

# Brief Analysis of Site Accident Cases



Safety



First



Occupational Safety and Health Branch  
Labour Department



Occupational Safety and Health Council

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# Brief Analysis of Site Accident Cases



**Occupational Safety and Health Branch  
Labour Department**

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# FOREWORD

Although the number of injuries in our construction industry has been declining in recent years, it remains at a high level. Many construction workers attribute their accidents to bad luck. It is a misconception stemmed from a lack of safety awareness. According to the studies on work injury cases, many accidents are preventable by taking simple measures, including good housekeeping of construction sites, proper use of personal protective equipment and provision of safety training, etc.

In terms of legal liability, though the responsibility for ensuring the safety and health of employees at work mainly lies on the employer, employees should also note that they are obliged to take care for the safety and health of themselves and others at the workplace, and to follow the safety rules and work procedures laid down by the employers. Should they notice any potential hazards at the construction site, they should bring them to the attention of the responsible persons so that action for improvement can be taken.

This booklet is mainly prepared for construction workers and frontline supervising personnel with a view to enhancing their awareness of occupational safety. Through a brief analysis of the causes of various real-life accident cases and provision of some important points-to-note, it is hoped that workers and supervising personnel will pay more attention to their personal safety, be more willing to report irregularities, and will make recommendations for improvement, leading to better communication and co-operation with the employers.

We hope that with the consensus and co-operation between the employers and employees, work safety of the construction industry can be further improved with a continued reduction in its accident rate.

## Case (1) Falling from Scaffold

### Brief Description of Case

The bamboo scaffold of a building under construction had been partially dismantled. To prevent the bamboo members of the scaffold from getting loose and falling down during the holiday, a team of scaffolders tied them up first. In the course of their work, one of the workers lost his balance and plunged to his death onto the platform.

### Illustration of Accident



### Cause of Accident

- A safe system of work for scaffold dismantling was not provided
- The worker did not attach his safety harness to the independent lifeline

### Illustration of Safe Practice

- Use a safety harness and attach it to the independent lifeline



#### Workers should

- ✓ wear safety harness while at work
- ✓ check whether the independent lifeline is secure
- ✓ attach the safety harness to the independent lifeline
- ✓ receive proper safety training and carry out the safety measures for work laid down by the employer

#### Workers shouldn't

- ✗ carry out scaffold dismantling without attaching the safety harness to the independent lifeline

### Points to Note for Foreman and Person-in-Charge

- Provide safety training to ensure that workers know the safety measures for work at height
- Provide suitable safety harnesses and independent lifelines for workers
- Ensure that workers working on a scaffold have been trained on scaffolding work and have sufficient experience
- Ensure that workers have their safety harnesses attached to independent lifelines during the erection or dismantling of a scaffold

## Case (2) Falling from mobile tubular scaffold

### Brief Description of Case

A worker carried out painting of the fire mains installed on the ceiling from a mobile tubular scaffold. As the floor was slightly inclined, he kept the scaffold in a level position by putting a steel plate beneath it to prevent it from moving. Subsequently, the tubular scaffold toppled over all of a sudden when the worker was painting from its top. As a result, the worker plunged to his death.

### Illustration of Accident



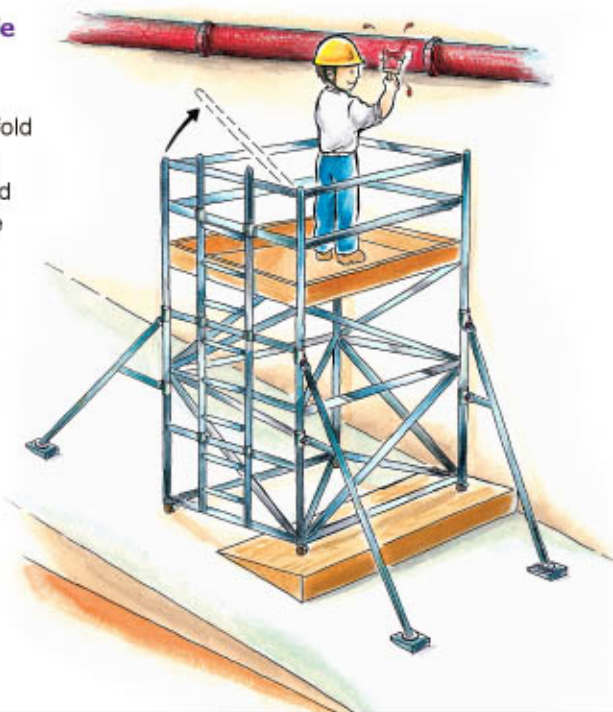
### Cause of Accident

- The tubular scaffold was not horizontally and securely erected on the inclined floor
- The worker overstretched his body from the working platform resulting in the imbalance of the tubular scaffold
- The steel plate underneath the tubular scaffold failed to balance and secure the scaffold



### Illustration of Safe Practice

- When erecting a mobile tubular scaffold on an inclined floor, suitable mats should be used to keep the scaffold in a level position



#### Workers should

- ✓ level an inclined floor with suitable materials
- ✓ check whether the tubular scaffold is secure
- ✓ move the tubular scaffold to the working position
- ✓ secure the tubular scaffold with bracings

#### Workers shouldn't

- ✗ secure the tubular scaffold on an inclined floor with wedges only
- ✗ overstretch the body from the working platform

#### Points to Note for Foreman and Person-in-Charge

- Provide a safe working platform for workers who work at height
- Have the tubular scaffold erected by trained and competent workers
- Have the tubular scaffold inspected by a competent person before use
- Provide safety training in respect of the use of the tubular scaffold (including how to erect a tubular scaffold on an inclined floor) for workers

## Case (3) Falling from temporary ladder

### Brief Description of Case

A worker lost his balance and fell to his death from a wooden ladder which was supported by a big iron barrel underneath when dismantling a 6-metre high wire mesh. Investigation revealed that the worker had drunk alcohol before work.

### Illustration of Accident



### Cause of Accident

- There was no suitable working platform
- Safe dismantling procedures were not provided

## Illustration of Safe Practice



### Workers should

- ✓ use a suitable platform for work at height
- ✓ report to the foreman on the lack of safety measures and give suggestions

### Workers shouldn't

- ✗ use insecure equipment for work at height
- ✗ drink alcohol before work

### Points to Note for Foreman and Person-in-Charge

- Provide safe working procedures for dismantling wire mesh
- Provide training and supervision for workers to ensure their compliance with the safe working procedures
- Provide a suitable working platform

## Case (4) Falling with boatswain's chair

### Brief Description of Case

A worker carried out paint work from a boatswain's chair at the external wall of a building. When he was working at the external wall on 14/F, the pulley from which the seat was suspended suddenly detached from the connecting bolt, causing the worker to fall to his death.

### Illustration of Accident

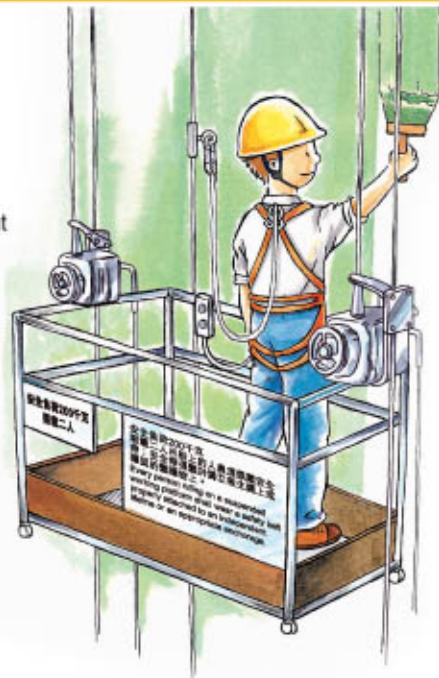


### Cause of Accident

- The overall structure of the boatswain's chair was unsafe
- The whole structure was not inspected by a competent examiner before use
- The fall arrestor and independent lifeline were not properly installed, thus failing to prevent the worker from falling

### Illustration of Safe Practice

- Use a suspended working platform instead of a boatswain's chair
- Inspect, examine and test the suspended working platform before use
- Use the safety harness and independent lifeline properly



#### Workers should

- ✓ use a suspended working platform instead of a boatswain's chair
- ✓ inspect the working equipment to ensure safety before work; if there is any query, approach the foreman immediately
- ✓ ensure that the safety harness and fall arrestor are properly attached to an independent lifeline
- ✓ receive recognised safety training and possess a valid certificate

#### Workers shouldn't

- ✗ use a boatswain's chair
- ✗ use defective working equipment
- ✗ use the safety harness and independent lifeline improperly

#### Points to Note for Foreman and Person-in-Charge

- Provide workers with a suspended working platform for carrying out works at the external wall
- Ensure that workers using the suspended working platform possess relevant valid certificates
- Provide training for workers so that they know how to use personal protective equipment

## Case (5) A metal bar falling from height

### Brief Description of Case

After completing the water pump works, an electrician stayed on an uncovered podium of a building without wearing a safety helmet. A metal bar of about 1.8m long and 10mm in diameter fell from height and hit his head.

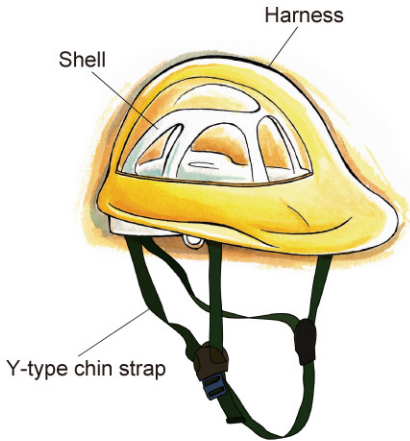
### Illustration of Accident



### Cause of Accident

- The metal bar was liable to fall as it was placed at the window edge on an upper floor
- The falling of the metal bar might be inadvertently caused by someone at work
- No secure fenders/bracings had been installed at the external wall of the building near the podium

**Illustration of Safe Practice**



(Structure of a Safety Helmet)

A clearance of 25–50mm between the harness and the inside of the shell should be maintained



**Workers should**

- ✓ never put construction materials at places such as the edges of windows or buildings where they are liable to fall
- ✓ take immediate action to address any hazards of falling objects and report to the foreman
- ✓ avoid staying at places with hazards of falling objects
- ✓ wear a safety helmet with a Y-type chin strap and buckle the chin strap properly when working on a construction site

**Workers shouldn't**

- ✗ put construction materials at places where they are liable to fall
- ✗ pay no regard to safety, resulting in others being injured by falling objects
- ✗ damage or improperly use personal protective equipment

**Points to Note for Foreman and Person-in-Charge**

- Inspect and supervise site condition to ensure that no loose materials are put at places where they are liable to fall
- Install secure fenders/bracings at the external wall near places such as the podium or the ground
- Instruct all site workers to prevent objects from falling
- Adopt reasonable measures to ensure that site workers wear safety helmets and buckle the Y-type chin straps properly

## Case (6) Bricks falling from height

### Brief Description of Case

At the material time of the accident, a delivery worker was operating a hoist to transport concrete bricks to the top floor. When the platform of the hoist moved up to the 10th floor after it was loaded with concrete bricks by workers on the ground, some concrete bricks were displaced due to the vibration during lifting. As the frame of the hoist was unfenced, a displaced brick fell from the frame and hit the head of a worker on the ground.

### Illustration of Accident



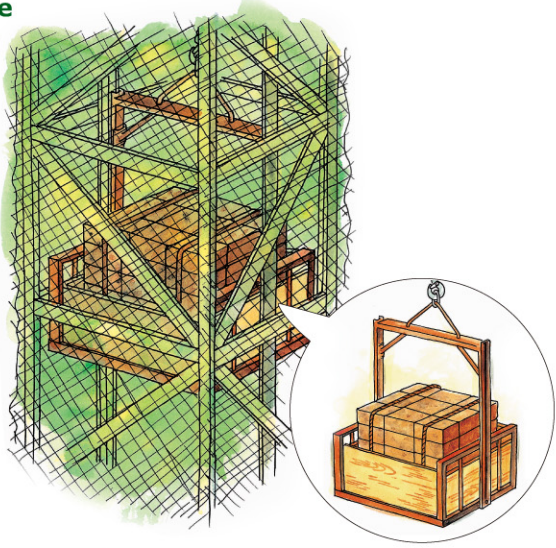
### Cause of Accident

- The concrete bricks were neither properly stacked nor securely tied
- The platform of the hoist was not installed with any enclosures to prevent loose materials from falling during lifting
- The frame of the hoist was unfenced



**Illustration of Safe Practice**

- Materials are properly stacked and securely tied
- The platform is enclosed
- The frame of the hoist is securely fenced



**Workers should**

- ✓ properly stack and securely tie materials on the platform
- ✓ use a hoist with an enclosed platform and a fenced frame
- ✓ stop the operation and inform the foreman promptly of any unsafe conditions
- ✓ receive safety training on the operation of hoists
- ✓ wear a safety helmet with a Y-type chin strap and buckle the Y-type chin strap properly

**Workers shouldn't**

- ✗ place loose materials on the platform of the hoist in a careless manner
- ✗ use a hoist not in compliance with the safety requirements
- ✗ pay no attention to the safe operation of hoists

**Points to Note for Foreman and Person-in-Charge**

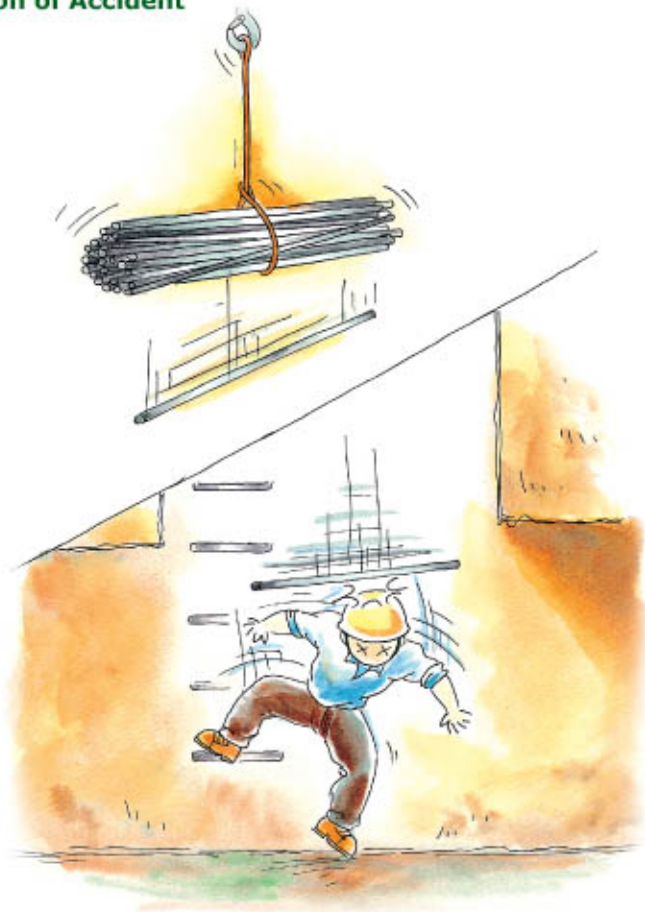
- The platform of the hoist for delivering materials should be enclosed
- The frame of the hoist should be securely fenced
- Workers should be provided with appropriate safety training on the operation of hoists
- Workers should be instructed to securely tie and properly stack materials before delivery
- Adopt reasonable measures to ensure that site workers wear safety helmets and buckle the Y-type chin straps properly

## Case (7) Metal pipes falling during lifting operation

### Brief Description of Case

Two workers were working at the bottom of a shaft which was 35 metres deep from the ground, while another team of workers were lifting the metal pipes with a mobile crane on the ground. When the metal pipes were being lifted over the top of the shaft, two of them suddenly slipped and fell into the shaft, striking a worker working there.

### Illustration of Accident



### Cause of Accident

- The metal pipes were not properly tied before lifting
- The materials were lifted past an area where workers were working

### Illustration of Safe Practice

- Properly tie up the pipes to be lifted
- The crane operator should take a safe lifting route with the assistance of a signaller



#### Workers should

- ✓ properly tie up the materials to be lifted
- ✓ receive safety training on lifting, and crane operators must hold a certificate of competency
- ✓ take a safe lifting route to avoid posing risks to others

#### Workers shouldn't

- ✗ tie the materials to be lifted in a careless manner
- ✗ pay no regard to the safety of others for convenience sake

#### Points to Note for Foreman and Person-in-Charge

- Provide relevant workers with safety training on lifting
- Supervise the lifting operation to ensure compliance of relevant safety measures by workers
- Avoid taking a lifting route which passes through an area where workers are working
- Ensure that crane operators hold valid certificates
- Arrange for a signaller to assist the crane operator with safe lifting

## Case (8) Formwork panels being knocked over

### Brief Description of Case

The metal and wooden formwork panels for building construction were kept in a vertical position in a construction site. A bundle of wooden panels was being lifted by a tower crane, which was operated by an operator holding a certificate of competency, to another location for storage. At the place of storage, the wooden panels had to be lifted across some of the metal panels. Suddenly, the operator stopped the tower crane without receiving the instruction from the signaller. The wooden panels then started to spin and knocked down a metal panel nearby, crushing a worker who was cleaning the panel to death.

### Illustration of Accident



### Cause of Accident

- The lifting operation was carried out despite insufficient communication between the crane operator and signaller
- The vertically placed panels lacked sufficient support and proper storage to prevent them from toppling over by accident

### Illustration of Safe Practice

- Adopt a standard set of hand signals or use other effective means of communication, such as walkie-talkies, for lifting operation
- Lifting operation has to be carried out according to the signaller's instructions



#### Workers should

- ✓ receive recognised safety training and obtain a valid certificate before they can operate the tower crane
- ✓ receive the safety training arranged by the employer before they can be a signaller
- ✓ maintain effective two-way communication when taking up the role of a crane operator or signaller

#### Workers shouldn't

- ✗ carry out lifting operation without sufficient communication with the signaller
- ✗ carry out lifting operation with a tower crane in the absence of an unobstructed and clear view and the assistance of a signaller

#### Points to Note for Foreman and Person-in-Charge

- Cranes have to be operated by operators holding valid certificates
- Only workers who have received safety training in lifting operation can be assigned as signallers
- Provide workers with a proper safe system of work and associated equipment
- Provide suitable support to prevent vertically placed panels from toppling over by accident

## Case (9) Toppling over of precast concrete building unit

### Brief Description of Case

A worker assisted in transporting four precast building units to a site by truck. Upon arrival, he first unloaded three building units from the truck platform on the site. The remaining unit had to be transported to another location on the same site. While the worker was still on the truck platform, the precast building unit suddenly toppled over, pressing him against the side panel of the platform and crushing him to death.

### Illustration of Accident

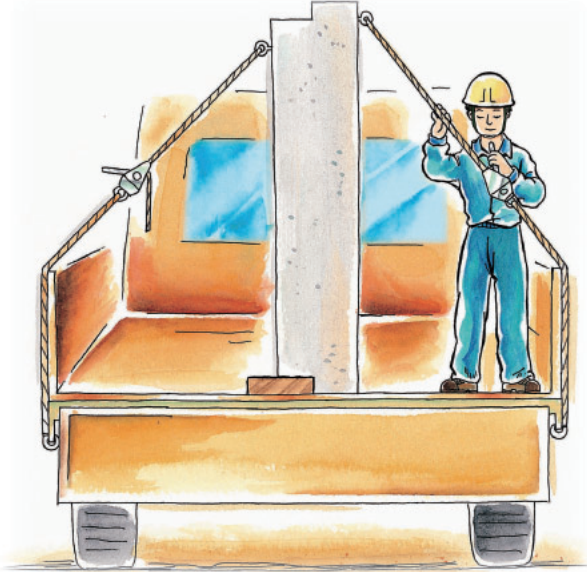


### Cause of Accident

- There were no suitable supporting frames or secured guy ropes to fix the precast building unit in position

**Illustration of Safe Practice**

- Use secured guy ropes or supporting frames to fix the precast building unit in position



**Workers should**

- ✓ follow the safe working procedures and carry out the safety measures provided by the employer
- ✓ immediately notify the foreman when a dangerous working procedure is detected
- ✓ receive proper training in lifting operation

**Workers shouldn't**

- ✗ stay in any environment where there are materials in danger of toppling over

**Points to Note for Foreman and Person-in-Charge**

- Develop safe working procedures and methods before handling heavy materials
- Train the delivery workers to adopt the safe working procedures and methods at work and supervise their work
- Provide suitable supporting frames or secured guy ropes and associated equipment for fixing building units in position

## Case (10) Poisoning in Manhole Sewer

### Brief Description of Case

A team of workers had to clear a sewer which was about 2 metres in diameter. A test was conducted before commencement of work. The result indicated that the environment was safe. Also, an air blower was provided at the top of the manhole to blow fresh air into the sewer. When the work was close to completion, the workers removed the air blower. A worker fell unconscious when entering the sewer for final clean-up, and so did the other workers during the rescue as they didn't wear any breathing apparatus when going inside. Subsequently, the foreman called the police for rescue.

### Illustration of Accident



### Cause of Accident

- The effluent in the sewer produced poisonous gas
- Poisonous gas accumulated more easily in the absence of an air blower
- The worker did not wear suitable breathing apparatus while at work
- The workers taking part in the rescue did not wear any safety equipment
- The quality of air in the sewer was not continuously monitored



### Illustration of Safe Practice



- Wear suitable and approved breathing apparatus
- Wear a safety harness connected to a lifeline, with the free end of the lifeline held by the worker staying outside for immediate rescue
- Equip oneself with warning and communication devices to keep in touch with the worker stationed outside



#### Workers should

- ✓ hold a certificate for "working in confined spaces"
- ✓ check whether the "risk assessment report", which states that work can be carried out safely, has been displayed
- ✓ follow the safe working procedures and emergency measures provided by the employer
- ✓ make good use of the safety equipment provided by the employer
- ✓ inform the worker stationed outside and get out immediately should any changes in the environment or physical discomfort be noticed

#### Workers shouldn't

- ✗ work in a confined space when he is not a holder of the certificate for "working in confined spaces"
- ✗ refuse to use the safety equipment provided by the employer
- ✗ continue working despite physical discomfort
- ✗ risk their own lives by entering the confined space to rescue others without receiving any safety training or wearing any safety equipment

#### Points to Note for Foreman and Person-in-Charge

- Only allow workers holding a certificate for "working in confined spaces" to work in the confined space
- Appoint a competent person to carry out continuous air safety test for the environment inside the sewer, and provide suitable ventilation equipment
- Ensure that every worker understands the safe system of work and emergency rescue procedures devised by the company, and provide all the safety equipment for emergency rescue

## Case (11) Poisoning in Metal Duct

### Brief Description of Case

A polishing worker was poisoned by the carbon monoxide produced by a portable diesel generator operating in a metal duct which was over 100 metres in length and 2.2 metres in diameter while he was polishing the internal surface of the duct alone.

### Illustration of Accident

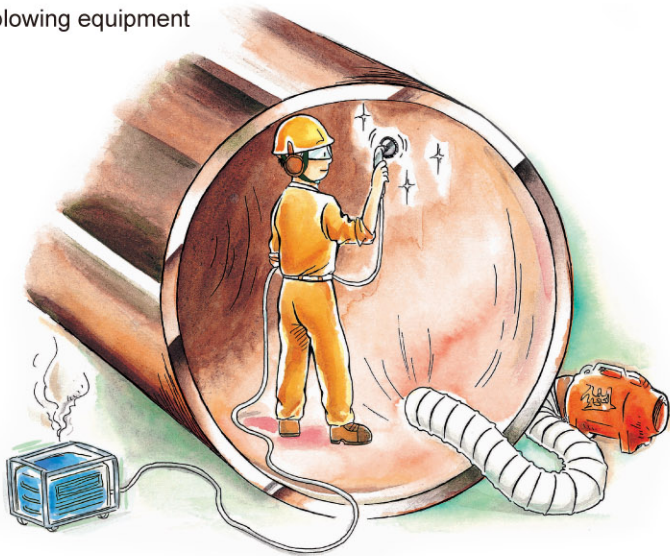


### Cause of Accident

- An enormous amount of poisonous carbon monoxide was produced when the fuel generator was in operation
- Poor air ventilation inside the metal duct had resulted in the accumulation of carbon monoxide
- Risk assessment for work in confined spaces was not carried out

**Illustration of Safe Practice**

- Place the generator outside the duct
- Provide proper air blowing equipment



**Workers should**

- ✓ place the fuel-powered machine outside the confined space
- ✓ hold a certificate for “working in confined spaces”
- ✓ check whether the “risk assessment report”, which states that work can be carried out safely, has been displayed
- ✓ use the safety equipment provided by the employer
- ✓ leave the confined space immediately and report to the foreman should any physical discomfort be noticed

**Workers shouldn't**

- ✗ work in a confined space when he is not a holder of the certificate for “working in confined spaces”
- ✗ enter the confined space for work without knowing clearly the safety condition of the work environment
- ✗ risk their own lives by entering the confined space to rescue others without receiving any safety training or wearing any safety equipment

**Points to Note for Foreman and Person-in-Charge**

- A safe system of work should be devised for work in confined spaces, which includes conducting “risk assessment for work in confined spaces” and issuing the assessment report by a competent person, carrying out the relevant safety measures, and drawing up emergency rescue procedures
- Only allow workers holding a certificate for “working in confined spaces” to work in the confined space

## Case (12) Trapped During Lift Maintenance

### Brief Description of Case

A lift mechanic was asked to carry out lift maintenance work in a commercial building. He first entered the machine room to adjust the lift car to a specific position. Then he opened the lift door and climbed onto the top of the lift car for carrying out maintenance work. In the course of work, the lift door suddenly closed, followed by the lift car going up. As a result, the mechanic was trapped between the lift car and the lift frame, sustaining serious injuries.

### Illustration of Accident



### Cause of Accident

- The stopping switch in the machine room as well as the emergency stop switch and the maintenance switch on top of the lift car were not activated before carrying out the maintenance work
- No warning sign was posted to warn other people not to use the lift

### Illustration of Safe Practice

- Activate the emergency stop switch and the maintenance switch before carrying out the maintenance work
- Put up a warning sign and fence the area



#### Workers should

- ✓ receive proper safety training
- ✓ activate the relevant stopping switch to cut off the normal control circuit of the lift
- ✓ put up warning signs to inform others that maintenance work is in progress

#### Workers shouldn't

- ✗ carry out lift maintenance work without cutting off the normal control circuit of the lift
- ✗ carry out lift maintenance work without taking any measures to prevent others from activating the lift accidentally
- ✗ carry out maintenance work without support or working partners

#### Points to Note for Foreman and Person-in-Charge

- Develop and implement a safe system of work to ensure workers to take necessary safety measures
- Supervise and ensure workers to comply with the safe system of work
- Provide proper safety training for workers
- Provide support or working partners to ensure that the maintenance work is conducted in a safe manner

## Case (13) Electrocution when Using Hand Tool

### Brief Description of Case

When a carpenter was standing on the ground with water pools cutting a wooden board with a portable electric saw, there was current leakage from the electric saw. The worker received electric shock and fainted.

### Illustration of Accident




### Cause of Accident

- The workplace was damp and with water pools
- The electric saw was not properly earthed
- The power socket was not fitted with any residual current device (commonly known as earth leakage circuit breaker)
- There was leakage current from the electric saw

### Illustration of Safe Practice

- Provide a dry working environment free of water pools
- Wear insulating safety shoes
- Use double insulated tools
- Use portable residual current device

Double insulated equipment usually bears the “” mark  
(See diagram below)


MODEL :  
INPUT : 220VAC 50Hz  
OUTPUT : 750W




COMPLY TO:  
BS 2769, BS EN 50144




#### Workers should

- ✓ check the working environment prior to commencement of work. Any water pool should be cleared first
- ✓ check whether the electric tool is intact and properly earthed before using it (only double insulated tools bearing the “” mark do not require an earth wire)
- ✓ wear insulating safety shoes
- ✓ receive proper safety training
- ✓ use portable residual current device

#### Workers shouldn't

- ✗ use electric tools on the ground with water pools
- ✗ use damaged or not properly earthed electric tools

#### Points to Note for Foreman and Person-in-Charge

- All electric tools, except double insulated tools bearing the “” mark, must be properly earthed, maintained and repaired as well as regularly tested
- The socket outlet circuits for electric tools must be fitted with proper residual current devices
- To connect the electric tool to the portable residual current device
- Put up the statutory notice on treatment for electric shock in conspicuous locations of the workplace where electricity is to be used
- Provide workers with proper safety and first aid training

## Case (14) Electrocution when Carrying Out Electrical Works

### Brief Description of Case

An electrician was asked to replace the old electrical wires installed in a false ceiling. He pulled the old wires out of the conduits with his right hand, and held the metal frame of the false ceiling with his left one. In the course of pulling the wires, his right hand touched a nearby wire with damaged insulation. As a result, he was electrocuted.

### Illustration of Accident



### Cause of Accident

- The power supply had not been disconnected before the works were carried out
- The insulations of some of the wires had been damaged



### Illustration of Safe Practice

- Turn off the main power switch and keep it locked. The key should be kept by the person in charge of the works, and a warning notice should be put up



#### Workers should

- ✓ check whether the main power switch has been turned off and locked with a warning notice put up before starting to work
- ✓ conduct tests to see whether the electrical installations involved in the works are live
- ✓ receive proper safety training
- ✓ use working platforms, step platforms or hop-up platforms for work at height

#### Workers shouldn't

- ✗ carry out the works when the main power switch is yet to be turned off
- ✗ carry out the works before conducting live tests for electrical installations
- ✗ carry out electrical work on a ladder

#### Points to Note for Foreman and Person-in-Charge

- Adopt a “work permit system” to ensure the power supply has been turned off before conducting any electrical work
- Provide workers with safety information, instruction and supervision to ensure their safety at work
- Put up the statutory notice on treatment for electric shock in conspicuous locations of the workplace where electricity is to be used
- Provide workers with proper safety and first aid training
- Provide workers with proper working platforms, step platforms or hop-up platforms for electrical work above ground

## Enquiries

If you wish to enquire about this booklet or require advice on occupational safety and health matters, please contact the Occupational Safety and Health Branch of the Labour Department through:

Telephone : 2559 2297 (auto-recording service available outside office hours)

Fax : 2915 1410

E-mail : [enquiry@labour.gov.hk](mailto:enquiry@labour.gov.hk)

Information on the services offered by the Labour Department and on major labour legislation is also available on our website at <http://www.labour.gov.hk>.

For details on the services offered by the Occupational Safety and Health Council, please call 2739 9000.

## Complaints

If you have any complaints about unsafe workplaces and work practice, please call the Labour Department's occupational safety and health complaint hotline at 2542 2172. All complaints will be treated in the strictest confidence.



