

Guidelines on Operation and Maintenance Manuals for Lift/Escalator Installations

1 Introduction

1.1 In respect of lifts and escalators, there are certain requirements for the preparation and provision of O&M manuals for the reference of owners, and installation and maintenance personnel.

1.2 These *Guidelines* following the requirements of BS EN 13015:2001 aim at outlining the basic functions of an O&M manual, how it is to be drafted and the procedure relating to the keeping of the O&M manuals for lift/escalator installations.

2 Functions of O&M Manuals

2.1 An O&M manual describing the specification of the equipment installed, detailing control and operating parameters in a systematic manner should be provided for every lift/escalator installation/location. The O&M manual should also outline maintenance requirements to make possible safe, proper and reliable operation of the lift/escalator system.

2.2 With O&M manuals, owners will be able to better deliver on their responsibilities to arrange for proper maintenance to ensure safe and reliable operation of the lift/escalator installation. Owners can also better understand the need for repair and/or component replacement.

2.3 An O&M manual can usually provide the following benefits:

- a. To allow the owner to follow safe practice, to institute appropriate controls and to take necessary precautions in relation to the safe use of a particular lift/escalator installation;
- b. To enable the owner to better understand maintenance and repair requirements, and to avoid unnecessary dispute and delay in repair;
- c. To enable the owner to better understand the installation and to communicate with the maintenance contractor more precisely and correctly;
- d. To provide the necessary information enabling a proper response to be made during an emergency;
- e. To help the owner to formulate cost effective and custom made maintenance contracts, and to decide appropriate stock level of essential spare parts;
- f. To provide necessary information for planning and implementation of modernization and replacement project.

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3. General Provisions

3.1 Every lift/escalator installation and/or system modification project should be provided with an O&M manual with the specification of the equipment installed, control details and general operating parameters in a systematic manner. Where more than one lift/escalator is provided for an installation project or similar modification works are applied to more than one lift/escalator of a location, one set of O&M manual will be required. However, all the specialities of the individual lifts/escalators and the works applied should be clearly stated in the O&M manual.

3.2 The O&M manual should also provide the as-installed information associated with the lift/escalator installation such as lift well dimensions, lift pit and machine room arrangement, lifting points and facilities, and any other auxiliary services (e.g. emergency power supply) and details which are needed for any equipment modification or replacement scheme for the lift/escalator system.

3.3 The registered lift/escalator contractor who maintains the lift/escalator installation should update the O&M manual in accordance with the requirements of these *Guidelines* by recording any modifications made to the system or replacement of any major equipment.

3.4 Results of risk assessment for the working area and tasks related to the operation and maintenance of the lift/escalator installation or modification should be provided. The registered lift/escalator contractor responsible for the maintenance of the lift/escalator installation or modification should make its own risk assessment prior to carrying out of any works.

4. Format of the O&M Manual

4.1 The format of the O&M manuals should generally be in accordance with the requirements laid down in the *European Standard, EN 13015, Maintenance for lifts and escalators – Rules for maintenance instructions*.

4.2 All O&M manuals should be prepared in standard size paper, paginated and bound in a systematic manner in durable hard cover file(s). Provision of the O&M manual in electronic form is also acceptable subject to the agreement of the owner and the fact that information stored electronically can be reproduced in paper form and means for updating the stored information upon modification of the lift/escalator system is available.

4.3 Official language(s) (English or Chinese) should be used in drafting the O&M manual. Translations in the official language(s) should be provided if the printed manuals are written in other languages.

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4.4 For mass manufactured individual items used in a lift system, e.g. door locks, safety switches, drives, governors, safety gears, ascending overspeed protection means, pressure relief valve, restrictor, and jack; and in an escalator system, e.g. safety switches, drives, governors, pallets, step chains; standard printed manuals or leaflets from the manufacturer will be acceptable provided that the requirements laid down in these *Guidelines* are generally met.

4.5 For custom assembled equipment, standard printed manuals or leaflets should be supplemented by specially prepared drawings, type-written documents with technical description, operating and maintenance procedures, and common trouble shooting information.

5. Presentation

5.1 Where more than one volume is provided to form the O&M manual, each volume should be clearly identified and should be contained in a separate file or binder.

5.2 A contents/index section listing all sections and sub-sections of all volumes of the O&M manual should be provided. Each group of drawings should be provided with a schedule giving drawing numbers, date of issue, amendment number, and drawing descriptions that identify clearly the equipment and purpose of the drawings.

5.3 Each major topic, equipment or standard manufacturers' manuals should be in a section separated by tabbed, numbered or lettered dividers in the sequence mentioned in the contents/index section. Printed catalogues or manufacturers' instruction manuals should collectively be placed in a separate subsection.

5.4 Large drawing prints should be neatly folded for binding into the O&M manuals. Consideration should be given to the use of robust, transparent plastic bags or folders for the protection of drawings in the O & M manual to ensure tidiness and longevity of the information stored.

6. Contents

6.1 The contents of the O&M manual should comply with the respective requirements of EN 81 for lifts and EN 115 for escalators and passenger conveyors. The essential information covered in the 'technical dossier' as mentioned in the aforementioned standards should also be available in the O&M manual. In drafting the O&M manual, the requirements of BS EN 13015 should also be observed.

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6.2 The contents of the O&M manual should include essentially the following information:

6.2.1 General Information

- a. A front cover sheet showing the address/location of the lift/escalator installation, drive system, power supply characteristics, capacity, speed, length of travel, number of stops, location of machine room where applicable, and quantities of major equipment installed and the date of issue of the O&M manual should be provided.
- b. The scope of the installation and/or modification works and the type/model of the equipment should be briefly described, e.g. 3 nos. 2.5 m/s 1050 kg 14 persons VVVF Lift Model ABC serving G/F to 22/F.
- c. Health and safety information in relation to the operation and maintenance of the lift system should also be included.

6.2.2 Operating Information

- a. Description of the plant together with its principle of operation, performance, capacity and quantity of equipment supplied under the installation and/or modification works should be given. Reference to the design operating conditions and requirements for the safe use of the equipment should be included. Functions and the uses of the supervisory panel(s), where provided, should also be mentioned in the O&M manual.
- b. Where the lift/escalator installed is restricted to any particular uses, information should be provided in the O&M manual. In addition, information including the duties of the owner, importance of updating and keeping the O&M manual in safe custody, safe use of the lift/escalator, maintaining free access on landings and keeping the machine room door locked, etc., should also be provided.
- c. A step by step procedure for start-up and shut-down of the equipment under interlocking control should be provided. Interlocking signals such as the operation of a shutter gate in front of the landing door or escalator entrance should be provided. In addition, this should apply to lift installations under group control and/or where special lift car allocation control has been provided and for escalator installations where successive escalators are provided.

6.2.3 Monitoring Information

- a. If event log for monitoring lift/escalator performance is available, such monitoring information with appropriate parameters should be covered in a schedule to form a part of the O&M manual. A sample log sheet with the parameters on a recommended recording time interval should be provided.

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6.2.4 Trouble-Shooting Information

- a. All alarms and their corresponding implications including the possible reason for activation, measures and rectification should be provided in the O&M manual.

6.2.5 Commissioning, Inspection and Calibration Information

- a. A copy of the duly endorsed test and examination reports specified in the Appendices of the Code of Practice for Lift Works and Escalator Works with all the check figures and testing results should be provided. Acceptable ranges of operating data enlisted in the test and examination reports should be given in the O&M manual. (Remarks: Such reports should have been provided to the owners together with the statutory form certifying completion of the installation/major alteration works).
- b. A copy each of the type test certificates and associated technical documents for all safety components used in the installation, together with the test and examination reports and certificates of the hoisting ropes or chains used should be included.
- c. Copies of the statutory form(s) relevant to the test and examination of the installation and/or modification works should also be included.

6.2.6 Maintenance Information

- a. Information for the routine maintenance of the lift/escalator and its accessories safety and in good working order should be provided.
- b. A schedule of recommended lubricants and frequency of application/changing, and a drawing showing all lubrication points of the installation should be provided.
- c. To facilitate scheduling of maintenance requirements, information should be in the form of a preventive maintenance chart or a maintenance plan detailing all routine and major overhaul operations to be carried out. Where maintenance requirements are to be determined by the operational periods or running hours of the lift/escalator, these figures should also be stated. Dismantling procedures and safety precautions for the removal and replacement of major components and equipment should be provided.

6.2.7 Spare Part Information

- a. A comprehensive list of recommended spare parts and special tools for the safe operation and proper maintenance including cross-reference information with the equipment should be provided. The list should be furnished with the names of the spare parts, brief descriptions, part numbers and the corresponding stock level for maintaining the plant for two years' operation. The list should also be completed with delivery schedule enabling the owner to arrange for ordering of spare parts and tools.
- b. The estimated service lives of major components and equipment in terms of operating hours or actuation numbers should be provided to facilitate scheduling of replacements of major components and equipment.

6.2.8 Other Information

- a. A collection of prints of the approved record drawings including layout plans, installation drawings with structural loading at anchoring points and sectional views showing run-bys, positions of safe spaces and locations of limit switches in the hoistway, machine room layout, power supply schematic diagrams, wiring diagrams and a major plant equipment register detailing the individual equipment by giving its equipment number/tag number, description, capacity, operating range, setting, power requirement, serial number, etc. should be provided. All drawings should be clearly legible and complete with legends. CENELEC symbols and ISO 1219 symbols should respectively be used for electric circuits and hydraulic circuits as far as possible.
- b. Where password is required for the access to the controller for routine maintenance and diagnosis, the default password should be stated in the O&M manual.
- c. If provisions have been provided in the system for connection of adaptor or similar detachable hardware for operation and maintenance of the system, the functions of the adaptor or similar detachable hardware should be mentioned in the O&M manual. If any such adaptor or similar detachable hardware is necessary for maintaining the lift/escalator installation in proper and good working order is not supplied as a part of the system, such device(s) should be available for purchase by the owner at a reasonable price.
- d. Step by step procedures showing how trapped persons are to be released and other emergency rescue operations with illustrations of the use of rescue tools should also be provided for use of authorized personnel.
- e. An amendment log with amendment dates and responsible parties should be provided for the systematic recording of the history of changes made to the lift/escalator installation and the O&M manual, where appropriate.

7. Ownership and Keeping of the O&M Manual and Special Tools

7.1 The O&M manual and special tools where provided should be regarded as a part of the lift/escalator system and should be the asset of the owner of the lift/escalator system. Where special tools are necessary for maintaining the lift/escalator system such tools should be made available on offer for the owner to purchase if they have not been included in the supply of the lift/escalator system.

7.2 The owner of a lift/escalator installation or the appointed agent, i.e. the incorporated owners or the appointed property management company, should be responsible for the safe custody of the O&M manual(s) and special tools which have been provided for use with the lift/escalator installation.

7.3 The owner of the lifts/escalators by agreement can transfer the custody of the O&M manuals and special tools which have been provided for use with the system to the contractor responsible for the maintenance of the lifts/escalators and upon termination of such maintenance retrieve the custody of the manuals and the special tools.

7.4 Whenever system modification of the lift/escalator installation is to be carried out, the owner should ensure that the contractor responsible for the system modification work updates the O&M manuals to reflect the system modification which has been undertaken on the installation and to also include the information needed for the operation and maintenance of the installation.

8. Supply of O&M Manual

8.1 O&M manuals should be prepared and provided by the registered lift/escalator contractors to the owners or his/her appointed agent upon completion of project works of the following categories:

- a. Installation of new lift(s)/escalator(s) and the associated control system(s);
- b. Major alteration work(s) for a lift/escalator installation; and
- c. Lift/escalator works involving modification of wiring, changing and replacement of major lift/escalator equipment and/or components.

8.2 According to BS EN 13015, O&M manuals should be provided at the latest by the time the system is put into use and operation. However, experience has shown that the incorporated owners would have yet to be established upon completion of a new building project not to mention the existence of the appointed property management company. The registered lift/escalator contractor responsible for the supply and installation of the lift/escalator system for a new building project will also be the contractor responsible for the maintenance of such system for the defects liability period for 12 months or longer. For new building projects, it would therefore be more appropriate that the registered lift/escalator contractor keeps the O&M manuals and hands over the same upon the establishment of the incorporated owners (or availability of the appointed agent) which is expected to take place within the defects liability

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period. By so doing, the chance of losing the O&M manual and special tools which have been provided for use with the lift/escalator installation can be minimized. Notwithstanding the above, the registered lift/escalator contractor should not delay completion of the O&M manual as which may be needed by incident investigation personnel and others for reference.

8.3 For major alteration and system modification works, if there is already a comprehensive O&M manual for the system, registered lift/escalator contractors should update the O&M manual by incorporating details of the works affected. Otherwise, O&M manual in accordance with the stipulated requirements should be provided for the scope of major alteration and/or system modification works performed.

8.4 It is advisable that the registered lift/escalator contractor responsible for the supply and installation of, or carrying out of major alteration and/or modification to the lift/escalator systems should also keep for each such system a set of O&M manual in paper form or in electronic form for his own reference and for the subsequent procurement of extra copies of the O&M manual by the lift/escalator system owners.