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February 23, 2007

All Registered Lift/Escalator Contractors / Engineers

Dear Sirs,

**Circular No. 3/2007**  
**Code of Practice on the Design and Construction**  
**of Lifts and Escalators (2000 Edition)**  
**Amendment No. 10**

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Pursuant to section 27G of the Lifts and Escalators (Safety) Ordinance, Cap. 327, the Code of Practice on the Design and Construction of Lifts and Escalators (2000 Edition) (the Design Code) has been amended by incorporating requirements to handle uncontrolled lift car movements and minor changes.

The changes have been provided for in Amendment No. 10 of the Design Code, a copy of which is attached herewith for your reference. Please note that the changes covered in Amendment No. 10 forming part of the Design Code shall become effective as from March 1, 2007 and the new requirements shall be applicable to lifts/escalators tendered on or after September 1, 2007.

Yours faithfully,



(CHUI Mow-wah, Gregory)  
for Director of Electrical and Mechanical Services

Encl.

c.c. AD/BS, D of Housing (Attn.: TS/2),  
D of Buildings (Attn.: CBS/Legislation), D of Fire Services (Attn.: Fire Safety Command),  
The Hong Kong General Union of Lift and Escalator Employees  
G28/28 SF1 Pt. IV

**Code of Practice  
on the Design and Construction of  
Lifts and Escalators  
(2000 Edition)**

**Amendment No. 10 of the 2000 Edition  
Requirements to Handle Uncontrolled Lift Car Movements and Minor Changes**

(Effective as from March 1, 2007 and  
applicable to lifts/escalators tendered on or after September 1, 2007)

<u>Item</u>	<u>Clause</u>	<u>Description</u>
1	Section E Part 1 Clause 5.11.1	Replace "guides" with 'guide rails' in the 1 <sup>st</sup> and 3 <sup>rd</sup> paragraphs of Clause 5.11.1.
2	Section E Part 1 Clause 5.11.2	Delete "or counterweight" following 'If the car' in the 2 <sup>nd</sup> paragraph of Clause 5.11.2.
3	Section E Part 1 Clause 5.11.5	Replace Clause 5.11.5 by the following:  <b>"5.11.5 Release</b>  5.11.5.1 When a safety gear has tripped its release shall require the intervention of a competent lift worker.  5.11.5.2 The release and automatic reset of a safety gear on the car or counterweight shall only be possible by raising the car or counterweight. "
4	Section E Part 1 Clause 5.11.6	Replace Clause 5.11.6 by the following:  <b>"5.11.6 Constructional Conditions</b>  5.11.6.1 Jaws or blocks of safety gears shall not be used as guide shoes.  5.11.6.2 For safety gear of the instantaneous type with buffered effect, the design of the buffering systems shall be of the energy accumulation type with buffered return movement or the energy dissipation type, satisfying the requirements of Clause 6.2.3 or 6.2.4.  5.11.6.3 If the safety gear is adjustable, the final setting shall be sealed. "

- 5 Section E Replace Clause 5.11.7 by the following:  
Part 1  
Clause 5.11.7
- “5.11.7 Inclination of the Car Floor on Operation of Safety Gear**
- When the car safety gear operates, the floor of the car without or with the load uniformly distributed shall not incline more than 5% from its normal position. ”
- 6 Section E Replace Clause 5.11.8 by the following:  
Part 1  
Clause 5.11.8
- “5.11.8 Electrical Checking on Operation of Safety Gear**
- When the car safety gear is engaged, an electrical safety device in conformity with Clause 10.2, mounted on the car shall initiate the stopping of the machine before or at the moment of safety gear operation. ”
- 7 Section E Replace Clause 5.12.2 by the following:  
Part 1  
Clause 5.12.2
- “5.12.2 Tripping Speed for the Car Overspeed Governor**
- Tripping of the overspeed governor for the car safety gear shall occur at a speed at least equal to 115% of the rated speed and conform to Table 3:

**Table 3**  
Relationship between Governor Tripping Speed,  
Type of Safety Gear and Rated Speed

Maximum Rated Speed	Type of Safety Gear	Maximum Governor Tripping Speed
0.63 m/s	Instantaneous type, except captive roller type	0.8 m/s
0.63 m/s	Captive roller Instantaneous type	1 m/s
1.0 m/s	Instantaneous type with buffered effect	1.5 m/s
1.0 m/s	Progressive type	1.5 m/s
Exceeding 1.0 m/s	Progressive type	$1.25V + 0.25V$ m/s

For avoidance of doubt, Table 3 shall not be used to determine the maximum tripping speed for ascending car overspeed protection means.

For lifts where the rated speed exceeds 1 m/s, it is recommended to choose a tripping speed as close as possible to the upper limit indicated in the table.

For lifts with very heavy rated loads and low rated speeds, the overspeed governor shall be specially designed for this

purpose. It is recommended to choose a tripping speed as close as possible to the lower limit. "

- 8 Section E Part 1 Clause 5.12.3 Replace Clause 5.12.3 by the following:
- "5.12.3 Tripping Speed for the Counterweight Overspeed Governor**
- The tripping speed of an overspeed governor for a counterweight safety gear shall be higher than that for the car safety gear according to Clause 5.12.2, but not exceeding it by more than 10%. "
- 9 Section E Part 1 Clause 5.12.6 Add "the" following 'The device shall be of' in the last paragraph of Clause 5.12.6.
- 10 Section E Part 1 Clause 5.12.8 Replace Clause 5.12.8 by the following:
- "5.12.8 Accessibility**
- 5.12.8.1 The overspeed governor shall be accessible and reachable for inspection and maintenance.
- 5.12.8.2 If located in the well the overspeed governor shall be accessible and reachable from outside the well.
- 5.12.8.3 The requirement of Clause 5.12.8.2 does not apply if the following three conditions are fulfilled:
- (a) the tripping of the overspeed governor according to Clause 5.12.9 is effected by means of a remote control, except cableless, from outside the well whereby an involuntary tripping is not effected and the actuation device is not accessible to unauthorized persons; and
  - (b) the overspeed governor is accessible for inspection and maintenance from the roof of the car or from the pit; and
  - (c) the overspeed governor returns, after tripping, automatically into the normal position, as the car or counterweight is moved in the upward direction.
- However the electrical parts may return into the normal position by remote control from the outside the well which shall not influence the normal function of the overspeed governor. "

- 11 Section E Part 1 Clause 5.12.9 Replace Clause 5.12.9 by the following:
- “5.12.9 Test Tripping of the Overspeed Governor**
- During checks or tests it shall be possible to operate the safety gear at a lower speed than that indicated in Clauses 5.12.2 and 5.12.3 by tripping the overspeed governor in a safe way.  
”
- 12 Section E Part 1 Clause 5.12.10 Replace Clause 5.12.10 by the following:
- “5.12.10 Sealing**
- If the overspeed governor is adjustable, the final setting shall be sealed. ”
- 13 Section E Part 1 Clause 5.12.12 Replace Clause 5.12.12 by the following:
- “5.12.12 Release**
- If after release of the safety gear (Clause 5.11.5) the overspeed governor does not automatically reset itself, an electrical safety device in conformity with Clause 10.2 shall prevent the starting of the lift while the overspeed governor is not in the reset position. This device shall, however, be made inoperative in the case provided for in Clause 10.3.1.4(b).
- Return to service of the lift shall be by a competent lift worker.  
”
- 14 Section E Part 1 Clause 5.13.1 Add “of” following ‘...movement of the ascending car at a minimum’ in Clause 5.13.1.
- 15 Section E Part 1 Clause 5.13.5 Replace “electric” with ‘electrical’ in Clause 5.13.5.
- 16 Section E Part 1 Clause 5.13.6 Replace “competent person” with ‘competent worker’ in Clause 5.13.6.
- 17 Section E Part 1 Clause 5.14 Add Clause 5.14 (as stated below) following Clause 5.13.11:
- “5.14 Protection Against Uncontrolled Car Movement**
- A traction drive lift shall be provided with a means to prevent uncontrolled movement of the lift car away from the landing

with (both) the landing door and the car door not in the locked position. The means shall conform to the following:

- 5.14.1 The means shall detect uncontrolled movement of the car away from the landing and cause the car to come to a stop at the latest in a distance of 1200 mm as measured from the landing sill.
- 5.14.2 Subsequent to operation of the uncontrolled car movement protection means for an upward moving lift car, the clearance between the landing door sill and the apron of the stopped lift car shall not exceed 200 mm. Subsequent to operation of the uncontrolled car movement protection means for a downward moving lift car, the horizontal distance between the sill or entrance frame of the stopped lift car and the wall of the well, from the landing sill to 1200 mm downward, shall not exceed 150 mm.
- 5.14.3 The means shall be capable of performing as required in Clause 5.14.1 without assistance from any lift component that, during normal operation, controls the speed or retardation, or stops the car, unless there is built-in redundancy of such component.

A mechanical linkage to the car, whether or not such linkage is used for any other purpose, may be used to assist in this performance.

- 5.14.4 The means shall not allow a retardation of the car, with any load up to 100% of the rated load, in excess of 1  $g_n$  during the stopping phase.

The means shall conform to the requirements of Clauses 5.13.4 - 5.13.9.

The speed reducing element of the ascending car overspeed protection means may be used to stop the car as required in Clause 5.14.1. "

- 18 Section E Part 1 Clause 8.4.2.3 Add the following paragraph to the end of Clause 8.4.2.3:  
" The operation of each set of the braking mechanism shall be positively monitored to prevent further operation of the lift machine, when any one set of the braking mechanism is not functioning properly. "
- 19 Section E Part 4 Table of Contents Replace "operation brake" with 'operational brake' under the descriptions for Clauses 8.3, 8.4.4 and 8.6.3 in the Table of Contents.

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| 20 | Section E<br>Part 4<br>Clauses 8.3<br>& 8.3.1 | Replace "operation brake" with 'operational brake' in Clauses 8.3 and 8.3.1.  |
| 21 | Section E<br>Part 4<br>Clause<br>8.4.1.3      | Replace "operation brake" with 'operational brake' in the 2 <sup>nd</sup> paragraph of Clause 8.4.1.3.  |
| 22 | Section E<br>Part 4<br>Clause<br>8.4.4        | Replace "operation brake" with 'operational brake' in Clause 8.4.4.   |
| 23 | Section E<br>Part 4<br>Clause<br>8.6.1        | Replace "operation brake" with 'operational brake' in sub-clauses (a) and (b) of Clause 8.6.1.  |
| 24 | Section E<br>Part 4<br>Clause<br>8.6.2        | Replace "operation brake" with 'operational brake' in sub-clause (c) and the paragraph following sub-clause (c) of Clause 8.6.2.  |
| 25 | Section E<br>Part 4<br>Clause<br>8.6.3        | Replace "operation brake" with 'operational brake' in the clause title and the 1 <sup>st</sup> paragraph of Clause 8.6.3.   |
| 26 | Section E<br>Part 4<br>Clause<br>8.6.4        | Replace "operation brake" with 'operational brake' in the Clause 8.6.4.   |
| 27 | Section E<br>Part 4<br>Clause<br>10.1.1       | <p>Replace Clause 10.1.1 by the following:</p> <p><b>"10.1.1 General Provisions</b></p> <p>Any one of the faults envisaged in Clause 10.1.1.1 in the electrical equipment of the escalator, if it cannot be excluded under conditions described in Clause 10.1.1.2 and/or Annex A of EN 115, shall not on its own be the cause of a dangerous malfunction of the escalator. "</p> |
| 28 | Section E<br>Part 4<br>Clause<br>10.1.1.1(e)  | <p>Replace Clause 10.1.1.1(e) by the following:</p> <p>"(e) short circuit or open circuit, change of value or function in an electrical component such as resistor, capacitor, transistor, lamp; "</p>  |

- 29 Section E Part 4 Clause 10.2.1.1 Replace Clause 10.2.1.1 by the following:
- “10.2.1.1 The operation of an electrical safety device for any of the events as described under Clauses 10.3.2.4(b) to (r) shall prevent the driving machine from starting or cause the immediate stopping of the driving machine according to Clause 10.2.4. The electrical safety devices shall consist of :
- (a) either one or more safety contacts satisfying Clause 10.2.2 directly disconnecting the supply to the contactors or their relay contactors; or
  - (b) safety circuits satisfying Clause 10.2.3 consisting of :
    - (1) either one or more safety contacts satisfying Clause 10.2.2 not directly disconnecting the supply to the contactors or their relay contactors; or
    - (2) contacts not satisfying the requirements of Clause 10.2.2; or
    - (3) other components in accordance with the requirements of Annex A of EN 115. ”
- 30 Section E Part 4 Clause 10.2.2.2 Replace Clause 10.2.2.2 by the following:
- “10.2.2.2 The safety contacts shall be provided for a rated insulation voltage of 250 V if the enclosure provides a degree of protection of at least IP 4X in accordance with EN 60529, or 500 V if the degree of protection of the enclosure is less than IP 4X.
- Safety contacts shall belong to the following categories as defined in the EN 60947-5-1:
- (a) AC-15 for safety contacts in a.c. circuits;
  - (b) DC-13 for safety contacts in d.c. circuits. ”
- 31 Section E Part 4 Clause 10.2.2.3 Replace Clause 10.2.2.3 by the following:
- “10.2.2.3 If the protective enclosure is not at least of type IP 4X the air gaps shall be at least 3 mm and the creep distances at least 4 mm. The distances for breaking contacts shall be at least 4 mm after separation.
- The live parts of safety contacts shall be accommodated in a protective enclosure.
- Protective enclosure need not be provided in the case of



external influences considered as normal in the Code of Practice for the Electricity (Wiring) Regulations issued under the Electricity Ordinance.

32 Section E  
Part 4  
Clause  
10.2.3

Replace Clause 10.2.3 by the following:

**“10.2.3 Safety Circuits**

10.2.3.1 Any one of the faults envisaged in Clause 10.1.1.1 shall not on its own be the cause of a dangerous situation.

10.2.3.2 Furthermore, the following conditions apply for the faults envisaged in Clause 10.1.1.1.

- (a) If one fault combined with a second fault can lead to a dangerous situation, the escalator shall be stopped by the time the next operating sequence takes place in which the faulty element should participate.

The possibility of the second fault leading to a dangerous situation before the escalator has been stopped by the sequence mentioned, is not considered.

If the malfunction of the component which has caused the first fault cannot be detected by a change of state, appropriate measures shall ensure that the fault is detected and movement prevented at the latest when the escalator is restarted according to Clause 10.3.4.

The mean time between failures (MTBF) of the safety circuit shall be at least 2.5 years. This time was determined under the assumption that within a period of 3 months each escalator is restarted according to Clause 10.3.4 at least once and, thus, is subject to a change of state.

- (b) If two faults combined with a third fault can lead to a dangerous situation, the escalator shall be stopped by the time the next operating sequence takes place in which one of the faulty elements should participate.

The possibility of the third fault leading to a dangerous situation before the escalator has been stopped by the sequence mentioned, is not considered.

If the malfunction of the components which have caused the two faults cannot be detected by a change of state, appropriate measures shall ensure that the faults are detected and movement is prevented at the

latest when the escalator is restarted according to Clause 10.3.4.

The mean time between failures (MTBF) of the safety circuit shall be at least 2.5 years. This time was determined under the assumption that within a period of 3 months each escalator is restarted according to Clause 10.3.4 at least once and, thus, is subject to a change of state.

- (c) A combination of more than three faults can be disregarded if:
- (i) the safety circuit is built-up of at least two channels, and their equal status is monitored by a control circuit. The control circuit shall be checked prior to a restart of the escalator according to Clause 10.3.4 (see also Fig. 9); or
  - (ii) the safety circuit is built-up of at least three channels, and their equal status is monitored by a control circuit.

If the requirements of (i) and (ii) are not fulfilled, it is not permitted to interrupt the failure analysis, which shall be continued analogous to Clause 10.2.3.2(b).  
“

33 Section E Part 4 Clause 10.2.4 Replace “operation brake” with ‘operational brake’ in the 1<sup>st</sup> paragraph of Clause 10.2.4.

34 Section E Part 4 Clause 10.2.5 Replace Clause 10.2.5 by the following:  
**“10.2.5 Control of Electrical Safety Devices**

The components controlling the electrical safety devices shall be selected and assembled so that they are able to function properly even under the mechanical stresses resulting from continuous operation.

In the case of redundancy type safety circuits, it shall be ensured by mechanical or geometric arrangements of the transmitter elements that a mechanical fault cannot cause unnoticed loss of redundancy.

For transmitter elements of safety circuits, the requirements of Clause 14.1.2.5 of EN115 shall apply. “

- 35 Section E Part 4 Clause 10.3.1 Add 'The direction of travel shall be distinctly recognizable from the indication on the switch.' to the end of Clause 10.3.1.
- 36 Section E Part 4 Clause 10.3.1.1 Replace "figure 1" with 'Fig. 1' in sub-clause (a) of Clause 10.3.1.1.
- 37 Section E Part 4 Clause 10.3.2.3 Replace Clause 10.3.2.3 by the following:
- "10.3.2.3 Emergency Stopping, Manually Operated**
- Emergency stopping devices (see Clause 10.3.2.4(h)) shall be placed in conspicuous and easily accessible positions at or near to the landings of the escalator (see Clause 11.1.2.2).
- For escalators with rise above 12 m, and for passenger conveyors with a length of the treadway of more than 40 m, additional emergency stopping devices shall be installed.
- The distances to and between the additional emergency stopping devices shall not exceed 15 m on escalators and 40 m on passenger conveyors.
- The emergency stopping devices shall be safety contacts according to Clause 10.2.2. "
- 38 Section E Part 4 Clause 10.3.4 Replace Clause 10.3.4 by the following:
- "10.3.4 Restarting of the Escalator**
- 10.3.4.1 Restarting by Switch
- After each stop (as per Clauses 10.3.2.1, 10.3.2.3, 10.3.2.4) except the one mentioned in Clause 10.3.2.2, restarting shall be possible only by means of the switches mentioned in Clause 10.3.1 or by means of the inspection control described in Clause 10.3.5. It shall be observed that where stopping is effected in the cases (e),(f),(g),(i),(k),(l),(n),(o),(p),(q) and (r) in Clause 10.3.2.4, restarting shall be possible only after the device causing the stop has been checked and reset to working order by a competent escalator worker.
- 10.3.4.2 Reactivation for Automatic Restart
- Where stopping is effected by an emergency stopping device according to Clause 10.3.2.3, reactivation of the escalator for automatic restart without the switches mentioned in Clause 10.3.1 is permitted under the following conditions.

- (a) The steps, pallets or the belt shall be supervised between the comb intersection lines and additional 0.3 m beyond each comb so that reactivation for automatic restart is effected only when there is no person or object within this zone.

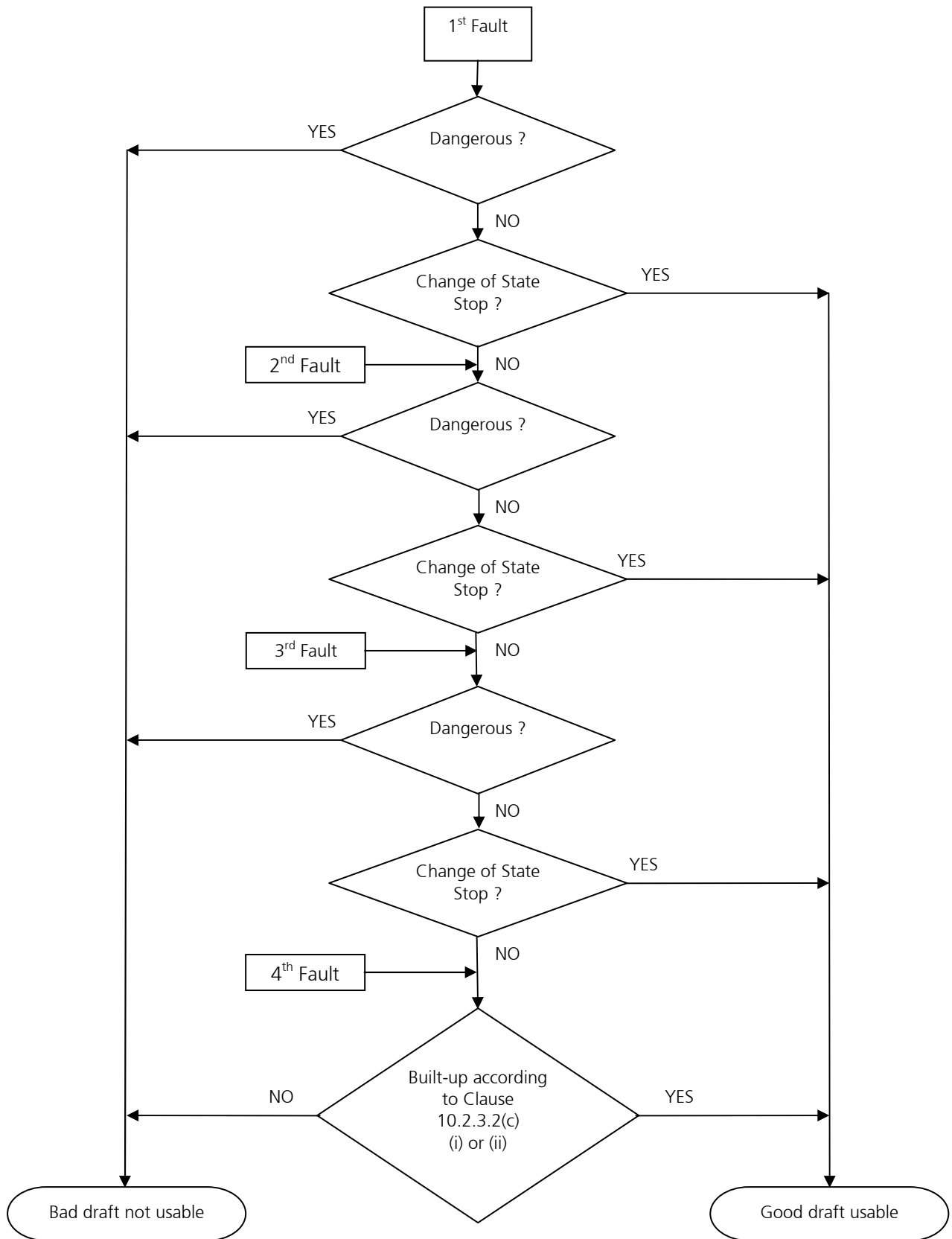
For the test, an opaque upright standing cylinder with a diameter of 0.3 m and a height of 0.3 m is used, which at any place within this zone shall be detected by the control device. As control devices, for instance, transmitters can be applied, placed at a distance of not more than 0.3 m in the inclined section and horizontal section and of not more than 0.2 m in the curved section.

- (b) The escalator shall be started by the passing of a user according to Clause 10.3.1.1.

Starting shall be effected only if, for a period of at least 10 s, the control device has not detected any persons or objects within the defined zone.

- (c) The reactivation control for automatic restart shall be an electrical safety device according to Clause 10.2. Self-controlling transmitter elements are permitted in single-channel design. “

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| 39 | Section E<br>Part 4<br>Clause<br>10.3.5.3 | Add 'The direction of travel shall be distinctly recognizable from the indication on the switch.' to the end of Clause 10.3.5.3. |
| 40 | Section E<br>Part 4<br>Fig. 9             | Insert the enclosed "Fig. 9 – Diagram for drafting and assessing safety circuits" following Section E Part 4 Fig. 8.             |



**Fig. 9 – Diagram for drafting and assessing safety circuits**