

STATUTORY REQUIREMENTS FOR LIFT AND ESCALATOR INSTALLATIONS IN HONG KONG

G.M.W. Chui, Electrical & Mechanical Services Department, Hong Kong

ABSTRACT

The Lifts and Escalators (Safety) Ordinance provides the Government with authority to regulate the design, operation, maintenance, examination and testing of lifts and escalators. This paper describes the mechanism of control, legislation and standards relating to lifts and escalators installed in Hong Kong.

1 INTRODUCTION

The Lifts and Escalators (Safety) Ordinance, Chapter 327 of the Laws of Hong Kong, (hereafter referred to as the Ordinance), provides the Government with authority to regulate and control the design, operation, examination and testing of lifts and escalators. Such authority is vested with the Director of Electrical & Mechanical Services (DEMS). Service lifts (or dumbwaiters) are also under the control of the Ordinance except those installed in factories or industrial undertakings. For those services/goods lifts exempted from the Ordinance, the Factories and Industrial Undertakings (Goods Lifts) Regulations apply.

The Ordinance was originated in 1960. It was amended in 1964, 1976, 1977, 1982, and received a major revision in 1987. Amendments were also made in 1989 and 1993.

2 LIFTS & ESCALATORS (SAFETY) ORDINANCE

There are three major principles in the Ordinance relating to safety aspects of lift installation, viz : -

- 1) The Registration of Lift & Escalator Engineers and Lift & Escalator Contractors : -

Lifts are put under regulatory control in that maintenance, tests and examinations stipulated in the Ordinance must be performed by registered lift and escalator contractors and registered lift and escalator engineers who are, in the opinion of DEMS, qualified to carry out the duties and exercise the functions required by the Ordinance. Their names are kept in registers.

To apply for registration as a Registered Lift or Escalator Contractor(R L/E C), the contractor should submit application forms Form 20 or Form 21, relevant documents showing the business registration, the decision of the Board of Directors to seek registration, the agency of certain lift and escalator manufacturers, the certificates confirming compliance with British Standards and Local Regulations and the workforce including workshop space and manpower. After that, DEMS will assign his staff to carry out an assessment and decide whether the contractor is qualified to be registered. Certificates of registration will then be issued.

To apply for registration as a Registered Lift or Escalator Engineer(R L/E E), the applicant must :

- a) have at least a higher diploma or higher certificate in mechanical or electrical or electronic engineering from the Hong Kong Polytechnic or a technical institute or equivalent as the Director may approve;
- b) have completed an apprenticeship in mechanical or electrical or electronic engineering and have not less than 3 years' subsequent supervisory experience in the erection, commissioning, testing and maintenance of lifts/escalators;
- c) have satisfied DEMS that he has the necessary practical experience and general knowledge of the statutory requirements to carry out the duties and exercise the functions so required of a registered lift/escalator engineer.

A person who has had ten years' practical experience in the erection, commissioning, testing and maintenance of lifts, may, in the opinion of DEMS, deem to satisfy aforementioned requirements a) and b).

The applicant has to submit Form 1 or Form 2 with supporting documents together with a covering letter from his employer. A written examination will be arranged for

applicants satisfying the above requirements a) and b), normally three hours for lift engineering and two and a half hours for escalator engineers.

The questions will be on the following fields :

- a) Lifts and Escalators (Safety) Ordinance;
- b) Building (Lifts) or (Escalators) Regulations;
- c) Topics on Firemen's lift;
- d) BS 5655, Lifts and Service Lifts;
- e) BS 5656, Safety Rules for the Construction and Installation of Escalators and Passenger Conveyors;
- f) Codes of Practice issued under Lifts and Escalators (Safety) Ordinance;
- g) Topics on Factories and Industrial Undertakings (Goods Lifts) Regulations;
- h) Theory of lift/escalator installations and practical experience.

The Department holds written examinations quarterly. If the applicant passes the written examination, he will be arranged to attend an interview. If the result of the interview is satisfactory, certificates of registration will be issued within 3 months after the receipt of the application. If the result is not satisfactory, the applicant will be advised when he may apply for registration again.

To ensure the Registered Lift/Escalator Engineers and Registered Lift/Escalator Contractors perform their duties in accordance with the requirements of the Ordinance, a Performance Monitoring Point System was established. DEMS may institute prosecution or bring the matter to a disciplinary board to conduct inquiry in the case where DEMS has reasons to believe the registered lift or escalator contractor or engineer has either committed an offence or is guilty of misconduct etc.

2) Testing of Lifts and Escalators after Installation or Alteration: -

The Ordinance stipulates the examinations and tests to be carried out after a new lift or escalator has been installed including :

- a) examination of all machinery, equipment and builder's work associated therewith;
- b) testing of the safety equipment with full rated load for lift and no load for

escalator.

Examination of a lift or escalator is performed to verify all the necessary builder's work have been completed and the proper functioning of all the safety devices such as door interlocks, and limit switches. It is also required to check the proper operation of lift with regard to speed, accurate levelling, response to hall and car calls etc.

Testing of safety gear simulates an emergency case wherein the car goes down at a speed higher than the rated speed. When tripping speed level is attained, the overspeed governor is required to actuate the safety gear which stops the car within a predetermined distance. The lift or escalator engineer performing the test shall, if he is satisfied by the result of such tests, submit a Form 5(a report of the test) to DEMS for certification. Upon receipt of the Form 5, arrangement will be made to inspect the lifts or escalators. The permit(Form 6) to use a new lift or escalator will be issued within 14 days, if it is satisfied that the lift or escalator is in safe working order.

The Ordinance also requires reporting of major alterations such as the replacement of safety equipment, controllers, addition of landings and change of speed etc. The procedure upon completion of major alteration is very similar to that prescribed for new installation. If Form 7 (the test certificate) is not submitted after a major alteration or if work affecting the safety of the lift or escalator has been carried out by some person other than a registered lift or escalator contractor, DEMS may require a lift or escalator to be examined/tested by issuing a Form 10.

3) Periodic maintenance, testing and examination of existing lifts and escalators : -

The statutory requirements for periodic maintenance, examination and testing of existing lifts and escalators by Registered Lift/Escalator Contractors(R L/E C) and Registered Lift/Escalator Engineers(R L/E E) are given below :

<u>Work by R L/E C/E</u>	<u>Intervals</u>	<u>Forms submitted by owner</u>
Periodic maintenance of lifts and escalators such as cleaning, oiling and adjusting	Not exceeding 1 month	
Periodic examination on escalators	Not exceeding 6 months	Form 12
Periodic examination on lifts	Not exceeding 12 months	Form 11
Periodic testing of safety equipment provided for lifts	Not exceeding 12 months	Form 11
Periodic testing of safety equipment of lifts with full rated load	Not exceeding 5 years	Form 11
Period testing of safety equipment of escalators with no load	Not exceeding 1 year	Form 12

DEMS may order the lifts or escalators to be examined/tested by issuing Form 9 if within 5 weeks after the expiration of the period prescribed for the periodic examination/testing, DEMS has not received a certificate to that effect. If the owner does not comply with the order within 21 days, DEMS may prohibit the use of the

lifts or escalators by issuing Form 16.

An order, Form 16, prohibiting the operation of a lift or escalator may be issued under any one of the following reasons :

- a) A registered lift or escalator engineer reports that the machinery and/or safety equipment is not in safe working order.
- b) No reply within 21 days after Form 9 or Form 10 is issued.
- c) No periodic maintenance on a lift or escalator over a month.
- d) Lifts or escalators not in safe working order.
- e) Lifts or escalators likely be used without necessary permission.

After the Form 16 is issued, the owner shall arrange for disconnection of power supply or the registered engineer/contractor to disconnect supply as instructed by DEMS. The owner shall arrange to rectify the defects and discrepancies. The registered engineer/contractor shall submit test certificate Form 17 or the registered contractor shall submit maintenance certificate, Form 18, to owner. The owner shall submit Form 17 or Form 18 to DEMS and DEMS may permit to resume the use of the lift or escalator by issuing Form 19 to the owner.

After November, 1987, all existing service lifts in non-industrial undertakings shall be registered and the owner shall arrange a registered lift engineer to carry out the periodic examination as stipulated in the Ordinance. The owner shall also ensure his service lift comply with the Lifts and Escalators (Safety) Ordinance and the Buildings Ordinance. Service lift means internal dimension of car not exceeding 1 m² floor area and height of 1.2m with rated load not exceeding 250 kg.

A list of Forms used in the Ordinance is shown in the following Table 1.

Table 1 List of Forms

Form 1	Application for inclusion in register of lift engineers
Form 2	Application for inclusion in register of escalator engineers

- Form 3 Certificate of registration of lift engineer
- Form 4 Certificate of registration of escalator engineer
- Form 5 Certificate on examination of lift or escalator and on testing of safety equipment provided therefor upon completion of the installation
- Form 6 Permit to use and operate a lift or an escalator
- Form 7 Certificate on examination and testing of lift in respect of which lift works consisting of major alterations have been carried out or of escalator in respect of which escalator works consisting of the alteration of the speed, operation or design thereof have been carried out
- Form 8 Permit to resume use and operation of lift in respect of which major alterations have been made or of escalator in respect of which there has been an alteration of speed, operation or design
- Form 9 Order requiring lift or escalator to be examined or the safety equipment provided therefor to be tested, or both
- Form 10 Order requiring lift or escalator to be examined or the safety equipment provided therefor to be tested, or both
- Form 11 Certificate on periodic examination of lift or periodic testing of safety equipment provided therefor, or both
- Form 12 Certificate on periodic examination of escalator or periodic testing of safety equipment provided therefor, or both
- Form 15 Certificate on examination of lift or escalator or testing of safety equipment provided therefor, or both, pursuant to an order under section 25
- Form 16 Order prohibiting use and operation of lift or escalator
- Form 17 Certificate from registered lift engineer/registered escalator engineer
- Form 18 Certificate from registered lift contractor/registered escalator contractor
- Form 19 Permit to resume use and operation of lift or escalator
- Form 20 Application for inclusion in the register of lift contractors
- Form 21 Application for inclusion in the register of escalator contractors
- Form 22 Certificate of registration of registered lift contractor
- Form 23 Certificate of registration of registered escalator contractor
- Form 24 Notice of commencement of lift or escalator works involving installation of new lift or escalator
- Form 25 Application for modification of and/or exemption from the provisions of the

	Code of Practice made under the Lifts and Escalators (Safety) Ordinance
Form 26	Approval under Section 27H(3)
Form 27	Order made under Section 11L
Form 28	Order made under Section 11M

3 CODES OF PRACTICE

Code of Practice on the Design and Construction of Lifts and Escalators was published in 1993. The Code, unless the Director of Electrical & Mechanical Services provides otherwise, is applicable to all lifts and escalators subject to the Lifts and Escalators (Safety) Ordinance. Compliance with the Code is deemed to have satisfied the relevant requirements of the Ordinance.

The Code of Practice defines technical details, methods and procedures related to lifts and escalators with a view to safeguarding persons and objects against the risk of accidents associated with the operation, installation, and alterations of lifts and escalators.

The Section on Specification is further divided into four parts where;

Part 1 deals with electric lifts where the car is suspended by ropes or chains;

Part 2 deals with the hydraulic lifts;

Part 3 deals with service lifts; and

Part 4 deals with escalators and passenger conveyors.

The technical requirements are generally the same as the BS 5655 and BS 5656 except for certain requirements which are amended to suit the local environments.

Where a RLE, REE, RLC or REC carries out lift or escalator works that are not in accordance with the relevant portions of the Code, he shall apply for an approval by submitting Form 25 and details of proposed lift/escalator works to the DEMS. The DEMS shall issue Form 26 to give approval to such proposed works, if he is satisfied that the requirements of the code can be complied with.

The Code does not give rules relating to the protection against fire of building elements.

Fire resistance requirements are made under the Code of Practice for Fire Resisting Construction issued by the Building Authority.

The Code does not give rules relating to building works for lifts and escalators. Such requirements are made under the Code of Practice on Building Works for Lifts and Escalators issued by the Building Authority.

The other Code of Practice on the Examination, Testing and Maintenance of Lifts and Escalators is being prepared and will soon be published.

4 FACTORIES & INDUSTRIAL UNDERTAKINGS (GOODS LIFTS) REGULATIONS

The Factories and Industrial Undertakings (Goods Lifts) Regulations ensure that goods lifts and services lifts in factories are properly constructed and maintained so that they can be used safely. These Regulations are applicable to goods lifts after they have been exempted from the Lifts and Escalators (Safety) Ordinance. The lift shall be properly constructed and maintained before it is put into operation. It shall be examined by a registered lift engineer at least once a year. Main technical requirements for goods lifts are : -

- a) A substantially enclosed liftway should be provided.
- b) Landing doors complete with interlocks should be provided.
- c) Every lift should be provided with adequate lighting, a "stop" switch at each landing and an automatic device to prevent the lift from overrunning.
- d) No operating switch should be installed in the car or platform of the lift.
- e) Notices in Chinese and English should be displayed stating the maximum working load and that no person should be carried in the goods lift.

BIOGRAPHY

GREGORY M.W. CHUI is being employed as a senior electrical and mechanical engineer by the Electrical & Mechanical Services Department of the Hong Kong Government. He is currently the head of the Lifts and Escalators Section of the General Legislation Division, and is responsible for the administration and enforcement of the Lifts and Escalators (Safety) Ordinance.