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Our Ref: OM-LA/004

25 April 2001

MEMORANDUM

To: Members of the Staff

From: Tan L S

SINGAPORE STANDARD CP2 : 2000
CODE OF PRACTICE FOR INSTALLATION, OPERATION AND MAINTENANCE OF ELECTRIC PASSENGER AND GOODS LIFTS

The following are extracts from a recent report by CP2 Technical Committee to BCA highlighting significant changes made to the superseded SS CP2 : 1979 for your information:

- Revised 3.11.3 Glass enclosure for observation lift. It shall comply with SS341 (Clause 3.12.3) vs BS 6206 (Clause 5).

- Revised 3.12.1 Access to pit: Hands-hold for pit ladder to extend up to 1500mm above bottom terminal floor & pit ladder to be installed for every lift.

- Revised 3.12.6 Minimum Pit Depth: Where there is a difference in level between the adjacent lift pits, a non-load bearing wall or wire-mesh screen not less than 1000mm high and measure from the level of the higher pit floor shall be constructed to separate such pits.

- Revised 3.2 Lift Well: Requirement for emergency openings of not more than 11m apart from sill to sill and the omission of requirements for 15m apart skip-stop lifts vs requirement of not more than 11m apart only for single lift and 15m apart for skip-stop lift.

- Revised 4.7 Ventilation for machine room: For natural ventilation, an opening of 20% of the floor area is recommended to achieve cross-flow. Where ambient temperature is more than 32°C, the provision of mechanical ventilation is recommended.

- Revised 4.8 Limitation to the Use of Machine Room: Machine room shall not be used as a means of gaining access to any other part of the building.

- Revised 4.10 Doors to Machine Room: It shall be self closing self locking door of not less than 1000mm wide and 2000mm height (Clause 4.10) vs access to machine room through a manhole in the floor (Clause 6.10).

- Added 4.11 Stairways: Stairways shall be provided for access to every machine room between the top floor served by the lift and the machine room floor level.

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BCA ISO 9000
CERT. NO.: 99/077
SS ISO 9001 : 1994

- Added 6.2.2.4 *For lifts which are located in an unprotected lift well (for example, edge of atrium floor)*, door panels made of glass shall be fixed in such a way that forces demanded by this, which may be applied, are transferred without damaging the fixing of the glass. The doors shall use laminated glass. *In the event of breakage, there shall not be any opening greater than 150mm in diameter. (text in italic not in public comment draft)*

- Revised 6.1.1.3 Top Emergency Exit: Exit opening size shall measure at least 350mm by 500mm. The top exit and suspended ceiling openings, if any, shall be located as to provide a clear passageway, unobstructed by fixed equipment located in or on top of car. The movable portion (exit panel) of the suspended ceiling which is below the top exit opening shall be restrained from falling. It may be hung upward or downward provided that the exit will permit a clear opening with the top exit opening (Clause 6.1.1.3) vs the exit opening shall have an area which permit easy passage of a normal grown up person (Clause 10.3).

- Revised 6.1.2.2 Ventilation (to lift car):

  Cars shall be provided with ventilation apertures in the upper and lower parts of the cars. (Clause 6.1.2.2.1).

  The effective area of ventilation apertures situated in the upper part of the car shall be at least 1% of the available car area, and the same also applies for the apertures in the lower part of the car. The gaps round the car doors may be taken into account in the calculation of the area of the ventilation holes, up to 50% of the required effective area (Clause 6.1.2.2.2).

  Ventilation apertures shall be built or arranged in such a way that it is not possible to pass a straight rigid rod 10mm in diameter through the car walls from the inside (6.1.2.2.3).

- Revised Side emergency exit: Silent (Clause removed) vs Allowed (Clause 11.3)

- Added 6.2 Car Doors:

  Car Doors General Requirement:
  Emergency unlocking devices shall be provided for every landing door (6.2.1.1).

  Car Doors protective device:
  Protective device shall automatically initiate re-opening of the door in the event of a person being struck (or about to be struck) by the door in crossing the entrance during the closing movement (Clause 6.2.1.5).

  Where power-operated horizontal sliding doors are used, the force necessary to prevent closing of the doors shall not be more than 150 N. This force shall be measured at the middle of its travel (Clause 6.2.1.6).

- Revised 6.4.1c Passenger Lifts Rated Loading Capacity: Recommended that beyond 40 persons or 2720 kg load, add 0.115 m^2 for each extra person or 0.16 m^2 for each extra 100 kg vs table with limit of 40 passengers.

- Added 11.2.1.1 Braking Systems:

The lift shall be provided with a braking system which operates automatically (Clause 11.2.1.1):

(a) in the event of loss of the mains power supply
(b) in the event of the loss of the supply to control circuits.

The braking system shall have an electro-mechanical brake (friction type), but may in addition, have other braking means (e.g. electric) (Clause 11.2.1.2).

Electro-mechanical brake (Clause 11.2.2).

This brake on its own shall be capable of stopping the machine when the car is travelling downward at rated speed and with the rated load plus 25%. In these conditions, the retardation of the car shall not exceed that resulting from operation of the safety gear or stopping on the buffer.

All the mechanical components of the brake which take part in the application of the braking action on the drum or disk shall be installed in two sets. If one of the components is not working a sufficient braking effort to slow down the car, travelling downwards at rated speed and with rated load shall continue to be exercised.

Any solenoid plunger is considered to be a mechanical part, any solenoid coil is not (Clause 11.2.2.1).

The component on which the brake operates shall be coupled to the traction sheave or drum or sprocket by direct and positive mechanical means (Clause 11.2.2.2).

The hold off the brake, in normal operation, shall require a continuous flow of current (Clause 11.2.2.3).

The interruption of this current shall be effected by at least two independent electric devices, whether or not integral with those, which cause interruption of the current feeding the lift machine.

If whilst the lift is stationary, one of the contactors has not opened the main contacts, further movement of the car shall be prevented at the latest at the next change in the direction of motion (Clause 11.2.2.3.1).

When the motor of the lift is likely to function as a generator, it shall not be possible for the electric device operating the brake to be fed by the driving motor (Clause 11.2.2.3.2).

Braking shall become effective without supplementary delay after opening of the brake release circuit (Clause 11.2.2.3.3).

Note: The use of a diode or capacitor connected directly to the terminals of the brake coil is not considered as a means of delay.

Any machine fitted with a manual emergency operating device shall be capable of having the brake released by hand and require a constant effort to keep the brake open (Clause 11.2.2.4).

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- Revised 13.1.3 Emergency operation of lift in the event of fire:

  In the event there is fire on the designated floor, the lift will be brought to the second designated floor vs only one designated floor (subclause 26.3).

- Revised 15 Interferences:

  The electromagnetic compatibility of the lift installations should comply with the requirements of EN12015 & EN12016 (Clause 15) vs Suppression of radio interference as laid down in Radio Communication Regulation Part V: Regulation of Electrical Interference (Clause 3.7).

- Added 16 Type Test Requirements (Clause 16)

  (a) Landing door locking device
  (b) Safety gear
  (c) Overspeed governor
  (d) Buffer
  (e) Safety circuit containing electronic components.

Please note SS CP2 : 2000 does not apply to:

(a) Lifts used solely for erecting, demolishing, altering or repairing buildings;

(b) Orchestral and stage lifts;

(c) Stacking machines and similar portable appliances;

(d) Conveyors used for the handling of materials and goods, such as swing tray lifts, bucket conveyors and similar appliances;

(e) Skip-hoists;

(f) Wharf ramps;

(g) Amusement devices;

(h) Mine lifts;

(i) Hillside inclined lifts;

(j) Paternosters;

(k) Service lifts (Dumbwaiters);

(l) Vehicle lifts, home lifts and stair lifts;

(m) Installation of electric lifts in existing buildings to the extent that space does not permit.

(n) Replacement or upgrading of existing lifts in buildings.

SS CP2 : 2000 is likely to be implemented from 1st October 2001.

Tan L S

cc RT/LCT
cc Notice Board

TLS/na

NA

From: NA
Sent: Thursday, April 26, 2001 5:04 PM
To: All

SINGAPORE STANDARD CP2 : 2000
CODE OF PRACTICE FOR INSTALLATION, OPERATION AND MAINTENANCE OF ELECTRIC PASSENGER AND GOODS LIFTS

You may view extracts from a recent report by CP2 Technical Committee to BCA highlighting significant changes made to the superseded SS CP2 : 1979 in the Intranet Website: Engineering\Electrical\Lift Installation\ or at the following link:

http://www.alpha.com.sg/electrical/Lift/ss%20cp%202.pdf

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REPORT

SINGAPORE STANDARD CODE OF PRACTICE FOR INSTALLATION, OPERATION AND MAINTENANCE OF ELECTRIC PASSENGER AND GOODS LIFTS (Revision of SS CP 2 : 1979)

1. Introduction

SS CP 2 was first published as Singapore Standard 51 : 1971. It was then revised in 1974 and became renamed Singapore Standard CP 2 : 1974. The second revision to CP 2 was completed in 1979. Between 1979 and the introduction of this revised edition, a total of seven amendments were introduced.

SS CP 2 : 1979 was identified for revision by the Electrical Industry Practice Committee so as to keep abreast of technological changes and technical developments.

The Technical Committee for revising SS CP 2 : 1979 had initially identified BS 5655 : Part 1 : 1986/ EN 81: Part 1 : 1985 and ASME A17.1 : 1993 as its reference standards. However, with the benefit of attending the ISO TC 178 (Lifts, Escalators and Passenger Conveyors) meeting in Singapore in 1995, the TC decided to form a Working Group to make comparisons between CP 2 and other national standards using ISO/TR 11071-1 : 1990. (Comparison of worldwide lift safety standards – Electric lifts).

In 1998, the TC noted that EN 81-1 had been drastically revised as EN 81-1 : 1998 while ASME A17.1 was revised as ASME A17.1 : 1996. The draft was subsequently updated to reflect changes in these new editions, where relevant. Changes were also made to improve clarity and rectify editorial errors.

2. Scope

This Code shall apply to the design, construction, installation, testing, inspection, operation and maintenance of permanently installed new electric lifts, with traction drive, serving defined landing levels, having a car designed for the transportation of persons or persons and goods, suspended by ropes and moving between guide rails inclined not more than 15° to the vertical.

Please refer to Annex A for items which do not apply to the Code.

3. Salient Points

3.1 Layout

The layout has been streamlined with the number of main clauses reduced from 35 to 16. The number of annexes was increased form 1 to 6 as general information as well as those on inspection, testing and periodic maintenance were transferred as annexes. In addition, the previous supplement on Observation lifts was incorporated into the main text in the revised code.

With these changes, users would find the revised code more organised.

3.2 Textual Changes

The following are some of the significant changes introduced in the revised draft :

- ~~Added 1.1(m) states that CP 2 does not apply to installation of electric lifts in existing buildings to the extent that space does not permit~~

- Revised 3.12.3 Glass enclosure for observation lift. It shall comply with SS341 (Clause 3.12.3) vs BS 6206 (Clause 5).

- Revised 3.13.1 Access to pit: Hands-hold for pit ladder to extend up to 1500mm above bottom terminal floor & pit ladder to be installed for every lift

- Revised 3.13.6 Minimum Pit Depth: Where there is a difference in level between the adjacent lift pits, a non-load bearing wall or wire-mesh screen not less than 1000mm high and measure from the level of the higher pit floor shall be constructed to separate such pits.

- Revised 3.2 Lift well : Requirement for emergency openings of not more than 11 m apart from sill to sill and the omission of requirements for 15 m apart skip-stop lifts vs requirement of not more than 11 m apart only for single lift and 15 m apart for skip-stop lift.

- Revised 4.7 Ventilation for machine room : For natural ventilation, an opening of 20% of the floor area is recommended to achieve cross-flow. Where ambient temperature is more than 32°C, the provision of mechanical ventilation is recommended.

- Revised 4.8 Limitations to the Use of Machine Room: Machine room shall not be used as a means of gaining access to any other part of the building

- Revised 4.10 Doors to Machine Room: It shall be self closing self locking door of not less than 1000mm wide and 2000mm height (Clause 4.10) vs access to machine room through a manhole in the floor (Clause 6.10).

- Added 4.11 Stairways: Stairways shall be provided for access to every machine room between the top floor served by the lift and the machine room floor level.

- Added 6.2.2.4 *For lifts which are located in an unprotected lift well (for example, edge of atrium floor),* door panels made of glass shall be fixed in such a way that forces demanded by this, which may be applied, are transferred without damaging the fixing of the glass. The doors shall use laminated glass. *In the event of breakage, there shall not be any opening greater than 150 mm in diameter. (text in italic not in public comment draft)*

- Revised 6.1.1.3 Top Emergency Exit- Exit opening size shall measure at least 350mm by 500mm. The top exit and suspended ceiling openings, if any, shall be located as to provide a clear passageway, unobstructed by fixed equipment located in or on top of car. The movable portion (exit panel) of the suspended ceiling which is below the top exit opening shall be restrained from falling. It may be hung upward or downward provided that the exit will permit a clear opening with the top exit opening (Clause 6.1.1.3) vs the exit opening shall have an area which permit easy passage of a normal grown up person (Clause 10.3).

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  Cars shall be provided with ventilation apertures in the upper and lower parts of the cars. (Clause 6.1.2.2.1).

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  Ventilation apertures shall be built or arranged in such a way that it is not possible to pass a straight rigid rod 10 mm in diameter through the car walls from the inside (6.1.2.2.3).

- Revised - Side emergency exit: Silent (Clause removed) vs Allowed (Clause 11.3).

- Added 6.2 Car doors

  Car Doors General Requirement:
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- Revised 6.4.1c Passenger Lifts Rated Loading Capacity: Recommended that beyond 40 persons or 2720 kg load, add 0.115 m^2 for each extra person or 0.16 m^2 for each extra 100 kg. vs table with limit of 40 passengers

- Added 11.2.1.1 Braking Systems:

  The lift shall be provided with a braking system which operates automatically (Clause 11.2.1.1):

  (a) in the event of loss of the mains power supply
  (b) in the event of the loss of the supply to control circuits

  The braking system shall have an electro-mechanical brake (friction type), but may in addition, have other braking means (eg. electric) (Clause 11.2.1.2).

  Electro-mechanical brake (Clause 11.2.2).

  This brake on its own shall be capable of stopping the machine when the car is travelling downward at rated speed and with the rated load plus 25%. In these conditions, the retardation of the car shall not exceed that resulting from operation of the safety gear or stopping on the buffer.

All the mechanical components of the brake which take part in the application of the braking action on the drum or disk shall be installed in two sets. If one of the components is not working a sufficient braking effort to slow down the car, travelling downwards at rated speed and with rated load shall continue to be exercised.

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Braking shall become effective without supplementary delay after opening of the brake release circuit (Clause 11.2.2.3.3).

Note: The use of a diode or capacitor connected directly to the terminals of the brake coil is not considered as a means of delay.

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- Revised 13.1.3 Emergency operation of lift in the event of fire

  In the event there is fire on the designated floor, the lift will be brought to the second designated floor vs only one designated floor (subclause 26.3)

- Revised 15 Interferences:

  The electromagnetic compatibility of the lift installations should ~~preferably~~ comply with the requirements of EN12015 & EN12016 (Clause 15) vs Suppression of radio interference as laid down in Radio Communication Regulation Part V: Regulation of Electrical Interference (Clause 3.7).

- Added 16 Type Test Requirements (Clause 16)

  (a) Landing door locking device
  (b) Safety gear
  (c) Overspeed governor
  (d) Buffer
  (e) Safety circuit containing electronic components

4. Composition of the Technical Committee and Working Groups

		Name	Organisation
Chairman	:	Mr Cheah Sin Chee	*PWD Corporation Pte Ltd*
Secretary	:	Mr Dennis Chew	*Singapore Productivity and Standards Board*
Members	:	Mr Chin Tam Wan	*Fujitec Singapore Corporation Ltd*
		Mr Peter Lock	*GET Pte Ltd*
		Mr Gilbert Lum Shuet Meng	*Hitachi Elevator Engineering (S) Pte Ltd*
		Mr Ng Tong Leng	*Department of Industrial Safety*
		Mr Phuah Cheng Kok	*Otis Elevator Company (S) Pte Ltd*
		Mr Johnson See	*Institution of Engineers Singapore*
		Mr Sitoh Yih Liang	*Singapore Institute of Architects*
Members	:	Mr Swee Mong Kooi	*Housing & Development Board*
		Maj Christopher Tan Eng Kiong	*Singapore Civil Defence Force*
		Er Tan Lai Siong	*Association of Consulting, Engineers*
		Mr Tan Lee Heng	*Singapore Productivity and Standards Board*
		Mr Tan Sing Ong	*Jurong Town Corporation*
		Mr Wang Hee Weng	*Power Supply Ltd*
		Mr Wong Twee Tyu	*General Electric Company of Singapore Pte Ltd*
		Mr Yeo Ann Cheong	*Singapore Lift and Escalator Contractors and Manufacturers Association*
Co-opted Members	:	Mr Kok Peng Koon	*Individual Capacity*
		Mr Wong Boon Kong	*Individual Capacity*

Two Working Groups were set up by the Technical Committee to assist in the preparation of this standard. They are as follows :

Working Group 1 : Comparison of standards requirements using ISO 11071-1 : 1990

		Name	Organisation
Convenor	:	Mr Wong Boon Kong	*Otis Elevator Company (S) Pte Ltd*
Members	:	Mr Henry Chan	*Kone Elevator Pte Ltd*
		Mr Chong Yam Haeng	*Schindler Lifts (Singapore) Pte Ltd*

Mr Kok Peng Koon	*Otis Elevator Company (S) Pte Ltd*
Mr Gilbert Lum Shuet Meng	*Hitachi Elevator Engineering (S) Pte Ltd*
Mr Johnson See	*Institute of Engineers Singapore*
Maj Christopher Tan Eng Kiong	*Singapore Civil Defence Force*
Mr Tan Sing Ong	*Jurong Town Corporation*
Mr Yeo Ann Cheong	*Singapore Lift and Escalator Contractors and Manufacturers Association*
Er Yeo Tiong Hong	*Housing & Development Board*

Working Group 2 : Technical editing of the standard

		Name	Organisation
Convenor	:	Mr Cheah Sin Chee	*PWD Corporation Pte Ltd*
Members	:	Mr Chin Tam Wan	*Fujitec Singapore Corporation Ltd*
		Mr Kok Peng Koon	*Individual Capacity*
		Mr Gilbert Lum Shuet Meng	*Hitachi Elevator Engineering (S) Pte Ltd*
		Mr Yeo Ann Cheong	*Singapore Lift and Escalator Contractors and Manufacturers Association*
		Er Yeo Tiong Hong	*Housing & Development Board*

5. Technical Committee Meetings

Date of first meeting: 27 May 1994 (including Amendment 7 issued in Nov 1994)

Total number of meetings: 28

6. Date of Approval by the Technical Committee

26 November 1999

7. Public Comment Period and Public Comments Received

Commencement date : 5 December 1999
Closing date : 4 February 2000

Comments Received :

(i) MINDEF/LEO (Annex B)

(ii) HDB (see Annex C)

(iii) Singapore Electrical Contractors Association (see Annex D)

Please refer to Annex E which contains the minutes of the 26th and 27th TC meetings indicating the TC's response to the above comments.

Late Comments Received :

(i) FSB/SCDF (Annex F)

(ii) SIA (Annex G)

(iii) Mr Paul Low (Annex H)
CIPC member representing SIA

Please refer to Annex I which contains the minutes of the 28th TC meeting indicating the TC's response to the above comments.

Annex A

The scope of the revised CP 2 does not apply to :

(a) Lifts used solely for erecting, demolishing, altering or repairing buildings;

(b) Orchestral and stage lifts;

(c) Stacking machines and similar portable appliances;

(d) Conveyors used for the handling of materials and goods, such as swing tray lifts, bucket conveyors and similar appliances;

(e) Skip-hoists;

(f) Wharf ramps;

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(m) Installation of electric lifts in existing buildings to the extent that space does not permit.

(n) Replacement or upgrading of existing lifts in buildings