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To: All Registered Lift/Escalator Contractors and Engineers

Dear Sirs,

**Circular No. 5/2013**

**New Requirement on Lift Regarding Safety Circuit Containing Electronic Components and/or Programmable Electronic System (PESSRAL)**

With a view to aligning with the latest requirement on lifts regarding Safety Circuit Containing Electronic Components and/or Programmable Electronic System (PESSRAL), the Code of Practice on the Design and Construction of Lifts and Escalators (2012 Edition) (the Design Code) is planned to be amended by incorporating this new requirement (marked with "blue" color in the attached Amendment No. 1) for lifts. This amendment will be incorporated in the next edition of the Design Code.

Please note that the new requirement provides practical guidance in respect of the design of lifts and advised to include in the tender with tendering date on or after 1 April 2014.

Yours faithfully,



(W.S. CHUI)

for Director of Electrical and Mechanical Services

- c.c. The Director of Housing (Attn.: SM/QM)  
The Director of Buildings  
Director of Architectural Services (Attn: CBSE/2)  
The Lift and Escalator Contractors Association  
The Registered Elevator and Escalator Contractors Association Limited  
The International Association of Elevator Engineers  
The Hong Kong General Union of Lift and Escalator Employees

**Code of Practice**  
**On the Design and Construction of Lifts and Escalators**  
**(2012 Edition)**

**AMENDMENT No. 1 of 2012 Edition**  
**Requirement for Safety Circuit Containing Electronic Components and/or**  
**Programmable Electronic System (PESSRAL)**

(The new requirement is provided practical guidance in respect of the new installation of lifts with effect from 1 April 2014 and advised to include in the tender with tendering date on or after 1 April 2014)

Revise the following Clauses after Section E: Part 1:

Item	Clause	Description
1	10.2.1.1	During operation of one of the electrical safety devices <del>listed in Clause 10.4</del> , movement of the machine shall be prevented or it shall be caused to stop immediately as indicated in Clause 10.2.4. <a href="#">A list of such devices is given in Table 4.</a> The electrical safety devices shall consist of:
	10.2.1.1 (b) (3)	components in accordance with Annex H of EN81-1, <a href="#">or</a>
	10.2.1.1 (b) (4)	<a href="#">programmable electronic systems in safety related applications in accordance with clause 10.2.6.</a>

Add the following Clauses after Section E Part 1:

Item	Clause	Description
2	Section E Part 1 Clause 10.2.6	<b>Programmable Electronic System in Safety Related Applications (PESSRAL)</b>
	10.2.6.1	<a href="#">The PESSRAL system is designed for control, protection or monitoring based on one or more programmable electronic devices, including all elements of the system such as power supplies, sensors and other input devices, data highways and other communication paths, and actuators and other output devices, used in safety related applications as listed in Table 4.</a>
	10.2.6.2	<a href="#">To avoid unsafe modification, measures to prevent unauthorised access to the program code and safety related data of PESSRAL shall be provided, e.g. using EPROM, access code, etc.</a>
	10.2.6.3	<a href="#">If a PESSRAL and a non-safety related system share the same hardware, the requirements for PESSRAL shall be met.</a>

10.2.6.4

The PESSRAL shall be type tested to the requirements of Annex F.6 of EN81-1, or other relevant international standards.

Delete the following Clause after Section E Part 1:

Item	Clause	Description
3	10.4	<p><del>Types of electrical safety devices to be used in a lift are as follows:</del></p> <ul style="list-style-type: none"><li><del>(a) — safety contacts (see Clause 10.2.2);</del></li><li><del>(b) — safety circuits (see Clause 10.2.3), whatever the type of the installation; and</del></li><li><del>(c) — safety circuits (see Clause 10.2.3), authorized by the Director in the case of installations requiring special protection against risks of humidity or explosion;</del></li><li><del>(c) — PESSRAL system (see Clause 10.2.6).</del></li></ul>

~~Conditions for their use are summarized in Table 4. The 'X' indicates the type of electrical safety device permitted to be used for each function. If there are several 'X's, there is a choice of devices.~~

**Table 4. Conditions for Use of Electrical Safety Devices**

Clause	Function	PESSRAL safety device		
		class 1	class 2	class 3
1.2	Check on closed position of inspection and emergency doors and inspection traps		x	
3.7.3	Check on locking of landing doors - automatically operated landing doors in accordance with 3.7.3; - manually operated landing doors		x	x
3.7.5	Check on closed position of landing doors			x
3.7.7.2	Check on closed position of the panels without locks			x
4.7	Check on closed position of car door			x
4.9	Check on locking of car door		x	
4.11.3	Check on locking of the emergency trap door and emergency door in car		x	
5.8.2	Check on the abnormal relative extension of a rope or chain in case of two ropes or two chain type suspension	x		
5.9.2	Check on the tension in the compensating ropes			x
5.9.4	Check on the anti-rebound device			x
5.11.8	Check on the operation of safety gear	x		
5.12.6	Check on the tension in the overspeed governor rope			x

Clause	Function	PESSRAL safety device		
		class 1	class 2	class 3
5.12.11	Check on the operation of the overspeed governor - Overspeed detection without actuating the ascending car over speed protection means - Overspeed detection actuating the ascending car over speed protection means	x	x	
5.12.12	Check on the release of the overspeed governor			x
5.13.5	Check on the ascending car overspeed protection means	x		
6.2.4.4	Check on the return to normal extended position of buffers			x
6.3.2.3 (b)	Check on the tension in the device for transmission of the car position (final limit switches)	x		
6.3.3.1 (b)(2)	Final limit switches for traction device lifts	x		
6.4.2	Check for slack rope or slack chain		x	
8.8.2.1(c)	Check on the tension in the device for transmission of the car position (slowdown checking device)		x	
8.8.2.2	Check on retardation in the case of reduced stroke buffers		x	
9.4.2 (b)	Control of main switch by means of circuit breaker contactor		x	
10.3.1.2(a)(2)	Check on levelling and re-levelling		x	

Clause	Function	PESSRAL safety device		
		class 1	class 2	class 3
10.3.1.2(a)(3)	Check on the tension in the device for transmission of the car position (levelling and re-levelling)		x	
10.3.1.3	Inspection operation switch			x
5.12.6	Emergency electrical operation switch			x
10.3.2	Stopping devices:- a. inspection operation b. at lift machine c. in the pit d. in pulley room e. on car roof	x	x x	x  x

**NOTE :**

1. The classification (i.e. Class 1, Class 2 and Class 3) in the above Table 4 applies only when programmable electronic systems (PESSRAL) are used. This classification is not a risk classification for safety contacts or safety circuits but a classification to define the safety integrity level for the PESSRAL to be used in the corresponding electric safety device.
2. Risk analysis, terminology and technical solutions have been taken into account in classification of safety functions applied to PESSRAL. Details of the methods are making reference to EN 61508 series of standards.

Revise and add the following Clauses after Section E Part 2:

Item	Clause	Description
1	10.2.1.1	During operation of one of the electrical safety devices <del>listed in Clause 10.4</del> , movement of the machine shall be prevented or it shall be caused to stop immediately as indicated in Clause 10.2.4. <del>A list of such devices is given in Table 2.</del> The electrical safety devices shall consist of:
	10.2.1.1 (b) (3)	components in accordance with Annex H of EN81-2, or
	10.2.1.1 (b) (4)	programmable electronic systems in safety related applications in accordance with clause 10.2.6.

Add the following Clauses after Section E Part 2:

Item	Clause	Description
2	Section E Part 2 Clause 10.2.6	<b>Programmable Electronic System in Safety Related Applications (PESSRAL)</b>
	10.2.6.1	The PESSRAL system is designed for control, protection or monitoring based on one or more programmable electronic devices, including all elements of the system such as power supplies, sensors and other input devices, data highways and other communication paths, and actuators and other output devices, used in safety related applications as listed in Table 2.
	10.2.6.2	To avoid unsafe modification, measures to prevent unauthorised access to the program code and safety related data of PESSRAL shall be provided, e.g. using EPROM, access code, etc.
	10.2.6.3	If a PESSRAL and a non-safety related system share the same hardware, the requirements for PESSRAL shall be met.
	10.2.6.4	The PESSRAL shall be type tested to the requirements of Annex F.6 of EN81-2, or other relevant international standards.

Delete the following Clause after Section E Part 2:

Item	Clause	Description
3	10.4	<del>Types of electrical safety devices to be used in a lift are as follows: (a) — safety contacts (see Clause 10.2.2); (b) — safety circuits (see Clause 10.2.3), whatever the type of the installation; and (c) — safety circuits (see Clause 10.2.3), authorized by the Director in the case of installations requiring special protection against risks of humidity or explosion;</del>

~~(c) — PESSRAL system (see Clause 10.2.6).~~

~~Conditions for their use are summarized in Table 4. The 'X' indicates the type of electrical safety device permitted to be used for each function. If there are several 'X's, there is a choice of devices.~~



Table2. Conditions for Use of Electrical Safety Devices

Clause	Function	PESSRAL safety device		
		class 1	class 2	class 3
1.2	Check on closed position of inspection and emergency doors and inspection traps		x	
3.7.3	Check on locking of landing doors - automatically operated landing doors in accordance with 3.7.3, - manually operated landing doors.		x	x
3.7.5	Check on closed position of landing doors			x
3.7.7.2	Check on closed position of the panels without locks			x
4.7	Check on closed position of car door			x
4.9	Check on locking of car door		x	
4.11.3	Check on locking of the emergency trap door and emergency door in car		x	
5.6.3	Check on the abnormal relative extension of a rope or chain in case of two ropes or two chain type suspension	x		
5.10.8	Check on the operation of safety gear	x		
5.11.8	Check on the operation of clamping device	x		
5.12.2.4	Check on the tension in the overspeed governor rope			x
5.12.2.9 (a)	Check on the operation of the overspeed governor	x		

Clause	Function	PESSRAL safety device		
		class 1	class 2	class 3
5.12.2.9 (b)	Check on the release of the overspeed governor			x
6.2.5.3	Check on the return to normal extended position of buffers			x
	Check on the return to normal extended position of buffers where energy dissipation are used in conjunction with pawl device			x
6.3.2.2 (b)	Check on the tension in the device for transmission of the car position for direct acting lifts (final limit switches)	x		
6.3.2.3 (b)	Check on the tension in the device for transmission of the ram position of indirect acting lifts (final limit switches)	x		
6.3.3	Final limit switch	x		
6.4	Check for slack rope or slack chain		x	
9.4.2 (b)	Control of main switch by means of circuit breaker contactor		x	
10.3.1.2(a)(2)	Check on levelling, re-levelling and electrical anti-creeping		x	
10.3.1.2 (a)(3)	Check on the tension in the device for transmission of the car position (levelling, re-levelling and electrical anti-creeping)			x
10.3.1.3	Inspection operation switch			x
10.3.2	Stopping devices:-			

Clause	Function	PESSRAL safety device		
		class 1	class 2	class 3
	a. inspection operation b. at lift machine c. in the pit d. in pulley room e. on car roof	x	x x	x  x

NOTE :

1. The classification (i.e. Class 1, Class 2 and Class 3) in the above Table 2 applies only when programmable electronic systems (PESSRAL) are used. This classification is not a risk classification for safety contacts or safety circuits but a classification to define the safety integrity level for the PESSRAL to be used in the corresponding electric safety device.
2. Risk analysis, terminology and technical solutions have been taken into account in classification of safety functions applied to PESSRAL. Details of the methods are making reference to EN 61508 series of standards.