TECHNICAL REPORT

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Comparison of worldwide safety standards on lifts for firefighters

Comparaison des normes de sécurité sur le plan mondial relatives à la lutte contre l'incendie dans les ascenseurs

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

In exceptional circumstances, when a technical committee has collected data of a different kind from that which is normally published as an International Standard ("state of the art", for example), it may decide by a simple majority vote of its participating members to publish a Technical Report. A Technical Report is entirely informative in nature and does not have to be reviewed until the data it provides are considered to be no longer valid or useful.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO/TR 16765 was prepared by Technical Committee ISO/TC 178, *Lifts, escalators, passenger conveyors*.

Introduction

At the 1996 plenary meeting of ISO/TC 178 it was agreed via Resolution 136 that a comparison between CEN Standard EN 81-72 for firefighting lifts (elevators) and the national codes of Australia, USA, Canada, Japan and Russia, would be produced. This has in the meantime been extended to include the codes of China, Hong Kong, India (Mumbai), Korea, Malaysia, New Zealand, Singapore and Taiwan. The goal was to prepare a technical report which would provide reference information to assist national standards committees when reviewing and revising individual codes and which may initiate a gradual convergence of the technical requirements worldwide.

It was agreed by ISO/TC 178 that the comparison required the additional input of firefighting experts in WG 6.

The comparison includes reference to national lift (elevator) codes, fire codes and building regulations.

The content of this Technical Report is based on the information provided by the ISO/TC 178/WG 6 members.

This Technical Report is intended to aid standards writers in developing their firefighters lift (elevator) requirements and to help standards users understand the basis for the requirements as they are applied throughout the world.

This Technical Report must be read in conjunction with the various lift (elevator), fire and building codes, as it was often necessary to summarize the requirements for the sake of the comparisons. Further, the information contained in this Technical Report does not necessarily represent the opinions of the standards writing organization responsible for the developments of the safety standards which are being compared and they should be consulted regarding interpretations of their requirements.

This Technical Report will be used as a basis together with an appropriate risk assessment when preparing a global standard for firefighting and/or evacuation lifts (elevators).

Comparison of worldwide safety standards on lifts for firefighters

1 Scope

This Technical Report consists of a comparison of the requirements of selected topics as covered by worldwide safety standards from the following countries.

a) ASME

— ASME/ANSI A17.1, Safety codes for Elevators and Escalators (Edition 2000)

b) Australia

— SA – AS 1735: Lifts 1997

c) Canada

— CAN/CSA B44 Safety Codes for Elevators (Edition 1994 including supplement 2 – 1998)

d) CEN

— European Standard EN 81: Part 3 (Edition 2000)

e) China

f) Hong Kong

g) India

h) Japan

— BSLJ 34-2

— BSLJ-EO 129-13-3

— JISC 0920 (1971)

— JEAS A 505 (1988)

— JEAS D 401 (1995)

— JEAS A 504 (1989)

— Notification No. 2000 – 1428

i) Korea

j) Malaysia

k) New Zealand

l) Russia

— SNIP 2-01-97 Fire Safety of buildings NPB 250-97 Firefighting lifts – general technical requirements

m) Singapore

n) Taiwan

This Technical Report applies to electric traction lifts only, although some sections may also be applicable for positive drive lifts and other lifts suspended by rope or chain.

It should be noted that in addition to the above listed standards, lifts should conform to the requirements of other standards covering mechanical, structural and electrical equipment.

Section 1 includes:

— Europe (Based on EN 81-3)

— Australia

— Russia

— Japan

— USA

— Canada

Section 2 includes:

— China

— Hong Kong

— India

— Korea

— Malaysia

— New Zealand

Section 3 includes:

— Singapore

— Taiwan

2 Terminology

2.1 The term **lift** as used in the CEN standard (and in Russia Code, as written in the Russian language) is referred to as **elevator** in ASME and CSA standards and in the English translation of Russia code. These terms are used interchangeably in this Technical Report.

2.2 For the purposes of this Technical Report, unless otherwise specified, the term **passenger lift** and **freight lift** correspond to the terms used in other standards and shown in Table 1.

Table 1 — Corresponding terms used in European, USA, Canadian, Russian and Japanese standards

Terms used in this Technical Report	Correspond to terms used in the following standards				
	CEN	ASME	CSA	Russia	Japan
Passenger lift	Lift except non-commercial vehicle lift	Passenger elevator + Freight elevator permitted to carry passengers		Passenger + Passenger freight elevator	Passenger + Passenger freight elevator
Freight lift	Non-commercial vehicle lift with instructed users	Freight elevator		Attendant operated freight elevator	Freight elevator (cannot be used as firefighting lift)
Firefighting lift	Special lift for normal use with special firefighter requirements	Every passenger lift for normal use, all with special firefighter requirements	Special firefighter elevator for normal use with special firefighter requirements	as CEN	Special lift for normal use with special firefighter requirements

Annex A
(informative)

Comparison of fire codes

Section 1 includes: Europe, Australia, Russia, Japan, USA, Canada

Section 2 includes: China, Hong Kong, India, Korea, Malaysia, New Zealand

Section 3 includes: Singapore, Taiwan

Section 1		EN 81-72	Australia	Russia	Japan	USA	Canada
1	**Building requirements**						
1.1	**Do you have harmonized building requirements?**	No Country specific	Yes Building code of Australia, being revised	Yes Construction norms and regulations of RF SNIP 21.01.97 “Fire safety of buildings” Items 8.1, 8.10	Yes BSLJ 34-2 BSLJ-EO 129-13-3	Yes Local codes by state/city typically based on one of 3 model-building codes. Numerous local variations	Yes A17/B44 harmonized codes and National building code of Canada
	Is a protected lobby in front of FF lift required?	Yes. New proposal to EU is already used in several countries e.g. UK, France etc.	No. Currently being considered	Guarded lift hall is required. (Fire safety norms “firefighting lifts). General technical requirements” NPB 250-97 Item 5.2.4	Yes BSLJ-EO 129-13-3-(3)	Sometimes, depending on the local building code requirements NOTE – A single, special firefighters' lift is not permitted and/or acceptable. All lifts must have fire fighter's service.	Yes. 45 min rating
1.2	**Above what building height (m) is an FFL necessary for**					.	
a)	firefighting?	18 m – 30 m	25 m	FFL shall be placed in buildings of more than 28 m in height with the purpose of firefighting and rescuing (non evacuation). SNIP 21.1.97 Item 8.10	31 m (BSLJ 34-2)	All lifts required to have Firefighters’ Service	18 m (Residential) 36 m (other occupancies)
b)	evacuation?	N/A	No specification		Not required BSLJ-EO 129-13-3-(2)	All lifts can be used on phase 2 for evacuation. See Note 1 and response to 3.3	N/A

Section 1		EN 81-72	Australia	Russia	Japan	USA	Canada
1.3	**Is smoke control required in**			Yes. Lift hoistways for firemen, as well as their lift halls in the sub-basements and basements of buildings shall be equipped with autonomous systems of inflow anti-fire ventilation for the creation of an excessive pressure at fire. NPB 250-97 Item 5.2.6			
a)	lift well?	Some countries	AS/NZS1668/1		Not required	Varies by local building code requirements	No
b)	lobby?	Some countries			Yes BSLJ-EO 129-13-3-(2)	Varies by local building code requirements	No
1.4	**Does the building design reduce water flowing into lift well during a fire?**	Yes Drainage in lobby. Protection to lift, drainage in lift pit. Building regulations	No	Yes There is a general requirement: "Penetration of water used for firefighting, in hoistways and machine rooms of lifts for firemen shall be prevented by building means and activities" NPB 250-57	Yes JEAS-A505 (88-Mar.)	No ASME A17.1 current and proposed requirements have taken into account water from fire fighting, e.g. water accumulation in pit due to sprinkler.	Pit drainage
1.5	**Can lifts other than FFL be used for evacuation?**	Country specific Special lifts for handicapped persons	No	No Code for the design and safe operation of elevators (PUBEL)	No	See response to 1.2 and 1.11. Model building codes require a minimum of one stretcher size car in high-rise buildings. They are required to accommodate an ambulance type stretcher (1 930 mm x 610 mm) in the horizontal position.	No
1.6	**Can lifts with partial well enclosures be used as FFLs?**	No	No	No specification	No	Yes and see Note 1	No

Section 1		EN 81-72	Australia	Russia	Japan	USA	Canada
1.7	**Can FFLs be part of a group?** If yes:	Yes	Yes	Yes. NPB 250-97 Item 5.1.3	Yes	Yes and see Note 1	Yes
a)	What are maximum number of lifts in one well?	Any (France 3)	No limit	No specification	Two — both lifts in one well shall be FFLs BSJL-EO 129-13-3-(4)	Varies with local building code, but never more than 4	No specification
b)	Must there be a solid dividing wall between FFL and rest of lifts in a common well?	Optional Subject to local building	No Was required in previous building code	FF2 is allowed to be placed in the common hoistway with other lifts. NPB 250-97 Item 5.1.7	Yes	NA. See Note 1	No
1.8	**Applicability of FFLs in a building**		Over 25 m	No specification	BSLJ-EO 129-13-3-(2)	See Note 1	
a)	single elevator	Yes		.	Yes		Yes — required
b)	multiple (group) elevators	Yes			Yes		Yes — permitted
c)	all elevators in a building	No			Yes		No
1.9	**What is maximum working temperature?**			No specification			No specification
a)	In machine room	40 °C	43 °C	.	Not required	As defined by lift manufacturer	
b)	In lift well	40 °C	No specification		Not required	Not defined	
c)	On lobby side of landing doors	65 °C	No specification		Not required	Not defined	
1.10	**What is the maximum time(s) for FFL to travel from fire service access level to top floor with normal power?**	60 s.	No specification	$\leqslant$ 60 s NPB 250-97 Item 4.2	About 60 s (not required) BSJL-EO 129-13-3-(11)	Not defined	60 s — Normal or emergency power
1.11	**Must a <u>single</u> FFL serve all floors of a building including those with sky lobbies?**	Yes	No Every floor must be served by two lifts	No specification	Yes BSJL-EO 129-13-3-(3)-1 Not required to serve floors where firefighting service is not necessary.	Model building codes require lift service to all floors in high-rise buildings. This may be provided by more than one lift. See Note 1.	No — one change allowed

Section 1		EN 81-72	Australia	Russia	Japan	USA	Canada
1.12	**What fire test code is used for lift landing doors?** Define the following:	EN 81-72 Based on concept of hot flow of gases	AS1735-11, AS1530-4	GOST 30247.2-97 "Elements of Building Construction. Fire Resistance Test Method / Doors and Gate".	Not required	UL 10B	CAN4-S104-M80 (R1985)
a)	Maximum temperature			T max = 330 °C		978 °C	978 °C
b)	Minimum temperature			T average = 280 °C		No specification	No specification
c)	Duration		1 h	1 h		1 1/2 h typical	1 1/2 h typical
d)	Door side exposed to flame	Landing	Landing	The door experiences flame effects on the side of the lift hall		Lobby side passenger lift hoistway side freight lift	Landing side – pass Hoistway side – freight
e)	Pressure:			Pressure in the process of testing		Natural pressure at top of door	No specification
	i) Positive	Yes		Positive on the height or 2/3 of the height of the door opening — (10 ± 2) Pa			
	ii) Negative						
f)	Interlock functional		No specification	No specification		No specification	
	i) Duration	N/A					1 h
g)	Hose steam pressure			No specification			
	i) Steam pressure	No	No specification			207 kPa	205 kPa
	ii) Duration	No	No specification			10 s/m^2	97 s/10 m^2
h)	Labels of certification	Yes	Yes	No specification		Yes	ULC
1.13	**Do lift landing doors of FFLs have to be thermally insulated?**	No	No	Yes NPB 250 -97 Item 5.1.7	Not required	No	No
1.14	**What is minimum fire rating (minutes) of lift landing doors for FFLs?**	30 min	60 FRL Fire resistance level	60 min Ei 60. NPB 250-97 Item 5.1.7	Not required	As required by building code. See Note 1 and response to 1.12	1 h
1.15	**Do the doors resist smoke penetration?**	No	No specification to do so		No BSLJ-EO 129-13-3-(3)	No	No

Section 1		EN 81-72	Australia	Russia	Japan	USA	Canada
1.16	**Are liquid base sprinklers allowed?**		Sprinkler code AS 2118	NPB 250-97 Item 5.2.8	Yes		
a)	In the machine room	No	Dry head only	No specification	Not stipulated	Yes. Typically required by building code	Yes
b)	In the HW top	No	Yes	No specification	Not stipulated	Yes. Though typically not provided	No
c)	In the lift lobby	No	Yes	No water sprinklers are required in the lift hall.	Yes	Yes. Typically required by building code	Yes
d)	In the HW pit	No	Yes	No specification	Not stipulated	Yes. Typically required by building code	Yes
2	**Firefighting lift (elevator) basic requirements**						
2.1	**What is minimum rated load (kg)?**	630 kg	600 kg When travel is over 75 m	Minimum load capacity is: 630 kg in residential buildings 1 000 kg in other buildings NPB 250-97 Item 4.2	1 150 kg Notification No.1971-112 BSLJ-EO 129-13-3-(6) JIS A 4301-1983	See Note 1 and response to 1.5	900 kg
2.2	**What are minimum car sizes (mm)?**			For residential buildings / For other buildings	BSLJ-EO 129-13-3-(6) JIS A 4301-1983		
a)	Internal width	1 100 mm		1 100 mm / 2 100 mm / 1 600 mm	1 800 mm	2 000 mm. See Note 1 and response to 1.5	2,2 m^2 useable platform area
b)	Internal depth	1 400 mm		2 100 mm / 1 100 mm / 1 400 mm	1 500 mm	1 400 mm. See Note 1 and response to 1.5	
c)	Internal height	2 100 mm		2 100 mm	2 300 mm	2 100 mm (2 030 mm A17.1). See Note 1	2 025 mm
2.3	**What are minimum entrance sizes (mm)?**		For emergency lifts		BSLJ-EO 129-13-3-(6) JIS A 4301-1983	The entrance specified is required to be side opening. A centre opening entrance will require increased car depth.	
a)	Width	800 mm	1 300 mm	800 mm	1 000 mm	1 100 mm. See Note 1 and response to 1.5	800 mm
b)	Height	2 000 mm	2 100 mm	2 000 mm	2 100 mm	2 100 mm. See Note 1 and response to 1.5	2 030 mm

Section 1		EN 81-72	Australia	Russia	Japan	USA	Canada
2.4	**Can the FFL car have decorative finishes?**	Yes	Yes	Yes	No	Yes	Yes (specified in NBCC)
	If yes, to what standard?	Various There is no harmonization in Europe. At present only national standards exist. CEN/TC127 is preparing a draft European standard	AS1735 Part 2	- Group of combustibility GOST 30244I2 - Group of inflammability GOST 30402 -B2 - Group of smoke-formation ability GOST 12.1.044 Item 4.18 - I3 - Group of toxic strength at burning GOST 12.1.044 Item 4.20 - T2	Notification No. 2000-1428	Walls and ceilings ASTM E84 flame spread index 0 -75; smoke development 0-450 Floor covering ASTM E648 critical radiant flux not less than 0,45 W/cm^2	Flame spread — walls/ceilings – 25 Floor – 300 Smoke development — walls/ceilings – 100 Floor 300
2.5	**Does the lift car have:**						
a)	an emergency roof trap door?	Yes	Yes	Emergency trap is available NPB 250-97 Item 5.1.8	Yes BSLJ-EO 129-6-(4) Notification No. 2000-1413-1-(1)	Yes, except in unenclosed shafts and see Note 1	Yes
	If yes:						
	i) is rescue of trapped persons from outside?	Yes	Yes	Yes PUBEL Item 2.20	Yes BSLJ-EO 129-6-(4)	Not specified	Yes
	ii) is self-rescue from inside for FFLs?	Yes	Yes		No BSLJ-EO 129-6-(4)	Not specified	No
	iii) What is minimum size (mm)	500 mm × 700 mm (630 kg: 400 × 500)	Min. 0,25 m^2	500 × 700 GOST 22011	400 mm (0,2 m^2) BSLJ-EO 129-6-(4)	400 mm × 650 mm	400 mm (0,26 m^2)
b)	Is an emergency side door allowed?	Yes. Not usual in Europe	No	Permitted PUBEL Item 5.5.24	No BSLJ-EO 129-6-(4)	Yes	No in harmonized code currently permitted in B44

Section 1		EN 81-72	Australia	Russia	Japan	USA	Canada
2.6	**Is the electrical equipment protected against splashing water entering the HW?**	Yes Up to 1 m from front of elevator shaft wall	No	No specification	Yes JEAS-A505 (88-Mar.)	No. See response to 1.4	No
	If yes:						
a)	To what IPXX rating?	IPX3 or if immersed in water IP67			IP 21 or IP 22 JIS C 0920-1971		
b)	Where is protection?		Supply mains				
	i) on the car	Yes IPX3			Yes JIS C 0920-1971		
	ii) on the landing doors	Yes IPX3			Yes		
	iii) in the pit	Yes			Yes		
	iv) for the buttons	Yes			Yes		
	v) for the indicators	Yes			Yes		
2.7	**Do FFLs always have power-operated automatic coupled sliding car and landing doors?**	Yes	Yes	Yes NPB 250-97 Item 5.1.6	Yes	No and see Note 1	No
2.8	**Can FFLs also be used for moving goods (freight)?**			No specification		Yes and see Note 1	Yes
a)	As a single lift in a residential building	No	Yes	.	Yes (Freight elevator cannot be used as firefighting lift)	See Note 1	Yes
b)	As part of a group installation	No	Yes		Yes	See Note 1	Yes
2.9	**Can the machine room be located**			No specification	BSLJ-EO 129-13-3-(1) JEAS-D401 (95 Aug.)		
a)	above the HW?	Yes	Yes		Yes	Yes	Yes
b)	under the pit?	Not specified	Yes		No	Yes	Yes
c)	at the side of well?	Yes	Yes		Yes	Yes	Yes
d)	remote from well, e.g. hydraulic?	Yes	Yes (special)		No	Yes	Yes

Section 1		EN 81-72	Australia	Russia	Japan	USA	Canada
2.10	**What FFL drives are allowed?** e.g.			No specification		Any drive permitted by ASME A17.1 for normal operation	No specification
a)	Electric traction	Yes	Yes		Yes BSLJ-EO 129-13-3-(1)		
b)	Hydraulic	Yes	Yes		No JEAS-D401 (95-Aug)		
c)	Rack and pinion/screw	Yes	Yes		No JAS-D401 (95-Aug)		
d)	Other		Yes, drum				
2.11	**Are FFLs without machine rooms allowed?**	Lifts without machine rooms are currently under review by the CEN/TC10/WG1 safety committee	Yes On some new units but has not been considered by code committee	No specification	No. Notification No. 2000-1413-1-(4)	Lifts without machine rooms are not currently addressed in ASME A17.1.	No specification
3.0	**Control system**						
3.1	**Is there a phase 1 recall FFL switch?**	Yes		No	Yes	Yes	Yes
a)	On fire service access level (FSAF)?	Yes	Yes		No BSLJ-EO 129-13-3-(7) The FSAF or floor immediately above or below the said FSAF (FSAF = escape floor in Japan)	Yes. In lobby and fire command station when required by building code	Yes (recall level)
b)	In the FFL car phase 2?	Some countries	Yes		Yes	Only phase 2 switch in car	Yes
c)	Key switch or manual toggle switch?	Triangular key switch	Switch		No Covered push *button for elevator lobby JEAS-D401 (95-Aug) (*same as fire alarm button)	Keyed	Key switch
3.2	**Is it required for FFL be recalled automatically by the fire alarm?**	Some countries	No	Yes NPB 250-97 Item 6.4.1	No	Fire alarm initiating devices, typically smoke detectors in lift lobby, machine room and hoistway	No

Section 1		EN 81-72	Australia	Russia	Japan	USA	Canada
3.3	**If the FFL is part of a group:**						
a)	Do all lifts in-group return to FSAF?	Not specified	Yes	Yes. Lift doors shall be kept on NPB 250-97.	No. Only FFL is required, BSLJ-EO 129-13-3-(7) but JEAS forces other lifts to return	Yes and see Note 1	Yes
	If yes, do doors remain open?	Not specified	Yes		FFL — Yes JEAS-D401 (95-Aug) Others — No JEAS-D401 (95-Aug)	Yes.	Yes
b)	Do the other lifts in the group have an FFL control system?	No		Other lifts in the group feature the operation mode of return on the firemen's entrance floor in the building and do not have the operation mode of transportation of fire squads.		.	
	i) Phase 1		Yes		No code requirement but JEAS forces to recall	Yes and see Note 1	Yes
	ii) Phase 2				No	Yes and see Note 1	Yes
	If yes:	N/A				.	
	can they also be used for evacuation?		Yes under control of firefighter		Manual operation by building manager JEAS-D401 (95-Aug)	Lifts are not specifically designed for evacuation. All are at the disposal of the fire authority for use at their discretion on phase 2.	No Specification
	should they have the same requirements as FFL?		No			Not specified	No Specification
3.4	**Are dual entry front and rear entrance doors allowed?** (Application large main lobbies/atriums etc.)	Yes	Yes	No specification	Yes	Yes.	Yes

Section 1		EN 81-72	Australia	Russia	Japan	USA	Canada
3.5	**When on phase 2 use under firefighters control**						
a)	Are all landing buttons inoperative and		Yes	The FFL design does not permit the use of apparatus and devices experiencing harmful effects of smoke and increased temperature.		Yes.	
	i) isolated from short circuits due to water?	Yes	No		Yes JEAS-D401 (89-Mar) and A505 (89-Mar)	No Yes, for next edition of ASME A17.1	Yes
	ii) isolated from short circuits due to smoke?	Yes	No	NPB 250-97 Item 6.8		No Yes, for next edition of ASME A17.1	Yes — any reason
	iii) isolated from short circuits due to heat?	Yes	No		No	No Yes, for next edition of ASME A17.1	
b)	Does door open button remain operative?	Yes	Yes	Door opening button shall remain inoperative.	Yes JEAS-D401 (95-Aug)	Yes	Yes
c)	Are door safety devices over-bridged if affected by heat or smoke?	Yes	Yes	See 3.5.1	Yes JEAS-D401	Interlocks and car door contacts are never bypassed. Reopening devices are bypassed.	Yes — all devices
d)	Does the FFL operate separately from a group?	Yes	Yes	Yes	Yes	No	Yes
e)	Is there a separate fire service communication system between FSAL, lift car and machine room?	Yes	FSAL or control room to car — Recommendation only machine room No.	Voice communication link between the lift car, the firemen's entrance floor in the building and the centre for fire defence is available.	No. Only required between car and central control room BSLJ-EO 129-13-3-(8)	Model building code requires this for lifts in high rise buildings.	High buildings require 2-way communications between car and control facility
	If yes, what type?			The design of the communication system is not regulated.			
	i) Jacking red phone	No					
	ii) Mobile phone	No		NPB 250-97 Item 6.10			
	iii) Intercom	Yes					
	iv) Other, please specify						

Section 1		EN 81-72	Australia	Russia	Japan	USA	Canada
3.6	**Firefighting lift operation phase 2**						
a)	Is constant pressure on car destination floor button until doors have closed required?	No	No key switch	Yes.	Yes JEAS-D401 (95-Aug)	Yes	No — constant pressure door close button
b)	Can additional car floor call be made while car is in motion?	Yes	Yes	No specification	Yes. But once FFL stops at nearest floor, other car call will be cancelled	Yes.	Yes
c)	Is there provision to cancel registered car call?	Yes, if not in slow down zone	No specification Only when car stops at floor	Yes	Yes. Once FFL stops, including emergency stop, registered car call will be cancelled	Yes.	Yes
d)	When car arrives at floor, do doors remain closed until door open button is pressed?	Yes	Yes	Yes	Yes JEAS-D401 (95-Aug)	Yes.	Yes
e)	Does it require constant pressure on the door open button until doors are fully open?	Yes	Yes	Yes	No	Yes.	Yes
f)	Is constant pressure of a door close button required for closing the door?	No	By use of a key switch	Yes	No By constant pressure of a car call button	Yes.	Yes
g)	Is there a car call registered indicator in the car?	Yes	No specification	Yes	No specification (normally yes)	Not specified. Typically found as required by accessibility regulations	No specification
h)	Is there a car position indicator in		.	Car position indicator is available in the car and on the entrance floor of the building NPB 250-97 item 6.9		Not specified. Typically found as required by accessibility regulations Specified by model building codes in fire command station in high rise buildings	No specification
	i) Car?	Yes	Yes		No specification (normally yes)	.	
	ii) The FSAF?	Yes	No specification		Yes. (All floor need) JEAS-D401 BSLJ-EO 129-13-3-(3)-9		

Section 1		EN 81-72	Australia	Russia	Japan	USA	Canada
4.0	**Emergency/Standby power**						
a)	Is an emergency standby power system always required for FFL?	Yes	No	Yes NOB 250-97 Item 6.11	Yes BSLJ-EO 129-13-3-(10)	Building code requirement. Model building codes require in high-rise buildings. See Note 1.	Yes
b)	Can it power the FFL at rated load and speed?	Yes	No specification	No specification	Yes BSLJ-EO 129-14-3-(10) JEAS-A504	Yes	Yes
	i) Is it large enough to return all lifts in-group to FSAF?	Not specified	No specification		No specification	No specification	Yes
	ii) If yes, can operation be staggered?	Not specified	No specification			Yes	Yes
c)	Must it be capable of running additional lifts on phase 2? If yes, how many?	Yes The largest lift in group at rated load and speed	No specification	No	No specification	See response to 1.11	Yes — One, unless staggered recall is < 5 min for all lifts
d)	Must emergency power source be a generator? If not what other system?	No Second independent supply from a sub station	No specification	No specification	Yes BSLJ-EO 129-13-3-(10)	Building code requirement	No specification
e)	What is time (seconds) for the emergency power system to be in operation?		No specification	⩽ 0,5 s Code for the design of electrical devices PUE, 1998, Item 3.3.40	JEAS-A504	Building code requirement. Time dependent on building occupancy and whether its standby or emergency power may be anywhere from 10 s to 60 s.	
	i) Minimum	Not specified			No specification		2 h
	ii) Maximum	Not specified			No specification		No specification
f)	Must the position of the lift be stored		No specification	No specification			
	i) On loss of power?	Not specified	Preferred		No specification	No	No
	ii) On restoration of normal power?	Not specified			No specification	No	No

Section 1		EN 81-72	Australia	Russia	Japan	USA	Canada
	If no:						
	i) How long is it allowed to find its next floor level?	Time to establish emergency power plus time to establish position in well	No specification		No specification	Not specified. Allowed to move to any terminal to re-establish position	No specification
	ii) Must the correction travel journey automatically (if needed) be towards the FSAF?	Yes (only a correction journey of two floors is allowed)	No specification		No specification	Not specified	No
g)	When emergency/standby power is operational and the doors are closed should phase 1 be automatically repeated?	No	No specification	No specification	Yes	Phase 1 operation remains in effect	Yes — except when on attendant, inspection or phase 2 operation
h)	When doors are fully open do they stay open when power is restored?	Not specified	Should do	No specification	No specification (normally yes)	Firefighters' service operation same as required on normal power	Yes
5	**Signals, fixtures, buttons, notices, etc.**						
a)	Can the car controls be operated using firefighters' gloves?	Not specified	No specification	No specification	No specification (normally yes)	Not specified	No specification
b)	Are smoke- or heat-sensitive buttons prohibited (e.g. touch buttons)		No specification	Yes See 3.5.1			No specification
	i) in the lift car?	Yes			Yes JEAS-D401 (95 Aug)	Not specified	
	ii) on the landing?	Yes			Yes	Not specified	
c)	Are the car buttons protected against water?	Yes IP33	No	No specification	Yes	No	No
d)	Are the landing buttons and indicators protected against short circuit and earthing?	Yes	No	Yes Code for the design of electrical devices (PUE)	Yes	No. Yes for next edition of ASME A17.1	Yes

Section 1		EN 81-72	Australia	Russia	Japan	USA	Canada
	Are FFLs required to be identified by		No			No and see Note 1	
	i) sign?	Yes		Yes, a special sign NPB 160-97 Item 14	Yes BSLJ-EO 129-13-3-(3)-9 JEAS-D401 (95 Aug)		Yes
	ii) notice?						No
6	**Operational Test**						
a)	Are there handover acceptance tests for FFLs?	Yes	Yes	Yes NPB 250-97 Item 7.8	Yes	Yes	Yes (Determined by provincial jurisdiction)
b)	Is an officially signed test certificate necessary?		Yes Under some local authorities	Yes PUBEL	Yes	Determined by local regulations. Not separate from general lift certificate	Yes (Determined by provincial jurisdiction)
c)	Are there periodic tests for FFLs after initial handover?	Subject to national regulations	Yes	Yes NPB 350-97 Item 7.8 PUBEL		Yes	Yes (Determined by provincial jurisdiction)
	If yes:						
	i) how often? (months)			At least once a year	Predetermined period between 6 months and 1 year. (Period determined by local authorities (mostly 1 year)	30 days, 6 months and 12 months	Yes (Determined by provincial jurisdiction)
	ii) is it a full or partial test as in (1)?			Partial	Partial test	Operational (30 days), partial (6 months) and full (yearly)	Full
7	**Firefighting concepts**						
	Is there an official firefighter's concept/method for fighting fires in buildings using FFLs?	Yes	Yes Different in some states of Australia	No specification	No, there is no officially written concept.	Yes by jurisdiction	Varies by jurisdiction
	If yes, please submit details as a separate report	See draft CEN Standard					

Section 1		EN 81-72	Australia	Russia	Japan	USA	Canada
8	**Evacuation concepts**						
	Is there an official evacuation concept/method for buildings using lifts? If yes, please submit details as a separate report	No	Yes, but does not include lifts.	No specification	No — Lift is not allowed to be used for evacuation.	Yes by jurisdiction	No
9	**Other items not listed above (please give details)**						
			Are door facings glued in place? Are door operators using belt drive? What is location of travelling cables with respect to door Is there a means of removing water from pit? Are the doors' coupling rollers on the landing door panels? Where is the controller located?			Copy of draft ASME A17.1-1999 attached	Alternate floor recall operation Automatic recall operation by machine room smoke sensors

Section 2		China	Hong Kong	India	Korea	Malaysia	New Zealand
1	**Building requirements**						
1.1	**Do you have harmonized building requirements?**	Yes, but sometimes local laws as well GB50045-95 is code for FFL in high rise buildings.	Yes		Yes	Yes – Malaysian uniform By-law 1984 Act 133	Yes
	Is a protected lobby in front of FF lift required?	Yes	Yes		Yes	Optional – if not provided FF1 to in separate well	No
1.2	**Above what building height (m) is an FFL necessary for**						
a)	firefighting?	32 m public building 19 floors residential			31 m		15 m
b)	evacuation?	No specification			Not required		No specification
1.3	**Is smoke control required in**						
a)	lift well?	No specification			Not required	No	AS/NZ 1668/1
b)	lobby?	Yes			Yes	No	
1.4	**Does the building design reduce water flowing into lift well during a fire?**	Yes Floor to slope up towards L/D			Yes		No specification
1.5	**Can lifts other than FFL be used for evacuation?**	No			No		No
1.6	**Can lifts with partial well enclosures be used as FFLs?**	No specification			No		Yes
1.7	**Can FFLs be part of a group?** If yes:	Yes			Yes		Yes
a)	What is maximum number of lifts in one well?	One			No limit		No limit
b)	Must there be a solid dividing wall between FFL and rest of lifts in a common well?	Yes			Yes	Yes — If entire lift shaft is not within fire protected lobbies.	No

Section 2		China	Hong Kong	India	Korea	Malaysia	New Zealand
1.8	**Applicability of FFLs in a building:**						
	i) Single elevator	Yes			Yes	Yes	
	ii) Multiple (group) elevators	1, FFL			Yes	1 per group	
	iii) All elevators in a building	In different FF areas			Yes	No	Over 15 m rise
1.9	**What is maximum working temperature?**						
a)	In machine room	40 °C			No specification		Sprinkler buildings only
b)	In lift well	No specification			No specification		11 °C above sprinkler maximum
c)	On lobby side of landing doors	No specification			No specification		11 °C above sprinkler maximum
1.10	**What is the maximum time(s) for FFL to travel from fire service access level to top floor with normal power?**	60 s		60 s or 1,5 m/s whichever is less	Around 60 ⩽	60 ⩽	No specification
1.11	**Must a <u>single</u> FFL serve all floors of a building including those with sky lobbies?**	Yes			Yes	Yes — Must service all floors at command of car calls in fire mode	No specification
1.12	**What fire test code is used for lift landing doors?**	GB 7588	BS 476 20 and 22		Not required	BS 476 – 20 and 22	AS 1530.4 or BS 476 20 and 22
	Define the following:	No enforced					
a)	Maximum temperature	N/A			No specification		
b)	Minimum temperature	N/A			No specification		
c)	Duration	N/A	1 h	1 h	No specification	1 h	1 h
d)	Door side exposed to flame	N/A	Landing		No specification	Landing	Landing
e)	Pressure:		8,5 Pa/m height. Maximum at top 20 Pa		No specification	8,5 Pa/m height. Maximum at top 20 Pa	> 8 Pa top 2/3 or as BS 476 of specimen
	i) Positive						
	ii) Negative						
f)	Interlock functional	No specification	No specification		No specification	No specification	No specification
	i) Duration						

Section 2		China	Hong Kong	India	Korea	Malaysia	New Zealand
	Hose steam pressure	No specification	No specification		No specification	No specification	No specification
	i) Steam pressure	No specification	No specification				
	ii) Duration	No specification	No specification		No specification	No specification	No specification
g)	Labels of certification						Yes
1.13	**Do lift landing doors of FFL's have to be thermally insulated?**	No			No	No	No
1.14	**What is minimum fire rating (minutes) of lift landing doors for FFLs?**	Not applicable Not enforced		60 min	Not required	60 min	60 min
1.15	**Do the doors resist smoke penetration?**	No specification			No	No	No specification
1.16	**Are liquid base sprinklers allowed**	GB7588					
a)	in the machine room?	No			No specification		Yes
b)	in the HW top?	No specification			No specification		Yes
c)	in the lift lobby?	Yes			Yes		Yes
d)	in the HW pit?	No specification			No specification		No specification
2	**Firefighting lift (elevator) basic requirements**						
2.1	**What is minimum rated load (kg)?**	> 800 kg in GB50045 > 630 kg in GB7588		> 544 kg	No specification	> 545 kg	No specification
2.2	**What are minimum car sizes (mm)?**	1,4 m^2 (GB7588)			No specification		No specification
a)	Internal width			Minimum floor area		Minimum floor area	
b)	Internal depth			1,45 m^2		1,45 m^2	
c)	Internal height			No specification		2 000	
2.3	**What are minimum entrance sizes (mm)?**	800 mm					No specification
a)	Width			No specification	No specification	800	
b)	Height			No specification	No specification	2 000	
2.4	**Can the FFL car have decorative finishes?**	Yes			Yes		Yes
	If yes, to what standard?	Fire proof material			Fire proof material		No specification

Section 2		China	Hong Kong	India	Korea	Malaysia	New Zealand
2.5	**Does the lift car have**						
a)	an emergency roof trap door? If yes:	Optional			Yes		NZS4332 Yes
	i) Is rescue of trapped persons from outside?	Yes, if fitted			Yes		Yes
	ii) Is self-rescue from inside for FFLs?	Yes, if fitted			No		No
	iii) What is minimum size (mm)?	If fitted 0,12 m^2 one side min. 250 mm			One side min 400 mm (minimum 0,2 m^2)		350 mm × 500 mm
b)	Is an emergency side door allowed?	Yes, optional			Yes		Not in the revised code Yes in the existing code
2.6	**Is the electrical equipment protected against splashing water entering the HW?**	Only power and control cables should be waterproof.			No		No
	If yes:						
a)	To what IPXX rating?	No specification					
b)	Wwhere is protection?	No specification					
	i) on the car						
	ii) on the landing doors						
	iii) in the pit						
	iv) for the buttons						
	v) for the indicators	Power and control cables					
2.7	**Do FFLs always have power-operated automatic coupled sliding car and landing doors?**	No specification		Yes	No	Yes	Yes

Section 2		China	Hong Kong	India	Korea	Malaysia	New Zealand
2.8	**Can FFLs also be used for moving goods (freight)?**						
a)	As a single lift in a residential building?	Yes			Yes		Yes
b)	As part of a group installation?	Yes			Yes		Yes
2.9	**Can the machine room be located**						
a)	above the HW?	Yes			Yes	Yes	Yes
b)	under the pit?	No			No		Yes
c)	at the side of well?	Yes			Yes	Yes	Yes
d)	remote from well e.g. hydraulic?	Yes					Yes
2.10	**What FFL drives are allowed?** e.g.						
a)	Electric traction	Yes			Yes	Yes	Yes
b)	Hydraulic	Yes			Yes	Yes	Yes
c)	Rack and pinion/screw				No		Yes
d)	Other	Yes, drum			Yes drum		No specification
2.11	**Are FFLs without machine-rooms allowed?**	Yes by exception			No specification		Yes
3.0	**Control system**						
3.1	**Is there a phase 1 recall FFL switch?**		Yes				
a)	On fire service access level (FSAF)?	Yes and/or central control room	Yes		Yes	Yes – Two mechanical latched switches marked “ON” (green) and “OFF” (red)	Yes – 2 position switch
b)	In the FFL car phase 2?	No	Yes		Yes three position key switch; off; fireman 1; fireman 2 spring loaded key switch	No	No
c)	Key switch or manual toggle switch?	Button or toggle behind glass	Toggle switch in lobby behind glass cover on red and white background				Key switch

Section 2		China	Hong Kong	India	Korea	Malaysia	New Zealand
3.2	**Is it required for FFL to be recalled automatically by the fire alarm?**	Yes	Yes to FASF or alternate service level (ASL) if fire on FASF		No	Yes	No
3.3	**If the FFL is part of a group:**		Yes		Yes		
a)	Do all lifts in-group return to FSAF?	Yes	Yes		Yes – photo cell on door, emergency stop switch in car and load weighing device made inoperative	Yes – without stopping, lifts travelling away from FSAF will stop at next floor and return to FSAF without opening door	Yes. A sign "Lift returning to main floor" shall be illuminated in car
	If yes, do doors remain open?	Yes	Yes, may close after between 12 s and 20 s		Yes	Yes – non-FFLs also required to switch off lights and ventilation.	Yes
b)	Do the other lifts in the group have an FFL control system?					No – non-FFL car and car and landing buttons inoperative	Yes
	i) Phase 1	No			Yes		Yes
	ii) Phase 2	No			Yes		Yes
	If yes:						
	i) Can they also be used for evacuation?	No			Not required		No
	ii) Should they have the same requirements as FFL?				Yes		Yes
3.4	**Are dual entry front and rear entrance doors allowed?** (Application large main lobbies/atriums etc.)	Yes			Yes, but may not be opened at the same time.		Yes

Section 2		China	Hong Kong	India	Korea	Malaysia	New Zealand
3.5	**When on phase 2 use under firefighters control**						
a)	Are all landing buttons inoperative and	Yes	Yes, also in phase 1		Yes	Yes	Yes
	i) isolated from short circuits due to water?	No	For any short of hall buttons operation of lift shall not be affected.		No		No
	ii) isolated from short circuits due to smoke?	No			No	.	No
	iii) isolated from short circuits due to heat?	No			No		No
b)	Does door-open button remain operative?	Yes	Yes		Yes	Yes — requires constant pressure while opening	Yes
c)	Are door safety devices over-bridged if affected by heat or smoke?	Yes	No		Yes, even safety shoes are deactivated.	Yes	All door safety device are rendered inoperative.
d)	Does the FFL operate separately from a group?	Yes, when in phase 1			Yes	Yes	Yes on phase 2
e)	Is there a separate fire service communication system between FSAL, lift car and machine room?	Yes intercom system			No	Yes — between car and fire control room or lift machine room	No
	If yes, what type?	To FSAI					
	i) Jacking red phone						
	ii) Mobile phone						
	iii) Intercom	Yes				Yes — two way	
	iv) Other, please specify						

Section 2		China	Hong Kong	India	Korea	Malaysia	New Zealand
3.6	**Firefighting lift operation phase 2**				See section 9 for fireman 2 operation		
a)	Is constant pressure on car destination floor button required until doors have closed?	Yes	Yes or constant press on door-close button		Yes	Yes or door close button	Constant pressure required on door close button
b)	Can additional car floor call be made while car is in motion?		Any car calls are cancelled when car reaches nearest floor corresponding to car call.		Yes — one only	Yes — car will stop at nearest floor in direction of travel and when all other car calls are cancelled.	Yes
c)	Is there provision to cancel registered car call?	No specification			All car calls are cancelled when car stops, including emergency stop.		When car reaches first stop all car calls are cancelled.
d)	When car arrives at floor, do doors remain closed until door open button is pressed?	No specification (depends on source of lift supplier)	Yes		Yes	Yes	Yes
e)	Does it require constant pressure on the door open button until doors are fully open?	No specification	Yes		Yes	Yes	Yes
f)	Is constant pressure of a door close button required for closing the door?	By use of key switch	Yes		Yes	Yes	Yes
g)	Is there a car call registered indicator in the car?	No specification				Yes	Yes
h)	Is there a car position indicator in	No specification					
	i) car?	No specification – normally supply	Yes			Yes	Yes
	ii) the FSAF?	No specification	Yes			Yes	No

	Section 2	China	Hong Kong	India	Korea	Malaysia	New Zealand
4.O	**Emergency/Standby power**						
a)	Is an emergency standby power system always required for FFL?	No			Yes	Yes – in buildings scheduled by the act	No
b)	Can it power the FFL at rated load and speed?	No specification			Yes	Yes	
	i) Is it large enough to return all lifts in-group to FSAF?	No specification			No specification	All FFLs and one other lift which is nearest to the lobby	
	ii) If yes, can operation be staggered?	No specification			No specification	Yes	
c)	Must it be capable of running additional lifts on phase 2? If yes, how many?	No specification			No specification	All FFLs	
d)	Must emergency power source be a generator? If not what other system?	No specification			Yes	Yes – scheduled buildings	
e)	What is time (s) for the emergency power system to be in operation?	No specification					
	i) Minimum				2 h		
	ii) Maximum				No specification		
f)	Must the position of the lift be stored	No specification					
	i) on loss of power?		Yes, in phase 2		No specification		
	ii) on restoration of normal power?				No specification		
	If no:						
	i) How long is it allowed to find its next floor level?				No specification		
	ii) Must the correction travel automatically (if needed) be towards the FSAF?				No specification		
g)	When emergency/standby power is operational and the doors are closed should phase 1 be automatically repeated?	No specification			Different operation with phase 1 operation		
h)	When doors are fully open do they stay open when power is restored?	No specification					

Section 2		China	Hong Kong	India	Korea	Malaysia	New Zealand
5	**Signals, fixtures, buttons, notices, etc.**						
a)	Can the car controls be operated using firefighters' gloves?	No specification			Yes		No specification
b)	Are smoke- or heat-sensitive buttons prohibited (e.g. touch buttons)	No specification					
	i) in the lift car?				Yes		No
	ii) on the landing?				Yes		No
c)	Are the car buttons protected against water?	No			No		No
d)	Are the landing buttons and indicators protected against short circuit and earthing?	No specification			No specification		Yes
e)	Are FFLs required to be identified by	No					
	i) sign?				No	Yes – The words “LIFT BOMBA” above each landing door	No
	ii) notice?				No		No
6	**Operational test**						
a)	Are there handover acceptance tests for FFLs?	Yes			Yes	Yes	Yes
b)	Is an officially signed test certificate necessary?	No			Yes	Yes	No
c)	Are there periodic tests for FFLs after initial handover?	No				Yes	Yes
	If yes:						
	i) How often? (months)				12 months		12 months
	ii) Is it a full or partial test as in (1)?						Partial
7	**Firefighting concepts**						
	Is there an official firefighter's concept/method for fighting fires in buildings using FFLs?	No			No		No
	If yes, please submit details as a separate report						

Section 2		China	Hong Kong	India	Korea	Malaysia	New Zealand
8	**Evacuation concepts**						
	Is there an official evacuation concept/method for buildings using lifts? If yes, please submit details as a separate report	No			No		Does not include lifts
9	**Other items not listed above (please give details)**						
		Require a water vacancy device in pit of FFL (GB50045)			A 2nd fireman switch is operated and continuous pressure on floor button sounds alarm and doors close (car can start moving even though doors are not closed). Once car starts moving alarm stops and car cannot run faster that 1 m/s. When car arrives at floor doors remain closed. If phase 1 switch in lobby is off and the 1st fireman switch is activated then i) emergency lamp turns on ii) if car is running it stops at nearest floor with doors closed. Thereafter doors can be opened by continuous pressure on door-open button and closed by continuous pressure on door-closed button.		

Section 3		Singapore	Taiwan					
1	**Building requirements**							
1.1	**Do you have harmonized building requirements?** Is a protected lobby in front of FFL required?	Only one building code						
1.2	**Above what building height (m) is an FFL necessary for**							
a)	firefighting?	24 m						
b)	evacuation?	Firefighting only						
1.3	**Is smoke control required in**							
a)	lift well?	No						
b)	lobby?	Pressurized						
1.4	**Does the building design reduce water flowing into lift well during a fire?**	Only using ramp up to sill						
1.5	**Can other lifts than FFL be used for evacuation**?	No						
1.6	**Can lifts with partial well enclosures be used as FFLs?**	Generally no, except for open lobbies						
1.7	**Can FFLs be part of a group?** If yes:	Yes						
a)	What is maximum number of lifts in one well?	4						
b)	Must there be a solid dividing wall between FFL and rest of lifts in a common well?	No but entire HWY and lift lobby forms a fire rated enclosure. Lobby is pressurized						
1.8	**Applicability of FFLs in a building**							
a)	Single lift	Yes						
b)	Multiple (group) lifts	Yes at least one						
c)	All lifts in a building							

Section 3		Singapore	Taiwan					
1.9	**What is maximum working temperature?**							
a)	In machine room	38 °C						
b)	In lift well	No specification						
c)	On lobby side of landing doors	No specification						
1.10	**What is the maximum time(s) for FFL to travel from fire service access level to top floor with normal power?**	60 s						
1.11	**Must a <u>single</u> FFL serve all floors of a building including those with sky lobbies?**	Yes	Yes					
1.12	**What fire test code is used for lift landing doors?** Define the following:	BS 476 20 and 22	Not required					
a)	Maximum temperature		N/A					
b)	Minimum temperature		N/A					
c)	Duration	1 h	N/A					
d)	Door side exposed to flame	Landing	N/A					
e)	Pressure:	8,5 Pa/m height, maximum at 20 Pa						
	i) Positive							
	ii) Negative							
f)	Interlock functional	No specification						
	i) Duration							
g)	Hose steam pressure	No specification						
	i) Steam pressure							
	ii) Duration							
h)	Labels of certification	No specification						
1.13	**Do lift landing doors of FFLs have to be thermally insulated?**	No	No					
1.14	**What is minimum fire rating of lift landing doors of FFLs?** (min)	60 min	N/A					
1.15	**Do the doors resist smoke penetration?**	No						

Section 3		Singapore	Taiwan					
1.16	**Are liquid base sprinklers allowed**							
a)	in the machine room?	Yes						
b)	in the HW top?	Yes						
c)	in the lift lobby?	Yes						
d)	in the HW pit?	Yes						
2	**Firefighting lift (elevator) basic requirements**							
2.1	**What is minimum rated load (kg)?**	Normal passenger car No minimum specified						
2.2	**What are minimum car sizes (mm)?**	No specification						
a)	Internal width							
b)	Internal depth							
c)	Internal height							
2.3	**What are minimum entrance sizes (mm)?**	No specification						
a)	Width							
b)	Height							
2.4	**Can the FFL car have decorative finishes?** If yes, to what standard?	No specification						
2.5	**Does the lift car have**							
a)	an emergency roof trap door?	Yes						
	If yes:							
	i) Is rescue of trapped persons from outside? or	Yes						
	ii) Is self rescue from inside for FFLs?	No						
	ii) What is minimum size (mm)	450 mm × 450 mm						
b)	Is an emergency side door allowed?	Not in revised code Yes in the existing code						

Section 3		Singapore	Taiwan					
2.6	**Is the electrical equipment protected against splashing water entering the HW?**	No						
	If yes:							
a)	To what IPXX rating?							
b)	Where is protection?							
	i) On the car							
	ii) On the landing doors							
	iii) In the pit							
	iv) For the buttons							
	v) For the indicators							
2.7	**Do FFLs always have power-operated automatic coupled sliding car and landing doors?**	Yes						
2.8	**Can FFLs also be used for moving goods (freight)?**							
a)	As a single lift in a residential building	Yes						
b)	As part of a group installation	Yes						
2.9	**Can the machine room be located**							
a)	above the HW?	Yes	Yes					
b)	under the pit?	Yes						
c)	at the side of well?	Yes						
d)	remote from well e.g. hydraulic?	Yes, not required for < 24 m						
2.10	**What FFL drives are allowed?** e.g.**:**							
a)	Electric traction	Yes						
b)	Hydraulic	Yes						
c)	Rack and pinion/screw	No specification						
d)	Other							
2.11	**Are FFLs without machine rooms allowed?**	No specification						

Section 3		Singapore	Taiwan					
3.0	**Control system**							
3.1	**Is there a phase 1 recall FFL switch?**							
a)	On fire service access level (FSAF)?	Yes	Yes					
b)	In the FFL car phase 2?	No	Yes – three position key switch; off; fireman 1; fireman 2 spring loaded					
c)	Key switch or manual toggle switch?	Toggle switch						
3.2	**Is it required for FFL be recalled automatically by the fire alarm?**	Yes – Lifts must be manually reset after inspection to determine effect of fire						
3.3	**If the FFL is part of a group:**		Yes					
a)	Do all lifts in group return to FSAF?	Yes Priority 1st FFL; 2nd passenger lifts; 3rd service lifts; 4th freight	Yes – photo cell on door, emergency stop switch in car and load weighing device made inoperative					
	If yes, do doors remain open?	Yes	Yes					
b)	Do the other lifts in the group have an FFL control system?							
	i) Phase 1	Yes						
	ii) Phase 2	No						
	If yes:							
	i) Can they also be used for evacuation?	No						
	ii) Should they have the same requirements as FFL?	N/A						
3.4	**Are dual entry front and rear entrance doors allowed?** (Application large main lobbies/atriums etc.)	Yes						

Section 3		Singapore	Taiwan					
3.5	**When on phase 2 use under firefighter's control**							
a)	Are all landing buttons inoperative and	Yes	Yes					
	i) isolated from short circuits due to water?	No						
	ii) isolated from short circuits due to smoke?	No						
	iii) isolated from short circuits due to heat?	No						
b)	Does door-open button remain operative?	Yes	Yes					
c)	Are door safety devices over-bridged if affected by heat or smoke?	No	Yes even safety shoes are deactivated.					
d)	Does the FFL operate separately from a group?	Yes	Yes					
e)	Is there a separate fire service communication system between FSAL, lift car and machine room?	Yes						
	If yes, what type?							
	i) Jacking red phone	No						
	ii) Mobile phone	No						
	iii) Intercom	Yes						
	iv) Other, please specify	No						
3.6	**Firefighting lift operation phase 2**		See section 9 for fireman 2 operation					
a)	Is constant pressure on car destination floor button required until doors have closed?	Constant pressure on door-close button	Yes					
b)	Can additional car floor call be made whilst car is in motion?	Yes but all car calls are cancelled when car stops.	Yes – one only					
c)	Is there provision to cancel registered car call?	All car calls are cancelled when lift stops at floor.	All car calls are cancelled when car stops including emergency stop.					

Section 3		Singapore	Taiwan					
d)	When car arrives at floor, do doors remain closed until door-open button is pressed?	Yes	Yes					
e)	Does it require constant pressure on the door-open button until doors are fully open?	Yes	Yes					
f)	Is constant pressure of a door-close button required for closing the door?	Yes	Yes					
g)	Is there a car call registered indicator in the car?	By tell-tale (indicator) light						
h)	Is there a car position indicator in							
	i) car?	Yes						
	ii) the FSAF?	Maybe						
4.0	**Emergency/Standby power**							
a)	Is an emergency standby power system always required for FFL?	Commercial buildings only – residential rely on ARD which only takes lift to nest floor.						
b)	Can it power the FFL at rated load and speed?	Yes						
	i) Is it large enough to return all elevators in-group to FSAF?	No – only by priority, see 3.3 a)						
	ii) If yes, can operation be staggered?	Must be according to priority, see 3.3 a)						
c)	Must it be capable of running additional lifts on phase 2? If yes, how many?	Yes FFL only						
d)	Must emergency power source be a generator?	Yes						
	If not what other system?							
e)	What is time(s) for the emergency power system to be in operation?	10 s to 30 s						
	i) Minimum	10 s						
	ii) Maximum	30 s						

Section 3		Singapore	Taiwan					
f)	Must the position of the lift be stored? i) On loss of power ii) On restoration of normal power If no: i) How long is it allowed to find its next floor level? ii) Must the correction travel journey automatically (if needed) be towards the FSAF?	Not specified but door must not open during correction run door only opens are FSAF.						
g)	When emergency/standby power is operational and the doors are closed should phase 1 be automatically repeated?	Yes						
h)	When doors are fully open do they stay open when power is restored?	Yes if fire alarm has not been reset; no for power failure only.						
5	**Signals, fixtures, buttons, notices, etc.**							
a)	Can the car controls be operated using firefighter's gloves?	Yes						
b)	Are smoke- or heat-sensitive buttons prohibited (e.g. touch buttons) i) in the lift car? ii) on the landing?	No Not used						
c)	Are the car buttons protected against water?	No						
d)	Are the landing buttons and indicators protected against short circuits and earthing?	No						
e)	Are FFLs required to be identified by i) sign? ii) notice?	 Yes N/A						

Section 3		Singapore	Taiwan					
6	**Operational test**							
a)	Are there handover acceptance tests for FFLs?	Yes						
b)	Is an officially signed test certificate necessary?	Yes						
c)	Are there periodic tests for FFLs after initial handover?	Yes						
	If yes,							
	i) How often? (months)	12 months to 24 months						
	ii) Is it a full or partial test as in (1)?	Full						
7	**Firefighting concepts**							
	Is there an official firefighter's concept/method for fighting fires in buildings using FFLs?	Yes						
	If yes, please submit details as a separate report?	Flow chart developed with their input; no official release of method						
8	**Evacuation concepts**							
	Is there an official evacuation concept/method for buildings using lifts?	Yes – Lifts not to be used						
	If yes, please submit details as a separate report							

Section 3		Singapore	Taiwan					
9	**Other items not listed above (please give details)**							
		A three-position key switch can be fitted on lobby call button plate or in supervisory panel in security room of fire command centre. The three positions are: i) Manual alarm bypass position to test lift's operation in fire mode ii) Normal operating position iii) To test fire alarm system without activating lifts.	A 2nd fireman switch is operated and continuous pressure on floor button sounds alarm and doors close (car can start moving even though doors are not closed). Once car starts moving alarm stops and car cannot run faster than 1m/s. When car arrives at floor, doors remain closed. If phase 1 switch in lobby is off and 1st fireman switch is activated then i) emergency lamp turns on ii) if car is running it stops at nearest floor with doors closed Thereafter doors can be opened by continuous pressure on door open button and closed by continuous pressure on door-closed button.					

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