

Voluntary Code of Practice for
Health and Safety Issues in
the New Zealand Lift Industry



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PREFACE

This guide has been produced in consultation with member companies of the New Zealand Lift and Escalator Association as a voluntary code of practice.

Its purpose is to provide a practical source of information relative to the vertical transportation industry in relation to environmental health and safety for their employees, customers and the environment.

The New Zealand Lift and Escalator Association recommends the use of this guide for the vertical transportation industry with the view to its being accepted as the approved code of practice for the industry by the Occupational Safety and Health Service of the Department of Labour.

The Health and Safety in Employment Act 1992 (HSE Act) places the responsibility for providing safe and healthy workplaces on all employers and on employees, that they should work in a safe and responsible manner to avoid being harmed.

The New Zealand Lift and Escalator Association is committed to promoting a safe and healthy work environment for the general public, its members and staff.

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FOREWORD

I commend the New Zealand Lift and Escalator Association for their initiative in producing this code of practice. It is a comprehensive document that provides practical guidance on managing health and safety in the vertical transportation industry. Adopting the safe work practices in this code will assist employers to meet their obligations under the Health and Safety in Employment Act 1992. The code will also assist employees to be aware of the health and safety hazards they may encounter at work and how to take the necessary precautions.

The Occupational Safety and Health Service of the Department of Labour encourages the adoption of this code of practice by all those working in the industry.



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General Manager

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1. SUMMARY OF THE HEALTH AND SAFETY IN EMPLOYMENT ACT 1992

1.1 Introduction

During 1991 and 1992, the Government introduced various legislation in the labour market area which had the common theme of moving responsibility and accountability away from central government into the individual workplace.

Employers are now required to manage their own workplaces in line with legislation which is basically self-regulatory. The style can be seen in the Employment Contracts Act, the Accident Rehabilitation and Compensation Insurance Act, the Industry Training Act and the Health and Safety in Employment Act.

1.2 Objective

The principal objective of the HSE Act is to prevent harm to employees at work. To achieve this, it imposes duties and responsibilities on employers, employees, principals and others, and promotes excellent health and safety management by employers.

1.3 Regulations

Regulations impose duties and responsibilities on employers, employees, designers, manufacturers and others relating to health and safety. These regulations apply to places of work, plant, processes or substances and may be made to deal with specific problems that have arisen.

1.4 Approved Codes of Practice

The HSE Act provides for the use of approved codes of practice. They are statements of preferred work practices, and may include other procedures that could be taken into account when deciding on practical steps to be taken. Compliance with codes is not mandatory, however it may be used as evidence of “good practice” in court.

1.5 Employers’ Duties

Employers are required to take all practicable steps to ensure that the safety of employees at work is not compromised, they are required to take all practicable steps to:

- Provide and maintain a safe work environment;
- Provide and maintain facilities for the health and safety of employees at work;
- Ensure that machinery and equipment is safe for all employees;
- Ensure that working arrangements are not hazardous to employees; and
- Provide procedures to deal with emergencies that may arise while employees are at work.

Taking “all practicable steps” means doing what is reasonable and able to be done in the circumstances, taking into account:

- The severity of any injury or harm to health that may occur;

- The degree of risk or probability of that injury or harm occurring;
- How much is known about the hazard and ways of eliminating, reducing or controlling it; and
- The availability, effectiveness and cost of possible safeguards.

1.6 Hazard Management

Employers must identify and regularly review hazards in the workplace, this includes existing, new and potential hazards, to determine whether they are significant and require further action. If an accident or harm occurs that requires particulars to be recorded, employers are required to investigate and determine whether it was caused by, or arose from, a significant hazard.

“Significant hazard” means a hazard that is an actual or potential cause or source of:

- Serious harm; or
- Harm (being more than trivial) where the severity of the effects on any person depends (entirely or among other things) on the extent or frequency of the persons exposure to the hazard; or
- Harm that does not usually occur, or is not usually easily detectable, until a significant time after the exposure to the hazard.

Where the hazard is significant, the HSE Act sets out the steps employers must take:

- Where practicable, the hazard **must be eliminated**.
- If elimination is not possible, the hazard **must be isolated**.
- If it is impractical to eliminate or isolate completely, then employers **must minimise** the hazard to employees.
- Where the hazard has not been eliminated or isolated, the employer must, where appropriate:
 - ensure protective clothing and equipment is provided, accessible and used;
 - monitor employees' exposure to the hazard;
 - seek the consent of employees to monitor their health; and
 - with their consent, monitor employees' health.

1.7 Information for Employees

Employers are required to inform employees of any health and safety monitoring. In doing so, the privacy of each employee must be protected.

Before employees begin work, they must be informed by their employer of:

- Hazards employees may be exposed to while at work;
- Hazards employees may create which could harm themselves or other people;
- Ways to minimise the possibility of becoming a source of harm to themselves or others;

- The location of safety equipment; and
- Emergency procedures.

1.8 Employee Involvement in Developing Health and Safety Procedures

Employees shall be given the opportunity to be fully involved in the development of procedures for the purpose of identifying hazards and dealing with significant hazards, or dealing with or reacting to, emergencies and imminent dangers.

1.9 Training of Employees

Employers must ensure employees are either sufficiently experienced to do their work safely, or are supervised by experienced people. In addition, employees must be adequately trained in the safe use of equipment in the place of work, including the use of protective equipment and clothing.

1.10 Safety of People Who Are Not Employees

Employers are responsible for the health and safety of people who are not employees. Employers must take all practicable steps to ensure that employees do not harm any other person while at work, including members of the public or visitors to the workplace.

1.11 Employees and Self-Employed Persons' Duties

Employees and self-employed persons are responsible for their own health and safety while at work. They must ensure that their actions do not harm anyone else. These responsibilities do not detract from employers' or principals' duties and responsibilities.

1.12 Accident and Serious Harm

The HSE Act requires employers to keep a register of work-related accidents and serious harm. This shall include every accident that harmed or might have harmed:

- Any employee while at work; and
- Any person in a place of work under the employer's control.

Employers are also required to investigate all accidents, harm or near-misses to determine whether they were caused by a significant hazard.

Employers must notify all cases of serious harm to employees while at work to the Secretary of Labour (in practice the nearest OSH office), as soon as possible. In addition, the accident must be reported on the prescribed form within 7 (seven) days. (Forms are included in the *Workplace Accident Register* available from OSH offices and selected stationers.)

If a person suffers serious harm, the scene of the accident must not be disturbed unless to:

- Save life or suffering;

- Maintain public access for essential services, e.g. electricity, gas; or
- Prevent serious damage or loss of property.

The OSH office will advise whether it wishes to investigate the accident and what action may be taken in the meantime.

2. INTRODUCTION

The requirements specified in this code are intended to serve as the basis upon which elevator businesses throughout the country can build comprehensive job site safety programmes that reflect individual operating needs. These minimum standards of performance provide a mandatory framework for each company to fulfil its obligation to provide its employees with a workplace free from recognised occupational hazards.

This procedure is focused on establishing and maintaining effective safety management systems and specifying key mandatory work rules designed to mitigate the possibility of injury or illness from hazards common to our industry.

Some clauses in this code make provision for alternative methods that can be used.

If a company wishes to use alternative methods, then the company must have a documented procedure for reviewing, approving and recording the alternative solutions. No alternative method shall be used unless it has undergone this procedure.

3. SCOPE

The standards apply to all job sites, and describe mandatory safe working provisions and practices (supported by training) for all companies responsible for and involved in the installation, examination, inspection, testing, manufacturing, service, maintenance, repair and dismantling (including complete demolition) of elevators, escalators and associated equipment.

The safe practices specified herein apply to all aspects of the work environment and reflect collective experience in the elevator, escalator and people-moving equipment business and the construction industry.

4. SAFETY MANAGEMENT SYSTEM

Each company must develop and implement a formal safety management system that includes, at a minimum, the following elements:

4.1 Statement of Policy

A policy statement that clearly communicates the company's commitment to the prevention of accidents must be written. The policy must be reviewed annually and updated as required.

4.2 Accountability

Each operating/line manager and/or supervisor will be held accountable for all aspects of the safety programme. Written safety objectives are to be developed, clearly communicated and used as a basis for performance evaluations and “pay-for-performance” programmes.

4.3 Hazard Identification and Control

Each company shall conduct a systematic analysis of workplace and job site risks and then develop and implement controls for the identified hazards. This process shall be accomplished at least once a year.

Prior to the signature of any new contractual agreement (including maintenance, new equipment, modernisation, and open order work), a risk assessment must be made of the work to be done and conditions of the job site. Based on the results of this

assessment, prevention and/or control measures necessary to safeguard identified hazards and risks must be established. For new construction sites, where access to the site or location is not possible, the assessment process must anticipate probable risks/hazards.

Control measures that are not the direct responsibility of the company must be specifically identified and put forth as requirements to the building owner, general contractor and/or sub-contractor as applicable.

4.4 Safety Education and Training

Specific employee training and education initiatives must be developed to address inherent risks present at all workplaces and job sites. All operating/line managers, supervisors and sales and marketing personnel must participate in training programmes to implement and enforce safety programme requirements.

4.5 Communication

Mechanisms must be established to facilitate communication among all employees in effectively conveying management's commitment to the prevention of accidents and to ensure receipt of information necessary to perform functions and enhance awareness of safety issues. Communication vehicles such as employee meetings, company newspapers, bulletin boards, and supervisor dialogues with workers are examples of the many channels that

can be used to meet these objectives.

4.6 Health and Safety Rules

Health and safety rules must be developed, documented and consistently applied to all aspects of the job. These rules must be reviewed with all personnel and are an important part of training new employees. Once established, health and safety rules must be enforced by line management.

4.7 Enforcement Programmes and Disciplinary Procedures

Enforcement programmes and disciplinary procedures must be formally documented and consistently applied at all levels of the organisation. Disciplinary action should be based on the seriousness of the violation and range from a verbal warning to job termination.

4.8 Maintenance of Safe Working Conditions

Routine job site safety inspections must be made by all levels of line supervision. These inspections will be designed to evaluate the effectiveness of the safety procedures. All inspection deficiencies must be documented and a corrective action plan developed which assigns responsibility and establishes a timetable for completion.

4.9 Measurement of Effectiveness

A comprehensive evaluation of the safety system must

be accomplished at least once a year to determine its effectiveness in achieving established goals. This evaluation must include a review of all accidents and their causes.

5. GENERAL SAFETY RULES

In order to maintain a safe work environment it is necessary to understand and follow all safety instructions. Therefore, safety instructions must be published and distributed. Supervision is required to ensure that employees are familiar with and follow these rules. At a minimum, general safety rules will include:

5.1 General

- 5.1.1. All employees will be trained by knowledgeable personnel on safety procedures and methods of eliminating or minimising hazardous conditions before performing or directing others to perform work. For each job site, management will designate an individual responsible for assuring implementation of a company safety policy and these standards.
- 5.1.2. Personal protective equipment, including equipment for eyes, face, head and extremities, protective clothing, hearing protection and respiratory devices shall be provided, used and maintained in a sanitary and reliable condition to protect against job site hazards.
- 5.1.3. Adequate lighting must be provided to ensure safe entry, exit and working conditions. Control switches should be located close to each access point to the area.

- 5.1.4. All lighting must be protected against mechanical damage and all lighting circuits must be properly fused and grounded or double insulated. Protection is required any time there is a potential for inadvertent or accidental contact.
- 5.1.5. No work shall be performed on metal ladders where the possibility exists of dangerous contact with live electrical conductors.
- 5.1.6. Clear warning signs must be installed in any place that a potential hazard exists in the work area.
- 5.1.7. The generation of excessive noise or harmful dusts and fumes should be avoided. If this is not possible, personnel shall wear appropriate personal protective equipment and take suitable precautions to protect others in the vicinity of the work from these environmental hazards.

5.2 Electrical Safety

The following requirements are applicable to all work activities and practices involving electrical circuits and equipment:

5.2.1 General Protection

- a) No employee shall be permitted to work in close proximity to any part of any electrical power circuit unless the employee is protected against electric shock by de-energising the circuit; by guarding it; by

effective insulation or by using safe electrical working practices.

- b) Proper warning signs shall be posted and maintained so as to eliminate the possibility of contact with any exposed or concealed electrical power circuit.
- c) Suitable barriers or other means of protection shall be provided to prevent inadvertent contact with exposed circuits on energised electrical equipment.
- d) All extension cords must have plugs and a third conductor which shall be used for equipment grounding purposes only. All extension cords must have the proper amperage rating and be suitable for the conditions of use and location. Altered, worn or frayed electric cords shall not be used.
- e) Fuses of the correct size, type and capacity must always be used. Never substitute wire for cartridge or one-shot fuses.

5.2.2 *Lock and Tagging of Circuits*

- a) Equipment or circuits that are de-energised shall be rendered inoperative and have locks applied and tags attached at all points where such equipment or circuits can be energised.
- b) Lockout/tagout procedures delineated in section 5.4.3 are to be adhered to at all times.
- c) Equipment that may have energised circuits

after the main line disconnect has been locked out and tagged must be labelled to indicate this situation.

5.2.3 *Residual Current Detectors or Earth Leakage Breakers (ELCBs)*

Residual current detectors (RCDs) shall be used with all portable tools and other electrical devices. All RCDs used for the protection of personnel must be rated nominally at 30 ma or less.

5.2.4 *Grounding*

The non-current-carrying metal parts of portable and fixed electrical equipment shall be grounded.

5.3 Fall Protection

Fall protection shall be provided for and used by employees who work at an elevated level of three or more metres or where other hazardous conditions such as working over machinery or moving equipment may present an additional hazard if a fall were to occur.

A guardrail system must be used as primary protection against falls. If the use of guardrails is not feasible, then an alternate means of protection must be provided.

Acceptable alternate protection includes the use of a fall-arrest system (safety harness with lanyard), covering all holes or openings, the installation of safety nets and/or other equivalent safeguards.

The use of a fall-arrest system requires the following equipment minimums:

- a) Full body harness;
- b) Shock-absorbing lanyard; and
- c) Lifeline secured above the work level to an anchorage or structural support or a structural attachment for use with body harness/lanyard.

5.4 Lockout/Tagout Procedures

- 5.4.1. When work is performed on equipment where operation is not required, the machinery must be brought to a zero energy state (completely de-energised) and locked and tagged out from its power source(s).
- 5.4.2. Personnel must be trained to perform lockout/tagout procedures and will have access to lockout tags and a lockout device. Only one key or combination shall be available to personnel for each lock in use. A master key, duplicate keys or combinations shall be available to one designated person on each shift, to be used in emergency situations.
- 5.4.3. *Sequence of Lockout and Tagout Procedures*
 - a) All affected employees must be notified that a lockout and tagout system is going to be utilised and the reason for it.
 - b) Equipment that is operating shall be shut down prior to locking and tagging.

- c) Valves or other emergency disconnecting means shall be operated so that the energy source or sources are isolated from the machinery. Where the potential for injury exists, stored energy in capacitor, and hydraulic, spring or pneumatic pressure must also be dissipated or blocked prior to performing work in their vicinity.
- d) The energy source shall be locked out with an assigned lock and a signed tag on the lock. Note the date and the time the lock was put in place. If more than one individual is required to work on the equipment, then each person must place their individual lock and tag on the energy isolating device.
- e) The employee shall ensure that no personnel are exposed and check the machine to verify all energy sources are isolated or dissipated by operating start buttons, switches, and/or controls.

f) *Return to Service*

After all work is completed, the following procedure shall be used to restore the equipment to service:

- i. Only the employee who performed the lockout may remove the lock and tag. If more than one individual placed a lock on the equipment, then each person must personally remove their own lock.

- ii. When the work is complete and the equipment is ready for testing, check the area for personnel, tools and other equipment before removing the lock and tag.
- iii. Before leaving the area, notify all other affected personnel that the work is complete.

5.5 Scaffolding

- 5.5.1. All scaffold materials shall be recognised scaffold grade by approved grading standards in New Zealand.
- 5.5.2. Prior to use, all scaffolds shall be erected in accordance with the manufacturer's recommendations. The designated job site safety officer must inspect the scaffolding for proper erection and apparent material defects. Any noted problems must be rectified prior to use.
- 5.5.3 The following design elements must be considered:
 - a) Head protection (roof or screen) must be provided if there is any potential for falling objects.
 - b) Firm footing must be provided for each scaffold upright. The poles, legs, or uprights of scaffolds shall be plumb, and they shall be securely and rigidly braced to prevent swaying and displacement.

- c) Guardrails, midrails, and toeboards shall be installed on all open sides and ends of platforms more than 1830 mm above the floor or working surface.
- d) Bracing must be provided to assure uprights are maintained in a plumb (90 degree vertical) position. In addition, the entire scaffold must be secured to the building structure.
- e) All planking of platforms shall be overlapped a minimum of 300 mm or secured from moving. Scaffold planks shall extend over their end supports not less than 155 mm and not more than 300 mm and be cleated.
- f) Wire, synthetic or fibre rope used with scaffolds must be capable of supporting at least six times the rated load and should be inspected before each use.
- g) A safe and convenient means of access, such as a fixed ladder or stairway, must be provided to gain access to the working platform where it is greater than 900 mm above or below the point of access.

5.6 Machine/Equipment Guarding

All potentially hazardous parts are required to be effectively guarded from accidental or incidental contact. The following items, for example, are considered potentially hazardous:

- a) Sheaves;
- b) Gear wheels, chain/sprocket and tape drives;
- c) Belt and pulley drives; and
- d) Commutators.

5.7 Hoisting and Rigging

Rigging practices shall conform to the standards approved in New Zealand. If no rigging practices exist, they should be developed with the assistance of a licenced professional engineer. Safe practices shall include, but are not limited to, the following:

- 5.7.1. Machines and hoisting devices (e.g. gasoline powered, electric winches, chain falls, etc.) must be used and maintained in accordance with manufacturer's recommendations.
- 5.7.2 Ropes and slings (e.g. wire, manila, synthetic fibre) must have a safety factor of at least six (6) when hoisting any equipment/materials.
- 5.7.3. Manufacturer's recommended load capacities on rigging hardware (e.g. turnbuckles, shackles, hooks, eyebolts, wire rope clips and clamps) shall not be exceeded. Application of these devices must be in accordance with the manufacturer's recommendations (e.g. wire rope clips — the "U" bolt portion shall only be placed on the dead end of the rope; thimbles must be used in the eyes of all rope; slings shall not be shortened with knots or other devices; slings shall be padded or protected from sharp edges).

5.7.4. Reeving must be done so that the hoisting strain comes on the centre of the blocks and they are prevented from toppling, twisting and causing injury to the rope by cutting across the edges of the reeve block.

5.7.5. *General*

- a) Responsible personnel (i.e. mechanic in charge, lead person, foreman, etc.) will be instructed regarding safety standards and proper application of all rigging and lifting equipment.
- b) A system of communication (e.g. hand signals) must be established and used for all hoisting/lifting operations.
- c) All rigging and lifting equipment shall be visually inspected initially before the equipment is placed in service and at least once a year thereafter. Inspections shall only be made by responsible personnel who are trained and competent to perform such inspections. Written records of initial and periodic inspections must be maintained and the equipment must be marked to indicate the last inspection date.
- d) All rigging and lifting equipment shall be visually inspected before each use for defects and deformation. Defective devices shall be immediately removed from service.
- e) All personnel shall be kept clear of suspended loads.

- f) Tag lines or guides shall be used when loads are likely to swing or pass through a restricted area.
- 5.7.6. All new equipment must be designed to incorporate proper hoisting provisions, tools and instructions.

5.8 Modifications to Circuitry and Software

Each company must establish a control procedure for modifying all circuitry and software. The managing director or company owner must personally approve this procedure. At a minimum, these procedures must provide for:

- 5.8.1. Formal designation of personnel authorised to approve any circuitry or software modification.
- 5.8.2. Accommodations for making both temporary changes and permanent modifications. A temporary change is defined as any field expedient modification, approved by the designated authority, to serve an immediate need. All temporary changes are considered short term and must also be processed as a permanent modification.
- 5.8.3. Establishing an interface with engineering or the supplying vendor to assure that appropriate design authorities are apprised of the reason that changes are required and to update the official drawings.

5.8.4. A means of communicating changes to equipment circuitry both within the company and to the design engineering entity for subsequent global distribution as appropriate.

5.9 Defeating Safety Circuits

The use of jumpers, bridges or shunts (generically referred to as ‘jumpers’) to short out or defeat a safety circuit shall only be allowed if there is no other way to accomplish the task. This requirement applies to all aspects of the work to include troubleshooting activities.

The managing director or company owner must personally approve this procedure. At a minimum, these procedures must provide for those activities or jobs that can only be performed by defeating a safety circuit.

The following requirements must be adhered to:

- 5.9.1. Personnel must be specifically trained in the use of jumpers and must have demonstrated their ability to effectively and safely use jumpers. Personnel who have met these prerequisites for use of jumpers must sign a formal acknowledgement form attesting to this training and be included on a company register.
- 5.9.2. Jumpers shall be designed such that they are readily visible and identifiable through the use of serial numbers or other equivalent system of identification.

- 5.9.3. A policy must be developed and implemented so as to limit the number and assignment of jumpers. The number of jumpers assigned to each person must be based on the work to be done and must be controlled by each supervisor. A signed record of receipt must be maintained.
- 5.9.4. Procedures must be established to control all aspects of the work. At a minimum, the following precautions are required:
- a) The affected elevator/equipment must be taken out of service for public use.
 - b) Before placing jumpers on door locks and safety circuits, ensure that the car can only operate on slow/inspection speed.
 - c) To alert other employees as to the use of jumpers, a warning tag shall be attached to each jumper in use. In addition, a warning sign shall be placed on the cover of the controller which indicates that a jumper(s) is in use. This warning shall identify the employee placing the jumper, date placed and the serial number of the jumper in use. Verbally notify other affected personnel of the circuit and the location where jumpers are being used. Upon removal, jumpers shall be matched to the serial numbers to ensure removal of all jumpers.
 - d) A personal reminder control (e.g. key bag, tag on tool box, badge clipped to shirt, etc.)

shall be used by each employee placing a jumper such that it will require the employee to return to the machine room to remove the jumper.

- e) If working in a hoistway, an emergency stop mechanism shall remain in effect. For example, never jump out the hoistway door locks and the car door locks at the same time.
- f) For maintenance and repair operations, jumpers shall be removed whenever the mechanic relinquishes the job task to another employee. For all operations, all jumpers must be removed before placing the elevator into service or back into service to the public.

5.9.5. It is preferable that new elevators be designed such that an elevator must automatically be placed on inspection mode before it can be moved with a jumper on the door contacts.

6. ELEVATORS

6.1 Working in the Hoistway

6.1.1. To gain access to the hoistway via landing doors, with the car situated at some convenient distance away from its normal position at a landing, an approved unlocking device or access key switch shall be used to unlock a landing door.

Before the door is opened for access, it must be decided if the work to be done will require the electrical power supply. If not, the main line switch must be in the “off” position (or the fuses must be withdrawn and retained in a secure place) and an appropriate lockout/tagout device shall be attached to the main line switch.

6.1.2. Before entering the hoistway a safe means of entry and exit from the hoistway must be clearly established.

6.1.3. Landing doors must not remain open longer than absolutely necessary.

6.1.4. Simultaneous work must not be conducted in the hoistway by employees or others, where individuals or groups would be working independently of each other and/or where the workers are stacked in the hoistway (i.e. above/below each other.)

CAUTION: No more than two persons will be permitted to work in each individual hoistway

at the same time. Any exception to this will require personal review and written authorisation from the installation or service manager.

- 6.1.5. After completion of work, an elevator must not be returned to normal operation until it has been confirmed that all workers, tools and equipment are clear or have been removed from the hoistway.

6.2 Working on the Car Top

Before attempting to gain access to the hoistway, it should be decided if the work to be done will require the electrical power supply. If not, the main line switch must be tagged and locked in the “off” position (or the fuses must be withdrawn and retained in a secure place) and an appropriate lockout/tagout device shall be attached to the main line switch.

- 6.2.1. If it is necessary for the electrical power supply to the car to be maintained for the work to be performed, use the following procedures:
 - a) The elevator must always be run in the inspection mode. Any deviation from this procedure will require written authorisation from the managing director or company owner.
 - b) Safe procedures must be established for accessing and exiting the car. These procedures must include a safe method for capturing the car, taking and verifying

control prior to getting on top of the car and maintaining control until safe egress has been achieved.

6.2.2. Fall protection must be provided at all times when a fall hazard exists when working on top of the car.

6.2.3. All elevators under maintenance contract will be provided with a car top inspection station. All such fixtures shall be provided with a common button and direction buttons wired so that both the common and a direction button must be depressed to operate the car.

When it is necessary for personnel to travel on top of a car, this inspection station must be fixed in place and checked for proper operation before proceeding with the work. (Down travel is safer than up travel.)

6.2.4. When work is being performed on top of the car in a common hoistway, a protective device must be installed to cover the height and width of the exposed work area to protect employees from adjacent moving equipment.

6.2.5. Additional precautions include:

a) Never wear anything that could catch or tangle while on top of a moving car. Never carry tools in pockets. Guardrails shall be used wherever possible where a fall hazard exists. As a general rule, harnesses and lanyards should not be worn while moving a

car on inspection. However, if unusual conditions require the use of this form of fall protection, then the following precautions must be followed:

- i. When the elevator is placed on inspection drive from the car roof top control station, it may only be returned to normal service by the operation of that same switch.
 - ii. A hazard analysis must be conducted and steps taken to ensure that the harness or lanyard can not become entangled or snagged. (Lanyards must be disconnected from harness during travel.)
- b) Ensure provision of a clean flat surface to stand on that will support the weight of personnel and equipment. Incorporate the use of special care when car tops are curved or domed.
 - c) To eliminate the possibility of falling while riding a moving car, always take a position near the centre of the car and maintain a firm handhold on the crosshead away from moving parts.
 - d) Tools and other equipment required for the job are to be temporarily place on the car top, safely positioned away from the edge of the car.
 - e) Do not store material of any nature on top of the car.

- f) Never hang an electric extension light from the hoist ropes.
 - g) Keep your body within the limits of the elevator hoistway being inspected. Accidents from adjacent moving elevators can occur. Be aware of the counterweights position at all times, including adjacent lifts.
- 6.2.6. The headroom above the car must be displayed in a prominent position, preferably near the car top control station to visually indicate the minimum overhead clearance.
- 6.2.7. All persons working in the hoistway must be aware of when and how the car is to be moved. It is also essential that only one person be in control. Each company must develop a communications procedure to be used by personnel working together in the hoistway. (See Appendix 9.4 for industry-recommended communication terms.)

6.3 Working in the Pit

Entry into the pit will only be permitted when two independent means of shutting off the elevator are available and used. For example, the use of an emergency stop switch and opening the door lock.

Where a redundant means of protection is not available, the main line switch must be tagged and locked in the off position (or the fuses should be withdrawn and retained in a secure place).

- 6.3.1. All pits must be equipped with at least one emergency stop switch which is easily accessible from the pit access and the pit floor. If more than one switch is present, they must be wired in series.

The lighting level in the pit must be adequate for the work being performed.

Where the lighting switch is co-located in the pit with the emergency stop switch, these switches must be clearly identified and separately positioned so that they cannot be confused.

All lighting must be protected against mechanical damage and all lighting circuits must be properly fused and grounded.

- 6.3.2. Safe procedures must be established for accessing and exiting the pit. These procedures must include a safe method for moving the car away from the pit, verifying control prior to getting into the pit and maintaining control until safe egress has been achieved.
- 6.3.3. When entering a pit from the lowest landing, a ladder must be used in all cases where the pit floor is greater than 1.0 metre below the landing sill (ref. BIA document D1). Suitable handholds at an appropriate height above the sill are required.
- 6.3.4. When working under a hydraulic elevator for longer than 15 minutes, the elevator must be

landed on a support capable of preventing accidental downward motion.

A safety sign visible from all access places must be displayed to advise personnel entering the pit to position the support prior to starting work.

- 6.3.5. A physical means of protection must be provided in the pit to prevent accidental contact with the counterweight.
- 6.3.6. An appropriate warning sign must be displayed on pit access doors to indicate moving equipment is contained within.
- 6.3.7. Entry into a wet pit must never be allowed when there is any source of electrical power present. The water must be removed and the pit dried out prior to the inspection or performance of any work.
- 6.3.8. An electrical receptacle should be readily available to accommodate the use of portable tools, lights and cleaning equipment. Ground fault circuit protection is required.

6.4 Landings

It should be decided if the work to be done will require the electrical power supply. If not, the main switch must be tagged and locked in the “off” position (or the fuses withdrawn and retained in a secure place).

Effective precautions shall be provided to protect an open landing entrance. This may take the form of any

of the following:

- 6.4.1. A barrier, capable of being fixed at the entrance, and which comprises a guardrail at least 1067 mm high with a midrail and toeboard, or a solid enclosure.
- 6.4.2. A portable device, fixed in place from within the hoistway, which will restrain a sliding landing door from opening or closing within 75 mm of the closed position.

These devices should be stored at strategic locations so they are readily available to personnel when required.

CAUTION: In an occupied building when the landing needs to be protected for longer than one work shift, a barrier must be provided that extends to the full height and width of the entrance.

6.5 Machine Rooms

Hazards in machine rooms relating to rotating machinery and electrical equipment are similar to those encountered at other locations on the job site and require the same type of protection.

At a minimum, the following safeguards must be implemented:

- 6.5.1 A safe means of access to equipment areas must be provided.
- 6.5.2. When access to the machine room is through a trap door, the opening shall be protected by a

guardrail system.

- 6.5.3. All electrical contacts, buss and wiring connections must be guarded to protect against electric shock.
- 6.5.4. The dimensions of holes in the slab and the floor shall be reduced to a minimum. To prevent objects falling through openings situated above the hoistway, including openings for electric cables, raised guards must be provided which project at least 50 mm above the slab or finished floor.
- 6.5.5. The floor must be free of oil and debris.
- 6.5.6. Accurate electrical schematic diagrams for all installations must be available at the job site. Any subsequent modifications to any part of the electrical power and safety circuits must be recorded on those diagrams by the persons making the modifications.

6.6 Running Platforms and False Cars

Running platforms (permanent equipment which includes car platform being used for this purpose prior to erection of the permanent car enclosure) and false cars are used to accomplish work in the hoistway during construction and on some modernisation jobs. Considering the variety of such devices that are found throughout the world, each company must develop procedures and standards of performance for each model of this type of equipment. At a minimum, company procedures must include the following:

- 6.6.1. Construction and operation of these devices shall be restricted to those personnel who have been specifically authorised to accomplish this work. The authorisation process must involve an evaluation of the person's training and work experience and incorporate a formal or written approval to use this equipment.
- 6.6.2. Fall protection must be in use at all times in accordance with Section 5.3.
- 6.6.3. The effective working capacity of this equipment must be clearly understood by all involved personnel and marked at prominent locations on all such devices and in the procedures or instructions for use.
- 6.6.4. Assembly of running platforms, false cars, or other such equipment will require:
 - a) That assembly and disassembly be accomplished at the lowest floor available, and incorporate the use of safety harnesses and lifelines during this operation.
 - b) The installation and use of standard guardrails and toeboards.
 - c) That adequate overhead protection be installed and maintained in place at all times.

A warning system consisting of both an audible alarm and light must be affixed to the bottom of the platform and wired into the control mechanism so that any movement of the car

will activate the alarm. All such warning systems will incorporate a five second delay feature to permit reaction prior to car movement.

- 6.6.5. All control mechanisms are to require the use of positive pressure buttons which prevent accidental operation.
- 6.6.6. All running platforms must have the governor cable installed with the permanent safeties operational.
- 6.6.7. All false cars must be equipped with redundant safeties or fall-arresting devices that are functioning properly at all times during operation. These safety mechanisms must be tested before each day's work. Examples of acceptable safeties include:
 - a) An independently-suspended safety bloc-stop.
 - b) The safety in the machine or lifting mechanism.
 - c) Mechanisms that apply rapidly increasing pressure to the guide rails in the event of an overspeed.

7. ESCALATORS/MOVING WALKS

7.1 Securing the Job Site

7.1.1. The method of removing an escalator/moving walk from service is as follows:

- a) Ensure that there are no persons on the escalator/moving walk.
- b) Stop the escalator/moving walk.
- c) Before work is begun, effective barriers shall be positioned at the entry and exit points of the escalator which will warn and guard against unauthorised persons from gaining access to the work area. The work area is defined to include the escalator/moving walk entry and exit floor plates and shall extend onto the floor space area sufficient to perform the work and accommodate necessary tools and equipment.

Appropriate safety signs shall be prominently displayed on barriers. The barriers shall be readily identifiable and shall be secured to guard against unauthorised displacement. The recommended barrier height is approximately 1 metre.

7.1.2. Prior to beginning work, turn off the main line switch and other power sources to the escalator, lock the main line switch in the “off” position (or otherwise secure to prevent any energy activation) and attach an appropriate lockout/

tagout device to the main line switch. Test and verify functionality of the lockout.

For each work activity which requires that power be maintained on the escalator, each company must establish written procedures to enable safe working conditions with power on including safe access procedures.

7.2 Working in the Truss (Upper/Lower Landing and Inclined Section)

Never wear anything that could catch or tangle. Never carry tools in pockets.

If the balustrade is not in place and a fall hazard exists, fall protection must be used.

Ensure proper safe footing. Be observant for grease or oil that may present a slipping hazard.

- 7.2.1. Newly designed and currently manufactured escalators are often provided with an emergency stop button and inspection controls. All such controls shall be provided with direction and common buttons wired so that both the common and direction buttons must be depressed to operate the escalator/moving walk.
- 7.2.2. The escalator/moving walk must be operated only by inspection controls, unless a risk assessment has been formally documented and approved in accordance with company policy approved by the managing director or company owner.

7.2.3. If steps are removed:

- a) Riding the escalator is not allowed, unless a risk assessment has been formally documented and approved in accordance with company policy approved by the managing director or company owner.
- b) Walking on step-axles is not allowed. Entry and exit from the truss frame must be achieved by safe means such as a temporary walkway or temporary work platform.

7.2.4. For manual operation of the escalator, direction indication must be marked on the machine.

7.2.5. The step chain must be physically prevented from movement by two independent means (e.g. machine brake and auxiliary brake) if work is being performed in the truss.

7.2.6. If the effort required to lift a removable floor plate exceeds the weight of 16 kg or exceeds 20 kg for a hinged floor plate, then an approved lifting tool must be used.

7.3 Working in the Pit (Lower Landing)

7.3.1. All pits must be equipped with an emergency stop switch which is easily accessible from the pit access and the pit floor. If more than one switch is present, they must be wired in series.

7.3.2. Adequate lighting must be provided to ensure safe entry/exit and safe working conditions. Control switches should be located close to

each access point.

- 7.3.3. Entry into a wet pit is not allowed when there is any source of electrical power present. The fluid must be removed and the pit dried prior to the inspection or performance of any work, lockout/tagout power prior to pit entry.
- 7.3.4. An electrical outlet should be readily available to accommodate the use of portable tools, lights and cleaning equipment. Ground fault circuit protection is required. All newly designed escalators shall incorporate ground fault circuit protection in all electrical outlets.

7.4 Working in the Machine Room

Accurate electrical schematic diagrams for all installations must be available at the site. Any subsequent approved modifications to any part of the electrical power and safety circuits must be recorded on those diagrams by the person making the modifications.

A permanent means for emergency stopping must be provided.

When access to the machine room presents a fall hazard of 3 metres, the access opening must be protected by a guardrail system.

- 7.4.1. A safe means of access to equipment must be provided. For newly designed and currently manufactured escalators, safe working conditions shall be provided in the pit and

machine room areas to perform maintenance and repair operations.

a) *Controller*

Before working on the controller, remove it from the truss using a mechanical lifting device and position at the floor level. If the effort required to remove the controller and attached cables exceeds 11 kg, then a lifting device is required and this requirement shall be clearly indicated on the controller.

A clear path must be provided in front of the controller. The controller cabinet must be secured to prevent it from tipping.

It is preferable that the controller be designed so that it can be serviced outside the truss.

Where the controller cannot be removed, each company must establish written procedures to enable safe working conditions.

b) *Motor Heat*

The motor/gearbox can reach high temperatures. Precautions must be taken to avoid contact with this machinery under these conditions. Warning signs or other visual indications must be placed on machinery that has the potential to reach high temperatures.

7.4.2. External Machine Room

- a) Hazards in machine rooms relating to rotating machinery and electrical equipment are similar to those encountered at other locations on the job site and require the same type of protection.

At a minimum, the following safeguards must be implemented:

- i) A safe means of access to equipment areas must be provided. If the main line disconnect can not be operated from the access, an emergency stop switch must be provided.
 - ii) When access to the machine room is through a trap door, the opening shall be protected by a guardrail system.
 - iii) All electric contacts, buss and wiring connections must be guarded to protect against electric shock.
 - iv) The floor must be free of oil and debris.
- b) On multiple installations, each machine and its related equipment must be clearly identified with the same markings.
 - c) Adequate lighting must be provided to assure safe entry/exit and safe working conditions. Control switches should be located close to each access point.

All lighting must be protected against mechanical damage and all lighting circuits

must be properly fused and grounded or double insulated.

- d) An electrical outlet should be readily available to accommodate the use of portable tools, lights and cleaning equipment. Ground fault circuit protection is required.

Newly designed escalators shall incorporate ground fault circuit protection in all electrical outlets.

8. VEHICLE SAFETY

A formal fleet safety programme is required to reduce the potential for accidents and lessen the severity of injury. This requirement applies to all vehicles used in performance of work for the company unless otherwise noted. These vehicles may be owned or leased by the company or they may be owned or leased by the individual when used in performance of the job.

Each company must develop and implement a formal fleet safety programme that, at a minimum, includes the following elements:

8.1 Policy Statement

A fleet policy statement must be developed and communicated to all employees, whether they operate a company or personally owned vehicle. This policy statement must, at a minimum, mandate the use of restraint systems and prohibit vehicle operation under the influence of alcohol or drugs.

8.2 Employee Training

Formal training programmes in defensive driving techniques must be provided to all employees.

8.3 Vehicle Inspection and Maintenance

Minimum requirements for design, inspection, maintenance and use of company owned vehicles must be established to ensure safe vehicle operation.

8.4 Communication Programme

An ongoing communication programme must be developed to strengthen and/or reinforce the importance of safe driving practices, awareness and attitudes among drivers through periodic written and verbal communications.

8.5 Accident Reporting and Investigation

An accident reporting and investigation system must be developed to identify immediate and basic causes of vehicle accidents/incidents so that corrective measures can be developed and implemented to prevent recurrence.

8.6 Driver Qualification

All drivers shall be qualified through the use of driver hiring standards, including verification for valid licence and acceptable driver history. For drivers of company-owned vehicles, qualification may include medical screening and initial validation of driving skills. For all drivers, performance must be reassessed periodically.

9. APPENDICES

9.1a Risk Score = Likelihood x Exposure x Consequences

Likelihood*	
	Value
Might well be expected (“happens often”)	10
Quite possible	6
Unusual but possible	3
Only remotely possible (“has happened somewhere”)	1
Conceivable but very unlikely (“hasn’t happened yet”)	0.5
Practically impossible (“one in a million”)	0.2
Virtually impossible (“approaches the impossible”)	0.1
* The probability of a loss when the hazardous event does occur	
Exposure*	
	Value
Continuous	10
Frequent (daily)	6
Occasional (weekly)	3
Unusual (monthly)	2
Rare (a few per year)	1
Very rare (yearly)	0.5
No exposure	0
* How frequently the hazardous event does occur	
Consequences*	
	Value
Disaster	40
Very serious (one fatality)	15
Serious (serious harm)	7
Important (temporary disability)	3

Based on article by William Fine, US Navy

This risk score formula gives an indication of priority actions, i.e.:

RISK

Likelihood x Exposure x Consequence			Risk	Priority
6	2	7	84	B
0.1	0.5	3	0.15	C
10	6	15	900	A

If the risk score is:

	Priority
199+	= A
67 - 198	= B
0.15 - 66	= C

9.1b Example of Hazard/Risk Assessment Checklist

EH and S Hazard Identification

Process: Cleaning rails

Date: 26 Jan 99

Location: Any jobsite

Step/ Activity	Actions of People and Equipment	Inputs		Outputs		Hazards
		Description	Quantity	Description	Quantity	
Prepare work area	Clear suitable work area	Workers Plastic sheeting	2 24 sqm	Debris		Dust inhalation
	Protect work area	Leather gloves	2pr			Hand injuries
Clean rails	Arrange suitable supports	Sawhorses or similar	2	Suitable work height		Back strain Unstable work
	Stack and wash rails	Rags, vinyl gloves, barrier cream, kerosene	10 kg 2pr 10 L	Waste rags Greasy kerosene	8 kg 8 L	Fire, dermatitis, hand traps Slipping
Store rails	Prepare storage area	Equal size battens	2 per layer	Straight rails	2	Uneven area Distorted rails
	Space battens evenly	25% and 75% of length	2	Evenly stressed rails		Poorly stacked, Damaged rails
	Stack rails	Each layer on their backs	4 wide	Battens above each other on subsequent layers	2 per layer	Hand traps Stressed rails Tripping
Clean up work area	Suitable clean sacks	Clean sacks, rags Workers	2	Cleaned worksite		Spills, fire, slipping, Soiling of work area

To create an effective set of hazard identification data, the steps or activities from the process should be entered in the *Step/Activity* column at left of chart. Each step is matched in the second column with the *Actions of People and Equipment* necessary to accomplish it. The *Inputs*, being chemicals, materials, labour, energy and equipment that go into each specific process step, are listed in the third column. If it is appropriate, quantities should be listed, such as number of litres of a solvent, frequency of repetitive motions, the weight of materials being handled, the airborne concentrations in the work environment, etc. In the fourth column *Outputs*, the outputs and/or by-products from the same process steps should be listed again with quantities that are relevant to the process steps. In the last column, *Hazards*, any hazards associated with the inputs or outputs should be listed in as much detail as necessary to adequately determine the risk.

9.2 Definitions

Occupational Overuse Syndrome (OOS): this term has officially replaced that of repetitive strain injury (RSI) in New Zealand.

Definitions as described in the Health and Safety In Employment Act 1992:

“Accident” means an event that—

- (a) causes any person to be harmed; or
- (b) in different circumstances might have caused any person to be harmed.

“Employer” means a person who or that employs any other person to do any work for hire or reward: and, in relation to any employee, means an employer of the employee. This means anyone who supervises others is effectively an employer.

“Employee”, subject to subsection 2(3) of the Act, means a person employed by any other person to do any work (other than residential work) for hire or reward; and, in relation to any employer, means an employee of the employer.

“Harm” means illness, injury or both; and “to harm”, “harmed” and “unharmed” have corresponding meanings.

“Serious harm”, subject to subsection (4) of the HSE Act section, means death, or harm of a kind or description declared by the Governor-General by Order in Council to be serious for the purposes of this Act; and “seriously harmed” has a corresponding meaning.

“At work”, in relation to any person, means present, for gain or reward, in the person’s place of work.

“Hazard” means an activity, arrangement, circumstance, event, occurrence, phenomenon, process, situation or substance (whether arising or caused within or outside a place of work) that is an actual or potential cause or source of harm; and “hazardous” has a corresponding meaning.

“All practicable steps”, in relation to achieving any result in any circumstances, means all steps to achieve the result that it is reasonably practicable to take in the circumstances, having regard to—

(a) the nature and severity of the harm that may be suffered if the result is not achieved; and

(b) the current state of knowledge about the likelihood that harm of that nature and severity will be suffered if the result is not achieved; and

(c) the current state of knowledge about harm of that nature; and

(d) the current state of knowledge about the means available to achieve the result, and about the likely efficacy of each; and

(e) the availability and cost of each of those means.

9.3 How to Contact OSH

OSH has branch offices in the following centres, and you can contact any office for more information or advice.

Manukau

Whangarei

West Auckland

Penrose

North Harbour

Hamilton

Rotorua

Tauranga

Palmerston North

New Plymouth

Napier

Wellington

Lower Hutt

Christchurch North

Christchurch South

Nelson

Dunedin

Invercargill

For information on OSH products and services, visit the OSH website at:

<http://www.osh.dol.govt.nz>

9.4 Terminology

Clear, concise, correct communication is VITAL TO THE SAFETY OF ALL CONCERNED.

Words that fit this category are:

- GO UP
- COME DOWN
- STOP
- ARE YOU CLEAR?
- OK
- YES
- NO

Be specific about how far the lift car is to be moved. Vague instructions create problems.

Prior to starting, go over instructions to be used with the people involved.

A team member, regardless of their position, must not feel inhibited about querying an instruction or acknowledgement if it is not fully understood or seems wrong.

Anybody who is unsure of what they are about to do or does not feel safe carrying out that instruction, either because they have misinterpreted what is required or they do not know how to do what is required, should ask. It may be, in fact, a poor or bad instruction.

Either way it is liable to end up being dangerous or worse still, a disaster.

If you mean, for example, that you only want the equipment to move up, say so.

e.g. GO UP 25 mm,
GO UP 300 mm,
COME DOWN 150 mm.

The terminology used in the issued instruction should be used in the repeat of that instruction.

Acknowledgement shall be when the issued instruction is considered to have been fully understood.

BE CLEAR ABOUT WHAT YOU MEAN!!

The person moving the lift car must ask the question:

“ARE YOU CLEAR?”

and wait for a “YES” or “OK” answer before moving the equipment. The driver must remain ALERT and be prepared to stop immediately on the slightest indication that all is not well.

There can be **NO EXCEPTION TO THE RULES** regarding the 4 Cs.

- CLEAR
- CONCISE
- CORRECT
- COMMUNICATION

The importance of the 4 Cs cannot be overstated, particularly when we are an industry of multinational people.

When a lift car has been correctly positioned, added safety can be achieved by tripping any ‘knock off’ type

safety switch so that accidental movement of the lift car is prevented. Switches that can be tripped and used for this purpose are:

- Overspeed grips switch (safeties operated switch) if accessible;
- Broken tape switch (when used);
- Compensation sheave switch (when used);
- Pit stop/run switch; and
- Main switch — locked and tagged out.

e.g. On completion of the work in the lift shaft getting out or exiting the lift shaft is every bit as important in respect to safe practices as for getting into the shaft in the first place.

NOTE: The lift car must always be operated on inspection mode when working in a lift shaft:

- Tell the assistant you are going to get out.
- Advise the assistant that you will stop them by your operation of the Pit Stop/Run Switch.
- Advise assistant to reset the tripped switches, if applicable.
- Instruct assistant to take lift car up “x” number of floors. **Do not** come down until instructed to do so.
- Communicate as above, e.g. “Are you clear?”, etc.

i.e. When the lift car has been taken up a suitable

distance set the stop/run switch to stop — the car must stop at the same time.

- Advise your assistant, that you are opening the landing doors.
- Remove the tools, etc. on to the landing.
- When clear of the lift pit reset the pit switch to run.
- Instruct assistant to bring car down so that the under car light can be turned off.
- Close the landing doors.
- Open hoistway doors when lift car has been positioned halfway down entrance to turn off the under car lights.

Arrange to meet your assistant on the next floor so that the job can be completed.

Remove any circuit jumpers. Record as necessary.

- Re-test that all safety circuits are operational.
- Turn off the hoistway lights.
- When satisfied, return the lift car to full service.

Remember this:

It is as much your responsibility to maintain your safety as it is your supervisor's to ensure that you know how to go about your duties in complete safety.

If you have any doubts, it is your responsibility to say: "I don't understand". "I'm not sure how to go about it".

There is no room for guess work and “she’ll be right” has no place in our industry.

While we have discussed the pit situation here, demanding ‘clear, concise, constant communication’, the same is required for:

- Hoistway/inside car;
- Machine room/sub floor;
- Machine room/pit (basement layout); and
- Escalator/moving walkway work.

You have all been, or should have been issued with the red and green *Lift Industry Accident Prevention Handbook*. This book is full of useful tips and good information about safety. It is designed to fit in your pocket for ready reference when needed. Pages 8 through to 16 cover safety:

- In the machine room;
- In the pit;
- In the lift well;
- With hydraulics;
- With escalators and moving walkways; and
- Electricity.

If you do not have a copy, ask your supervisor for one, it was compiled for the industry.