OTIS
EMPLOYEE & SUBCONTRACTOR SAFETY HANDBOOK

Version 5.1
May 2025

OTIS

Employee and Subcontractor Safety Handbook

Safety is a high priority within Otis and our management team is committed to providing and maintaining workplaces, products and services that are safe and free from injury/illness.

Your role in helping Otis achieve this objective is important and highly valued.

This safety handbook is a tool you can use to ensure your safety and the safety of others while working at Otis.

I encourage you to adopt the principles in this handbook to ensure your safety.

Pedro Marcal
VP and Managing Director

FOR RECENT CHANGES / UPDATES REFER TO THE SUMMARY OF CHANGES ON PAGES 288-290. ANY CHANGES FROM VERSION 5.0 HAVE BEEN HIGHLIGHTED IN YELLOW WITHIN THE HANDBOOK.

INTRODUCTION

The safe practices in this book are the result of the Otis Safety Standards (OSS) - previously known as World Wide Job Site Safety Standards (WWJSSS) - and the local WHS Legislation, Codes of Practice, Standards etc. OSS must always be followed unless the local laws are more stringent, or a contradiction exists.

A contradiction exists if a code requirement prohibits an item in the OSS or when both the code and the OSS applied together create an identified additional risk. If either of these conditions exists, the country's local code should be followed, if it is a regulatory requirement.

If the code is not mandatory, then the OSS requirement should be followed. Where a contradiction exists, the Otis Company should implement a plan to either modify the local code and/or obtain a variance from the appropriate code authorities.

Unless stated otherwise, all requests for deviations must be submitted to the WHQ-EH&S, Vice-President.

This information has been gathered from all facets of the operation and to date represents the best way to control hazards and minimise the risk present in our workplace, as well as the experience of Otis personnel in the lift industry.

This handbook is not intended to be a substitute for technical training. It should be used to support such training. Ongoing participation in safety and technical training will provide you with the detail you need to better understand how to safely perform the tasks you have been employed to do.

Your ideas and suggestions for improving safety are always welcome. Please refer suggestions to your Manager, Health & Safety Representative or Safety Committee member.

SCOPE

This Handbook applies to all Otis employees and contractors.

INTENT

A copy of this handbook in an electronic or paper-based format must always be readily available for example, during safety audits and surveys, so ensure it is available at all times.

In the event that a procedure needs to be performed and the description found in the handbook is not sufficient to direct you in the safe performance of the task, discuss the issue with your immediate manager and perform a Job Hazard Analysis before proceeding with the task.

OBJECTIVES

- Eliminate all employee injuries by making the workplace free from hazards and unsafe actions.

- Reduce the likelihood and severity of accidents to users of Otis equipment and equipment serviced by Otis.

- Incorporate safety and conserve natural resources in the design, manufacture, use and disposal of products and delivery of services.

- Establish safety and environmental protection standards that both comply with local laws and go beyond, when necessary, to achieve the goals of this policy.

- Hold operating managers accountable for safety and environmental performance and for providing leadership and required resources.

- Require all employees to comply with these standards.

Contents

PART 1

ROLES AND RESPONSIBILITIES

ALL OTIS EMPLOYEES

Safety at Otis is a condition of employment. Employees are expected to accept their responsibility for safety when they join the Company. This includes their personal safety and that of the people and families with whom they work.
Failure to comply with Otis safety rules, or other rules contained within this booklet, may result in disciplinary action, up to and including dismissal.

- Always follow prescribed safety procedures and work practices in performance of their assigned task
- Use all safety equipment provided when performing their work promptly report all accidents and near hits that occur in the course of their work assignments
- Bring unsafe conditions to the attention of their immediate Supervisor/Manager
- Abide by Company, customer and site safety rules, laws and regulations.

MANAGERS & SUPERVISORS

The Company through its supervisors and managers is totally committed to providing safe working conditions and practices for all of our employees.

In order to support our commitment to health, safety and environmental protection, managers and supervisors must always comply with the Otis Cardinal Rules.

Failure to observe these rules may result in disciplinary action, up to and including dismissal.

SITE SUPERVISION / MANAGEMENT

On any Otis job site, an employee is assigned the responsibility for seeing that the work is performed in accordance with the work instruction or contract. Depending on the type of work being done, they may be a Supervisor, a Team Leader, Service Manager, Charge Hand, Mechanic or Project Manager.

In fulfilling this additional responsibility, they must take all practical steps to be sure that the work is performed with due regard for safety and environment e.g., safety for their fellow workers, safety for the public, safety for themselves, and for the property of the Company and others. They must walk the walk and strictly follow all safety rules.

To keep site operations safe, Managers and Supervisors should follow these key principals:

- Routinely inspect all equipment and job site areas to identify any unsafe practices or conditions which could cause injury or property damage.
- Assess any unsafe conditions or practices that are under the control of the Company and eliminate or reduce the risk to the lowest level possible.
- Report unsafe practices by workers of other trades that could cause injury to Otis employees or damage Otis property, to those responsible at the job site and the appropriate Otis Supervisor/ Manager. Immediately take steps to safeguard the employees or property.

- Notify the Client, Building Owner, General Contractor or responsible individual at the job site and the appropriate Otis Supervisor of the corrective actions to be completed by the other trades.
- Ensure Otis work or storage areas accessible to the public have: restrictive barricades, warning signs, lights etc.
- Anticipate the effect of removal of a component on the entire lift system. As an example, when renewing a seal on a hydraulic lift, the platform and car must be propped, and the hydraulic system depressurized.
- To prevent accidents, ensure that all employees are made aware of the hazards in the type of work to be performed. Undertake a job hazard analysis and implement corrective actions before starting the work.
- Do not allow any employee to work when their ability or alertness is impaired by fatigue, illness, physical, psychological or mood altering substances that might expose themselves or others to injury.
- Always determine the whereabouts of each person in the work group before everyone leaves the job site for meals, during a site evacuation, at finishing time or for any other reason.
- Never allow Company equipment to be loaned to or used by anyone other than Otis personnel, without the written approval of the Manager.
- Never, transport non-Otis employees or materials on incomplete elevators / escalator/ travelator or other installations.
- Ensure that all Otis employees adhere to all safety and Environmental rules.

FIELD EMPLOYEES

The Company is totally committed to safe work practices.

All employees are expected to work in a safe manner at all times, in accordance with the Company's and client's safety rules.

In order to achieve the Company's commitment to health, safety and environmental protection, employees must always comply with the following rules, which have been established to ensure safe working. Failure to observe these rules may result in disciplinary action up to and including dismissal.

- Conduct a JHA before commencing any task or whenever the situation changes.
- Use **only inspection control** when travelling on top of car.
- Use only certified lifting equipment within its Safe Working Limits.
- Any lift, running platform or false car on which work is carried out must have effective safety gear or devices.
- Protect open lift shafts and access to escalators from fall hazards in an approved fashion.
- Follow the Company safety procedures when entering lift shafts and pits or working on an escalator or travelator.
- Never modify control circuits without approval from the Field Engineering Department.
- All bridging (jumper) leads must be company issued/approved.
- Work only on scaffolding which satisfies Company safety standards and local scaffolding regulations.
- Electrical energy shall be controlled in accordance with Company safety procedures at all times.
- Always follow the elevator and escalator cardinal rules.
- Use required Personal Protective Equipment in all designated areas.

Remember: Report all accidents, hazardous incidents, near hits or unsafe working conditions.

SPARE PARTS WAREHOUSE / BRANCH STORE / WORKSHOP EMPLOYEES

The Company is totally committed to safe working practices. In order to achieve the Company's objectives for health, safety and environmental protection, employees must always comply with the following rules, which have been established to ensure safe working.

All employees are expected to work in a safe manner at all times.

- Use only properly maintained and certified lifting equipment e.g. forklift, Crown lifter etc. within it's safe working limits.
- Designated aisles and passageways must be kept clear of all obstacles at all times
- Ensure the safety of all visitors including the wearing of PPE where required.
- Waste material must be stored and disposed of in accordance with the Company's instructions.
- Ensure storage racks/shelving are free from physical damage. It is secured to the floor. All racks to have load limits posted on each shelf.

OFFICE EMPLOYEES

The Company is totally committed to safe work practices.

All employees are expected to work in a safe manner at all times, in accordance with the Company's and client's safety rules.

In order to achieve the Company's commitment to health, safety and environmental protection, employees must always comply with the following rules, which have been established

to ensure safe working. Failure to observe these rules may result in disciplinary action up to and including dismissal.

- Always follow Otis safety rules
- Assess any unsafe conditions or practices that are under the control of the Company and eliminate or reduce the hazard to the lowest level possible.
- Follow the Company Safety Procedures when visiting job sites
- Ensure the safety of their visitors to the office or on site, including the wearing of PPE where required.
- Only Company approved substances shall be used (eg Cleaners, oil, chemicals). Obtain and check SDS sheet before you use, to make sure the correct PPE is used for the task.
- Use required Personal Protective Equipment in all designated areas including a full body harness when visiting sites.
- Report unsafe practices by workers of other trades that could cause injury to Otis employees or damage Otis property.
- Do not allow any employee to work when their ability or alertness is impaired by fatigue, illness, physical, psychological or mood altering substances they might expose themselves or others to injury.
- Adjust your workplace to suit your work needs, follow recommended ergonomic principles.
- Always respond to evacuation alarms, ensure you are aware of the exits and assembly points.

Office — working alone

Should any Otis employee find that they are required to work alone (e.g. after hours) in any Otis premises they must make regular contact with another Otis employee.

This could be through Otisline, their immediate manager, administrator, or a work colleague.

This is to ensure employee wellbeing is maintained. Contact can be made either by direct telephone or mobile phone.

In the event that contact between the Otis employees is not maintained for over two-hours, then an emergency escalation process must be instigated.

This could be by means of sending a local Otis field employee to check the whereabouts of the employee.

SUBCONTRACTORS

Definition

"Subcontractor" includes a person or an organization who is under contract with Otis to undertake a specific scope of work.

This includes, but is not limited to NE installation, service, and major or minor repairs in maintenance, modernization and other related areas of contractual services.

Requirements for other contractors working on Otis job-sites are determined in accordance with scope of works.

Subcontractors are required to assume all the applicable roles and responsibilities of Otis Managers, Supervisors and Employees as described earlier in this Handbook.

This includes compliance to all rules and procedures applicable to the work subcontracted, as described in this handbook and the OSS.

Selection Process

- Only those subcontractors who satisfy our safety and quality requirements shall be approved and allowed to work at Otis job sites. This will include: Ensuring past safety performance is taken into consideration Safety is included as part of the contract
- Agree to abide by all Otis safety requirements, including OSS and to comply with government regulations
- Keep their workers compensation premium payments current (for Australian contractors)
- Report all accidents/incidents on Otis sites to Otis
- Monitor compliance to safety requirements and take corrective action where non-compliances have been observed
- Meeting all requirements of the contract

Training

Otis subcontractors are responsible for conducting regular safety training. Otis will provide specific safety training where required. Otis at each location can verify that training has been completed in house or externally (e.g. Pegasus).

Records/ Identification

Subcontractor companies are required to be compliant (ABN, licenses, etc) in Pegasus with employees, and sub subcontractor employees, to also be compliant in any relevant safety modules assigned in Pegasus for their role/s.

Contract

Subcontractor agreements shall include compliance with requirements as outlined in the Supply Management Group Policies "S05 Adding and Maintaining Vendors VMF process and Corporate Policy Manual (CPM) 17.

Construction Subcontractors

Before a subcontractor can begin any installation work at an Otis job site, the Supervisor must verify that the job site is ready and complies with basic safety requirements and that contractual obligations are met as outlined in the Otis SIP process. This must include verification of job site barricades and lifelines.

Subcontractors must conform to Otis Installation requirements, including, but not limited to quality, safety and on-time installation standards as outlined in the Otis Field Installation Manual, including critical installation points utilizing the IPC (in process check) process. IPC findings must be documented.

Auditing

All Subcontractors must conduct regular safety and quality inspections. Employee training on general safe working practices must be evident.

The responsible Otis Supervisor is required to conduct routine, unscheduled inspections to assess subcontractor compliance with Fall Protection, Control of Elevator/Escalator, Electrical and Mechanical Energy, Hoisting & Rigging, Scaffolding, False Cars & Running Platforms and Jumpers & Shunts.

The audits frequency for contractors who provide regular services to Otis will be the same as the frequency of a direct employee, and to plan whenever is reasonably practical for contractors who work infrequently for Otis.

UNIVERSAL CARDINAL RULES

ALWAYS assure protection from falling where a fall hazard exists.

ALWAYS follow lock out and tag out procedures when power is not required for a work activity.

ALWAYS use Residual Current Devices (RCD's) on portable corded electric tools and devices.

NEVER work or position body parts in proximity to unguarded moving parts or electrical circuits

ELEVATOR CARDINAL RULES

ALWAYS maintain control of the elevator when accessing / egressing the hoistway, working on the car top or in the pit.

ALWAYS follow Otis's authorised control processes when using jumpers and shunts.

ALWAYS follow Otis procedures for hoisting and rigging and mechanical blocking of elevator equipment.

ALWAYS follow Otis procedures for false cars /running platforms.

NEVER ride the car top with the elevator in normal operation

Failure to observe the Cardinal Rules may result in referring to the Just Culture Decision Tree.

ESCALATOR AND TRAVELATOR CARDINAL RULES

ALWAYS use inspection controls to operate/move the step chain.

ALWAYS verify the proper functioning of the escalator's emergency stop switch prior to entering the machine-room or the pit.

ALWAYS use effective barriers & warnings AND block the unit electrically and mechanically, when leaving the escalator unattended with steps /pallets removed**.**

ALWAYS secure the step chain from movement by two independent means when work is performed in the truss.

NEVER walk on the step axles

NEVER ride the unit with steps/pallets removed

UNLESS
i. there is only one opening,
ii. the opening is barricaded,

iii. the unit is on inspection and
iv. there are clear modes of communication to ensure that all personnel are aware of when and how the unit will move.

Failure to observe the Cardinal Rules may result in referring to Just Culture Decision Tree.

INCIDENTS, NEAR HITS

& DANGEROUS OCCURRENCES

Reporting workplace incidents promptly plays an important role in preventing further incidents.

It is also a legislative requirement.

Report all accidents/near hits/dangerous occurrences as soon as possible to your Supervisor, Manager or Otisline as per procedure EHS 07 Incident Reporting and Investigation, no matter how trivial they seem.

In the event of any serious incident or accident resulting in time being lost it is especially important these issues are escalated immediately.

In the first instance you should contact your Supervisor.

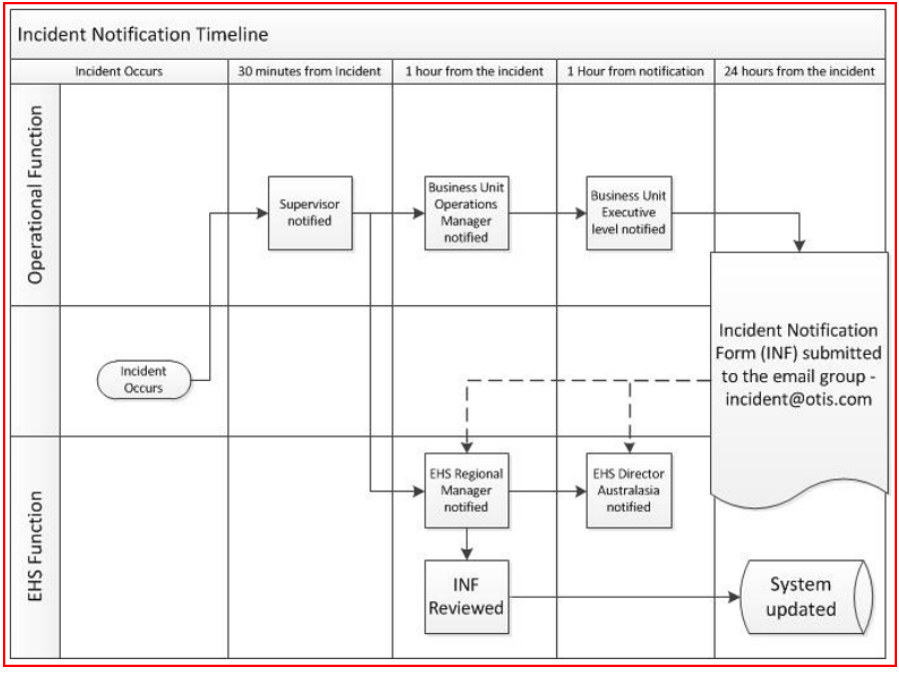
If he/she is not available, you should contact your EHS Manger or Branch Manager who will escalate the information to the appropriate person.

Where a serious incident or accident occurs out of normal working hours in the first instance you should attempt to contact your Duty Supervisor.

If this is not possible you should contact Otisline and give them details of the event, they will then contact the appropriate person.

In all cases, please contact your Otis EHS Manager, Safety Representative or Branch manager to ensure that all the requirements are met.

The Company and its contractors have a legal obligation to record and report certain notifiable work-related injuries, diseases and dangerous occurrences to the applicable local EH&S authority in accordance with OH&S regulations.


Incident Notification Timeline
Incident Occurs
30 minutes from Incident
1 hour from the incident
1 Hour from notification
24 hours from the incident
Operational Function
Supervisor notified
Business Unit Operations Manager notified
Business Unit Executive level notified
Incident Occurs
Incident Notification Form (INF) submitted to the email group - incident@otis.com
EHS Function
EHS Regional Manager notified
EHS Director Australasia notified
INF Reviewed
System updated

Near Hits

Hazard = Potential Hazard

Near miss = Hazard has reached potential, but the exchange of energy didn't impact a person or surrounding,

Incident = Hazard has reached potential and the exchange of energy results in injury or property damage,

Safety Dilemma = When the mechanic believes they will breach Otis cardinal rules if they continue on the path / plan of work. Stop, liaise with your supervisor

ALL EMPLOYEES ARE ENCOURAGED TO REPORT POTENTIAL HAZARDS, ACTUAL HAZARDS & NEAR HITS

No disciplinary action will be taken against employees who report near hits in good faith.

Treatment of Injuries

All injuries shall be treated, by someone qualified to render the appropriate treatment. Field employees should make themselves aware of job site or local area first aid facilities. Personal first aid kits are provided for employees use.

It is not intended for this emergency first aid treatment to take the place of a doctor's service, therefore, if necessary, see a doctor at the earliest opportunity after an accident.

Note: Site, workshop and offices emergency first aid locations and phone numbers are to be displayed at these locations.

Caution:

Moving an injured person may aggravate the injury and should only be considered when further danger is imminent. (E.g. when person is laying in the path of oncoming traffic.)

Accident/ Incident Investigations

After every reported accident / incident there is an investigation process. The main purpose of this is identify to the root causes of incidents and initiate the corrective action necessary to prevent them happening again.

Your support, when required, in the investigation process, including providing complete, accurate reports and other input is essential to reducing and eliminating similar incidents and injuries in the future.

Note: In the case of a serious incident, the site of the incident shall be left untouched, pending the investigation, unless this is necessary to;

- Help someone who is injured
- Protect someone's health and safety
- Take essential action to make the site safe to prevent a further accident.

External Communications

Employees should not express any statement or opinion on any aspect of any work-related or public incident to any person outside the company.

Any interviewing of employees by the relevant authorities will be arranged by the applicable EHS Manager in consultation with the company Legal Counsel.

INJURY MANAGEMENT

The Otis Injury Management policy has been established to assist employees in returning to work as safely and as soon as possible following a work-related injury or illness.

Early notification, intervention and return-to-work ideally to the same job and workplace are the key aims in effective injury management.

The aim of injury management is getting the employee back to work as quickly as possible, ideally in the same job and workplace they had before their injury or illness.

This may involve a period of alternative duties and/or a gradual return to duties prior to returning to the pre-injury job. Injury management involves:

- Early notification of the injury to your Supervisor, EHS or Workers Compensation Manager.
- Treatment of the injury by an injury management provider.
- The provision of suitable alternative duties and a written plan to upgrade these duties in line with your treating doctor.
- Management of workers compensation process.

The Company has a nominated Workers Compensation Case Manager who makes contact with the worker and his/her doctor and insurance company.

They will prepare a return to work plan and manage the return to work process.

They also monitor progress in treatment, rehabilitation services and return to work plans and maintain the confidential case records.

The steps to be taken to get the injured employee back to work will be specified in a return to work Plan, which will be agreed on by the employee before it can proceed.

It is critical that the rehabilitation and medical treatment aspects of service are working in a complementary way to achieve pre-injury conditions for the employee.

Remember: Inform your Supervisor and EHS Manager as soon as possible

Supervisors can assist the Injury management process by:

- Promoting a safe workplace
- Act early if a worker is injured.
- Ensure that the worker receives timely income support from the insurer and necessary treatment.
- Keep in touch with the worker and offer suitable duties to help the worker recover and return to work as soon as possible
- Help the workers compensation insurance company manage claims.
- Quickly notify Branch and EHS Manager, send in any necessary information and regular updates on worker's progress.

PART 2

SPECIFIC HAZARDS

Risk Assessments.

Job Hazard Analysis (JHA)

Safe Work Method Statement (SWMS)

The safe working procedures and practices described in this handbook represent the most effective and practical way of controlling the hazards, which most commonly occur on our jobsites and workplaces.

However they cannot deal with every circumstance or situation.

In the event that you are faced with a task or situation that does not allow you to use one of the established Otis procedures, proceed to do a **JOB HAZARD ANALYSIS** (JHA).

Before commencing tasks, all foreseeable hazards (for example, falling off platform, falling objects) and actual consequences (e.g. death, serious injury) should be identified and appropriate safety measures put in place by applying the Hierarchy of Control (e.g. install guard railing, prevent access).

When must a JHA be completed?

As a general rule a written JHA is required:

- Before starting or returning to any task.

- Whenever circumstances might have changed.

As well as:

- When moving from one job to another.
- As a daily planning tool or prior to starting a NE, mod. or repair job
- A safe work process or procedure does not exist.
- A standard procedure cannot be followed, or a change is required to any of the above.
- For training new employees.
- When employees are not familiar with the task.

SWMS Steps

To be effective SWMS' must be task specific, not a general process to follow. The SWMS should focus on the activity itself and on the steps of the activity where the risk exists.

The basic steps involved in a Safe Work Method Statement are:

- Define a task.
- Establish the basic job steps.
- Identify the existing and or potential hazards associated with those tasks.
- Assess the risk of exposure to the identified hazards.
- Identify and implement control measures that either eliminate or minimise the identified hazards.
- Evaluate the residual risk of exposure to the hazard with the controls in place.
- Review of the SWMS regularly and revise it if necessary

SWMS' must be:

- Monitored and reviewed to maintain currency.

- Communicated to employees, contractors and customers.
- Understood and followed.

Conducting a Risk Assessment

The process involves taking a close look at the specific job or task.

List the basic steps

The most effective way to conduct the Risk Assessment is to visit the workplace and observe or walk through the task step-by-step.
Nearly every job can be broken down into a series of basic job steps.

In the first part of the SWMS list each step-in order of occurrence.
Be sure to describe each step, but not make the breakdown too detailed.

Considerations should be made for:

- Site access
- Ergonomics
- Environment
- Tools and equipment required

Identify the existing and or potential hazards with each step

Once the steps are listed, go through each step thoroughly to identify the hazards.

Also identify in the hazards column any unexpected events that could occur at each step

Hazard: A hazard is defined as something that has the potential to cause harm to life, health or property. Such as:

- Chemicals
- Electrical or mechanical energy
- Pneumatic energy
- Falling from heights
- Equipment heavy and awkward to lift
- Tools and materials in the way (tripping hazard)
- Exposed live electrical equipment
- Fingers or hands expose d to moving equipment (guarding is inadequate)
- Personal protection equipment is not adequate

Next to each step, identify what part of the task may affect those on the job or the environment according to the six (6) most common categories of hazards;

- Caught in or between moving objects
- Contact with a harmful energy source
- Struck-by a moving object or hit an object
- Slip, trip loss of balance and falls
- Over-exertion or straining while doing a task
- Exposure to harmful substances/ conditions

Risk Assessment Process

Risk Assessment is a legal requirement and a Company responsibility.

Risk ranking

For each identified hazard, assess the risk of exposure by using the risk ranking table.

Risk: The likelihood and consequence of harm occurring

Risk = Hazard Severity x Probability (Likelihood of Occurrence)

The evaluation is not on how well the job is being performed, but to identify the hazards that must be reduced or eliminated to make the job safer.

Control measures that either eliminate or minimize the identified hazards
For each identified hazard, find ways to eliminate or control the hazard and identify those responsible to implement the control measures.

Carefully study each hazard identified, along with the job step or steps associated with it to figure out the control measure that must be implemented to eliminate or reduce the hazard to a low level.

The hierarchy of controls should be followed to reduce the risk of exposure to as low as practicable.

A combination of control measures may be required for some situations. **Some solutions might be**:

A different way to perform the job, one that would eliminate the hazard Adding machine guards or ventilation
Combine several steps or perform the steps in a different order that would be less hazardous
Use additional equipment (lifting) or take other precautions
Using specific personal protective equipment

Ensure the control measures identified have been implemented before proceeding with the task.

Risk Matrix

CONSEQUENCE / LIKELIHOOD	Insignificant (E)	Minor (D)	Moderate (C)	Major (B)	Severe (A)
Almost certain (5)	Medium (E5)	High (D5)	Extreme (C5)	Extreme (B5)	Extreme (A5)
Likely (4)	Medium (E4)	Medium (D4)	High (C4)	Extreme (B4)	Extreme (A4)
Possible (3)	Low (E3)	Medium (D3)	Medium (C3)	High (B3)	Extreme (A3)
Unlikely (2)	Low (E2)	Low (D2)	Medium (C2)	Medium (B2)	High (A2)
Rare (1)	Low (E1)	Low (D1)	Low (C1)	Medium (B1)	Medium (A1)

Consequence Descriptor

Descriptor	Level	Definition
Insignificant	E	No Injury
Minor	D	Injury / ill health requiring first aid
Moderate	C	Injury/ill health requiring medical attention
Major	B	Injury/ ill health requiring hospital admission
Severe	A	Fatality

Likelihood descriptor

Descriptor	Level	Definition
Rare	1	May occur somewhere, sometime ("once in a lifetime/ once in a hundred years")
Unlikely	2	May occur somewhere within the Department over an extended period of time
Possible	3	May occur several times across the Department or a region over a period of time
Likely	4	May be anticipated multiple time over a period of time. May occur once every few repetitions of the activity or event
Almost certain	5	Prone to occur regularly. It is anticipated for each repetition of the activity or event

Residual risk level / rating and actions

Descriptor	Definition
Extreme	**Notify Workplace Manager and cease work until controls lower risk level to So Far As is Reasonably Practicable (SFAIRP)**
High	**Notify Workplace Manager and cease work until controls lower risk level to SFAIRP**
Medium	Continue to work with risk controls in place
Low	Continue to work with risk controls in place

Hierarchy of Control

Hierarchy of controls – listed from most to least effective	
1. Elimination:	Removing the hazard completely. E.g. designing noise out of new plant /
2. Substitution:	Replace hazardous material and processes with safer alternatives
3. Isolation:	Separate the person from the hazard like enclosing noisy machinery
4. Engineering:	Controls like providing machine guarding or a guardrail on top of lift car
5. Administrative controls:	Including safe work procedures, training, LOTO or warning signs
6. Personal Protective	e.g. hearing and eye protection

SAFE WORK PRACTICES & BEHAVIOURS - GENERAL

In order to maintain a safe work environment, all Otis employees are required to review and follow all general safety rules. General safety rules include, but are not limited to the following:

- **Air hoses** (compressed air) must never be used to clean clothes, hair, or any parts of the body. When cleaning equipment, consider others. Never point an air hose in the direction of others.

- **Proper dress** must be worn for the work involved. Loose clothing, dangling neckties, long hair, lanyards etc, must be contained at all times while working at or near moving machinery. Facial hair may interfere with the proper fitting of respiratory equipment. Large metal belt buckles should not be worn due to the possibility of an electrical shock hazard. Approved safety footwear must be worn at all times on all job sites and other designated areas. If clothing becomes saturated with solvent or lubricant it should be changed at once.

- **Rings, bracelets,** wrist watches, necklaces etc. must not be worn around moving machinery, electricity, or at any other operation where they may be a potential source of injury.

- **Horseplay** will not be tolerated. Practical jokes and fighting can cause accidents and serious injuries. Such actions on the job are forbidden. Do not distract or annoy other employees. Besides having a responsibility for your own safety, you have a responsibility for the safety of others.

- You are expected to maintain an **acceptable standard of behaviour** while at work and to treat your co-workers

with respect. In particular, unacceptable behaviour that will not be tolerated includes:

- Engaging in violence of any kind
- Bullying, pranks
- Sexual harassment or racial vilification

Note: If you are subjected to any of the above, report it immediately to your supervisor.

- **Safety devices and guards** are for your protection, make sure guards are in place and safety devices are in working order and properly adjusted before you operate any equipment or machine.
- Do not tie down, block out, or otherwise short cut or tamper with safety devices whilst equipment is in normal operation.
- All bridging (jumper) leads must be company issued/approved if it is necessary to repair the equipment.
- If using a jumper across a safety switch/ circuit, you must first: Place lift on inspection control.
- Carry out an inspection to ensure the lift is mechanically safe to move (e.g. Inoperative brake, broken machine gears! shaft or equipment making it unsafe to be moved)
- Make sure all doors are closed (If this is not possible a second person must assist to ensure that passengers and the public are safe while the lift is being moved).
- All potentially hazardous parts are required to be effectively guarded from accidental or incidental contact.
- The following items, for example, are considered potentially hazardous - Sheaves; gear wheels, chain/sprocket and tape drives; belt and pulley drive, selectors/controllers/drive units.

- **Good housekeeping** is necessary. All work areas must be kept clean of waste materials, rubbish and other debris.

- **Operate machines** or use equipment only if you are qualified and authorised to do so.

- **Lift safely**.

  a. Use lifting devices available
  b. Push, don't pull equipment
  c. Do not lift heavy objects alone
  d. Warm and stretch muscles, before lifting.
  e. Use staggered stance/squat don't bend, pivot don't twist
  f. Keep load close when lifting

- When walking you should remain alert and focus your attention
  on where you are going.
  Use caution when on slippery surfaces (e.g., wet floors etc).
  Do not take short cuts through work and storage areas or step
  over materials, pallets etc.
  Use caution when approaching and using stairs (always use the
  handrails). Never run in any workplace.

- **Accident prevention signs and tags** are provided for your protection. All messages on these signs must be obeyed. Familiarise yourself with instructions presented on Safety Instructions signs.

- **Adequate lighting** must be provided to assure safe access/egress and safe working conditions. Control switches should be located close to each access point to the area.

- **All lighting must be protected** against mechanical damage (e.g. guards), and all lighting circuits must be properly fused and grounded or double insulated.

- **The use or possession of drugs or intoxicating beverages** on the job is strictly prohibited. (Working around moving or energised equipment while suffering from a hangover is dangerous).
  For details on Alcohol and Drugs Policy, contact your Supervisor.

- **Naked flames** shall not be used for illumination.

- **Visitors.** All visitors and contractors who work for Otis or who are under the direction of Otis shall follow the same rules for WORK PRACTICES including wearing of PPE as workshop/store/field employees.

- **Heat stress.** When working in high temperature areas/ sites the areas management will provide portable fans, plenty of drinking water (as per local regulations). If you have any health issues that affect you while working in high heat situations, report them to your Supervisor.

- **Climbing in hoistways** must be restricted to proper devices such as ladders. Many accidents have occurred as a result of climbing up and down rail brackets, beams, etc.

  DO NOT CLIMB on guide rails, beams, buffer frames, etc.

GENERAL - WORKING SAFELY ON SITE

It is Company policy that no employee will be permitted to work under conditions, which could prejudice their safety. Where it is known that risks exists on certain sites or due to contractual obligations then two-person working will be arranged.

- All mechanics must make their presence known upon entering and leaving any building or construction site
- A Job Hazard Analysis must be completed before commencing work

Job conditions may dictate the need for safety equipment or procedures not covered by this Handbook. See your supervisor for specific instructions

Service (Maintenance and Repairs)

All work must be carried out in accordance with Company rules, the safe systems of work outlined in this Handbook and OSS. These tasks include, but are not limited to:

Maintenance and repair of machine room equipment
Maintenance and repair of all shaft equipment, which can be accessed safely when that equipment is isolated

Maintenance and repair of equipment in the lift shaft using a moving lift car provided a TOCI is fitted and used

Safe work methods to be adopted when fault finding on electrical equipment

At no time will the mechanic attempt to reinstate a lift, escalator etc. into service, where it may result in an unsafe practice being used. They must immediately call for Otis assistance and if they are unable to obtain assistance, then the unit must be left isolated and out of service

In case of an emergency callout where the employee faces a situation, where qualified assistance is required, they are instructed by the Company not to attempt the work, but to leave the unit shut down and call their Supervisor for the required assistance

No employee shall enter a lift pit on their own without a suitable barrier being in place and action taken to ensure that they have control of the lift car and can work safely.

Mechanics are issued with mobile phones and these must be kept switched on at all times so that contact can be maintained to ensure the continued wellbeing of the mechanic. Refer to Mobile phones at work section below for more details

Construction and Modernisation

The requirements stated above equally apply to Construction and Modernisation, particularly the need for a Job Hazard Analysis, which must be used to ensure that the task to be undertaken is safe. All mechanics must make their presence known upon entering and leaving the site.

Threats to Physical Safety

Occasionally employees may find themselves in situations where other people threaten their physical safety. This is most likely on night calls where our mechanics can find themselves being verbally abused by individuals under the influence of alcohol, drugs or where employees confront

intruders on Company premises. Unless handled carefully these situations have the potential to develop into incidents that result in serious injury.

In these situations the Company has no wish to see you injured...so if you are confronted by someone whilst at work, withdraw from the conflict. You can obviously help avoid such situations by making your work location safer by locking doors but this needs to be balanced by the need to escape in an emergency.

If you are confronted remember: -

- Allow the aggressor plenty of space - both personal and verbal...that is allow them to say what they want to say!
- Breathe slowly and evenly. Control your voice and use it to calm the situation
- Be aware of your body language...for example, relax your stance and do not clench your fists
- Stay confident yourself...be firm but not aggressive.
- Listen to what is being said...offer a compromise

Leave the area and notify your manager/supervisor. In order to do this look for possible ways of escape and try to keep the person from blocking these possible escape routes. Never turn your back on them but slowly move away backwards.

All incidents must be reported so that action can be taken to avoid similar situations in the future.

Mobile Phones at Work

It is recognised by the Company that mobile phones are a useful tool for communication between Otis employees. In the interest of safety, employees are reminded that they

should only use or answer their mobile phone when it is safe to do so. If the phone needs to be switched off for a period of time the employee must review their mobile phone mailbox on a regular basis.

There are a number of sites such as hospitals and chemical plants, where the use of or the carrying of mobile phones is prohibited. It is important in these cases that regular communication with the Company is adhered to on the grounds of safety.

For guidance on the use of mobile phones in vehicles please see the section on Vehicle Safety. Do not use the mobile phone when refueling the vehicle.

COMMUNICATIONS ON SITE

Two Person Communications on Site: The Seven (7) Steps.

Step 1 NOMINATE A TEAM LEADER
One member of the two-person team should be nominated to implement the procedure. The person nominated need not be the most senior person on site.

Step 2 ESTABLISH A COMMUNICATION LINK The person nominated as the team leader for a communication, is responsible for establishing a communication link by the method that ensures a continuous link will be maintained.

Step 3 THE TEAM LEADER COMMUNICATES THE INSTRUCTION
The team leader is in control of communication and is the person who will be in control of lift movement.

Step 4 THE ASSISTANT ACKNOWLEDGES AND REPEATS THE INSTRUCTION OF THE TEAM LEADER

Step 5 THE TEAM LEADER CONFIRMS THE INSTRUCTION

Step 6 THE INSTRUCTION IS ACTIONED

Step 7 CONSTANT ACTION CONFIRMATION

The assistant should maintain a constant link with the team leader while the procedure is in operation.

Working at Height / Fall Protection

Falls from heights are the most common cause of fatal / serious injuries on Building and Construction sites in Australia and New Zealand

This section gives interpretation and guidance of the Working at Height Regulations.

On New Equipment and Modernisation job sites all mechanics must wear a full body harness and shock absorbing lanyard at all times when working in the shaft - including the pit.

The only exception to this is where no fall hazard exists **AND** any of the conditions listed below exist

- The project is no longer considered a construction site
- The handover to Service has been completed
- When final testing commences (door locks in circuit), the need for a fall arrest or fall restraint system may be determined by a written risk assessment and Job Hazard Analysis (Ref OSS)

Working at Height Definitions

The definition of work at height is work in any place from which a person could fall a distance liable to cause personal injury.

Areas include:

- Access and egress to and from a place of work
- Work on Scaffolding
- Work on Platforms
- Work on lift car top (where there are voids)
- Working over machinery and moving equipment
- Ladders (which includes customer ladders)
- Stepladders
- Unprotected edges of flat roofs
- Unprotected hatchways/trapdoors
- Pit access
- Access to components
- Work on stairs
- Vehicles (working/access/egress from the back of trucks etc.)
- Working within 2 metres of a gap greater than 300mm x 300mm (225mm x 225mm in Victoria) is considered to be a fall hazard.

Anyone working within two metres of such a gap must take action to ensure a fall cannot occur.

The “two metre height rule” no longer applies in most jurisdictions and every potential fall situation needs to be assessed.

This includes working over machinery and moving equipment. If a person is close to a void and personal injury could result from a fall, then action must be taken.

Risk assessments, written Job Hazard Analysis must be carried out before any work at height is undertaken, with control measures in place to prevent the fall.

Working at Height Hierarchy

- To avoid work at height - if possible. E.g. if repair or adjustment on a door gear is required, can it be carried out from the landing rather the car roof?
- Filling in fall hazards e.g. top of lift car extensions, shaft screening.
- Where not possible use permanent protective measures such as fitted guardrails.
- Guardrail requirements are as per the following: At a minimum, a top and mid rail are required. The top rail must be between 900mm and 1100mm high. The rails must be able to withstand a horizontal and a vertical force of 900 Newton’s (90kg) applied independently. The clearance between the guardrail and any shaft projection must be at least 100mm.
- Temporary guardrails must conform to the same specifications as for permanent guardrails.
- Where the above control measures cannot be employed, the use of fall protection equipment must be the final option.

On Construction and Modernisation Sites:

Guardrails will have top rails at least 900mm, intermediate rails and toe boards positioned so there is no gap greater than a distance equal to half the height of the top rail.

Fitted on all four sides of work platforms where fall hazard exists. Full height landing protection capable of stopping people and objects from falling down the shaft

On Service Sites:

If guardrails do not exist or are non-compliant and temporary measures can't be used, then a JHA must be completed and fall protection used if employees are exposed to a fall hazard.

Use pit ladders that provide safe handholds during access and egress. If safe handholds are not available, then a written JHA must be conducted before access. If the JHA confirms it's unsafe do not access. Notify your manager immediately.

Ensure clients' ladders or other work equipment that is used, are subject to regular inspection. If the client provides ladders for access to mechanics/inspectors it's the client's responsibility. However, we should carry out checks before we use ladder, as part of the JHA process.

Deep Pit Access

Deep pits should be fitted with fall protection. However, pit depth is not the only criterion. Sites with shallower pits

may still require fall protection.
Some typical reasons would be:

- Very long reach to the ladder where it is not possible maintain three points of contact when accessing and egressing the pit.
- Inadequate hand-hold due to awkward door frame profiles.
- Customers wanting fall protection to be fitted.

There are two solutions available

1. Fixing on Landing - This can be achieved by fitting either a Safe-Ring or a Push-Lock anchor point

2. Safe-Ring inside shaft

Procedures covering the installation and use of Deep Pit Access equipment are contained in Technical Article **A-XVIII-01-26**. Copies of this can be obtained from your Supervisor

There is a third method that may also be suitable, depending upon the configuration of the shaft. If trimmer beams are fitted and they can be verified as having the correct load rating it is permissible to install either a girder clamp or a bow strap around the beam. In this case verification of the trimmer beam capacity MUST be obtained before the beam is used as a height safety anchor point.

Fall Restraint

This control measure covers techniques that restrict the movement of the user to prevent them approaching the fall hazard. The mechanic wears a harness and an adjustable

lanyard that requires them to adjust the length of the lanyard to prevent them reaching the fall hazard.

This requires a very strict safety discipline by the mechanics, and enforcement by management so that the lanyard is always adjusted to stop the mechanic reaching the fall hazard.

Fall Arrest

Limited Fall Arrest is where the fall distance is LESS than 600mm (does not require approval as it allows for self-rescue).
To work in limited fall arrest, attach the short lanyard to:
- a lifeline
- and to the front of your harness.

Full Fall Arrest is when the fall will be GREATER than 600mm.

If required to work in full fall arrest you must stop and;

- Get EHS Approval
- Complete risk assessment / SWMS
- Have a rescue plan and retrieval kit

If work tethering is not practical because the person needs to work adjacent to the fall hazard, then some form of temporary barrier should be considered in preference to the wearing of fall arrest equipment.

Where this is not possible, then the Otis fall arrest system consisting of a full body harness, hitch strap, energy absorbing device to limit the forces exerted on the body should a fall take place must be used. The intention of the system is to stop collision of the user with the ground or any structure.
Account should therefore be taken of the distance the person will fall before being arrested. Using this equipment on top of

a lift with the lift located at the lowest level in the shaft or working on the counterweight in the pit from a ladder may not give sufficient height for a fall to be arrested before contact is made with the pit floor etc. Likewise a clear zone into which to fall must be available. These facts must be taken into account when deciding on the fall protection systems. When using the standard synthetic Otis lifeline only the 390mm short lanyard with a shock absorber shall be used.

The Anchorage point to which the lanyard of fall arrest equipment is attached must be carefully considered to ensure that it has sufficient strength to take the load, should a fall or trip occur. The anchorage point should ideally be as high as possible firstly to limit the distance of a fall and secondly to ensure that fall arrest device will work effectively. A low anchorage point reduces the effectiveness of the equipment to arrest a fall.

Note: Ensure you use the correct rope grab. Rope grabs used for steel ropes are different from rope grabs used with synthetic lifelines. Make sure the size of the rope grab is suitable for the size of the lifeline rope. Do not connect rope grab to main hoisting rope

The Otis Safety Standards (previously World Wide Job Site Safety Standards policy - OSS 4.3E) requires that on New Equipment / Modernisation, a fall arrest system (full body harness and shock-absorbing lanyard) or fall restraint system shall be worn at all times while working in the hoistway (including the pit).

On service the requirement is that fall protection must be worn if exposed to a fall hazard.

Anchor point requirements:

Anchorages used for attachment of person fall arrest equipment shall be designed, installed and used as follows: -

- As part of a complete personal fall arrest system which maintains a safety factor of at least two (must have a minimum breaking strength of 1,500 Kg or 15kN).

- Only mechanics trained in the installation of hitch point anchors shall install them. The installing mechanic must test and tag the anchor if found adequate. The tag must have the date of test, Safe Working Load and signature of the testing mechanic. Equipment specially designed for fitting of lifelines or as a hitch point. (It must be designed and certified by a certified engineer) This equipment must meet the OSS requirements and Australian and New Zealand Standards.

- If using the hitch strap around a beam/ structure or connecting the lanyard directly to a structure. The structure/ beam must have a minimum breaking strength of 1,500 Kg or 15kN.

ONLY FALL PROTECTION EQUIPMENT APPROVED AND ISSUED BY OTIS MUST BE USED.

Approved Lifelines

The standard Otis lifeline is the 12 mm Kernmantle lifeline with approximately 3% stretch to help cushion the fall.

These may be purchased in any length; typical lengths are 20m or 60m with eyelets at both ends for hitching purposes.

Approved lifelines should normally be secured to independent overhead supports separate from false car supports unless the hitch point is approved by engineering. Ensure hitch point is rated to take all loads if using the same beam/ hitch point.

The block stop/ Skylock / R1 modified Astro over speed steel rope used on false cars can be used as a lifeline **under the following conditions only**.

The hitch point or beam used to support the block stop/ Skylock /the R1 modified Astro over speed steel rope must be capable of safely holding the weight required to hold the false car in the event of the block stop/ Skylock/ R1modified Astro overspeed being activated and meet regulatory and OSSOSS requirements.

The rope grab must not be connected to the main hoisting rope. If any other type of lifeline (not the Otis standard lifeline) is to be used for a specific reason, a JHA shall be carried out, and approval must be obtained from the EHS manager. These lifelines may have additional requirements such as, the need for a shock absorber fitted to the lifeline or special rope grab equipment. Ensure manufacturers recommendations, regulations and OSSOSS requirements are always complied with.

Lifelines must be tensioned before use once they have been hung in position by using a "bob weight" at the bottom of the lifeline to ensure the lifeline does not tangle or bunch when the fall arrestor is pushed up the lifeline.

Only one lifeline per person is to be used.

- The Lifeline should be visually inspected before each use by the user
- The lifeline must be inspected for frayed strands, broken yarns, cuts and abrasions etc. Check for other physical, chemical or ultraviolet light damage.

Any damaged lifeline or hardware must immediately be taken out of service and reported to the supervisor

Karabiner

This is a metal hook device to join ropes or to attach them to hitch points. These hooks have a two-operation gate to prevent accidental opening.

Lifeline Rope Grab

The Lifeline rope grab device should be positioned on the lifeline at the highest point possible, whenever connected; this reduces the fall distance to less than 600mm.

The rope grab used when using the block stop steel rope as a lifeline must be designed and tested for use on steel rope and should not damage the rope under normal operating conditions. A shock absorbing lanyard must be used when used in the fall arrest mode.

Only use the approved rope grabs for the specific lifeline it is designed for. The rope grab used for steel rope life lines is different from the rope grab used for the synthetic lifelines. If in doubt, check with your regional safety manager or supervisor.

Managing the Harness and Lanyard:

Part of wearing fall protection equipment is the management of the harness and lanyard etc. Throughout the day the harness may become loose or the lanyard may become free of its storage position creating a potential snagging hazard the same as loose

clothing. It is each employee's responsibility to manage his or her harness and lanyard. As a minimum the following activities shall be followed: - Before you put your harness on, it should be checked for signs of wear and tear.

Confirm the harness is properly connected and adjusted so that the straps fit close to your body and the ends of the adjusting straps are secured by the retaining clips or tied off in such a manner that the potential for snagging is minimised.

This can be accomplished by adjusting length of the lanyard to prevent reaching the fall hazard. (The wearing of disconnected leg straps is not permitted).

When working in an area with exposed electrical equipment such as a controller or an area with rotating equipment, always check the fall arrest system equipment to see that it is fastened close to the body **BEFORE** entering or passing through the area.

Otis Employees and others Visiting Site

All Otis Field Managers, other Otis personnel and Visitors under the direction of Otis must wear fall protection in accordance with the above requirements.

RESCUE

Prior to commencing work on a site, a review of the existing site emergency rescue arrangements shall be carried out.

This involves consultation with the Principal Contractor and review of the site's emergency rescue arrangements.

The review should identify and assess the suitability of any pre-arranged site rescue plan for the task to be carried out.

It is also essential that prior to commencing work where fall arrest is the implemented control, an Otis rescue kit or similar must be present on site and accessible in the event of a fall.

Also ensure that a qualified first aid person is available on site when performing tasks where fall arrest is used.

Rescue arrangements will need to consider:

- Support for person being rescued
- Access and egress to work area
- Promptly alerting emergency services
- Facilitating emergency services access to site
- Meeting and guiding emergency services to place of rescue
- Liaison with site manager

Where suitable, adopt the site's pre-arranged rescue plan in the emergency response plan.

Where not suitable, rescue arrangements are to be developed and included in the Otis Safe Work Method Procedures for the works prior to commencement of work at the job site.

The plan shall be posted and communicated to all Otis personnel working on the site.

Do not attempt assisted rescue, unless you have suitable rescue equipment and /or have been trained. Vertical height rescue is a dangerous operation and needs to be undertaken by trained professionals.

In the event of a fall where a worker is suspended in a harness, contact emergency services immediately by dialing.

000 in Australia 111 in New Zealand

And state the following:

“Ambulance, a person has suffered a fall and is trapped in a lift shaft in a harness".

Answer emergency service's questions and follow instructions. Someone should also stay near the fallen person to provide reassurance that emergency services is on the way.

An Otis employee should go to the access point to meet emergency services and guide them to the accident location.

An Otis employee should also stay near the fallen person to provide reassurance that emergency services is on the way.

The site should then be prepared for the rescue squad e.g. Lock and tag out the equipment which could endanger victim or rescuers.

Barricade the area to prevent unauthorised access.

TOP OF CAR ACCESS / EGRESS

Always comply with the Company Top of Car Access procedures for accessing top of car

Use the door blocking device to control the landing doors whenever accessing / egressing the car top or pit, or when the landing doors are required to be held open.

Conduct a Job Hazard Analysis

Working on the Car Top (Static or Moving)

Before attempting to gain access to the hoistway, it should be decided if the work to be done would require the electrical power supply. If not required, follow the approved lock and tag out procedure.

Some general issues to be considered when conducting a Job Hazard Analysis for working on Car tops are:

- Make sure that the car top is clean. Make sure that there are no grease or oil spills, and no loose objects.
- Secure tools and door blocking device or anything else needed for the job on the car top, make sure that they will be out of your standing area, and that they do not project over or near the edge of the car top.
- Be sure you have a surface to stand on that will support your weight. Don't stand on the car top trap door or fan unit and use special care where the car tops are curved or domed.
- If you are a passenger on the car top, have a firm hand hold on the crosshead, or other part of the car structure when the

car is moving. Never hold onto (2:1) ropes when the car is moving.

- When you are on the car top, make sure that any protective equipment that you are wearing cannot become entangled or catch on any protrusions. Ensure tools and equipment are stored and secure on the car top during your work task, or before you move the car.
- Do not put sharp or pointed tools in your pockets. Pagers and mobile phones should be secured where possible in a pouch secured to your belt.
- Always keep all parts of your body within the limits of the hoistway of the lift being inspected. Be especially careful if there is another lift running alongside.
- Where overhead clearance is limited, always be aware of any overhead obstructions. Affix a warning label the top of the car.
- **And most important -** Always be alert, and always be aware of your surroundings and the conditions that exist.

Moving the lift from the top of car

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:

- Conduct a Job Hazard Analysis (e.g., remove adjacent car from service or install barrier). 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 allowed to move the lift. All personnel must follow the Company approved communication process when working together in the hoistway

- The lift must always be run on inspection control. Deviation from this policy requires a written procedure by your immediate Manager. This procedure must be approved by EHS Australasia Director, FOD Director, and Australasia Managing Director.

- When modernisation or construction work is being performed on top of the car in a multi-unit hoistway, a protective device (e.g. full shaft screening) must be installed to cover the height and width of the exposed area to protect our employees from adjacent moving high speed (i.e., lifts operating on normal, independent service

- When maintenance or minor repairs are performed near adjacent moving equipment, precautions such as screening /guarding must be taken

- **Remember:** Downward travel from the car top is safer than travelling in a up direction

- Movement from car top to car top is prohibited. (e.g., stepping from one car top to another)

Fall Protection on the Car Top

- Fall Protection must be used when a fall hazard exists
- The preferred control method for a fall hazard is a guardrail.

Q: What is an adequate guardrail?

- Top rail between 900 & 1100mm high
- Midrail between 450mm & 550mm
- Minimum of 100mm clearance between guardrail and any shaft projection

- Able to withstand a force of 90kg applied in a horizontal or downward direction
- PPE shall be worn if adequate guardrails are not fitted to the car top and a fall hazard exists
- The lanyard must be attached to a suitable anchor point or a hitch strap wrapped around the top bow

Control of the Lanyard

When using fall restraint equipment, whenever the lanyard is not connected to a hitch point, disconnect it from the harness.

Before accessing or egressing the car top, false car or working platform and when moving around the site, car top/ working platform, the lanyard length needs to be reduced to reduce any snagging risk.
This can be achieved by bringing the lanyard in between your legs and clipping onto the front of the harness, or by wrapping the lanyard around your waist and again clipping on to the front of the harness

Use of Fall Protection on Top of a Stationary Car

If the lift system does not need to be energised, stop the lift in the correct position to carry out the work then follow the Lock and Tag Out procedure for that lift.

Note: Always keep the machine room door locked when you leave the machine room.

Use of Fall Protection on Energised Lift Cars

If the lift system needs to remain energised, the car must be on inspection control.

It is important that the lanyard is not connected to your harness when accessing or egressing the car top and when the car is being moved while you are on the car top

Note: Follow the Company Car Top Access procedure and **Do Not** attach the lanyard to the car top whilst standing on the landing.

If a fall hazard exists, take up a safe position so as not to expose yourself to a fall hazard (as close as possible to the centre of the lift car).

Then disconnect the lanyard from the harness before you move the car.

When you have moved the lift to the position you wish to work:

- Place the stop switch to the stop position. This ensures at least two means of isolation are applied to protect the lift from inadvertent movement i.e., the car under inspection control and the TOC stop switch applied.

- Other means of isolation could be opening the car gate switch or other safety switches such as safety operating switch or tape switch. (These safety devices must be verified for safe operation before they are used)

- When the lift car is under your control with the above safety means applied you can attach your lanyard to the appropriate hitch point to carry out the work

- When your work is completed, move to a safe position on the car top, always disconnect your lanyard from the harness end.

- Drive the lift preferably to the same entrance you accessed the lift car to egress the lift car top

REMEMBER:

Do Not Attach Your Lanyard to The Car Top Whilst Standing on The Landing.

Do Not Step onto The Landing with Your Lanyard Still Attached to The Car Top.

Using a Harness on a Moving Car

In general, you must not be attached to the lanyard when the lift is moving.

A lanyard may only be attached after a Job Hazard Analysis determines there is no other way to control the fall hazard. Examples of these special conditions are: Lifts which have curved or sloping car tops that do not have a safe place to stand, or an open structured building with adverse weather conditions. Care must be taken to ensure the lanyard does not snag up whilst moving the lift on inspection under these conditions. Under these special conditions the following rules apply: -

- The lift is placed on inspection by two independent methods e.g. In the controller and on the top of car
- The lanyard is attached to a designated point that does not allow the person to leave the car while attached to the lanyard (cannot use an adjustable lanyard)
- The Company car top access and egress procedures still apply when using a harness on a moving car under these circumstances.

Procedure for Accessing and Egressing the Car Top (for units with top of car inspection) -Does Not Include Full Compass Units

Suggested Tool/ Equipment List:

- Barricades
- Hoistway door unlocking devices and keys
- Out of service signs
- Door blocking device for holding doors open
- PPE required for the task

Car top access and egress process:

Ensure you:

Have complete control of hoistway doors during access and egress procedure. Always use the door blocking device.

Test and verify at least two safety circuits prior to accessing the car top. (e.g., Door lock circuit, TOC Stop switch and Inspection switch)

Test and verify the TOCI operating (direction) buttons as part of the safe access procedure

Maintain complete control of the car and hoistway doors during access, and egress from the car top

Place stop switch to “Stop” position when accessing and egressing the car top.

The stop switch must be in **stop position whenever** the lift is stopped to carry out any task

If the lift car is at another floor level during the safety circuit verification process. The landing call must be

registered to create a demand, this is required on lifts that drop their car calls when the stop switch is activated

All employees who are required to access the top of lift cars must be trained in the company's Top of Car Access procedure.

Car Top Access Procedure

Traditional Method

- Make sure lift is free of passengers and place "Out of Service" signs at landings.

- Use entrance barricade to protect the public at the access floor.

- Capture the lift car and register 2 car calls a. 1 for the floor below and 1 for the bottom floor.
- Stop the car in a safe TOC access position by using the landing door unlocking device.
- Close the doors, recall the lift and start procedure again if the car has already reached the floor zone below and the doors are starting to open.

5. Verify that the door locks have stopped the lift and that it did not make a normal stop at the floor below.
6. Mechanically block the landing doors using the approved door block or door wedge. Use the door block or door wedge whenever leaning into the shaft or whenever the doors need to be held ajar.
   (Note: The doors may only be held ajar whilst an Otis employee is in direct attendance at the landing doors.
7. Place the Car Top Stop switch to the STOP position.
   (**NOTE**: If the Stop switch is not within easy reach –

maximum 750mm – of the landing consider alternative safety switches. This may include Safety Operating Switch, Broken Tape Switch and Car Door Switch)

8. Remove door blocking device;

- Close landing door;
- Place landing call;
- Wait at least 10 seconds

9. Open landing door and check that the car DID NOT move. If the car did not move

- Insert door blocking device
- Place Inspection switch to INSPECTION
- Place Stop switch to RUN
- Turn on car top lighting and, if available, shaft lighting

10. Remove Door block;

- Close landing doors;
- Place landing call
- Wait at least 10 seconds

11. Open landing doors and check that car DID NOT move. If the car did not move

- Insert door blocking device
- Place Stop switch to STOP position

12. Assess hazards and if OK step to a safe position on the car top.

13. If a fall hazard exists Fall Protection MUST be used

14. Remove door blocking device and close landing doors

15. Assume a position that will be safe when the car is mobile.

    DO NOT hold onto ropes when the lift is roped in any configuration other than 1:1.

16. Release Stop switch and check Inspection buttons.

17. Check DOWN direction first then check UP direction.

ERO Method

1. Call lift to top floor and ensure no passengers are in the car.

2. Use entrance barricades to protect the public at the access floor where required.

3. Open E&I Panel and put ERO control onto Inspection

4. When Doors have closed fully drive lift down using driving buttons in E&I Panel.

5. Stop the car in a safe TOC access position – check position by slightly opening landing doors using the landing door unlocking device – If position is wrong, close doors immediately and reposition using the driving buttons.

6. **If the position OK, you MUST verify that the open landing door contacts will prevent the lift from moving before proceeding. To do this You Must:**

7. Mechanically block the landing doors using the door-blocking device – Ensure that a less that 300mm gap (225mm in Vic) between the doors is

maintained. Use the door blocking tool whenever the landing door have been opened.

8. Try to drive the car down using the driving buttons in the E&I Panel. If the car does not move then the door locks have been verified.

9. Fully open the landing doors and reposition the door blocking device. Place the Stop switch to the stop position.

(Note: If the stop switch is greater than 750mm from the landing there should be an aux. stop switch provided).

10. Remove door blocking device, close door, try to drive the car down using the driving buttons in the E&I Panel - Check the indicator in the E&I panel when trying to drive both up & down

11. Open door, check that car didn't move and insert door block**.** If the car has not moved then the stop button has been verified

12. Place TOC inspection switch to 'inspection.' Release the Stop switch to the run position, remove door blocking device, close door & try to drive the car down using the driving buttons in the E&I Panel. The car should not move – Check the indicator in the E&I panel when trying to drive both up & down.

13. Turn the ERO switch back to normal position – ensure that the 'INSP' LED does not change state.

14. Attempt to register a Car Call to Top and Car Call to Bottom from the E&I Panel – watch the indicator for movement.

15. If no change in state:

16. Open door, check that car didn't move and insert door block**.** If the car has not moved then the Inspection Switch has been verified.

17. Now place the Stop switch to the stop position.

Note 1: When the car top tasks are completed it's advisable to egress the car top at the same floor where the verification was conducted.
This is because the Door Locks at that floor have been verified as working correctly. If egress at another floor is required those door locks **MUST** be verified **BEFORE** that floor is used for egress.

Note 2: Before accessing the car top carry out a Job Hazard Analysis to identify hazards such as, if a landing barrier is required or fall protection is required. When using the car top as a working platform, with the top of the car at the landing level and the hoistway doors open, a hoistway barrier must be used.

Note 3: Remember when returning the car to normal operation the lift car may move unexpectedly in the following situations:

- The car does a correction run.
- The car does a zoning or terminal floor run. The car returns to a home landing.
- The car may level to the nearest floor.

SPECIAL RISK CATEGORIES

This guidance is to be read in conjunction with the Company Top of Car Access procedure.

Gearless lifts

If stopped from high speed, the lift could slide to a stop in another floor zone and open the doors out of floor level. There is also a need to keep the residual loop volts to a minimum by restricting the lift speed.

This helps to reduce the risk of some series wound compound "variable voltage" systems driving through the brake under fault conditions when stopped from high speed by interruption of the lock circuit

Unexpected movement of Lift (or doors)

This is more likely to occur when stepping off the lift following work in the shaft. It is essential that the lift mechanic is standing on the landing when the lift is reinstated e.g. when finally placing the TOC stop switch to the Run position.

Always stand in a position such that you would not be unbalanced or trapped by unexpected door gear operation or any car movement.

NOTE: The Top of Car Inspection (TOCI) control should be positioned within 750mm of the landing (OSSS requirement).

Where the TOCI is not properly located an alternate means of controlling the lift to allow safe access must be used. (E.g. LOTO in the Machine Room)

Full Compass Method

Full Compass Lifts are fitted with a programmable feature known as "Compass to Landing". This feature allows the mechanic to select a specific car from the group and call it to the desired landing.

This feature is accessed by using the Compass Key Pad or

Touch Screen. To call lift to a floor, follow the steps below.

1. Using the Key Pad or Touch Screen press the bottom right hand key twice in quick succession.

2. Enter Code 123.

3. Select the number of the lift you require. Compass recognises lifts
alphabetically and assigns letters as follows:
Lift A = Lift 1; Lift B = Lift 2 etc.

4. When the selected lift arrives at the landing open the COP panel to reveal the car call buttons.

5. Enter a car call for the floor below the access floor and for the bottom floor.

6. From this point onwards the TOC access procedure is the same as for traditional lifts.

7. Close the COP panel and ensure it is securely locked before putting the lift back into service.

WORKING IN THE PIT

Many serious injuries occur every year, entering and exiting pits. Every employee must be aware of the hazards before they enter a pit.

Some of the most common hazards that need to be managed are: Inadequate lighting, improper access keys, unsafe pit ladders, height of the toe guard, wet pits, integrity of door lock safety chain, integrity of pit stop switch safety chain, lack of refuge space, moving equipment, etc.

Take steps to minimise these and other hazards. When climbing, use both hands and maintain 3 points of contact.

To perform inspections, lubrication, or minor cleaning tasks, retrieval of keys or tools, etc., entry into the pit through lowest landing door will only be permitted if;

- the lift is shut off and LOTO performed or,
- when two independent means of stopping the lift are available and used.

For example, the use of an emergency stop switch and opening of the door lock

Suggested Tool List includes:

- Barricades
- Release keys
- Out of Service Signs
- Door blocking device for holding doors open
- Torch

Remember to test and verify the door lock circuit and the stop switch safety chain before you enter. Always use the door- blocking device during this process.

For all other tasks where power is not required lock and tag out the main line circuit breaker

Where a back-up/secondary means of protection is not available, the main line switch must be locked and tagged

When in the pit, particular attention should be paid to the position of the car and counterweight of the car you are working on and equipment, which is operated by other cars. E.g. counterweight, governor sheaves, etc.

Gaining Control of the Lift Car & Working in the Pit Procedures

- Prior to entering a lift pit, check with the building manger if there have been any situations that may affect the working atmosphere of the pit, a visual inspection must also be undertaken to determine if operating conditions in or around the pit have changed. For example, water or oil may have leaked into the pit that may affect the air quality of the pit or create other hazards such as electrocution or slips.
- Do not enter a wet pit when there is any source of electrical power present. The water must be removed, and the pit dried out prior to the inspection or commencement of any work.
- The location of hazardous substances nearby, underground car parks and/or industrial sites creates additional risks of contaminated air.

- If a visual inspection reveals changed conditions or potential risks to the air quality of the pit, **DO NOT ENTER THE PIT**. Contact your supervisor and building manager who will coordinate to undertake a Job Hazard Analysis (JHA).
- Always identify a refuge space before entering the pit. Be aware of possible hazards in the pit; (e.g., counterweights, sump holes, brackets, sheaves, standing water, travelling cables, compensation ropes / chains, etc.) Take steps to ensure that no part of your body inadvertently projects into portions of any adjoining lift hoistway area.
- Some sites will have specific work procedures. Personnel should be made aware of these by the site or building manager and should follow these guidelines at all times.
- Entry into the pit will only be permitted after a visual inspection and, where necessary a JHA. Two independent means of stopping the elevator must be verified and used (follow the pit access procedure). For example, the use of an emergency stop switch and opening door lock.
- Where a redundant means of protection is not available, the main line switch must be locked and tagged in the off position (or the fuses should be withdrawn and be retained in a secure place) as per the Lock and Tag Out procedure.
- All pits must be equipped with emergency stop switch(s) which are clearly identified and 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. If lighting is inadequate, supplement with a portable light connected to a Residual Current Device (RCD).

- 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 may not be confused.
- All lighting must be protected against mechanical damage and all lighting circuits must be properly fused and grounded.
- When entering a pit from the lowest landing, a ladder must be used in all cases. Suitable handholds at an appropriate height above the sill are required. Always use a safe means of access, if necessary, use a portable ladder.
- When working under a hydraulic lift or a lift not equipped with safeties e.g., dumbwaiter, install pit props to safeguard you from accidental contact with the lift. When working on the hydraulic or suspension system the car must be landed on the pit props.
- Remember to protect yourself and the public. Once you have entered the pit, block the door approximately 80mm from fully closed and use the door-blocking device. This will ensure that the door lock contact remains open. To prevent the public from opening the door, block the door so that it cannot be opened by the public.

Note: On some units if you close the landing doors onto the Door Blocking Device the landing lock may mechanically lock and could restrict your egress from the pit.

For Hydraulic Elevators and Dumbwaiters please refer to the specific sections in this Handbook.

Inspection Operation with Person in the Pit:

The following precautions must be observed when it is necessary to operate a lift with a person stationed in the pit.

1. The lift must only be operated on inspection speed.

2. The lift is to be moved on inspection control by the person stationed on the car top.

3. A clear means of communication must be developed and used between the two parties. This communication system should include these minimum precautions. The car should be moved only when and as directed by the person in the pit. If there is no reply the process must stop.

4. The operator should state the directions e.g. “Bringing the lift down”, the person in the pit confirms by saying “OK to bring the lift down” The person on the car reconfirms the instruction “Bringing the lift down now” before moving the car.

5. Before entering the pit the other mechanic who is accessing the car top must follow the Otis top of car access procedure i.e., test and verify the operation of the following:

   a. Hoistway door interlocks or other electrical contacts

   b. Car top emergency stop switch and inspection switch

6. The person accessing the pit must test the operation of at least two safety circuit switches (follow the pit access procedure) such as: -

   a. Hoistway door interlock and pit stop switch

   b. Pit stop switch and down final limit/ buffer switch

c. Two pit stop switches

d. Pit stop switch & compensation switch

7. To prevent accidental movement of the car, each time the car has been moved the Top of Car stop switch and the pit stop switch must be actuated and left in the stop position until the car needs to be moved again.

Pit Access Procedure

A safe procedure must be followed for accessing and egressing the pit:

1. Call the car to be accessed (check for no passengers)
2. Place (register) two car calls, one at the next landing and the other to the top floor
3. Send the car away and capture the car in position for access by opening the hall door with the door-unlocking device
4. Close the doors, recall the lift and start procedure again if the car has already reached the floor zone above and the doors are starting to open.
5. Block the door mechanically with the portable door block device
6. Place top pit emergency stop switch to "stop"
7. Remove door block and close the door

8. Wait 10 seconds, reopen the hall door and check the car has not moved

9. Turn on shaft lights in hoistway and under car light if easily accessible

10. Ensure access keys are removed

11. Undertake visual inspection on pit and surrounds

12. If safe, proceed with access to pit and work. If not, contact your supervisor

Should the work require the movement of the car then the bottom emergency stop switch must be verified as well. The person in the pit must be positioned in a refuge space that is safe and accessible to the pit stop switch or any other safety chain switch that has been verified. This is a two-person operation.

13. After verifying the top emergency stop switch undertake a visual inspection of the pit and surrounds

14. If operating conditions have changed that make the pit unsafe for entry, contact your Supervisor to undertake JHA

15. If safe, enter the pit and place the bottom emergency stop switch to stop

16. Egress the pit

17. Restore the top emergency stop switch to run

18. Remove the block and close the hall door

19. Wait 10 seconds, reopen the hall door and check the car has not moved

20. Place the top emergency stop switch to stop

21. You may now enter the pit and control the car from either top or bottom emergency stop switches

22. Ensure access keys are removed

23. If moving car when on TO C or in pit, the car must be moved on inspection only

When entering a pit from the lowest landing, a ladder must be used. Suitable handholds at an appropriate height above the sill are required.

A physical means of protection must be provided in the pit to prevent accidental contact with the counterweight. In a common hoistway if a screen has not been fitted, then the adjacent car must be under your control to prevent inadvertent contact with moving equipment.

An appropriate warning sign must be displayed on pit access doors to indicate moving equipment is contained within.

An electrical power outlet should be readily available to accommodate the use of portable tools, lights, and cleaning equipment. Ground fault circuit protection must be used at all times (RCD).

Note: When entering the pit a suitable barrier must be used. Remember to protect yourself and the public.

Once you entered the pit, block the door approximately 80-90mm from fully closed. Use door-blocking device. This will ensure that the door lock contact remains open.

The lift must be operated on inspection only; the lift must never be run on normal while an employee is in the hoistway or pit

Remember: On some units if you close the landing doors onto the Door Blocking/Stopping Device the landing lock may mechanically lock, and could restrict your egress from the pit.

CLEANING AND REPAIR OPERATIONS IN LIFT, ESCALATOR AND DUMBWAITER PITS

When carrying out maintenance operations if there is the potential for cuts or puncture wounds to occur, the procedures outlined below must be followed to minimise the chances of the employee receiving a cut or skin puncture and becoming infected.

Procedure

a. Should a needle be found, employees are instructed not to touch it but report it to their supervisor immediately so that suitable arrangements can be made with the customer for its disposal. Due to the risk of infection that injury from needles presents, all field employees should consult their doctor regarding vaccination against Hepatitis B. Immunization against Tetanus should also be maintained.

b. When cleaning or working in the lift pit or other areas, if the surface is seen to contain blood, biological materials, syringes, needles etc, contact your supervisor who will contact the administration of the hospital or other organisation. The supervisor will inform them of the problem and request that they remove all medical waste from the pit before

commencing or continuing any work. Entry of other than qualified lift people must be supervised and safety procedures must be strictly adhered to (e.g., Work method statement, Lock out tag out).

c. Any skin surface, which comes in contact with blood or other substances, should immediately be washed thoroughly with soap and water. **Notify your Supervisor of any such occurrence.**

COUNTERWEIGHT/CAR PIT PROPS

Pit props for landing counterweights can be a solid construction or a suitable commercial or other engineered configuration that has a safe working load and capacity to safely hold the load of the counterweight or car. The safe loading capacity must be strictly adhered to.
While props have a high load bearing capacity, they are not designed to handle shock loads e.g. loads being driven down onto them. In this respect we must ensure counterweights or any other loads for that matter does not subject them to shock loading.
Prop Use must meet the following guidelines:

- All use must meet the manufacturers recommendations and instructions.
- Adjustable props must only be a single length unless multiple lengths or extensions are permitted by the manufacturers
- Solid props must not exceed 5 metres and be no more than 3 joined sections. Joined sections must be bolted together an all fixing points.
- The weight of the counterweight or car must be known before using a prop to ensure the safe working load is known

- Allowance must be made according to manufacturer's recommendations for any extended props and holding capacity reduction. Refer to manufacturer tables.

- Custom or Engineered props must have the following recorded on the prop – manufacturer, date of manufacture and Safe Working Load (typically supplied for under car hydraulic stands and platforms)

- All props must be tested and certified as safe for use. (Refer manufacturers testing requirements)

- Props must be adequately fixed to prevent movement by brackets or fixings at ends

- Props and Counterweight/Car must be observed to be landed and securely holding the full load before entering the pit

- Prop must be installed in a vertical position

- Prop must not be installed by hand and a setting tool or bracket used to hold the prop in position when the counterweight or car is landed to prevent employees being exposed to danger

- When two independent props are used to support a counterweight, each must have sufficient load carrying capacity to support the entire weight of the car or counterweight independently

- Required Prop length should be established prior to landing the Counterweigh or Car to ensure correct sizing and capacity of the installed prop.

- Loads must be gently lowered on to the prop to prevent damage or adjusted to accommodate counterweight or car position.

- Employees must prove the load has been landed on the prop

- Manufacturer supplied pit props, typically for hydraulic lifts, must be used and installed as per the manufacturer's recommendation.

Installation Method Counterweight Pit Props

Landing loads on props is typically part of high-risk tasks such as roping, motor and gearbox repairs, sheave repairs and hydraulic system work. The work should be planned and subject to approved safe work methods. A thorough JHA should be conducted as part of undertaking this specific task and any risks identified and controlled.

1. Verify pit stop switches work using pit access procedure.

2. Take control of the car using approved procedures (TOC inspection or ERO). Position the car and counterweight in a suitable position to avoid the need to move the lift long distances when landing the load on the prop.

3. Ensure barricades and suitable fall protection exists at the lower pit access floor. Prior to accessing the pit and installing the prop(s), the risk of falling should be assessed and the necessary control measures put in place to prevent falling. This is particularly relevant when working at a height of more than 2 metres from the pit floor.

4. Verify Pit access is safe and lift cannot move.

5. Access the pit and lower the prop and other required tooling into the pit. Ensure protection from falling objects and manual handling risk.

6. Place the prop and ensure it is secure. Prop should be installed in a plumb position and per guidelines. Brackets or braces must be used so that employees are not holding the prop in place whilst being lowered to avoid crush and injuries by moving equipment (i.e. use a pit prop guide as per figure 4 below). The first-choice position of the prop is directly under the buffer striking plate, as this is normally the center of gravity of the counterweight or car. This could mean that the buffer would need to be removed. If the bottom of the counterweight presents a suitable flat surface, a position as close to the buffer as possible is acceptable. Where the counterweight is fitted with two buffers the same methodology should be used. If there is any doubt that the load might shift because it is unbalanced, then a second prop can be used or alternative means such as rigging can be used to prevent the load shifting.

7. Lower the load slowly on to the prop to prevent impact damage or moving the prop by ERO or manual winding of the brake. Verify the load is landed by checking with a brake lifting device for the counterweight side or attempting to move the car on ERO on the car side.

8. Inspect the pit area and prop and verify the prop has been landed and the prop is plumb and position. Confirm the prop is secured and unable to move.

Fig. 1 below shows an example of props authorised for use on Otis sites.

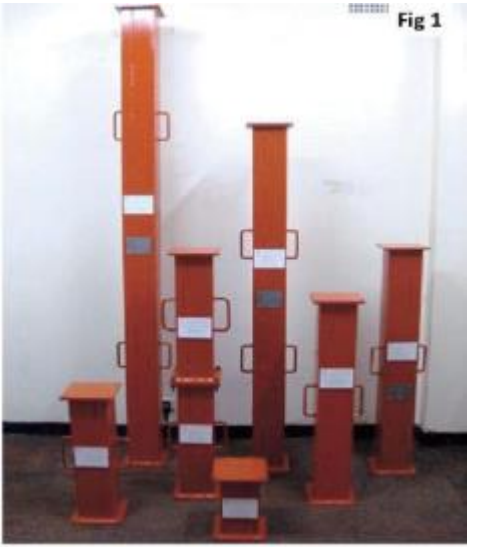


Fig. 2 below shows the certification which MUST BE CLEARLY VISIBLE on all props or available in onsite documentation.

Fig.3 below shows examples of solid and adjustable commercial props that may be used subject to compliance with guidelines and loads holding capacity.

Fig 3

Fig 4. Pit Prop Guide

Fig 4

HYDRAULIC ELEVATORS

When working under a hydraulic elevator the elevator must be landed on a support (pit props etc.) capable of preventing further downward motion i.e. Service/Repair or construction when there is work on hydraulic system or where the integrity of the hydraulic system is in any doubt or any work in the pit taking more than 15 minutes.

- In such cases the elevator must be locked and tagged out electrically and the hydraulic valve mechanically.

- For service work taking less than 15 minutes the elevator should always be run to the highest possible position if the supports (pit props) are not being used. **Note:** (If you are unsure of how long the task will take then place Pit props in position as soon as you enter the Pit).

- The supports or other specifically designed and approved system used to prevent movement shall be capable of supporting the cars full rated load (weight of car plus the rated capacity of the car). The use of non-approved timber or props not designed for the task is not permitted. The prop must be capable of being fitted in an upright position e.g. over the buffer or on a bedplate.

- If the pit props are to be used the lift should be positioned approximately 50mm above the pit props to reduce the distance the lift could drop. The lift car must be landed on the pit prop if working on the cylinder or pipe work.

Note: **When working on the hydraulic or suspension system of a hydraulic lift, roped hydraulic or dumbwaiter, or while performing any work that could damage the integrity of the**

piping or hydraulic system, in addition to lockout and tag, the elevator must be 'landed' on pit props or guide clamps fitted to prevent accidental motion.

To perform a brief inspection (refer to Otis pit access procedure) mechanical blocking is not required unless conditions indicate the need.

Ensure that two safety circuits are utilised to disable the lift, if this is not possible then the lift must be locked and tagged out in the machine room.

After all work has been completed make sure to remove the pit props used and exit the lift pit on to the landing.

Whilst remaining on the landing, switch the pit light off then place the pit stop switch to the run position, remove the door blocking devices and close the landing doors.

Remove the lock and tag if fitted and call the lift using the landing call button.

Remember: you must fit the door blocking device to hold the landings doors in the open position, each time you open the hoistway door.

To prove that the operation of the lift has not been adversely affected send the lift to another floor and then call it to return.

After ensuring that all safety circuits are functioning correctly remove all lift "Out of Service" signs and re-instate the lift to normal service.

Note: Remember when returning the car to normal operation the lift car may move unexpectedly in the following situations:

- Correction run.
- Zoning or terminal floor run.

- Returns to a home landing.
- Levelling to the nearest floor.

WORKING IN THE HOISTWAY

Always use the Company Safety Working Rules for accessing Top of Car and use the door-blocking device to control the landing doors whenever leaning into the shaft "in case you slip". Always wear your eye protection as per company policy.

a. To gain access to the hoistway via landing doors, an approved unlocking device or access key switch shall be used to unlock the 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, follow the approved lockout procedure.

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

c. Landing doors must not remain open longer than absolutely necessary. Only use the Otis approved door-blocking device to control the landing doors whenever leaning into the shaft. Use barricades to protect the public from getting near the opening.

d. Simultaneous work must not be conducted in the hoistway by Otis 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.

NOTE: A duplex or a triplex shaft is classed as one hoistway until suitable shaft screening or dividers are fitted, i.e. temporary screening to prevent employees' traversing

from one shaft to another. Each shaft has to have its own entrance/exit.

Exceptions to this rule will require a documented Job Hazard Analysis and approval with a written authorization of the documented standard work procedure by the Managing Director of Otis, prior to work being performed

Adequate overhead protection must be provided in the hoistway and in any other work area where there is exposure to falling objects. This
protection must prevent all parts of the body from being struck by falling tools, debris, small parts, etc.

WARNING: **Ledges / Steel Structures within hoistway. All employees that have access to the hoistway are instructed that they must not stand on any ledges or steel structures within the hoistway to allow others to drive the lift car past them, this would also include the highly dangerous practice of standing on the lift counterweight.**

MACHINE ROOM SAFETY

ACCESS TO THE MACHINE ROOM

Stairway -this is the preferred access to the machine room and should be:

1. Free from obstruction
2. Properly lit, including Emergency lighting if Emergency access is required
3. Nonslip
4. Properly constructed and fire protected
5. Be equipped with a handrail

6. Have edge protection

Risk Assessment

Once the need for access on the roof has been identified, a Job Hazard Analysis must be completed to identify the precautions needed to reduce the risk to an acceptable level.

SAFETY GLASSES /GOGGLES SHALL BE WORN

Hazards

The main hazards of roof access are summarized below.

- Failure to provide edge protection or guard rails/toe boards to roof edges, openings, gangways across roofs and working platforms
- Falls through fragile material
- Walking off designated routes onto unsafe roofs; badly maintained or inadequate walkways
- High winds across exposed roofs
- Overbalancing whilst carrying materials
- Falls through holes or opening in the roof
- Failure to secure ladders
- Slips and falls due to green algae, damp
- Falling trap doors
- Doors blowing shut
- Inadequate lighting

- Falling objects from above, such as unsecured materials / tools dropped by workers

The control measures/precautions needed to prevent these must be considered and introduced following a Job Hazard Analysis must be completed to identify the precautions needed to reduce the risk to an acceptable level.

NOTE: Refer also to the section of this Handbook on the safe use of ladders.

Weather Conditions

Rain, ice or snow make surfaces slippery, while gusts of wind can cause overbalancing. The weather conditions at the time of access must be taken into account. It may be necessary to suspend or delay the start until the adverse conditions have abated.

Note: All employees are instructed that, if weather conditions create hazards during roof access, then they must not access the roof. Provision may need to be made in advance to access lift machine rooms in emergency situations in extreme weather conditions. Electromagnetic Radiation (e.g. Satellite dishes).

The current knowledge is that electromagnetic radiation from such equipment on building sites, do not create any dangers to health, although they can cause heating of the body and therefore exposure should be avoided.

Symptoms of being exposed to excessive levels of this radiation apart from heating are sore eyes and head, itching skin, and general tiredness that may last a couple of days.

If mechanics have sites where they have to walk in front of such equipment or work very close [3 to 4 metres] to them they should report them to their manager so that the situation can be reviewed with the client.

Other Potential Hazards

Electric shock from faulty equipment or from overhead power cables.

Electrical Equipment and Rotating Machinery

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.

All potentially hazardous parts are required to be effectively guarded from accidental or incidental contact. Eg. Controllers, selectors, sheaves, gear wheels, chain sprockets, tape drives, belt pulley drives and commutators.

During Modernisation work, barriers should be erected between equipment that is being worked on and unguarded equipment that is still in service.

Refer to the procedure for working in the machine room near unguarded sheaves.

Refer to the procedure for working in the machine room near unguarded sheaves.

Fall Hazards / Falling Objects

Fall hazards and the risk of falling objects can be eliminated or minimised by the following:

- Reducing the size of the holes in the slab and the floor to prevent objects falling through openings and into the hoistway.
- Provide raised guards that project at least 50mm above the slab or finished floor.
- Ensure the floor is free of oil and debris.
- Cover redundant holes.
- Provided guardrails and steps on split levels.

Heating Lighting & Ventilation

The machine room should be:

- Well vented for the prevention of dust, harmful fumes and humidity.
- Maintained at a reasonable ambient temperature.
- Adequately lit, with light switch located in the machine room.
- Provided with a minimum of one power socket outlet.

Handling of Equipment

Equipment should be lifted by a Lifting Beam, Lifting Eye etc. The beam shall be used only if marked with the Safe Working Load. If not marked, it shall be tested and certified for the safe working load before use.

General Information for Machine Room

- They should have:
- Current wiring diagrams.
- Brake release and hand winding equipment.
- Hazard warnings e.g. Electric shock warning notices.
- Landing door release devices.

- Motor room door warning notices.
- Machine equipment and switchgear/circuit breakers correctly numbered.

Procedure for working in the Machine Room near unguarded sheaves

NOTE: A single safe procedure for working in the proximity of a moving sheave would probably not cover all possible situations therefore, the following guidelines result from carrying out a general Job Hazard Analysis.

Definitions:

Working The mechanic is performing a task that may draw his/her attention away from the associated risks.

Sheave Any rotating component that is carrying or being driven by a rope or tooth tape (e.g. drive, diverter, governor, tape sheaves, etc.)

Proximity A mechanic shall be considered as working in the proximity of a danger zone if from his/her normal working position, any nip point and rope or sheave structure can be reached through inadvertent movement of any limb. Proximity to a moving sheave may also occur during access/egress of the machine room

Note: An alternative definition of working in proximity, is working within 1.5 m of the hazard.

Nip Point The 'nip point' is that area of the equipment where the in-running rope/tape meets the sheave.

Instructions

The employee should perform a specific Job Hazard Analysis to establish whether he/she is exposed to the risk of inadvertent contact.

The following activities shall not, in any case, be performed in the proximity of an unguarded moving sheave.

- A task that requires the employee to reach inside the area known as the 'nip point'
- Machine/sheave cleaning, painting, lubricating, checking oil levels and/or adjustments.

When performing any of the above activities, the equipment must be de-energised and locked and tagged out as per Otis procedures.

Safeguards

If the machine and sheave(s) must be in motion to allow adjustment (e.g. final brake adjustment), and there are no permanent guards fitted, temporary guards must be installed to prevent chance of inadvertent contact with any moving part.

These guards shall be constructed in such way so as to avoid creating additional risk.

SAFETY AT LIFT ENTRANCES - BARRIERS / BARRICADES

ALL OPENINGS MUST BE EFFECTIVELY GUARDED

Service/Repair

Anytime a mechanic is accessing or working from a landing a physical barricade is required at the landing entrance. E.g. portable barricade.

Barricades should be stored at strategic locations or in a service vehicle so they are readily available to personnel when required.

Alternatively a mechanic can use the door block device so that the doors are secured less than 100mm apart.

Modernisation

A barrier must be provided that extends to the full height and width of the entrance and must be lockable. E.g. wire mesh or a wood/steel hoarding.

If a fall hazard exists a guard rail must be installed at the landing entrance. Fall restraint can be used in addition to a guardrail.

Construction

A barrier must be provided that extends to the full height and width of the
entrance and must be lockable on all open landing door entrances.
E.g. wire mesh

If a fall hazard exists a guard rail must be installed at the landing entrance.

Fall restraint can be used in addition to a guardrail.

SAFETY WHEN WORKING ON ESCALATORS AND TRAVELATORS

SERVICE SAFETY:

The following safety guidance must be followed when working on Escalators and Travelators.

- Whenever work is to be performed on the unit that does not require power, lockout and tag the mainline circuit breaker in the OFF Position.

- Always test between each leg and to ground with a meter at the controller for power before working on the equipment. (Verify operation of meter on a known voltage source).

- OSS 6.2 Working in the Truss (Upper/Lower Landing and Inclined Section) F. If the effort required to lift a removable floor plate exceeds 16kg, or exceeds 20kg for a hinged floor plate, then an approved lifting tool must be used.

- OSS 6.4 Working in the Machine Room A. Integrated Machine Room (machine in Upper Landing) Section 3 Controller: If the effort required to remove the controller and attached cables exceeds 11kg then a lifting device is required and this requirement shall be clearly indicated on the controller.

- Use the temporary walk platform when steps are removed, do not walk on the axles.

- Remember: Always lock and tag out and verify Zero electrical energy, and ensure you have two independent mechanical means to stop step chain movement before you insert body parts where electrical, pinch, shear, jam or trap hazards exist.

- Removable controller**:** Ensure power is off when removing and replacing the controller, make sure it is always in its designed operational position (e.g., upright) when moved from its normal location. (e.g., if positioned improperly circuits may function due to gravity).

- Never switch an escalator or a travelator 'ON' or 'OFF' if passengers are on the unit.

- Before work begins, the mechanic should make themselves and all employees aware of the location of the emergency STOP button and safety switches.

- Before entering the unit or pit, test and verify at least two switches. Personally verify that the unit will not start by testing all locations and possible combinations of the run and key-start switches.

- When working around moving equipment, secure loose clothing, hair, tools and equipment to avoid entanglement.

Public Safety / Communication

- Mechanics arriving at a location to perform service or repairs must alert the owner of the building. Place Otis - approved barricades at both ends of escalators and travelators to restrict all non-authorised persons from entering the work area or stairways.

- Alert the owner or owner's representative that the integrity of the barricade must be maintained if the maintenance crew has to leave the site for any period of time.

- If the configuration of the escalator or travelators is such that there is a danger of entanglement from an adjacent unit, all units which pose a hazard must be locked and tagged out and barricaded at both ends.

- Advise the client of the hazards of using the escalator or travelator as a staircase.

a. Using an escalator as a stairway could cause injuries
b. For example, the height of the step riser on an escalator is greater than typical stairs
c. Escalator steps are wider (front to back) than normal stairs
d. These differences could result in a person catching their foot on the edge of the steps. In addition, the height of the step riser is not consistent throughout the length of the unit.
e. Also if there is too much weight on the escalator / travelators it may cause it to slide through the brake in an un-controlled manner.

- Ensure the equipment used for oiling does not endanger the worker while performing this task. Use a long nozzled oiler with a breakaway fitting to decrease the risk of injury.

- If the escalator is to be left unattended when steps, step-treads, pallets, comb plates, floor plates or trap doors have been removed, the equipment must be locked out and tagged out in the off position. Barricades must be put in place to prevent accidental removal and/or collapse.

- Power may be restored to the unit only after determining that the safety of the public and the co- workers on the job site has not been compromised in your absence.

- Communicate with all personnel before moving an escalator or travelators. Repeat commands or direction signals. Make sure their actions show they understand your message.

CAUTION: Due to the length of some escalators and Travelators, normal voice and visual communication may not be adequate.

A clear means of communication must be established, as per the communication process in Section 2 of this Handbook. Working in the Truss

- A method of restraining the steps or step chain from moving should be put in place before entering the truss. As some activities may cause the step chain to move (e.g. working on the brake system or gear box, main drive chain or with more than 1/3 of the steps removed). This is particularly relevant.

- when carrying out work on the escalator units that have the machine located within the truss

- Note: Some escalators / Travelators are fitted with secondary braking systems.

- Be aware that voltage supply may still be live on the equipment even after the mainline power has been disconnected. Use a meter to test all circuits before working on them (See LOTO Section).

- If a unit is equipped with a handheld pendant control this should be used when servicing the unit.

CAUTION:

- Beware of instant start units
- The weight of a full ring of keys can hold a key switch over and could start the unit. Separate your escalator or travolator start keys from your key ring
- Always remove the start key from the switch, especially when you are leaving the area
- Always ensure you are in a safe position outside the escalator before operating the unit

- Always use safe lifting practices to avoid injury when removing steps or pallets

WARNING:

"Do not ride the unit" when any steps or pallets are removed. When walking on a partially disassembled unit, it must be locked and tagged out in the off position. Walking on the step axles is not permitted.

Removal of Escalator Steps:

There are many types and different designs of escalators and to encompass them all into the handbook would not be practicable. The following is just one example of a safe method for the removal of escalator steps.

a. Install and secure barricades at the top and bottom landings to restrict access by unauthorised persons
b. Ensure that no one is riding on escalator, then stop escalator
c. Open up escalator machine room when applicable
d. Remove lower landing tread plate to gain access to the escalator pit
e. Install the escalator control pendant
f. Operate escalator start key to ensure that the pendant control overrides the key switch. (Remove the key from key switch)
g. Verify that the escalator control pendant is functioning correctly before proceeding to position escalator. Verify that the stop switch is operational and that the control run buttons are working correctly. If escalator control pendant is not available, verify the stop switch and direction switch

h. Install and secure barricades at the top and bottom landings to restrict access by unauthorised persons
i. Ensure that no one is riding on escalator, then stop escalator
j. Open up escalator machine room when applicable
k. Remove lower landing tread plate to gain access to the escalator pit
l. Install the escalator control pendant
m. Operate escalator start key to ensure that the pendant control overrides the key switch. (Remove the key from key switch)
n. Verify that the escalator control pendant is functioning correctly before proceeding to position escalator. Verify that the stop switch is operational and that the control run buttons are working correctly
o. If escalator control pendant is not available, verify the stop switch and direction switch
p. For secondary safety, verify that the carriage switch is operational by tripping the carriage switch and trying the pendant buttons with the stop switch in the on position. The escalator should not move, you now have two proven safety circuits protecting you
q. After reinstatement of the carriage switch position the escalator from a safe position **outside** the escalator for step removal and for insertion of the step lifter tool
r. Turn off the pendant stop or Stop switch and for secondary safety operate the carriage switch
s. Install step lifters and disengage sleeves
t. Remove the step if crab casting is cut to allow same
u. Remove step and place in safe storage area
v. Operate the carriage switch and stop switch to reposition the escalator for further step removal
w. Re-installation of steps must follow the above procedure using the reverse order

Remember: This is only one example of the removal of escalator steps. Other alternative safe methods such as

hand winding must be considered. This must be determined by a Job Hazard Analysis which is approved by your Supervisor.

HEALTH HAZARD: Use of recommended cleaning materials on escalators / travelators to clean equipment will require adequate ventilation or respiratory protection.

Use SDS for specific precautions. Use only approved chemicals.

Construction Safety for Escalators and Travelators:

- During construction or modernisation, the entire well way should be protected with proper barricades.

- When the balustrade is not in place, fall protection may be required. If required connect to an adequate hitch point or use a lifeline.

- Remember that you may need to protect other contractors or members of the public. Barrier off the work area above and below you and introduce the Company or contractors permit to work system.

- Secure equipment while moving, storing, hoisting and installing operations are taking place to ensure no release of mechanical energy.

- Inspect rigging and hoist equipment for wear or damage before use.

- Use safe work procedures when hoisting escalator equipment by using a lifting plan.

- Stand well clear of openings while hoisting or moving equipment. All personnel must be kept clear of suspended equipment.

- Minimum personal protective equipment required (safety footwear, fall protection, eye protection, hard hat, gloves)

CAUTION: Gloves and protective spectacles must be worn when tightening clamps on glass supports or doing any work involving balustrade glass. The glass could shatter or break with explosive force.

IF ABNORMAL SITUATIONS ARISE: Notify your Manager or another worker for assistance in assessing the

hazard and forming appropriate work procedure. Perform a Job Hazard Analysis.

ELECTRICAL SAFE WORK PRACTICES

All electrical voltages are dangerous. Contact with any voltage can result in serious accidents by causing workers to become startled or disorientated and make sudden uncontrolled movements.

The following requirements are applicable for all activities and practices involving electrical circuits and equipment when work such as troubleshooting that must be performed with the power "ON".

General

Working LIVE is NOT encouraged or condoned without a documented Risk Assessment.
Always ask yourself when working around any electrical equipment: "DO I NEED THE POWER ON?"

Conduct Lockout and tag procedure when power is not required to perform the task.

- If the equipment must remain energised, STOP and assess your task. What electrical PPE will you use? e.g. rubber gloves, rubber mats on floor, use insulating plastic sheet, use insulated tools, avoid grounding yourself, wear approved protective eye wear, remove jewellery, do not use metal framed glasses.
- Consider using a barricade in your work zone that highlights the area

When working on electrical systems such as Controllers, Top-Of-Car Controls, Hoistway, Halfway Boxes and Car Junction Boxes, the Company rule is to work with all power supplies isolated and locked and tagged out wherever possible.

- Before starting to carry out work use the wiring diagram whether there are any power supply sources that are live even though the mains isolator is switched e.g. signal transformers, lighting, alarms, controller interconnections, REM units, door detectors, fans, selectors, emergency power sources. Note: this is not a definitive list and all units should be carefully checked.
- Even though all power supplies may have been isolated there is also the hidden danger of electric shocks from charged capacitors, especially on VF drives. VF drives should always be left until the charge indicator light goes off or at least three minutes have passed in order to allow internal capacitors to discharge.

When testing circuits to determine the value of any voltage present, always use a meter, which is initially set for its highest range, then adjust down to appropriate range. All meters must comply with Aust/NZ standards. **The use of homemade test lamps is strictly prohibited.**

REMINDERS:

- **Do not perform work beyond the main line isolator in the machine room without authorisation of a field supervisor.**
- **If replacing fuses in a main line isolator in a machine room they must be the correct type and current value.**
- **Bring all incoming mains power sources to a zero-energy state where ever possible.**
- **When operating the main line isolator always stand to the side facing away, using the hand that will position you the furthest distance from the isolator.**

- When working around or checking motor generator sets and lift motors. Remember that armature voltages present may be as high as 600 volts.
- Avoid leaning on or otherwise touching the normally grounded parts of such equipment while it is operating. It is always possible that grounding circuitry may have become disconnected. Contact could result in your body providing the path to ground thus resulting in either serious shock or injury.
- Ensure Protective clothing, covering arms and legs, nonconductive footwear and safety eyewear is worn. Remove or insulate any metal items. E.g. watches, jewellery, body piercing, metal spectacle frames.
- Before working on circuits containing capacitors. Discharge any stored energy by waiting 3 minutes.
- Take precautions to keep metal objects from touching or coming in contact with any live parts to prevent electrical shock.
- Objects such as tools, oil cans, nuts, bolts and washers must be kept clear of field magnets to prevent them from being drawn into moving parts.
- Only insulated tools may be used when working on electrical circuits.
- Do NOT use measuring devices constructed of metal when working around live circuits or apparatus e.g. rulers, tape measures, torches.
- Where work is performed on electrical circuits located in dark areas, use adequate, non-conducting auxiliary lighting.
- When using portable electrical tools, make sure they are connected to a 10mA RCD.
- All extension leads shall be made of heavy duty double-insulated cord, and must be tested and tagged. Altered worn or frayed electric leads shall not be used. E.g. modifying the earth pin of a 15A plug to fit a 10A socket is prohibited.
- All hand lamps must be protected against breakage

- Always connect a 10mA RCD to the source prior to connecting electrical leads, portable tools, hand lamps etc.
- Fuses of the correct size, type and capacity must always be used. Never substitute wire or other devices for fuses. All circuits must always be treated the same as live circuits until they are proven to be dead.
- Always protect temporary wiring from damage.

Lockout and Tagging of Circuits

1. Equipment or circuits that are de-energised shall be rendered inoperative and have locks applied and tags attached.
2. Lockout/ Tagout procedures detailed in "Lock out and Tag Out" section are to be adhered to at all times.
3. Equipment that may have energised circuits after the main line isolate has been locked out and tagged must be labelled to indicate this situation.

Residual Current Device - Fault Protection

10mA Residual Ground-fault circuit interrupters (RCD) must be used with all portable tools and other electrical devices.

Refer to the RCD section in the Handbook.

LOCK AND TAG OUT PROCEDURE

This guide details the procedures to be followed for securing the locking and tagging out of equipment undergoing installation, modernisation, repairs, maintenance, warehouse/stores or offices where injury could result from unexpected motion and start up or contact with energised circuits.

Company Lock Out and Tag Out Policy (LOTO)

- Employees are required to use the Lock out and Tag out procedure must be trained in this procedure

- Failure to follow Company LOTO procedures represents a Cardinal Rule breach and will be investigated as a serious near miss.

General LOTO Rule:

When work is performed on equipment where the power is not required, the equipment must be brought to a Zero Energy State and Locked and Tagged out.

Conduct a JHA before commencing any task or whenever the situation changes.

If additional controls are identified during the JHA process such as risk of accidental contact, arc flash or other increased risk then additional controls such as insulating blankets, insulating mates or other controls may be required.

When work is performed on equipment requiring employees to place any part of their body within proximity of unguarded electrically energised circuits or equipment, nip points, points of operation, rotating or oscillating parts or where operation is not required, the machinery must have the power completely shut off and the LOTO procedure performed.

Stored energy must be neutralised. This includes the release of hydraulic or pneumatic pressure and blocking or releasing any spring driven or gravity operated mechanism or adequate insulation to prevent contact with auxiliary circuits, condensers, resistors, etc.

When work is performed on equipment where operation is not required, the machinery must be completely de-energised and the LOTO procedure performed at its power source.

Each employee or subcontractor must lock and tag out the equipment they will be working on PRIOR to starting the task main line isolation may not ensure all power is shut off as isolators can be faulty or other unknown energy sources may be feeding the equipment. E.g. such as car lighting and signal circuits

Therefore, a meter must be used to test for Zero Energy before work commences on the equipment.

This meter must be verified for operation against a known voltage source prior to each use." WARNING: Other trades may be doing work on a power source. (e.g., Electricians connecting main line feeders to controller.)

Take steps to ensure control of the system while other trades are involved with a power source.

- Disconnect wiring at a point that will provide you with control.
- Communicate the issue to all concerned workers.

Test function of lockout when you turn off the main line isolator.

NOTE: Fault finding, and testing may need to be performed with the power "on". However, once the problem has been identified, ALL the sources of power must be shut off, locked and tagged prior to performing repairs or inspections.

LOTO Equipment:

All Otis field employees will be issued with Lock and Tag out kits.

Where individual padlocks are issued the kit will consist of:

- Lock out portable devices (different types depending on application requirements)

- Minimum of 3 padlocks (no more than one key per lock series)
- Danger tags and Warning tags
- Pair of insulating electrical gloves and barrier gloves (Issued to Electricians only)

Electrical Glove Protection:

All Electricians will be issued with a pair of insulating gloves and barrier gloves. The insulating gloves will be a minimum of Type 00 – Low Voltage (500VAC and 700VDC). The barrier glove will be leather and be worn over the insulating glove to prevent damage to the insulating glove and protect worker from arc flash potential.

- Insulating gloves must be issued within 12 month of manufacture
- Initial use date must be recorded on the insulating glove
- Insulating gloves must be replaced every 24 month or when unserviceable or when local codes require more frequent inspections
- Insulating gloves must be inspected prior to use and removed from service if not fit for service – an air leak test and visual must be conducted (pinholes, cracks, blisters, cuts, conductive embedded matter, creases, pinch marks, voids, prominent ripples and prominent mould)
- Any grease, oil, carbon or other material on insulating gloves should be cleaned using manufactures instructions.
- Barrier gloves should be serviceable and provide full protection to the working area of the insulating glove

- Electrical Protection gloves should be stored to avoid sunlight and direct heat

Electrical LOTO Procedure:

1. Notify the people that may be affected that Lock Out and Tag Out is going to be conducted and the reasons for it.

2. Fit "**Lift out of Service**" signs at lift landings if a the complex or rise is a single lift. Position the lift as necessary to protect the public and for task to be performed.

3. Prior to isolating the equipment make sure it is safe to do so, e.g., no passengers in the lift car, follow the shutdown procedure if applicable, etc.

4. Take control of the car. Where possible Inspection controls should be used to verify control of the elevator and all immediately available emergency stops should be verified as functioning correctly and activated.

5. The main power switch/isolator/circuit breaker and/ or ALL OTHER isolators (e.g., lighting, signals) supplying electrical energy to each lift should be identified. All switches should be clearly marked with the relevant lift number. When confronted with an isolator that cannot be locked out using Company methods, complete a Stop Work Authority.

6. Contact your Supervisor/EHS manager for assistance if a safe method of locking out the equipment is not available. A JHA should be completed prior to undertaking the agreed alternative method.

7. Inspect your Electrical Insulated Gloves for cleanliness, damage and check for air leaks. You must wear electrical gloves whilst within 1.5 metres of exposed electrical conductors or when exposed to accidental contact with electrical sources.

8. Inspect your electrical multimeter to ensure it is on the right voltage setting. Check that the leads are correctly positioned and not damaged.

9. Identify the correct Zero Energy State (ZES) test point/s by using the controller drawings for the unit you are about to work on.

10. Verify that your electrical multimeter is working correctly. Test it at a known power source of the correct voltage:

    - For AC - at an adjacent GPO (for AC) or at the test points you intend to use to check for ZES in the controller.

    - For DC – at the controller test points or a portable Battery

11. Ensure you have no exposed electrically conductive materials on your person, e.g. key chains on belt loops, metallic jewelry necklaces, steel rule in shirt pocket etc.

12. Switch off each power supply remembering to stand to one side and face away from the isolator (in some cases, malfunctions can cause an electrical explosion).

13. Secure each isolator/switch from being switched “on” by using suitable lock out devices and the Company issued personal padlocks to lock the switches. Apply the danger

tag with the padlock – write your name (if not on tag) and a contact number. It is good practice to include the date the tag is applied.

14. Multiple lockout devices of various sizes and styles are issued for use where the circuit breaker cannot be locked out due to inherent design or does not have the lock out capability. It is good practice to use a hasp lock in lock out situations to allow multiple users to apply locks.

15. Employees are issued at least three locks to secure more than one source of power where required. The employee should only have one key for any lock or series of locks.

16. Where multiple employees are working on equipment, or would be endangered if the power is reconnected, they must also apply their padlock and danger tag.

17. Each employee must place his or her own personal lock and tag through the lockout device (i.e., two people – two locks and two tags, on each lockout device).

18. Isolators can become faulty. Verify that the lock is effective in preventing the switch from being returned to the 'on' position.

19. Insulating Gloves must be used for all electrical testing to prevent accidental contact with live sources.

20. If testing is interrupted for any reason, then the meter SHALL be re-verified. e.g. such as moving the lift car, changing the voltage setting or turning the meter off.

21. Check the equipment, e. g. controller or contacts, test each isolated power supply to verify that they

are all at ZERO ENERGY STATE (ZES) Check all conductors with electrical potential (phase to phase, phases to earth, phases to neutral, neutral to earth and any current carrying DC conductors). Check around the area that you will be working in to ensure that it is at ZES.

22. Verify any other electrical energy sources have been dissipated or removed such as interconnections, capacitors and emergency power. Electrical drawings should be reviewed to confirm supply voltages and sources.

23. Verify your multi-meter on a known source and correct to confirm the meter is still functioning correctly.

24. Where possible verify by the inspection or run controls or by placing a demand on the system that the unit will not run or move and confirm all electrical, stored and mechanical energy is dissipated.

25. Mechanical tags will be placed onto circuit breakers / sub boards at same time as electrical tags if a mechanical item is also isolated.

26. Mechanical tags will be left attached at end if shift when DANGER tags are replaced with WARNING out of service tags if unit is still electrically and mechanically isolated.

27. Electrical DANGER or WARNING tags must not be removed until all mechanical locks identified in MECHANICAL tag have been removed.

REMOVAL AND ISOLATION OF UNSAFE EQUIPMENT FROM SERVICE

This guide details the procedures to be followed for isolation or removing unsafe equipment from service when Lock and Tag Out Procedures are not applicable or not practical.

General Rule for Isolation and removal of equipment from service:

All unsafe or potentially unsafe equipment must be identified, isolated and removed from service until it is safe for use.

LOTO Equipment:

All Otis field employees and relevant office-based employees will be issued with Lock and Tag out kits.

Equipment Subject to Inspection:

Plant and equipment should always be subject to periodic and pre-use inspection to ensure it is safe for use. This includes inspecting for damage, testing and certification, suitability for use, servicing requirements, and compliance with standards and Otis requirements.

Examples of equipment subject to inspection include:

- Rigging Equipment (“C” Class equipment, shackles, chains, lifting devices, slings, steel ropes, winches, etc.)
- Electrical Equipment (Leads, Portable RCDs, Lights, etc.)

- Tooling (Grinders, Battery Tools, Welders, Trolleys, Lifting Aides, etc.)
- Heights Equipment (Harness, Carabiner, Lifelines, Bow Straps, Lanyards, etc.)
- Ladders and Scaffolds or Suspended Working Platforms (Portable Ladders, Quick Stage Scaffold, Extension Ladders, False Cars, etc.)
- Other Plant or Equipment (Forklifts, Walkie Stackers, Electric Pallet trolley, Scissor Lifts etc.)

Unsafe Equipment Removal and Isolation Procedure:

1. All equipment should be inspected prior to use and periodically as per the OTIS and relevant code requirements

2. When unsafe equipment is identified a plan for the safe shut down and removal of the equipment from service must be implemented. Where a standard operating procedure does not exist or working conditions have changed or are unsafe, a site-specific plan, including a JHA, should be implemented to manage the risks associated with removing the equipment from service. For guidance a supervisor should be immediately contacted.

3. All affected employees should be notified of the activities and the equipment involved. A supervisor must be notified and consulted for remedial actions. The equipment should be safely shut down and usage stopped.

4. Isolate the equipment from any hazardous energy sources and dissipate any energy so it is safe.

5. Remove the unsafe equipment from service.

6. Apply any additional steps identified to make the equipment safe such as storing in a secure or quarantine area, retention of keys, removal of batteries, barriers, plug covers, etc.

7. Apply Warning Tags to the unsafe Equipment. The Tag must be readily and easily identifiable to prevent any other person from using the equipment. The Warning Tag must contain written details of the person isolating the equipment, a contact number, date/time removed from service, description of the equipment and fault.

8. The equipment failure or unsafe condition is to be recorded using the appropriate register or Safety Dilemma Form.

Reinstatement of Equipment:

1. A supervisor must provide guidance prior to the equipment being returned to service.

2. Only a qualified and competent person can remove a Warning Tag (Out of Service Tag) and only after the unsafe condition has been remedied. A Danger Tag must only be removed by the person who placed the tag.

3. Certain types of equipment may require additional licensing or qualifications to verify equipment is safe to use. (E.g. Rigging, Electrical, Heights)

4. All necessary actions, including testing, certification, and inspections must be undertaken to ensure the equipment is safe for operations before a Warning Tag is removed.

5. All affected workers must be advised that the equipment has been returned to service. Any tags, registers and records must be updated.

6. Equipment requiring external certification, inspection or testing must be transported with Warning Tags attached.

Retiring or Disposal of Equipment:

1. A supervisor must provide guidance on any equipment that is unable to be returned to service or retired from service.

2. Any equipment retired from service must not be able to be repurposed or reused. The Warning Tag must remain attached to the equipment, and the equipment must be appropriately disposed of.

3. Any records or registers must be updated to reflect the disposition of the equipment.

POINTS TO REMEMBER ABOUT DANGER TAGS

ALWAYS have your Padlock and Danger Tag with you whenever onsite. **NEVER** leave a site with your Danger Tag and Padlock still in place.

ALWAYS remove your Danger Tag and replace it with an Out of Service/Warning Tag if you leave site.

NEVER ask anyone else to fill in, attach or remove your Danger Tag. It's there for your PERSONAL protection.

NEVER fill out attach or remove a Danger Tag that is not YOURS.

YOU FILL IT OUT - YOU PUT IT ON - YOU TAKE IT OFF

Using a branch lock to isolate when leaving unfinished work (LOTO)

If the worker has to leave site before work is complete and the equipment is not in a safe condition to be returned to normal operations, and the machine room is not secure (e.g with restricted access) then the worker should:

For NSW only: A lock should be added even if the machine room door can be locked/secured.

1. Remove their personal lock.
2. Replace their personal lock with an approved branch lock (e.g a team padlock or combination lock).
3. Attach a warning tag which includes their details and their supervisor's details.
4. Inform the site contact and their supervisor that a branch lock has been put in place to secure the equipment
5. If the worker who put the branch lock is not returning to site and it is removed by others, the branch lock should be returned to the Otis Supervisor and the original installer should be notified.

Employees are reminded that they must not leave their own personal locks in place to shut down or leave a lift or escalator isolated for repairs, additional items of work on modernisation, or construction.

JUMPERS / BRIDGING WIRES / DEFEATING SAFETY CIRCUITS

Service / Repairs /Mods

New Equipment /

Electrical Mechanics must be trained in the proper use of bridging / jumper kits as detailed in technical training.

Only competent employees who are required to use jumpers to perform their duties will be allowed to do so

The rules detailed below must be followed. Each manager will maintain a record of all employees who have been issued with a jumper kit. Only Company issued or approved bridging wires must be used

All other bridging wires must be removed from toolboxes, motor rooms, and service vans etc.

General Rules:

- Jumpers must only be used in a controlled manner.

- Jumpers must not be used for any longer than absolutely necessary and they must be removed as soon as their purpose has expired.
- Ensure that the lift is on inspection prior to placing shorts on door, gate or safety circuits.
- Ensure that the lift is isolated and at zero energy prior to fitting a jumper.
- Jumpers must not be used as a diagnostic tool. Always use a meter to troubleshoot circuits.
- In Service/ Minor Repairs never short out the landing door and car gate contacts at the same time
- Temporary bridging devices / jumpers must never be used to short out landing door contacts (exception is the MCS/Gen2 Door Bridge Plug device).
- When passenger(s) are trapped inside a car, mechanics must never short out the car gate contact and move the car from the machine room unless they have communication either directly with the passenger(s) or with a second mechanic and have determined that all landing doors have been checked and are closed.
- Ensure landing doors are mechanically closed if door lock fault is suspected, before moving elevator using a jumper.

- In these types of situations, it is paramount that when moving the lift, you use the Top of Car Inspection, BRB button in E&I panel or hand wind / hand lower the lift.
- All jumpers must be company issued/approved and have an identification label fitted.
- The label must be marked up with employee's name and jumper number.
- Always advise your Supervisor if you need to replace damaged jumpers.
- Jumper sets with defective bridging wires must be returned complete to Supervisor for replacement who will organize the previous Jumper set to be destroyed.

Service & Minor Repairs (Maintenance Jumpers)

Procedures

1. Display out of service notices and remove lift from public use
2. Lock and Tag Out the lift from mains.
3. Take control of the elevator, e.g., switch to ERO.

If there is no ERO box fitted, e.g. Relay Logic, please follow the following steps:

Notify your Supervisor

Arrange drawings to be provided to your local Field Engineer

Field Engineer to supply procedure for taking control of elevator

Follow the procedure provided to take control of the elevator

A copy of the Control of Elevator Procedure to be left in the motor room.

4. Remove shorting leads(s) from pouch – refer figure 1

5. Install temporary jumper, and verbally advise workmates where jumpers are to be used detailing what circuits will be affected.

6. When work is complete, all bridging wires must be removed, counted, and returned to the shorting lead kit pouch.

7. Never leave clip or bridging wires on equipment or in the machine room.

8. Ensure machine room door is locked when leaving.

Construction & Modernisation (including Major Repairs)

Construction & Modernisation mechanics may not be issued a bridging kit, due to the nature of construction & modernization work, mechanics will be issued with orange temporary bridging tags.

Mechanics working on both minor and major repairs may be issued a maintenance jumper kit. When they are carrying out major Repairs (example Controller upgrade), Repairs mechanics MUST use the Construction & Modernisation process.

- When required to use a bridging wire, mechanics will produce a bridging wire of at least 1 metre in length.
- A temporary bridging wire tag must be applied to each bridging wire and marked up with the mechanics name, circuit being bypassed as well as the function and date applied (Tag will have unique identification number).
- The bridging wire must only be made up as and when required.
- Factory supplied jumpers shall have a Temporary jumper tag applied.
- The mechanic must complete Temporary Jumper log ZS 5588 (Note: Jumper log to be fixed to the Controller door and remain visible to workers.

Note: for ordering purposes the Temporary Jumper tag (SPW) Part Number VPT077.

Construction and Modernisation (including Major Repairs Procedure

- Display out of service notices and remove lift from public use (If required)
- Lock and Tag Out the lift from mains.
- Complete all required information on the Jumper Tag & Jumper Log
    - Points to be jumped
    - Function of jumped circuit

    - Jumper installed by & Date
    - Job Name & Contract number
- Install Temporary Jumper/s
- All bridging wires must be removed and recorded on the log sheet at the time of removal.
- Once this has been completed the Temporary bridging wires log sheet can be removed from the controller.
- Once removed, NE/MOD bridging wires must be destroyed and discarded in a controlled manner. They are not to be left on site in the machine room, toolbox or vehicle.
- On completion of the job, prior to the unit going into public service, the unit must be inspected by the Adjuster to ensure that all bridging wires have been removed.
- The Supervisor must account for all registered jumpers, ensuring they have been removed from circuits and the jumper log updated to reflect this.
- For new Premier 5 jumpers/ shunts:
    - Otis Australia originally designed a field shunt for Gen2 Comfort and Premier3.
    - For **Premier 5 installation** Otis now utilises factory supplied jumper plugs.
    - This is an engineering designed shunt and now forms part of the install process – refer to FIM.
    - Pre-made plugs are an installation process improvement and are safer than using the traditional single use, single point jumpers.

- Pre-made plugs may not always look the same although they will work the same way.
- Utilise our standard process for recording jumpers. If using jumper plugs:
    - Add a completed Temporary Jumper tag to the wiring and
    - Record this on the Temporary Jumper log on controller.

- If no ERO box fitted If there is no ERO box fitted, e.g. Relay Logic, please follow the following steps:
    - Notify the Supervisor
    - Arrange drawings to be provided to local Field Engineer
    - Field Engineer to supply procedure for taking control of elevator

- Follow the procedure provided to take control of the elevator
- A copy of the Control of Elevator Procedure to be left in the motor room.

Adjusters will be issued with bridging wires as per the service procedure and may have more than one bridging kit depending on the equipment being worked on.

WORKING ON LIVE EQUIPMENT

Remember: It is the Company's expectations that all work will be conducted on dead equipment. Before starting the task:

Decide if it is **ESSENTIAL** to undertake work with a portion of the equipment **"live".**

Proceed ONLY after a Job Hazard Analysis has been conducted and control measures such as wearing of insulating gloves and/or placing insulating sheeting to increase your level of protection.

Ensure all power sources have been identified.

CAUTION: Be aware of possible interconnections from group operations

If troubleshooting or testing must be performed with the power “ON" refer to this section of the Handbook.

Once the problem is identified, shut off power and perform the LOTO procedure before performing the repair

LOTO Steps – Other Energy Sources

1. Circuit breakers, valves or other energy 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 capacitors, hydraulic systems, springs, or pneumatic pressure must also be dissipated, blocked or isolated prior to performing work in their vicinity.

2. The energy source shall be locked out with a personal lock using the LOTO procedure. 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.

Remember to check that the lock and tag has done its job by trying to operate the equipment

3. The employee shall ensure that no personnel are exposed and check equipment to ensure all energy sources all isolated or dissipated by operating start buttons, switches, and/or controls. Take precautions to protect yourself, (e.g install guards/insulating sheets). It is preferable to lock out all power sources if possible.

Note: Be aware of interconnections from group operations, lighting, and signal circuits.

4. If an employee has applied his LOTO and is required to leave the job site where the equipment needs to stay shut off. The circuit breaker must be left in the off position; the employee must remove his/her padlock and danger tag (as this is for his/her personal protection) and apply a yellow Warning tag on the circuit breaker.

5. If more than one shift is involved to complete the work. The relief person should place his/her lock on the energy-isolating device prior to the removal of the original lock and tag.

6. Returning the lift back to service.

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

- 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 his or her own lock.

- **NOTE:** In an emergency, if it is necessary to operate a piece of equipment which is locked out, every effort must be made to locate the employee whose lock is on the equipment. If they cannot be located, and after positive assurance is made that no one is working on the locked out equipment, the Manager/Supervisor may personally remove the lock. The Manager/Supervisor must remember that there is an inherent danger of the employee involved returning, thinking the machine is still locked out, when actually it has been reactivated. The Manager/Supervisor must ensure that the equipment is once again locked out before the employee resumes work or inform the employee directly that the equipment has been turned “on” and released to operate.

- 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.

- Before leaving the area notify all other affected personnel that the work is complete.

Note: When working on the hydraulic or suspension system of a hydraulic lift, roped hydraulic or dumbwaiter, or while performing any work that could damage the integrity of the piping or hydraulic system, in addition to Electrical lockout/ tag out, the lift must be 'landed' on pit props or guide clamps fitted to prevent accidental motion and LOTO performed on the mechanical system too.

REMINDER: Precautions must be taken to lock out/guard mechanical systems to eliminate various forms

of stored energy and/or moving equipment. (e.g., working in multiple hoistways, working in pits, within close proximity of adjacent moving equipment, working in machine rooms in close proximity (1.5 m) to energised machinery, working in pits in close proximity to moving and/or energised equipment.

REMINDER: All jewellery, including rings, necklaces, ear rings, metal watches and other exposed body piercings must be removed or insulated prior to working on live electrical equipment. Belt buckles and harness connections which are not in direct contact with the skin are permitted.

MODIFICATIONS TO CIRCUITRY & SOFTWARE

- Only Otis Electricians may modify circuitry and software detailed in Engineering Authorised Changes or Australian Technical Articles. If the modifications are not detailed in Engineering Authorised Changes or Australian Technical Articles, then the Electrician and/or Service Mechanic is to seek assistance from their Field Engineer or person designated by the Field Engineer in the area. When necessary an Australian Technical Article should be raised to cover any future problems.

- Wherever possible the field employee is to obtain a clean set of diagrams from their Supervisor/Team Leader.

WORKING ON DOOR OPERATORS

Car door operator troubleshooting/repair/adjusting guidelines.

Repairs to the door operator should be carried out from the landing wherever possible. If unable to do this, contact your supervisor to discuss the issue.

Common for all types of door operators

- Take control of the elevator at the landing where the work is to be carried out, using the operations Top of Car Access procedure.

NOTE: Complete a Job Hazard Analysis (JHA) to determine the safe area to work on the door operator (preferably landing). This will be based on the door operator equipment configuration, availability and location of any door open/ door close switches, any unguarded door operator equipment such as levers and pulleys. If the door operator has any unguarded parts such as sprockets, linkages, or entrapment points, the power must be switched off, locked out and tagged out.

- Access the car top (see appendix A) and move the elevator on inspection control to a convenient and safe position to work on the door operator.
- Exit the top of car leaving the elevator on inspection and with stop button in stop position.

CAUTION: Putting the top of car emergency stop switch into the stop position normally prevents the door operator opening and closing the car doors. However some components of the door operator hardware may still have live electrical power.

- To identify the problem, block the landing doors open using a door blocking tool, manually open the car doors and then release the top of car stop button and watch the car doors close.

- To check for any mechanical problems, put the top of car stop switch in the stop position, then manually open and close the car doors to determine if there are any mechanical problems.

CAUTION: If the door operator attempts to close on power with the stops switch in the stop position, the elevator must be locked and tagged out (LOTO) to carry out the mechanical check.

LOTO before making any repairs/adjustments to cams, resistor settings or the door operator hardware.

- Carry out the identified repairs and or adjustments as per the operations standard work procedures, field installation manuals (FIM's) and product manuals.
- Return the elevator to normal operation and check door operation from inside the elevator car.

CAUTION*:* Replace all door operator and junction box covers/guards before placing the elevator in normal operation. Always follow safe electrical practices.
If further checks are needed to identify/resolve problems, reference the additional guidelines below dependent upon the type/configuration of the door operator.

For Door operators that can be operated using a service tool that plugs into the top of car or E&I panel at the floor that work is being performed.

- Insert the service tool from the landing.
- Use the service tool commands to open and close the doors (stay clear of any moving equipment).
- Carry out the identified repairs and or adjustments as per the operations standard work procedures, FIM's and product manuals.

- Return the elevator to normal operation and check door operation from inside the elevator car.

For Door operators that have Door open/Door close switches on the car top

- Take up a position on the landing (or car top) as determined by the JHA.
- Using the open and close switches operate the doors to determine the problem (stay clear of any moving equipment).
- LOTO before making any repairs/adjustment to cams, resistor settings or the door operator hardware.
- Carry out the identified repairs and or adjustments as per the operations standard work procedures, FIM's and product manuals.
- Return the elevator to normal operation and check door operation from inside the elevator car.

For Door operators that do not have Door open/Door close switches on the car top

- Follow the procedure as in 1 above.

WORKING ON LOWEST FLOOR FROM INSIDE THE CAR

Determining which method to use to access the Lowest Floor Door Locks etc.

Question: Is the door lock accessible from inside the car?

If **YES**: Access the door lock from inside the car (Preferred method); or If **NO**: Ask the question:

Can the door lock be accessed safely from the pit by using a working platform (or pedestal ladder?)

If **YES**: Access the door lock from the pit.
If **NO**: Contact your supervisor to discuss options.

Step 1: Check the Landing Doors
Check and ensure the landing doors are mechanically locked or barricades are in place on the lowest floor door landing.

Step 2: Take Control of the Elevator
Take control of the elevator in the machine room by accessing TOC
inspection, E&I panel, or ERO.

Step 3: Lock Out and Tag Out
Apply LOTO to mains supply and move the car up to a suitable height to manually work on the lock using the manual brake release / or hydraulic hand pump if applicable.

Step 4: Apply Jumper
Apply authorized jumpers across the landing door locks.
NOTE: With elevators that have the landing door lock by-pass device
(e.g. GEN2) the device should be used to by-pass the landing door locks.

Step 5: Move the Car
Run the elevator on machine room inspection or ERO up to a position where the car doors can be accessed at a suitable height safely from the lowest floor door landing.

NOTE: Be aware of the position of the car i.e. Chalk mark on main ropes**.**

Step 6: Remove Jumper
Remove jumpers from lock circuit after positioning the lift.

Step 7: Lock Out and Tag Out
Lock out and Tag out the unit.

Step 8: Open Landing Door
Using the landing door unlocking device open the landing door on the lowest floor less than 300mm and check position of elevator car for any hazards. Open the landing and car door and access the car.

Step 9: Work on the Door Lock
You can now proceed to work on the affected door equipment.

Step 10: Check the Landing Doors
Egress the lift car, close the car and landing doors and physically check
the landing door is mechanically locked.

Step 11: Remove Lock Out and Tag Out
Remove lock and tag out from the unit isolator in preparation to return the
unit to service.

Step 12: Place on Normal Mode
From the machine room, place machine room inspection or E&I panel or
ERO to Normal Mode Position.

Step 13: Place Elevator Back in Service
If the problem has been resolved remove the barricades and place the elevator back in service. The elevator can now be checked on inspection to ensure it is running correctly.

WORKING ON LOWEST FLOOR FROM INSIDE THE PIT

Determining which method to use to access the Lowest Floor Door Locks

Question: Is the door lock accessible from inside the car?

If **YES**: Access the door lock from inside the car (Preferred method); or If **NO**: Ask the question:

Can the door lock be accessed safely from the pit by using a working platform (or pedestal ladder?)

If **YES**: Access the door lock from the pit.
If **NO**: Contact your supervisor to discuss options.

Step 1: Check the Landing Doors
Check and ensure the landing doors are mechanically locked or barricades are in place on the lowest floor door landing.

Step 2: Lock Out and Tag Out
Lock and tag out the elevator as per company procedure.

Step 3: Move the Car
Using the brake release tool/device, move the car up a few centimeters at a time by lifting the brake until the car is in a position to enable the mechanic to safely access to the pit and be able to reach the door lock from the pit floor.

NOTE: For hydraulic elevators use the hydraulic pump to move the car up to a safe position.

Step 4: Open the Landing Door
Using the landing door unlocking device open the bottom floor door less

than 300mm and check position of the elevator car for any fall hazards.

CAUTION: Assess hazards before opening the landing doors.

Step 5: Install Door Blocking Device
With the landing doors opened install the door blocking device.

Step 6: Install the Working Platform or Platform Ladder in the Pit Use the pit access procedure to access the pit and install the working platform in the pit.

NOTE: HYDRAULIC ELEVATORS
For service work taking less than 15 minutes the elevator should always be run to the highest possible position if the supports (e.g. pit props, rail blocks) are not being used.

If you are unsure of how long the task will take then place pit props in position as soon as you enter the pit.

Hydraulic systems have a risk of slow leakage - which may result in
workers being trapped or crushed in the pit
.
Step 7: Work on the Door Lock
You can now proceed to work on the affected door equipment.

Step 8: Egress the Pit
When the task is completed egress the pit using the relevant pit egress procedure. Remove the working platform, close the landing doors and ensure they have locked mechanically.

NOTE: For hydraulic elevators the two-independent means of support or pit props must be removed.

Step 9: Place Elevator Back in Service
If the problem has been resolved remove the barricades and place the elevator back in service. The elevator can now be checked on inspection to ensure it is running correctly. Remove the elevator lock and tag.

USE OF BRAKE RELEASE

Examples of typical tasks requiring use of brake release (but not limited to);

- Release of trapped passengers.
- Bottom floor door lock access procedures.
- Release of safety gear (non-ERO).
- Brake adjusting & maintenance.

  The specific method for manually releasing the brake varies significantly depending on the age, design and type of lift equipment.

Applicable elevator cardinal rules

- **ALWAYS** follow lock and tag out procedures when power is not required.
- **NEVER** work or position body parts in proximity of unguarded moving parts or electrical circuits.

Use of brake release – Potential Hazards

If not used in a controlled manner, the act of manually releasing a brake is extremely hazardous and has resulted in fatal incidents and serious damage.

If the brake is lifted and the elevator is allowed to accelerate, there is a high risk the brake will not be effective in retarding the elevator when reapplied.

The car can run out of control and cause significant injury & incident to;

- Members of the public.

- Field employees and Sub-contractors.
- Elevator equipment.
- Building structure.

Use of brake release – OSS Summary

The use of manual brake release tools are only permitted if there are no other alternative methods;

Is it possible to move the elevator using inspection or ERO control?

- **ALWAYS** ensure that all tasks have documented and approved procedures prior to commencing work.
- If no approved and documented procedure is available for the task, stop work and contact your supervisor.
- **ALWAYS** ensure that movement of the elevator is controlled at all time.
- Only short distances at a time – Maximum of 300mm (12”)
- Always ensure the elevator has completely stopped moving before lifting brake again.
- **NEVER** “Free wheel” the elevator – e.g. allowing the elevator to move more than 300mm (12”) at a time is strictly forbidden.

TRAPPED PASSENGER RELEASE

Respond to a trapped passenger call as quickly as possible.
On arriving at the site, contact Otisline on;

1800 626 847 in Australia or
0800 656 847 in New Zealand.
This will serve as a record of the time of your arrival.

Otisline can also assist you by informing the passengers that you are on site and give you more information about the trapped passenger call.

You should also inform the building management that you are on site. A safe way to release the passengers is to fix the problem if it is not going to take too long and run the lift (with no circuit bridged out), under normal operating conditions or If the lift is at or near floor level open the doors and let the passengers out.

Communicate with the trapped passengers and find out:

- If they are in need of emergency medical treatment.
- If they opened any doors or turned any switches On or Off.
- How the lift stopped, this may give you a clue to the fault

Reassure them

- that they are safe, and how long it might take to get them out of the lift.

Instruct them that:

- That they must stay clear of the doors and not press any buttons unless requested by you
- Not to attempt getting out of the lift until you ask them to

Only attempt to release trapped passengers when:

- The lift is near floor level (no more than 300mm above or below the landing).
- There is no possibility of the lift moving while the doors are open.

- There is no possibility of injuring the passengers

If using a jumper across a safety switch/ circuit you must:

- Place lift on inspection control.
- Carry out an inspection to ensure the lift is mechanically safe to move (e.g. Inoperative brake, broken machine gears! shaft or equipment making it unsafe to be moved).
- Make sure all doors are closed.(If this is not possible a second person must assist to ensure that passengers and the public are safe while the lift is being moved).
- Complete LOTO procedure and install jumpers
- Remove LOTO so that lift can be moved to a safe position
- Complete the LOTO procedure again before asking the passengers to leave the lift.

If moving the lift manually you must:

Lock and Tag out the lift.
Make sure all passengers are clear of the doors.
Have a second person to assist you.
Move the lift only a few centimetres at a time.
Stay clear of unguarded sheaves.

If a passenger is in need of urgent medical attention ensure that Emergency Services are contacted immediately.

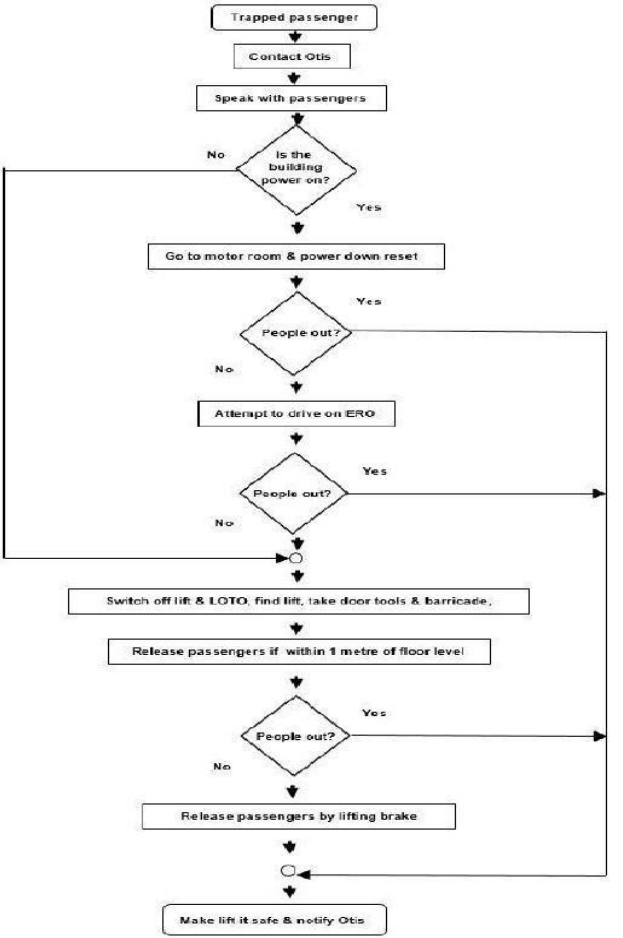
When the emergency Services personnel have arrived and taken charge of the scene the Supervisor is to be contacted. The Supervisor will contact the General Manager. If the lift cannot be moved safely and there is no Danger to passengers (this could be due to several reasons such as damaged equipment) then the Supervisor is to be contacted. The Supervisor will make the decision whether or not emergency services will have to be called in to release the trapped passenger.

Except in the case of a medical emergency the mechanic must always attempt to contact a supervisor before calling emergency services.

Assist emergency service under their instructions. Follow the Otis trapped passenger release procedure. If this is not possible due to site conditions or a non-standard lift configuration contact your supervisor before proceeding. Do not attempt to release trapped passengers if unsure how to do so safely.

Always lock and tag out the main circuit breaker when working on lifts where there is a power failure as the power could return at any time.
If a passenger is in need of urgent medical attention ensure that

Emergency Services are contacted immediately. When the emergency Services personnel have arrived and taken charge of the scene the Supervisor is to be contacted. The Supervisor will contact the General Manager.


Trapped passenger
Contact Otis
Speak with passengers
Is the building power on?
No
Yes
Go to moter room & power down reset
People out?
Yes
No
Attempt to drive on ERO
People out?
Yes
No
Switch off lift & LOTO, find lift, take door tools & barricade,
Release passengers if within 1 metre of floor level
People out?
Yes
No
Release passengers by lifting brake
Make lift it safe & notify Otis

HOISTING & RIGGING

- Only authorised personnel shall be permitted access to the hoistways or areas where hoisting operations by Otis personnel is being undertaken.

- Only employees with the approved Rigging qualifications are permitted to undertake and/or direct Hoisting and Rigging operations.

- Other trades MUST not use the hoistway for handling material without permission of the Otis Supervisor/PM. A documented work procedure MUST be provided and approved by the OTIS Supervisor/PM

- Only Otis issued hoisting equipment with a current inspection tag is to be used.

- Never permit others to use Otis hoisting equipment, and under no circumstances are OTIS employees or Sub-Contractors to hoist for others.

- A record of test shall be recorded and a tag fitted that clearly indicates the date of test and/or the date that the equipment has to be retested. The test records and report will be provided and kept with the branch office with a copy on site with the equipment.

- A system of communication e.g., phones, two way radios and hand signals) must be established and used for all hoisting/lifting operations.

All lifting hooks 2 tonne and under must be fitted with self-closing safety clips.

Before lifting any loads always carry out a SPEC CHECK:

- Have you completed the Lifting Plan?
- What capacity do you need?
- What height of lift do you need?
- What is required to suspend it from?
- Will any slings or shackles be needed?
- Ensure all test certificates are collected and stored within the site folder or job documentation.

Hanging the Car or Counterweight

The weight of the car and counterweight must be known before any lifting commences.

Two independent means of preventing the car or counterweight from falling MUST be used (each means MUST be able to take the full load being supported, including equipment and employees).

Note: When hanging the car to conduct an inspection of the machine gears, two lifting devices should be used to assure the car cannot move and activate the safety gear.

Prior to the removal of ropes, the governor must be tripped or the safeties actuated.

No more than one half the number of running ropes shall be removed at one time.

Materials Handling Safety Measures

Inspect the load for weight and size. Look for rough or sharp edges, wear appropriate gloves to prevent hand injuries and de-burr where necessary. Think the job through -every step you'll take. Clear the path of objects and people. Get help if you can't safely do it alone. **How to use Lifting and Moving Aids Safely**

- Bars - Keep fingers, hands, and toes, away from compression points.
- Rollers -Keep feet clear to avoid crushed toes.
- Jacks -Make sure they're adequate for the load. Wheelbarrows, hand trucks -keep the load centered over the axle.

Maximum Employee Lifting Capacity

The maximum weight to be carried by one individual is 25 Kg; two individuals may carry up to 50 Kg. Tasks that require lifting more than 50 Kg shall be supported by forms of tooling/devices that limit the potential for injuries (e.g. winches, chain falls, pallet jacks, etc.).

Chain Blocks/Winches

Never leave a load suspended on a Chain Block or Winch unattended without a secondary safety device or safety sling in place.

Plan the Lift

- Establish the weight of the load as accurately as possible.

- Where more than one sling is to be used, do not overcrowd the hook? Never tie a knot in a sling

Lifting Plans

- For construction, re-roping / rope shortening, major repairs and modernization jobsites, tasks that involve material handling of machines, gearboxes, controllers, or other bulky items, a documented Lift Plan MUST be provided as part of the pre task preparation

Wire Rope Slings

- Every wire rope sling should be marked with its safe working load.

They should be checked frequently. Always give a thorough examination before use. Typical faults include kinking, damaged wires and needling.

- Only preformed slings must be used.

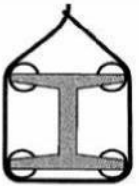
- Do not bend a wire rope sling around a diameter less than 8 times the diameter of the wire rope sling.

- Definition of a sharp edge for a wire rope sling: A corner that is less than 8 times the Diameter of the wire rope sling. e.g. For a 6mm Diameter wire rope sling <49mm corner is sharp edge.

Shackles

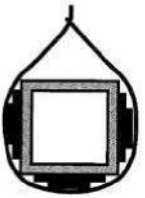
- Shackles should be of forged construction marked with the safe working load.

- Only the original correct pin should be used.



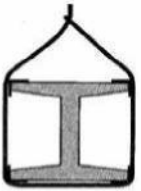
Good Practice –

Packing on sharp corners



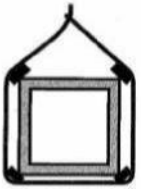
Good Practice –

Adequate radius & No kinking



Bad practice –

Chain links may bend and get damaged



Bad Practice –

Timber packing may split and

Chain Blocks

In line with Otis Worldwide Job Site Safety Standards requirements, all lifting hooks on hoisting equipment of 2,000 kg or lower capacity must have positive locking latches\fitted.

Positive locking means that the latches are self-locking when the hook is loaded.

- The load and hand chains should be kept clean of dirt, rust and substances at all times. In addition, the load chain should be kept lubricated in accordance with manufacturers" instruction.

- Chain hoists must be handled with reasonable care and must not be overloaded.

- The use of two or more chain hoists for hoisting a single load is not permitted unless each chain hoist will handle the entire load by itself.

- Before using a hoist, inspect it for damage, sprung hooks or other deficiencies and verify presence and currency of Test tag/certificate.
- Chain links should be checked for stretched or worn condition. Any sign of worn links are found the chain hoist should be withdrawn from use immediately and replaced.

- Chain hoists are designed so that one person operating the pull chain can lift the rated load. Whenever one person pulling on the chain cannot lift a load, investigate for overload or a defect in the chain hoist.

- Self-closing snaps or "moused" hooks must be used to prevent hoist from being disengaged from the overhead support, hoist rails, brackets, etc., shackles, with lock devices and/or a moused hook must be used.

- Chain hoists should be given regular periodic inspection The Otis policy on the frequency of Testing and Tagging is 12 monthly. This can be verified by a visual inspection of the tag/certificate at the time of issue.

- Note: the lower hook on all chain hoists is designed to be the weakest part and will, when overloaded, spread

- The most important point to remember when using chain hoists is to use a chain hoist larger than the load requires to ensure easier operation and greater safety e.g. 1000 Kg load will require the use of a 2000 Kg chain hoist.

- Ensure you stand clear of any surplus chain that is on the floor when hoisting or lowering the load.

- All damaged hoisting equipment must be marked up 'DO NOT USE' and returned for repair.

Inspection/ Examination of Lifting Equipment

Regulations require that all lifting equipment and accessories for lifting shall be thoroughly examined and inspected before use and at the specified intervals (Shackles only require pre use inspection).

Where a defect has been observed the equipment must not be used, it must be tagged with “DO NOT USE”, returned to the branch and must be reported to the supervisor.

Evidence of a thorough examination shall be in writing and a copy of the examination report will be provided and kept with the equipment with the branch and on the job site for inspection.

In the case of lifting equipment used for lifting or supporting persons e.g. Sky climbers/Astros or any other accessories used for lifting or supporting persons follow the manufactures requirements or local regulations (annual testing or when they should be tested by a competent person as per regulations)

Marking

Every sling, shackle and wire rope sling, chain, etc. must be clearly marked with its SWL and carry an identity mark for proper inspection, the chain should be cleaned so that marks, nicks, wear and other defects can be seen.

Ratchet Lever Hoists

- It is important that the ratchet lever hoist being used, matches as close as possible, the load being lifted e.g., it is not good practice to lift a two tonne load using a six tonne ratchet lever hoist. For increased brake efficiency it would be better to use a three tonne ratchet lever hoist.

- When lifting a load where there is any likelihood of overloading the ratchet lever hoist, a load link must be used to ensure that the rated capacity of the lifting device is not exceeded, e.g. when a ratchet lever hoist is being used to release a safety gear which is pulled in hard.

- In this situation it would be impossible to estimate the applied forces required to pull out the safety gear.

- Therefore a load link would have to be used to measure the force being applied to ensure that the rated capacity of the lifting device is not exceeded.

Hanging the Car and Counterweight

- When carrying out lifting operations only use certified lifting equipment within its safe working load.

- Further: If the main ropes are not in place (as in new installations) when hanging a car or counterweight then two independent means of preventing the car or counterweight from falling must be provided, e.g., two lifting devices, two slings or one of each. The safety gear must also be activated.

Note: Suspended loads should not be left unattended during the day or overnight, particularly on webbing / fibre slings /hoisting equipment. The load must be protected by the use of a steel safety sling in place.

Electric Hoists

The electric hoist is similar in operation to a manual chain hoist, but with the manual effort of the operator being eliminated.

All precautions applicable to chain hoists are equally applicable to electric chain hoists, plus inspections of the Electrical leads must be conducted in accordance with Section on Portable Appliance Testing. Hoist manufacturers' instructions must be followed.

Hoists used for false cars have special requirements such as more frequent inspections and tests. Ensure these requirements are complied with.

Before using any Electric Chain hoist always check the following:

- Having you completed the Lifting Plan?
- What capacity do you need?
- What height of lift do you need?

- Do you require a girder clamp or a push trolley?
- What voltage do you require?
- What length of pendant do you require?
- Will any slings or shackles be required?
- Check that the tag has a current test date. Get a copy of the test certificate it will be needed on the job site for inspection?
- Will any other equipment be required to ease or speed up the job.

Rigging

- Machines/hoisting devices (e.g. electric winches, hoists) must be used and maintained in accordance with manufacturer's recommendations.

- Manufacturer's recommended load capacities and application on rigging hardware (e.g., turnbuckles, shackles, hooks, eyebolts, and clamps) shall not be exceeded. Slings shall be padded or protected from sharp edges).

- You must ensure that the lifting beam chosen has been tested and inspected for the load to be applied on it and must have the safe working load clearly marked.

- A communication system (e.g., telephone, two-way radio, hand signals and verbal communication) must be established and used for all hoisting/lifting operation.

- All rigging and lifting equipment shall be visually inspected before each use for defects and deformation, and for verification that inspection tag or alternative is in place. Defective devices shall be immediately removed from service.

- All personnel shall be kept clear of suspended loads. Tag lines or guides shall be used when loads are likely to swing or pass through a restricted area.

All lifting equipment should have the safe working load clearly marked on it and a check made before it is used that the limits will not be exceeded.

Beams and clamps for rigging

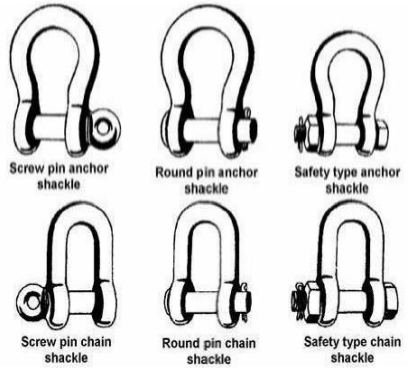
- Always establish the load carrying capacity of the beam and clamp to be used for hoisting.

- When using a beam clamp, a safe rule is to load the lower flange to no more than 50% of the carrying capacity of the beam.

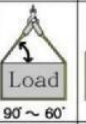
Shackles

- There are two types of shackles commonly used in rigging. They are the anchor (bow type) shackle and chain ('D' type) shackle. Both are available with screw pins or round pins.
- Shackles should only be forged alloy steel. Shackles MUST inspected by a Rigger prior to every use.
- There is no requirement for Shackles to be annually certified like other Hoisting and Rigging Equipment.
- Never replace the shackle pin with a bolt, only the proper fitted pin must be used. Bolts are not designed to take the bending that is normally applied to the pin.
- All pins must be straight, and all screw pins must be completely seated. Cotter pins must be used with all round pin shackles. Shackles worn in the crown or the pin by more than 10% of the original diameter should be destroyed.
- Never allow a shackle to be pulled at an angle because the capacity will be tremendously reduced. Centralize

whatever suitable washers or spacers are hoisting on the pin. Do not use screw pin shackles if the pin can roll under load and unscrew.



Webbing Slings

COLOR CODE	WLL (Ton)	WIDTH (mm)	WORKING LOAD LIMIT (W.L.L)					
			VERTICAL	CHOKER	BASKET	SINGLE BASKET WITH ANGLE		
			M = 1.0	M = 0.8	M = 2.0	M = 1.7	M = 1.4	M = 1.0
						 90° ~ 60°	 60° ~ 45°	 45° ~ 30°
	1	30	1	0.8	2	1.7	1.4	1
	2	60	2	1.6	4	3.4	2.8	2
	3	90	3	2.4	6	5.1	4.2	3
	4	120	4	3.2	8	6.8	5.6	4
	5	150	5	4.0	10	8.5	7.0	5
	6	180	6	4.8	12	10.2	8.4	6
	8	240	8	6.4	16	13.6	11.2	8
	10	300	10	8.0	20	17.0	14.0	10

If a sling is wrapped around a square load, the capacity is reduced by 50 % or 1/2

Eye Bolts:

- It is recommended that all eye bolts and ring bolts used for hoisting, be of forged alloy steel and equipped with shoulders or collars.

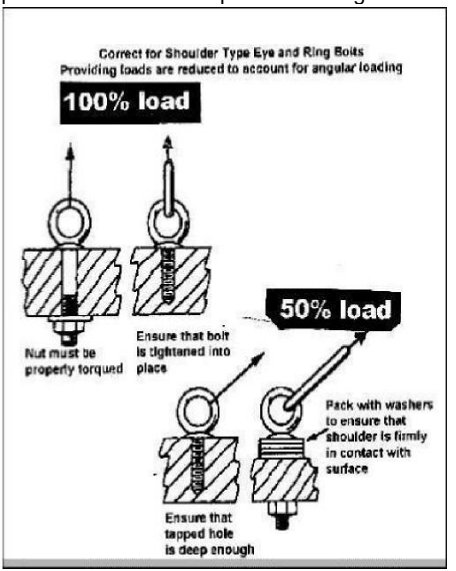
- They should be identified and be inspected and tagged as same as chain hoists etc.

- The plain or shoulder-less eye bolt is fine for vertical loading, but if it is loaded at an angle it is subjected to bending and the load it can safely carry is severely reduced, even when equipped with shoulders, the safe working loads of eyebolts and ringbolts, are reduced with angular loading. When installed, the shoulder must be at right angles to the surface and the nuts must be properly torqued.

- Washers or shims may have to be used to ensure that the shoulders are firmly in contact with the working surface.

- The tapped hole for screwed eyebolts (body bolts) should have a minimum depth of one and one half times the bolt diameter, and must be a good fit for the screwed shank of the eyebolt.

- To keep the bending to a minimum, the loads should always be applied to the plane of the eye, never in the other direction. This is particularly important when bridle slings are used because an angular pull is always developed in the eye bolts, unless a spreader bar is used as part of the sling.



Never insert the point of a hook in an eyebolt, always use a shackle.

Use and Handling of ropes for Lifts

Wire ropes, like the machines and hoists on which they are used, require careful use, handling and maintenance for satisfactory performance, long life and adequate safety.

The following precautions should be observed to meet these requirements:

- Ensure that the correct rope is used.
- Inspect regularly, following the rope manufacturer's guidelines, recommendations and statutory requirements.
- Avoid dragging the rope from under loads or over obstacles.
- Avoid dropping the rope from heights.
- Never use wire rope, which has been cut, badly kinked or crushed.
- Prevent loops in slack lines from being pulled tight and kinking, once a kink has been made in a wire rope the damage is permanent. A weak spot will always remain no matter how well the kink seems to have been straightened out. If a loop forms, don't pull it out, unfold it.
- Ensure that the drums and sheaves are of sufficient diameter and avoid reverse bends.

- Ensure the sheaves are aligned and the fleet angle is correct. Replace sheaves having deeply worn or scored grooves, cracked or broken rims and worn or damaged bearings. Ensure that the rope spools properly on the drum. Never allow the rope to cross wind.

- Ensure rope ends are properly seized.

- Ensure that the ropes do not bind in sheaves, new wire rope requires a run-in period before operating at full load and full speed.

- Use thimbles in eye fittings at all times. Lubricate regularly according to the rope manufacturer's recommendations.

- Watch for local wear.

During re-roping operations it is a Company requirement that no more than half the main ropes are removed at any time.

It is also a Company requirement that there should be two independent means of supporting the lift car, two lifting device or two slings or one sling and one lifting device must be used.

The safety gear of the lift must also be activated.

Fist Grips/Double Saddled Grips:

Fist grips/ double saddled grips are not to be used to make slings for hoisting or rigging purposes. Only preformed slings must be used

It is Otis policy wherever possible to replace all rope clips at the <u>time of a re-rope or modernisation with wedge clamps</u>

SAFETY GEAR ROPE TERMINATIONS

On many lifts, the safety gear rope is terminated using rope grips. It is important that the rope is doubled back and a rope thimble is fitted and at least two rope grips are fitted to secure the terminations.

Seizing and Cutting:

It is most important that tight seizings of annealed wire or strand be maintained on the ends of all ropes.

If this is not done the wires and strands may become slack with consequent upsetting of uniformity of tensions in the rope.

This results in overloading of some strands, under loading of others, "Bird caging" and breakage.

For stranded ropes there are two (2) preferred methods of seizing:

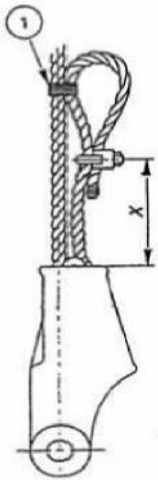
- For ropes larger than 25mm diameter, use a soft annealed seizing wire and place one end in the valley between two strands. The long end of the wire should then be turned at right angles to the rope and wound closely and tightly back over the end of the wire and around the rope several times.
  Finally, the two ends of the wire should be twisted together and pulled until the seizing is tight.

- For ropes smaller than 25mm diameter, after winding the seizing wire on the rope, the two ends should be twisted together at approximately the centre of the seizing by alternately twisting and pulling until the seizing is tight.
  If the rope is to be cut, seizings must be placed on both sides of the point where the cut is to be made. It can then be cut with mechanical shears.

Note: Do not use angle grinders to cut ropes.

Recheck nut torque after rope has been in operation.

Methods for dealing with the rope tail end



Note: The measurement X above being the distance of the grip from the nearest part of the socket body, Clips should be installed such that it will prevent the rope from slipping through in case of the wedge moving. Refer to AS 1735

The use of Bulldog clips are Not Allowed for hoisting and making slings, however they are allowed for non-hoisting purposes such as governor ropes.
In situations where rope clips are allowed only fist clips are allowed.

Note: Rope grips and wire ropes must not be used to make slings that will be used for hoisting and rigging.

RE-ROPING OF HOISTING ROPES

- Before commencing a re-roping job a JHA must be performed.

- Ensure all work areas are barricaded to guard against tripping and fall hazards.

- The use of more than two employees in the hoistway requires that the procedure is approved by the Managing Director of Otis Australasia and followed by the mechanics doing the task.

- Ensure a communication system is established before commencing work, to ensure that the whereabouts of employee carrying out functional operations in related areas or semi related areas is known to each other at all times.

- All persons working in the hoistway must be aware of when and how the car is to be moved. It is essential that only one person be in control.

- Two independent means of preventing the car or counterweight from falling must be used (e.g. two slings, two lifting devices or one of each). The two independent means shall be in addition to the car safeties or CWT safeties (the governor must be tripped or safeties actuated).

- No more than half the number of running ropes shall be removed at any time during the re-roping process.

- Prior to rope detachment from the car, machine room or counterweight ensure the ropes are secured using a rope clamp/ holdback device.

- Ensure all ropes are terminated correctly e.g., double nutted and cotter pins, fist grip at the tail end.

CARE AND MAINTENANCE OF ROPES

Good lubrication practice dictates that hoist/compo ropes must be clean before they can be adequately lubricated. Ropes that have a sludge or grease build up will not allow the lubricant to penetrate to the core and apply the necessary lubrication film.

Lubricating dirty hoist ropes has caused slippage and mislead the observer into thinking that the lubricant caused the slipping when in reality the ropes needed a thorough cleaning.

A properly lubricated set of hoist ropes using Otis approved lubricant will not adversely affect traction.

In the long term lubrication placed in the centre fibre core and between the strands of an elevator wire rope during manufacture seldom lasts longer than a few years depending on usage and site conditions.

As a practical guide to identify the need for rope lubrication, the following "finger test" method has been found very effective: press a finger against the rope groove without a rubbing motion. When the finger is withdrawn, there should

Elevator must be Locked and Tagged out before performing the “finger test"

This “finger test" should be carried out during normal maintenance (Refer to current Maintenance schedule) and lubrication is advisable when the test leaves the finger dry and clean.

Where new ropes are supplied with a protective coating, this coating must be removed prior to the elevator going into service.

For the correct cleaning compound, contact your local rope supplier; alternatively contact Field Engineering for further advice

Rope cleaning/lubricating and belt cleaning must only be conducted using approved permanent or portable tooling, no manual hand cleaning or lubricating.

Any exception to this requirement must be approved on a case by case basis by the Managing Director

ROPE LUBRICATION

When cleaning or lubricating ropes follow the correct rope lubrication procedure.

Improper lubricants may reduce traction and cause rope slippage**.**

Contact Supervisor if further advice on current rope suppliers recommended product and application methods is required.

Do Not Lubricate Governor Ropes.

Where ropes are very dry, several light applications over a number of visits is better than a heavy soaking as over-lubrication may result in loss of traction.

As a guide, one litre of rope lubricant is sufficient to treat approx. 25 floors of 5 X 16mm rope or 35 floors of 5 X 12mm rope. Ropes may absorb more oil dependent on the level of dryness.

SCAFFOLDING

General Rules

All scaffolds, work platforms and other similar devices must be installed to meet the Australian / New Zealand Standards/Regulations and Otis requirements . All scaffolding no matter how high MUST use the tagging system to identify:

1. The date the scaffold was erected.

2. Confirming the scaffold was erected as per the manufacturer's specifications.
3. The selected system must be approved by Otis and be installed by a competent person in accordance with the relevant regulations.

4. Modular scaffolding under 4 meters does not require a license to install in Australia. Installation of scaffolding above 4 metres in Australia requires a scaftag installed by a licenced scaffolder (noting in New Zealand the requirement is above 5 metres).

5. The scaffolding should be designed and certified as fit for purpose.

6. Any deviation to the manufacturer's scaffold design (irrespective of scaffold height) will require task to be undertaken by licensed scaffolder.

7. If scaffold deviation requires worker to be in fall arrest, then you will also require EHS approval.

8. **Note:** A Risk Assessment must be conducted for overhead protection determined in all cases.

- On sites where lifts are running on either side, adequate protection (partitions) MUST be used between hoistways.

- Always carry out a documented safety inspection before first using scaffolding.

- Never work on an unsafe or untagged scaffold.

- Ensure that it supports the weight of workers using it and any tools and materials they are likely to use and is properly braced to prevent swaying or movement.

Ensure guard rails and toe boards are in place.

- Work platform boards must be secured & overhang no more than 150mm
- Protection such as debris hoistway opening cages/boarding etc. will be needed to protect OTIS employees or other persons working on the job site
- All metal scaffolds do not need to be grounded (earthed), if extension cords are protected by 10 mA GFCIs (or a combination of double insulation and 30mA GFCI), and cables are positioned to prevent damage.
- Do not use scaffolding to lift/support loads, unless it is designed and certified by a competent person.
- Do not work at height unless it is essential to do so.

Always use your fall protection if a fall hazard exists.

- Alterations and changes to the scaffold must be made only by a certified scaffolder.
- Do not leave unsecured tools or equipment on scaffold.

Working with Scaffold Towers

Scaffold towers must comply with the same requirements of a scaffold, including:

- Lock any wheels or outriggers in place. Erect a full deck from below for all platforms above 2m.
- Do not allow people or materials to remain on towers when they are moved.
- Tower scaffolds are not to be used to lift or support loads.

EWP's (Elevated Work Platforms)

- EWP's MUST only be operated by employees with the relevant High Risk License.
- The EWP MUST be supplied by OTIS. A Daily Pre-start start inspect MUST be carried out on the EWP prior to use.

FALSE CARS / RUNNING PLATFORMS

- A running platform is a new or existing car or any portion of the car that is used as a work station, whilst connected to the permanent suspension ropes/belts and machine. A running platform must have the governor cable installed with the permanent safeties operational.
- A false car is a temporary work station operated by a hoist (e.g. rope climbing hoist) that is removed prior to the installation of the permanent platform. Two devices independent of the lifting mechanism must be used to prevent the false car from falling
- A running platform configured as a false car is a new or existing car or any portion of the car that is used as a

work station, whilst being operated by a hoist (e.g. rope climbing hoist, single rope). Two devices independent of the lifting mechanism must be used to prevent the running platform from falling

FALSE CARS

Construction: All False Cars MUST be constructed in accordance to ATA; A-XVI-01-24

Initial Testing: ALL Safety Tests outlined in 6.1 of the above ATA, MUST be completed prior to the use of the False Car.

Daily Testing: ALL Daily Safety Tests outlined in 6.2 of the above ATA MUST be completed each day prior to the use of the False Car.

Weekly Testing: ALL Weekly Safety Tests outlined in 6.2 of the above ATA MUST be completed each week prior to the use of the False Car.

ALL Tests: MUST be carried out by a competent person, and all test results MUST be recorded in the False Car Logbook.

SAFE USE AND OPERATION OF A RUNNING PLATFORM (WHEN THE LIFT IS USED AS A MOVING WORK PLATFORM)

This section applies to New Installation and Modernisation projects, when the lift car is used as a moving work platform. E.g. with the Gen2 installation

- The running platform (running car, temporary work platform, and lift platform) is required by the Company policy to have standard guardrail (top-mid- toe board) on three (3) sides

- Employees must wear a full body harness as per company policy

- If a fall hazard exists fall the lanyard must be connected to an adequate hitch point or lifeline (see fall protection section of this book)

- Overhead protection must be installed if hoistways and overhead openings are not guarded or sealed

- The governor and car safeties shall have been tested and be operational whenever the running platform is operating Proper balancing of the counterweight must be done before work is performed

- All running platforms should be equipped with an audiovisual alarm. The audio alarm must sound for 5 seconds prior to car movement but can be turned OFF after the 5 second delay which precedes false car movement. The visual portion of the alarm must continue until the car has stopped moving. The visual alarm must be active while car is in motion

- When using the lift car as a running platform on New Installations and modernisation, remove the correction run feature until the lift is ready for the adjustment stage. (Home landing run, Firemen's circuit, Levelling Zones)

DUMBWAITERS AND RESIDENTIAL HOME LIFTS

Because dumbwaiters and small service lifts are small, many field
mechanics have been injured because they did not take them seriously. Often, dumbwaiters can be more hazardous than most lifts.

Working on the Car Top:

- Dumbwaiters are not normally designed for personnel to work on the top of them
- Never ride the top of a dumbwaiter unless it is designed for top of car operation and has safeties fitted.
- If working off the top of the car is required, assess the situation and carefully plan your work as follows

CONDUCT A JOB HAZARD ANALYSIS BEFORE STARTING WORK.

1. Ensure that catastrophic failure of a safety component has not occurred before moving or working on this type of equipment
2. Ensure that any drive chains or rope(s) are not slack in the lift shaft or on the drive machine before you proceed with the work. To do this carry out a Job Hazard Analysis
3. Does the service lift have a top of car inspection operation? If not. Lock and Tag Out the main line isolator
4. Is the lift car strong enough to support a person, tools and equipment? If not take steps to reinforce it. What is the rated capacity of the car? Use fall protection where required.

5. Do not work on top of the car of a lift without safety gear unless it is independently supported by two means and remember to use fall protection
6. Do not work under this type of lift unless it is independently supported by two means
7. Can you get in and out of the hoistway safely? Use ladders properly and make sure the hoistway is large enough for you to enter, exit and work safely
8. Be aware that overhead space is usually very small
9. If in any doubt you should contact your manager

Working In the Pit:

1. Lock and tag out the main line isolator before entering the pit.
2. Mechanically block the dumbwaiter to prevent accidental motion.
3. Do not enter pits of dumbwaiter lifts unless it is mechanically blocked with pit props or it is blocked and tackled if a safety device is not fitted to prevent accidental movement.

General Safety Rules:

1. Many dumbwaiters have drum drive machines. Always be aware that slack cable can cause the dumbwaiter to fall. Even a few centimetres of slack can cause serious injury when reaching inside or underneath the car. Use a mechanical blocking device (e.g. brackets, beams, pipes, slings) to safeguard against accidental downward motion of the dumbwaiter.
2. Controllers are often in remote locations. Don't take chances in moving the car without proper communication. Be careful, drum drive machines can create slack cable.
3. If more than one dumbwaiter share a common hoistway, always shut down the adjacent car(s) and

Lock and Tag It Out when you need to work inside the hoistway. If you are within 500 mm of adjacent car, a barrier between hoistways should be fitted before starting work.

4. Many dumbwaiters have locks and contacts instead of interlocks. Ensure that the dumbwaiter cannot run with the doors open.

Residential Home Lifts

Field mechanics may not work on these units very often and therefore extra caution should be exercised.

Working on the Car Top:

1. Residential lifts are not normally designed for personnel to work on the top of them.
2. If you ride on the top of a residential lift, it must be equipped with top of car inspection.
3. At a minimum working on the car top would require the following assessment / job hazard analysis.

Procedure:

1. Does the lift have top of car inspection operation? If not, Lock and Tag Out the main line switch.
2. Does the lift have safety devices? If the lift is not equipped with safeties, mechanically block the car and wear fall protection, and tie off to a solid structure (1500Kg breaking strength) or lifeline.
3. Is the car top strong enough to support a person, tools and equipment? If not take steps to reinforce the car top.
4. Can you get in and out of the hoistway safely? Use ladders properly and make sure the hoistway

is large enough for you to enter, exit, and work safely.

5. Be aware that overhead space is usually very small.

Working In the Pit:

1. Lock and Tag Out the main line switch before entering the pit.

2. Mechanically block the lift to prevent

accidental motion **General Safety Rules:**

Some residential home lifts have drum machines. Always be aware that slack cable can cause the lift to fall. Even a few centimetres of slack can cause serious injury when reaching inside or underneath the car.

Controllers are often in remote locations. Don't take chances in moving the car without proper communication. Be careful, drum machines can create slack cable.

If more than one lift shares a common hoistway, always shut down the adjacent cars and Lock and Tag It Out when you need to work inside the hoistway and you are working within 500 mm of an adjacent car and no barrier is placed between hoistways.

LADDER SAFETY

Great care should be taken when descending a ladder. This is when most ladder accidents occur i.e., Always maintain three point contact.

This can be by one (1) foot and two (2) hands, or two (2) feet and one (1) hand.

Portable Ladders

- All portable ladders must be constructed of non-conductive material i.e. fiberglass.
- Wooden ladders are NOT acceptable. Wooden Ladders may conduct electricity when wet.
- Ladders shall be examined for defects before every use. Those found to be broken, cracked or otherwise defective must be discarded. Look for twisting, distortion, corrosion, loose rungs, mechanical damage, damaged parts etc.
- Ladders owned by OTIS MUST be formally inspected at intervals no greater than 6ths. A record should be made of the inspection.
- Only ladders of sufficient length shall be used. Adding makeshift extensions is dangerous and prohibited
- Before working from a ladder, it must be set on a firm, level surface, with the base approximately one-fourth of the ladder's length (distance between upper and lower ladder support) from the vertical. If the ladder does not have safety feet fitted it must be footed. Do not work above the second to top step on a ladder.
- If working higher than 2m off the ground, Platform ladders fitted with Drop Bars should be utilised, if this is not possible then fall protection must be worn and lanyard connected to lifeline or other adequate support.
- When ladders are used for ascending or descending from one level to another, extend the ladder top at least 1 m above the landing being served and tie off the ladder
- When a ladder is being used in a doorway or other locations where it may be dislodged by others in the area, there must be a second person at the bottom of the ladder or an adequate barricade must be in place, ladders shall never be left in such locations when not in use.

- When not attended by a second person, ladders must be either cleated at the bottom or tied at the top, to prevent displacement
- If a ladder is to be placed in the hoistway, the car MUST be Lock and Tagged Out. See lock and tag out procedure in "Lock Out and Tag Out Section"
- When climbing up or down, always face the ladder, use both hands and maintain 3 points of contact (2 hands and 1 foot or 1 hand and 2 feet) at all times. Carry small articles in the shoulder tool bag; lift and lower large articles by a hand line

Stepladder Rules:

Same guidance as portable ladders plus the following:

- Ladder legs MUST be fully spread and spreading bars MUST be locked
- Never stand on the top 2 steps
- Ideally place stepladders at 90° to the work to be undertaken.
- Don't use the top step except for platform ladders.
- Don't use as straight ladder
- Don't stand on the top 2 steps

Loft Type / Pull Down Ladders

There are some machine rooms with this type of ladder which are normally pulled down using a pole.

- Accidents have occurred when the ladder shoots down and hits the person pulling down the hatch way door. Care should be taken when carrying out this operation, it is advisable to stand to one side out of the way when undertaking this operation

- Any suspect ladder or hatchway door should be reported to the client through your manager immediately

Fixed Ladders

Ladders typically found in pit access, machine room access, secondary level, roof top access, and scaffolds etc., may be hazardous due to their location, length and condition.

Hazardous ladders should be raised with your Supervisor/PM, and a Safety Dilemma raised if required.

Inspection of Ladders

Ladders owned by OTIS MUST be formally inspected at intervals no greater than 6ths. A record should be made of the inspection.

During the inspection attention should be paid to the following points.

- Cracks, warping, wear and tear at the head and foot of stiles.
- Rungs missing, warping, looseness, excessive wear.
- Broken or loose tie rods. Loose/broken rivets
- Twisting, looseness, distortion, excessive wear, severe discoloration of fiberglass.

Ensure you comply with the local OH&S regulations on the use of ladders.

These regulations may differ from state to state.

MANUAL HANDLING

General requirements:

For construction, re-roping / rope shortening, major repairs and modernization jobsites, tasks that involve material handling of machines, gearboxes, controllers, or other bulky items, must have a documented SWMS / Risk Assessment as part of the jobsite preparation.

At a minimum, the plan shall detail:

- The process to handle the material in and out of the building.
- The tools and methods to be used.
- The maximum weight to be carried by one individual is 25 Kg; two individuals may carry up to 50 Kg.
- Tasks that require lifting more than 50 Kg shall be supported by forms of tooling/devices that limit the potential for injuries (e.g. winches, chain falls, pallet jacks etc.).

When any object is to be lifted and carried to another point. Firstly, check if the object can be moved by means other than manual lifting. For example, using a hoist, on a trolley etc. If this is not possible and a heavy object is to be lifted and carried to
another point carry out a Job Hazard Analysis.

All tasks need to be assessed taking into account.

- The task.
- The load. (Determine weight of object).
- The individual's capabilities.
- The working environment.

- Be sure there is nothing in the way that might cause slipping or tripping.
- Inspect the object to be lifted to determine how it should be grasped. Make sure it is free of sharp edges, protruding nails, slivers or other hazards that might cause injury to the hands or body.
- Incorrect lifting methods require unnecessary effort and often cause strain or other types of injuries.

For ALL Manual Handling Task ensure that pre-task stretching is undertaken for the sections of the body being utilised.

REMEMBER TO BEND KNEES, NOT YOUR BACK

Safe Lifting Guidelines:

1. Warm up your body before attempting to lift (stretch your muscles)

2. Get a secure footing (front foot close to the load).
3. Use a staggered stance, squat, don't bend at waist, bend at the knees and grasp the object.
4. Grasp the load diagonally with palms and fingers.
5. Keep load close to your body when lifting (keep your arms inside your knees).
6. Lift gradually by straightening your legs and keeping your back straight.
7. If you need to pivot move your feet. (Don't twist your body).
8. Wearing gloves before attempting to lift may reduce the risk and severity of hand injuries.

- The same safe procedure should be observed when setting loads down. Use landing blocks to avoid pinching fingers. The use of belts should not be a substitute for proper lifting technique and practices.

- When it is necessary to lift any object, which is difficult for one person to lift, ask for help. Team lifting: When team lifting, it is important to establish communication between the team, coordinate the lift on a signal such as 1, 2 3...

Handling Heavy Materials

- The handling of all heavy material requires considerable care. The use of proper and adequate Mechanical Lifting Devices is always safer and often more economical.

- Never use unsafe “short cuts".

- Whenever jacking or hoisting a load, stay clear of the load at all times.

- Pay particular attention to the position of fingers and feet when using rollers, pinch bars, jacks and blocking to move heavy materials and equipment.

- Particular care must be taken when wearing gloves around this activity since gloves may become entangled and pull your hand into the pinch point.

- Before trying to lift a load with a crow bar, be sure to take an ample "bite".

- Jacks must always be placed on a solid footing and so located that a good "bite" is provided on the object being moved.

- Timber should be used for blocking and must be of adequate size to carry and distribute loads being supported.

- When placing blocking, be sure to have ample bearing surface. Never stack the timber in such a manner that maneuvering the load could cause it to tip.

- Whenever more than two tiers of timber are used, be sure to cross rib.

- Secure skid boards to eliminate the possibility of their shifting and block or secure them to prevent excessive or uneven deflection.

MANY BACK INJURIES HAVE OCCURRED WHEN WORKING ON ESCALATORS, USE CORRECT TECHNIQUE WHEN LIFTING COMPONENTS.

HOT WORK PERMIT PROCEDURE

Definition:

Hot Work is any work activity that can generate an ignition source capable of igniting any materials in the work area

Procedure: EHS 36 Hot Works

Form: ZS 5675 Hot Work Procedure Form.

- Identify requirement to complete Hot Works
- Inspect work area for combustible materials.
- Worker to Complete a JHA for the Hot Works
- Supervisor/PM to complete Hot Works Permit.
- Worker confirms with the OTIS Supervisor/PM, and the Building Management / Security that ALL Hot Work Permit controls are in place prior to works commencing.
- Where a customer Hot Work Permit is required to be used, the Otis Supervisor/Project Manager must ensure that the controls specified in the client Hot Work Permit are implemented and understood by the Otis workers carrying out the Hot Work.

PERSONAL PROTECTIVE EQUIPMENT

Employees will be issued with the Personal Protective Equipment that is required to perform their work safely.

Otis employees who are expected to perform all aspects of Otis work, should be issued with the following.

Employees and subcontractors must only use PPE that has been approved and issued by Otis.

Semite/Field Engineers PPE Requirements - Z55568A

Mandatory Minimum PPE Requirement		**As Required**	**Comments**
Safety Glasses MUST be worm while on site.		"Safety Goggles "Face Shield "Prescript' on Safety Glasses	* Mandatory when working in Machine Rooms, Hoistways and Escalator Pits "As described in JHA " Prescription Safety GI asses or **MUST** be worm when required "See attached exemptions
Cut 3 Resistant Gloves		Rigger Gloves Cut 5 Gloves Electrical Gloves	"Gloves shall NOT be worn around rotating equipment (e.g. drills, ropes/sheaves etc.) "Gloves shall be worn when using both hands to hold a portable tool (e.g. drill, grinder) and that the mate dal is secured from movement. * Electrical Gloves are to be replaced every 2 years
Long Sleeve Top			(MUST cover full length of arm when performing Electrical or Exposed to sharp edges)
Long Pants			
Safety Boots (Ankle High)		*Rubber Bum Boots	
2Door Blocking Devices (Brass & Aluminum)			

		*Hard Hat *Bump Cap	* mandatory inside the hoistway and activities with overhead hazards, examples: hoisting and rigging, car and counterweight replacement, re-roping, rope shortening, etc. * mandatory in all activities outside the hoistway. The use of bump caps is allowed only in activities without overhead hazards, examples: wiring in the controller, work on hall fixtures, brake work, etc.
		Hearing Protection	
		Dusk Mask	
		Safety Harness, Long &Short Lanyard, Bow Strap & Rope Grab.	
		First aid Kit	
		LOTO Kit	

Repairs - PPE Requirements - Z55568C

, Mandatory Minimum PPE Requirement		As Required	Comments
Safety Glasses		"Safety Goggles ' Face Shield " Prescription Safety Glasses	" Mandatory when working in Machine Rooms, Hoistways and Escalator Pits "As described in JHA " Prescription Safety Glasses or MUST be worm when required • See attached exemptions
Cut 2 Resistant Gloves		Rigger Gloves Cut 5 Gloves Electrical Gloves Welding Gloves	• Gloves shall not be worn around rotating equipment (e.g. drills, ropes/sheaves etc.) • Gloves shall be worn when using both hands to hold a portable tool (e.g. drill, grinder) and that the material is secured from movement. " Electrical Gloves are to be replaced every 2 years
Long Sleeve Top			(MUST cover full length of arm when performing Electrical or Exposed to sharp edges)
Long Pants			
Safety Boots (Ankle High)		" Rubber Bum Boots	
2 Door Blocking Devices (Brass & Aluminum)			

		" Hard Hat " Bump Cap	" While waiting in the machine room, hoistway and pit, or in any other work area where there is a risk bumping the head. • The use of hard hat is mandatory while troubleshooting in the hoistway.
		Hearing Protection	
		Dusk mask	
		Safety Harness, Long & Short Lanyard, Bow Strap & Rope Grab.	
		First Aid Kit	
		LOTO Kit	

MODS - PPE Requirements - ZS5568D

Mandatory Minimum PPE Requirement		**As Required**	**Comments**
Safety Glasses MUST be worm while on site.		*Safety Goggles *Face Shield *Prescription Safety Glasses	*where existing buildings are being refurbished i.e. construction sites, all employees that work or visit site must wear *eye* protection at all times . 0n smaller Modernisation jobs, the service eye protection policy may apply. *Prescription Safety GI asses or MUST be worm when required
Cut 3 Resistant Gloves		Rigger Gloves Cut 5 Gloves Electrical Gloves Bridging Kit	*Gloves shall not be worn around rotating equipment (e.g. drills, ropes/sheaves etc.) *Gloves shall be worn when using both hands to hold a portable tool (e.g. drill, grinder) and that the material is secured from movement. Electrical Gloves are to be replaced every 2 years
Hard Hat			`The use of hard hats is mandatory on all MOD jobsites * Hard Hat MUST be within used by date.
Long Sleeve Top			(MUST cover full length of arm when performing Electrical or Exposed to sharp edges)
Long Pants			
Safety Boots (Ankle High)		*Rubber Burn Boots	

		Dusk Mask	
		Safety Harness, Long & Short Lanyard, Bow Strap & Rope Grab.	
		First Aid Kit	
		Hearing Protection	
		LOTO Kit	
		Knee Pads	
		High Vis Top	
		2 Door Blocking Devices (Brass &Aluminum)	

New Equipment - PPE Requirements - ZS5568D

Mandatory Minimum PPE Requirement		As Required	Comments
Safety Glasses, MUST be worm at ALL times while on site		* Safety Goggles * Face Shield * Prescription Safety Glasses	Due to the nature of the risk on construction sites all employees are required to war eye protection at all times. The only exception to this is in designated areas where PPE is not required to be worn
Cut 3 Resistant Gloves		Rigger Gloves Electrical Gloves Bridging Kit Welding Gloves	* Gloves shall not be worn around rotating equipment (e.g. drills, ropes/sheaves etc.) * Gloves shall be worn when using both hands to hold a portable tool (e.g. drill, grinder) and that the material is secured from movement. * Electrical Gloves are to be replaced every 2 years
Hard Hat			* The use of hard hats is mandatory on all NE jobsites * Hard Hat MUST be within used by date.
High Vis Top			
Long Sleeve Top			* (MUST cover full length of arm when performing Electrical or when sharp edges are present)
Long Pants			

Safety Boots (Ankle High)			
		Dusk Mask	
		Safety Harness, Long & Short Lanyard, Bow Strap & Rope Grab.	
		Hearing Protection	
		First Aid Kit	
		LOTO Kit	
		2 Door Blocking Devices (Brass & Aluminum)	

Standard Safety Kit Construction / Modernisation

- Safety Helmet
- Ear protection (Earmuffs or disposable ear plugs)
- Safety Goggles, glasses
- Cover Specs (optional)
- Rigger Gloves
- Cut Resistant Gloves
- Respirator (Dust Mask).
- Safety Harness, 2 mtr adjustable Lanyard with Shock Absorber 390mm shock absorbing lanyard, Hitch point strap
- Lifeline Rope Grab
- First Aid kit
- Approved Safety Footwear
- Lock & Tag out Kit
- Safety Bag
- Bridging Kit (to approved personnel only)
- Door Blocking Device and Door Stop device

Standard Safety Kit Service I Repairs

- Safety Helmet
- Ear protection (Ear muffs or disposable ear plugs).
- Safety Goggles, glasses
- Eye Protection, Cover Specs (optional)
- Rigger Gloves (If required)
- Cut Resistant Gloves
- Respirator (Dust Mask)
- Safety Harness, 2 mtr adjustable Lanyard with Shock Absorber
- First Aid Kit
- HiViz Vest

- Approved Safety Footwear
- LOTO Kit
- Safety Bag
- Door Blocking Device and Door Stop device

Standard Safety Kit Staff

- Safety Helmet.
- Ear Plugs
- Eye Protection
- Spectacles (where required)
- First Aid Kit (all company vehicles)
- HiViz Vest
- Approved Safety Footwear
- Safety Bag

All employees are responsible for using appropriate **PPE** as directed by this Employee Safety Handbook, local rules and procedures, as a result of job hazard analysis and as required by Otis standard work processes such as OSS whenever it is required.

(See form 255568A/B/C/D for up-to-date PPE list which is available from your Supervisor / Manager)

Plan your work, assess the hazards, and wear the correct PPE.

Dress on Job Site

- Appropriate clothing should be worn on all job sites
- Depending on the hazards of the job site, this may include removal of necklaces, scarves and securing of neckties, etc.
- Long trousers/overalls should always be worn at job sites to protect against sharp objects and flying debris, etc.
- Long sleeved shirts, with sleeves rolled down when working on live electrical equipment

- All visitors who work for Otis, or who are under the direction of Otis shall follow the same rules for PPE as employees

Safety Shoes/ Boots:

- Safety Shoes /boots are required for all employees and for all visitors to field jobsites. Also required in certain designated areas of the Spare parts warehouse and stores.

- Contact your Supervisor for the correct Otis safety footwear requirements for your department.

Hearing Protection

Noise can damage your hearing if it is over 85 decibels and you are exposed to that level of noise for an extended period of time. Common examples of over-exposure are;

- More than 8 hours of drilling machine noise (typically considered to be about 85 dB)

- 2 to 8 hours of mowing your lawn (typically considered to be 90 to 100 dB)

- 2 to 120 minutes of jack hammer noise (typically considered to be 100 to 130 dB)

Typical Otis jobs do not require hearing protection, but occasionally unusual situations arise where noise levels can reach or exceed 85dB. In these cases hearing protection will be mandatory.

- On certain sites such as power stations, chemical plants, and hospital plant rooms etc. ear protection is

mandatory. This should be defined by a blue safety notice in the area where the protection must be worn.

- Excessive levels can easily be determined in other areas by this simple test:

If you need to raise your voice to talk to someone a metre away, then the noise is above 85dB you need hearing protection.

- Otis provides earplugs and earmuffs as hearing protection.

- Use this protection any time you are exposed to excessive noise levels.

- Report noisy machine rooms and machinery spaces to your supervisor, so that assessments can be carried out.

An example could be multi-generator sets in machine rooms.

Normally it would be the building owner/occupiers responsibility to carry out these assessments.

If in doubt wear ear protection until assessments have been made in any noisy areas.

Head Protection

Hard hats must be worn in accordance with the following:

- *At all times on construction and modernisation*
- Job Hazard Analysis must be performed for repairs to determine other times when hard hats are required.

- In all other designated mandatory areas by Otis or its Customer/Clients.

Guidelines for the proper wearing and care of hard hats.

- The wearing of hard hats backwards is not permitted.
- When welding, brazing, cutting or performing a task that requires face protection to be fastened to a hard hat, use a separate hard hat that is fitted with the necessary eye and face protection.
- Return to use of regular hard hat when task is complete.
- The painting of hard hats is not permitted.
- The drilling of holes in hard hats is not permitted.
- Hard hats should be stored away from direct sunlight.
- Defective linings should be replaced immediately.
- Hard hats should be cleaned and inspected daily for defects and replaced as necessary e.g. if they are cracked or chipped or any deep scratches.
- The date identified inside hard hats identifies the date of manufacture. They should be replaced 2 years from date of issue. Contact your Supervisor if in doubt.
- A chin strap is required for hard hats when working in environments where hard hats could fall off or be blown off.
- Do not store hard hats in the rear windows of vehicles. In the event of a sudden stop or collision the hat may be dislodged and strike the driver or passengers in the head.
- Sun damage may also reduce the protective qualities of the hard hat.

Eye Protection

Employees will be issued with protective eyewear appropriate to the location and tasks being performed.

All Eye Protection worn by Otis employees, subcontractors and visitors must conform to recognised Australian and New Zealand standards.

All frames will be made of non-conductive material.

Eye protection must be available at all times and be worn as per the requirements below.

Employees are responsible for;

- Maintaining their protective eyewear in good condition
- Replacing damaged or worn protective eyewear
- Wearing their protective eyewear as per Otis or Client

requirements. **Prescription Spectacles**

Otis will provide prescription safety eyewear to those employees who require prescription glasses.

These are obtained by contacting your supervisor who will arrange the necessary order forms.

In order to obtain prescription safety eyewear employees MUST have a current prescription.

If one isn't available the employee is responsible for meeting the costs of obtaining one.

Construction Sites

Due to the nature of the risk on construction sites all employees are required to war eye protection at all times.

The only exception to this is in designated areas where PPE is not required to be worn.

Modernisation Sites

On large modernisation sites where existing buildings are being refurbished i.e. construction sites, all employees that work or visit site must wear eye protection at all times.

On smaller modernisation jobs, the service eye protection policy may apply. This will be determined in conjunction with a written JHA.

Service Sites including Repairs, Call-outs and Maintenance

All employees that visit site must have eye protection readily available and ready for use.

All management and other visitors to site must wear eye protection at all times unless one of the examples below exist. In the following examples wearing eye protection is not compulsory;

- When walking through a clean well-lit machine room / plant room.
- When carrying out a discussion in the machine room.

- When reading diagrams / drawings / method statements / risk assessment / completing log cards, or service visit reports, etc in the machine room.
- When riding inside the lift car checking ride quality and call buttons.
- At other times where justified by written JHA.

SPW/Store/Workshop

In all designated areas.

Company Visitors to Sites

All visitors to Company controlled locations on sites must wear eye protection, as designated above

Client Rules.

All employees are also required to obey the client's own safety rules regarding the wearing of eye protection.

TASK	TYPE OF EYE PROTECTION
Working in Hoistway/Pit	Safety Spectacles
Cleaning	Safety Spectacles or Goggles as determined by JHA
Hammering, chiseling, drilling, using babbit metal, using hand or power tools (except grinders, welders and oxy) Handling chemicals	Goggles

Grinding and cutting with power tools	Face shield and safety spectacles
Welding	Welding mask
Oxy cutting	Oxy goggles
Outdoor work	Safety spectacles or Goggles as determined by JHA

Hand Protection

At all times, gloves must be readily available with the mechanic (in his/her pocket, tucked in his/her belt etc).

When carrying out hazardous operations, gloves to suit the

task must be worn. Typical hazards include;

- Using chemicals or handling materials likely to cause dermatitis or other skin problems
- Handling sharp objects or objects with sharp edges such as doors; door frames; stainless steel; glass etc
- Working on electrical equipment
- Working with hot equipment such as when welding or grinding There are various types of glove available from Otis suitable for the above tasks.
- Cut Resistant Class 3 & Class 5
- Riggers Gloves
- Chemical Gloves
- Electrical Insulating Gloves;

- Must be replaced every 2 years from date of issue.
- When they are damaged.
- When they fail a pressure test.

Gloves can be ordered by contacting your Supervisor

Use and Maintenance

- Hand cleanliness prior to donning gloves and their removal is essential as gloves can become contaminated
- All gloves should be inspected before and after use for damage.
- Damaged gloves must not be used.
- Contaminants should be removed from the surface of gloves prior to removal.
- When not in use, gloves should be stored in a suitable location away from direct sunlight and extreme temperatures.

Sharps

You should not be picking up or disposing of needles

A sharp is any metal, glass or plastic object capable of penetrating skin. This includes syringes. It is important to scan the area before commencing tasks especially in the hoistway, pit and in the lift car (cleaning lighting areas, telephone compartments etc).

If a sharp has been identified in the work area or access to your work area, you should;

- Notify the building owner to arrange removal
- Notify your supervisor

- Where possible and safe to do so, guard the sharp to protect others
- against possible injury

If an employee sustains an injury from a sharp, they should:

- Note the time.
- Immediately wash the puncture site with running water.
- Gently encourage the wound to bleed.
- Never keep the sharp.
- Notify your supervisor.
- Go to a medical practitioner / centre, a blood test may be required.

Respiratory Protection

When employees must work in environments or generate harmful dust, fogs, smokes, mists, fumes, gases, vapours, or spray appropriate controls need to be implemented to manage the hazard.

Whether or not these contaminants pose a health hazard depends upon the type, size and concentration of the contaminant. Air contaminants are classified as follows:

- Solids: Dust from grinding
- Liquids: Cleaning fluids, solvents
- Gasses: Hydrogen, acetylene, propane
- Vapours: Paint solvents
- Metal fumes: fumes from molten metal

Where toxic substances are present in the workplace atmosphere and elimination or engineering controls are not practicable to reduce the risk, respirators are necessary.

Otis work environments generally do not pose a health risk from

contaminated breathing air. However, on occasion, respiratory protection is needed.

Respirators work in one of two ways: they purify the air you breathe or provide a new air source.

Half Face Respirator with Cartridges

Always ensure that you are using the correct filter cartridges for the job at hand as per manufacturer's recommendations.

The most frequently used are: Dust, chemical (cleaners, lubricants, solvents, paints). Contact your EHS manger if you are not sure of which filter cartridge to use.

- Air-purifying respirators filter air by mechanical, chemical or combined mechanical/chemical processes. These respirators are not designed for oxygen deficient air.
- The mechanical filter is comprised of fibrous material, which traps the gasses, solid or liquid contaminants.

- The chemical filter uses a granular porous chemical called an absorbent, to filter harmful gasses or vapours. The combination mechanical/chemical filter can be used for particle, gas or vapour filtration.

Note: Air Purifying Respirators do not provide protection against oxygen deficient environments.

- Prior to wearing an Air-purifying respirators, ensure you've obtained the correct respirator for the hazard / task and that you've read and understand the manufactures donning instructions and limitations of respirator.

- In the event a full face respirator is required to complete work, notify your supervisor to ensure appropriate arrangements to ensure the correct type and fit is provided.

- One important fact to remember is that chemical filter respirators are designed for low concentrations of vapours and gasses, and are not to be used in atmospheres that may be dangerous to life or health.

- Certain warning signals should be used as an indication of when to return to fresh air. They are:

    - The odour of the gas or vapour is detected within the face piece.
    - Eye irritation develops.
    - Nausea, dizziness, or signs of distress develop

Dust Mask

Inspection

The person using the respirator should inspect it before and after use. Inspection involves the following:

- Examine the face piece for damage, cracks and dirt.
- Examine the head straps or harness for breaks by stretching the elastic parts to expose cracks or other damage.
- Look for faulty attachments such as broken or bent buckles Inspect the inhalation and exhalation valves for damage or improper sealing caused by foreign material.
- On cartridge style respirators, check that the cartridge is designed for the contaminant present and that the cartridge is properly seated in the holder.

Oxygen Deficiency:

- Oxygen deficient atmospheres pose a respiratory hazard. Atmospheres with oxygen level below 19.5% are considered to be Oxygen deficient atmospheres and therefore Air-purifying respirators MUST NOT be used.
- If an oxygen deficient atmosphere is identified, notify your supervisor and implement appropriate controls, which may include purging, installing temporary ventilation system, confined space entry permit and or atmosphere-supplying respirators (self-contained breathing apparatus (SCBA)).

- If an atmosphere-supplying respirator is required, employee donning this type of equipment will require appropriate training and operate equipment within manufacturer's safe operating procedure.
- Caution should be taken to ensure that proper ventilation exists when working in and around machine rooms, shafts, pits, car interiors, etc., to ensure that a normal air mix is maintained.

ASBESTOS

Modernisation

- Asbestos can be found in many pre 1973 buildings. It was used as a fire proofing agent, noise suppressant and insulator.
- During modernization work, the demolition/renovation of hoistways and/or adjacent areas may have removal work in progress.

Otis employees are not to engage in any building material asbestos removal.

- If you suspect that building asbestos is present in your work area or you are performing a task where asbestos may be present, (e.g., drilling doors, cleaning, trunking, cabling procedures in hoistways, and removal of old hoistway doors) inform your supervisor who will have it checked by a professional asbestos removal company or will ask the owner to do so.
- Before commencement of any modernisation work where a building may contain asbestos it is a requirement to obtain an asbestos inspection report from the builder / owner.

Service/Maintenance

- Asbestos removal projects may be in progress while Otis personnel are to perform their duties.
- Contact your Supervisor before you enter any asbestos cleanup area
- Otis personnel are not to clean up any area that has become contaminated by asbestos, due to building work.

- If you are unsure about the insulation in pre 1973 buildings and you are required to do tasks such as drilling in the hoistway.
- Contact your Supervisor to determine from the building owner if it is asbestos.

Do not take any samples yourself.

- When removal of an asbestos or suspected asbestos brake shoe is necessary, contact your supervisor for the asbestos brake removal equipment and as a precaution follow the procedure below.
- Do not remove the brake lining from the brake shoe. This must be done by an Otis approved brake replacement company that is licensed to carry out such work

Brake Shoe Removal

Some old brake linings contain a small quantity of asbestos. If removing a brake shoe which contains asbestos, contact your supervisor for the asbestos brake removal equipment.

- The equipment consists of a disposable protective coveralls, P2 or P3 dust mask, disposable gloves, goggles and at least 3 special Asbestos disposable plastic bags that are sealable and must be used.
- Put the brake shoes in double bags and use one for the rags and coveralls).

Procedure:

- Take control of the lift and conduct the lock and tag out procedure.

- Land the counterweight on the buffer. Put on the coveralls, gloves and dust mask (P2 or P3).
- Prior to commencing, cool the machine room by decreasing the air condition temperature etc as the coveralls make it very hot to work in.
- Wear light clothing under the coverall.
- Do not allow people into the machine room who are not wearing the coverall, mask, gloves and who acknowledge and understand the process of work being undertaken.
- Shut down or redirect away any fans that blow air near the place you are working, this will prevent dust from becoming airborne.
- Use a wet rag and wipe the area around the brake housing to pick up any brake liner dust.
- Do not brush or blow the dust.
- Measure the spring tension of both springs to ensure the brake tension is set correctly when you fit the new brake shoes.
- Remove the brake shoes.
- Once the brake shoes have been removed intact, place them in the asbestos disposable bags, seal and mark up, and send to your Supervisor for replacement.
- Again wipe down the area around the brake with a damp cloth.
- Place the rags into another asbestos disposable bags.
- Fit new brake shoes and adjust brake tension and lift clearances, tighten check nuts and replace cotter pins.
- Remove coverall, gloves, mask and place into the issued plastic bag, seal the bag and give to your supervisor for disposal to an approved asbestos disposal contractor.
- Wash your goggles with flowing water and soap, also wipe down your shoes and place rag in bag.
- Remove any “Asbestos” sign that was on the brake housing and put lift back in service.
- Update the Asbestos register of building.

- Give Asbestos disposal bags containing the brakes shoes and rags to your supervisor for proper disposal.
- The brake lining replacement vendor must be informed of the type of brake lining.

The vendor must have proper work and disposal methods as required by regulations.

Ensure you follow the safe procedures to neutralize the electrical energy by LOTO and the mechanical energy by landing the counterweight on the buffers and releasing the buffer tension BEFORE you commence removing the brake

EMPLOYEE HAND TOOLS

- Employees must maintain hand tools in good condition at all times. Never use a pipe wrench or pliers with worn or broken teeth.
- Never use a socket, open-end or an adjustable wrench that is worn, cracked or broken.
- Split or loose handles on files, hammers or sledgehammers must be replaced with new and properly fitted handles before being used.
- Defective handles must never be wired or taped
- Only use insulated tools for their intended purpose. (E.g. not to be used as a chisel or lever.
- Wooden handles must not be painted) Always keep screwdriver tips properly ground and their handles in good condition.
- Never use a screwdriver as a drift or a chisel. Hand files should always have a proper handle.
- Cold chisels, centre punches, etc., shall be dressed periodically to prevent their handle becoming “mushroomed".
- Regular Stanley and craft type knives should NOT be used for general work purposes such as, escalator hand rails, travelling cable and compensation chain installation.
- A Stanley Safety Spring Loaded Retractable Blade Knife or similar type should be used.

- Depending on work environment, tethered tool options may be required to prevent damage events occurring from falling objects

Remember:

- Always use the safe appropriate tool for the task.
- Eye and hand protection must be worn at all times when working with hand tools.

USE OF RESIDUAL CURRENT DEVICE (RCD)

- All portable equipment must be protected by a 10mA RCD with the exception of cable hoists/winches and welders requiring no greater than 30mA protection.
- RCDs can either be incorporated into the tools or fitted via an extension cord connecting the tool to the power supply.
- The RCD must be connected directly to the supply.
- RCDs shall be tested and used with all portable tools and other electrical devices.
- All electrical equipment must be tested to the Otis requirements and local regulations and be visually inspected for damage on a daily basis.
- Remove from service and tag damaged equipment.
- Do not use damaged equipment, return to the factory/stores or local office for repairs/ replacement.

- Top of car hand lamps are considered portable tools and must be fitted with a 10mA RCD if connected to the main supply.

- As an interim measure, tie up the hand lamp flexible cable and the lamp, this will minimise the potential to get damaged.

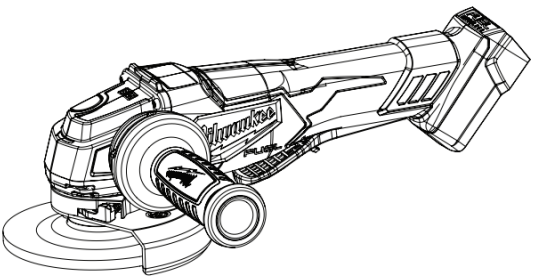
PORTABLE ELECTRICAL POWER TOOLS

10mA RCDs must be used with all portable electric tools, except for battery operated tools and portable welding machines.

- Electric shock is the chief hazard associated with electrically powered tools.
- Make sure that they are grounded at all times when in use. Approved double insulated tools need not be grounded. These tools also must be connected to a RCD.
- Temporary light or power lines used for tools shall have at least 3 wires. Always use one for grounding and be sure it is always grounded unless they are double insulated. An RCD is still required to be connected
- Never tamper with or remove three prong grounded plugs to eliminate the grounding protection
- Ensure live circuits are at **zero energy** state before working with electric-powered tools near electrical circuits or apparatus
- Never use defective tools. When tools cannot be repaired immediately, they must always be tagged as defective and returned for repair as soon as possible.
- Wear appropriate Personal Protective Equipment (PPE) such as face shields, safety goggles dust masks, ear protection, gloves.
- Eye Protection must be worn at all times when working with power tools. e.g. goggles

Power tools such as drills, hammer drills, angle grinders, jigsaws etc.

- Use the power tool only for the specific task it was designed for. Read the owner's manual before use.
- Ensure all power tools have been electrically tested before use (unless power tool is new). Ensure test tag is compliant with local regulations.
- Check the power tool carefully before each use and periodically during the work task.
- Check the plug and extension cords regularly for cracks, fraying or other signs of wear.
- Use a 10mA RCD at all times.



- Ensure that you will not drill through into concealed wires or pipes. (Use electronic detector to check for cables and pipes before you proceed).

- Never use power tools when standing in water or when working outside in rainy weather.
- Keep power tools unplugged when not in use.
- Always unplug the power tool, if you need to change accessories or examine it.
- Do not wear rings, jewellery or loose clothing when operating.
- Never clean or repair a power tool unless the power is disconnected.
- Never use a power tool if damaged.
- Repairs to power tools should only be carried out by trained and licensed personnel.
- Never pick up a power tool by its cord. Never disconnect power by pulling on the cord, remove the plug from the outlet.
- Use only sharp bits and blades.
- Make sure the work piece is secure.
- Do not secure work piece by trapping it under your feet or holding in your hand.
- Keep legs away from the shower of sparks from the cutting wheel.
- Just before the bit breaks through the other side, reduce the pressure on the drill.

Battery Power Tools

- The battery charger:

  — Must have a current electrical test tag fitted
  — If there is any damage to the electrical cable, the charger must not be used.
  — Ensure the charger is always powered through a 10mA RCD.

- Batteries need to be disposed of if:

— the tool doesn't turn on or if the charge runs down too quickly, the battery may have gone bad or expired.

— The battery is tested with a multi meter, and the voltage is less than the indicated number on the battery.

— The battery or the charger heats up when charging

— The charger's indicator lights show a faulty battery

- Battery Powered Tools have power anytime the battery is in place, so be extra cautious.
- Remove the battery when not using the power tool.
- Store the batteries so that the contacts cannot be shorted out.
- Return old and dead batteries to company for disposal or through Licensed Waste Disposal Company

Note*:* All power tools with trigger retaining buttons should already be phased out of use, or once the power tool requires replacement.

Mechanics should not remove the buttons on existing power tools, this is because it will not pass its electrical test

Visual Inspection of Portable Electrical Equipment

Portable and transportable electrical equipment e.g. electrical drills, grinders, extension leads etc. can be subject to damage which could result in electric shock or burns.

In order to ensure that the equipment continues to be safe it must be inspected each time before use. In particular look for:

- Bare wires not visible at appliance or plug end.
- The cable covering is not damaged and is free from cuts and abrasions.
- The plug is in good condition i.e. the casing is not cracked, the pins are not bent or the key way (socket) is not blocked with loose material.
- There are no taped or other non-standard joints in the cable. The outer covering (sheath) of the cable is gripped where it enters the plug or the equipment.
- The coloured insulation of the internal wiring is not visible. The outer casing of the equipment is not damaged or loose and all screws are in place.
- There are no signs of overheating of the equipment or discoloration of the cables or plug.
- RCD are working effectively (The test button to be pressed before use).
- Suitability of the equipment for the conditions.

Formal Inspection of Portable Electrical Equipment

Local regulations and Company rules requires that all portable or transportable electrical equipment be inspected on a regular basis to ensure that the equipment continues to be safe.

This should not be confused with regular calibration checks conducted as a feature of the quality procedures. (Comply with AS/NZ 3670 table 2 and local regulations).

Records must be kept of all items inspected/tested. All items found in good condition must be marked with the correct colour coded tag indicating the date of the test and the next due date.

In addition to the checks above all users of electrical equipment must check that the electrical equipment is within the valid test period before they use it.

All equipment found damaged or not within the valid period must be marked “Not to be used" and withdrawn from use.

The following tests are to be conducted:

- Earth continuity test
- Insulation test
- Earth leakage test
- The cover to the plug (where not molded) and covers fitted to
- equipment must be removed, and a check made to ensure that the
- correct terminals are used
- The correct amount of insulation is stripped back on wires and
- check for insecure strands of wire made around terminals
- The correct capacity rating fuse appropriate for the current is fitted in
- the plug

RCD Inspection / Testing

- Operation of the test button to ensure correct functioning.
- Combined inspection and Test as per AS/NZ Standards 3760.

- Inspection of the RCD using test tool Test of tripping time of the RCD must be conducted by use of a R.C.D. tester.
- Where the RCD is fitted into the main leads to electrical equipment this test is conducted when the cover to the electrical equipment is removed for the checking of correct tightness of the terminals.
- The trip tester to be fixed to the exposed terminals on the electrical equipment at this time and the tripping test conducted.
- The trip time to be recorded along with the other test information.

All portable electrical tools (except battery operated) MUST be protected by a company issued 10mA RCD.

Inspection of ESD (Earthing) Grounding Straps should contain a 1 Mega Ohm or greater resistor to limit current flow in the event of accidental contact with high voltage.

The straps are only to be used on equipment, which has been isolated from its power source.

Hired Portable Equipment must come with a documentation (or tagged) confirming that it has been tested within the above periods.

New Equipment should be given a visual check before use.

It must also be given Company identification and entered on the records so that it is subject to future tests in accordance with the time scales above.

All employees are reminded that all unsafe equipment must be marked. Do Not Use and be withdrawn from use. It must be reported to your Manager/Supervisor immediately.

Safe use of Portable Electric Angle Grinders

Many accidents and injuries have occurred involving the use of angle grinders.

Conduct a job hazard analysis before starting any grinding operations and implement appropriate controls measures before commencing the task.

- Is a grinder the most suitable piece of equipment for the job task?
- Do you need a hot work permit to operate an angle grinder on the job site?
- Always ensure a suitable fire extinguisher is at hand when any grinding operations are being carried out.
- After the job task has been completed check the work area every 10 minutes for any signs of fire to make certain it is safe. Inspection should take place at least twice before the end of the shift.
- Ensure the grinder is fitted with the following safety features;
  a. An auxiallary/side handle
  b. An enclosed spark guard or arrest
  c. A positive pressure switch to stop the grinder when released (dead man switch)
  d. A brake to stop the tool rotating when released
  e. An anti-kick back safety clutch

Note: When purchasing grinders consideration should be given to purchasing the highest protection such as "rapid stop" features. (see example of Milwaukee Rapid Stop below) Clip on guards can be used to enclose spark arrestor (see example below)

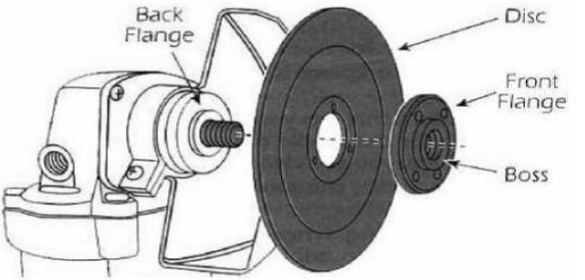
Milwaukee 'Rapid Stop' with red wheel stop button

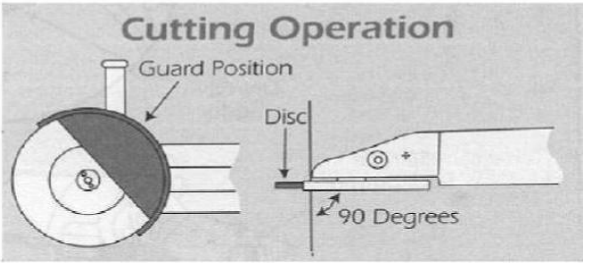
Clip on Guard to enclose spark arrestor

- Never us d

- Always check the condition of the grinder before use. If there are any cracks in the casing, or damage to the electrical cable it is not to be used.
- The grinder must have a current electrical test tag fitted.
- Ensure any mains powered grinder is always powered through an RCD.
- Full-face shield and goggles (NOT safety glasses that have gaps and can let sparks in) must be worn when operating angle grinders. (Exception exists only when prescription glasses are required for safe work and goggles will restricted vision. In this instance safety glasses with wrap around protection may be used as a substitute to goggles but all alternatives to cutting or grinding must be considered or eliminated, and dust/fumes must be controlled by other means such as dust extraction tooling).
- Ensure the correct gloves are worn at all times (heat and cuts assessed).
- Use a dust mask when grinding. Some materials can generate dust, and or fumes, which may be harmful to health if inhaled.
- Grinders generate potentially harmful noise levels when used so earmuffs or earplugs must be worn.
- If doing sustained cutting/ grinding, consider wearing fire retardant clothing.
- Ensure all work wear is secure; avoid loose work wear and jewellery.
- Never use an angle grinder at heights from ladders or steps.
- Ensure the immediate work area is clear of debris, any inflammable materials and has good lighting.
- Never use a grinder within 5m of any flammable materials without suitable protection to prevent fire or damage taking place.
- Always be aware that sparks and debris from grinders can cause damage to others and building finishes.
- Never carry or pull a grinder by its electrical cable.
- Ensure side handles and guards are secure in the correct positions before starting the job task.

- Beware when starting the grinder; it can kick due to the rotating force of the disc.
- Ensure you have a firm grip with 2 hands.
- Employees must have had appropriate training to change a cutting or grinding disc.
- Always ensure if changing a grinding, or cutting disc, that the grinder and intended disc are clearly marked with the rated speeds.
- Always ensure that the quoted grinding disc RPM is equal to or greater than the grinding machine RPM.
- Nine Inch angle grinders must not be used.





Grinding - The Job Task

- Always ensure the work piece is secure, by use of a vice or with the aid of clamps
- Always ensure the guard is in the correct position for the disc you are using. See diagram
- Grip the grinder firmly in both hands, and adopt a stable and comfortable stance. This lets you see what you are doing.
- With the disc clear of the work piece start the grinder.
- Ensure the disc is at its full speed.
- If a grinding disc is being used, work the grinder back and forth over the work area while holding the grinder at an angle of 10 to 15 degrees. Ensuring the guard is in the correct position
- If a cutting disc is being used, move the disc in a straight line, across the work piece at a 90-degree angle.
- Never twist the grinder or apply any sideways force as this may cause the discs to break up and shatter.
- Whichever discs you are using only apply enough pressure to ensure reasonable progress through the work piece.
- Ensure the disc has completely stopped rotating before placing the grinder in a safe position on level ground.
- Always ensure you have the correct disc for the grinder and the job task.
- Always use the proper tool to remove or fit the centre boss Ensure the centre boss is fitted with the front flange the correct way for the type of disc you are using.
- Check the condition of the back flange and boss when changing discs.

- If using a quick release boss ensure it is fitted with the two C spanner inserts facing out towards you.

Job tasks at which angle grinders <u>can</u> safely be used are:

- Cutting guide rails (small section, prior to installation) dressing welds, preparing edges for welding cutting shafts & pins cutting angle iron.
- Removing excess metal from flat surfaces.
- Cutting cast gear boxes I bedplates and drive shafts.
- Removing safety gear Indentations In guide rails.
- De –burring.
- Dressing floor fixings.
- Removing paint I rust (note: use a dust mask for this job task).
- Some materials can generate dust, and or fumes, which may be harmful to health if inhaled).

Job Tasks at which angle grinders <u>cannot</u> be safely used are:

- Large section guide rails.
- Cutting ropes.
- Cutting / trimming sheet metal panels, cutting trunking.
- Removing sharp edges.
- Cutting / trimming car or landing door panels or car operating panels.
- Metal or plastic conduit.

Other Tools to Consider

- Hydraulic rope cutters
- Jigsaw.

- Rail saw, hacksaw, hand files.
- Reciprocating saw.
- Nibbler.

Grinding Wheel Inspection

- Prior to mounting, all new abrasive wheels and disks must be closely inspected to make sure they have not been damaged from handling, shipping or other causes

- It is important to check before fitting, match the RPM rating of the wheel with the RPM rating of the grinder. Test run a new grinding wheel at operating speed for at least one minute before putting into service

- Worn grinding wheels must be dressed before using. Always replace damaged, out of balance or badly worn grinding wheels immediately

- Machine guarding. All abrasive wheels must be used with safety guards

- Balance: wheels must be replaced if they are out of balance. Side grinding: wheels designed for peripheral grinding should not be used for side grinding because they cannot withstand the pressures exerted

OXYGEN- ACETYLENE WELDING & CUTTING

Essential Requirements

- Welding should only be used when all other means of securing equipment at the jobsite are impractical and have been exhausted.
- The use of all gas welding, i.e., oxy-acetylene is prohibited for use at all Otis jobsites
- The use of oxy-acetylene for cutting/dismantling purpose is only allowed by exception and must be approved by the Senior Field Operations Manager on a job by job basis before the job commences. Refer OSS Section 4.11 for details.
- Only trained and authorised employees and contractors must use any welding and cutting equipment.
- Before using any cutting or welding equipment, a method statement must be produced, in conjunction with following the ·hot work permit procedure.
- Maintain and operate oxy-acetylene equipment in a safe manner as directed by supervision and in compliance with this procedure
- Use all required personal protective equipment, at all times. Report all defective equipment and hazardous conditions to supervisor
- Prior to starting work, the responsible person at the job site should be notified
- Comply with instructions given by responsible person.
- Ensure emergency procedures are in place to address the threat relating to cylinders (including gas leaks), and that fire extinguishers are available.
- Ensure flash back arrestors are fitted.

Marking the Cylinders

1. Oxygen and acetylene cylinders are to be legibly marked as to the contents. Colour coding is not always a positive means of identifying the contents of a cylinder
2. Cylinders where the contents are not positively identified are not to be used

Handling of Cylinders

1. All oxygen and acetylene cylinders are to be handled carefully
2. Cylinders are not to be dropped, struck or allowed to strike other objects.
3. Cylinders are not to be rolled or used as a support to roll other cylinders or equipment.
4. Cylinders are to be transported, stored, and used only when secured in an upright position; racks, chains or straps must be used to secure cylinders in the upright position.

Storage and Use of all Cylinders

1. Cylinders are to be stored and used in locations which are:-

- Capable of cylinders being fixed in the upright position. No
- cylinder should be stored or used in the horizontal position.
- Well-ventilated and away from corrosive chemicals and fumes.
- Away from lifts and stairs.
- Away from sources of heat.
- Where they cannot form part of an electric circuit.
- Far enough away from the actual welding or cutting operations so that sparks, slag or flame will not reach them.

2. Cylinders are to be stored at least 6 metres from highly combustible materials such as oil.

3. Oxygen and acetylene cylinders must be stored at least 3 metres from highly hazardous classes 2.1, 2.2 and 2.3 or separated by a non-combustible barrier not less than 1.5 metres high having a fire resistance rating of at least 30 minutes.
4. When cylinders are stored outside, they are to be protected against accumulations of rain, snow and away from the direct rays of the sun.
5. Cylinder valves are to be closed whenever the cylinder is not being used. Empty cylinders are to be stored with cylinder valves closed.
6. Valve protection caps are to be kept in place whenever cylinders are being stored and handled.
7. When storing cylinders, the hose and regulator assembly must be disconnected.
8. If a leak is found in a cylinder, move the cylinder out-doors, away from any source of ignition, and notify the supplier.
9. Valves regulator parts and fittings must not be lubricated.
10. Cylinders are to be stored at least 6 metres from highly

Acetylene Cylinders

1. Acetylene cylinders are placed with the valve end up whenever they are stored, transported or used.
2. When acetylene cylinders are in use, nothing is to be placed on top of the cylinder, which may damage the safety plug or interfere with the quick closing of the valve.
3. Valves on acetylene cylinders are not to be opened greater than three quarters of a turn.
4. If the acetylene cylinder is fitted with a valve operated by a wrench, the wrench is to be left on the cylinder while the cylinder is in use.
5. Acetylene is never to be used at pressures above 100 kPa when cutting.
6. Only cylinders of Otis approved size should be used.

7. Acetylene cylinders shall not be used within 1 hour of being in a horizontal state.
8. Never store cylinders in an enclosed place with no ventilation such as a site box, as any leakage of the gas would accumulate, creating an explosive condition.

Oxygen Cylinders

1. Oxygen cylinders are to be kept free from oily or greasy substances.
2. A jet of oxygen is never to be permitted to strike an oily surface, greasy clothes or gloves, or to enter a fuel oil tank or combustible substance
3. Oxygen cylinders are never to be stored near any flammable or combustible materials.
4. Stored oxygen cylinders are to be separated from acetylene cylinders by a non-combustible barrier or a distance of 6 metres.
5. Oxygen is never to be used in place of compressed air.
6. A serious accident may result if oxygen is used in place of compressed air.
7. Never use standard pipe fitting compounds or thread lubricants with oxygen cylinders, valves or connections.
8. Use only materials approved for use on oxygen systems.

Valves and Regulators

1. Cylinders (Oxygen and Acetylene) are only to be used with pressure reducing regulators.
2. Before connecting the regulator to the cylinder valve, the valve is to be quickly opened and closed. This action is called "cracking" and is used to clear the valves of dust and dirt.
3. When opening the valve, stand to one side of the outlet, never in front of it.
4. Acetylene cylinders are never to be opened near other welding works or sparks, flames or sources of ignition.
5. After the regulator has been attached to the valve, the cylinder valves are to be opened slowly.
6. On oxygen cylinders, the valve can be opened to its full limit. Valves on acetylene cylinders are not to be opened any more than three quarters of a turn.
7. The threads on oxygen connections are different than those on an acetylene connection (regulator outlets, those coup lings and torch valve inlets).
8. If threads do not fit easily, the connections are mixed. Never force a connection.
9. Regulators that are not operating properly should be replaced.
10. Oxygen equipment including valves, regulators and hoses are not to be used with other gases.
11. Equipment used for other compressed gases cannot be used with oxygen.
12. It is an Otis requirement to use flash black arrestors at both ends of the hose with all oxygen and acetylene cylinders.

Hoses

1. Only approved type hoses are to be used for oxygen and acetylene operations. The hose is of a rubber reinforced fabric construction. Copper or plastic tubing is not approved for acetylene use.

2. Care should be taken to protect the hose against damage such as flying sparks, hot slag or hot objects. The hose should not be dragged across the floor.
3. Red coloured hose is used for acetylene, Black (Blue or black in NZ) coloured hose is used for oxygen. Note: Acetylene has left hand thread connections at hook-up.
4. Hoses may be taped together, however, no more than 100 mm of tape for each 300 mm of hose is permitted.

5. Hoses are to be frequently inspected for leaks, burns, worn places, loose connections or other defects which may render the hose unsafe for service. All hoses suspected of leaking should be leak tested
6. Hoses that have been damaged or are worn out should be replaced. Tape is never to be used to repair damaged hose
7. Hoses must have flash back arrestors fitted to both ends
8. Install check valves before attaching the torch
9. When work is stopped for any extended period, e.g., overnight, the equipment must be properly secured and all valves shut and regulators and hoses vented

The Torch

1. Torches are to be lit using friction lighters, stationary pilot flames
or other suitable sources of ignition. Cigarette lighters of any type are not to be used.
2. When extinguishing the torch, close the acetylene valve first, then close the oxygen valve.
3. When welding or cutting is to be stopped for extended periods of time, or when the operator leaves the scene for any period of time, the equipment is to be secured as follows:

a. Extinguish the torch.
b. Close both acetylene and oxygen cylinder valves.
c. Torch valves should then be opened to vent pressure from the line & shut again.
d. Close both regulators. The regulator pressure adjusting screws should then be released.

4. Torches that are damaged or are not functioning properly should be repaired or replaced.

Ventilation

1. Oxy-acetylene operations are to be done in well-ventilated areas. If there is any question concerning the adequacy of ventilation in a particular area the Supervisor or safety manager should be notified.

2. Approved mechanical ventilation is required when welding or cutting is done in an inadequately ventilated area (e.g. exhaust fans). Contact your supervisor and get approval first before working in such an area.

3. Special ventilation and respirators may be required when the welding or cutting involves:

a. Fluorine (Flux).

b. Zinc (base metal or filler, galvanized metal).

c. Lead (base metal and metals painted with a lead-based paint).

d. Beryllium (base or filler metal).

e. Cadmium (coated or cadmium bearing).

f. Galvanized Metal.

Welding Lens Protectors

Lenses are available in goggles, and helmets to protect the wearer against visible and invisible light radiation, typically encountered in welding operations.

Safety spectacles must be worn under welding helmets and in conjunction with hand shields.

The shade of lens must conform to AS/NZS 1338.1 Which will determine the type of lens needed for the task.

Liquefied Petroleum Gas

Otis only uses LPG hand blowtorches for Babbitt white metaling or heating to remove bearings etc. but only after authorisation from the client and complying with any permit to work system that may be in operation at the job site

Emergency fire procedures must be in place to address the threat of fire, which will include fire extinguishers. (Refer to "Hot work permit procedure in this Handbook.)

HOT WORK

When required by client's rules or Company policy always obtain a written hot work permit before using portable cutting or welding/grinding equipment anywhere on the job.

Protective clothing must be worn (e.g.: leather gloves, aprons, leggings, vests, etc.) during any burning or welding operations.

All clothing should be clean and free from flammable contaminants. Before starting to burn or weld, floors must be swept clean.

Wooden floors must be covered with sheet metal or fire retardant material e.g. Fire Blanket. Avoid letting sparks fall where they may start a fire or burn other workers, e.g. Screens.

Move combustible material a safe distance away from the work if possible. If combustible material cannot be moved, cover it carefully and completely with a fire retarding blanket or sheet metal.

Do not burn or weld in old hoistways where rails may be constructed of wood or in circumstances where equipment is covered with oil or lint.

Be extremely cautious when working with adhesives/paints on installations. Solvent vapours can collect and unless these vapours are forced out by fresh air, a spark can cause an explosion that may result in injury or possible suffocation.

Obtain specific instruction from your supervisor before proceeding with this work.

Where sparks cannot be controlled, to make sure fires do not start; provide a fire watch (a person assigned to monitor the

activity). At the same time, have suitable fire extinguishers at the location where the work is being performed.

Fire extinguishers should be of the dry chemical (Dry Powder) or CO2 type and must be readily available where burning or welding work is being performed. These must have been inspected and tagged before use.

Never burn or weld over other workers.

Before starting any electric welding operation; always ensure that you have a prepared non-flammable non-conducting and clear area for resting the live electrode holder.

After completing a burning or welding operation, frequently (ten minute intervals) check the scene of work area for smoldering fires.

Also inspect adjoining areas and floors above and below.

Do not use flame cutting, welding or grinding equipment near flammable liquids or on closed tanks, which have held flammable liquids or other combustibles.

It must be remembered that gases given off by fires are invariably dangerous even when inhaled in minute quantities.

Toxic fumes may be aggravated by the use of extinguishing agents and caution should be exercised, especially where fires are in confined quarters.

Immediately after extinguishing a fire, adequate ventilation should be supplied and all persons should vacate to an open area.

If there is an indication of fire:

Call the local fire service before attempting to extinguish a fire.

Ensure that emergency phone numbers are posted in a location available to all.

Keep cutting and welding equipment in good operating condition at all times.

Equipment found to be defective must be tagged immediately and returned for repair.

Grinders and saws produce also hot particles and proper protective measures should be taken when using these types of tools.

FIRE SAFETY

Otis has a legal responsibility to comply with the Fire Regulations.

Get to know the fire drill and evacuation procedures in your office or when visiting other offices.

You will need to know:

- How to sound the alarm.
- Where the firefighting equipment is kept and how to use it.
- The escape route plan.
- The assembly point outside the building.

Fire Extinguishers: Ensure you know the type of fire extinguisher to use.

Fire Prevention:

1. Fires don't just happen; they are caused when three elements are present. E.g. **Oxygen, Fuel, Ignition.** Remove anyone element and the fire dies.
2. Store flammables safely.
3. Keep rubbish in containers.
4. Ensure electrical wiring and portable appliances are in good order.
5. Keep the work area clean of wastepaper and cardboard.
6. Ensure electrical sockets are not overloaded. Only smoke in designated areas.

	A Wood, Paper & Plastic	B Flammable & Combustible Liquids	C Flammable Gases	E Energised Electrical Equipment	F Cooking Oils & Fats	**Notes:** "Limited indicates that the extinguishant is not the agent of choice for the class of fire, but that it will have limited extinguishing capability. Class D fires involving combustible metal(s) use only special purpose extinguishers - please seek expert advice. **Comments:** (Refer Appendix A of AS 2444)
Powder ABE	☺	☺	☺	☺	☹	Special Powders are available specifically for various types of metal fires. Seek expert advice.
Powder BE	☹	☺	☺	☺	☺	Special Powders are available specifically for various types of metal fires. Seek expert advice.
Carbon Dioxide (CO_2)	Limited	Limited	☹	☺	☹	Generally not suitable for outdoor fires. Suitable only for small fires.
Water	☺	☹	☹	☹	☹	Dangerous if used on flammable liquid, energized electrical equipment and cooking oil/fat fires.
Foam	☺	☺	☹	☹	Limited	Dangerous if used on energized electrical equipment.
Wet Chemical	☺	☹	☹	☹	☺	Dangerous if used on energized electrical equipment.
Fire Blanket	☹	☹	☹	☹	☺	Use blanket to wrap around a human torch. Ensure you replace the blanket with a new one after use.
Fire Hose Reel	☺	☹	☹	☹	☹	Ensure you maintain a path of egress between you and the nearest exit.

HOW TO USE A FIRE EXTINGUISHER

Extinguishers come in a number of shapes and sizes. They all operate in a similar manner. Here's an easy acronym for fire extinguisher use:

P	**PULL THE PIN** – Break seal and test extinguisher.
A	**AIM AT BASE OF FIRE** – Ensure you have a means of escape.
S	**SQUEEZE THE OPERATING HANDLE** – To operate extinguisher and discharge the agent.
S	**SWEEP FROM SIDE TO SIDE** – Completely extinguish the fire.

OFFICE SAFETY

Office environments can present a range of hazards.

Don't forget safety when you are in the office!

This section outlines some common hazards and how to prevent or manage them.

General Office Safety

- Keep all walkways, workplace floor areas clear of obstruction.
- Do not tamper or interfere with broken office machinery or electrical equipment.
- Do not leave filling cabinet drawers open. Report any damaged or malfunctioning cabinets to your manager.
- Do not store overhead objects in an unsafe manner.
- Do not run through the office or up and down stairways.
- Always hold onto stair rail.
- Learn how to operate office machinery safely before you use it.

Slips, Trips, Falls

- Don't wait for a small spill to dry itself, clear it up.
- Where flooring is wet, make sure warning signs are in place. Watch out for floors that have been waxed, and other highly slippery surfaces.
- Watch out for uneven, wet or icy footpaths; always walk slowly on uneven, wet or icy surfaces.

- Keep telephone and electric cables out of the way, or keep under floor cable protectors.
- Look out for damaged carpets or flooring. (Report to manager if you find them).
- Make sure you do not leave filing cabinets or drawers open. Wear shoes that are appropriate. Don't run.
- Don't stand on insecure objects such as chairs.
- Don't stretch.
- Don't jump, you must lower or use the correct equipment to get down from any elevated work area.

Manual Handling / Kinetic Lifting

Even in an office environment moving and lifting equipment can cause injury problems.

For instruction on correct lifting techniques, please refer to the section of this handbook on Manual Lifting

Remember to plan the lift, and ensure your route is clear. Use carrying aids such as a trolley. If the object is heavy, call for assistance.

Working with Display Screen Equipment (Monitors)

The use of Monitors should not cause problems as long as some simple precautions are taken.

Training/Education is provided so that users know how to arrange their work and workstation to avoid awkward movements, reflections, aches and pains.

Your EHS Manger can help in assessing your work station

All users should check that they are comfortable at their workstation. These checks should include:

- Is the chair correctly adjusted? Not only the height of the seat, but
also the backrest so that you can sit in the chair and your lower
back is supported.
The height of the seat is correct when your forearms are horizontal and your wrists straight when working the keyboard.
A footrest to support your legs may be necessary.
You should rest your arms whenever your routine allows.

- Are there obstructions that prevent you sitting upright? These should be removed so that you can sit upright and you do
not have to learn to read documents.
Use a document holder the same height and distance away as the
screen so that your eyes do not have to keep refocusing.

- Is the screen adjusted correctly? The angle should be adjusted to your sitting height so that your head and neck movements are minimized and reflections on the screen are avoided.
  If there are reflections from windows then use blinds or consider whether you can sit sideways to the window. Keep the screen clean and adjust the brightness if light levels change.

- Break up your work on the Computer or monitor with other duties so that your eyes can have a rest from the screen and you can change your posture.

- Your workstation should be formally assessed to ensure it provides the safest working environment.

Report any aches and pains in your upper limbs and back that you think may be work-related to your manager/supervisor.

- In the meantime if you have any problems report them immediately to your manager.


CORRECT AND INCORRECT WORK STATIONS
Screen distance approx arm's length
15°
Screen eye level
Wrist straight
Wrist rest (when required)
90°
Sufficient desk space
Chair back supporting spinal curves
Chair to tilt pelvis forward
Adjustable chair height
Feet flat on foot stool
Organise your desk top so that there is space in front of you for immediate tasks, and space for lower-priority items.

First Aid

Each Otis branch office, stores or site should have First Aid facilities within them.

The extent of the facilities will depend on the number of employees employed in the branch or workshop and the type of risk the employee is exposed to.

Any employee requiring first aid treatment should report any treatment received to their supervisor/manager.

All work related accidents should be reported using the Otis
Accident/Incident Reporting Procedure.
Refer also First Aid at Work Section in this handbook.

Safety Assessment practices and procedures

Under the Company's statutory obligation to ensure the health and safety of all its employees, it will require that independent periodic safety checks of the work environment be performed by the employee's manager or another appropriately qualified individual.

Electrical equipment provided by the Company should be tested regularly.

VEHICLE SAFETY

All Employees who operate a company or personally owned vehicle for company business travel shall:

- Wear the vehicle seatbelt at all times (This includes all passengers).
- Be prohibited from operating a vehicle when they are under the influence of alcohol or drugs.

- Operate vehicles in accordance with their design criteria.
- Have the vehicle inspected and maintained in accordance with Company procedures.
- Report all incidents or accidents which occur with company owned vehicles or if privately owned then while on Company business to your Manager.
- Have a valid driver's license.
- Comply with all motor vehicle laws and regulations.
- Do not use hand-held devices e.g., hand held phones/pagers whilst driving a motor vehicle.
- Check tyres, lights and other items regularly to ensure the vehicle is road worthy

Mobile Phone Use:

- Drivers must not use mobile telephones whilst driving vehicles unless a hands free car kit has been installed
- Employees should keep mobile phone usage to a minimum whilst driving
- Where a company vehicle is provided to a mobile user, a hands free car kit will also be provided
- The phone should be configured to automatic answer to remove the manual intervention of operating the phone whilst driving
- Employees should not make calls whilst driving. If there is a need to make a call during a journey, employees should identify an appropriate safe place to park prior to making the call
- Under no circumstances are drivers to write or read text, messages, email or other social media messages whilst driving
- Must be in compliance to local laws

GENERAL

Remember allow yourself plenty of time
Plan those long journeys

Remember to take a break every two hours
Check on weather and road reports
Do not attempt to travel in severe weather conditions.
Remember some medication can cause drowsiness

Do not drink and drive; you could lose your license, your job or your life

SPARE PARTS WAREHOUSE / BRANCH STORE SAFETY

A warehouse or store presents a broad range of safety hazards

Good housekeeping and storage is critical to preventing accidents in these areas. This section outlines some common hazards in warehouses/stores and how to control these hazards.

Welfare & First Aid

Toilets and washing facilities are provided but they must be kept in a clean and hygienic condition.

First Aid kits are provided and a qualified First Aider appointed (Appointed Person must be a certified first aider)

Ensure proper storage of Personal Protective Equipment and personal clothing so that it is kept clean and undamaged when not in use.

Fire

All warehouses/ stores must be equipped with suitable fire extinguishers as described in this handbook.

Good Housekeeping

Ware houses/ Stores must be kept tidy at all times. Walkways should be clearly designated with lines and kept clear of material and waste.

Materials including waste or stored items should not be allowed to obstruct access to machinery, switchgear, fire alarms, extinguishers and exits etc.

Regular checks should be conducted to check that the workshop remains tidy

Spills of liquids should be cleared up immediately both for safety and environmental reasons. Spill kits should be placed where substantial spills of liquids may occur

Material Storage

Hazardous liquids need to be stored in a manner that if a spill was to occur adequate containment will occur to prevent ground and or ground to water contamination.

All materials stored on shelving shall be restrained to prevent them from falling

All substances with a flash point below 55°C should be stored in a fire resistant store/cabinet

Paints containing Isocyanides must not be used.

Personal Protective Equipment

As explained in other sections of this handbook the Company issues a range of Personal Protective Equipment (PPE) to protect employees" health and safety.

- Hand protection when handling material or equipment that may cause a laceration or occupational dermatitis.
- Safety footwear in the designated area.
- Hand protection when handling sheet metal.
- High visibility coat / vest if in the area where forklifts are moving or other designated areas.

Lifting Equipment

Refer to hoisting & rigging section of this handbook

Lifting equipment must only be operated by authorized and trained personnel.

All lifting equipment must be thoroughly examined every twelve months (or sooner if the local regulations require it or manufacturer / Otis recommends it) and the equipment tagged to show that the equipment has been tested and is within its valid period.

A record of the test /examination shall be maintained. Evidence of a thorough examination shall be in writing and a copy of the
examination report will be provided and kept with the equipment for inspection.

Fork Lifts

Fork lift trucks must only be operated by Company appointed drivers who are licensed to do so.

Proof of license is required by Otis, before authorisation is given as an approved driver.

Drivers must ensure that they have clear view of the area ahead and around them.

Fork lifts must be maintained in good condition and comply with local regulations.

Fork Lifts need to be inspected at the commencement of the day and the log book completed.

Prior to operating the Fork Lift a visual inspection and review of log book is required to ensure operator is certain the fork lift is safe to operate.

Electrical Equipment

All portable electrical equipment should be subject to regular testing as detailed in this handbook. Checks should be made that electrical equipment is within its valid period of test before it is used.

Any repairs to electrical tools etc. must be carried out by authorized, licensed personnel to undertake the work safely. Non-Electrical licensed trade's personnel must not undertake any electrical work. Lock and Tag Out systems must be applied to ensure the safety as detailed in this handbook.

All portable electrical equipment must be protected by 10mA RCD as detailed in this handbook.

WASTE

As far as reasonably practicable, waste material should be segregated for recycling purposes; e.g waste metal, oil etc.

All waste must be stored as detailed in this handbook - paying particular attention to the storage of waste oil and general rubbish / debris.

Such materials must be stored so that it cannot leak or blow away causing damage to the environment.

Waste Storage Areas should be inspected on a regular basis and action
taken to avoid the accumulation of large amounts of waste.
Licensed waste disposal companies must be used.

Transfer and Consignment notes must be obtained when the waste is transported away from the Company's premises.

Records of waste disposal (weight, cost) must be maintained for reporting to WHQ and to meet regulatory requirements.

Disposal of Waste Materials

Used solvents, paints (including thinners) and substances with Flash Points under 55°C must be held in suitable containers, duly labelled and stored in a fireproof cabinet or store Such waste is considered as "Special Waste" and should be disposed of as such through Licensed Waste Management Contractors.

Field employees should return the waste back to the stores or as arranged by the branch for safe disposal to a licensed waste management contractor.

Capacitors and transformers may contain harmful substances.

Do not touch any liquids leaking from such items. When electrical components containing dielectric liquids require disposal, seek advice from your EHS Manager

Waste Oils

Arrangements for the disposal/recycling of waste oil should be made locally, through licensed Waste Disposal/Recycling Companies

Wherever possible, waste oil should be sold for re-cycling.

If immediate disposal is not possible, then used oil should be placed at the branch designated Waste Storage Area, in suitable containers, and marked appropriately. It should not be stored where spills/leaks can enter the drainage system

Large amounts of waste oil should not be allowed to

accumulate. **Scrap Metals**

This includes used metal materials and components, which should be disposed of immediately through a licensed contractor.

If storage is essential then it must be stored in suitable storage areas/containers.

Scrap metal merchants should be checked to ensure that they are licensed Records of the quantity and value of scrap metal disposal is to be maintained.

Asbestos Waste at Otis Premises

Asbestos or Asbestos waste must not be stored on our premises.

Hypodermic Needles

If any hypodermic needles are found on client's premises, do not
attempt to move them.
Inform the customer and your supervisor about it.
It is the customers" responsibility to remove these foreign objects.

Batteries

Nickel cadmium batteries, e.g., mobile phone batteries and other batteries, containing toxic substances, e.g. lead, acid, are deemed "Special Waste" and must be disposed of through a Licensed Waste Management Contractor.

Fluorescent Tubes

Fluorescent tubes contain toxic substances. Small numbers (<5) of tubes may be disposed of as "Controlled" Waste (i.e. with normal branch waste).

If large numbers of tubes require disposal, then they must be disposed of through a Licensed Waste disposal company.

Office Waste

Individual waste bins should be provided for the accumulation of office waste, paper, etc.

Consignment Notes and Transfer of Waste

Repeated transfer of the same kind of waste between the same parties can be covered by one Transfer Note, for up to one year.

The details required on the Transfer Note are:

- A description of the waste
- The identity and quantity of the waste
- The type of container, if applicable
- The time and place of the transfer
- The name and address of the Transferee and the Transferor, whether the Transferor is the Producer, and the category into which the Transfer and the Transfer fall e.g., waste producer, registered carrier, etc., together with the Registration Numbers.
- Both parties must keep copies of the Transfer Note, and the description, for two years.

DANGEROUS GOODS MANAGEMENT

Ensuring we protect the environment from harm is equally as important as preventing harm to yourself.

Ensure you follow these procedures while at work or at home.

Dangerous Goods are substances that are corrosive, flammable, explosive, spontaneously combustible, toxic, and oxidising or water reactive.

These goods can be deadly and can seriously damage property and the environment. Therefore it's important that they are stored and handled safely.

Petrol, LPG, paints, oils and acids are examples of commonly used dangerous goods.

Is listed in the Australian Code of Transport of Dangerous Goods by Road and Rail (ADG code)

Is listed as a scheduled poison in the Standard for Uniform Scheduling of Drugs and Poisons published by the National Health and Medical Research Council

Is listed as a carcinogen by the International Agency for Research of Cancer

Has exposure standards determined by Safe Work Australia. Is otherwise specified by Safe Work Australia.

It poses a risk to health if, besides meeting one or more of these criteria, the harmful ingredients are present in concentrations sufficient to cause adverse effects.

Control of Substances Hazardous to Health

Otis requires that employees be provided with information and training about the hazards (both physical and chemical) associated with the use of substances (oils, cleaners, dusts and fumes) in their work environment.

Compliance with AS2508, AS1678, AS 2931 and Otis Environmental Protection Policy is essential. Information on these subjects can be obtained from the MSDS sheets and through your Supervisor

All manufacturers of hazardous materials supplied to Otis have to provide details of the potential hazards associated with each product they manufacture and distribute.

The Safety Data Sheet will provide you with specific details on material ingredients, safety precautions and actions to be taken, fire precautions, and health hazard information.

This must always be obtained and used. Use the PPE as suggested in the SDS Otis will provide employees with information and training on hazardous substances in their work area where applicable, and in cases when a new substance is introduced into the work area.

All requirements for working with hazardous chemicals are to be found in the Environmental section of this handbook.

Only Otis approved substances and material are to be used and purchased. Use of substances not approved by Otis is forbidden.

Typically used materials include paints, chemicals, lubricants and cleaners used on Service, Construction, or Modernisation job sites.

These containers shall not bear the Otis name.

Always exercise caution when handling and using all materials on the job.

Before using any material, always be familiar with and use the personal protective equipment, first aid and ventilation requirements that are appropriate for the material you are using.

Refer to SDS Safety Data Sheets.

Workplace Procedures

All supervisors and managers should store a copy of current SDS for products in use in a place accessible to every employee, and should encourage employees to read the SDS relevant to their work situation

Manufacturers and suppliers are to provide information "about any conditions necessary to ensure that the substances will be safe and without risks to health".

This is usually supplied with the first shipment of the substance Purchasing obtains the SDS whenever they purchase new substances, or updates them on expiry

The Company will "provide such information, instruction, training and supervision as may be necessary to ensure the health and safety of employees"

The Company will "make available in connection with the use of any plant or substance at the place of work, adequate information about any conditions necessary to ensure that the substance will be safe and without risks to health when properly used"

EHS maintains the company central register for all SDS'.

SDS' are only current for 5 years. If the product has not changed then a new copy, should be obtained and dated accordingly.

Storage of Materials on Sites

As a general rule, the quantity of materials stored on a job site should never exceed the amounts necessary to satisfy the contractual requirements.

Service

- Only approved materials can be stored at the job.
- Materials stored on the job site must be secured in an area of limited access and be accessible to authorised personnel only.

- Storage areas should be protected by lock and key.
- Materials should not be stored in the pit
- Storage areas should be kept neat and clean, good housekeeping procedures must be followed. Storage shall not obstruct or adversely affect means of access or egress.
- All materials shall be stored, handled and stacked with due regard for their fire characteristics.
- New materials should be segregated from the waste materials at all times.
- All new or unused materials in excess of job requirements should be returned to the local office in their original containers.

Modernisation, Repair and Construction

- Whenever possible materials should be stored inside the building or, if stored outside, protected with plastic cover from the elements.
- Oils and other liquids should be located in a bunted area, If bunted storage is not available, the containers should be placed on a substantial plastic sheet and the edges drawn up around the containers and secured thereby creating sealed storage.

- Account must be taken of the consequences of any leaks. Storage is only permitted, where leakage will not enter drains or water courses

- It is recommended that wherever possible delivery of liquids is scheduled so that the amount stored on site is kept to a minimum.

- It must be kept in mind that these projects have constantly changing environment and when materials are stored, consideration should be given to the activities of others in order to avoid incident or unnecessary handling.

PART 3
General Information

FIRST AID AT WORK

There may be occasions where a work colleague needs first aid treatment. In the first instance contact your trained first aid officer to provide treatment. If a first aid officer is not available you can help by following these basic procedures;

- Assess the situation;
- Do not put yourself in danger.
- Make the area safe.
- Assess all casualties and attend first to any unconscious casualties;
- Send for help do not delay.

Severe Bleeding

- Apply direct pressure to the wound.
- Raise and support the injured part (unless broken).
- Apply a dressing and bandage firmly in place.

Broken Bones & Spinal Injuries

- If a broken bone or spinal injury is suspected, obtain expert help.
- Do not move casualties unless they are in immediate danger

Burns

- Burns can be serious so if in doubt, seek medical help.

- Cool the part of the body affected with cold water until pain is relieved.
- Thorough cooling may take 10 minutes or more, but this must not delay taking the casualty to hospital.
- Certain chemicals may seriously irritate or damage the skin.
- Avoid contaminating yourself with the chemical.
- Treat in the same way as for other bums but flood the affected area with water for 20 minutes.
- Continue treatment even on the way to hospital, if necessary. Remove any contaminated clothing, which is not stuck to the skin.

Eye Injuries

- All eye injuries are potentially serious.
- If there is something in the eye, wash out the eye with clean water or sterile fluid from a sealed container, to remove loose material.
- Do not attempt to remove anything that is embedded in the eye.
- If chemicals are involved, flush the eye with water or sterile fluid for at least 10- 15 minutes, while gently holding the eyelids

Automated External Defibrillator (AED)

- Automated External Defibrillator (AED) are located at each Otis office and warehouse.
- Please ensure manufacturer instructions are followed to safely administer the AED function.
- If the AED is required, ensure the site First Aider and management are notified of the incident.
- When working on sites away from Otis offices, make sure you Familiarise yourself with where First Aid kits and

AED's are kept and who and where the site First Aider can be contacted.

Electric Shock

WARNING: Even for a mild electric shock, encourage the patient to seek medical aid for assessment of potential effects on the heart.

Signs and Symptoms

- Difficulty in breathing or no breathing at all.
- A weak, erratic pulse or no pulse at all.
- Burns, particularly entry and exit burns.
- Loss of consciousness.
- Cardiac arrest.

Downed Power Lines

- Remain at least 6 meter from any cable
- DO NOT attempt to remove the cable
- If a vehicle is being touched by a high voltage cable, DO NOT go near the vehicle or try to remove the patient from the vehicle
- Advise the patient no to move.

What to do;

1. Check for danger to yourself, bystanders and the patient.
2. Switch off power, if possible, before trying to help the patient.
3. If the patient is in contact with high voltage lines, do not approach, but wait until power is disconnected by an authorised electrical personnel.
4. If power cannot be switched off quickly, remove the patient from the electrical supply without directly touching them. Use a non-conductive, dry material (eg a dry wooden broom handle)
5. Follow DRSABCD. Call triple zero (000) for an ambulance.
6. Hold any burnt area under cool running water for 20 minutes
7. Remove jewellery & clothing from burnt areas unless stuck to the burn.
8. Cover the burnt area with a loose and light nonstick dressing, preferably clean, dry, non-fluffy material such as plastic cling film.
9. Seek Medical aid

Resuscitation Chart

D 

Danger

Check for **Danger** to Yourself, the Patient and Bystanders.

R 

Response

Check for **Response** by talk and touch.

S 

Send

If unresponsive, **Send** for help by calling **Triple Zero (000).**

A 

Airway

Open **Airway** and ensure it is clear.
If not, roll patient onto their side and clear the airway.

B 

Breathing

Check **Breathing.**
If patient is not breathing or breathing is not normal, commence CPR.

C 

CPR (30:2)

Start CPR
Give 30 Chest Compressions followed by 2 rescue breaths.
If unwilling or unable to perform rescue breaths continue chest compressions.

D 

Defibrillation

Attach an Automated External Defibrillator (AED) as soon as it is available and follow its prompts.

Continue CPR until:

- The patient responds or begins breathing normally
- It is impossible to continue (e.g. exhaustion)
- A health care professional arrives and takes over CPR
- A health care professional directs that CPR be ceased

To get involved and learn to save a life, enrol at sls.com.au or call 1300 766 257

This information is not a substitute for first aid training.
Surf Life Saving recommends that everyone be trained in first aid.

Australian for life.

ACKNOWLEDGEMENTS

This employee safety handbook has been updated with assistance from the EHS Managers and Safety committee members.

We wish to thank all employees who have been part of this consultation process for their valuable input.

If you have comments or suggestions to improve the safety handbook contact your EHS Manager or the National EHS Team in Head Office.

SUMMARY OF CHANGES

Version No.	Summary of Amendment	From Page Number	Date	Changed By	Approved By
5.0	Updated cardinal rules into 3 categories; including addition of exception to Cardinal Rule – Never ride the unit with steps/ pallets removed	22	20 Jan 2025	Lisa Robb	Jasmine Yee-Yet
	Update to fall arrest information	55			
	Update to approved lifelines information	58			
	Update to TOC Access procedure	63			

	Update to Pit Access procedure	83			
	Update to Pit Prop examples	91			
	Updates to General LOTO procedure/ equipment and electrical glove protection	117			
	Addition of section: Removal and Isolation of Unsafe Equipment from Service	126			
	Hanging the car or CWT – addition of weight of car/ CWT to be known prior to lifting	159			
	Update to Scaffolding information	183			
	Update to Battery Powered Tooling information	237			
	Update to Safe Use of Portable Electric Grinder information	242			
5.1	Update to Counterweight/ car pit prop section – criteria for adjustable pit	87-92	16/05/ 2025	Lisa Robb	Jasmine Yee-Yet

	props and use of pit prop guide				
	Update to jumpers/ bridging wires / defeating safety circuits information	132-139			
	Update to Safe use of portable electric angle grinders - required PPE section	244			