning Standards and Guidelines provides general siting requirements for such installations.

2.2.5 Compatibility of DG

2.2.5.1 It is of utmost importance that incompatible DG should not be stored together.

2.2.5.2 Should the applicant have limited knowledge on the chemicals under application, they should obtain assistance from the manufacturers or suppliers of the chemicals, e.g. by obtaining the corresponding SDS of the chemicals.

2.2.5.3 The applicant should ensure that a proper classification of the chemicals is done in accordance with Cap. 295E, and the DG intended to be stored are compatible by observing Chapter 2.3 of CoP.

2.2.5.4 Pursuant to s. 110 of Cap. 295G, a person must not store, or cause or permit to be stored, 2 or more types of DG (whether or not of the same class) that are incompatible in a licensed store.

2.2.5.5 2 or more types of DG are incompatible if, when they come into contact with each other or all others—

(a) a combustion occurs or is likely to occur;
(b) considerable heat is, or is likely to be, generated;
(c) a flammable, asphyxiant, oxidizing or toxic gas is, or is likely to be, generated;
(d) a corrosive substance is, or is likely to be, formed; or
(e) a chemically unstable substance is, or is likely to be, formed.

2.2.5.6 In addition, the following restrictions for storage of DG in the same store shall be observed:

(a) Class 2 DG must not be stored with DG of a different class;
(b) Class 3 DG must not be stored with DG of a different class, except Class 3A DG or paint materials that are Class 3 DG or Class 8 DG;
(c) Class 3A DG must not be stored with DG of a different class, except Class 3 DG or paint materials that are Class 3 DG or Class 8 DG; and
(d) Class 4 DG, Class 5 DG, Class 6.1 DG, Class 8 DG or Class 9 DG must not be stored with Class 2 DG, Class 3 DG or Class 3A DG, or DG of any other classes so specified for the purposes of this paragraph in Chapter 2.3 of CoP.

2.2.6 Submission of Plans

2.2.6.1 In general, 2 sets (unless otherwise specified in (k) below) of the following plans drawn to the nearest metric scales are required in the submission:

(a) block plan(s) showing the location of the building and its surrounding buildings / public thoroughfares;
(b) layout plan(s) showing the floor level of the proposed DG store;
(c) layout plan(s) showing the one floor above and one floor below of the proposed DG store;
(d) layout plan(s) showing the proposed DG store;
(e) section plan(s) showing the details of the proposed DG store;
(f) elevation plan(s) showing the details of the proposed DG store;
(g) plan(s) showing the hazardous area related to the proposed DG store (See paragraph 2.2.7 for details)
(h) (if applicable) plan(s) showing the installation of mechanical ventilation system for the proposed DG store;
(i) (if applicable) plan(s) showing the routing of the piping for the distribution of DG from the proposed DG store;
(j) (if applicable) schematic diagram(s) showing the piping for the distribution of DG from the proposed DG store; and/or
(k) (if applicable; but only one set of) plan(s) showing the location(s) at which the DG may be used if such location(s) is inexplicable as an address in the application form (See paragraph 2.2.8 for details).

2.2.6.2 In general, the following details of the proposed DG store must be shown on the submitted plans:

(a) Location –

- the siting of the proposed DG store;
- for storage involving Class 3 or 3A DG only:

  (*where the proposed DG store does not form part of other premises*)

  - the distance between the proposed store and any other premises or public place; or

  (*where the proposed DG store forms part of other premises*), sufficient particulars to indicate the position of the proposed DG store in relation to

  - such other parts of the premises as are adjacent to the proposed store; and
  - any staircase, external fire escape, window or other means of egress from the premises.

(b) Elements of Construction –

- the material of which the proposed DG store is or is to be constructed
- the FRR for the construction of the proposed DG store including floors, walls, ceiling or roof;
- the FRR for the door(s) of the proposed DG store.

(c) Measurement Details –

- the dimension of the proposed DG store;
- the calculation for the cubic volume of the proposed DG store;
- (if applicable) the height of the door curb and calculation for the retaining capacity.

(d) Ventilation –

- the means of ventilation;
- the size of the effective louvre area for the high / low ventilators;
- the calculation for the total area of the ceiling plus walls of the proposed store / premises;
- the calculation for the ventilation ratio.

(e) Piping (*if applicable*) –

- the material of which the pipeline is or is to be constructed;
- the routing of and method of fixing any pipeline which is to be installed for the purpose of distributing DG from the proposed store to any part of other premises which the proposed store serves or is intended to serve.

(f) Hazardous Area –

- the hazardous area of the proposed DG store.

(g) Others –

- such other material particulars, if any, that FSD may require to be shown on the plans.

2.2.6.3 Any handwriting on the submitted plans should be signed and stamped. Where necessary, the applicant or his / her authorised representative may make minor amendments to the submitted plans following by signature and stamping thereon.

2.2.7 Hazardous Area

2.2.7.1 General

2.2.7.1.1 "Hazardous area" has the following definition in s. 92 of Cap. 295G:

"Hazardous area (危險區), in relation to a licensed factory, licensed store or Class 3A premises, means the area of, and adjacent to, the factory, store or premises that is marked as 'hazardous area' on the latest plan of the factory, store or premises approved by the Director"

2.2.7.1.2 In relation to a licensed factory, licensed store and Class 3A premises, it shall be identified for the purpose of setting restriction area for licence conditions and precautionary measures to be taken place.

2.2.7.2 Determination of hazardous area

2.2.7.2.1 The applicant shall submit 2 sets of plans including layout plan and elevation plan indicating the "hazardous area" in relation to the proposed factory, store or premises during application for a licence.

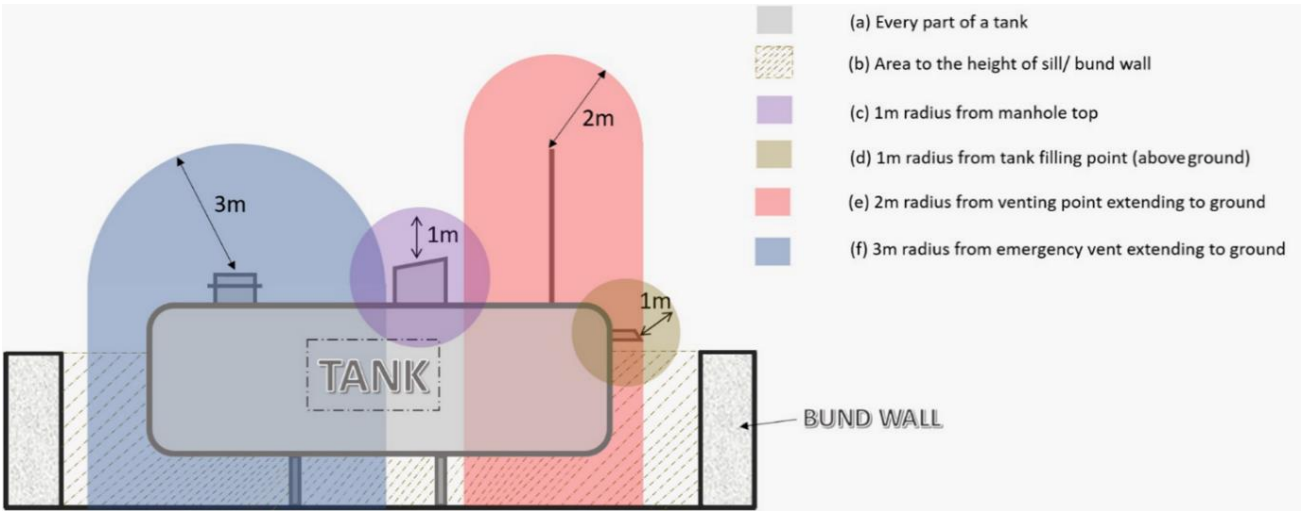
2.2.7.2.2 The applicant may follow the listed guidelines in demarcating the hazardous area:

(a) <u>DG store or Class 3A premises enclosed by fire compartment</u>

- Every part of the fire compartment

(b) <u>Class 3 / 3A aboveground tank in bunded area</u>

- Every part of a tank
- Area to the height of sill / bund wall
- 1m radius from manhole top
- 1m radius from tank filling point (aboveground)
- 2m radius from tank venting point extending to ground
- 3m radius from emergency vent extending to ground



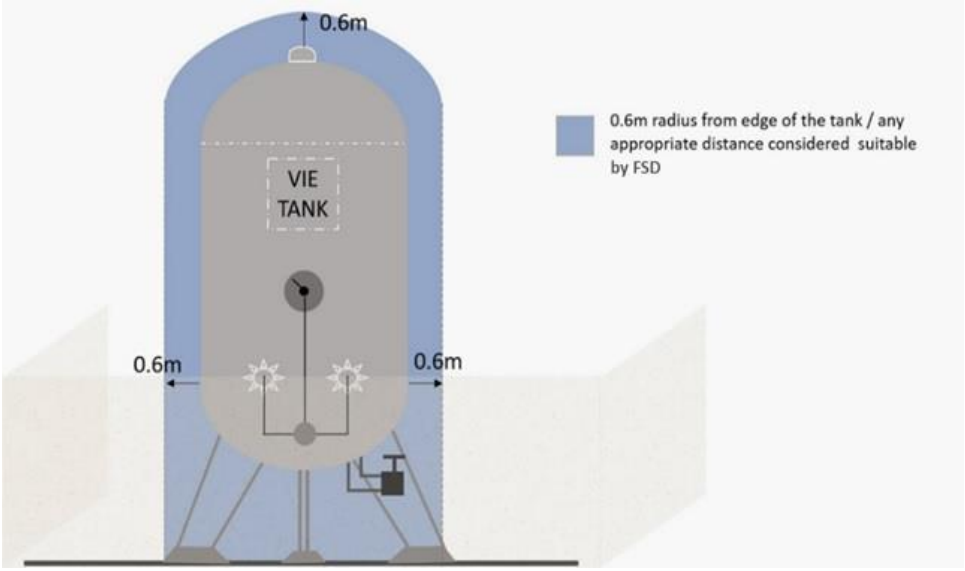
(c) <u>Petrol Filling Station</u>

- Underground storage tank
  - Every part of a tank
  - Within tank access chambers which do not have tank filling points
  - Within any access chamber or pit in which there are tanker delivery hose connection point
- Filling point
  - 1m radius from tank filling point (aboveground)
  - 1m radius from edge of the chamber if filling point is below ground
  - 4m radius of aboveground offset fill connection
- Vent pipe
  - 2m radius around tank venting point extending to ground
- Road tanker unloading
  - 1m radius along the delivery hose route from tanker connection point to the tank filling point
  - 4m radius of a tanker connection point
  - 1m radius around the tanker connection point including vapour return hose connections extending to ground
  - 1m radius around vapour return hose connection point

- Dispenser
  - Every part of a dispenser
  - Area covered by a hose length plus 1m extending to 1.2m from ground
- Oil / water separator
  - Within a separator
  - Within the access chamber of a separator
  - 2m radius from the edge on a separator
  - 1m radius around a venting point of a separator

(d) <u>Class 2.2 DG in VIE tank</u>

- 0.6m radius from edge of the tank OR any appropriate distance considered suitable by FSD



2.2.7.3 For situation other than the typical examples illustrated above, the applicant shall contemplate the actual operation of the factory, store and premises and propose the hazardous area with reference to international standards, if any, and prevailing circumstances.

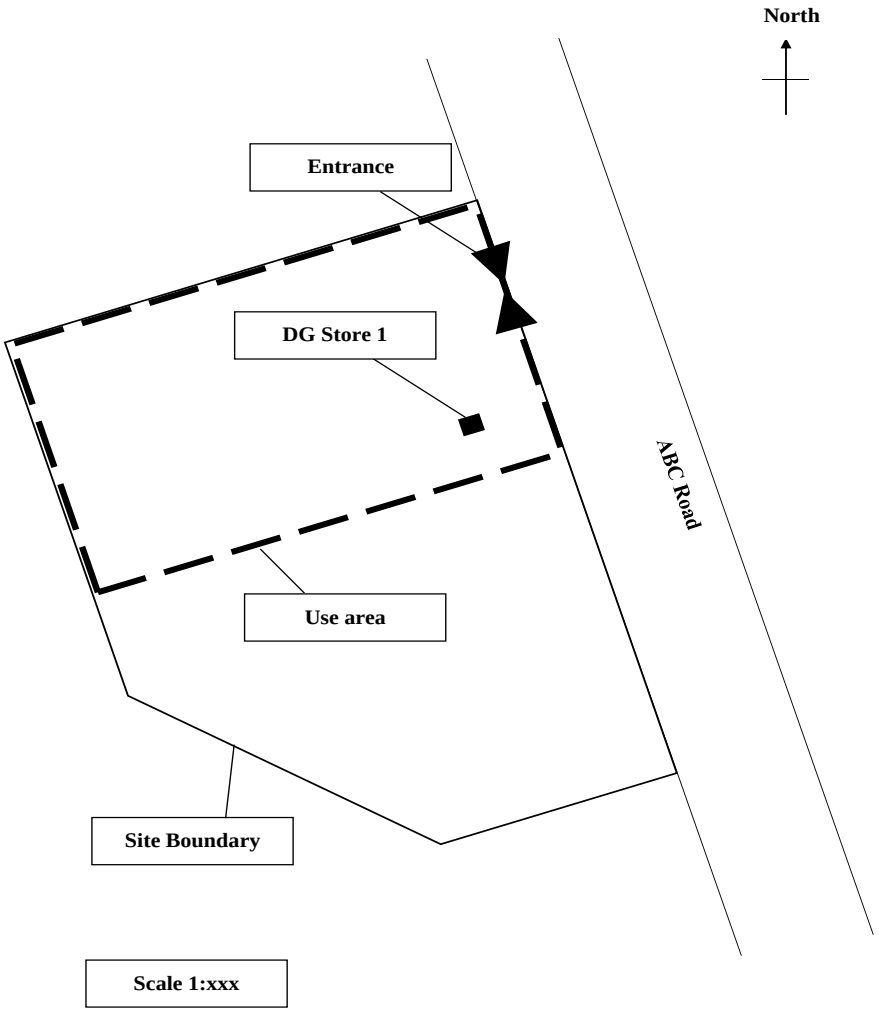
2.2.7.4 Each application shall be considered and assessed on its individual merits. Risk assessment will be conducted by the case officer of DGCD upon site inspection to determine whether the proposed hazardous area is acceptable.

2.2.8 Use area

2.2.8.1 General

2.2.8.1.1 The applicant shall specify the use area and the purpose of using the DG in the application form. The applicant may be required to provide supporting documents or information of the use area for FSD's consideration.

2.2.8.1.2 If the address of the use area is inexplicable in writing, the applicant shall submit separate layout plan(s) in A4 size depicting the use area. Please refer to the following sample:



2.2.8.2 Acceptance of Use Area

2.2.8.2.1 Applicant shall specify in writing the purpose of using DG in the proposed area.

2.2.8.2.2 The proposed use area shall be subject to a test of reasonableness. For example, the use area is under the control of the applicant and the use of DG in the area is required for the work process relating to business operation.

2.2.8.2.3 Any area irrelevant to the use of DG shall not be included in the submission. Taking a laboratory as an example, the common corridor, lift lobby and toilet outside the laboratory area shall not be accepted as use area.

2.2.8.2.4 DG transferred through piping from DG store to use area will generally be accepted, such as (i) the transfer of Class 3A DG from an underground tank to an emergency generator, or (ii) the transfer of medical gases from the DG store to wards of the hospital. In those cases, such emergency generator room and wards will also be accepted as use areas.

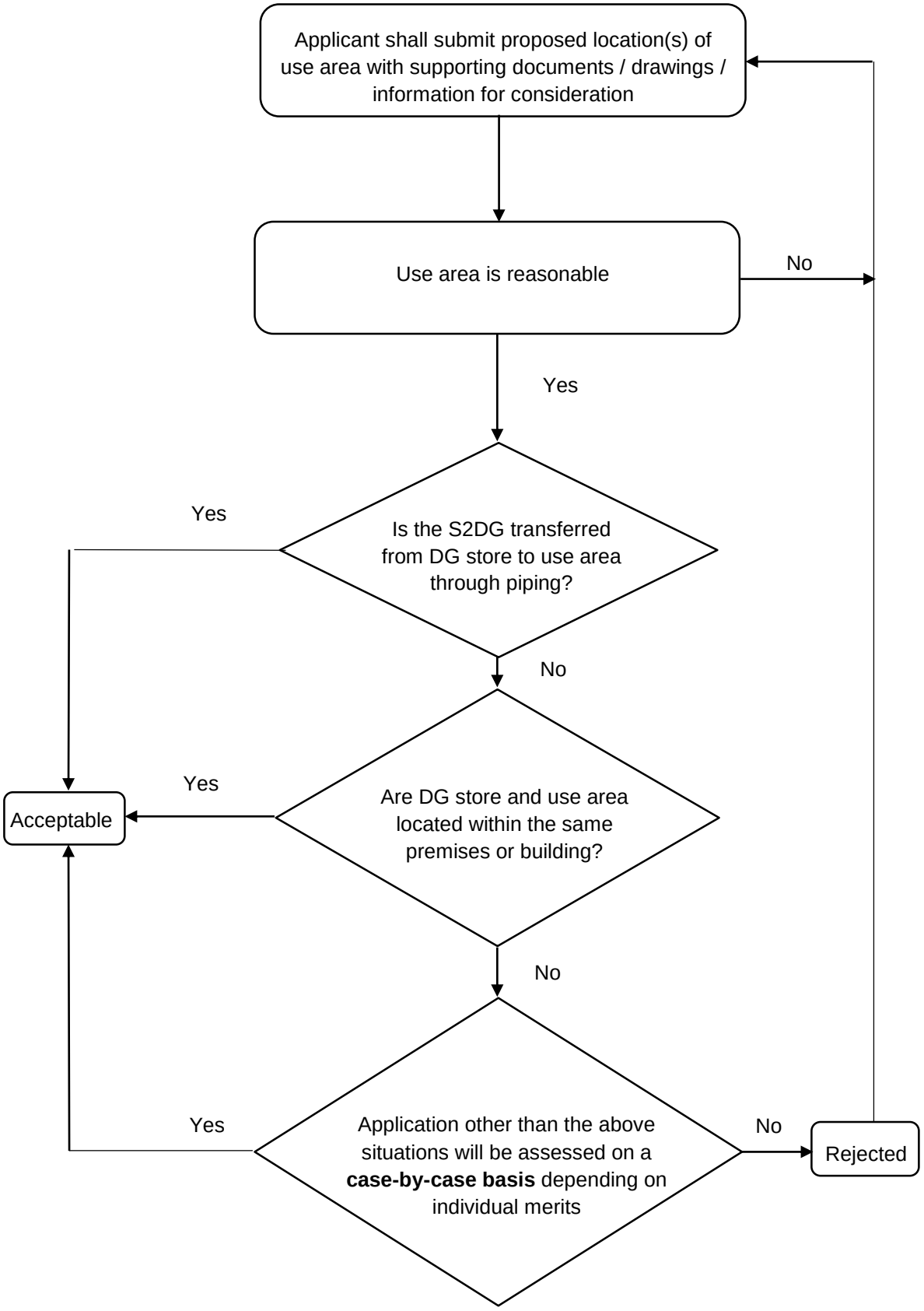
2.2.8.2.5 It is also acceptable in principle if the use area and DG store are located within the same premises or building.

2.2.8.2.6 Should the use area be not connected through piping to DG store or not located at the same premises or building with the DG store, these applications will be assessed on a case-by-case basis, with the following considerations which are by no means exhaustive:

(a) the surrounding environment and neighborhood of the use area as designated in the licence; and

(b) the conveyance of the S2DG between the store and the use area.

2.2.8.2.7 In considering the application for the use area, the following flowchart shall be observed:



2.2.8.3 The layout plan(s), if any, as described in paragraph 2.2.8.1.2 above will be a part of the store and use licence. It is required to display the layout plan along with the licence in a conspicuous place at the DG store.

2.2.8.4 All use area must be endorsed by FSD. DG exceeding EQ shall only be used in the endorsed use area. The aggregate quantity of DG being used in an endorsed use area and stored in the licensed store must not exceed the maximum quantity specified in the store and use licence.

2.2.8.5 Pursuant to s. 9B of Cap. 295, the breach of any condition endorsed upon a licence may constitute an offence and is liable to a fine at level 5 and imprisonment not exceeding 1 month for a first offence.

2.2.9 Fire Safety Requirements

2.2.9.1 In case the required plans and all supporting documents are acceptable, a set of case-specific FSR will be issued. Pursuant to s. 93 of Cap. 295G, DFS may from time to time issue or amend the FSR that sets out the safety standards required for a licensed store.

2.2.9.2 The FSR issued for the DG store must be complied with at all times.

2.2.9.3 Samples of FSR are attached in Appendices VIII and IX for general reference only. They are not exhaustive and do not preclude FSD from issuing additional requirements as each application will be considered on its own merits.

Appendix	**Typical Form of Construction**	**For the Storage of**
VIII (for Class 3 DG)	bunded area at open space	aboveground tank
IX (for Classes 4 to 9 DG)	fire compartment within building	drums, jerricans, etc.

2.2.10 Report of Compliance

2.2.10.1 After the completion of the construction works and full compliance with the FSR, the applicant may inform DGCD in writing to arrange a compliance inspection.

2.2.10.2 During the compliance inspection, the applicant shall make reference to the Compliance Check List as shown below and produce the supporting documents to the case officer for verification:

	Description	Completed (Y/N)	Supporting Documentation Required			
			Catalogues	Approval Letters	FS 251	Remarks
1.	**General (Layout and Design)**					
1.1	Layout Identical to Approved Plans					
1.2	Fire Resisting Door					
1.3	Fire Resisting Construction Materials					
1.4	High / Low Ventilators					
1.5	Door Sill					
1.6	Vapour-escape Pipe (Vent Pipe)					
2.	**Electrical Installation and Fittings**					
2.1	Lighting Fittings					Note 1
2.2	Electrical Wiring					Note 1
2.3	Switchgear					Note 1
2.4	Electro-thermal Link/ Fire Damper			Note 2		
2.5	Mechanical Ventilation System					Note 3
2.6	Work Completion Certificate (Form WR1)					
2.7	Others:					
3.	**Fire Service Installations or Equipment**					
3.1	Fire Extinguisher					
3.2	Fixed Sprayer					
3.3	Fixed FSI					
3.4	Sand Buckets					
3.5	Fire Detection System					
4.	**Signs (Including Notices)**					
4.1	"NO SMOKING 不准吸煙" Notice					
4.2	"NO NAKED FLAME 不准明火" Notice					
4.3	"DANGEROUS GOODS 危險品 " Notice					
4.4	Mark to Reflect UN no. / HK no. and PSN in Chinese and English of the DG Contained in Tank (if any)					
4.5	Pictorial Plate(s) to Reflect the Class(es) and Subsidiary Hazard(s)					

	Description	Completed (Y/N)	Supporting Documentation Required			
			Catalogues	Approval Letters	FS 251	Remarks
4.6	Notice Required at External Wall of Approaching Lobby (if any)					
5.	**Others**					
5.1	Confirmation Letter from Ultimate Licensee / User					
5.2	Copy of Business Registration Certificate					
5.3	Operation Manual as Required in FSR					
5.4	Level Sensor			Note 4		
5.5	Dispensing Facilities					Note 1
5.6	Manifolds and Control Panels for Piped Gas Installation					Note 1
5.7	Certificate of Piped Gas Installation					
5.8	Survey Report for Storage Tank					

Remarks:

Note 1: Letter of Compliance from VD of FSD is required for any electrical installation and fittings installed in the hazardous area of a DG store where Class 2.1, 3, 3A, 4, 5 DG, or DG of any other Classes with subsidiary hazard of 2.1, 3, 4.1, 4.2, 4.3 or 5.1 is involved, or of a Class 3A premises.

Note 2: Equipment should be on the acceptable material list issued by VD of FSD if FSD Approval Letter is not available.

Note 3: Letter of Compliance from VD of FSD is required for any mechanical ventilation and its ancillary electrical installation.

Note 4: Relevant Explosion-proof Certificate should be provided if FSD Approval Letter is not available.

2.2.10.3 If non-compliance with any FSR is noted during the compliance inspection, a notification indicating the outstanding item(s) will be forwarded to the applicant. The applicant may inform DGCD in writing for arrangement of re-inspection upon full compliance with the FSR.

2.2.11 Issuance of Licence and Prescribed Fee

2.2.11.1 Upon a compliance inspection with satisfactory result, the applicant will be notified in writing that a store and use licence / manufacture licence is available for collection at the designated shroff office upon payment of the licence fee.

2.2.11.2 Licence fees specified in Part 2 of Sch. 8 to Cap. 295G are summed up in the following table for easy reference:

Column 1	**Column 2**	**Column 3**	**Column 4**
Licences[1]	Fee for grant or renewal $	Fee for duplicate or replacement of licences and identification discs[2] $	Fee for alteration or addition or endorsement of conditions $
A manufacture licence	1,560	275	275
A store and use licence for storing Class 2 DG in—		275	275
(a) each licensed tank	1,310		
(b) each licensed store (other than a licensed tank) for storing—			
(i) not more than 500 units[3] in one or more receptacles	530		
(ii) more than 500 units but not more than 2 500 units in one or more receptacles	1,040		
(iii) more than 2 500 units in one or more receptacles	2,600		
A store and use licence for a licensed store for storing Class 3 DG or Class 3A DG of quantities[4]—		275	275
(a) not exceeding 500 units	300		
(b) exceeding 500 units but not exceeding 2 500 units	575		
(c) exceeding 2 500 units but not exceeding 5 000 units	870		

Column 1	Column 2	Column 3	Column 4
Licences[1]	Fee for grant or renewal $	Fee for duplicate or replacement of licences and identification discs[2] $	Fee for alteration or addition or endorsement of conditions $
(d) exceeding 5 000 units but not exceeding 25 000 units	2,760		
(e) exceeding 25 000 units	7,570		
A store and use licence for a licensed store for storing Class 4 DG, Class 5 DG, Class 6.1 DG, Class 8 DG or Class 9 DG of quantities—		275	275
(a) not exceeding 25 units	575		
(b) exceeding 25 units but not exceeding 100 units	1,150		
(c) exceeding 100 units	2,530		

Remarks:

Note 1: For a licence specified in column 1 of the above table –

(a) The fee specified in column 2 corresponding to the licence is prescribed for the grant or renewal of the licence for 12 months;

(b) The fee specified in column 3 corresponding to the licence is prescribed for a duplicate or replacement of the licence and identification disc; and

(c) The fee specified in column 4 corresponding to the licence is prescribed for an alteration or addition to, or endorsement of conditions on, the licence and identification disc;

Note 2: Identification disc has the meaning given by s. 115 of Cap. 295G and is not applicable to a store and use licence / manufacture licence;

Note 3: Unit has the same meaning as in s. 4 of Cap. 295E; and

Note 4: Quantity has the same meaning as in s. 5 of Cap. 295E.

2.2.12 Conditions of Licence and Other Restrictions

2.2.12.1 The conditions of a store and use licence / manufacture licence shall be continuously complied with in order to maintain the validity of such licence. Pursuant to s. 9B of Cap. 295, the breach of condition endorsed upon such licence shall constitute an offence which is liable on conviction to—

(a) for a first offence, a fine at level 5 and imprisonment not exceeding 1 month;
(b) for a subsequent offence, to a fine at level 6 and imprisonment not exceeding 3 months.

2.2.12.2 DFS may impose any of the following conditions on a store and use licence under s. 98 of Cap. 295G:

(a) the licence or a copy of it must be displayed in a conspicuous place at the licensed store;
(b) the licence must be produced for inspection if requested by DFS;
(c) the licence must not be altered without the approval of DFS;
(d) the quantity for the storage and use of DG in aggregate must not exceed the maximum quantity for the storage and use in aggregate as specified in the licence;
(e) when the DG specified in the licence are not in use[8], they must be returned to the store for storage;
(f) the FSR issued for the store must be complied with at all times;
(g) adequate measures must be taken to ensure the safe operation of the store, including the housekeeping, management, security, staff training, emergency preparedness and other control of the store;
(h) the layout and structure within the hazardous area of the store must be kept in the same way as shown in the latest plan of the store approved by DFS in writing;
(i) the store (including any fittings or equipment in it) must be maintained in good order and condition at all times;
(j) the store and all other areas in the hazardous area must be maintained in a clean and tidy condition;

(k) the store must not be used for the storage of any thing or DG (other than the DG specified in the licence), except—

(i) any thing that is necessary to facilitate the storage of the DG; or

(ii) an empty receptacle used for containing the DG;

(l) if there is any ventilation opening provided in the store, the opening must not be obstructed;

(m) no vehicle may be parked in the hazardous area of the store for any purpose other than refueling;

(n) one way traffic flow must be maintained for the entry and exit routes for a store that is a refueling station;

(o) when a vehicle delivers fuel to the store, a safe emergency route must be maintained;

(p) DG must not be placed outside the store for any purpose or duration, unless the DG are in use[8] or the placing of the goods is reasonably necessary in the course of handling the DG;

(q) the FSI or equipment for the store must be kept in efficient working order;

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[8] To satisfy the definition of "in use" as per the provisions stated in sections 98 (e) and (p) of Cap. 295G, the DG concerned must fulfill the following requirements:

(i) situated in the *use area designated in the licence;

(ii) for a reasonable intended usage, with the kind of business involved taken into consideration; and

(iii) in a reasonable quantity, with due consideration of the quantity of the S2DG generally used in that business within a certain period of time and its inherent hazards.

*remarks: when assessing the location of a proposed use area in the course of processing a store and use licence application, the following considerations may be taken into account:

(a) the surrounding environment and neighborhood of the use area as designated in the licence; and

(b) the conveyance of the S2DG between the store and the use area.

(r) the FSI or equipment for the store must—

(i) be inspected by a registered contractor at least once in every 12 months; and

(ii) be certified, after the inspection, to be in efficient working order by a certificate issued by the registered contractor under regulation 9 of the Fire Service (Installations and Equipment) Regulations (Cap. 95 sub. leg. B);

(s) the FSI or equipment for the store must not be obstructed by any thing in a way that may affect its operation;

(t) if there is any incident of explosion or fire in, in the vicinity of or in connection with the store, or any leak of DG from the store—

(i) the incident must be reported immediately to DFS; and

(ii) if loss of life or personal injury is caused by the incident—the loss or injury must also be reported immediately to DFS;

(u) any spill or leakage of DG must be stemmed and handled promptly;

(v) if a licensed tank is inspected under regulation 8 of the Building (Oil Storage Installations) Regulations (Cap. 123 sub. leg. K) and, after the inspection, a certificate of inspection is issued under that regulation, a copy of the certificate must be delivered to DFS as soon as practicable.

2.2.12.3 DFS may impose any of the following conditions on a manufacture licence under s. 96 of Cap. 295G:

(a) the licence or a copy of it must be displayed in a conspicuous place at the licensed factory;

(b) the licence must be produced for inspection if requested by DFS;

(c) the licence must not be altered without the approval of DFS;

(d) the FSR issued for the factory must be complied with at all times;

(e) adequate measures must be taken to ensure the safe operation of the factory, including the housekeeping, management, security, staff training, emergency preparedness and other control of the factory;

(f) the layout and structure within the hazardous area of the factory must be kept in the same way as shown in the latest plan of the factory approved by DFS in writing;

(g) except with DFS's written approval, no alteration or addition may be made to the factory (including any fittings or equipment in it);

(h) the factory (including any fittings or equipment in it) must be maintained in good order and condition at all times;

(i) the FSI or equipment for the store must be kept in efficient working order;

(j) the FSI or equipment for the store must—

(i) be inspected by a registered contractor at least once in every 12 months; and

(ii) be certified, after the inspection, to be in efficient working order by a certificate issued by the registered contractor under regulation 9 of the Fire Service (Installations and Equipment) Regulations (Cap. 95 sub. leg. B);

(k) the FSI or equipment for the store must not be obstructed by any thing in a way that may affect its operation;

(l) if there is any incident of explosion or fire in, in the vicinity of or in connection with the store, or any leak of DG from the store—

(i) the incident must be reported immediately to DFS; and

(ii) if loss of life or personal injury is caused by the incident—the loss or injury must also be reported immediately to DFS;

(m) any spill or leakage of DG must be stemmed and handled promptly.

2.2.12.4 Notwithstanding the above, the licensee shall also observe that:

2.2.12.4.1 The statutory restrictions and safety precautions relating to a licensed store / licensed factory as stipulated in s. 101 to s. 113 of Cap. 295G are complied with; and

2.2.12.4.2 The DG so stored in the licensed store are packed, marked and labelled in accordance with the requirements as stipulated in Sch. 6 to Cap. 295G.

Failure to comply with the requirements may lead to an offence pursuant to s. 142(1) of Cap. 295G. For details of PML requirements, please refer to Part III and IV of CoP.

2.2.13 Renewal of Licence

2.2.13.1 A licence is valid:

(a) for 12 months with effect from the date of grant or renewal; or
(b) for such a lesser period as may be specified in the licence.

2.2.13.2 If renewal of the licence is required, the licensee shall ensure that the licence is renewed before its expiry.

2.2.13.3 The application for renewal of licence shall be made in writing to DGCD of FSD, and shall include a completed application form. The form can be downloaded from the following link:

https://es.hkfsd.gov.hk/dg/en/licence/form/

2.2.13.4 An application for renewal of licence shall be submitted:

(a) not less than 2 months before the expiry of the licence; and
(b) not more than 3 months before the expiry of the licence.

2.2.13.5 Licensees shall make sure that any periodic inspections in relation to any equipment, electrical installation, tank, pipeline, FSI and equipment, etc., if any, are conducted before the renewal inspection.

2.2.13.6 Licensees shall make sure that copies of supporting documents as required in the application form should be sent to DGCD 7 working days before renewal inspection. The originals of these documents shall be available for verification at the time of renewal inspection.

2.2.13.7 The licence would only be renewed upon continuous compliance with the FSR and conditions and full payment of the licence fee (see paragraph 2.2.11.2 for details).

2.2.14 Revocation and Cancellation of Licence

2.2.14.1 Pursuant to s. 9(2) of Cap. 295, DFS may revoke a licence if there is sufficient proof that a licensee has committed an offence against Cap. 295 or breached any licence conditions.

2.2.14.2 Pursuant to s. 17 of Cap. 295, if the licensee is convicted on charges under Cap. 295 and its subsidiary legislation, the magistrate may, in addition to any other penalty, order that any licence issued under Cap. 295 held by such licensee shall be cancelled.

2.2.15 Points to Note for Fuel Tank Room (FTR)

Introduction

2.2.15.1 This paragraph is to provide specific guidance on application for approval of a fuel tank for storing Class 3A DG in FTR in addition to paragraphs 2.2.2 to 2.2.10.

2.2.15.2 “Tank” has the meaning given by s. 2 of Cap. 295G, i.e. a static tank or a reservoir used to contain S2DG.

2.2.15.3 “Approved tank” has the meaning given by s. 92 of Cap. 295G, i.e. a tank approved under s. 114(1).

2.2.15.4 “Class 3A premises” has the meaning given by s. 92 of Cap. 295G, i.e. the premises in which an approved tank containing Class 3A S2DG is located.

2.2.15.5 FTR in this paragraph means a fire compartment completely separated from the rest of building in which a tank containing Class 3A DG is located.

2.2.15.6 For a fuel tank with water capacity of 500 litres or below containing Class 3A DG, it shall comply with the respective PML requirements as stipulated in CoP. However, if the tank has complied with the requirements under Fire Services Standard Requirements of Emergency Electrical Generator [NP/105], the PML requirements are not applicable.

2.2.15.7 For a fuel tank with water capacity exceeding 500 litres, it may fall into one or the following circumstances: -

2.2.15.7.1 A store and use licence shall be required as the capacity of such tank exceeds the size of the specified receptacle (see paragraph 1.2.2 for details); or

2.2.15.7.2 If the aggregate quantity of Class 3A DG does not exceed 2,500 litres, and the circumstances under s. 28A of Cap. 295E are satisfied, such tank shall be an approved tank. S. 28A of Cap. 295E stipulates that:

the storage and use of Class 3A DG in any premises are exempt from the operation of s. 6 of Cap. 295, if –

(a) such goods are used for –

(i) an emergency generator for any FSI or equipment;

(ii) an emergency power backup facility; or

(iii) (if those premises are industrial premises) any industrial undertaking carried out in those premises;

(b) such goods are –

(i) wholly contained in an approved tank; or

(ii) partly in an approved tank and the remainder are in packaged form;

(c) the aggregate quantity of such goods does not exceed 2,500 litres; and

(d) if such goods are partly in packaged form—the quantity of such goods in packaged form does not exceed the industrial exempt quantity, general exempt quantity or special exempt quantity (as the case may be) under s. 14(1) of Cap. 295E.

Application Procedure

2.2.15.8 Applicant may make an application by himself / herself or any person authorised in writing by the applicant.

2.2.15.9 The application for **approval of tank** containing Class 3A DG shall be made in writing to DGCD of FSD with the following information:

(a) a copy of the applicant's identity proof – HKID card / Business Registration Certificate;
(b) a copy of the agent's identity proof – HKID card / Business Registration Certificate (applicable to applications submitted by agent);
(c) an authorisation letter from the applicant (applicable to applications submitted by agent);
(d) a copy of relevant SDS; and
(e) 2 sets of applicable plans as required in paragraph 2.2.6, except the layout plan(s) for use area.

2.2.15.10 The flowchart showing the application procedure for approval of tank is shown in paragraph 2.2.2.3.

General Siting Requirements

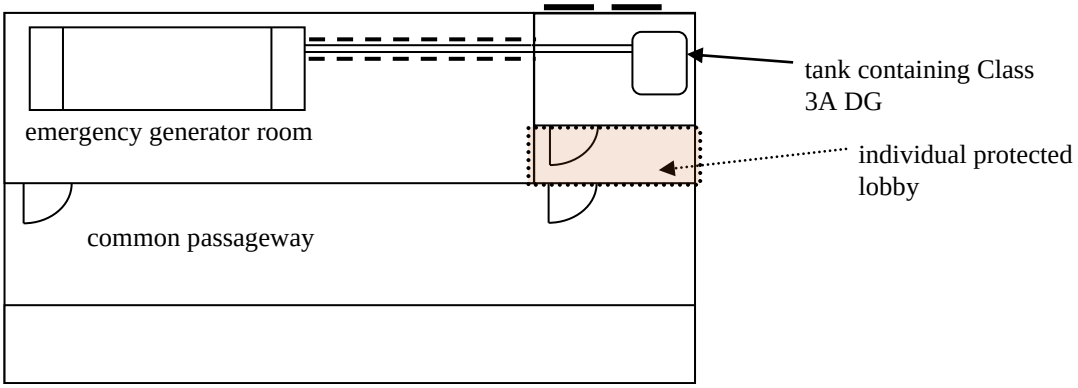
2.2.15.11 The submission of general buildings plans to the Building Authority for the siting approval of a proposed FTR is required (see paragraph 2.2.4 for details).

2.2.15.12 The general siting requirements for a proposed FTR within a building are as follows:

(a) the requirements as prescribed in paragraph 2.2.4.1.2(a), and (c) to (f) should be fulfilled;

(b) *if such building is a domestic building used exclusively for dwelling purpose or a composite building where upper floors are used for dwelling purpose,* the FTR could be located on the upper floor not higher than 30 metres above the ground floor level;

(c) *when access from or discharge to open air is not possible*, the FTR should be provided with an individual protected lobby. A sample plan is provided below for reference:



(d) *if provided with the individual protected lobby*, the doors of the lobby should be self-closing with an FRR of not less than one hour, and be opened in the direction of egress.

2.2.15.13 The following salient points shall also be observed when planning the storage of Class 3A DG in a proposed FTR within a building:

(a) The aggregate storage quantity of Class 3A DG on any upper floor (including the roof) shall not exceed 2,500 litres.

(b) The roof or floor loading on which the proposed FTR is located should be structurally capable of withstanding the envisaged storage load.

(c) Routing of the piping for distribution of DG, if any, shall also be carefully pre-planned. Piping passing through any means of escape / common area is prohibited. Piping running inside building and passing through floors will generally not be accepted unless additional fire safety measures are imposed, which will be considered on a case-by-case basis.

Fire Safety Requirements

2.2.15.14 Each application will be considered on its own merits. The FSR issued for Class 3A premises shall be satisfactorily addressed before an approval of tank is granted by FSD.

Grant and Withdrawal of Approval

2.2.15.15 Upon full compliance with the FSR issued for the Class 3A premises, the applicant will be notified in writing that the tank under application is approved for containing Class 3A DG.

2.2.15.16 FSD may withdraw any approval granted for a tank containing Class 3A DG if any of the FSR issued for the Class 3A premises is breached.

Other Restrictions

2.2.15.17 Notwithstanding the above, the person who owns or possesses the approved tank shall also observe that:

(a) the statutory restrictions and safety precautions in relation to a Class 3A premises as stipulated in s. 101 to s. 113 of Cap. 295G are complied with; and

(b) the Class 3A DG in packaged form so stored in the Class 3A premises (if any) are packed, marked, labelled in accordance with the requirements as stipulated in Sch. 6 to Cap. 295G. Failure to comply with the requirements may constitute an offence pursuant to s. 142(1) of Cap. 295G. For details of PML requirements, please refer to Part III and IV of CoP.

2.2.16 Points to Note for Store and Use Licence in Construction Site

2.2.16.1 This paragraph is to provide specific guidance on application for store and use licence in construction site in addition to paragraphs 2.2.2 to 2.2.14. It is not applicable to DG stores of permanent nature.

Introduction

2.2.16.2 DG, such as paint, thinner, diesel, oxygen, acetylene, etc., are commonly used in construction site. The details are listed in Table 2.2.16.2 below for reference.

Table 2.2.16.2 DG Commonly Used in Construction Site

UN / HK No.	Proper Shipping Name	Class	Industrial Exempt Quantity*
UN 1001	ACETYLENE, DISSOLVED	2.1	300 litres
UN 1072	OXYGEN, COMPRESSED	2.2	300 litres
UN 1202	GAS OIL or DIESEL FUEL or HEATING OIL, LIGHT	3	150 litres
UN 1203	MOTOR SPIRIT or GASOLINE or PETROL	3	150 litres
H301	DIESEL or FUEL OIL or FURNACE OIL	3A	2,500 litres

* As construction site is an industrial premises under the interpretation of Cap. 295E, the IEQ may be observed.

Siting of the Store / Tank in Construction Site

2.2.16.3 The siting requirements of the store / tank in construction site include:

(a) No DG store shall be placed underneath a bridge or flyover.

(b) A clear distance of 6 metres from any discharge opening of a staircase shall be maintained.

(c) No naked flame, forge, heat source of substantial heat, combustible material and dry undergrowth is allowed within 6 metres perimeter of the DG store unless separated by a fire resisting wall approved by DFS.

(d) For aboveground tank in open space, a clearance of not less than 4m radius shall be maintained.

Construction Materials

2.2.16.4 The DG store shall be:

(a) constructed of materials with not less than 2-hour FRR or of mild steel of at least 6mm thick.

(b) provided with door(s) of self-closing type and open outwards / sliding. They should be made of material with at least 1-hour FRR or mild steel of at least 3mm thick.

Ventilation

2.2.16.5 Ventilation of the DG store shall be designed as follows:

(a) Each ventilation opening shall have a minimum size of 200mm x 200mm and evenly distributed.

(b) Ventilators shall be of weather proof type and fitted with mesh wires.

(c) High and low-level ventilators shall be provided. The high-level ventilators shall be as near to the roof as possible.

Other Guidelines

2.2.16.6 Other guidelines for safe operation and management of the DG store include:

(a) A clearance of at least 300mm from low-level ventilators shall be maintained for effective ventilation.

(b) The high-level ventilators shall be higher than the receptacles containing DG. A clearance of at least 300 mm is required if the high-level ventilators are lower than the top of the receptacles.

(c) A clearance of at least 300 mm from door sill shall be maintained for effective fire separation for stores.

(d) All pressure receptacles should be stowed in upright position and chained up to prevent toppling.

(e) Security arrangement such as fencing off open storage areas may be provided to prevent trespassing or tampering.

Submission of Plans

2.2.16.7 The following plans shall be included in the submission:

2.2.16.7.1 2 sets of site location plan

(a) For easy identification of the exact location of the site, a site location plan incorporating nearby development or structures shall be submitted.

(b) The plan(s) shall be drawn to a scale of not less than 1:1,000.

(c) The boundary of the construction site, the exact locations of the stores and safety distance shall be shown.

(d) Other details such as buildings in the vicinity, temporary structures, major installation and vehicular access road within 100 metres of the store under application shall be shown.

2.2.16.7.2 2 sets of layout plans of the proposed DG store

(a) The plans should be drawn to a scale of not less than 1:100. All dimensions should be given in metric units.

(b) The plan and side elevations of the store shall be shown.

(c) Details of the construction material, means of ventilation, entrance door, arrangement of the storage of DG, provisions of FSI or equipment, and protection against lightning shall be clearly indicated.

(d) If storage tank is involved, the design and construction of the tank, its tankage, ancillary container, pipelines and dispensing facility or pumping equipment with relevant standards shall also be indicated.

2.2.16.7.3 Separate layout plan(s) for use area at which the DG may be used should be submitted if such location(s) is inexplicable as an address in the application form (See paragraph 2.2.8 for details).

Fire Safety Requirements

2.2.16.8 Sample of FSR is attached in **Appendix X** for general reference only. It is not exhaustive and does not preclude FSD from issuing additional requirements as each application will be considered on its own merits.

Relocation of DG Store in Construction Site

2.2.16.9 On the occasion of relocation of a DG store in construction site, the following shall be observed.

2.2.16.9.1 Before the relocation, the licensee of the store and use licence is required to notify FSD of the new location of the DG store through submitting two sets of revised site location plan (see paragraph 2.2.16.7 above for details). In case the submission is acceptable, one set of the revised plan will be returned to the licensee.

2.2.16.9.2 Upon approval, the licensee shall return the original licence to FSD for amendment. Fee for making alteration of a store and use licence is provided in paragraph 2.2.11.2.

2.2.17 Points to Note for UN 3065 Alcoholic Beverages

2.2.17.1 This paragraph is to provide specific guidance on application for store and use licence or conveyance licence of UN 3065 Alcoholic Beverages in addition to paragraphs 2.2.2 to 2.2.14.

2.2.17.2 Exempt Quantity –

2.2.17.2.1 A store and use licence is not required for storage and use of UN 3065 in packaged form if the quantity does not exceed –

(a) if the water capacity of each receptacle in which the alcoholic beverages are contained does not exceed 5 litres, 6,250 litres or, if the place in which those receptacles are stored is protected throughout by automatic sprinkler installations, 12,500 litres; and

(b) in any other case, 2,500 litres.

2.2.17.2.2 A conveyance licence is not required for conveyance of UN 3065 in packaged form if the quantity does not exceed 12,500 litres.

2.2.17.3 General Siting Requirements –

(a) Basement storage or retail outlet shall not be permitted;
(b) Designed godowns (storage floor height not to exceed 30m above street level);
(c) Ground floors of industrial buildings with exits discharging directly to open air;
(d) Single storey detached type buildings;
(e) Floors under 30m in height of industrial buildings which are provided with permanent means of direct and adequate open air access to the satisfaction of DFS may be considered on their merits;
(f) Floors within a designed container terminal building not exceeding 30m above street level. If the store is situated on a floor exceeding 30m above street level, it may also be considered provided that adequate direct vehicular access for major fire appliance to reach the storage floor is available; and
(g) Licensed bonded warehouses / stores under the control of the Customs and Excise Department at Container Terminals shall be subject to individual consideration.

2.2.17.4 Each case will be considered on its own merits. Additional FSR, which include but not limited to the followings, may be issued by the DFS for a proposed DG store for UN 3065:

(a) The premises shall be protected throughout by a sprinkler installation or other fixed system(s) approved by the DFS;
(b) The storage area shall be liquid tight where the walls join the floor;
(c) Metal or non-combustible material having a strength and durability not inferior to that of metal, shall be used for shelving, racks, dunnage, floor overlay and similar installations;

(d) A minimum of 1 metre clearance must be maintained between stacks of goods and any sprinkler heads;

(e) Clear aisle(s) of at least 1 metre in width shall be maintained amongst piles of stocks of dangerous goods within the storage area;

(f) Exit sign(s) shall be placed at all approved way(s) out and notice(s) indicating the escape route(s) shall be placed at all main passageways; and

(g) Unobstructed passageway leading to exits shall be maintained.

2.2.17.5 Despite licence may not be required for storing and using UN 3065 in packaged form (see para. 2.2.17.2.1), the quantity of UN3065 being displayed in any area accessible to the public should be limited to 2,500 litres as a good practice. Any remaining stocks should be kept in storerooms with 1-hour FRR, adequate ventilation to open air and portable fire-fighting equipment.

Chapter 2.3 Ventilation and Electrical Installation for Storage and Manufacture of DG

2.3.1 Introduction

2.3.1.1 In order to safeguard public safety, precautionary measures are enforced to prevent the buildup of hazardous atmosphere inside a licensed DG store / licensed factory / Class 3A premises (hereafter referred to as “DG premises”). The principal precautionary measure is the provision of a continuous supply of adequate ventilation inside the DG premises. In gauging whether adequate ventilation is in place, key considerations include the physical and chemical properties of gas / vapour released from the DG concerned, as well as the air movement at different levels of the DG premises. As such, essentially the minimum capacity of any ventilating system installed shall be sufficient to ensure gases / vapours generated to be diluted with and removed by the flow of air passing through the DG premises.

2.3.1.2 There are two kinds of ventilating systems:

(a) Natural ventilating system; and

(b) Mechanical ventilating system.

2.3.1.3 Any of the above ventilating systems shall be installed at DG premises, and often fitted with appropriate electrical installation.

2.3.2 The Requirements of Natural Ventilation

2.3.2.1 Natural ventilation can be achieved by providing fixed and permanent ventilation openings (such as louvres) at high and low levels on external walls of the DG premises to outside open space. The ventilation openings shall have a minimum total effective louvre area equivalent to 1% and not exceeding 3% of the total area of the walls and roof / ceiling of the DG premises.

2.3.2.2 The low-level ventilation openings shall be situated immediately above the level of door sill.

2.3.2.3 To maintain effectiveness of natural ventilation, the ventilation openings shall not be obstructed on either side of any building structures by container stacks, dirt or articles.

2.3.3 The Requirements of Mechanical Ventilation

2.3.3.1 If the requirements for natural ventilation cannot be met, adequate ventilation can be achieved by alternative means – mechanical ventilation.

2.3.3.2 Typically, a mechanical ventilating system consists of air blowers and air ducts, which shall maintain air intake from open space, circulate fresh air through the DG premises and then exhaust air to open space. When an air duct passes through fire compartment walls / floors, fire damper(s) shall be fitted in the air duct to curb the spread of fire and smoke through the air duct system in case of fire. The following are some requirements for mechanical ventilation:

(a) A minimum ventilation rate of 5 litres per second per square metre of the DG premises floor area shall be provided. The fresh air intake flowrate shall be slightly less than that of the exhaust air to avoid gases / vapours overflowing;

(b) The arrangement of the mechanical ventilating system ductwork shall produce a “cross-flow” effect to eliminate stagnant points within the DG premises;

(c) The points of extraction / supply shall be arranged in such a way that the gases / vapours are extracted at locations where they usually accumulate. For instance, the extraction points for gases / vapours, which are heavier than air, shall be provided at low level of the DG premises;

(d) For storage of Class 2.1, 3, 3A, 4 or 5 DG, or DG of other Classes with subsidiary hazard of 2.1, 3, 4.1, 4.2, 4.3 or 5.1:

(i) The electrical installation and fittings of a mechanical ventilating system shall be of explosion proof type conforming to BS EN 60079 or equivalent to relevant national / international standards;

(ii) The fan components of a mechanical ventilating system, including impeller and casing, shall comply with ATEX Directive 2014/34/EU or other national / international standards which are proven to be equivalent to the former so as to avoid ignition of flammable vapours;

(e) If total flooding gaseous system or fire sprayer unit is provided, means shall be provided to close the openings of the DG premises and switch off the mechanical ventilating system automatically on or before actuation of the total flooding gaseous system or fire sprayer unit in case of fire;

(f) Electro-thermal links for fire curtains / dampers / shutters, if applicable, shall be released by a signal from an appropriate heat / smoke detector fixed on the ceiling to actuate the device. Moreover, the links shall not be placed inside the DG premises or installed along the possible air flow passing through a hazardous area[9];

(g) If a heat detector is used to actuate the electro-thermal links for fire curtains / dampers / shutters, the actuation temperature shall be rated at 54^{o}C to 65^{o}C to allow a period of delay time before the release of flooding gas; and

[9] See further in Chapter 2.2.

(h) The device shall be installed by a Registered Fire Service Installation Contractor (RFSIC), and the copy of Certificate of Fire Service Installation and Equipment (FS 251) issued shall be forwarded to DFS by the RFSIC within 14 days after completion of the work (r. 9(1) of the Fire Service (Installations and Equipment) Regulations (Cap. 95B)).

2.3.4 The Requirements of Electrical Installation and Fittings

2.3.4.1 In general, all electrical apparatuses (including but not limited to junction boxes, switchgears, electrical components of FSI or equipment) and associated wirings shall be installed outside the hazardous area of the DG premises.

2.3.4.2 If electrical apparatuses and/or electrical wirings are installed inside the hazardous area, they shall meet the explosion proof standards suitable for related class and subsidiary hazard of the DG under the licence. For instance, for the storage of Class 2.1, 3, 3A, 4 or 5 DG, or DG of other Classes with subsidiary hazard of 2.1, 3, 4.1, 4.2, 4.3 or 5.1, the electrical apparatuses and associated wirings shall meet the requirements of BS EN 60079 or equivalent to relevant national / international standards.

2.3.4.3 The following shall be forwarded to DFS after all fixed electrical installations have been inspected, tested and certified by an electrical worker / contractor registered under the Director of Electrical and Mechanical Services:

(a) A copy of “Work Completion Certificate” (WR1); and

(b) A copy of “Periodic Test Certificate” (WR2) - annually.

2.3.4.4 For storage of Class 2.1, 3, 3A, 4 or 5 DG, or DG of other Classes with subsidiary hazard of 2.1, 3, 4.1, 4.2, 4.3 or 5.1:

(a) All electrical wirings shall be mineral insulation copper sheathed cables conforming to the requirements of BS EN 60702 or equivalent to relevant national / international standards; and

(b) The lighting fittings shall be of totally enclosed type conforming to the requirements of BS EN 60529 with protection level equivalent to or above IP44, or equivalent to relevant national / international standards.

2.3.5 Administration Procedure

2.3.5.1 Please read this part in conjunction with Chapter 2.2 which outlines the process and workflow for completing a DG licence / approval application in general, if applicable.

Documents for application

2.3.5.2 When all mechanical ventilation and/or electrical installation works have been completed, the following documents shall be submitted to VD of FSD for arrangement of a compliance inspection:

(a) The original copy of Form Vent/425-DG;

(b) SDS indicating the physical and chemical properties including the vapour densities, ignition points and flash points of the chemicals under application;

(c) An air change report for the mechanical ventilating system of the DG premises;

(d) The mechanical ventilation drawings which clearly indicate the layout of all air ducts, positions of fire dampers and ventilation equipment, if applicable, in connection with the DG premises; and

(e) For storage of Class 2.1, 3, 3A, 4 or 5 DG, or DG of other Classes with subsidiary hazard of 2.1, 3, 4.1, 4.2, 4.3 or 5.1:

(i) A full list of fixed electrical apparatus / equipment (including but not limited to junction boxes, switchgears, electrical components of FSI or equipment) installed in the DG premises;

(ii) Certificate of Conformity in English / Chinese version issued within 10 years;

(iii) Translated certificate shall be endorsed to be true and correct by the accredited laboratory.

Application for Alteration of Mechanical Ventilating System

2.3.5.3 Regarding an application for alteration of a mechanical ventilating system (both new licence application and renewal of licence), a valid annual inspection certificate, if applicable, for the system shall be provided.

2.3.6 Compliance Inspection

2.3.6.1 Applicant or representative, such as a contractor, shall attend the compliance inspection and demonstrate that the mechanical ventilating system, and/or electrical installation operates as designed.

2.3.6.2 Applicant or representative shall provide suitable access facilities conforming with the laws and regulations of the LD, such as ladder and working platform to facilitate the compliance inspection. The absence of suitable access facilities and/or access / inspection panels may hinder the inspection progress, thus delaying the issuance of a Letter of Compliance.

2.3.6.3 During the compliance inspection, if the mechanical ventilating system and/or electrical installation is found not conforming with the requirements, the Inspection Officer of VD will advise if remedial works are required. VD will then issue a list of non-compliance works for follow-up action. After rectifying the defects of the ventilation works and/or electrical installation, follow-up action of compliance shall be reported to VD by using Form Vent/425-DG which can be downloaded from the following link:

https://es.hkfsd.gov.hk/dg/en/licence/form/

2.3.6.4 Failure to provide sufficient information (e.g. as-built drawing for the ventilation installation) and necessary certification document for verification may delay the compliance inspection process.

2.3.7 Issuance of Letter of Compliance

2.3.7.1 VD will issue a Letter of Compliance (Ventilating System and/or Electrical Installation) if all requirements on the mechanical ventilating systems and/or electrical installation are met.

2.3.7.2 The Letter of Compliance (Ventilating System and/or Electrical Installation) is one of the FSR for obtaining a DG licence / approval.

Chapter 2.4 Application for Store and Use Licence of Special Gases in the Microelectronics Industry

2.4.1 Introduction

2.4.1.1 This Chapter is to provide specific guidance on the application for a store and use licence of special gases in the microelectronics industry.

2.4.1.2 Guidance on general requirements in respect of the following safety aspects of the storage and use of special gases in the microelectronics industry are provided in paragraph 2.4.6:

(a) Restrictions on Siting

(b) Compatibility of Storage

(c) External Storage

(d) Internal Storage

(e) Control Room

(f) Wafer Fabrication Area (Cleanroom)

(g) Electrical Installation and Equipment

(h) Gas Detection System

(i) Fire Suppression System

(j) Pressure receptacle

(k) Dispensing and Use of Gas

(l) Safe Working System

2.4.1.3 For ease of reference, the definition of “Competent person” used in this Chapter is defined as follows:

Competent person means a professional chemist or an occupational hygienist with relevant qualification and experience, namely under certification programmes of the American Board of Industrial Hygiene (ABIH), the Canadian Registration Board of Occupational Hygienists (CRBOH), the British Institute of Occupational Hygienists (BOHS), the Australian Institute of Occupational Hygienists (AIOH), the Hong Kong Institute of Occupational and Environmental Hygienists (HKIOEH) or other persons with equivalent qualification.

2.4.2 Examples of Special Gases

2.4.2.1 Examples of special gases commonly used in Hong Kong are listed in Table 2.4.2.1 below:

Table 2.4.2.1 Examples of Special Gases Commonly Used in Hong Kong

No.	**Name of Special Gas**	**Chemical Formula**	**Threshold Limit Values (ppm)**	**Flammability**
1	Silane	SiH_4	0.5	Flammable
2	Dichlorosilane	SiH_2Cl_2	*5	Flammable
3	Trichlorosilane	$SiHCl_3$	*5	Flammable
4	Tetrachlorosilane	$SiCl_4$	*5	Flammable
5	Diborane	B_2H_6	0.05	Flammable
6	Arsine	AsH_3	0.05	Flammable
7	Phosphine	PH_3	0.3	Flammable
8	Germane	GeH_4	0.2	Flammable
9	Boron Trifluoride	NF_3	1	Non-flammable
10	Boron Trichloride	BCi_3	*1	Non-flammable

Notes

1. (*) Tentative guideline value as agreed by Government Laboratory and EPD for use as a safety factor until an internationally recognised Threshold Limit Value (TLV) is available.
2. The above list is not exhaustive. Other gases used in microelectronics industry may be considered as special gas.

2.4.3 Properties of Special Gases

2.4.3.1 Table 2.4.3.4 shows the potentially hazardous properties of special gases, which may not be exhaustive, for general reference. Details of the related hazards should be extracted from the suppliers' SDS, literature, or publication from professional institutions or organisations.

2.4.3.2 These special gases may pose health, flammable or other hazards. They can be toxicants, carcinogens, irritants, sensitisers, corrosives, asphyxiants or materials with other health hazard properties. Some of them may carry multiple hazards. Gas mixtures should be assumed to have the same hazards as individual gases. The potential of synergistic, i.e. more than additive, effects must also be considered. The actual hazards depend on the mixture components and their concentration.

2.4.3.3 The physical properties of gases such as vapour density and saturated vapour pressure should be taken into consideration.

Table 2.4.3.4 Physical and Chemical Characteristics of Special Gases

GAS	CLASSIFICATION		LC50/1 hr ISO/DIS 10298 (ppm by vol)	FLAMMABLE LIMITS (% IN AIR)	RELATIVE DENSITY GAS (AIR=1)	RELATIVE DENSITY LIQUID (WATER = 1)	VAPOUR PRESSURE AT 20 °C (bar abs)
	CHIP	IGC					
* Ammonia	T	T,C	7,338	15-30	0.6	0.7	8.6
Arsenic pentafluoride	-	T+,C	20	-	5.9	-	16.7
Arsine	-	F+, T+	20	3.9-77.8	2.7	1.6	15
Boron trichloride	T+,C	T,C	2,541	-	4	1.3	1.6
Boron trifluoride	T+,C	T,C	387	-	2.4	1.6	2.2
Bromomethane (R40B1)	T, Xi	F+, T	850	8.6-20.0	3.1	1.7	1.9
1,3-Butadiene	F+	F+, T	no acute toxicity	1.4-16.3	1.9	0.65	2.4
Carbon monoxide	F, T	F+, T	3,760	12.5-74	1	0.79	-
Carbonyl fluoride	-	T, C	360	-	2.2	0.7	-
Carbonyl sulphide	-	F+, T	1,700	12-28.5	2	1.2	11
* Chlorine	T	O, T, C	293	-	2.5	1.6	6.8
Chlorine pentafluoride	-	O, T+, C	122	-	4.5	1.9	3.4
Chlorine trifluoride	-	O, T, C	299	-	2.8	1.9	1.5
Chlorotrifluoroethylene (R1113)	-	F+, T	2,000	4.6-64.3	4	1.5	5.1
Cyanogen	F, T	F+, T	350	3.9-36.6	1.8	0.95	4.8
Cyanogen chloride	-	T+, C	80	-	2.1	1.2	1.3
Diborane	-	F+, T+	80	0.8-98P	1	0.42	-
Dichlorosilane	-	F+, T, C	314	2.5-80	3.5	1.3	1.6
Ethylene oxide	F+, T	F+, T	2,900	3-100	1.5	0.89	1.4
Fluorine	T+,C	O, T+, C	185	-	1.3	1.5	-
Germane	-	F+, T+	20	not known	2.6	-	-
Hexafluoroacetone	-	T, C	470	-	5.8	1.5	5.9
Hydrogen bromide	C, Xi	T, C	2,860	-	2.8	2.2	21
Hydrogen chloride	C, Xi	T, C	3,120	-	1.3	1.2	21
Hydrogen iodide	C, Xi	T, C	2,860	-	4.5	2.8	7.5
Hydrogen selenide	-	F+, T+	2	not known	2.8	2	9.5
Hydrogen sulphide	F+, T+	F+, T	712	4.3-45.5	1.2	0.92	18.8
Hydrogen telluride	-	F+, T+	2	not known	4.5	-	-
Methylmercaptan	F, Xn	F+, T	1,350	3.9-21.8	1.6	0.89	1.7
Nitric oxide	-	O, T+, C	115	-	1	1.3	-
Nitrogen dioxide	T+, Xi	O, T+, C	115	-	2.8	1.4	1
Nitrosyl chloride	-	T+, C	35	-	2.3	1.4	2.7
Phosgene	T+	T+, C	5	-	3.5	1.4	1.6
Phosphine	-	F+, T+	20	not established / P	1.2	0.74	34.6
Phosphorus pentafluoride	-	T+, C	190	-	4.5	-	-
Phosphorus trifluoride	-	T, C	320	-	3	1.6	-
Selenium hexafluoride	-	T+, C	50	-	6.7	-	-

Table 2.4.3.4 Physical and Chemical Characteristics of Special Gases (Cont'd.)

GAS	CLASSIFICATION		LC50/1 hr ISO/DIS 10298 (ppm by vol)	FLAMMABLE LIMITS (% IN AIR)	RELATIVE DENSITY GAS (AIR=1)	RELATIVE DENSITY LIQUID (WATER = 1)	VAPOUR PRESSURE AT 20 °C (bar abs)
	CHIP	IGC					
Silane	-	F+	no acute toxicity	not established / P	1.1	0.55	-
Silicon tetrafluoride	-	T, C	450	-	3.6	-	-
Stibine	-	F+, T+	20	not known	4.3	2.2	-
Sulphur tetrafluoride	-	T+, C	40	-	3.7	-	-
Sulphuryl fluoride	-	T	3,020	-	3.7	1.7	16
Sulphur dioxide	T, Xi	T, C	2,520	-	2.3	1.5	3.3
Vinyl chloride (R1140)	F, T	F+, T	no acute toxicity	3.8-31	2.2	0.97	3.4

LIQUID	CLASSIFICATION		LC50/1 hr ISO/DIS 10298 (ppm by vol)	FLAMMABLE LIMITS (% IN AIR)	RELATIVE DENSITY GAS (AIR=1)	RELATIVE DENSITY LIQUID (WATER = 1)	VAPOUR PRESSURE AT 20 °C (bar abs)
	CHIP	IGC					
Hydrogen fluoride	T+, C	T+, C	1,276	-	0.7	0.97	1
Tungsten hexafluoride	-	T+, C	160	-	10.3	3.4	1.1
Trichlorosilane	F	-	1,040	1.2 - 90.5	5	1	1

Legend

O - Oxidant
F+ - Extremely flammable
F - Highly flammable
T+ - Very toxic
T - Toxic
Xn - Harmful
C - Corrosive
Xi - Irritant
P - Pyrophoric

CHIP - Chemicals (Hazard Information Packaging for Supply) Regulation
IGC - Industrial Gases Council
ISO/DIS 10298 - Determination of the toxicity of a gas or gas mixture

* - In the event of storage and use of only one type of special gas (e.g. ammonia or chlorine), merit consideration for relaxation of the safety requirement may be given.

Source: British Compressed Gases Association (1995), Code of Practice-CP 18: The Safe Storage, Handling and Use of Special Gases in the Microelectronics Industry (Revision 1).

2.4.4 Hazards of Special Gases

2.4.4.1 Health Hazard

(a) Corrosive gases such as boron trichloride, boron trifluoride, chlorine, dichlorosilane, hydrogen chloride and hydrogen fluoride are harmful and can cause irreversible damage to animal tissue when in direct contact. It may react with the materials of construction and ventilation system causing material damage and possible failure.

(b) Toxic gases such as arsine, diborane and phosphine may cause acute or chronic damage to health when inhaled, swallowed or absorbed through the skin.

(c) Asphyxiation hazard exists with any gas or gas mixture that does not contain sufficient oxygen to support life. Such gas or gas mixtures can dilute the oxygen content in the atmosphere to a level causing health hazard. The generally accepted minimum level of oxygen is about 18% for physically fit persons.

2.4.4.2 Toxicity

(a) Toxic level is usually indicated by median lethal concentration in parts per million, volume by volume (ppm, v/v) for a gas or vapour in air, or in milligram per litre (mg/L) for an aerosol or particulate, in a period of 1 hour's or 4 hours' exposure (LC50/1hr or LC50/4hrs). LC50 are experimental data on animals for establishing dose-relationship and may not be directly translated into acute toxicity for human. One of its uses is the classification of toxic level for hazard warning. Lethal concentration for a liquid substance means the toxicity level of the liquid when it becomes a vapour.

(b) In terms of LC50/4hr, the Notification of New Substances Regulations UK, 1993 classifies a gas or vapour as very toxic (LC50/4hr at or less than 0.5 mg/L), toxic (LC50/4hr between 0.5 mg/L and 2 mg/L) and harmful (LC50/4hr between 2 mg/L and 10 mg/L). Occupational Safety and Health Administration (OSHA) of USA classifies a hazardous gas as highly toxic if its LC50/4hr is less than 200 ppm or toxic if it is between 200 and 2000 ppm. There is no worldwide consensus on the classification of toxicity in terms of toxic concentrations. Accordingly, manufacturers may provide different toxic classifications for the same substance in their respective SDS.

2.4.4.3 Occupational Exposure Limit (OEL)

(a) In the evaluation of health hazards, references should be made to the Occupational Exposure Limits (OELs) published by the LD of the HKSAR. These limits are intended to provide guidance for designing control measures to ensure workplace safety. There are three categories of OELs, i.e. 8-hour TWA (Time-Weighted Average), STEL (Short-Term Exposure Limit) and C value (Ceiling)[10]***.***

(b) The “Immediately Dangerous to Life or Health (IDLH)” value”, established by the National Institute for Occupational Safety and Health (NIOSH) of USA, is defined as a level that is likely to cause death, immediate or delayed adverse health effects, or inhibition of escape from such an environment. They are given in ppm or mg/m^3 for a 30-minute exposure. The 30 minutes is the maximum time for escape under an IDLH environment.

[10] TWA value refers to the recommended limit of exposure for an 8-hour day and a 5-day workweek without causing adverse effects to nearly all the workers. STEL refers to the exposure limit for 15-minutes and C value refers to the maximum concentration which should not be exceeded during any period of the work day.

(c) When chemical substances are not listed in the publication of the LD, reference may be made to the published Threshold Limit Values (TLVs) developed by the American Conference of Governmental Industrial Hygienists (ACGIH), the Workplace Environmental Exposure Level (WEEL) developed by the American Industrial Hygiene Association (AIHA), Maximum Exposure Limit (MEL) and Occupational Exposure Standard (OES) approved by the Health and Safety Commission (HSC) in United Kingdom, or other standards published by the reputable international organisations.

(d) The OELs are only intended to be reference levels for ensuring occupational hygiene, and therefore should not be used for any other purpose whatsoever, such as indication of relative toxicity. All health-based exposure limits are approximate with considerable variability from different reputable sources owing to the difference in sampling and adopted methodology to obtain the toxicity data. It is recommended to be conservative in using those figures. From time to time, the exposure limits may be reviewed and revised. Reference should be made to the latest publication of the local Authority or a reputable organisation, e.g. LD of the HKSAR, ACGIH, AIHA, NIOSH or HSC.

(e) The implementation of health and safety measures in a workplace or other premises storing or using electronic gases shall follow, for the sake of consistency, one single set of health-based standard as far as practicable. Its implementation and monitoring shall be carried out by a competent Occupational Hygienist.

2.4.4.4 Fire Hazard

(a) Three conditions are needed simultaneously in order to ignite a flammable gas: a concentration within the flammable limits of that gas; an oxidizer, and a source of ignition. The flammability limits of a gas or vapour define the range of concentrations in mixtures with air that will propagate flame. Flammable range of a gas or vapour is the concentrations in air between the Lower Flammable Limit (LFL) and the Upper Flammable Limit (UFL).

(b) Mixtures of flammable gas with air or other oxidants within the flammable range have the potential to explode. The severity of an explosion caused by the ignition of a flammable gas / air or other oxidant mixture depends on several factors like the quantity and extent of enclosure or confinement of the gas mixture.

(c) Another special hazard is pyrophoric gases. Gases such as silane, phosphine, and diborane under suitable chemical kinetics condition, will ignite spontaneously in contact with air without the application of external heat. Under some conditions, spontaneous ignition may not occur, resulting in the formation of an unstable volume of pyrophoric gas or a mixture with oxidant which may explode subsequently.

2.4.5 Application Procedure

2.4.5.1 On receipt of the application, FSD will refer the application to related government departments such as the Boilers and Pressure Vessels Authority of LD, EPD and Government Laboratory for comment on the safety of compressed gases and pressurised systems, environmental protection and chemical compatibility. In formulating specific FSR, FSD will consider the comment offered by the above Authority and Departments.

2.4.5.2 Information Required for Applying for a Licence

(a) Any application for a licence to store and use of special gases in the microelectronics industry shall be accompanied by 2 copies of plans as nearly as may be to scale of the store and every such plan shall include the following particulars:

(i) the siting of the store;

(ii) the material of which it is or is to be constructed;

(iii) the means of ventilation and/or the ventilation plan if mechanical ventilation is provided or required in the store;

(iv) the routing of and method of fixing any pipeline which is to be installed for the purpose of distributing gas from the store to any part of the premises which the store serves or is intended to serve, and the material of pipelines is to be constructed; and

(v) such other particulars like waste treatment system and drainage system, if any, as DFS may require to be shown on the plan.

(b) Every application shall also be accompanied by the following documents:

(i) a statement in writing declaring the nature of the gas or gases to be stored and the maximum quantities of storage thereof in respect of which the licence is required;

(ii) a Risk Assessment Report (RAR) with details as follows:

The objective of the RAR is to provide detailed information of the proposed project with a view to facilitating DFS in deciding on whether or not a licence under s. 6 of Cap. 295 should be granted for the storage and use of special gases used in the microelectronics industry. The contents of RAR should include the following information, where appropriate. However, should there be any vital information that DFS may require, the applicant / project proponent would be advised accordingly.

- Executive Summary – Summary of main issues, findings, conclusions and recommendations;

- Introduction – Purpose of the RAR and The Approach;

- Description of the Project –

  (1) Site location, means of access and evacuation routes;

  (2) Key project requirements including information on storage and use of pressure receptacle, method of conveyance of pressure receptacle from suppliers to the store, routing of supply pipelines and material used for the construction of the store and the gas supply piping;

  (3) Size or scale and design of the project;

  (4) Description of scenarios with the project, existing occupancies and planned development within 100m radius of the proposed store; and

  (5) The nature of activities to be carried out in the premises where gases are stored or used.

- Description of Assessment Methodologies – Assessment methodologies, assumptions and criteria, including calculations and inputs and outputs files of a typical model run for all mathematical modelling;

- Identification of On-site Risk to Life and Properties Impacts:

  (1) Potential on-site risks to life and properties impacts including the types, characteristics and estimated quantities of leakage / emissions, discharges, potential disturbances or displacement associated with the activities relating to the project during operation;

  (2) Potential risk due to exposure situation/ hazard; and

  (3) Specific hazardous areas within the project premises.

- Mitigation of Risks due to Adverse Situations – Measures to eliminate or reduce the potential risks to life and properties due to adverse situations;

- Conclusions and Recommendations;

- Appendix – Any other information relevant to the project, such as details of past accidents involving special gases.

(iii) the specifications of electrical installation including the lighting fittings and gas detection system provided in the store;

(iv) design and specifications to which it is intended that any distribution pipeline or other ancillary equipment is to be constructed;

(v) design and specifications of gas detection system, gas cabinet, and any other safety installations or hazard control measures; and

(vi) a health and safety plan including emergency procedure.

(c) Additional copies of plans, design and specifications of the distribution pipeline or other equipment may be required for comments by other government departments.

2.4.5.3 No licence shall be granted by DFS for the storage and use of special gases used in the microelectronics industry unless DFS is satisfied in relation to the store that:

(a) the site of the store and the plan(s) have been approved by DFS and the construction of the store conforms with the plan;

(b) FSR issued are being complied with. The licence holder is obliged to ensure the continuous compliance with the FSR at all times; and

(c) Other requirements in this Chapter are compiled with.

2.4.5.4 The applicant shall also comply with regulations or requirements as prescribed by other government departments for the purpose of obtaining a licence.

2.4.5.5 A licence shall only be granted by DFS upon satisfactory compliance with the licensing requirements and the payment of fee, if any, as specified in Cap. 295G.

2.4.6 Fire Safety Requirements

2.4.6.1 FSR would be formulated upon receipt of application for DG store and use licence. Subject to the risk assessment, DFS may, in view of any particular risk associating with the storage and use of special gases, vary any of the provision of standard requirements.

2.4.6.2 Restrictions on Siting

(a) Only low-rise institutional or industrial buildings under single occupancy, from which evacuation can easily be effected, are considered suitable for the storage and use of these gases.

(b) Locations for storage or inspection of pressure receptacle shall be on street level and accessible by cart, trolley or other transport vehicle for easy carriage or urgent removal in case of emergency. The storage area and fabrication area should also be accessible by major fire appliances for fire-fighting purpose.

(c) Sites for storage and use should be provided with adequate means of escape leading to the place of safety, which should be kept free from any obstruction at all times.

(d) All locations for indoor and open storage shall be carefully selected so that the risks posed to nearby occupancies could be kept to minimal.

(e) Applicant is advised to seek advice from PD and the LandsD on the land use matter, if applicable.

2.4.6.3 Compatibility of Storage

Different Classes of DG shall not be placed in the same store. Gases incompatible to each other shall not be stored in the same storage area unless they are in separate gas cabinets. Notwithstanding the aforesaid, gases incompatible to each other shall not be stored in the same cabinet. In this regard, the advice of the Government Laboratory will be sought.

2.4.6.4 External Storage

(a) If the special gases are to be stored in an external storage, the store shall be located in an open area of the premises or in a detached single-storey building on open ground. The design and construction for the detached single-storey building shall follow the requirements of an internal storage.

(b) The siting for an external storage shall be so selected that maximum natural ventilation can be achieved to prevent accumulation of any leaked gas in an enclosed volume. The selected site shall be sufficiently open (at least open on two sides), so as to provide a high degree of natural ventilation. Vents in the roof shall be provided to avoid the accumulation of gas lighter than air in the roof-space. Sufficient headroom in the store structure is necessary to provide good cross ventilation.

(c) Materials used for the construction of the external storage shall be non-combustible. External storage area for pressure receptacles shall be provided with a non-combustible roof to keep the pressure receptacles out from the weather. A light-weight friable roof shall be provided to a flammable gas storage area. Wire-mesh fence shall be provided for security reason. Suitable crash barriers shall be provided to protect the store from mechanical damage of moving vehicles, forklifts, etc.

(d) Means shall be provided to secure the pressure receptacles in an upright position.

(e) The storage area is to be kept away from sources of ignition, building alleys, building openings or ventilation intakes. Various exposures shall be kept at a minimum separation distance from the storage area in accordance with the figures as shown below (see Table 2.4.6.4.e):

Table 2.4.6.4.e Minimum Separation Distances

Typical Type of Exposure	Features to be Separated	Minimum Separation Distance (Metre)
Smoking, Naked Flames	Storage Area	3
Bulk Storage of Flammable Gases and Liquids	Storage Area	3
Unprotected Electrical Equipment	Flammable	3
(a) Site Boundaries (b) Air Compressors & Ventilator Intakes (c) Roadways (other than those required for access) (d) Bulk Storage of Cryogenic Liquids (e) Building Openings	Toxic, Flammable and other Gases	3
Pyrophoric Gases in Store	Other Gas Containers	2
Pyrophoric Gases Connected for use	Other Gas Containers	2
Note: These distances are recommendations only. The risk assessment may suggest other distances.		

[Source: Table 4 of British Compressed Gases Association (BCGA), Code of Practice – CP18 The Safe Storage, Handling and Use of Special Gases (Revision 3: 2014)]

(f) Gases shall be segregated in groups according to their hazardous characteristics. Gases incompatible to each other shall not be stored in the same store.

(g) Nominally empty containers shall be segregated from full containers. They shall be clearly marked and stored in the same way as full container as the hazard remains. They should be returned to the gas supplier as soon as practicable.

(h) An approved water spray system shall be provided.

(i) An approved gas detection system shall be provided.

(j) Proper drainage provision shall be provided in the storage area.

2.4.6.5 Internal Storage

(a) <u>General</u>

(i) If the special gases are to be stored in an internal storage, the store shall be located at street level. A minimum separation distance of 6 metres in all directions from any source of ignition, ventilation intake, building opening or building exit shall be provided.

(ii) The store shall be constructed of non-combustible materials from floor to ceiling having FRR as required by the BD for special hazards. Good ventilation for such location of special hazard, either by mechanical ventilation or natural ventilation with opening facing at least two different directions should be adopted.

(iii) Mechanical ventilating system with cross flow effect shall be provided in the pressure receptacle store and dispensing room. Extraction points shall be provided at suitable locations for the avoidance of accumulating and short-circuiting of the gases with make-up air.

(iv) An approved automatic sprinkler system shall be provided.

(v) An approved gas detection system shall be provided to detect the presence of a hazardous condition.

(b) Service Corridor

(i) Service corridor shall be designed for the carriage of hazardous materials on cart or trolley to and from the storage area. Means of escape shall not be used for the carriage of hazardous materials**.**

(ii) In existing building, where, service corridor is not provided, a designated route inside the premises shall be used for the carriage of pressure receptacles. Other persons should not use the route during the time of carriage. If such designated route is not possible, additional protection of the pressure receptacles by specially designed pressure receptacle container should be used.

(iii) Gas detection system together with manually activated alarm buttons shall be strategically spaced in the service corridor. On activation, it shall produce a distinctive local audio and visual alarm. The signal shall also be transmitted to the designated control room in the premises.

(iv) The carriage of pressure receptacles in the designated route shall be carried out by trained personnel and be supervised by a competent person.

(v) An approved sprinkler system shall be provided in the corridor.

(c) Mechanical Ventilating System

(i) Forced ventilating system with a minimum air change rate of 10 air changes per hour shall be provided to the pressure receptacle storage and dispensing room unless the pressure receptacles are stored in gas cabinets.

(ii) The system shall have an emergency source of power. The mechanical ventilating systems of pressure receptacle stores, dispensing rooms, air extraction systems of gas cabinets shall be working continuously at all times.

(iii) Local air extraction systems for equipment involving hazardous gases shall be kept working continuously during the operation process.

(iv) The duty ventilation fans and standby units shall be operated independently. If a duty fan fails to work, the standby fan shall start to operate automatically to maintain the minimum air change rate. An independent distinctive audio and visual alarm shall be actuated and the fan failure signal shall be transmitted to the designated control room in the premises to alert the management to effect immediate repair action.

(v) No portions of the building structure such as service ducts shall be used as an integral part of the air transfer or air exhaust systems. Exhaust duct penetrating compartment wall or fire resistance construction shall be enclosed with the building materials equivalent to the FRR of the building structure in order to maintain a proper compartmentation.

(vi) All ductworks including air intake, exhaust air duct, distribution and return air systems shall be constructed of “non-combustible” materials in compliance with BS 476 Part 4 or another standard acceptable to DFS. Unless there is a justifiable reason, this requirement should be generally applied in line with the Building (Ventilating Systems) Regulations (Cap. 123J). Where the exhaust gas is flammable, fan component shall be constructed with both static and spark minimizing features. Fire dampers shall not be installed at exhaust air system. If the fan blade is driven by a motor at a position outside air stream, special design shall be incorporated to avoid spilling out of exhaust air through the driving mechanism.

(vii) Exhaust air ducts from different gas cabinets or compartments shall not be connected together if mixing of the gases will create a fire or chemical reaction hazard. System pressure balance across the branches of ventilating system shall be so adjusted to ensure that exhaust air will not flow in a reverse direction from one compartment or cabinet to another. Due consideration shall be given to the instant pressure change when cabinet door is opened.

(viii) Fail-safe airflow detection device shall be installed at each ventilating system. Apart from the audio and visual alarm, total failure of the ventilating system shall automatically suspend the operation process inside the affected compartment and cabinet through an interlocking device. Automatic reset of alarm system and restart of operation process before resumption of ventilation are not permitted.

(ix) An automatic shut-off device in the gas supply system shall be actuated upon failure of the exhaust system.

(x) Exhaust air discharged from pressure receptacle stores, local air extraction system, inspection areas, purging equipment, gas cabinets or overpressure relief devices shall not be re-circulated.

(xi) The exhaust air shall be properly treated by appropriate equipment before discharged to the atmosphere. The discharge shall be at a suitable location to meet the EPD's requirement in respect of air pollution control.

2.4.6.6 Control Room

A round-the-clock attended emergency control room shall be provided at a location on the premises for overall surveillance of the condition of storage area, cleanroom and service corridor. Emergency alarm, gas leakage, smoke and fire signals shall be relayed to this control room. Closed circuit television (CCTV) equipment and telephone communication system for the wafer fabrication area shall be provided.

2.4.6.7 Wafer Fabrication Area (Cleanroom)

(a) Wafer fabrication area shall be constructed of non-combustible material from floor to ceiling of not less than 2-hour FRR.

(b) The ventilation system of wafer fabrication area shall be an independent system from other ventilating systems in the building. The air intakes shall be so selected as to avoid the draw-in of hazardous materials. The air ducts, connectors and fan equipment shall be constructed of non-combustible materials in compliance with BS 476 Part 4 or another standard acceptable to DFS. If a ventilation air duct passes through a compartment with fire resisting construction, it shall be wholly protected by an enclosure having equivalent FRR.

(c) An approved automatic sprinkler system and fire alarm system shall be installed in the cleanroom. Quick response sprinkler heads should be used within the down-flow air streams in cleanrooms.

(d) The activation of fire detection and manual fire alarm systems shall raise a distinctive audio and visual alarm in the premises. The signal shall be transmitted to the designated control room in the premises and FSD.

(e) Fire detection and gas detection systems shall not be designed to interfere with the shutdown of local air exhaust system involving hazardous gases.

(f) The actuation of the gas detection system shall automatically shut off the gas supply in the system.

(g) A smoke detection system shall be provided in the fabrication area. The sensitivity of smoke detection system shall be at a minimum of 0.01% per metre obscuration. It shall be capable of monitoring particles to 10 microns or less.

(h) Local air extraction system shall be provided to the workplace or cleanroom. The air extraction system shall be so designed to extract effectively any hazardous gas or vapour within the station enclosure. Exhaust air shall not be re-circulated into the workplace or cleanroom.

2.4.6.8 Electrical Installation and Equipment

(a) Uninterruptible power supply (UPS) capable of sustaining full load operation for not less than 6 hours shall be provided for the mechanical ventilating system, gas detection, fire suppression system, fire alarm system and waste treatment systems. To ensure continuous running of the systems, the UPS can be a combination of static type inverter and diesel generator for reinforcing the power supply reliability.

(b) In the fabrication area, electrical equipment within 1.5 metres of workstation or tool where flammable gas is used, and other electrical equipment, e.g. sensor, fan component and motor installed at air stream serving pressure receptacle stores, workplaces, dispensing rooms, air grill and extraction points shall be selected and installed in accordance with BS EN 60079 or another standard acceptable to DFS. Other than the explosive hazard mentioned above, all the equipment should be proved to be of an appropriate type suitable for use inside the hazardous atmosphere.

(c) Electrical installations inside cleanrooms, pressure receptacle stores, dispensing rooms and workplaces shall follow requirements as stipulated in the Electricity (Wiring) Regulations (Cap. 406E).

(d) All metallic parts of equipment and installations including exhaust fans, ductworks, gas pipelines, cabinets, tools and workstations shall be equipotentially bonded and earthed to protect against the effects of lightning and static electricity. An earthing system shall be provided in accordance with Cap. 406E.

2.4.6.9 Gas Detection System

(a) Areas for storage and use of special gases shall be provided with a gas detection system which should be acceptable to DFS. It shall give a distinctive audio and visual alarm both inside and outside the affected areas when leakage of gas is detected. Sufficient gas detectors shall be positioned at strategic locations for effective detection.

(b) A two-tiered alarm system may be adopted in the gas detection system. Level one shall be set at an air-borne concentration at or below the Occupational Exposure Limit-Time Weighted Average (OEL-TWA) of a hazardous gas or vapour. The level should be as low as practicable for early warning. Actuation of the alarm shall give a distinctive audio and visual signal for immediate inspection and remedial action. Level two may be set at a higher concentration but under all circumstances it shall be well below the Short Term Exposure Limit (OEL-STEL), Ceiling value (OEL-C), or IDLH value of a hazardous gas or vapour. Single-tiered alarm and level two alarm of a two-tiered system shall initiate evacuation and emergency procedure, and the gas supply shall be shut off automatically. There are circumstances that OEL or IDLH value for a gas is not available. In that case, advice from a competent person should be sought.

(c) A flammable gas detection system shall give distinctive audio and visual alarm when a flammable gas is detected. It shall be set at a level below the Lower Flammability Limit (LFL) of the flammable gases (for example 20 – 25% of LFL), and as low as practicable to allow a wide safety margin and early warning. For gases with both toxic and flammable nature, the lower of the two warning levels shall be adopted as the alarm levels.

(d) Exhaust air enclosures in which flammable or toxic gases may evolve or any equipment with a purposely built-in component for storing gases shall be provided with an approved gas detection system therein for continuous monitoring.

(e) In an emergency situation, the gas detection system shall automatically shut off the gas supply and initiate a distinctive local audio and visual alarm inside and outside the affected rooms. It shall also transmit the signal to the designated control room in the premises for initiating the pre-determined emergency procedure and to FSD.

2.4.6.10 Fire Suppression System

(a) An approved sprinkler system shall be provided for all workplaces such as dispensing room, fabrication area, indoor storage of flammable gases, etc. A gaseous suppression system is not acceptable as a substitute for a sprinkler system for areas where there is continuous ventilation.

(b) An approved water spray system shall be provided to protect the open storage. The water spray system shall be actuated by a suitable fire detector such as an ultraviolet or infrared detector and also be provided with means for manual operation.

(c) Gas cabinet containing pyrophoric / flammable gas shall be internally provided with a sprinkler system.

2.4.6.11 Pressure Receptacles

(a) Pressure Receptacles Standard

Pressure receptacles used for the storage of special gases are required to meet the following criteria and approved by FSD:

(i) Manufactured to BS 5045, BS EN 1975, DOT specifications or any other specifications approved by FSD;

(ii) the valves to be fitted with gas tight metal plugs capable of maintaining gas tightness at a pressure equal to the test pressure of pressure receptacles;

(iii) A flow limiting orifice to be provided to the pressure receptacle valve to limit the maximum flow to 30 litre/min if the pressure receptacle contains flammable, toxic, corrosive or oxidizing gas;

(iv) the valve to be fitted with valve protection caps capable of protecting the valve from all directions in the event of the pressure receptacle being dropped;

(v) pressure receptacles to be painted in colour as stipulated in the relevant standards and to be clearly stencilled in paint or ink with the contents of pressure receptacle;

(vi) Labels stating the names, chemical formulas and hazardous properties of the contents in both English and Chinese to be affixed on the pressure receptacles; and

(vii) Labels indicating the consumption status (i.e. full, in use, empty) of pressure receptacles to be affixed to the pressure receptacles.

(b) <u>Pressure Receptacles Handling</u>

(i) Only persons having undergone training as per paragraph 2.4.6.13 (d) will be permitted to handle pressure receptacles.

(ii) Pressure receptacles carried by metal cart or trolley should be in an upright position and properly secured from accidental falling.

(iii) Suppliers are required to provide suitable place and facilities within their licensed premises for pressure receptacle inspection, emergency leakage repair or purging of residual gas in used pressure receptacles with an inert gas. Suppliers are also required to provide suitable pressure receptacles retrieval system for emergency removal of leaky pressure receptacles from the premises of a user.

(iv) No gas decanting is allowed except by a gas supplier under a separate licence as granted by FSD.

(v) Suppliers should inspect and certify pressure receptacles being in safe working condition upon acceptance after importation.

(vi) An updated inventory record of full and consumed pressure receptacles and movement of pressure receptacles shall be maintained. Such record should be readily available for inspection by FSD.

(vii) Supplier should provide SDS to the purchasers when delivering the pressure receptacles.

2.4.6.12 Dispensing and Use of Gas

(a) <u>Gas Cabinet</u>

(i) A gas cabinet is a purpose-built enclosure for the containment of pressure receptacles to supply gas to the production equipment. It shall be constructed of non-combustible material and of robust design. It shall be provided with a view panel made of transparent wired glass for unobstructed viewing of its content and access to the pressure receptacle valve groups. The doors shall be closely fitted and self-closing with a self-latching device. The specifications of cabinets shall be submitted to FSD for examination and approval before being put into use.

(ii) Exhaust air ducts from different gas cabinets shall not be connected together if the mixing of gases will create a fire or chemical reaction hazard. System pressure balance across the branches of ventilating system shall be so adjusted to ensure that the exhaust air will not flow in reverse direction from one cabinet to another. Due consideration shall be taken on the instant pressure change when cabinet door is opened.

(iii) The cabinet shall be treated or coated to prevent chemical reaction with the stored gases.

(iv) Incompatible hazardous gases shall not be stored in the same cabinet. The gas supply system shall be located as close to the fabrication area as possible to minimise the length of supply pipeline.

(v) An independent forced air extraction system capable of maintaining an adequate negative pressure inside a gas cabinet shall be provided. Minimum velocity of 1m/sec across the face of the view panel opening shall be provided. Cabinets may share the same extraction ducting system provided that it will not create a reaction hazard in the ductwork.

(vi) An automatic inert gas line purging system with manual backup shall be provided to the gas cabinet. Purging system shall be constructed of material compatible with the gas that it serves. It shall be designed to prevent the cross contamination of purge gas. An isolation valve should be provided in the purge line in order to facilitate the maintenance of purging system.

(vii) Type of gas, purge gas and the process tool that it serves shall be labelled prominently on the gas cabinet.

(viii) Names in Chinese and English, chemical formulas and warning information of a gas serving a tool or workstation should be displayed at a prominent position thereon.

(ix) Within the cabinet there shall be facilities to secure the pressure receptacle.

(x) A gas detection system appropriate to the stored gas shall be provided inside a gas cabinet.

(b) Distribution System

(i) Materials for the pipeline, fittings, and ancillary equipment for distribution of substances including liquids and gases shall be compatible with the substances and be constructed to the standards acceptable to DFS. The detailed schematic diagram shall be submitted for examination with the licence application package.

(ii) Pressure receptacles, except with the approval of FSD, should not be stored inside cleanroom. The supply pipeline shall not run in the means of escape. The pipeline shall be suitably secured and protected from mechanical damage.

(iii) Manual shut-off device shall be provided in the pipeline at an easily accessible location near a tool or workstation using toxic, flammable or corrosive gas and such device shall also be provided in a similar manner near its supply pressure receptacle.

(iv) Over-pressure relief device shall be provided to the supply pipeline. Such device shall vent to an approved location or to a proper treatment system. The relieved gas shall be discharged to open air only when it will not jeopardise the safety of neighbouring life and property.

(v) An automatic shut-off device to be actuated by a suitable detection system in the event of leakage shall be provided. The shut-off device shall be located as near as possible to the supply pressure receptacle.

(vi) A by-pass valve, which is provided across the automatic shut-off device, shall be normally closed except in the course of purging.

(vii) A clearly labelled pipeline diagram showing the piping connection and gas route from a supply pressure receptacle to a tool or workstation shall be provided in a conspicuous position near the gas supply point.

(viii) Stress from subsidence or heat may damage the pipeline and cause subsequent gas leakage. Risk level of subsidence in the site and pipeline expansion shall be assessed and suitable means to offset such stress shall be provided.

(ix) Gas leakage in the supply pipeline system shall actuate a distinctive audio and visual alarm and automatically shut off the gas supply.

(x) Gas supply systems shall be designed, installed, tested, inspected, commissioned and maintained by an AP(Piped Gas Installation) (AP(PGI)).

2.4.6.13 Safe Working System

(a) <u>General</u>

(i) To reduce the chance of an accident, it is essential to establish a safe working system in consultation with a competent person. The general duties provisions of the Factories and Industrial Undertakings Ordinance (Cap. 59) and those of the Occupational Safety and Health Ordinance (Cap 509) require employers to provide and maintain a safe system of work in their workplaces. It should include, as a minimum, health and safety precautions, emergency procedure, training and auditing. A written Health and Safety Plan documenting all pertinent elements of such a safe system of work shall be prepared and submitted with the licence application package.

(ii) The implementation of health and safety measures in a workplace or other premises storing or using special gases shall follow, for the sake of consistency, one single set of health-based standard as far as practicable. Its implementation and monitoring shall be carried out by a competent person.

(b) Health and Safety Precautions

(i) A risk assessment should be carried out to identify the health and fire hazards and to recommend appropriate safety precautions. Subsequent safe working procedure, in-house safety rules, safety precautions or appropriate safety measures by engineering control shall be established.

(ii) SDS, site plans of hazardous materials and installations shall be readily available in the emergency control room and outside the DG store.

(iii) A requirement of a minimum of two persons to carry out duty in the storage room, cleanroom and handling of pressure receptacles should be adopted.

(iv) Unauthorised entry into the premises shall be prohibited.

(c) Emergency Procedure

(i) A designated competent person, in consultation with the emergency services shall work out an emergency response plan and arrange regular joint exercises with the local fire station. As condition requires, he may initiate an on-site emergency procedure and render appropriate assistance to the responding emergency services. The designated competent person should have appropriate backup to take up his duty in case he is not available on the occurrence of any accidents.

(ii) On the occurrence of an accident, the emergency response team shall, according to the emergency response plan:

(1) Put on personal protective gears including breathing apparatus;

(2) Evacuate people in the premises;

(3) Cut off the hazardous chemical supplies, shut down plants and installations;

(4) Stop leaks, control spills and check fires if condition permits;

(5) Obtain plans of hazardous materials storage area, fabrication area, gas distribution system and other installations or facilities in connection with the hazardous event;

(6) Make available the hazardous substance inventory and respective SDS;

(7) Conduct on-site hazard assessment; and

(8) Inform the responding emergency services the prevailing situation and actions taken and advise them on the nature of risks involved and possible hazards.

(d) Training

(i) An employer shall provide such information, instruction and training to his employees including the nature and risk in connection with their work, monitoring procedure, control measures, use of protective clothing and equipment. Induction course to new employees and regular refresher training should be conducted. Periodic training must be provided to ensure that employees can apply and use its principles and equipment. Both lecture and practical sessions should be well planned, recorded and regularly updated. A requisite examination commensurate with nature of duties should be conducted before assumption of a post. Employer shall ensure that the employees possess sufficient knowledge, skill and experience to a level appropriate to their involvement in handling of special gases.

(ii) Training shall include, but not limited to:

(1) the marking and labelling of pressure receptacles;

(2) proper procedure for pressure receptacles changeover and pipeline purging;

(3) maintenance of equipment or other systems in such places where storage or use of special gases is involved;

(4) principle and operation of gas supply, monitoring and treatment systems;

(5) hazardous properties of the special gases involved in the operations and the precautionary measures;

(6) safe disposal of the hazardous substances;

(7) donning, use and removal of personal protective equipment and clothing;

(8) first-aid and casualty handling;

(9) principles of fire protection systems and basic fire-fighting techniques;

(10) emergency procedure; and

(11) other related contents of the Health and Safety Plan.

(iii) The extent of training should be commensurate with the job nature and responsibility of an employee. For example, a pressure receptacle handler may only require basic training on hazards, safety operation of pressure receptacles and associated emergency procedure whereas a member of emergency response team may require extensive training on all aspects.

(e) Periodic Review and Auditing

A periodic audit by a competent person should be adopted to ensure that the objectives of the safe working system are achieved. The Health and Safety Plan should be periodically reviewed and revised. Additional risk assessment should be conducted to formulate strategies and procedure to mitigate any new or altered risk arising from changes in equipment, facilities, installation, work processes, or storage and use of hazardous substances.

Part 3
Approved Person and Pressure Receptacle

Chapter 3.1 Application for the Status of Approved Person

3.1.1 Role of an Approved Person for Works Specified in Cap. 295G

3.1.1.1 Under FSD's DG regulatory system, there are various types of works which must be conducted by an AP approved by DFS pursuant to Cap. 295G. Contravening the legal provisions therein may result in criminal proceedings.

3.1.1.2 Based on the nature of works involved, AP is categorized as follows:

(a) AP(Gas Free) (AP(GF)) - to certify that :

(i) all areas in the hazardous area of the licensed store or Class 3A premises is free from flammable vapour under s. 105 of Cap. 295G;

(ii) a tank is free from flammable vapour under s. 112 of Cap. 295G; and/or

(iii) a tank on licensed tank vehicle is free from flammable vapour under s. 137 of Cap. 295G;

(b) AP(Pressure Receptacle) (AP(PR)) – to inspect or test a pressure receptacle under s. 145(1) of Cap. 295G; and

(c) AP(Piped Gas Installation) (AP(PGI)) - to inspect, test and certify piped gas installation in accordance with the FSR issued by DFS under s. 93 of Cap. 295G;

3.1.1.3 Applicant for being an AP(PR) and / or an AP(PGI) must be qualified in <u>at least one</u> of the following capacities, or equivalents:

(a) Holder of Class 1 Certificate of Competency for Marine Engineer Officer (Seagoing) of MD; or

(b) Boiler Inspector appointed by the Labour Department (LD); or

(c) Registered Professional Engineer under Engineers Registration Ordinance (Cap. 409) in discipline of either Mechanical, Chemical, Gas, or Marine Engineering and being a member of an appropriate Engineering Institution.

3.1.1.4 Applicant for being an AP(GF) must possess academic / professional qualifications in at least one of the following areas:

(a) Being an AP(PR) and /or AP(PGI) under the route of paragraph 3.1.1.3(a) above; or

(b) Being a person approved by the MD to issue "Gas Free Certificate"; or

(c) Being a Registered Safety Officer under the Factories and Industrial Undertakings (Safety Officers and Safety Supervisors) Regulations (Cap. 59Z), and has obtained a certificate as a competent person pursuant to s. 4 of the Factories and Industrial Undertakings (Confined Spaces) Regulations (Cap. 59AE) and thereafter attained at least one year's relevant working experience in the field.

3.1.2 Application Procedure

Application Form and Supporting Documents

3.1.2.1 Depending on the categories of AP under application, appropriate application form(s) shall be completed accordingly. The application forms could be found at: https://es.hkfsd.gov.hk/dg/en/pressure_receptacle/guidance_registration/

3.1.2.2 For each kind of application, the following documents should be provided:

(a) A completed application form;

(b) A recent photo;

(c) A copy of HKID Card / Passport;

(d) A copy of relevant academic and professional qualification certificates / diplomas etc.;

(e) Testimonials of the relevant working experience issued by employers; and

(f) Valid document showing the membership of appropriate Engineering Institution.

3.1.2.3 The application form and the supporting documents should be submitted to the following address:

Dangerous Goods Enforcement Division,

Licensing and Certification Command,

Fire Services Department,

2/F, Tsim Sha Tsui Fire Station Complex,

333 Canton Road, Tsim Sha Tsui,

Kowloon

3.1.2.4 E-application may also be made via “iAM Smart” from the following website: https://www.iamsmart.gov.hk/en/

Other Notes on Application

3.1.2.5 After preliminary examination of the documents submitted, the applicant is required to produce the original copies of the supporting documents upon request.

3.1.2.6 In general, it takes approximately 45 working days for the processing of a new application.

3.1.2.7 During the application process, FSD will seek technical advice from the Boilers and Pressure Vessels Division (BPVD) under LD regarding the academic/professional qualification and working experience of the applicant.

3.1.2.8 Approval status will be valid for 2 years.

3.1.2.9 Application for renewal of the approval status should be submitted 2 months prior to expiry by sending the completed application form for renewal to the address mentioned at paragraph 3.1.2.3 above.

3.1.2.10 Applicant may be required to attend an assessment interview to ensure his / her competency in discharging the duties of the AP.

3.1.3 Guidelines for Inspection and Testing of Pressure Receptacle and Piped Gas Installation

3.1.3.1 AP(PR) shall observe the following when conducting inspection and testing of pressure receptacle:

(a) Statutory Requirements

(i) s. 145 of Cap. 295G;

(ii) s. 146 of Cap. 295G; and

(iii) Part IV of CoP on “Packing and Special Packing Requirements for Pressure Receptacle Containing Class 2 Dangerous Goods”

(For details of CoP, please visit: https://es.hkfsd.gov.hk/dg/en/administration/codes_of_practice/)

(b) Inspection and Testing - Marking of Pressure Receptacle

At the time of inspection, AP(PR) shall ensure that the pressure receptacle is of a type approved by DFS with the following information marked on the pressure receptacle, as appropriate:

(i) The specification marking, immediately followed by the service pressure. For example, **DOT-3A 1800**.

(ii) The serial number, to be marked below or on the same level following the specification marking. For example, **A 123456789**.

(iii) The inspector's mark and date of test.

For example, **Üz 5-95** / **Üz May 1995**.

(iv) The manufacturer's marking (either the name or the symbol).

For example, **ABC Inc.**

(For list of approved pressure receptacles, please visit https://es.hkfsd.gov.hk/dg/en/pressure_receptacle/search/)

(c) Inspection Report

The record must include all of the following information in respect of each inspection or testing (s. 146(2) of Cap. 295G) :

(i) The name of the person who conducted the inspection or testing;

(ii) The date of inspection or testing;

(iii) The details of the inspection or testing; and

(iv) The results of the inspection or testing.

3.1.3.2 AP(PGI) shall observe the requirements formulated on a case-by-case basis when conducting inspection and testing of piped gas installation.

3.1.4 Guidelines for Certification of Flammable Vapour Free (Gas Free)

3.1.4.1 AP(GF) shall observe the following when conducting inspection for the certification of flammable vapour free for work:

(a) Statutory Requirements

(i) Please refer to s. 105, s. 112 and s. 137 of Cap. 295G, concerning:

1. "Use of fire, flame, etc. prohibited in hazardous area of licensed store or Class 3A premises";
2. "Repair of tank"; and
3. "Repair of tank on licensed tank vehicle".

(For details, please visit https://www.elegislation.gov.hk/)

(ii) Part V of CoP on "Decommissioning of Tank"

(For details of CoP, please visit: https://es.hkfsd.gov.hk/dg/en/administration/codes_of_practice/)

(b) Gas Free Certificate

(i) AP(GF) shall prepare a gas free certificate confirming that the store, tank or tank on vehicle has been inspected and certified free from flammable vapour prior to commencement of work;

(ii) Details of gas conditions and recommendations for the suitability of commencement of work should be clearly recorded in the certificate;

(iii) The certificate should be displayed at a prominent position at the workplace and ready for inspection by officer of FSD.

3.1.5 Monitoring of Performance of Approved Person

3.1.5.1 AP(PR) and AP(PGI) shall observe the "Guidelines for Inspection and Testing of Pressure Receptacle and Piped Gas Installation" in paragraph 3.1.3 and AP(GF) shall observe the “Guidelines for Certification of Flammable Vapour Free (Gas Free)” in paragraph 3.1.4 at all times.

3.1.5.2 In any circumstances, the AP shall discharge their professional responsibilities with integrity, dignity, fairness and courtesy.

3.1.5.3 In case of failure to adhere to paragraph 3.1.5.1 and 3.1.5.2 above, DFS may revoke the approval on proof to his satisfaction of an offence against Cap.295 or a breach of any statutory requirements by the AP.

3.1.5.4 Should the AP concerned be a member of professional bodies, like the Hong Kong Institution of Engineers etc., FSD may also refer the case to those professional bodies and Engineers Registration Board for appropriate actions under their jurisdiction.

3.1.5.5 Any records of persistent sub-standard performance may render the application for renewal of approval unsuccessful.

3.1.6 Enquiry

3.1.6.1 For general approval procedures, please contact:

Dangerous Goods Enforcement Division,
Licensing and Certification Command,
Fire Services Department,
2/F, Tsim Sha Tsui Fire Station Complex,
333 Canton Road, Tsim Sha Tsui, Kowloon
Tel. No.: (852) 3850 8472
Fax No.: (852) 3850 8450

Chapter 3.2 Application for Pressure Receptacle Approval

3.2.1 Control of Pressure Receptacle

Packing, Marking and Labelling Requirements

3.2.1.1 FSD puts in place a control regime on PML of pressure receptacle. The related requirements are stipulated in s. 142 of and Sch.6 to Cap. 295G.

Packing Requirements

3.2.1.2 For practical guidance regarding the compliance with both packing requirements (including those for filling ratio) and special packing requirements for pressure receptacle containing Class 2 DG, please refer to Part IV of CoP.

Control Regime for Pressure Receptacle

3.2.1.3 Under s. 145(1) of Cap. 295G, one must not use a pressure receptacle to contain Class 2 DG unless the pressure receptacle–

(a) is of a type[11] approved by DFS for the purpose;

(b) is inspected or tested –

(i) in accordance with the standards specified in CoP[12];

(ii) at the frequency specified in CoP[13]; and

(iii) by a person approved[14] by DFS to conduct the procedures; and

(c) has passed the inspection or test.

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[11] See further in paragraph 3.2.3.

[12] See 4.3.4 of Part IV of CoP.

[13] See 4.3.4 of Part IV of CoP.

[14] Please refer to s. 145(1)(b)(iii) of Cap. 295G for the definition of "person approved for inspection or testing of pressure receptacle".

3.2.2 Exemptions

3.2.2.1 To facilitate the trade and daily use of Class 2 DG by the public, the control regime as mentioned in paragraph 3.2.1.3 above does not apply to the following pressure receptacle pursuant to s. 145(2) of Cap. 295G –

(a) a pressure receptacle, refillable or non-refillable, that contains Class 2 DG in limited packs[15]; or

(b) a non-refillable pressure receptacle with all of the following conditions met –

(i) it is manufactured in accordance with the standards specified in CoP[16];

(ii) it contains Class 2, 2.1 or 2.2 DG directly (i.e. without any form of intermediate containment), and

[15] For the definition of "limited packs", please see s. 21A of Cap. 295E. To identify DG in limited packs, the limited quantity ("LQ") in relation to a DG is specified in column 8 of the table in Part 2, 3 or 4 of Schedule 2 to Cap. 295E or the DG list in CoP.

[16] See 4.3.3 of Part IV of CoP.

(iii) either of the following –

- For Class 2 DG with water capacity not exceeding 1 Litre; or
- For Class 2.1 or Class 2.2 DG with water capacity and pressure not exceeding the following limits:
  - its water capacity does not exceed 5 Litres, and the pressure of which exceeds 35 bars but does not exceed 250 bars; or
  - its water capacity does not exceed 25 Litres, and the pressure of which does not exceed 35 bars.

Class	Water Capacity of the Receptacle	Working Pressure of the Receptacle
(A) Class 2	≤ 1 litre	--
(B) Class 2.1 or 2.2	≤ 5 litres	> 35 bars and ≤ 250 bars
	≤ 25 litres	≤ 35 bars

3.2.3 Types of Approval Application

3.2.3.1 Broadly speaking, there are two types of approval applications: (i) New Application and (ii) Re-application.

New Application for Approval

3.2.3.2 Under this category, there are three sub-categories – application for:

(a) Model Approval

(b) Batch Approval

(c) Model and Batch Approval

Application for Model Approval

3.2.3.3 This is an application related to a model of pressure receptacle with a design introduced in Hong Kong for the first time, i.e. if no previous approval letter from DFS has been issued for the design of the pressure receptacle under the application, the pressure receptacle should then be considered to be introduced in Hong Kong for the first time.

Application for Batch Approval

3.2.3.4 This is an application related to a model of pressure receptacle with a design previously approved by DFS, which includes newly introduced pressure receptacle bearing the body and valve designs previously approved by DFS. As such, the approval letter issued by DFS for the model with respective design should be enclosed with the application.

3.2.3.5 It is the duty of the applicant to prove that the Model Approval has been obtained for the pressure receptacle under application.

Application for Model and Batch Approval

3.2.3.6 This type of application has been introduced with an aim to facilitate trade and business operation – the applicant may file a Model Approval application together with a Batch Approval application.

Re-application for Approval

3.2.3.7 Upon filing a New Application, Re-application may take place if:

(a) the applicant is requested to provide additional information; and / or

(b) the applicant provides supplementary information.

3.2.4 Application Procedure

Application Form and Supporting Documents

3.2.4.1 For both New Application and Re-application, the following should be provided to FSD:

(a) Application Form (Rev. 2/2022), which can be downloaded from https://es.hkfsd.gov.hk/dg/en/pressure_receptacle/application_form/; and

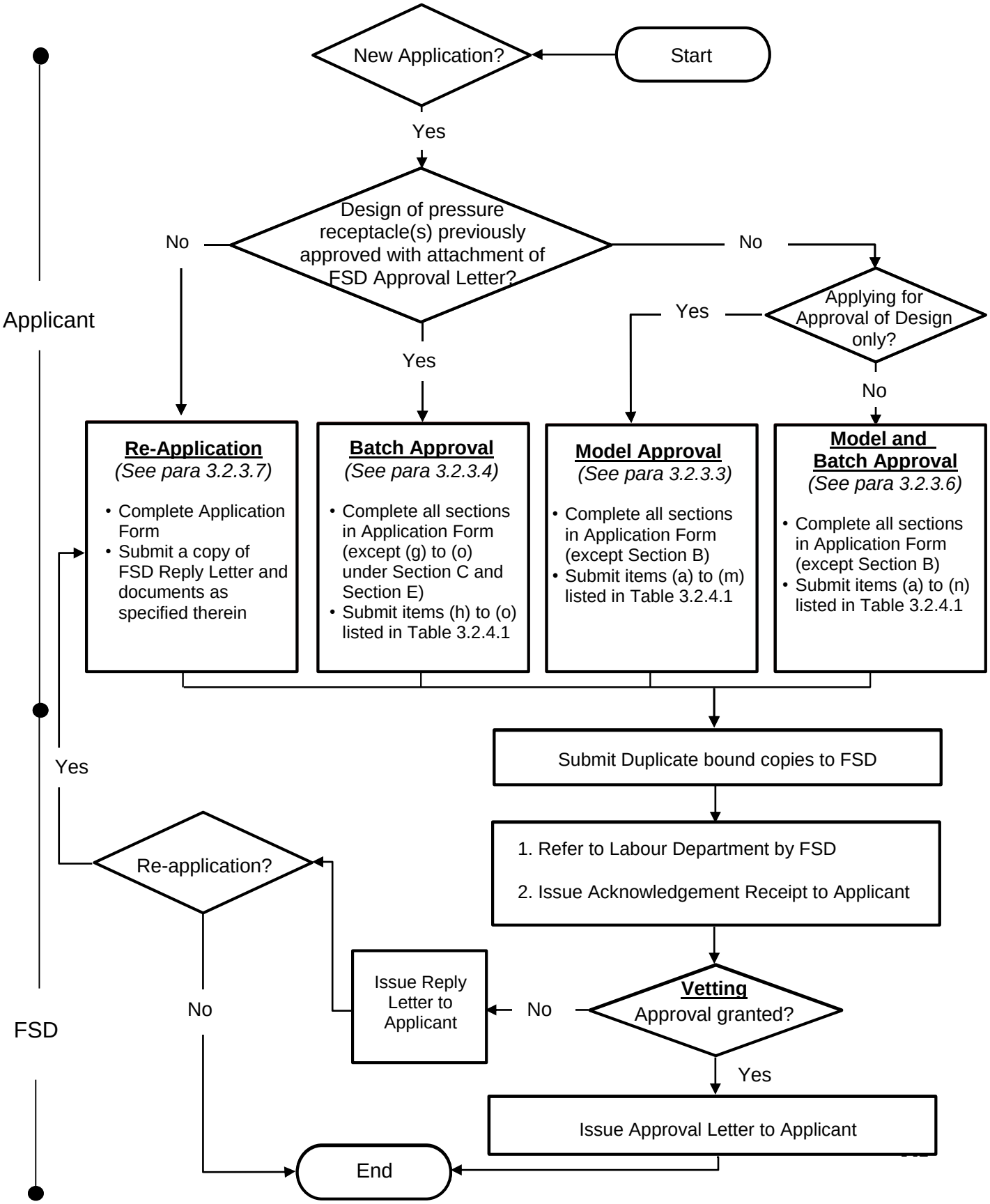
(b) Supporting documents in Chinese or English in duplicate, as shown in the table below:

Supporting Documents for Pressure Receptacle Approval Applications

Item	Supporting Document	New Application			Re- application / Submission of Supplementary Information
		Model	Batch	Model and Batch	
(a)	Model and Design of Receptacle(s)	✓		✓	As specified in FSD's Reply Letter
(b)	Technical Details and Drawing(s)	✓		✓	
(c)	Design Specification and Calculation	✓		✓	
(d)	Gas(es) Details	✓		✓	
(e)	Valve Specification	✓		✓	
(f)	For filament-wound composite receptacle (if applicable): (i) Life extension plan; (ii) NDE scheme; and (iii) Maintenance manuals	✓		✓	
(g)	Product Catalogue (if applicable) of: (i) Pressure Receptacle (ii) Valve	✓		✓	
(h)	Manufacturer's Certificate	✓	✓	✓	
(i)	Inspection Report issued by recognized independent inspection authority/body	✓	✓	✓	
(j)	Report of Physical Test	✓	✓	✓	
(k)	Report of Chemical Analysis of Material	✓	✓	✓	
(l)	Other Test Report(s)	✓	✓	✓	
(m)	Details of any heat treatment	✓	✓	✓	
(n)	Serial numbers of Pressure Receptacle(s)		✓	✓	
(o)	Previous FSD's approval letter(s) for respective model/design of respective Pressure Receptacle(s)		✓		
(p)	Other documents requested by FSD (if any)				
(q)	Copy of FSD's Reply Letter(s)				✓

3.2.4.2 The flowchart below provides an overview of the application process.

Flowchart of the Application Procedure for Pressure Receptacle



3.2.4.3 Independent inspection authority/body recognised by FSD could be found below:

	Name of the Inspection Authority / Body
1	APRAGAZ, Belgium
2	Arrowhead Industrial Services, Inc., USA
3	Authorized Testing Inc., USA
4	Bureau Veritas, Austria
5	Det Norske Veritas, Norway
6	TÜV SÜD, Germany
7	TÜV Rheinland Industrie Service GmbH, Germany
8	上海市特種設備安全監督檢驗研究院, China
9	北京市特種設備檢測中心, China
10	浙江省特種設備檢驗研究院, China
11	江蘇省特種設備安全監督檢驗研究院, China
12	中國特種設備檢測研究院, China
13	撫順市特種設備檢驗檢疫總局, China
14	天津市特種設備監督檢驗技術研究院, China
15	大連鍋爐壓力容器檢驗檢測研究院有限公司, China

*The list above is for reference only and not exhaustive.

Other Notes on Application

3.2.4.4 Any documents not written in English or Chinese must be supported by a corresponding English or Chinese translation.

3.2.4.5 During the application approval process, FSD will seek technical advice from BPVD under LD. If BPVD notices any technical irregularities in the submission, where necessary, BPVD officer may contact the applicant for clarification.

3.2.4.6 In general, it takes approximately 45 working days for the processing of a new application.

3.2.4.7 If all requirements are met to the satisfaction of DFS and BPVD, an approval letter would be issued to the applicant.

3.2.5 Standards / Specifications Accepted by FSD

3.2.5.1 Regarding the manufacture and testing of a pressure receptacle, FSD accepts the following national and international standards:

American Standards	**Australian Standards**	**Canadian Standards**
DOT 3A	AS B110	CTC 3A
DOT 3AX	AS B111	CTC 3AX
DOT 3AA	AS B113	CTC 3AA
DOT 3AAX	AS B114	CTC 3AAX
DOT 3AL	AS B115	CTC 3AL
DOT 4B	AS B189	CTC 4B
DOT 4BA	AS B239	CTC 4BA
DOT 4BW	AS 1777	CTC 4BW
DOT 4L	AS 2030	CTC 4L
DOT 8AL	AS 2468	CTC 8AL
DOT 8	AS 2469	CTC 8
DOT 39	AS 2470	CTC 8WC
DOT FRP-1 Type 3FC	AS 2527	
	AS 2875	

Chinese Standards	British Standards	Japanese Standards
GB 5099	BS 5045	JIS B8234
GB 5100	BS 6061	JIS B8241
GB 11638	HOAL	JHPGCL
GB 11639	HSE-AL-FW2	
GB 11640	HSE-TP-FW3	

3.2.5.2 Apart from the standards above, FSD would also consider accepting other engineering standards / specifications if proved to be equivalent to the accepted standards. To this end, FSD may require supporting documents and evaluation reports as a proof.

3.2.6 Record of Inspection and Testing of Pressure Receptacle

3.2.6.1 Pursuant to s. 146(1) of Cap. 295G, an owner of an approved pressure receptacle must –

(a) keep either a record of inspection or a record of testing of the pressure receptacle conducted in compliance with s. 145(1)(b) of Cap. 295G;

(b) produce the record to DFS for inspection upon request; and

(c) transfer the record to the new owner during the transfer of ownership of the pressure receptacle.

3.2.6.2 According to s. 146(2) of Cap. 295G, the record mentioned in s. 146(1) of Cap.295G must include all of the following information in respect of each inspection or testing –

(a) the name of the person who conducted the inspection or testing;

(b) the date of the inspection or testing;

(c) the details of the inspection or testing; and

(d) the results of the inspection or testing.

3.2.6.3 If an owner of an approved pressure receptacle contravenes s. 146(1) of Cap. 295G, the owner commits an offence and is liable on conviction to a fine at level 4 and to imprisonment for 1 month (s. 146(3) of Cap. 295G).

3.2.7 Enquiry

3.2.7.1 For general approval procedures, please contact:

Dangerous Goods Enforcement Division,
Licensing and Certification Command,
Fire Services Department,
2/F, Tsim Sha Tsui Fire Station Complex,
333 Canton Road, Tsim Sha Tsui, Kowloon
Tel. No. : (852) 3850 8472
Fax No. : (852) 3850 8450

3.2.7.2 For other technical requirements, please contact:

The Boilers and Pressure Vessels Division
Labour Department
Unit 01 – 02, 20th Floor, Millennium City 6
392 Kwun Tong Road
Kwun Tong, Kowloon
Tel. No. : (852) 3107 3445 or (852) 3107 3446
Tel. No. : (852) 2517 0875

Part 4
Miscellaneous

Chapter 4.1 Notification of Storage of Class 9A Dangerous Goods

4.1.1 Introduction

4.1.1.1 Class 9A Dangerous Goods mean DG specified in Sch. 3 to Cap. 295E.

Exemption from Licensing, Packing, Marking, and Labelling for Class 9A DG

4.1.1.2 Pursuant to s. 30 of Cap. 295E, Class 9A DG are exempt from the operation of s. 6, 8 and 10 of Cap. 295.

4.1.1.3 Unlike other Classes of S2DG, store and use licence, manufacture licence, and conveyance licence are not required for Class 9A DG.

4.1.1.4 PML requirements as stipulated in s. 138 – 146 and Sch. 6 to Cap. 295G are not applicable to Class 9A DG.

Notification Regime for Storage of Class 9A DG

4.1.1.5 Despite the exemptions above, storage of Class 9A DG on land is controlled by the notification regime pursuant to s. 149 and s. 150 of Cap. 295G.

4.1.1.6 If Class 9A DG are stored in the premises (other than an approved container terminal specified in Sch. 2 to the Dangerous Goods (Shipping) Regulation 2012 (Cap. 295F)) and the quantity of the DG exceeds the specified quantity for that type of premises, a written notice should be submitted within 48 hours after the quantity being exceeded.

Specified Quantity for Storage of Class 9A DG

4.1.1.7 The following table shows the specified quantity for storage of Class 9A DG in an industrial premises[17] and non-industrial premises[18] (Sch. 7 to Cap. 295G).

Table 4.1.1.7 Specified Quantity for Storage of Class 9A DG in Industrial Premises and Non-Industrial Premises

Combustible Goods Class 9A DG	Specified Quantity in Non-industrial premises	Specified Quantity in Industrial premises
1. Cotton waste	100 kg	2 tonnes
2. Cotton (raw)	50 kg	2 tonnes
3. Kapok	50 kg	2 tonnes
4. Polymethylmethacrylate (raw material)	250 kg	2 tonnes
5. Polypropylene (raw material)	250 kg	2 tonnes
6. Polystyrene (raw material)	250 kg	2 tonnes
7. Polytetrafluoroethylene	250 kg	2 tonnes
8. Polythene (raw material)	250 kg	2 tonnes
9. Polyvinyl chloride (raw material)	250 kg	2 tonnes
10. Rubber (raw) (excludes any S2DG with UN number UN 1287 or UN 1345)	100 kg	2 tonnes
11. Rubber tyres for motor vehicles and aircrafts	50 tyres	500 tyres

[17] Pursuant to s. 149(6) of Cap. 295G, industrial premises has the meaning given by s. 2 of Cap. 295E, and includes an open space used exclusively for storing Class 9A DG.

[18] Pursuant to s. 149(6) of Cap. 295G, non-industrial premises means the premises other than an industrial premises.

4.1.2 Notification Procedure

4.1.2.1 If the storage of Class 9A DG exceeds the specified quantity corresponding to the premises as mentioned above, a written notice should be submitted using Form DG/TS/317A[19], which can be downloaded from the following link, within 48 hours after the quantity being exceeded.

https://es.hkfsd.gov.hk/dg/en/licence/form/

4.1.2.2 The Form DG/TS/317A shall contain all the following information:

(a) the address of the premises (including the floor number) and the type of the premises;

(b) the description and quantity of the Class 9A DG stored in the premises; and

(c) the purpose for which the Class 9A DG are stored in the premises.

4.1.2.3 If, after the notice was sent, there is any increase in the quantity of Class 9A DG stored in the premises, another written notice (i.e. the Form DG/TS/317A) shall be sent to DFS within 48 hours of the increase.

4.1.2.4 A person who contravenes subsection (1) or (3) of s. 149 of Cap. 295G commits an offence and is liable on conviction to a fine at level 4.

4.1.2.5 Pursuant to subsection (5) of s. 149 of Cap. 295G, if a person who sent a written notice (i.e. the Form DG/TS/317A) wilfully or recklessly makes a statement or provides any information that is false in a material particular, the person commits an offence and is liable on conviction to a fine at level 4.

[19] The Form DG/TS/317A shall be sent to the Dangerous Goods Control Division at 4th Floor, Fire Services Department Kwai Chung Office Building, 86 Hing Shing Road.

4.1.3 Direction for Storage of Class 9A DG

4.1.3.1 Following receipt of the Form DG/TS/317A, DFS will issue a Direction to the owner or occupier of the premises to:

(a) prohibit the use of naked light or flame of any description in the premises;

(b) require the placing of one or more notices in the premises that bear the English words “Smoking Prohibited” and the Chinese characters “嚴禁吸煙” the height of which must not be less than 180 mm; or

(c) prescribe the conditions subject to which the Class 9A DG must be stored, including conditions relating to—

(i) the nature and construction of the receptacle in which the Class 9A DG are stored;

(ii) the maintenance of free access way within the premises; or

(iii) the provision and maintenance in good working order of adequate FSI or equipment in the premises.

4.1.3.2 Dry sprinkler system shall be installed in all factories in industrial buildings which are not provided with sprinkler system for application involving storage of any Class 9A DG over the specified quantity.

4.1.3.3 Pursuant to s. 150 of Cap. 295G, an owner or occupier who fails to comply with a Direction commits an offence and is liable on conviction to a fine at level 4.

4.1.4 Report of Compliance

4.1.4.1 The applicant shall inform case officer in writing after the compliance with all the Directions issued by DFS.

4.1.4.2 During the compliance inspection, Certificate of Fire Service Installation and Equipment (FS 251) shall be provided to prove that the FSI or equipment required under the Direction is/are in efficient working order.

4.1.4.3 If any provisions under the Direction is found not being complied with, the applicant will be issued with a list of non-compliance works for follow-up action. Re-inspection will be arranged after receipt of the report of compliance.

4.1.5 Issuance of Letter of Compliance

4.1.5.1 Upon a compliance inspection with satisfactory result, a Letter of Compliance would be issued to the applicant.

Appendices

Appendix I -
Sample of Standard Fire Safety Requirements for Tank Vehicle Used for Conveyance of Class 3/3A DG
(Type B Dangerous Goods Vehicle)

1. **Engine**

1.1 The engine of the tank vehicle shall be the type of compression ignition (Diesel).

1.2 The exhaust system of the engine shall be situated wholly in front of the fire resisting shield and the discharge shall be arranged to offside of the vehicle.

1.3 For any fuel pipe forming part of a gravity feed system, the fuel feed pipe shall be fitted with a quick action cut-off valve situated in an easily accessible position and clearly marked as such.

2. **Fuel Tank**

2.1 The fuel tank shall:

(a) comply with a double cases construction;

(b) be screened from the body by a fire resisting shield;

(c) be protected from blows by strong steel guards or by the frame of the body chassis of the vehicle; and

(d) be fitted with a lock to the fuel tank lid.

3. **Cargo Tank**

3.1 The gross vehicle weight or the axle weights of the tank vehicle shall not exceed the permitted gross vehicle weight or the permitted axle weights as specified in the Road Traffic Ordinance (Cap. 374) and its subsidiary Regulations.

3.2 The cargo tank shall be inspected by a competent person at an interval of every 5 years. The relevant tank survey report should include the required design and inspection information related to this requirement and should be submitted to FSD upon new licence application and subsequently at a 5-year interval.

N.B.

Competent Person referred to in this Appendix means a Registered Professional Engineer in the "Marine & Naval Architecture Discipline" or "Mechanical Discipline" or an "Authorized Surveyor" under the Merchant Shipping (Local Vessels) Ordinance (Cap. 548) or the "Boiler Inspector" under Boilers and Pressure Vessels Ordinance (Cap. 56).

3.3 The minimum thickness of the cargo tank shall follow the specifications stipulated below (Table Ia):

Table Ia - Specifications on the Minimum Thickness of Cargo Tank

		Diameter of tank ≤ 1.8m	**Diameter of tank >1.8m**
Minimum thickness of cargo tank	Austenitic stainless steels	2.5 mm	3 mm
	Austenitic-ferritic stainless steels	3 mm	3.5 mm
	Other steels	3 mm	4 mm
	Aluminium alloys	4 mm	5 mm
	Pure aluminium of 99.8%	6 mm	8 mm

3.4 The cargo tank shall be secured on the vehicle.

3.5 The rear end of the cargo tank shall be protected by a robust steel bumper which is situated at least 75 mm away from the rear of the nearmost part of the tank; and extended on each side of the vehicle to at least the maximum width of the cargo tank and tank fittings.

3.6 “KEEP CLOSED 保持緊閉” notice shall be provided for the filling pipes and discharging pipes (See Table Ib).

3.7 The feed pipes of the cargo tank shall be fitted with a quick action shut off valve situated in an easily accessible position and clearly marked in English and Chinese letters / characters.

3.8 Every draw-off pipe shall be fitted with an internal valve and a strongly secured screw cap.

3.9 Any cargo tank with a total capacity exceeding 5,000 litres shall be divided into several enclosed compartments. Each compartment shall have a capacity of not exceeding 5,000 litres and be fitted with a lock to the fuel tank lid. For tank vehicle operating on Hong Kong Island, the capacity of each compartment shall not exceed 3,600 litres.

3.10 Built-in type quick shut-off valves shall be provided for each tank compartment of tank vehicle. “KEEP CLOSED AND LOCKED 保持緊閉及上鎖” notice shall also be provided (See Table Ib).

3.11 Every fuel tank lid of the cargo tank shall be fitted with “KEEP CLOSED AND LOCKED 保持緊閉及上鎖” notice (See Table Ib).

3.12 Power-driven pumps for product off-loading shall be fitted with emergency controls situated in an easily accessible position in front of the fire resisting shield and clearly marked as such.

3.13 Piping and/or fittings shall not be projected beyond any sides of the vehicle. All piping, equipment, hoses, valves, accessories and outlet valves shall be adequately protected against accidental damage or interference. Outlet valves shall be protected by (a) the bumper if the valves are located at the rear of the vehicle; and / or (b) a substantial protective metal bar if located at the side.

3.14 The body chassis, cargo tank, piping and associated equipment shall be adequately bonded.

3.15 The body chassis, fuel tank and fittings shall be constructed of strong and non-combustible materials.

4. Delivery Hose

4.1 Delivery hose(s) for transfer of DG, if provided, shall be in accordance with BS EN 1360, BS EN 13483, BS EN 13765, BS EN 1761, EN ISO 1825 or equivalent.

5. Tyres

5.1 Tyres shall be the “anti-static” type, the electrical resistance of which shall be in accordance with BS 2050 or equivalent.

6. Fire Resisting Shield

6.1 The engine, fuel tank, electrical generator, batteries switch gear, fuses and exhaust system of the tank vehicle shall be situated in front of a fire resisting shield and effectively screened from the cargo tank by the fire resisting shield.

6.2 The installation of fire resisting shield shall be projected upwards to a point above the topmost level of the cargo tank, and downwards to a point not more than 300 mm from the ground. (The steel driver’s cab can be deemed to constitute part of the shield.)

6.3 Any windows in the fire resisting shield shall be wire glazed in fixed metal frame and not capable of being opened.

6.4 Any aperture made to allow any piping to pass through the fire resisting shield (e.g. air brake tubing) shall be so sealed as to prevent the passage of flammable vapour through the shield.

6.5 A clear space shall be maintained at least 150 mm between the back of the fire resisting shield and the front of the cargo tank.

7. Electrical Installation and Fittings

7.1 Tank vehicle shall be equipped with an earth cable. “CONNECT TO RECEIVING EQUIPMENT 與接收裝備連接” notice shall also be provided (See Table Ib).

7.2 No article capable of causing fire or explosion and no lighting apparatus except such portable lighting apparatus designed and constructed to be intrinsically safe and not exhibiting any metal surface liable to produce sparks should be carried on the vehicle.

7.3 All electric wiring shall be heavily insulated and resistant to abrasion and chemical action. The wiring fixed at positions behind the fire resisting shield shall be run in flexible metal conduit.

7.4 A safety cut-off switch shall be fitted in the driver’s cab to isolate the electrical system from the battery.

7.5 The nominal voltage of the electrical circuit shall not exceed 24 volts.

8. **Signs (Including Notices and Placards)**

8.1 A warning sign shall be displayed at a conspicuous place at the front and rear of the tank vehicle.

8.2 The warning signs must conform with the form and specifications stipulated in Sch. 4 to Cap. 295G.

8.3 A placard showing the Class of DG carried on the vehicle shall be displayed at a conspicuous place on both sides and the rear of the tank vehicle. The placards must conform with the form and specifications stipulated in Sch. 5 to Cap. 295G.

8.4 Notwithstanding the paragraph 8.3 above.

(a) for all tank compartments carrying the same cargo (single-load):

(i) A HAZCHEM code plate complying with the relevant specifications and colour scheme shall be displayed at a conspicuous place on both sides and the rear of the tank vehicle. English and Chinese Proper Shipping Name (PSN) of the actual DG carried by the vehicle shall be displayed above the UN no./ HK no. on the code plates.

(b) for tank compartments carrying different cargoes (multi-load):

(i) A HAZCHEM code plate complying with the relevant specifications and colour scheme shall be displayed at a conspicuous place on both sides and the rear of the tank vehicle.

(ii) An identification plate complying with the relevant specifications and colour scheme shall also be displayed at the exterior on both sides of each tank compartment of the vehicle. English and Chinese PSN of the actual DG carried by each compartment shall be displayed above the UN no./ HK no. on the identification plates.

8.5 A “NO SMOKING 不准吸煙” notice with letter / character of not less than 120 mm in height shall be displayed at a conspicuous place on both sides of the vehicle.

8.6 One portable “NO SMOKING 不准吸煙” notice with letter / character of not less than 120 mm in height shall be carried on the vehicle.

8.7 The notice(s) as specified in paragraph 8.5 and 8.6 above shall be provided with reflective white or silver letters and characters on a red background. English letters with height and width in the proportion of 2:1 (e.g. 120 mm letters with 60 mm width) and a 6 mm spacing for each letter are recommended.

8.8 For details about the signs (including notices and placards) for Type B DGV, please refer to Table Ib, Figure Ic and Figure Id.

9. Fire Service Installation or Equipment

9.1 2 nos. of dry powder fire extinguishers, each with a capacity of at least 2 kg and not exceeding 9 kg, shall be provided with one on each side of the vehicle and accessible from outside the driver’s cab. The fire extinguishers shall also be inspected by an RFSIC at least once in every 12 months.

10. Operation, Housekeeping, Management, Security, Staff Training and Emergency Preparedness

10.1 An operation manual containing procedures in respect of the operation, housekeeping, management, security, emergency preparedness of the licensed vehicle shall be provided for training and guidance to the driver and vehicle attendants. The manual shall be stowed in the driver’s cab at all times and the procedures shall at least include the following scopes:

(a) The driver should only use the licensed vehicle to convey DG of class(es) permitted by the subject licence at any one time.

(b) The driver should properly display the identification disc and the signs as specified in the FSR above when he/ she is using the licensed vehicle to convey DG.

(c) The driver and/or operators should only transfer the DG directly from the licensed vehicle to an approved tank, a receptacle located in a licensed factory or licensed store, or a receptacle located in the premises in which the storage of DG is exempt from the operation of s. 6 of Cap. 295.

(d) The driver and/or operators should not smoke, carry a lighted cigarette, cigar or pipe, or carry a naked flame when they are using the licensed vehicle to convey DG, or loading DG onto, or unloading DG from, the vehicle.

(e) The driver should not leave the licensed vehicle conveying DG unattended. If another person is authorised by the driver to attend to the vehicle, such person shall attain the age of 18, and be aware of the whereabouts of the driver and the nature of the DG on the vehicle.

(f) The driver should not use the licensed vehicle conveying DG to carry any passenger other than operators.

(g) The driver and/or operators should keep every fuel tank lid of the cargo tank closed and locked to avoid spillage during conveyance of DG.

(h) During the loading or unloading operation, the driver and/or operators should take adequate precaution as specified in the CoP to prevent the accumulation of electrostatic charges.

(i) Except during the loading or unloading operation, the driver and/or operators should keep all filling pipes and discharging pipes closed at all times.

(j) Except during the loading or unloading operation, the driver and/or operators should keep the built-in quick shut-off valves of each tank compartment closed and locked at all times.

(k) During the loading or unloading operation, the driver and/or operators should properly wear personal protective equipment including protective goggles and gloves (if any), and display the portable “NO SMOKING 不准吸煙” notice at a prominent location (See Table Ib).

(l) Unless a tank or any tank compartment of the licensed vehicle has been certified free from flammable vapour by an AP(GF), the driver and/or operators should not repair the tank or the tank compartment if the repair involves the use of any source of artificial heating, or a process producing or likely producing heat or sparking.

(m) The driver and/or operators should report immediately any incident of explosion or fire in, in the vicinity of or in connection with the licensed vehicle, or any leak of DG from the vehicle to FSD by dialling “999”.

(n) The driver and/or operators should have sufficient understanding on the nature and hazard of the DG on the licensed vehicle, and adopt suitable measures, as far as practicable, to stem and handle any spill or leakage of DG promptly.

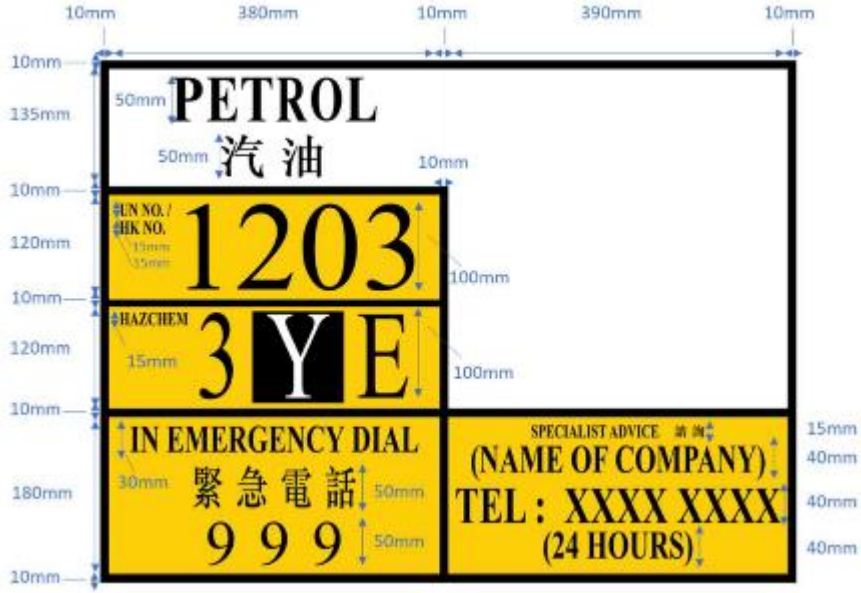
Table Ib - Signs (including Notices and Placards) for Type B Dangerous Goods Vehicle

Column 1	Column 2	Column 3	Column 4	Column 5
Signs	**Paragraph**	**Display**	**Location for Display**	**Size and Colour**
"KEEP CLOSED 保持緊閉" Notice	3.6		As specified in the Column 2	As appropriate for easy and clear identification
"KEEP CLOSED AND LOCKED 保持緊閉及上鎖" Notice	3.10			
"CONNECT TO RECEIVING EQUIPMENT 與接收裝備連接" Notice	7.1			

Column 1	Column 2	Column 3	Column 4	Column 5
Signs	**Paragraph**	**Display**	**Location for Display**	**Size and Colour**
Warning sign	8.1-8.2		Front and rear of the vehicle	As specified in Part 2 of Sch. 4 to Cap. 295G: 1. A warning sign must be displayed in an upright position. 2. A warning sign must have the minimum height of 300 mm and the minimum width of 400 mm. 3. All Chinese characters in the warning sign must be at least 90 mm in height and in width. 4. All English letters in the warning sign must be at least 70 mm in height and 35 mm in width. 5. If a warning sign's dimensions are bigger than the minimum height of 300 mm and the minimum width of 400 mm, the dimensions of every Chinese character and English letter in the sign must be adjusted upward proportionally.

Column 1	Column 2	Column 3	Column 4	Column 5
Signs	**Paragraph**	**Display**	**Location for Display**	**Size and Colour**
Placard	8.3	 **Or**	Both sides and rear of the vehicle	As specified in Part 2 of Sch. 5 to Cap. 295G: 1. A placard must be displayed in an upright position. 2. A placard must be square-shaped, with the minimum length of each side measuring 250 mm (minimum dimensions). 3. For a placard of minimum dimensions, the number “2” or “3” at the bottom of the placard (as required by Part 1 of this Schedule) must be at least 25 mm in height. 4. If no specific dimensions are indicated for a feature of a placard in this Part or in the relevant Figure in Part 1 of this Schedule, the feature must be in the appropriate scale as shown in the Figure. If a placard’s dimensions are bigger than the minimum dimensions, the dimensions of every feature in the placard must be adjusted upward proportionally. 5. A placard must be displayed on a background of contrasting colour or, if a background of contrasting colour cannot be provided, have a dotted or solid outer boundary line.

<table>
<tr><th>Column 1</th><th>Column 2</th><th>Column 3</th><th>Column 4</th><th colspan="2">Column 5</th></tr>
<tr><th>Signs</th><th>Paragraph</th><th>Display</th><th>Location for Display</th><th colspan="2">Size and Colour</th></tr>
<tr><td>HAZCHEM code plate (single-load)
(UN 1203 as example)</td><td>8.4(a)(i)</td><td> 
</td><td>Both sides and rear of the vehicle</td><td>Size</td><td>As shown in Figure A1</td></tr>
<tr><td></td><td></td><td></td><td></td><td>Colour</td><td>  </td></tr>
<tr><td>HAZCHEM code plate (Single-load)

(UN 1203 as example)</td><td>8.4(a)(i)</td><td colspan="3"><u>Figure A1</u>
Size and Colour:
 
</td></tr>
<tr><td>HAZCHEM code plate (multi-load)</td><td>8.4(b)(i)</td><td> 
</td><td>Both sides and rear of the vehicle</td><td>Size</td><td>As shown in Figure A2</td></tr>
<tr><td></td><td></td><td></td><td></td><td>Colour</td><td>  </td></tr>
</table>

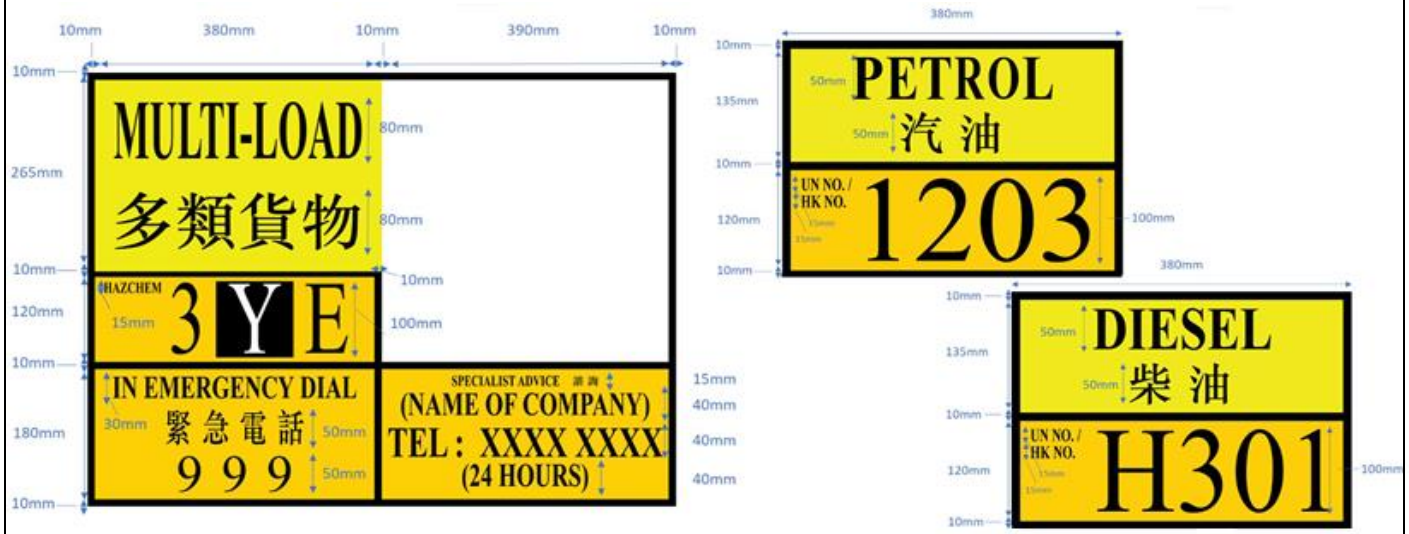
Column 1	Column 2	Column 3	Column 4	Column 5		
Signs	**Paragraph**	**Display**	**Location for Display**	**Size and Colour**		
Identification plate (multi-load) *(UN 1203 as example)*	8.4(b)(ii)		The exterior on both sides of each tank compartment of the vehicle	Size	As shown in Figure A2	
				Colour		
HAZCHEM code plate and identification plate (Multi-load) *(UN 1203 and H301 as examples)*	8.4(b)(i), 8.4(b)(ii)	Figure A2 Size and Colour: 				
"NO SMOKING 不准吸煙" Notice	8.5 - 8.7, 10.1(k)		Both sides of the vehicle and portable notice	Letter / Character Size	Height	120 mm
					Width	60 mm
					Spacing	6 mm
				Colour	Background	Red
					Letter	White

Figure Ic - Sketch Showing the Signs Required for Single-load

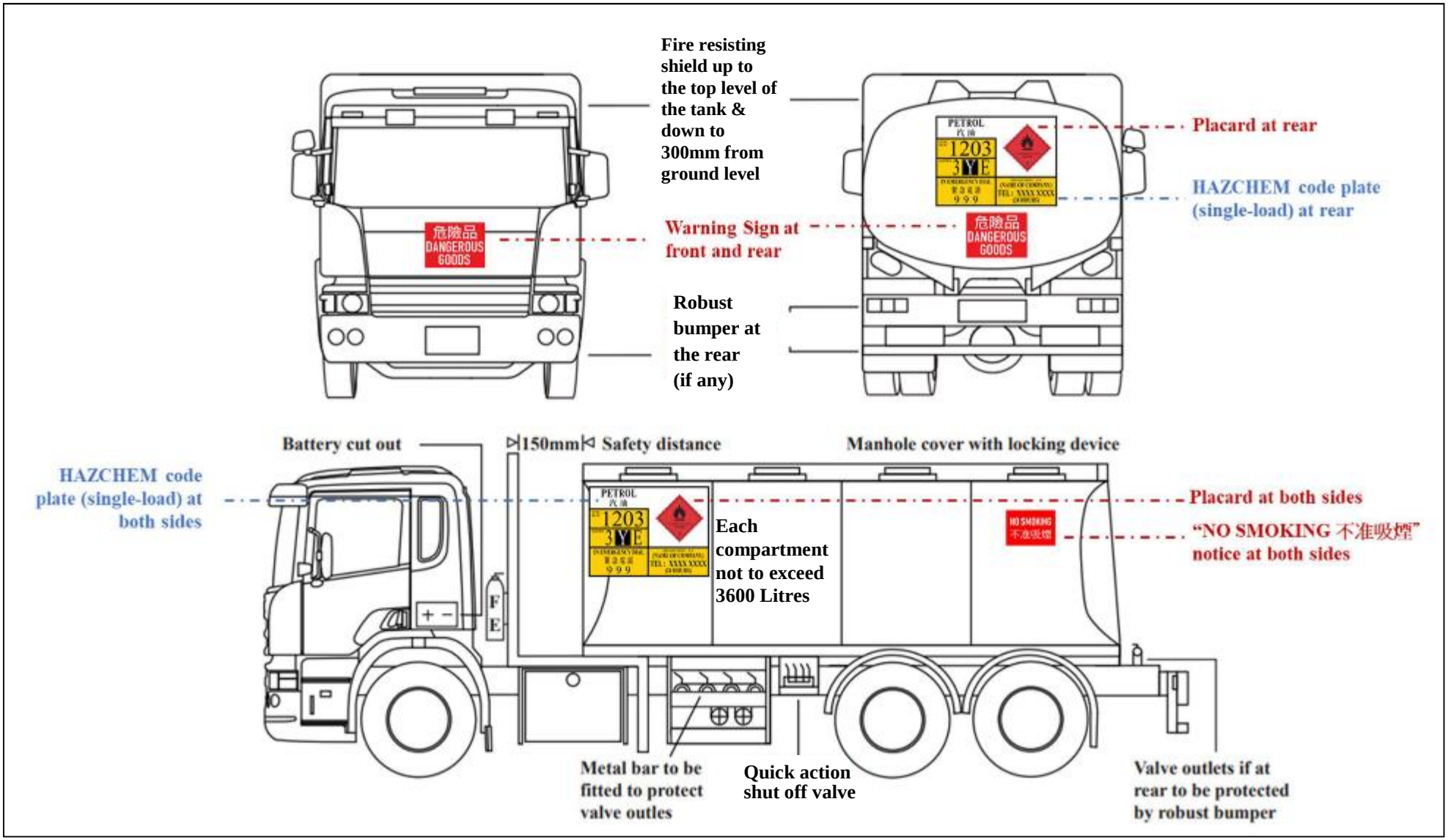
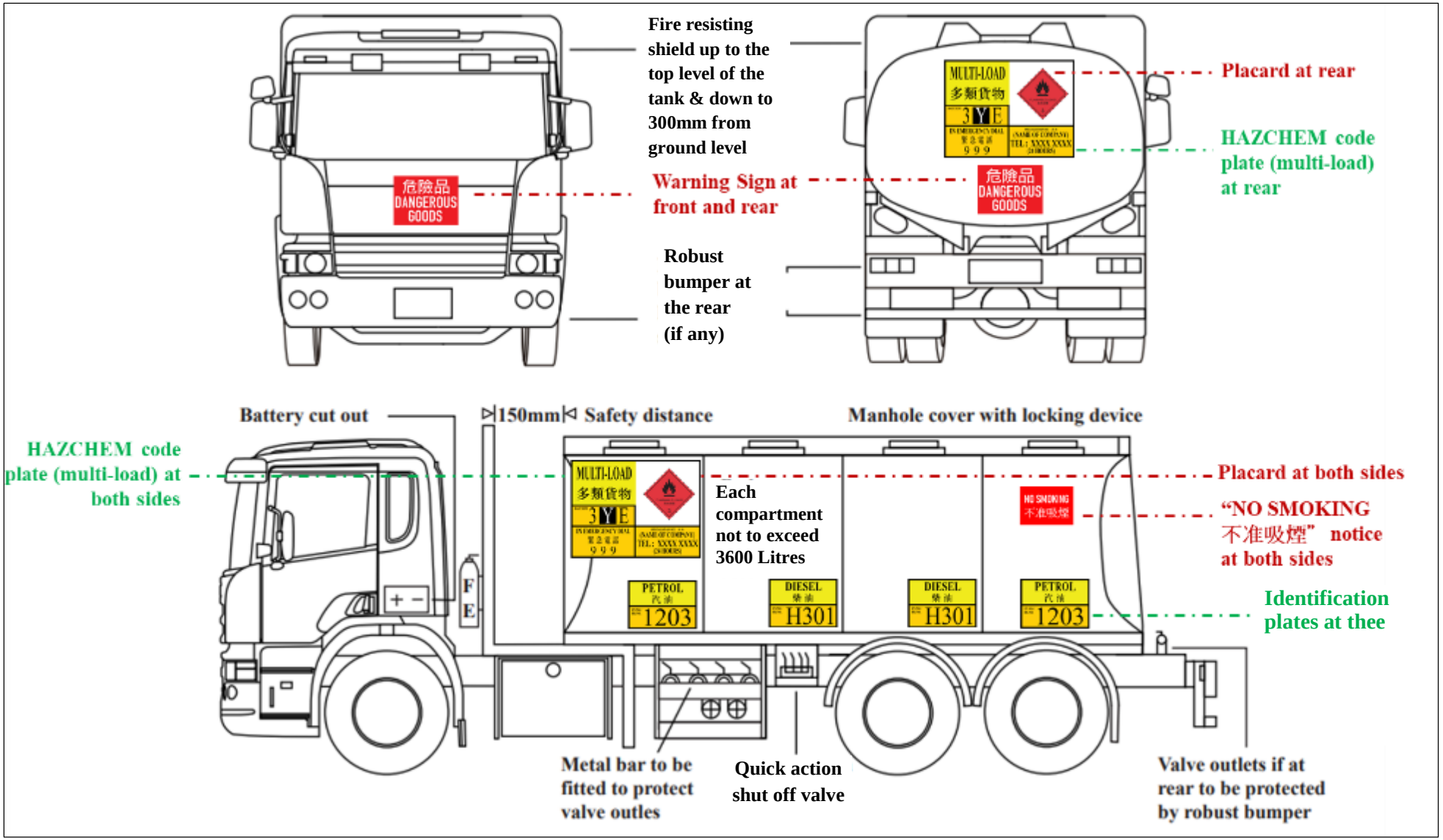


Figure Id - Sketch Showing the Signs Required for Multi-load



Appendix II -
Sample of Standard Fire Safety Requirements for Goods Vehicle Used for Conveyance of Class 2 DG (Excluding Chlorine and Special Gases)
(Type C Dangerous Goods Vehicle)

1. **Engine**

1.1 The engine of the vehicle shall be the type of compression ignition (Diesel).

1.2 The exhaust system of the engine shall be situated wholly in front of the fire resisting shield and the discharge shall be arranged to offside of the vehicle.

1.3 For any fuel pipe forming part of a gravity feed system, the fuel feed pipe shall be fitted with a quick action cut-off valve situated in an easily accessible position and clearly marked as such.

2. **Fuel Tank**

2.1 The fuel tank shall:

(a) comply with a double cases construction;

(b) be screened from the body by a fire resisting shield;

(c) be protected from blows by strong steel guards or by the frame of the body chassis of the vehicle; and

(d) be fitted with a lock to the fuel tank lid.

3. **Cargo Compartment**

3.1 The gross vehicle weight or the axle weights of the vehicle shall not exceed the permitted gross vehicle weight or the permitted axle weights as specified in the Road Traffic Ordinance (Cap. 374) and its subsidiary Regulations.

3.2 A fixed roof cover shall be constructed of fire resisting material and provided for covering the cargoes.

3.3 Piping and/or fittings shall not be projected beyond any sides of the vehicle. All piping, equipment, hoses, valves, accessories and outlet valves shall be adequately protected against accidental damage or interference. Outlet valves shall be protected by (a) the bumper if the valves are located at the rear of the vehicle; and / or (b) a substantial protective metal bar if located at the side.

3.4 The cargo compartment of the vehicle shall be well ventilated.

4. Fire Resisting Shield

4.1 The engine, fuel tank, electrical generator, batteries switch gear, fuses and exhaust system of the vehicle shall be situated in front of a fire resisting shield and effectively screened from the cargo compartment by the fire resisting shield.

4.2 The installation of fire resisting shield shall be projected upwards to a point above the topmost level of the cargo compartment, and downwards to a point not more than 300 mm from the ground. (The steel driver's cab can be deemed to constitute part of the shield.)

4.3 Any windows in the fire resisting shield shall be wire glazed in fixed metal frame and not capable of being opened.

4.4 Any aperture made to allow any piping to pass through the fire resisting shield (e.g. air brake tubing) shall be so sealed as to prevent the passage of flammable vapour through the shield.

5. Electrical Installation and Fittings

5.1 No article capable of causing fire or explosion and no lighting apparatus except such portable lighting apparatus designed and constructed to be intrinsically safe and not exhibiting any metal surface liable to produce sparks should be carried on the vehicle.

5.2 All electric wiring shall be heavily insulated and resistant to abrasion and chemical action. The wiring fixed at positions behind the fire resisting shield shall be run in flexible metal conduit.

5.3 A safety cut-off switch shall be fitted in the driver's cab to isolate the electrical system from the battery.

5.4 The nominal voltage of the electrical circuit shall not exceed 24 volts.

6. Signs (Including Notices and Placards)

6.1 A warning sign shall be displayed at a conspicuous place at the front and rear of the vehicle.

6.2 The warning signs must conform with the form and specifications stipulated in Sch. 4 to Cap. 295G.

6.3 One or more than one placards showing the Class(es) of all DG carried on the vehicle shall be displayed at a conspicuous place on both sides and the rear of the vehicle. The placards must conform with the forms and specifications stipulated in Sch. 5 to Cap. 295G.

6.4 A "NO SMOKING 不准吸煙" notice with letter / character of not less than 120 mm in height shall be displayed at a conspicuous place on both sides of the vehicle (See Table IIa).

6.5 The notice(s) as required by the paragraph 6.4 above shall be provided with reflective white or silver letters and characters on a red background. English letters with height and width in the proportion of 2:1 (e.g. 120 mm letters with 60 mm width) and a 6 mm spacing for each letter are recommended.

6.6 For details about the signs (including notices and placards) for Type C DGV , please refer to Table IIa, Figure IIb and Figure IIc.

7. **Fire Service Installation or Equipment**

7.1 2 nos. of dry powder fire extinguishers, each with a capacity of at least 2 kg and not exceeding 9 kg, shall be provided with one on each side of the vehicle and accessible from outside the driver's cab. The fire extinguishers shall also be inspected by an RFSIC at least once in every 12 months.

8. **Operation, Housekeeping, Management, Security, Staff Training and Emergency Preparedness**

8.1 An operation manual containing procedures in respect of the operation, housekeeping, management, security, emergency preparedness of the licensed vehicle shall be provided for training and guidance to the driver and vehicle attendants. The manual shall be stowed in the driver's cab at all times and the procedures shall at least include the following scopes:

(a) The driver should only use the licensed vehicle to convey DG of class(es) permitted by the subject licence at any one time.

(b) The driver should properly display the identification disc and the signs as specified in the FSR above when he/ she is using the licensed vehicle to convey DG.

(c) The driver and/or operators should only transfer the DG directly from the licensed vehicle to an approved tank, a receptacle located in a licensed factory or licensed store, or a receptacle located in the premises in which the storage of DG is exempt from the operation of s. 6 of Cap. 295.

(d) The driver and/or operators should not smoke, carry a lighted cigarette, cigar or pipe, or carry a naked flame when they are using the licensed vehicle to convey DG, or loading DG onto, or unloading DG from, the vehicle.

(e) The driver should not leave the licensed vehicle conveying DG unattended. If another person is authorised by the driver to attend to the vehicle, such person shall attain the age of 18, and be aware of the whereabouts of the driver and the nature of the DG on the vehicle.

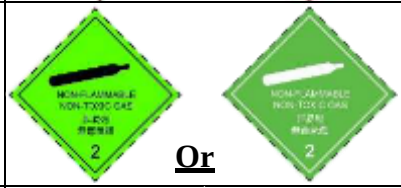
(f) The driver should not use the licensed vehicle conveying DG to carry any passenger other than the operators.

(g) The driver and/or operators should report immediately any incident of explosion or fire in, in the vicinity of or in connection with the licensed vehicle, or any leak of DG from the vehicle to FSD by dialling “999”.

(h) The driver and/or operators should have sufficient understanding on the nature and hazard of the DG carried on the licensed vehicle, and adopt suitable measures, as far as practicable, to stem and handle any spill or leakage of DG promptly.

Table IIa - Signs (including Notices and Placards) for Type C Dangerous Goods Vehicle

Column 1 **Signs**	Column 2 **Paragraph**	Column 3 **Display**	Column 4 **Location for Display**	Column 5 **Size and Colour**
Warning sign	6.1-6.2		Front and rear of the vehicle	As specified in Part 2 of Sch. 4 to Cap. 295G: 1. A warning sign must be displayed in an upright position. 2. A warning sign must have the minimum height of 300 mm and the minimum width of 400 mm. 3. All Chinese characters in the warning sign must be at least 90 mm in height and in width. 4. All English letters in the warning sign must be at least 70 mm in height and 35 mm in width. 5. If a warning sign's dimensions are bigger than the minimum height of 300 mm and the minimum width of 400 mm, the dimensions of every Chinese character and English letter in the sign must be adjusted upward proportionally.

Column 1	Column 2	Column 3	Column 4	Column 5
Signs	**Paragraph**	**Display**	**Location for Display**	**Size and Colour**
Placard - if Class 2.1 DG is carried	6.3	 **Or**	Both sides and rear of the vehicle	As specified in Part 2 of Sch. 5 to Cap. 295G: 1. A placard must be displayed in an upright position. 2. A placard must be square-shaped, with the minimum length of each side measuring 250 mm (minimum dimensions). 3. For a placard of minimum dimensions, the number “2” or “3” at the bottom of the placard (as required by Part 1 of this Schedule) must be at least 25 mm in height. 4. If no specific dimensions are indicated for a feature of a placard in this Part or in the relevant Figure in Part 1 of this Schedule, the feature must be in the appropriate scale as shown in the Figure. If a placard’s dimensions are bigger than the minimum dimensions, the dimensions of every feature in the placard must be adjusted upward proportionally. 5. A placard must be displayed on a background of contrasting colour or, if a background of contrasting colour cannot be provided, have a dotted or solid outer boundary line.
Placard - if Class 2.2 DG is carried	6.3	 **Or**		
Placard - if Class 2.3 DG is carried	6.3			

Column 1	Column 2	Column 3	Column 4	Column 5		
Signs	**Paragraph**	**Display**	**Location for Display**	**Size and Colour**		
“NO SMOKING 不准吸煙” Notice	6.4 - 6.5		Both sides and rear of the vehicle	Letter / Character Size	Height	120 mm
					Width	60 mm
					Spacing	6 mm
				Colour	Background	Red
					Letter	White

Figure IIb - Sketch Showing the Signs Required for Class 2.1 DG

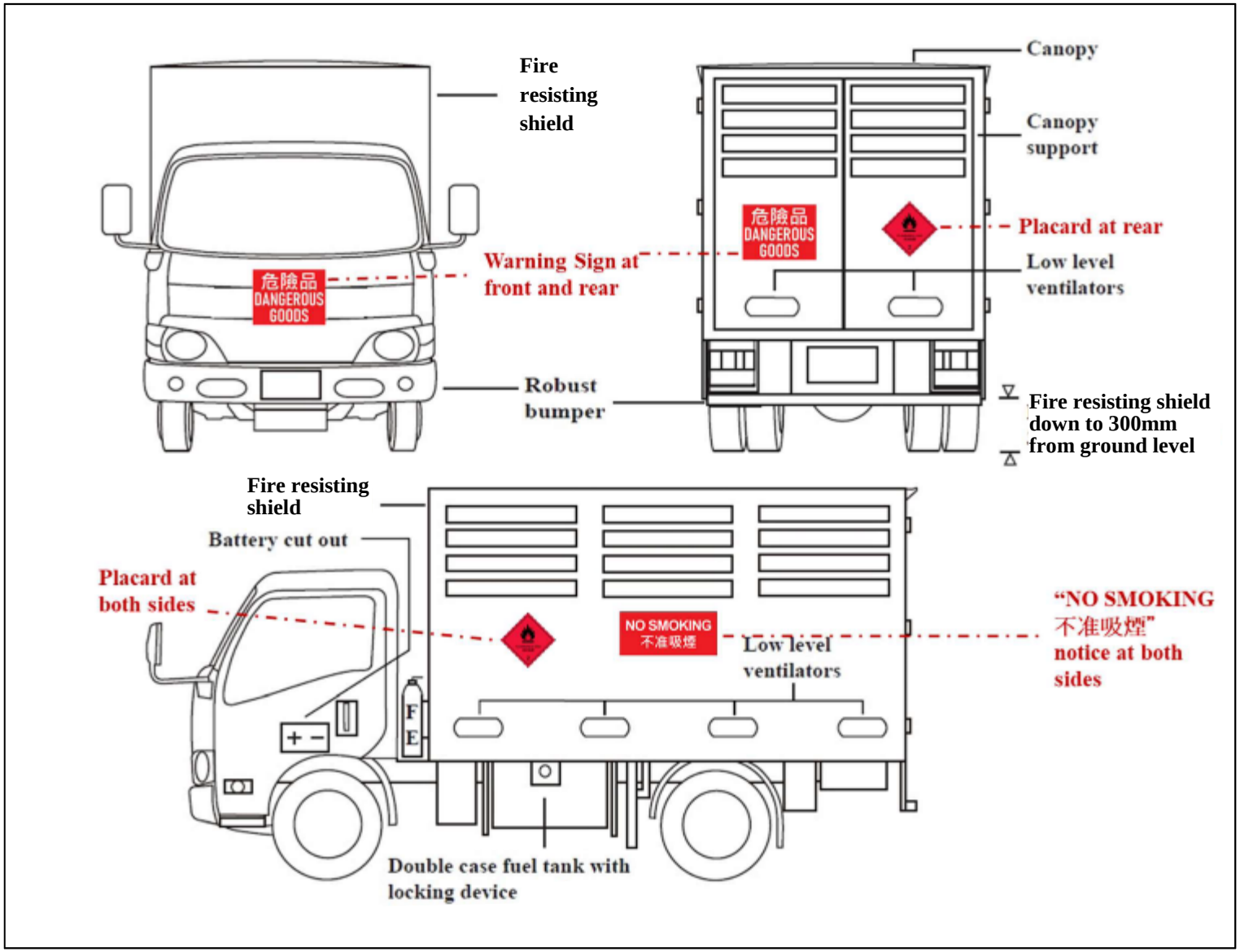
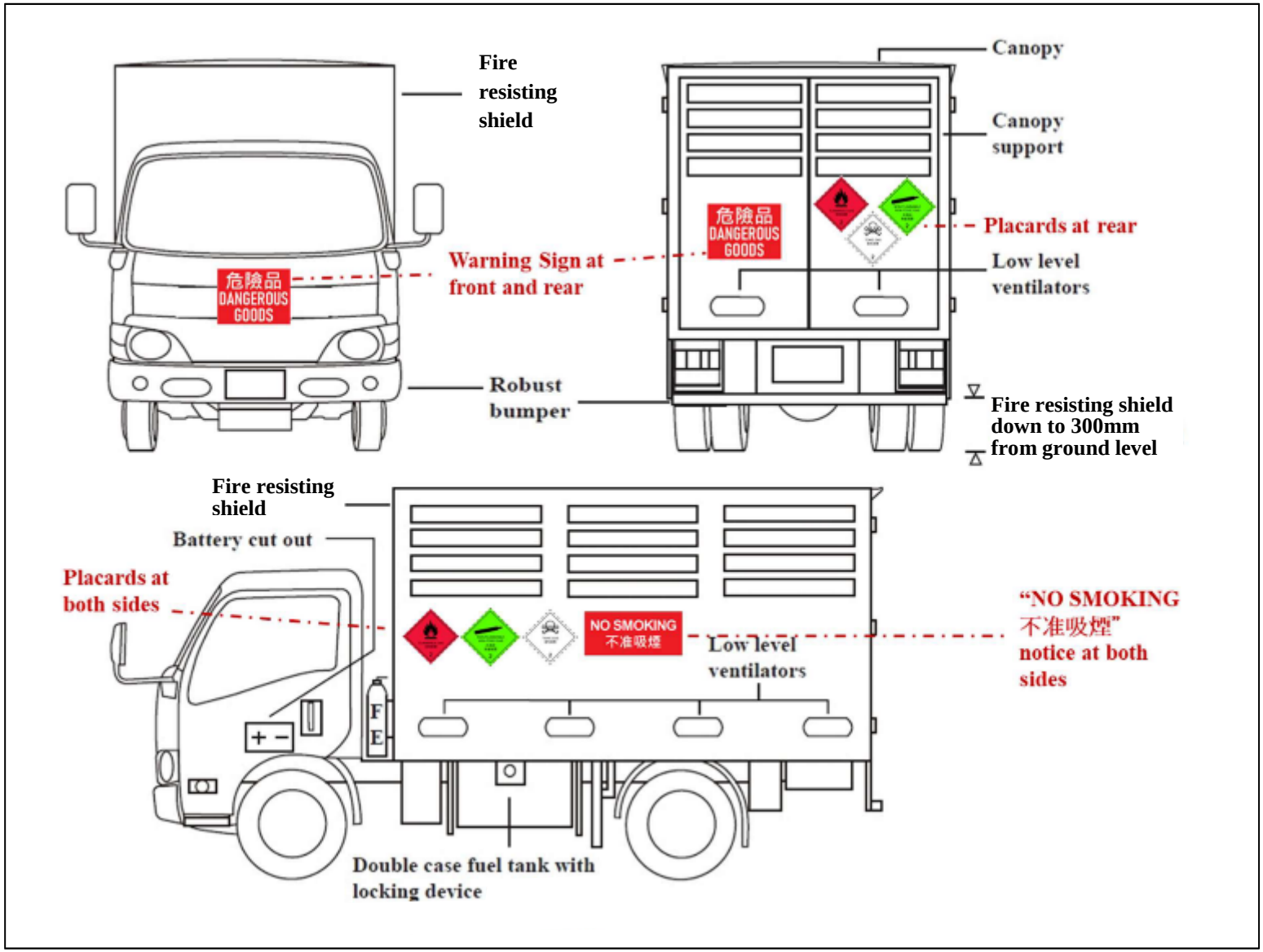


Figure IIc - Sketch Showing the Signs as Required for Class 2.1, 2.2 and 2.3 DG



Appendix III -
Sample of Standard Fire Safety Requirements for Goods Vehicle Used for Conveyance of Class 3/3A DG
(Type D Dangerous Goods Vehicle)

1 Engine

1.1 The engine of the vehicle shall be the type of compression ignition (Diesel).

1.2 The exhaust system of the engine shall be situated wholly in front of the fire resisting shield and the discharge shall be arranged to offside of the vehicle.

1.3 For any fuel pipe forming part of a gravity feed system, the fuel feed pipe shall be fitted with a quick action cut-off valve situated in an easily accessible position and clearly marked as such.

2 Fuel Tank

2.1 The fuel tank shall:

(a) comply with a double cases construction;

(b) be screened from the body by a fire resisting shield;

(c) be protected from blows by strong steel guards or by the frame of the body chassis of the vehicle; and

(d) be fitted with a lock to the fuel tank lid.

3 Cargo Compartment

3.1 The gross vehicle weight or the axle weights of the vehicle shall not exceed the permitted gross vehicle weight or the permitted axle weights as specified in the Road Traffic Ordinance (Cap. 374) and its subsidiary Regulations.

3.2 A fixed roof cover shall be constructed of fire resisting material and one for covering the cargoes.

3.3 Piping and/or fittings shall not be projected beyond any sides of the vehicle. All piping, equipment, hoses, valves, accessories and outlet valves shall be adequately protected against accidental damage or interference. Outlet valves shall be protected by (a) the bumper if the valves are located at the rear of the vehicle; and / or (b) a substantial protective metal bar if located at the side.

3.4 The cargo compartment of the vehicle shall be well ventilated.

4 Fire Resisting Shield

4.1 The engine, fuel tank, electrical generator, batteries switch gear, fuses and exhaust system of the vehicle shall be situated in front of a fire resisting shield and effectively screened from the cargo compartment by the fire resisting shield.

4.2 The installation of fire resisting shield shall be projected upwards to a point above the topmost level of the cargo compartment, and downwards to a point not more than 300 mm from the ground. (The steel driver's cab can be deemed to constitute part of the shield.)

4.3 Any windows in the fire resisting shield shall be wire glazed in fixed metal frame and not capable of being opened.

4.4 Any aperture made to allow any piping to pass through the fire resisting shield (e.g. air brake tubing) shall be so sealed as to prevent the passage of flammable vapour through the shield.

5 Electrical Installation and Fittings

5.1 No article capable of causing fire or explosion and no lighting apparatus except such portable lighting apparatus designed and constructed to be intrinsically safe and not exhibiting any metal surface liable to produce sparks should be carried on the vehicle.

5.2 All electric wiring shall be heavily insulated and resistant to abrasion and chemical action. The wiring fixed at positions behind the fire resisting shield shall be run in flexible metal conduit.

5.3 A safety cut-off switch shall be fitted in the driver's cab to isolate the electrical system from the battery.

5.4 The nominal voltage of the electrical circuit shall not exceed 24 volts.

6 Signs (Including Notices and Placards)

6.1 A warning sign shall be displayed at a conspicuous place at the front and rear of the vehicle.

6.2 The warning signs must conform with the form and specifications specified in Sch. 4 to Cap. 295G.

6.3 A placard showing the Class of DG carried on the vehicle shall be displayed at a conspicuous place on both sides and the rear of the vehicle. The placards must conform with the form and specifications stipulated in Sch. 5 to Cap. 295G.

6.4 A "NO SMOKING 不准吸煙" notice with letter / character of not less than 120 mm in height shall be displayed at a conspicuous place on both sides of the vehicle.

6.5 The notice as required by the paragraph 6.4 above shall be provided with reflective white or silver letters and characters on a red background. English letters with height and width in the proportion of 2:1 (e.g. 120 mm letters with 60 mm width) and a 6 mm spacing for each letter are recommended.

6.6 For details about the signs (including notices and placards) for Type D DGV, please refer to Table IIIa and Figure IIIb.

7 **Fire Service Installation or Equipment**

7.1 2 nos. of dry powder fire extinguishers, each with a capacity of at least 2 kg and not exceeding 9 kg, shall be provided with one on each side of the vehicle and accessible from outside the driver's cab. The fire extinguishers shall also be inspected by an RFSIC at least once in every 12 months.

8 **Operation, Housekeeping, Management, Security, Staff Training and Emergency Preparedness**

8.1 An operation manual containing procedures in respect of the operation, housekeeping, management, security, emergency preparedness of the licensed vehicle shall be provided for training and guidance to the driver and vehicle attendants. The manual shall be stowed in the driver's cab at all times and the procedures shall at least include the following scopes:

(a) The driver should only use the licensed vehicle to convey DG of class(es) permitted by the subject licence at any one time.

(b) The driver should properly display the identification disc and the signs as specified in the FSR above when he / she is using the licensed vehicle to convey DG.

(c) The driver and/or operators should only transfer the DG directly from the licensed vehicle to an approved tank, a receptacle located in a licensed factory or licensed store, or a receptacle located in the premises in which the storage of DG is exempt from the operation of s. 6 of Cap. 295.

(d) The driver and/or operators should not smoke, carry a lighted cigarette, cigar or pipe, or carry a naked flame when they are using the licensed vehicle to convey DG, or loading DG onto, or unloading DG from, the vehicle.

(e) The driver should not leave the licensed vehicle conveying DG unattended. If another person is authorised by the driver to attend to the vehicle, such person shall attain the age of 18, and be aware of the whereabouts of the driver and the nature of the DG on the vehicle.

(f) The driver should not use the licensed vehicle conveying DG to carry any passenger other than the operators.

(g) The driver and/or operators should report immediately any incident of explosion or fire in, in the vicinity of or in connection with the licensed vehicle, or any leak of DG from the vehicle to FSD by dialling “999”.

(h) The driver and/or operators should have sufficient understanding on the nature and hazard of the DG carried on the licensed vehicle, and adopt suitable measures, as far as practicable, to stem and handle any spill or leakage of DG promptly.

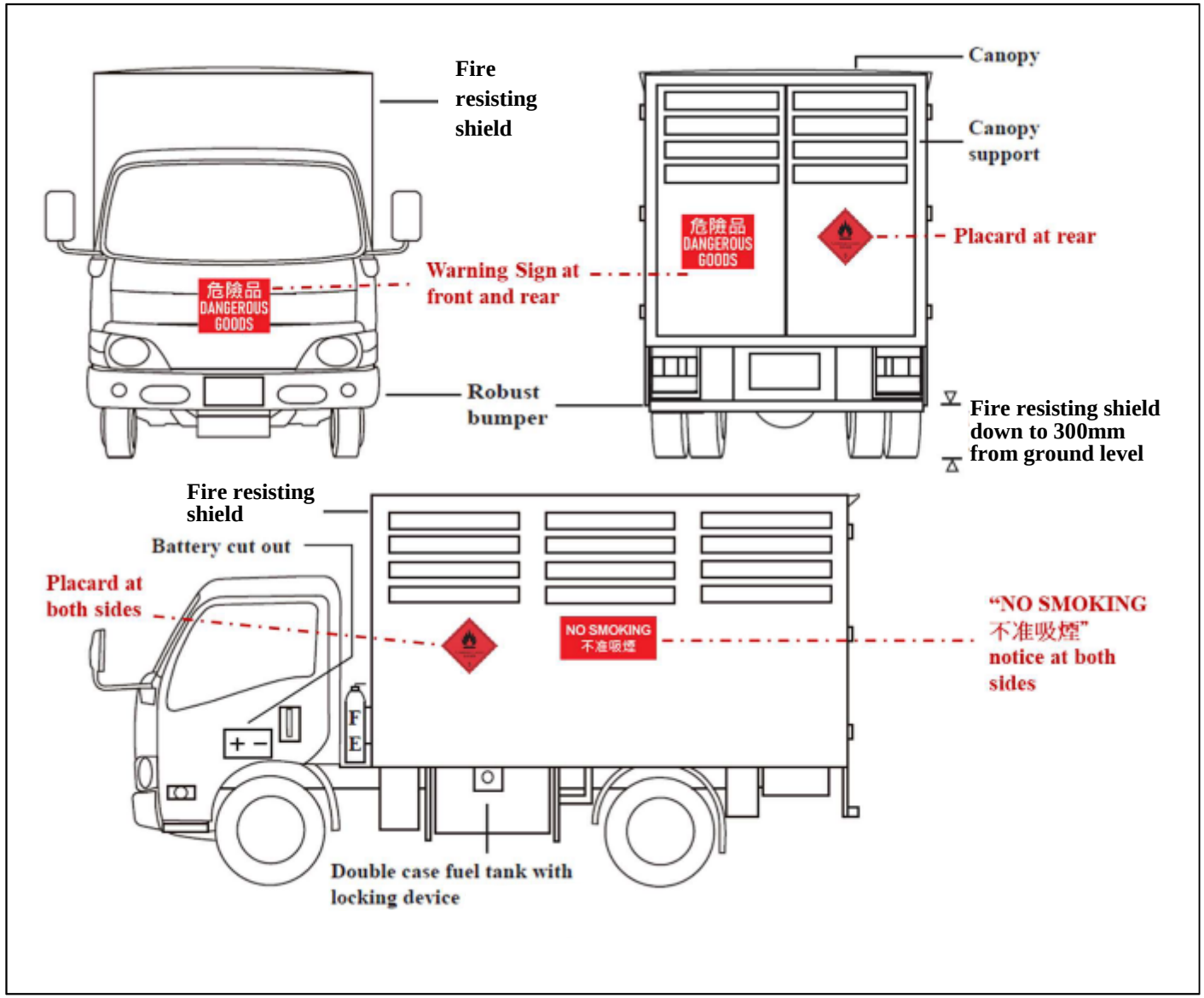
Table IIIa - Signs (including Notices and Placards) for Type D Dangerous Goods Vehicle

Column 1	Column 2	Column 3	Column 4	Column 5
Signs	**Paragraph**	**Display**	**Location for Display**	**Size and Colour**
Warning sign	6.1-6.2		Front and rear of the vehicle	As specified in Part 2 of Sch. 4 to Cap. 295G: 1. A warning sign must be displayed in an upright position. 2. A warning sign must have the minimum height of 300 mm and the minimum width of 400 mm. 3. All Chinese characters in the warning sign must be at least 90 mm in height and in width. 4. All English letters in the warning sign must be at least 70 mm in height and 35 mm in width. 5. If a warning sign's dimensions are bigger than the minimum height of 300 mm and the minimum width of 400 mm, the dimensions of every Chinese character and English letter in the sign must be adjusted upward proportionally.

Column 1	Column 2	Column 3	Column 4	Column 5
Signs	**Paragraph**	**Display**	**Location for Display**	**Size and Colour**
Placard	6.3	 **Or**	Both sides and rear of the vehicle	As specified in Part 2 of Sch. 5 to Cap. 295G: 1. A placard must be displayed in an upright position. 2. A placard must be square-shaped, with the minimum length of each side measuring 250 mm (minimum dimensions). 3. For a placard of minimum dimensions, the number “2” or “3” at the bottom of the placard (as required by Part 1 of this Schedule) must be at least 25 mm in height. 4. If no specific dimensions are indicated for a feature of a placard in this Part or in the relevant Figure in Part 1 of this Schedule, the feature must be in the appropriate scale as shown in the Figure. If a placard’s dimensions are bigger than the minimum dimensions, the dimensions of every feature in the placard must be adjusted upward proportionally. 5. A placard must be displayed on a background of contrasting colour or, if a background of contrasting colour cannot be provided, have a dotted or solid outer boundary line.

Column 1	Column 2	Column 3	Column 4	Column 5		
Signs	**Paragraph**	**Display**	**Location for Display**	**Size and Colour**		
“NO SMOKING 不准吸煙” Notice	6.4 - 6.5		Both sides of the vehicle	Letter / Character Size	Height	120 mm
					Width	60 mm
					Spacing	6 mm
				Colour	Background	Red
					Letter	White

Figure IIIb - Sketch Showing the Signs Required



Appendix IV -
Sample of Standard Fire Safety Requirements for Tank Vehicle Used for Conveyance of Class 2 DG (Refrigerated Liquefied Gas Only) (Type F Dangerous Goods Vehicle)

1 **Engine**

1.1 The engine of the vehicle shall be the type of compression ignition (Diesel).

1.2 The exhaust system of the engine shall be situated wholly in front of the fire resisting shield and the discharge shall be arranged to offside of the vehicle.

1.3 For any fuel pipe forming part of a gravity feed system, the fuel feed pipe shall be fitted with a quick action cut-off valve situated in an easily accessible position and clearly marked as such.

2 **Fuel Tank**

2.1 The fuel tank shall:

(a) comply with a double cases construction;

(b) be screened from the body by a fire resisting shield;

(c) be protected from blows by strong steel guards or by the frame of the body chassis of the vehicle; and

(d) be fitted with a lock to the fuel tank lid.

3 **Cargo Tank**

3.1 The gross vehicle weight or the axle weights of the tank vehicle shall not exceed the permitted gross vehicle weight or the permitted axle weights as specified in the Road Traffic Ordinance (Cap. 374) and its subsidiary Regulations.

3.2 The cargo tank shall be designed, fabricated and tested in accordance with a recognised code or by a person approved by DFS for the purpose.

3.3 The cargo tank shall be secured on the vehicle.

3.4 The rear end of the cargo tank shall be protected by a robust steel bumper which is situated at least 75 mm away from the rear of the nearmost part of the tank; and extended on each side of the vehicle to at least the maximum width of the tank and tank fittings.

3.5 The feed pipes of the cargo tank shall be fitted with a quick action shut off valve situated in an easily accessible position and clearly marked in English and Chinese letters / characters.

3.6 The cargo tank shall be equipped with pressure relief valves of spring-loaded type, having direct access to the vapour space of the tank. The discharge arranged shall be vented away from the tank upwards and unobstructed to open air to avoid any impingement of the escape vapour on the tank. A loose fitting rain cap shall also be provided for the valves to prevent the ingress of rain water.

3.7 The pressure and liquid level gauges shall be placed in a position that they shall be read from ground level without climbing the cargo tank.

3.8 All gas inlets and outlets except safety relief valves, pressure and liquid level gauge connections, shall be clearly marked in English letters and Chinese characters to prevent incorrect operation by the operators of the vehicle.

3.9 Power-driven pumps for product off-loading shall be fitted with emergency controls situated in easily accessible position forward of the fire resisting shield and clearly marked as such.

3.10 Piping and/or fittings shall not be projected beyond any sides of the vehicle. All piping, equipment, hoses, valves, accessories and outlet valves shall be adequately protected against accidental damage or interference. Outlet valves shall be protected by (a) the bumper if the valves are located at the rear of the vehicle; and / or (b) a substantial protective metal bar if located at the side.

3.11 The body chassis, cargo tank, piping and associated equipment shall be adequately bonded.

3.12 The body chassis, fuel tank and fittings shall be constructed of strong and non-combustible materials.

4 Tyres

4.1 Tyres shall be the “anti-static” type, the electrical resistance of which shall be in accordance with BS 2050 or equivalent.

5 Fire Resisting Shield

5.1 The engine, fuel tank, electrical generator, batteries switch gear, fuses and exhaust system of the tank vehicle shall be situated in front of a fire resisting shield and effectively screened from the cargo tank by the fire resisting shield.

5.2 The installation of fire resisting shield shall be projected upwards to a point above the topmost level of the cargo tank, and downwards to a point not more than 300 mm from the ground. (The steel driver’s cab can be deemed to constitute part of the shield.)

5.3 Any windows in the fire resisting shield shall be wire glazed in fixed metal frame and not capable of being opened.

5.4 Any aperture made to allow any piping to pass through the fire resisting shield (e.g. air brake tubing) shall be so sealed as to prevent the passage of flammable vapour through the shield.

5.5 A clear space shall be maintained at least 150 mm between the back of the fire resisting shield and the front of the cargo tank.

6 Electrical Installation and Fittings

6.1 The tank vehicle shall be equipped with an earth cable. “CONNECT TO RECEIVING EQUIPMENT 與接收裝備連接” notice shall also be provided (See Table IVa).

6.2 No article capable of causing fire or explosion and no lighting apparatus except such portable lighting apparatus designed and constructed to be intrinsically safe and not exhibiting any metal surface liable to produce sparks should be carried on the vehicle.

6.3 All electric wiring shall be heavily insulated and resistant to abrasion and chemical action. The wiring fixed at positions behind the fire resisting shield shall be run in flexible metal conduit.

6.4 A safety cut-off switch shall be fitted in the driver’s cab to isolate the electrical system from the battery.

6.5 The nominal voltage of the electrical circuit shall not exceed 24 volts.

7 Signs (Including Notices and Placards)

7.1 A warning sign shall be displayed at a conspicuous place at the front and rear of the tank vehicle.

7.2 The warning signs must conform with the form and specifications stipulated in Sch. 4 to Cap. 295G.

7.3 A placard showing the Class of DG carried on the tank vehicle shall be displayed at a conspicuous place on both sides and the rear of the vehicle. The placards shall conform with the forms and specifications stipulated for Class 2.1/2.2 DG in Sch. 5 to Cap. 295G.

7.4 A notice "CAUTION (CHEMICAL FORMULA) REFRIGERATED LIQUID 冷凍液態(化學方程式)，危險勿近" with letter / character of not less than 120 mm in height shall be displayed at the front and rear of the vehicle.

7.5 A "NO SMOKING 不准吸煙" notice with letter / character of not less than 120 mm in height shall be displayed at a conspicuous place on both sides of the vehicle.

7.6 One portable "NO SMOKING 不准吸煙" notice with letter / character of not less than 120 mm in height shall be carried on the vehicle.

7.7 The notices as specified in paragraph 7.4 to 7.6 above shall be provided with reflective white or silver letters and characters on a red background. English letters with height and width in the proportion of 2:1 (e.g. 120 mm letters with 60 mm width) and a 6 mm spacing for each letter are recommended.

7.8 For details about the signs (including notices and placards) for Type F DGV, please refer to Table Iva, Figure IVb and Figure IVc.

8 **Fire Service Installation or Equipment**

8.1 2 nos. of dry powder fire extinguishers, each with a capacity of at least 2 kg and not exceeding 9 kg, shall be provided with one on each side of the vehicle and accessible from outside the cab. The fire extinguishers shall also be inspected by an RFSIC at least once in every 12 months.

9 **Operation, Housekeeping, Management, Security, Staff Training and Emergency Preparedness**

9.1 At least one set of protective goggles and gloves shall be provided for the driver and each vehicle attendant on the tank vehicle.

9.2 An operation manual containing procedures in respect of the operation, housekeeping, management, security, emergency preparedness of the licensed vehicle shall be provided for training and guidance to the driver and vehicle attendants. The manual shall be stowed in the driver's cab at all times and the procedures shall at least include the following scopes:

(a) The driver should only use the licensed vehicle to convey DG of Class(es) permitted by the subject licence at any one time.

(b) The driver should properly display the identification disc and the signs as specified in the FSR above when he / she is using the licensed vehicle to convey DG.

(c) The driver and/or operators should only transfer the DG directly from the licensed vehicle to an approved tank, a receptacle located in a licensed factory or licensed store, or a receptacle located in the premises in which the storage of DG is exempt from the operation of s. 6 of Cap. 295.

(d) The driver and/or operators should not smoke, carry a lighted cigarette, cigar or pipe, or carry a naked flame when they are using the licensed vehicle to convey DG, or loading DG onto, or unloading DG from, the vehicle.

(e) The driver should not leave the licensed vehicle conveying DG unattended. If another person is authorised by the driver to attend to the vehicle, such person shall attain the age of 18, and be aware of the whereabouts of the driver and the nature of the DG on the vehicle.

(f) The driver should not use the licensed vehicle conveying DG to carry any passenger other than the operators.

(g) During the loading or unloading operation, the driver and/or operators should take adequate precaution as specified in CoP to prevent the accumulation of electrostatic charges.

(h) During the loading or unloading operation, the driver and/or operators should properly wear personal protective equipment including protective goggles and gloves, and display the portable “NO SMOKING 不准吸煙” notice at a prominent location (See Table IVa).

(i) Unless a tank or any tank compartment of the licensed vehicle has been certified free from flammable vapour by an AP(GF), the driver and/or operators should not repair the tank or the tank compartment that has been used to contain Class 2.1 DG if the repair involves the use of any source of artificial heating, or a process producing or likely producing heat or sparking.

(j) The driver and/or operators should report immediately any incident of explosion or fire in, in the vicinity of or in connection with the licensed vehicle, or any leak of DG from the vehicle to FSD by dialling “999”.

(k) The driver and/or operators should have sufficient understanding on the nature and hazard of the DG carried on the licensed vehicle, and adopt suitable measures, as far as practicable, to stem and handle any spill or leakage of DG promptly.

Table IVa - Signs (including Notices and Placards) for Type F Dangerous Goods Vehicle

Column 1	Column 2	Column 3	Column 4	Column 5
Signs	**Paragraph**	**Display**	**Location for Display**	**Size and Colour**
"CONNECT TO RECEIVING EQUIPMENT 與接收裝備連接" Notice	6.1		As specified in the Column 2	As appropriate for easy and clear identification
Warning sign	7.1-7.2		Front and rear of the vehicle	As specified in Part 2 of Sch. 4 to Cap. 295G: 1. A warning sign must be displayed in an upright position. 2. A warning sign must have the minimum height of 300 mm and the minimum width of 400 mm. 3. All Chinese characters in the warning sign must be at least 90 mm in height and in width. 4. All English letters in the warning sign must be at least 70 mm in height and 35 mm in width. 5. If a warning sign's dimensions are bigger than the minimum height of 300 mm and the minimum width of 400 mm, the dimensions of every Chinese character and English letter in the sign must be adjusted upward proportionally.

Column 1	Column 2	Column 3	Column 4	Column 5
Signs	**Paragraph**	**Display**	**Location for Display**	**Size and Colour**
Placard - if Class 2.1 DG is carried	7.3	 **Or** 	Both sides and rear of the vehicle	As specified in Part 2 of Sch. 5 to Cap. 295G: 1. A placard must be displayed in an upright position. 2. A placard must be square-shaped, with the minimum length of each side measuring 250 mm (minimum dimensions). 3. For a placard of minimum dimensions, the number “2” or “3” at the bottom of the placard (as required by Part 1 of this Schedule) must be at least 25 mm in height. 4. If no specific dimensions are indicated for a feature of a placard in this Part or in the relevant Figure in Part 1 of this Schedule, the feature must be in the appropriate scale as shown in the Figure. If a placard’s dimensions are bigger than the minimum dimensions, the dimensions of every feature in the placard must be adjusted upward proportionally. 5. A placard must be displayed on a background of contrasting colour or, if a background of contrasting colour cannot be provided, have a dotted or solid outer boundary line.
Placard - if Class 2.2 DG is carried	7.3	 **Or** 		

Column 1	Column 2	Column 3	Column 4	Column 5		
Signs	**Paragraph**	**Display**	**Location for Display**	**Size and Colour**		
“CAUTION (CHEMICAL FORMULA) REFRIGERATED LIQUID 冷凍液態(化學方程式)，危險勿近” Notice	7.4		Front and rear of the vehicle	Letter / Character Size and Colour	Height	120 mm
					Width	60 mm
					Spacing	6 mm
“NO SMOKING 不准吸煙” Notice	7.5 - 7.7, 9.2(h)		Both sides of the vehicle and portable notice		Background	Red
					Letter	White

Figure IVb - Sketch Showing the Signs Required
(For example: UN 1966 Hydrogen, Refrigerated Liquid – Class 2.1)

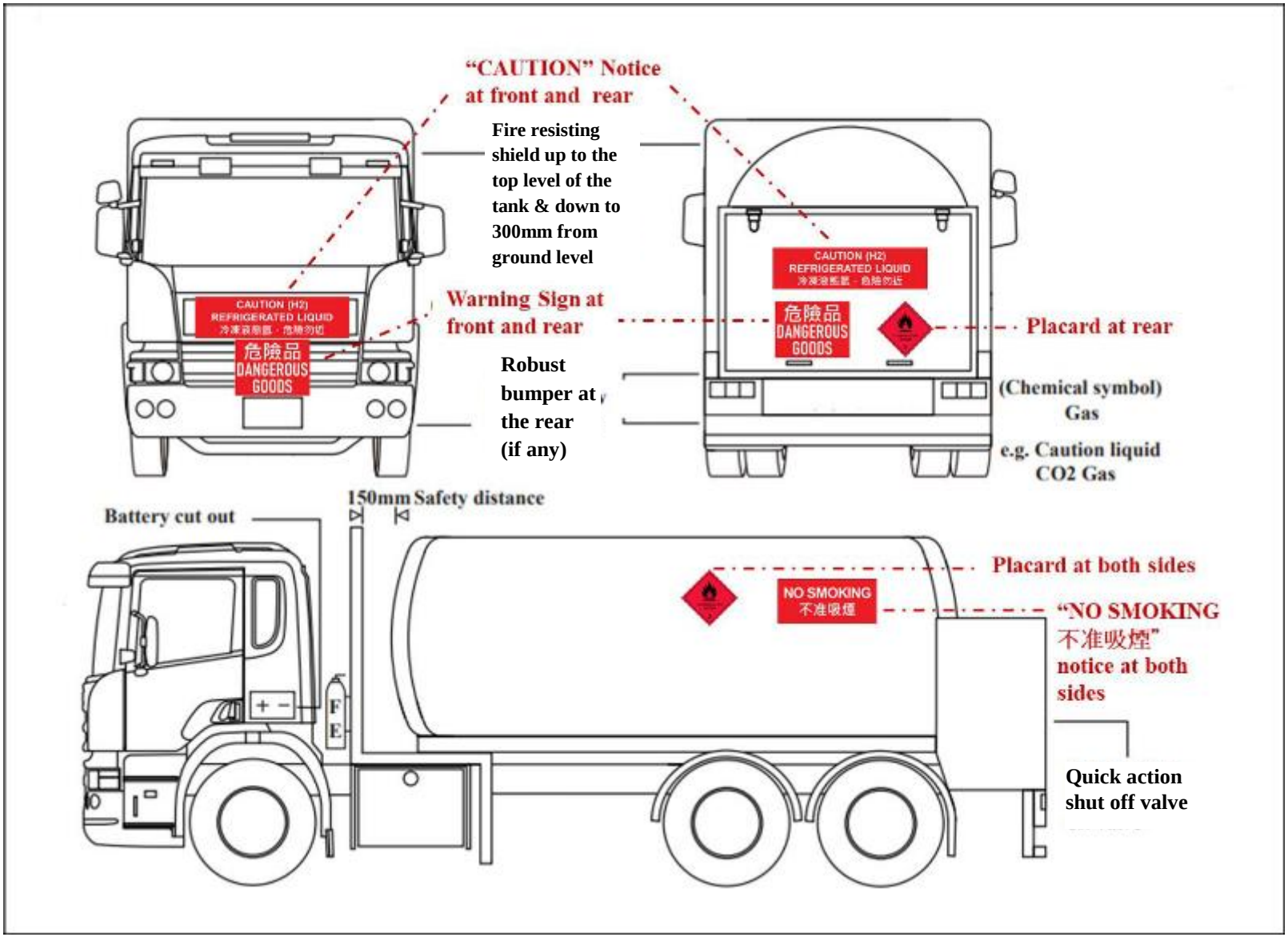
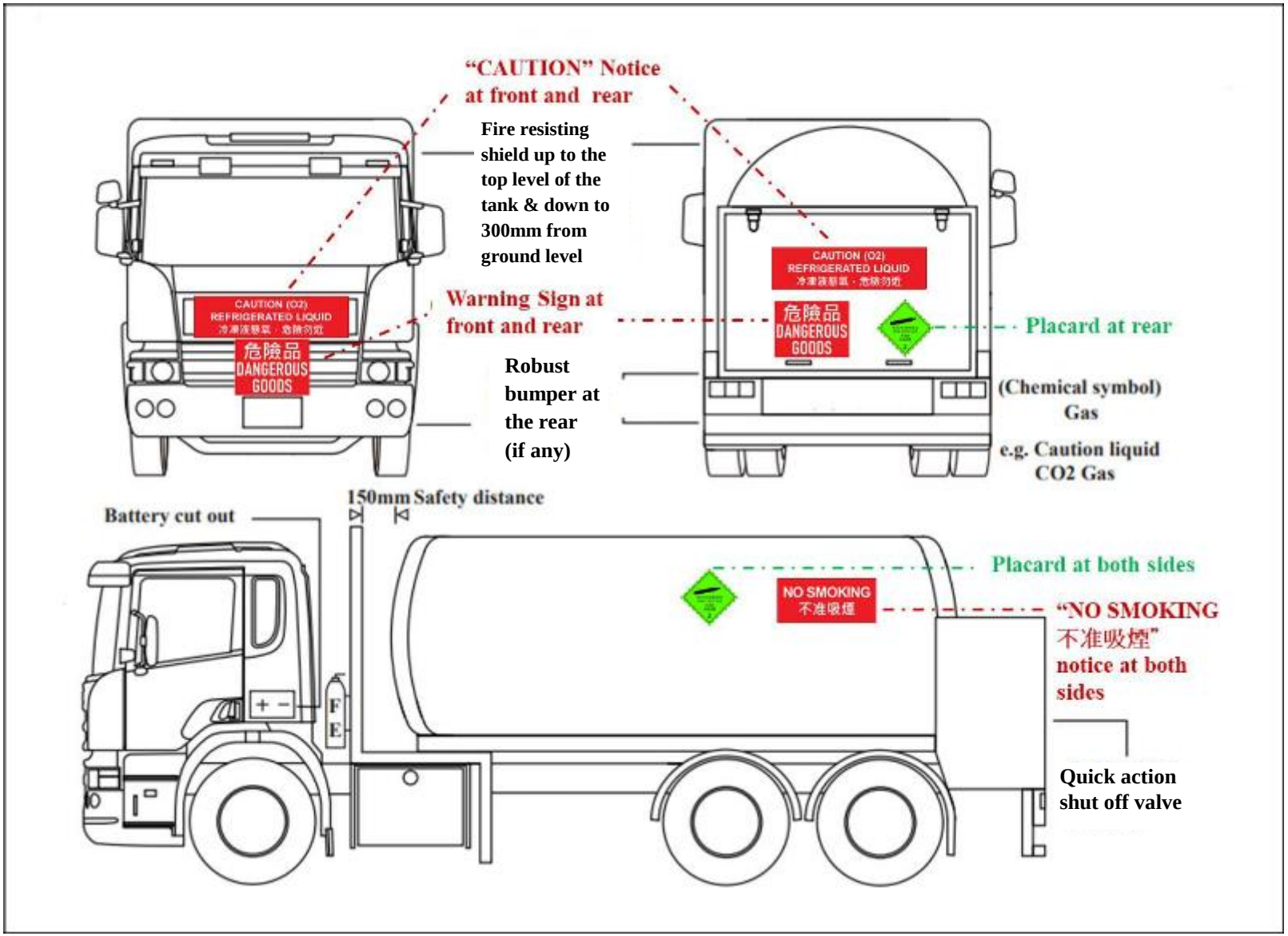


Figure IVc Sketch Showing the Signs Required
(For example: UN 1073 Oxygen, Refrigerated Liquid – Class 2.2)



Appendix V -
Sample of Standard Fire Safety Requirements for Motor Tractor or Freight Container Trailer Used for Conveyance of Class 2 DG (Excluding Chlorine and Special Gases) or Class 3/3A DG (Type G Dangerous Goods Vehicle)

1. **Engine**

1.1 The engine of the vehicle shall be the type of compression ignition (Diesel).

1.2 The exhaust system of the engine shall be situated wholly in front of the fire resisting shield and the discharge shall be arranged to offside of the vehicle.

1.3 For any fuel pipe forming part of a gravity feed system, the fuel feed pipe shall be fitted with a quick action cut-off valve situated in an easily accessible position and clearly marked as such.

2. **Fuel Tank**

2.1 The fuel tank shall:

(a) comply with a double cases construction;

(b) be screened from the body by a fire resisting shield;

(c) be protected from blows by strong steel guards or by the frame of the body chassis of the vehicle; and

(d) be fitted with a lock to the fuel tank lid.

3. **Freight Container**

3.1 The gross vehicle weight or the axle weights of the fright container shall not exceed the permitted gross vehicle weight or the permitted axle weights as specified in the Road Traffic Ordinance (Cap. 374) and its subsidiary Regulations.

3.2 A fixed roof cover shall be constructed of fire resisting material and provided for covering the cargoes.

3.3 The body chassis, freight container, piping and associated equipment shall be adequately bonded.

4. Tyres

4.1 For conveyance of dangerous goods by motor tractor and trailer with tank, the tyres shall be the “anti-static” type, and the electrical resistance of which shall be in accordance with BS 2050 or equivalent.

5. Fire Resisting Shield

5.1 The engine, fuel tank, electrical generator, batteries switch gear, fuses and exhaust system of the vehicle shall be situated in front of a fire resisting shield and effectively screened from the freight container / trailer with tank by the fire resisting shield:

(a) Conveyance of dangerous goods by motor tractor and freight container trailer

The fire resisting shield shall be projected upwards to a point above the mid-cab level. (The steel driver’s cab can be deemed to constitute part of the shield.); or

(b) Conveyance of dangerous goods by motor tractor and trailer with tank

The fire resisting shield shall be projected upwards to a point above the topmost level of driver’s cab, and downwards to a point not more than 300 mm from the ground (The steel driver’s cab can be deemed to constitute part of the shield.

6. **Electrical Installation and Fittings**

6.1 No article capable of causing fire or explosion and no lighting apparatus except such portable lighting apparatus designed and constructed to be intrinsically safe and not exhibiting any metal surface liable to produce sparks should be carried on the vehicle.

6.2 A safety cut-off switch shall be fitted in the driver's cab to isolate the electrical system from the battery.

6.3 The voltage of the electric current shall not exceed 24 volts.

7. **Signs (Including Notices and Placards)**

7.1 A warning sign shall be displayed at a conspicuous place at the front and rear of the vehicle.

7.2 The warning signs must conform with the form and specifications stipulated in Sch. 4 to Cap. 295G.

7.3 One or more than one placards showing the Class(es) of DG carried on the vehicle shall be displayed at a conspicuous place on both sides and the rear of the vehicle. The placards must conform with the form and specifications stipulated for Class 2.1/2.2/2.3/3/3A DG in Sch. 5 to Cap. 295G.

7.4 A "NO SMOKING 不准吸煙" notice with letter / character of not less than 120mm in height shall be displayed at a conspicuous place on both sides of the vehicle.

7.5 One Portable "NO SMOKING 不准吸煙" notice with letter / character of not less than 120 mm in height shall be carried on the vehicle.

7.6 The notices as required by the paragraph 7.4 to 7.5 above shall be provided with reflective white or silver letters and characters on a red background. English letters with height and width in the proportion of 2:1 (e.g. 120 mm letters with 60 mm width) and a 6 mm spacing for each letter are recommended.

7.7 For details about the signs (including notices and placards) for Type G DGV, please refer to Table Va, Figure Vb and Figure Vc.

8. Fire Service Installation or Equipment

8.1 2 nos. of dry powder fire extinguishers, each with a capacity of at least 2 kg and not exceeding 9 kg, shall be provided with one on each side of the vehicle and accessible from outside the driver's cab. The fire extinguishers shall also be inspected by an RFSIC at least once in every 12 months.

9. Operation, Housekeeping, Management, Security, Staff Training and Emergency Preparedness

9.1 An operation manual containing procedures in respect of the operation, housekeeping, management, security, emergency preparedness of the licensed vehicle shall be provided for training and guidance to the driver and vehicle attendants. The manual shall be stowed in the driver's cab at all times and the procedures shall at least include the following* scopes:

**Delete as appropriate*

(a) The driver should only use the licensed vehicle to convey DG of Class(es) permitted by the subject licence at any one time.

(b) The driver should properly display the identification disc and the signs as specified in the FSR above when he/ she is using the licensed vehicle to convey DG.

(c) The driver and/or operators should only transfer the DG directly from the licensed vehicle to an approved tank, a receptacle located in a licensed factory or licensed store, or a receptacle located in the premises in which the storage of DG is exempt from the operation of s. 6 of Cap. 295.

(d) The driver and/or operators should not smoke, carry a lighted cigarette, cigar or pipe, or carry a naked flame when they are using the licensed vehicle to convey DG, or loading DG onto, or unloading DG from, the vehicle.

(e) The driver should not leave the licensed vehicle conveying DG unattended. If another person is authorised by the driver to attend to the vehicle, such person shall attain the age of 18, and be aware of the whereabouts of the driver and the nature of the DG on the vehicle.

(f) The driver should not use the licensed vehicle conveying DG to carry any passenger other than the operators.

(g) The driver and/or operators should keep every fuel tank lid of the cargo tank closed and locked to avoid spillage during conveyance of DG.

(h) During the loading or unloading operation, the driver and/or operators should take adequate precaution as specified in CoP to prevent the accumulation of electrostatic charges.

(i) Except during the loading or unloading operation, the driver and/or operators should keep all filling pipes and discharging pipes closed at all times.

(j) Except during the loading or unloading operation, the driver and/or operators should keep the built-in quick shut-off valves of each tank compartment closed and locked at all times.

(k) During the loading or unloading operation, the driver and/or operators should properly wear personal protective equipment including protective goggles and gloves (if any), and display the portable “NO SMOKING 不准吸煙” notice at a prominent location (See Table Va).

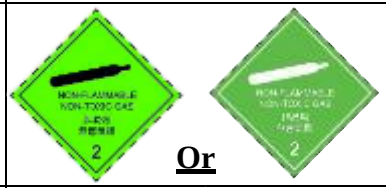
(l) Unless a tank or any tank compartment of the licensed vehicle has been certified free from flammable vapour by an AP(GF), the driver and/or operators should not repair the tank or the tank compartment if the repair involves the use of any source of artificial heating, or a process producing or likely producing heat or sparking

(m) The driver and/or operators should report immediately any incident of explosion or fire in, in the vicinity of or in connection with the licensed vehicle, or any leak of DG from the vehicle to FSD by dialling “999”.

(n) The driver and/or operators should have sufficient understanding on the nature and hazard of the DG carried on the licensed vehicle, and adopt suitable measures, as far as practicable, to stem and handle any spill or leakage of dangerous goods promptly.

Table Va - Signs (including Notices and Placards) for Type G Dangerous Goods Vehicle

Column 1	Column 2	Column 3	Column 4	Column 5
Signs	**Paragraph**	**Display**	**Location for Display**	**Size and Colour**
Warning sign	7.1-7.2		Front and rear of the vehicle	As specified in Part 2 of Sch. 4 to Cap. 295G: 1. A warning sign must be displayed in an upright position. 2. A warning sign must have the minimum height of 300 mm and the minimum width of 400 mm. 3. All Chinese characters in the warning sign must be at least 90 mm in height and in width. 4. All English letters in the warning sign must be at least 70 mm in height and 35 mm in width. 5. If a warning sign's dimensions are bigger than the minimum height of 300 mm and the minimum width of 400 mm, the dimensions of every Chinese character and English letter in the sign must be adjusted upward proportionally.

Column 1	Column 2	Column 3	Column 4	Column 5
Signs	**Paragraph**	**Display**	**Location for Display**	**Size and Colour**
Placard - if Class 2.1 DG is carried	7.3	 **Or**	Both sides and rear of the vehicle	As specified in Part 2 of Sch. 5 to Cap. 295G: 1. A placard must be displayed in an upright position. 2. A placard must be square-shaped, with the minimum length of each side measuring 250 mm (minimum dimensions). 3. For a placard of minimum dimensions, the number “2” or “3” at the bottom of the placard (as required by Part 1 of this Schedule) must be at least 25 mm in height. 4. If no specific dimensions are indicated for a feature of a placard in this Part or in the relevant Figure in Part 1 of this Schedule, the feature must be in the appropriate scale as shown in the Figure. If a placard’s dimensions are bigger than the minimum dimensions, the dimensions of every feature in the placard must be adjusted upward proportionally. 5. A placard must be displayed on a background of contrasting colour or, if a background of contrasting colour cannot be provided, have a dotted or solid outer boundary line.
Placard - if Class 2.2 DG is carried	7.3	 **Or**		
Placard - if Class 2.3 DG is carried	7.3			
Placard - if Class 3/3A DG is carried	7.3	 **Or**		

Column 1	Column 2	Column 3	Column 4	Column 5		
Signs	**Paragraph**	**Display**	**Location for Display**	**Size and Colour**		
“NO SMOKING 不准吸煙” Notice	7.4 -7.6 and 9.1(k)		Both sides and rear of the vehicle	Letter / Character Size	Height	120 mm
					Width	60 mm
					Spacing	6 mm
				Colour	Background	Red
					Letter	White

Figure Vb - Sketch Showing the Signs Required for Class 3 DG

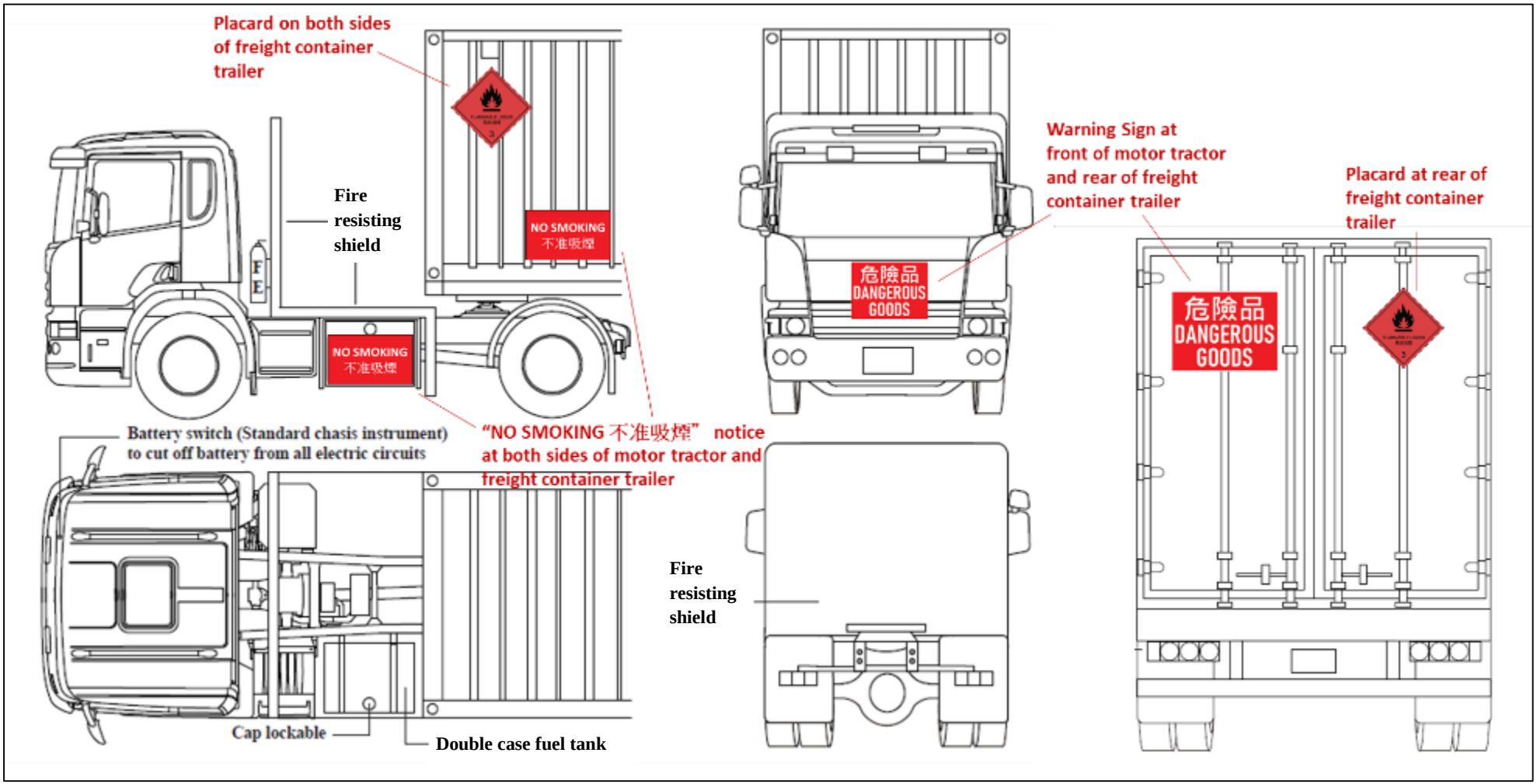
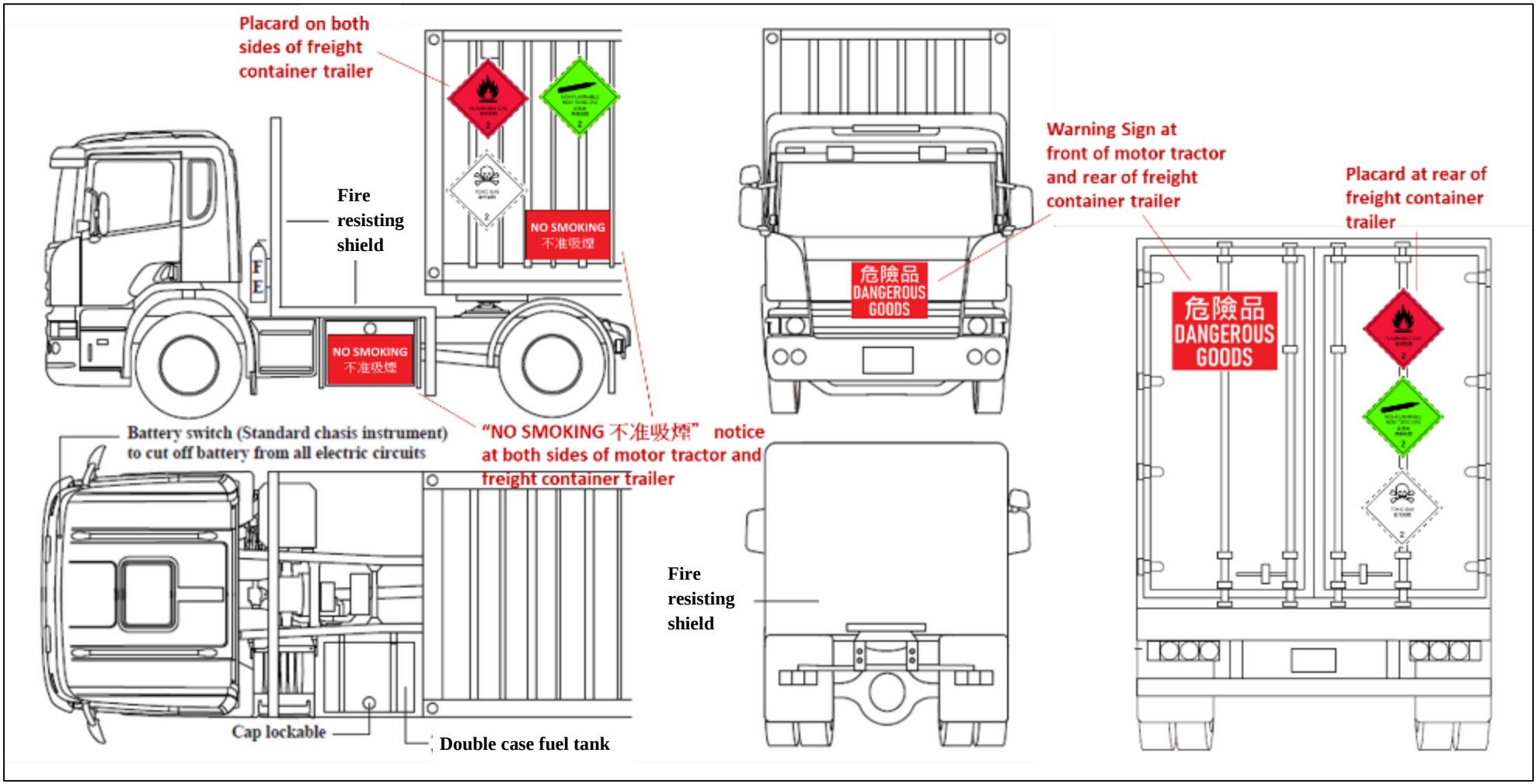


Figure Vc - Sketch Showing the Signs Required for Class 2.1, 2.2, and 2.3 DG



Appendix VI -
Sample of Standard Fire Safety Requirements for Goods Vehicle Used for Conveyance of Class 2 DG (Chlorine Only) (Type H Dangerous Goods Vehicle)

1 **Engine**

1.1 The engine of the vehicle shall be the type of compression ignition (Diesel).

1.2 The exhaust system of the engine shall be situated wholly in front of the fire resisting shield and the discharge shall be arranged to offside of the vehicle.

1.3 For any fuel pipe forming part of a gravity feed system, the fuel feed pipe shall be fitted with a quick action cut-off valve situated in an easily accessible position and clearly marked as such.

2 **Fuel Tank**

2.1 The fuel tank shall:

(a) comply with a double cases construction;

(b) be screened from the body by a fire resisting shield;

(c) be protected from blows by strong steel guards or by the frame of the body chassis of the vehicle; and

(d) be fitted with a lock to the fuel tank lid.

3 **Cargo Compartment**

3.1 The gross vehicle weight or the axle weights of the cargo compartment shall not exceed the permitted gross vehicle weight or the permitted axle weights as specified in the Road Traffic Ordinance (Cap. 374) and its subsidiary Regulations.

3.2 Piping and/or fittings shall not be projected beyond any sides of the vehicle tank. All piping, equipment, hoses, valves, accessories and outlet valves shall be adequately protected against accidental damage or interference. Outlet valves shall be protected by (a) the bumper if the valves are located at the rear of the vehicle; and / or (b) a substantial protective metal bar if located at the side.

3.3 Canvas sheets of suitable size to cover the entire cargo compartment shall be provided.

4 Securing Devices

4.1 The clamping devices for chlorine drums shall be mounted on the mainframe / subframe of the vehicle.

4.2 The subframe for the cargo platform shall be reinforced to withstand side impact during accident.

4.3 The V-notches, clamps and straps shall be directly bolted or welded onto the subframe cross and longitudinal members.

4.4 Suitable tightening devices shall be provided to hold the chlorine drums firmly in the V-notch without any side and vertical movements.

4.5 Crash barriers of 300 mm in height at mid-drum level shall be provided for full length of the cargo platform on both sides to protect the main drum valve. Similar crash barrier shall be provided at the rear of the cargo compartment if no special fittings are installed at the rear.

4.6 A full width robust bumper shall be mounted at the rear of the vehicle with at least 75 mm clearance between the cargo platform and the bumper.

4.7 A purposely designed cage for carrying cylinders shall be provided. It shall be constructed such that the cylinders can be tightly tied together and onto the cage without relative movements. A suitable locking device shall also be fitted to lock the cage on the cargo platforms of the vehicle.

5 Tyres

5.1 Tyres shall be the “anti-static” type, the electrical resistance of which shall be in accordance with BS 2050 or equivalent.

6 Fire Resisting Shield

6.1 The engine, fuel tank, electrical generator, batteries switch gear, fuses and exhaust system of the vehicle shall be situated in front of a fire resisting shield and effectively screened from the cargo compartment by the fire resisting shield.

6.2 The installation of fire resisting shield shall be projected upwards to a point above the topmost level of the cargo compartment, and downwards to a point not more than 300 mm from the ground. (The steel cab can be deemed to constitute part of the shield.)

6.3 Any aperture made to allow any piping to pass through the fire resisting shield (i.e. air brake tubing) shall be so sealed as to prevent the passage of flammable vapour through the shield.

6.4 Any windows in the fire resisting shield shall be wire glazed in fixed metal frame and not capable of being opened.

7 Electrical Installation and Fittings

7.1 No article capable of causing fire or explosion and no lighting apparatus except such portable lighting apparatus designed and constructed to be intrinsically safe and not exhibiting any metal surface liable to produce sparks should be carried on the vehicle.

7.2 All electric wiring shall be heavily insulated and resistant to abrasion and chemical action. The wiring fixed at positions behind the fire resisting shield shall be run in flexible metal conduit.

7.3 A safety cut-off switch shall be fitted in the driver's cab to isolate the electrical system from the battery.

7.4 The voltage of the electric current shall not exceed 24 volts.

8 **Signs (Including Notices and Placards)**

8.1 A warning sign shall be displayed at a conspicuous place at the front and rear of the vehicle.

8.2 The warning signs must conform with the form and specifications stipulated in Sch. 4 to Cap. 295G.

8.3 A placard showing the Class of DG carried on the vehicle shall be displayed at a conspicuous place on both sides and the rear of the vehicle. The placards must conform with the form and specifications stipulated in Sch. 5 to Cap. 295G.

8.4 A "CAUTION CHLORINE KEEP CLEAR 氯氣，危險勿近" notice with letter / character of not less than 120 mm in height shall be displayed at the front and rear of the vehicle.

8.5 A "NO SMOKING 不准吸煙" notice with letter / character of not less than 120 mm in height shall be displayed at a conspicuous place on both sides of the vehicle.

8.6 One portable "CAUTION, TOXIC GAS, KEEP CLEAR 毒性氣體，危險勿近" notice with letter / character of not less than 120 mm in height shall be carried on the vehicle.

8.7 The notices as required by the paragraph 8.4 to 8.6 above shall be provided with reflective white or silver letters and characters on a red background. English letters with height and width in the proportion of 2:1 (e.g. 120 mm letters with 60 mm width) and a 6 mm spacing for each letter are recommended.

8.8 For details about the signs (including notices and placards) for Type H DGV, please refer to Table VIa and Figure VIb.

9 Fire Service Installation or Equipment

9.1 2 nos. of dry powder fire extinguishers, each with a capacity of at least 2 kg and not exceeding 9 kg, shall be provided with one on each side of the vehicle and accessible from outside the driver's cab. The fire extinguishers shall also be inspected by an RFSIC at least once in every 12 months.

10 Operation, Housekeeping, Management, Security, Staff Training and Emergency Preparedness

10.1 Tools for Notification and Warning

10.1.1 A mobile phone in good working order shall be stowed inside the driver's cab to facilitate easy communication with the Hong Kong Police Force (HKPF) and FSD in case of emergency.

10.1.2 A loud-hailer in good working order shall be stowed on the vehicle for immediate use at any time.

10.1.3 A portable amber flashing lamp in good working order shall be stowed on the vehicle for immediate use at any time.

10.2 First Aid Box

10.2.1 A fully kitted-up first aid box shall be stowed on the vehicle for immediate use at any time.

10.3 **Personal Protective Equipment**

10.3.1 Two sets of protective clothing and gloves to the satisfaction of DFS and two helmets shall be stowed on the vehicle.

10.3.2 Two sets of positive pressure breathing apparatus (B.A.) in good working order which have been approved under s. 12 of the Factories and Industrial Undertakings (Confined Spaces) Regulation (Cap. 59AE) shall be stowed on the vehicle. Each set of B.A. shall be equipped with a pressure receptacle fully charged with compressed air of a working duration not less than 30 minutes.

10.4 **Tools Against Chlorine Leakage/ Release**

10.4.1 An Emergency Repair/ Stoppage Kit comprising all the following materials/ equipment/ tools shall be stowed on the vehicle:

(a) Canvas straps

(b) Spanners

(c) Two large buckets of sand

(d) Silicone weather-proofing sealant

(e) Plastic sheets

(f) Lead plates

(g) Hammer, small

(h) Ammonia spray bottle

(i) Lime Powder

(j) Any other appropriate materials/equipment/tools as advised by FSD.

10.5 **Training for Specialized Staff**

10.5.1 At any one time, the vehicle with chlorine drums and/ or cylinders onboard shall be manned by at least one responsible person other than the driver having reasonable experience in the handling of chlorine and having been trained in accordance with the FSR above. The responsible person:

(a) shall receive his/ her training in dealing with chlorine leakage / release and on how to stop the leak, etc. through an authorised organisation e.g. the chlorine supplier company, such as

i. to ensure that all chlorine drums and cylinders are properly and securely placed on the vehicle before conveyance;

ii. to dismiss the crew except the driver in case of emergency and implement the guidelines stipulated in the TREMCARD under the FSR with the aid of the driver, where appropriate, before the arrival of Fire Services personnel;

iii. to ensure that both the driver and himself don the B.A. capable of providing a working duration of not less than 30 minutes, and wear the personal protective equipment if a leakage/ release of chlorine is suspected;

iv. to act as a co-ordinator between the conveyance team (i.e. driver/ other operators) and the emergency stand-by team of the supplier company;

v. to brief Fire Services personnel of the situation upon their arrival; and

vi. Upon completion of the training, a copy of the certificate or letter of competence issued by the supplier company shall be forwarded to DFS for scrutiny.

(b) shall be a permanent employee of the Contractor and therefore able to train up other staff on safety/ emergency procedures.

10.5.2 The driver and the responsible person referred to the FSR above shall also receive training on the use of B.A., the test procedures and the subsequent maintenance through the B.A. supplier company. Upon completion of the training, a copy of the certificate or letter of competence issued by the supplier company shall be forwarded to DFS for scrutiny.

10.6 Safety and Emergency Procedures

10.6.1 An operation manual containing procedures in respect of the operation, housekeeping, management, security, emergency preparedness of the licensed vehicle shall be provided for training and guidance to the driver, the responsible person referred to the FSR above and all operators. The manual shall be stowed in the driver's cab at all times and the procedures shall at least include the following scopes:

(a) The driver should only use the licensed vehicle to convey DG of Class(es) permitted by the subject licence at any one time.

(b) The driver should properly display the identification disc and the signs as specified in the FSR above when he / she is using the licensed vehicle to convey DG.

(c) The driver, responsible person and/or operators should only transfer the DG directly from the licensed vehicle to an approved tank, a receptacle located in a licensed factory or licensed store, or a receptacle located in the premises in which the storage of DG is exempt from the operation of s. 6 of Cap. 295.

(d) The driver, responsible person and/or operators should not smoke, carry a lighted cigarette, cigar or pipe, or carry a naked flame when they are using the licensed vehicle to convey DG, or loading DG onto, or unloading DG from, the vehicle.

(e) The driver should not use the licensed vehicle conveying DG to carry any passenger other than the responsible person and those operators.

(f) During the loading or unloading operation, the driver, responsible person and/or operators should display the portable “CAUTION, TOXIC GAS, KEEP CLEAR 毒性氣體，危險勿近” notice at a prominent location (See Table VIa).

(g) A TREMCARD (Transport Emergency Card) containing the following guidelines:

i. report immediately any incident of explosion or fire in, in the vicinity of or in connection with the licensed vehicle, or any leak of dangerous goods from the vehicle to the Hong Kong Police Force (HKPF) and FSD by dialling “999”;

ii. in case of a suspected chlorine leakage/ release, if possible, keep the vehicle moving to open ground and ensure that driver and others are kept upwind of escaping gas;

iii. stop the engine (beware – internal combustion engines can stall in a gas cloud);

iv. no naked lights and no smoking;

v. driver and the responsible person, where possible, shall don the B.A. in the ‘use’ position and wear the personal protective equipment stowed on the vehicle as soon as a leakage/ release of chlorine is suspected;

vi. mark road and warn other road users by displaying amber flashing lamp and the portable “CAUTION, TOXIC GAS, KEEP CLEAR 毒性氣體，危險勿近” notice stowed on the vehicle at a safe location (See Table VIa);

vii. attempt to stop the leakage / release by shutting off the valve of chlorine drum/ cylinder if the leak is located there upon inspection, or by using the materials/ equipment/ tools in the Emergency Repair/ Stoppage Kit, where possible; and

viii. do not take further emergency action and evacuate to a safe place immediately if acting alone or without full equipment.

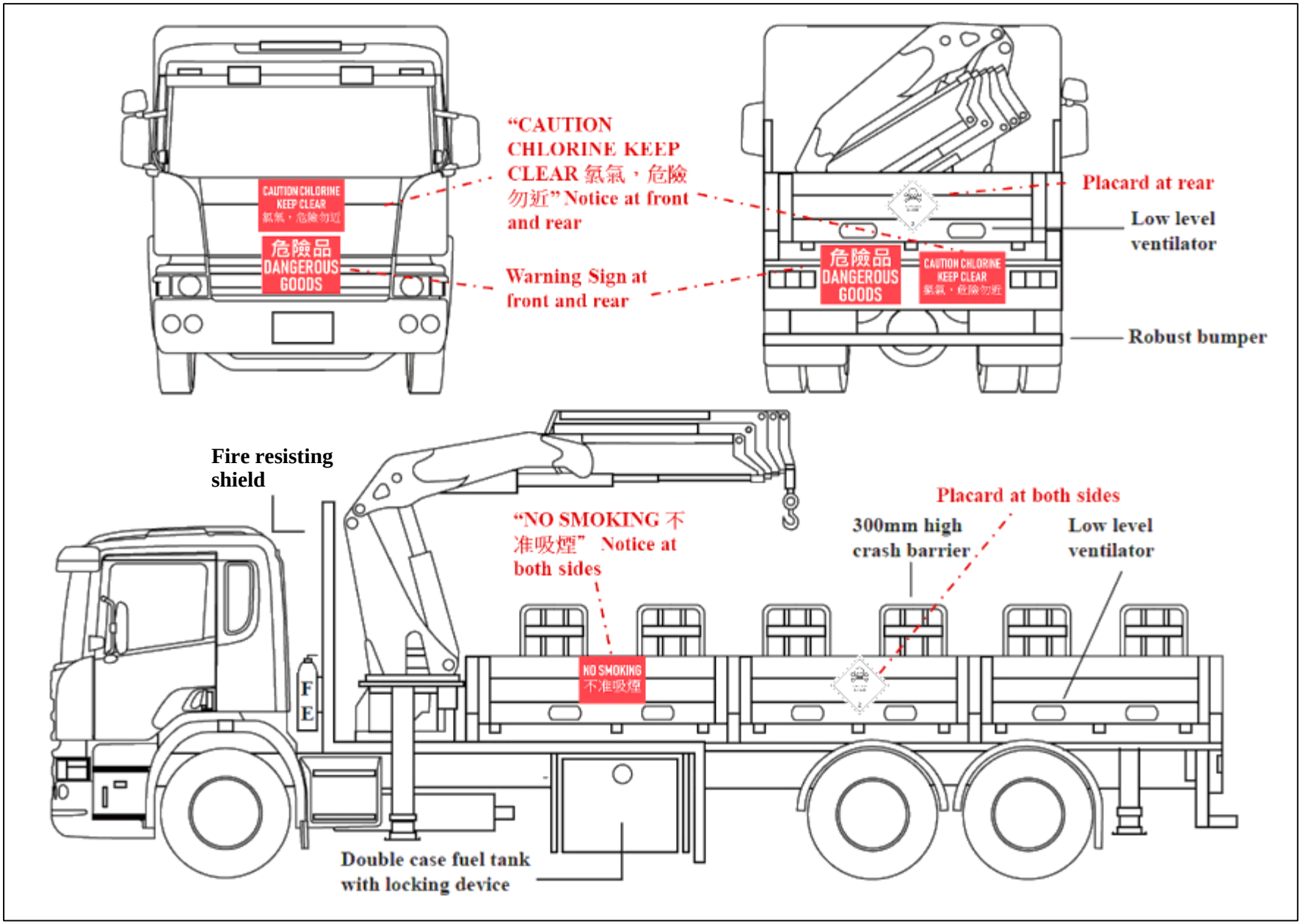
Table VIa - Signs (including Notices and Placards) for Type H Dangerous Goods Vehicle

Column 1	Column 2	Column 3	Column 4	Column 5
Signs	**Paragraph**	**Display**	**Location for Display**	**Size and Colour**
Warning sign	8.1-8.2		Front and rear of the vehicle	As specified in Part 2 of Sch. 4 to Cap. 295G: 1. A warning sign must be displayed in an upright position. 2. A warning sign must have the minimum height of 300 mm and the minimum width of 400 mm. 3. All Chinese characters in the warning sign must be at least 90 mm in height and in width. 4. All English letters in the warning sign must be at least 70 mm in height and 35 mm in width. 5. If a warning sign's dimensions are bigger than the minimum height of 300 mm and the minimum width of 400 mm, the dimensions of every Chinese character and English letter in the sign must be adjusted upward proportionally.

Column 1	Column 2	Column 3	Column 4	Column 5
Signs	**Paragraph**	**Display**	**Location for Display**	**Size and Colour**
Placard	8.3		Both sides and rear of the vehicle	As specified in Part 2 of Sch. 5 to Cap. 295G: 1. A placard must be displayed in an upright position. 2. A placard must be square-shaped, with the minimum length of each side measuring 250 mm (minimum dimensions). 3. For a placard of minimum dimensions, the number “2” or “3” at the bottom of the placard (as required by Part 1 of this Schedule) must be at least 25 mm in height. 4. If no specific dimensions are indicated for a feature of a placard in this Part or in the relevant Figure in Part 1 of this Schedule, the feature must be in the appropriate scale as shown in the Figure. If a placard’s dimensions are bigger than the minimum dimensions, the dimensions of every feature in the placard must be adjusted upward proportionally. 5. A placard must be displayed on a background of contrasting colour or, if a background of contrasting colour cannot be provided, have a dotted or solid outer boundary line.

Column 1	Column 2	Column 3	Column 4	Column 5		
Signs	**Paragraph**	**Display**	**Location for Display**	**Size and Colour**		
“CAUTION CHLORINE KEEP CLEAR 氯氣，危險勿近” Notice	8.4		Front and rear of the vehicle	Letter / Character Size; and Colour	Height	120 mm
					Width	60 mm
					Spacing	6 mm
“NO SMOKING 不准吸煙” Notice	8.5		Both sides of the vehicle		Background	Red
					Letter	White
“CAUTION, TOXIC GAS, KEEP CLEAR 毒性氣體，危險勿近” Notice	8.6, 10.6.1(f) and 10.6.1(g)		Portable notice only			

Figure VIb - Sketch Showing the Signs Required



Appendix VII -
Sample of Standard Fire Safety Requirements for Pantechnicon Used for Conveyance of Class 3/3A DG
(Type P Dangerous Goods Vehicle)

1 **Engine**

1.1 The engine of the vehicle shall be the type of compression ignition (Diesel).

1.2 The exhaust system of the engine shall be situated wholly in front of the fire resisting shield and the discharge shall be arranged to offside of the vehicle.

2 **Fuel Tank**

2.1 The fuel tank shall:

(a) comply with a double cases construction;

(b) be screened from the body by a fire resisting shield;

(c) be protected from blows by strong steel guards or by the frame of the body chassis of the vehicle; and

(d) be fitted with a lock to the fuel tank lid.

3 **Cargo Compartment**

3.1 The gross vehicle weight or the axle weights of the vehicle shall not exceed the permitted gross vehicle weight or the permitted axle weights as specified in the Road Traffic Ordinance (Cap. 374) and its subsidiary Regulations.

3.2 Depending on the unladen weight, top half of the both sides and bottom half of the rear of the cargo compartment shall be fitted with permanently fixed open louvers complying with the following area requirements to maintain maximum airflow (See Table VIIa):

Table VIIa - The Area Requirements to Maintain Maximum Airflow

For Vehicle with Unladen Weight Up to	**Area Requirements for the Permanently Fixed Open Louvers**	
	Both Sides of the Cargo Compartment (Part A)	**Panels of Doors at the Rear (Part B)** ***(For vehicle fitted with a lifting platform at rear, the alternative requirement stipulated in paragraph 3.2(a) below shall be complied with)***
1 tonne	0.4 m^2 per side	0.2 m^2 per side
1.5 tonnes	0.6 m^2 per side	0.3 m^2 per side
2 tonnes	0.8 m^2 per side	0.4 m^2 per side
3 tonnes	1.2 m^2 per side	0.6 m^2 per side
4 tonnes	1.6 m^2 per side	0.8 m^2 per side
5 tonnes and above	2 m^2 per side	

(a) For vehicle fitted with a lifting platform at rear, permanently fixed open louvers complying with the area requirement as specified in Part B above shall be installed at bottom half of the rearmost portion of both sides of the cargo compartment.

3.3 The vehicle shall be provided with a roof cover of fire resisting material.

3.4 The body chassis and fittings shall be constructed of strong and non-combustible materials.

4 **Fire Resisting Shield**

4.1 The engine, fuel tank, electrical generator, batteries switch gear, fuses and exhaust system of the vehicle shall be situated in front of a fire resisting shield and effectively screened from the cargo compartment by the fire resisting shield.

4.2 The installation of fire resisting shield shall be projected upwards to the topmost level of the cargo compartment, and downwards to the floor of the compartment.

4.3 Any windows in the fire resisting shield shall be wire glazed in fixed metal frame and not capable of being opened.

5 **Electrical Installation and Fittings**

5.1 No article capable of causing fire or explosion and no lighting apparatus except such portable lighting apparatus designed and constructed to be intrinsically safe and not exhibiting any metal surface liable to produce sparks should be carried on the vehicle.

5.2 All electric wiring shall be heavily insulated and resistant to abrasion and chemical action. The wiring fixed at positions behind the fire resisting shield shall be run in flexible metal conduit.

5.3 A safety cut-off switch shall be fitted in the driver's cab to isolate the electrical system from the battery. This installation shall be indicated in English letters and Chinese characters on the door of the vehicle and on the position inside the cab.

5.4 The nominal voltage of the electrical circuit shall not exceed 24 volts.

6 **Signs (Including Notices and Placards)**

6.1 A warning sign shall be displayed at a conspicuous place at the front and rear of the vehicle.

6.2 The warning signs must conform with the form and specifications stipulated in Sch. 4 to Cap. 295G.

6.3 A placard showing Class of DG carried on the vehicle shall be displayed at a conspicuous place on both sides and rear of the vehicle. The placards must conform with the form and specifications stipulated in Sch. 5 to Cap. 295G.

6.4 A "NO SMOKING 不准吸煙" notice with letter / character of not less than 120 mm in height shall be displayed at a conspicuous place on both sides of the vehicle.

6.5 The notice as required by the FSR paragraph 6.4 above shall be made of reflective white or silver letters and characters on a red background. English letters with height and width in the proportion of 2:1 (e.g. 120 mm letters with 60 mm width) and a 6 mm spacing for each letter are recommended.

6.6 For details about the signs (including notices and placards) for Type P DGV, please refer to Table VIIb and Figure VIIc.

7 **Fire Service Installation or Equipment**

7.1 Depending on whether the driver's cab is adjoining the cargo compartment, 2 nos. of dry powder fire extinguishers, each with a capacity of at least 2 kg and not exceeding 9 kg, shall be provided at the following positions of the vehicle. The fire extinguishers shall also be inspected by an RFSIC at least once in every 12 months:

(a) If the driver's cab is not adjoining the cargo compartment, dry powder fire extinguisher shall be provided with one on each side of the vehicle and accessible from outside the driver's cab. For vehicle with unladen weight of two tonnes or less (if applicable), only 1 no. of such fire extinguisher at either side of the vehicle is required; or

(b) If the driver's cab is adjoining the cargo compartment, the dry powder fire extinguishers shall be provided at the nearside of the vehicle inside the driver's cab, in an easily accessible and prominent position. A "Fire Extinguisher Inside 內有滅火筒" notice shall be indicated on the door of the vehicle. For vehicle with unladen weight of two tonnes or less (if applicable), only 1 no. of such fire extinguisher inside the driver's cab is required.

8 Operation, Housekeeping, Management, Security, Staff Training and Emergency Preparedness

8.1 An operation manual containing procedures in respect of the operation, housekeeping, management, security, emergency preparedness of the licensed vehicle shall be provided for training and guidance to the driver and vehicle attendants. The manual shall be stowed in the driver's cab at all times and the procedures shall at least include the following scopes:

(a) The driver should only use the licensed vehicle to convey DG of class(es) permitted by the subject licence at any one time.

(b) The driver should properly display the identification disc and the signs as specified in the FSR above when he/ she is using the licensed vehicle to convey DG.

(c) The driver and/or operators should only transfer the DG directly from the licensed vehicle to an approved tank, a receptacle located in a licensed factory or licensed store, or a receptacle located in the premises in which the storage of DG is exempt from the operation of s. 6 of Cap. 295.

(d) The driver and/or operators should not smoke, carry a lighted cigarette, cigar or pipe, or carry a naked flame when they are using the licensed vehicle to convey DG, or loading DG onto, or unloading DG from, the vehicle.

(e) The driver should not leave the licensed vehicle conveying DG unattended. If another person is authorised by the driver to attend to the vehicle, such person shall attain the age of 18, and be aware of the whereabouts of the driver and the nature of the DG on the vehicle.

(f) The driver should not use the licensed vehicle conveying DG to carry any passenger other than the operators.

(g) The driver and/or operators should report immediately any incident of explosion or fire in, in the vicinity of or in connection with the licensed vehicle, or any leak of DG from the vehicle to FSD by dialling “999”.

(h) The driver and/or operators should have sufficient understanding on the nature and hazard of the DG carried on the licensed vehicle, and adopt suitable measures, as far as practicable, to stem and handle any spill or leakage of DG promptly.

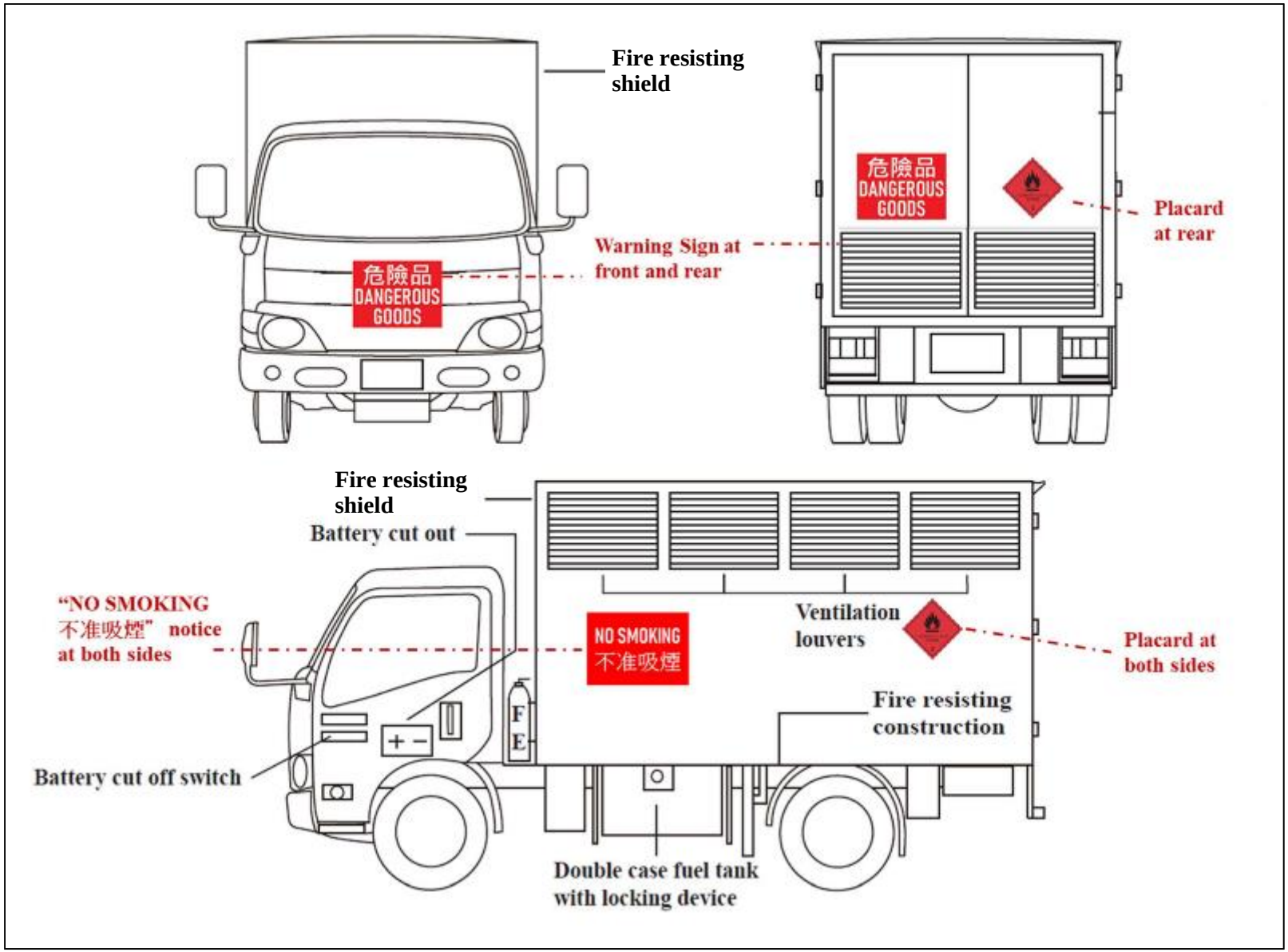
Table VIIb - Signs (including Notices and Placards) for Type P Dangerous Goods Vehicle

Column 1	Column 2	Column 3	Column 4	Column 5
Signs	**Paragraph**	**Display**	**Location for Display**	**Size and Colour**
Warning sign	6.1-6.2		Front and rear of the vehicle	As specified in Part 2 of Sch. 4 to Cap. 295G: 1. A warning sign must be displayed in an upright position. 2. A warning sign must have the minimum height of 300 mm and the minimum width of 400 mm. 3. All Chinese characters in the warning sign must be at least 90 mm in height and in width. 4. All English letters in the warning sign must be at least 70 mm in height and 35 mm in width. 5. If a warning sign's dimensions are bigger than the minimum height of 300 mm and the minimum width of 400 mm, the dimensions of every Chinese character and English letter in the sign must be adjusted upward proportionally.

Column 1	Column 2	Column 3	Column 4	Column 5
Signs	**Paragraph**	**Display**	**Location for Display**	**Size and Colour**
Placard	6.3	 **Or** 	Both sides and rear of the vehicle	As specified in Part 2 of Sch. 5 to Cap. 295G: 1. A placard must be displayed in an upright position. 2. A placard must be square-shaped, with the minimum length of each side measuring 250 mm (minimum dimensions). 3. For a placard of minimum dimensions, the number “2” or “3” at the bottom of the placard (as required by Part 1 of this Schedule) must be at least 25 mm in height. 4. If no specific dimensions are indicated for a feature of a placard in this Part or in the relevant Figure in Part 1 of this Schedule, the feature must be in the appropriate scale as shown in the Figure. If a placard’s dimensions are bigger than the minimum dimensions, the dimensions of every feature in the placard must be adjusted upward proportionally. 5. A placard must be displayed on a background of contrasting colour or, if a background of contrasting colour cannot be provided, have a dotted or solid outer boundary line.

Column 1	Column 2	Column 3	Column 4	Column 5		
Signs	**Paragraph**	**Display**	**Location for Display**	**Size and Colour**		
“NO SMOKING 不准吸煙” Notice	6.4 – 6.5		Both sides of the vehicle	Letter / Character Size	Height	120 mm
					Width	60 mm
					Spacing	6 mm
				Colour	Background	Red
					Letter	White

Figure VIIc - Sketch Showing the Signs Required



Appendix VIII -
Sample of Fire Safety Requirements for Dangerous Goods Store (Aboveground Tank in Bunded Area for Class 3 DG)

Aboveground Tank in Bunded Area at Open Space

UN 1299 TURPENTINE / PG III (Class 3 DG, no subsidiary hazard)

1. **Design and Construction**

1.1 The DG store constructed of fire resisting materials throughout shall be provided in accordance with the latest plans approved in writing by DFS.

1.2 The actual layout of the store, including the piping, fittings or equipment designed and constructed for the distribution of the DG from the store (if applicable) shall be in accordance with the latest plans approved in writing by DFS.

1.3 For outdoor storage, a bunded area constructed of impervious materials shall be provided in open space away from heat and naked flame.

2. **Piping, Fittings and Equipment**

2.1 Aboveground tank shall be firmly fixed onto the ground.

2.2 For tank used for storage of Class 3 DG:

(a) The tank shall be tested by a recognized Marine Engineer / Surveyor before putting into commission; and

(b) A certificate in respect of the suitability shall be obtained and submitted to DFS.

2.3 The tank shall be fitted with a vapour-escape pipe. The outlet of the vapour-escape pipe shall be fitted with fine brass wire gauze and terminated outdoor.

2.4 Filling point of the tank shall comply with the following requirements:

(a) The filling inlet shall be protected against physical damage and provided with a screw cap; and
(b) The filling point shall be provided with a locking device and a "KEEP CLOSED AND LOCKED 保持緊閉及上鎖" notice shall be displayed at a conspicuous position.

2.5 Any aperture made to allow any piping to pass through the walls / ceiling / floor/ bunds shall be suitably sealed.

3. Retaining Facilities and Drainage

3.1 For outdoor storage, the bunded area shall be capable of providing 100% retaining capacity of the DG storage.

4. Electrical Installation and Fittings

4.1 All fixed electrical installation,

(a) shall be inspected, tested and certified by an electrical worker/contractor registered by the Director of Electrical and Mechanical Services after completion of installation works. A copy of the "Work Completion Certificate" (WR1) shall be forwarded to DFS as proof of compliance; and
(b) shall be subsequently inspected, tested and certified an by electrical worker/contractor at least once every year. A copy of the "Periodic Test Certificate" (WR2) shall be forwarded to DFS as proof of compliance.

4.2 Lightning rod and earthing connections shall be provided to the store or the tanks, and be inspected, tested and certified in accordance with the paragraph 4.1 above. Copy of the relevant Certificates shall be forwarded to DFS as proof of compliance.

4.3 For all electrical apparatus, switchgears, electrical components of fire service installation or equipment (including heat/ smoke detector heads and mounting bases) and the associated wirings of these fittings installed inside the hazardous area, they shall be in compliance with BS EN 60079 or other relevant standards where appropriate. Upon confirming that the requirements for the installation have been complied with, a Letter of Compliance will be issued by VD.

4.4 All electrical wirings shall be of mineral insulated copper sheathed cable and, where protection is required, with industrial type glands and heavy gauge conduit fittings.

4.5 Lighting fittings shall be of totally enclosed type to BS EN 60529 standard with protection not less than IP 44.

5. Fire Service Installation or Equipment

5.1 The following portable hand-operated approved appliance shall be provided:

(a) One 4.5 kg CO_2 type fire extinguisher and two buckets of dry sand shall be provided and allocated outside the store near the entrance or the bunded area.

(b) One 4.5 kg CO_2 type fire extinguisher shall be provided near the pump.

6. **Signs (Including Notices)**

6.1 “NO SMOKING 不准吸煙” notice with letter / character of not less than 120 mm in height shall be displayed at a conspicuous position of the entrance, on the bund, or the wall above the underground tank.

6.2 “NO NAKED FLAME 不准明火” notice with letter / character of not less than 120 mm in height shall be displayed at a conspicuous position of the entrance, on the bund, or the wall above the underground tank.

6.3 “危險品 DANGEROUS GOODS” notice complying with the following requirements shall be displayed at a conspicuous position of the entrance, on the bund, or the wall above the underground tank:

(a) The height and width of the notice shall not be less than 300 mm and 400 mm respectively;
(b) The notice shall be made of white or silver characters on a red background; and
(c) The notice shall adhere to the following sample (features of the notice shall be in the appropriate scale as shown in the sample):

6.4 Mark(s) complying with the following requirements shall be displayed at a conspicuous position of the entrance, on the bund, or the wall above the underground tank to correctly reflect the UN no. or HK no., and PSN in both Chinese and English of the DG contained in any tank(s):

(a) The letter / character shall not be less than 120 mm in height;
(b) The information reflected by the notice shall be clearly identifiable despite any exposure to open air and water;
(c) The required mark(s) shall be:

UN 1299 TURPENTINE 松節油

6.5 One or more than one pictorial plate(s) complying with the following requirements shall be displayed at a conspicuous position of the entrance, on the bund, or the wall above the underground tank to correctly reflect the Class(es) and subsidiary hazards (if any) of all DG stored:

(a) The pictorial plate shall be square-shaped, with the minimum length of each side measuring 150 mm;
(b) The pictorial plate(s) shall be displayed on a background of contrasting colour, or if a background of contrasting colour cannot be provided, have a dotted or solid outer boundary line; and
(c) The pictorial plate(s) shall adhere to the following samples (features of the pictorial plate(s) shall be in the appropriate scale as shown in the samples):

Or

7. Operation, Housekeeping, Management, Security, Staff Training and Emergency Preparedness

7.1 The licensee shall confirm in writing the receipt of the approved plans and the set of FSR issued by DFS for every application for new construction or alteration. (This requirement is only applicable to application(s) submitted by agents.)

7.2 An operation manual containing procedures in respect of the operation, housekeeping, management, security, emergency preparedness of the licensed store shall be provided for training and guidance to all operators of the store. The manual shall be stowed in a suitable place readily available for inspection upon demand, and the procedures contained in the manual shall **at least** include the following scopes:

(a) The operators shall only store in the licensed store, DG of the types and of the quantity not exceeding those specified in the licence. Storage of DG which are specified as incompatible in CoP is prohibited.

(b) The operators shall ensure that the DG are only used in the location(s) specified in the licence, and returned to the store when they are not in use.

(c) The operators shall not smoke, carry a lighted cigarette, cigar or pipe in the hazardous area of the licensed store.

(d) Except when access is required to the licensed store for the inspection, maintenance or handling of the DG in it, the operators shall ensure every entrance to it be at all times securely closed and locked.

(e) The operators shall ensure that no children below the age of 14 or no persons without obtaining licensee's permission enter or remain in the licensed store.

(f) The operators shall only use naked flame, flame or other source of substantial heat, or other means of igniting flammable substances or vapour in the hazardous area of the licensed store, on the condition that (A) prior approval of DFS has been obtained, or (B) the subject hazardous area has been certified free from flammable vapour after all DG have been removed from the store.

(g) Except with the approval granted in writing by DFS and the site separated from the licensed store by a fire resisting wall of the dimensions and construction as required by DFS, no forge, furnace or installation capable of fire ignition or of emitting source of substantial heat shall be sited by the operators in an area within the hazardous area, or within 6 m of the store.

(h) The operators shall only install electrical apparatus and the associated wirings in the hazardous area of the licensed store, after an application for these installations has been approved by DFS and these installations are in compliance with the standard specified in the above FSR.

(i) The operators shall only repair the tank by means involving the use of a source of artificial heating, or a process producing or likely producing heat or sparking after the tank has been certified free from flammable vapour by an AP(GF).

(j) The operators shall not make any alteration or addition to the store that results in any deviation in any material particular from the latest plans approved by DFS if the alteration or addition has not been approved by DFS.

(k) The operators shall report immediately to FSD by dialling “999” any incident either inside the store or in its vicinity in relation to the DG, including but not limited to incident causing injury to any person, any explosion or fire or leakage of DG from the store.

(l) The operators shall have sufficient understanding on the nature and hazard of the DG stored in the licensed store, and adopt suitable measures, as far as practicable, to stem and handle any spill or leakage of DG promptly.

Appendix IX -
Sample of Fire Safety Requirements for Dangerous Goods Store (Fire Compartment within Building for Classes 4 to 9 DG)

Fire Compartment within Building

UN 1789 HYDROCHLORIC ACID / PG III (Class 8 DG, no subsidiary hazard)

UN 2031 NITRIC ACID / PG II (Class 8 DG, subsidiary hazard of 5.1)

UN 2809 MERCURY / PG III (Class 8 DG, subsidiary hazard of 6.1)

1. Design and Construction

1.1 The DG store constructed of fire resisting materials throughout shall be provided in accordance with the latest plans approved in writing by DFS.

1.2 The actual layout of the store, including the piping, fittings or equipment designed and constructed for the distribution of the DG from the store (if applicable) shall be in accordance with the latest plans approved in writing by DFS.

1.3 Door opening(s) of the store shall be fitted with self-closing door(s) having an FRR of not less than one hour and being capable to be opened in the direction of egress.

1.4 Locking device shall be provided to the door(s) of the store to prevent unauthorised intrusions when not being attended.

2. Ventilation

2.1 Natural or mechanical ventilation shall be provided to ensure adequate air movement at high and low levels of the store.

2.2 For natural ventilation,

(a) Fixed and permanent ventilation openings at high and low levels in the external walls of the store shall be provided. The total free area of all ventilation openings shall be equivalent to 1 – 3% of the total area of the walls and ceiling of the store; and

(b) High and low ventilators covered internally with metal wire gauze of nominal aperture size not greater than 12 mm and externally with non-corrodible metal gratings or louvers shall be provided.

3. Retaining Facilities and Drainage

3.1 A door sill of not less than 300 mm above the floor level with 100% retaining capacity of the DG storage shall be provided.

3.2 The low ventilators shall be wholly situated above the level of the door sill to prevent DG from leaking out of the store.

4. Electrical Installation and Fittings

4.1 All fixed electrical installation,

(a) shall be inspected, tested and certified by an electrical worker/contractor registered by the Director of Electrical and Mechanical Services after completion of installation works. A copy of the “Work Completion Certificate” (WR1) shall be forwarded to DFS as proof of compliance; and

(b) shall be subsequently inspected, tested and certified by an electrical worker/contractor at least once every year. A copy of the “Periodic Test Certificate” (WR2) shall be forwarded to DFS as proof of compliance.

4.2 For all electrical apparatus, switchgears, electrical components of fire service installation or equipment (including heat/ smoke detector heads and mounting bases) and the associated wirings of these fittings installed inside the hazardous area, they shall be in compliance with BS EN 60079 or other relevant standards where appropriate. Upon confirming that the requirements for the installation have been complied with, a Letter of Compliance will be issued by VD.

4.3 All electrical wirings shall be of mineral insulated copper sheathed cable and, where protection is required, with industrial type glands and heavy gauge conduit fittings.

4.4 Lighting fittings shall be of totally enclosed type to BS EN 60529 standard with protection not less than IP 44.

5. Fire Service Installation or Equipment

5.1 Sprinkler heads at the store shall be blank off.

5.2 The following portable hand-operated approved appliance shall be provided:

(a) One 4.5 kg CO_2 type fire extinguisher and four buckets of dry sand shall be provided and allocated outside the store near the entrance or the bunded area.

5.3 An automatic closing device complying with the following requirements shall be provided to the high and low ventilators of the store, which shall also be installed by an RFSIC with the copy of certificate issued being forwarded to DFS upon completion:

(a) fire curtains/ dampers/ shutters equipped with electro-thermal link released by a signal from an appropriate type heat/ smoke detector(s) fixed on the ceiling to actuate the device to be provided;
(b) the actuation temperature of heat detector(s) (if any) to be rated at 54°C to 65°C; and
(c) control panel to be located outside the store.

5.4 The store shall be protected by the following automatic fixed installation or fixed automatically operated approved appliance, which shall also be installed by an RFSIC with the copy of certificate issued being forwarded to DFS upon completion:

(a) A fixed automatically operated approved appliance, e.g. a sprayer unit, containing an inert extinguishing medium of a quantity adequate for the protection to the store shall be provided; and
(b) Warning / instruction of the relevant automatic protection shall be suitably marked with the appropriate label on or near the entrance door.

5.5 Any alteration to FSI of the store shall be carried out by an RFSIC appropriate to class, and amended fire service installation plan shall be submitted to DFS, prior to the commencement of work. On completion of the alteration, DFS shall be informed in writing, and the installation shall be tested in accordance with the relevant requirements stipulated in the Code of Practice for Inspection, Testing and Maintenance of Installations and Equipment.

6. **Signs (Including Notices)**

6.1 “NO SMOKING 不准吸煙” notice with letter / character of not less than 120 mm in height shall be displayed at a conspicuous position of the entrance, on the bund or the wall above the underground tank.

6.2 “NO NAKED FLAME 不准明火” notice with letter / character of not less than 120 mm in height shall be displayed at a conspicuous position of the entrance, on the bund or the wall above the underground tank.

6.3 “危險品 DANGEROUS GOODS” notice complying with the following requirements shall be displayed at a conspicuous position of the entrance, on the bund or the wall above the underground tank:

(a) The height and width of the notice shall not be less than 300 mm and 400 mm respectively;
(b) The notice shall be made of white or silver characters on a red background; and
(c) The notice shall adhere to the following sample (features of the notice shall be in the appropriate scale as shown in the sample):

6.4 One or more than one pictorial plate(s) complying with the following requirements shall be displayed at a conspicuous position of the entrance, on the bund or the wall above the underground tank to correctly reflect the Class(es) and subsidiary hazards (if any) of all DG stored:

(a) The pictorial plate shall be square-shaped, with the minimum length of each side measuring 150 mm;

(b) The pictorial plate(s) shall be displayed on a background of contrasting colour, or if a background of contrasting colour cannot be provided, have a dotted or solid outer boundary line; and

(c) The pictorial plate(s) shall adhere to the following samples (features of the pictorial plate(s) shall be in the appropriate scale as shown in the samples):

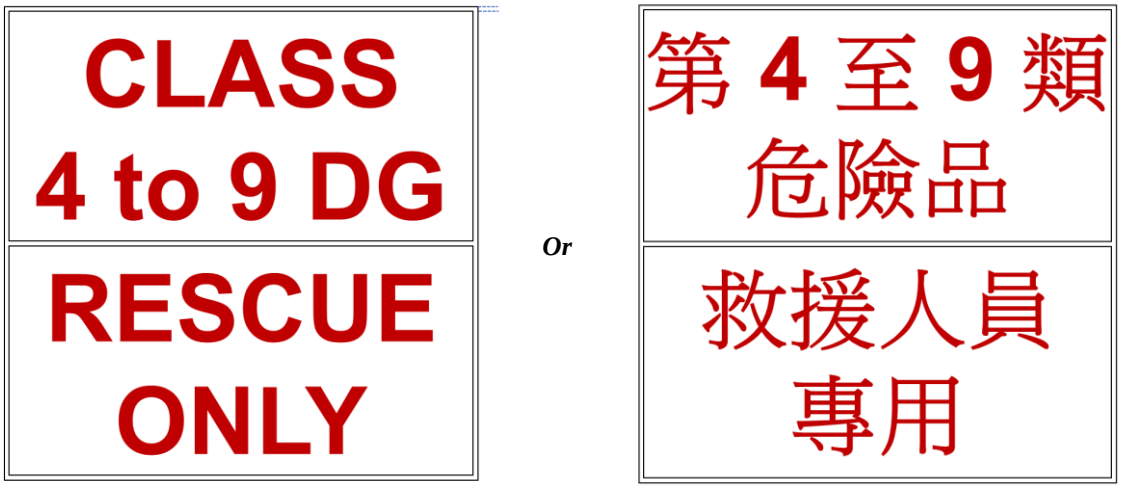
6.5 A notice complying with the following requirements shall be displayed at the external wall of approaching lobby (if any):

(a) The notice shall have a minimum height and width of 950 mm;

(b) The notice shall be made of red English letters or Chinese characters on a white background with the following mark;

(c) The notice shall not obstruct access or ventilation to the lobby; and

(d) The notice shall adhere to either of the following samples (features of the notice shall be in the appropriate scale as shown in the samples):



7. **Operation, Housekeeping, Management, Security, Staff Training and Emergency Preparedness**

7.1 The licensee shall confirm in writing the receipt of the approved plans and the set of FSR issued by DFS for every application for new construction or alteration. (This requirement is only applicable to application(s) submitted by agents.)

7.2 An operation manual containing procedures in respect of the operation, housekeeping, management, security, emergency preparedness of the licensed store shall be provided for training and guidance to all operators of the store. The manual shall be stowed in a suitable place readily available for inspection upon demand, and the procedures contained in the manual shall **at least** include the following scopes:

(a) The operators shall only store in the licensed store, DG of the types and of the quantity not exceeding those specified in the licence. Storage of DG which are specified as incompatible in CoP is prohibited.

(b) The operators shall ensure that the DG are only used in the location(s) specified in the licence, and returned to the store when they are not in use.

(c) The operators shall not smoke, carry a lighted cigarette, cigar or pipe in the hazardous area of the licensed store.

(d) Except when access is required to the licensed store for the inspection, maintenance or handling of the DG in it, the operators shall ensure every entrance to it to be at all times securely closed and locked.

(e) The operators shall ensure that no children below the age of 14 or no persons without obtaining licensee's permission enter or remain in the licensed store.

(f) The operators shall only use naked flame, flame or other source of substantial heat, or other means of igniting flammable substances or vapour in the hazardous area of the licensed store, on the condition that (A) prior approval of DFS has been obtained, or (B) the subject hazardous area has been certified free from flammable vapour after all DG have been removed from the store.

(g) Except with the approval granted in writing by DFS and the site separated from the licensed store by a fire resisting wall of the dimensions and construction as required by DFS, no forge, furnace or installation capable of fire ignition or of emitting source of substantial heat shall be sited by the operators in an area within the hazardous area, or within 6 m of the store.

(h) The operators shall only install electrical apparatus and the associated wirings in the hazardous area of the licensed store, after an application for these installations has been approved by DFS and these installations are in compliance with the standard specified in the above FSR.

(i) The operators shall not make any alteration or addition to the store that results in any deviation in any material particular from the latest plans approved by DFS if the alteration or addition has not been approved by DFS.

(j) The operators shall report immediately to FSD by dialling “999” any incident either inside the store or in its vicinity in relation to the DG, including but not limited to incident causing injury to any person, any explosion or fire or leakage of DG from the store.

(k) The operators shall have sufficient understanding on the nature and hazard of the DG stored in the licensed store, and adopt suitable measures, as far as practicable, to stem and handle any spill or leakage of DG promptly.

Appendix X -
Sample of Fire Safety Requirements for Dangerous Goods Store (DG Store in Construction Site for Class 2.2 DG)

DG Store in Construction Site

UN 1072 OXYGEN, COMPRESSED (Class 2.2 DG, subsidiary hazard of 5.1)

UN 1006 ARGON, COMPRESSED (Class 2.2 DG, no subsidiary hazard)

1. Design and Construction

1.1 The DG store constructed of fire resisting materials throughout shall be provided in accordance with the latest plans approved in writing by DFS.

1.2 The actual layout of the store, including the piping, fittings or equipment designed and constructed for the distribution of the DG from the store (if applicable) shall be in accordance with the latest plans approved in writing by DFS.

1.3 Door opening(s) of the store shall be fitted with self-closing door(s) having an FRR of not less than one hour and being capable to be opened in the direction of egress.

1.4 Locking device shall be provided to the door(s) of the store to prevent unauthorised intrusions when not being attended.

2. Ventilation

2.1 Natural or mechanical ventilation shall be provided to ensure adequate air movement at high and low levels of the store.

2.2 For natural ventilation,

(a) Fixed and permanent ventilation openings at high and low levels in the external walls of the store shall be provided. The total free area of all ventilation openings shall be equivalent to 1 – 3% of the total area of the walls and ceiling of the store;

(b) High and low ventilators covered internally with metal wire gauze and externally with non-corrodible metal gratings or louvers shall be provided; and

(c) The low ventilators shall be wholly situated above the floor level by 150 mm.

3. **Electrical Installation and Fittings**

3.1 All fixed electrical installation,

(a) shall be inspected, tested and certified by an electrical worker/contractor registered by the Director of Electrical and Mechanical Services after completion of installation works. A copy of the "Work Completion Certificate" (WR1) shall be forwarded to DFS as proof of compliance; and

(b) shall be subsequently inspected, tested and certified by an electrical worker/contractor at least once every year. A copy of the "Periodic Test Certificate" (WR2) shall be forwarded to DFS as proof of compliance.

3.2 Lightning rod and earthing connections shall be provided to the store or the tanks, and be inspected, tested and certified in accordance with the paragraph 3.1 above. Copy of the relevant Certificates shall be forwarded to DFS as proof of compliance.

3.3 For all electrical apparatus, switchgears, electrical components of fire service installation or equipment (including heat/ smoke detector heads and mounting bases) and the associated wirings of these fittings installed inside the hazardous area, they shall be in compliance with BS EN 60079 or other relevant standards where appropriate. Upon confirming that the requirements for the installation have been complied with, a Letter of Compliance will be issued by VD.

3.4 All electrical wirings shall be of mineral insulated copper sheathed cable and, where protection is required, with industrial type glands and heavy gauge conduit fittings.

3.5 Lighting fittings shall be of totally enclosed type to BS EN 60529 standard with protection not less than IP 44.

4. Fire Service Installation or Equipment

4.1 The following portable hand-operated approved appliance shall be provided:

(a) One 9-litre water type fire extinguisher shall be provided and allocated outside the store near the entrance.

4.2 An automatic closing device complying with the following requirements shall be provided to the high and low ventilators of the store, which shall also be installed by an RFSIC with the copy of certificate issued being forwarded to DFS upon completion:

(a) Fire curtains/ dampers/ shutters equipped with fusible links with actuation temperature rated from 54°C to 65°C to be provided.

4.3 The store shall be protected by the following automatic fixed installation or fixed automatically operated approved appliance, which shall also be installed by an RFSIC with the copy of certificate issued being forwarded to DFS upon completion:

(a) A fixed automatically operated approved appliance, e.g. a sprayer unit, containing an inert extinguishing medium of a quantity adequate for the protection to the store shall be provided; and
(b) Warning / instruction of the relevant automatic protection shall be suitably marked with the appropriate label on or near the entrance door.

5. Signs (Including Notices)

5.1 "NO SMOKING 不准吸煙" notice with letter / character of not less than 120 mm in height shall be displayed at a conspicuous position of the entrance.

5.2 "NO NAKED FLAME 不准明火" notice with letter / character of not less than 120 mm in height shall be displayed at a conspicuous position of the entrance.

5.3 "危險品 DANGEROUS GOODS" notice complying with the following requirements shall be displayed at a conspicuous position of the entrance:

(a) The height and width of the notice shall not be less than 300 mm and 400 mm respectively;
(b) The notice shall be made of white or silver characters on a red background; and
(c) The notice shall adhere to the following sample (features of the notice shall be in the appropriate scale as shown in the sample):

5.4 One or more than one pictorial plate(s) complying with the following requirements shall be displayed at a conspicuous position of the entrance to correctly reflect the Class(es) and subsidiary hazards (if any) of all dangerous goods stored:

(a) The pictorial plate shall be square-shaped, with the minimum length of each side measuring 150 mm;

(b) The pictorial plate(s) shall be displayed on a background of contrasting colour, or if a background of contrasting colour cannot be provided, have a dotted or solid outer boundary line; and

(c) The pictorial plate(s) shall adhere to the following samples (features of the pictorial plate(s) shall be in the appropriate scale as shown in the samples):

Or

6. **Operation, Housekeeping, Management, Security, Staff Training and Emergency Preparedness**

6.1 The licensee shall confirm in writing the receipt of the approved plans and the set of FSR issued by DFS for every application for new construction or alteration. (This requirement is only applicable to application(s) submitted by agents.)

6.2 An operation manual containing procedures in respect of the operation, housekeeping, management, security, emergency preparedness of the licensed store shall be provided for training and guidance to all operators of the store. The manual shall be stowed in a suitable place readily available for inspection upon demand, and the procedures contained in the manual shall **at least** include the following scopes:

(a) The operators shall only store in the licensed store, DG of the types and of the quantity not exceeding those specified in the licence. Storage of DG which are specified as incompatible in CoP is prohibited.

(b) The operators shall ensure that the DG are only used in the location(s) specified in the licence, and returned to the store when they are not in use.

(c) The operators shall not smoke, carry a lighted cigarette, cigar or pipe in the hazardous area of the licensed store.

(d) Except when access is required to the licensed store for the inspection, maintenance or handling of the DG in it, the operators shall ensure every entrance to it be at all times securely closed and locked.

(e) The operators shall ensure that no children below the age of 14 or no persons without obtaining licensee's permission enter or remain in the licensed store.

(f) The operators shall only use naked flame, flame or other source of substantial heat, or other means of igniting flammable substances or vapour in the hazardous area of the licensed store, on the condition that (A) prior approval of DFS has been obtained, or (B) the subject hazardous area has been certified free from flammable vapour after all DG have been removed from the store.

(g) Except with the approval granted in writing by DFS and the site separated from the licensed store by a fire resisting wall of the dimensions and construction as required by DFS, no forge, furnace or installation capable of fire ignition or of emitting source of substantial heat shall be sited by the operators in an area within the hazardous area, or within 6 m of the store.

(h) The operators shall only install electrical apparatus and the associated wirings in the hazardous area of the licensed store, after an application for these installations has been approved by DFS and these installations are in compliance with the standard specified in the above FSR.

(i) The operators shall not make any alteration or addition to the store that results in any deviation in any material particular from the latest plans approved by DFS if the alteration or addition has not been approved by DFS.

(j) The operators shall report immediately to FSD by dialing “999” any incident either inside the store or in its vicinity in relation to the DG, including but not limited to incident causing injury to any person, any explosion or fire or leakage of DG from the store.

(k) The operators shall have sufficient understanding on the nature and hazard of the DG stored in the licensed store, and adopt suitable measures, as far as practicable, to stem and handle any spill or leakage of DG promptly.