CUGE®
CENTRE FOR URBAN GREENERY AND ECOLOGY

LEARNER GUIDE

Hazards and Risk Control, and Policy Management (Level 2)

LNS-WSH-2087-1.1

Version	Effective Date	Changes	Author
1.0	8 Jul 2016	Curriculum Development	Comat Training Services Pte Ltd
2.0	24 May 2017	Revise Course Duration to 16 Hours	Vital Connectors 3.0
3.0	Jun 2021	Update Course Code and Title	CUGE
4.0	June 2023	Update Course Content and alignment to TSC LNS-WSH-2087-1.1	CUGE

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Contents

Course Overview

Purpose and focus of this course

On successful completion of this unit, participant will have the the skills and knowledge to interpret relevant Workplace Safety and Health (WSH) legislations and relevant industry codes, use proper personal protective equipment, safety devices and equipment, identify hazards and risks at workplace, and reporting workplace safety and health issues.

Course learning objectives

By the end of this course, learners will be able to:

- Follow safe work practices according to safety guidelines, standards and legislations including Singapore's Workplace Safety and Health Act and related statutes
- Participate in risk control measures in accordance with regulatory and organizational requirements
- Follow Workplace Emergency Response Procedures WSH legislation and organisational procedures

Industry

ES Workplace Skill series

Competency category

Workplace Safety and Health

Course duration

18 hours: Two eight-hour days, including 2 hours of assessment.

Course level

This course is at a Proficiency Level 2.

Skills Framework for Workplace Safety and Health	
TSC Category	Safety
TSC	Hazards and Risk Control, and Policy Management
TSC Description	Ensure a systematic and objective approach for hazards identification and risk assessment to effectively manage the hazards that may occur within the workplace
TSC Proficiency Description	Level 2
	LNS-WSH-2087-1.1
	Interpret relevant Workplace Safety and Health (WSH) legislations and relevant industry codes to aid in hazards identification at the workplace

Target group

This course is targeted at front-line workers at operations level, normally without any supervisory responsibility for others.

Participant pre-requisites

The *Assumed knowledge and skills* section below outlines the knowledge and skills that are essential for successful performance in the course and on the job. Entry to the programme without one or more of the pre-requisites may affect the learner's chances of achieving the Competency Unit covered by this course.

Assumed knowledge and skills

The skills and knowledge for this unit which the participant is assumed to possess are:

- No prior knowledge or skills or experience associated with workplace safety and health
- Able to listen and speak English at a proficiency level equivalent to the Employability
- Skills System Workplace Literacy (WPL) Level 6
- Able to read and write English at a proficiency level equivalent to Employability Skills
- System Workplace Literacy (WPL) Level 6
- Able to use Numeracy skills equivalent to the Employability Skills System Workplace Numeracy (WPN) Level 6

Participants who do not possess the assumed knowledge and skills set out above should not be precluded from training but it is recommended that they be counselled and advised on suitable preparatory courses that they could undertake to improve their ability to benefit from the module.

Teaching methods used during this course

This course uses a range of teaching methods to cater to learners with different learning styles. Teaching methods include:

Demonstration – the trainer shows learners how to perform a task
Role play - simulation for real -life application of learning
Lecture/presentation – the trainer explains new contents to learners
Group discussion – the trainer facilitates group discussions about a particular topic.

Assessing methods used in this course

The following assessment methods will be used in this course:

Role play
Oral Questioning.

Resources that learners need to bring with them

Prior to the course, learners will be advised that they need to bring the following items with them: A pen and notebook. Personal protective equipment, such as, safety helmet, overalls, safety shoes and safety glasses.

Learning Unit 1: Interpret WSH Act, its Subsidiary Legislations and the Relevant Codes of Practice

This section looks at the WSH Act, its subsidiary legislations, and the relevant Codes of Practice and its applications at workplace.

Learning Outcomes (LO)	Abilities (A)	Knowledge (K)
LO1 Recognize WSH Act, its subsidiary legislations, and the relevant Codes of Practice	A1 Establish job and WSH objectives according to work instructions, organisational WSH procedures and policies	K1 Types and interpretation of relevant WSH legislations and relevant industry Codes of Practice (CP)
		K2 WSH legislative requirements

Workplace Safety and Health (WSH) Act, its subsidiary legislations, and the Relevant Codes of Practice

First conceptualised in 2005, Singapore's Workplace Safety and Health (WSH) framework guides all stakeholders including the government, industry, as well as all employees in the management of WSH. The framework aims to cultivate a shift in the mindset of all stakeholders towards WSH to take pre-emptive steps to ensure the safety and health of all individuals at the workplace – from top management to the last worker.

Workplace Safety and Health Act (WSHA)

The Workplace Safety and Health (WSH) Act is an essential part of a framework to cultivate good safety habits in all individuals, so as to create a strong safety culture in workplaces. The WSH Act requires stakeholders to take reasonably practicable measures to ensure the safety and health of persons at the workplace.

The three guiding principles of the WSH Act are to:

Reduce risk at the source by requiring all stakeholders to remove or minimise the risk they create	•The party who creates the risk is responsible for managing and mitigating the risk to as low as is reasonably practicable
Impose higher penalties for poor safety management and outcomes.	•Instil that poor safety and health management incurs cost and consequences
Encourage industries to **adopt greater ownership** of safety and health outcomes.	•Proactive planning to achieve a safety and healthy workplace

The WSH Act has four key features:

The WSH Act covers the following:

- All workplaces, unless exempted
- Responsibilities of stakeholders
- Hazardous substances
- Machinery and equipment

<u>Liabilities and Penalties under Workplace Safety and Health (WSH) Act</u>

Not complying with a Remedial Order or Stop Work Order

Offence	Maximum fine	Maximum imprisonment	Conditions
Not complying with Remedial Order	$50,000 and additional fine of $5,000 for each day of continued offence	12 months	Either or both
Not complying with Stop Work Order	$500,000 and additional fine of $20,000 for each day of continued offence	12 months	Either or both

General penalties

For offences where no penalty is expressly provided in the WSH Act, the penalties are as follows:

Type of offender	Maximum fine	Maximum imprisonment	Conditions
Individual	First conviction: $200,000 Repeat offender: $400,000	2 years	Either or both
Corporate body	First conviction: $500,000 Repeat offender: $1 million	N.A.	N.A.

Source: https://www.mom.gov.sg/workplace-safety-and-health/workplace-safety-and-health-act/liabilities-and-penalties

Workplace Safety and Health (Risk Management) Regulation

Came into operation on 1 September 2006. WSH Risk Management (RM) is a systematic way to identify, evaluate, control and monitor WSH risks associated with any work activity or trade, and to communicate these risks to employees, contractors and other relevant parties.

Purpose of the Regulation:

- To make every employer, self-employed person and/or principals (including contractors and sub-contractors) accountable in managing the risks he or she create within his or her premises.
- Assess risk to safety and health of any person who may be affected by their undertaking
- Identify hazards and risk of injuries/accidents
- take all reasonably practicable steps to eliminate any foreseeable risk to any person who may be affected by his undertaking in the workplace
- where risk cannot be eliminated, the employer, self-employed person and principal (including contractor and sub-contractor) must take reasonably practicable measures to minimise the risk (introducing controls)

WSH (Risk Management) Regulations - Offences

Any employer or self-employed person who fails to comply with Part II of the provisions:

- First offense - fines not exceeding $10,000
- Repeat offense – fines not exceeding $20,000 or to imprisonment for a term not exceeding 6 months or to BOTH

Work Injury Compensation Act (WICA)

The Work Injury Compensation Act (WICA) lets employees make claims for work-related injuries or diseases without having to file a civil suit under common law. It is a low-cost and quicker alternative to common law for settling compensation claims.

Who is covered - the Work Injury Compensation Act (WICA) covers any **local or foreign employee** who is under a **contract of service** or contract of apprenticeship, regardless of salary, age or nationality. It doesn't cover:

a) Independent contractors and the self-employed.
b) Domestic workers.
c) Uniformed personnel – members of the Singapore Armed Forces, Singapore Police Force, Singapore Civil Defence Force, Central Narcotics Bureau and Singapore Prison Service.

Key changes to WICA

- Changes in compensation and medical expenses limits.
- Expand mandatory insurance coverage to non-manual employees, regardless of where they work.
- Expand scope of compensation to include light duties.
- Compulsory reporting for any instance of medical leave or light duties issued for work accident.

The changes to the Work Injury Compensation Act (WICA) take effect in 2020. for more info on key changes, refer to Changes to Work Injury Compensation Act in 2020 (mom.gov.sg)

Other WSH Guidelines, Regulations and Standards relevant to Landscape Industry

- WSH (Risk Management)
- WSH (General Provisions)
- WSH (Incident Reporting) Regulations
- Workplace Safety and Health (Confined Spaces) Regulations
- WSH (Scaffold) Regulations
- WSH (Noise) Regulations
- WSH (First Aid) Regulations
- WSH Guidelines on Management of Hazardous Chemicals Programme
- WSH Guidelines on Managing Heat Stress in the Workplace
- WSH Guidelines on Hearing Conservation Programme

Workplace Safety and Health Guidelines for Landscape and Horticulture Management

The guide provides information and guidance on:

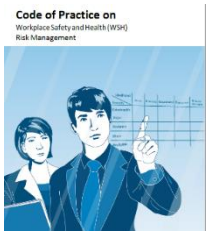
- common landscaping maintenance activities hazards; and
- their preventive measures.

Applicable Singapore Standard SS and Code of Practice

Code of Practice (CP) - provides practical guidance on safety and health to the industry, i.e. what constitutes reasonably practicable WSH measures and the parties responsible for these measures. Exact steps or specific methods for implementing these measures are not listed in CP,

therefore organisations may decide how best to meet the WSH standards or practices stated in each CP.

Example of CP - Code of Practice on WSH Risk Management
The purpose of Code of Practice on WSH Risk Management (RMCP) is to establish the minimum requirements and duties for implementing workplace Risk Management in Singapore, and to provide guidance on its implementation.



For list of CP, you can refer to Workplace Safety and Health Council (WSHC) at https://www.tal.sg/wshc. CP related to landscape industry (but not restricted to) are:

- Code of Practice for Confined Spaces
- Code of Practice for WSH Guidelines on Landscape and Horticulture Management
- Code of Practice for Working Safely at Heights 2013

Singapore Standards (SS) - are nationally recognized documents established by consensus. They are functional or technical requirements in the form of specifications for materials, product system or process, codes of practice, methods of test, terminologies, guides etc. SS related to landscape industry (but not restricted to) are:

You can refer to the Standards of WSH Management Systems, SS ISO 45001 Occupational Health and Safety Management Systems - a framework for managing OH&S risks and opportunities and to enable an organization to provide safe and healthy workplaces, prevent work-related injury and ill health, and continually improve its OH&S performance for more information.

Find out more at https://www.iso.org/standard/63787.html

Roles and Responsibilities under Workplace Safety and Health Act

Roles and Responsibilities of Employers
As an employer, you must protect the safety and health of your employees or workers working under your direction, as well as persons who may be affected by their work by:

- ensuring that workers comply with WSHA
- providing safety instruction and job training
- ensuring that workers have the right equipment and safety gear
- ensuring workers are not exposed to health and safety hazards
- following proper procedures in case of injury
- identifying hazards and obtaining information about them
- conducting accident investigations and workplace inspections
- making recommendations to resolve safety and health concerns

Roles and Responsibilities of Persons at Work/Employee
As an employee, you must:

- follow the workplace safety and health system, safe work procedures or safety rules implemented at the workplace.
- not engage in any unsafe or negligent act that may endanger yourself or others working around you.
- not tamper with any safety device or untaken any wilful or reckless acts;

- use personal protective equipment provided to you to ensure your safety while working. You must not tamper with or misuse the equipment.

Roles and Responsibilities of Workplace Safety and Health Committee

- Act as advisory body
- Identify hazards & obtain information about them
- Inspect workplace of any unsafe acts or unsafe conditions
- Inspect any accident or dangerous occurrences occurs at workplace
- Recommend corrective actions & monitor results of implemented solutions
- Promote co-operation between management & employees
- Assist in organizing activities to promote safe conduct of work

Case Study 1 – Fall from Height

Description of Incident

The deceased and his co – worker were tasked to clear the leaves and branches on the rooftop of a building. Upon reaching the rooftop, the co-worker waited for the deceased. After waiting for about 5 minutes, the co-worker walked back to look for the deceased. He found the deceased lying about 1 meter away from the fixed ladder with a trash bag and broom beside him. He was pronounced dead at the scene.

Findings by Investigator

- It was the first time that the deceased and his co-worker attempted to clean the rooftop
- The deceased has probably carried the trash bag and broom thus lost his footing while climbing the vertical ladder
- RA and Safe Work Procedures were not relevant to the ad-hoc work activities which is cleaning of roof-top
- Workers was not wearing safety harness and proper PPE

For Discussion

1. Suggest ways on how the safety of the workers could be improved
2. Present your findings to the class

Learning Unit 2: Recognize Organisational Safety and Health Policies, Procedures and Programmes

This section looks at the importance of personal hygiene practices and personal protective equipment including safety devices commonly used in workplaces.

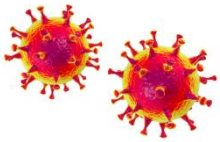
Learning Outcomes (LO)	Abilities (A)	Knowledge (K)
LO2 Practise personal hygiene at workplace and use appropriate Personal Protective Equipment (PPE), safety devices and equipment	A2 Plan work activities to meet WSH requirements	K3 Types and usage of Personal Protective Equipment (PPE), safety devices and equipment
		K4 Types and interpretation of safety signage

Workplace Personal Hygiene, Safety Devices for Machinery and Equipment and Common Safety Signs

Personal Hygiene at Workplace

Why is it important to practise good personal hygiene in any workplace:

1. To get rid of the unwanted germs that tend to accumulate in various parts of human body that causes infection, illness and odours



2. To prevent the spread of infectious disease

The simplest way to prevent illness is to practise discipline related to health like washing hands regularly and keeping the fingernails clean and cut neatly.

Methods of Hand Washing – 8 Steps

Source: https://www.healthhub.sg/live-healthy/471/keepyourhandsclean

When to Wash Your Hands

Source: https://www.fairprice.com.sg/tips/money-saving/7-steps-of-handwashing/

Personal Hygiene Good Habits

1. Keep Fingernails Clean

Hands are always the first and main part of the body that becomes dirt in our everyday activities. Overlooking on the fingernails that accumulate dirt shall cause various infections especially ingestion and contact. To maintain the nails clean:

- Never scrap or scratch anything. Keep the nails short.
- Do not bite your nails. This habit will weaken the nails.
- Soak your nails with warm soapy water for about 2-3 minutes.

2. Wear Clean Attire

Clean clothing acts as a barrier, therefore, it is essential to wear a clean attire to prevent cross contamination of communicable diseases from one person to another.

- wear clothes that have maximum coverage over the body; and
- replace clothes on regular basis especially when soiled, torn or frayed

3. Keep Hair Neat and Tied Back or Covered with Cap

To prevent hair related injuries, i.e., hair trapped within machinery,

- Restrain hair by using hairnet.
- Keep the hair tied or pleated to prevent loose hair.
- Wash hair periodically and keep it clean.

4. Covering Cuts or Sores with Waterproof Plasters

Exposed / cut part of the body is easily prone to bacterial accumulation.

- ensure that all cuts and grazes are clean and have appropriate dressings.
- wash the cut areas with clean water and a gentle cloth to clean the wound
- apply authorized antibiotics or waterproof plaster to cover the wound from exposure to bacteria
- all swabs used to clean injuries shall be disposed correctly.
- if symptoms of yellow liquid persist, see the doctor immediately.

5. Covering Mouth when Coughing or Sneezing

To stop infections, adhere to the following good practices:

- use tissue to cover your mouth and nose during coughs and sneezing.
- dispose the blown nose tissue correctly into a bin
- wash your hands and mouth with clean water

Personal Protective Equipment

What is Personal protective equipment (PPE)

PPE is equipment worn to minimize exposure to hazards that cause serious workplace injuries and illnesses. These injuries and illnesses may result from contact with chemical, radiological, physical, electrical, mechanical, or other workplace hazards.

Responsibilities of employers and workers

Employers are required to train every worker and every worker should know the following info on PPE:

1. when the use of PPE is necessary
2. what type of PPE is necessary
3. how to properly put it on, adjust, wear and take it off
4. limitations of the PPE
5. proper care, maintenance, and disposal of the equipment

Types of PPE and its Functions

There are many types of PPE for the various hazards and industries. All personal protective equipment should be maintained in a clean and reliable fashion. For PPE to be effective, it should fit comfortably. If the personal protective equipment does not fit properly, it can make the difference between being safely covered or dangerously exposed.

Eye Protection (Goggles; eyeglasses, face shield) 	For landscape industry, eye protection safeguards a person against: • against high-speed flying large particles such as wood dusts, grass, pebbles or foreign objects when carrying out tree pruning or grass cutting. • Chemical splash / sprays from activities such as spray paints, mixing of enormous amount of chemicals • Radiations from welding, heat, sparks • Biological infections Workers can also use combination of goggles and face shield for optimum protection to their eyes and face against flying particles, chemical splashes and dust. *Important - face shield should not be used as the sole means of protection against injury to eyes.* <u>Maintenance</u> Eye protection shall be maintained properly by cleaning, avoiding any scratches, breaks. Always keep them clean and dry.

Ear Protection (Ear mufflers, ear plug) 	To reduce the noise level generated form machinery or from the environment when worn. The audible limit for human ears is 85dB. Hearing protectors should be worn if the noise level exceeds the audible limit. For landscape industry, excessive noise could be generated during the operation of chainsaw, grass cutter or ride-on mower. <u>Maintenance</u> The ear plug shall be checked for any wear and tear; replace when it is out of shape, broken. Clean the ear plugs with warm water for hygienic condition.
Hand Protection (Gloves) 	There are different types of gloves that suit the work nature. For example, rubber gloves used in hospitals; neoprene gloves used to handle chemicals in various industries, cements in construction worksites; general plastic gloves used to handle food. Gloves provide protection against hot surfaces, allergic reaction by chemicals; biological protection against infections while handling foods, bacteria and wastes. In landscape industry, hand protection is required when handling chemicals such as pesticide, fertilizer, diesel and working with sharp edged hand tools such as cutters. <u>Maintenance</u> Gloves have to be examined for holes, cuts. Fill water into the gloves to check for any leaks. Remove any ornaments like rings, bracelet while wearing gloves.
Protective Clothing (Overalls/Shirt with Long Sleeves, Long Pants) 	For landscape industry, it is recommended for workers to wear protective clothing, such as a long sleeve shirt to protect them against minor cuts by tree branches/ shrubs and sharp tools as well as UV rays from sun. Additional protective clothing such as chainsaw chaps (pants) will be required for works involving hazardous machinery such as the chainsaw and grass cutter. <u>Maintenance</u> Ensure that the protective clothing have no tears, and are in good, hygienic condition.
Fall Protection (Safety belt, safety harness, Safety /Travel restraint system)	Fall protection equipment provides protection from person falling from height. There are different types of fall protection systems. Example, safety belt, safety harness are personal fall protection equipment. Safety /Travel restraint system restricts the movement of people to a certain distance in respect to the length of the lanyard. In landscape industry, work activities such as horticulture pruning at overhead bridges and tree pruning, require the use of fall protection PPE. For roof top activity, fall restraint roof-edge

	restraint systems will provide limit access where workers could work. These systems will prevent the workers from falling over the edge of the building by limiting or restraining the worker's movement. <u>Maintenance</u> All fall protection system shall be checked daily before usage. Ensure the buckles, stitching, lanyards are in good condition.
Head Protection (Safety helmet /hard hat) 	Head protection equipment shall be worn in condition which give raise to objects fall from height, workers located at high risk environment such as construction sites, or during conductive work such as handling wiring or electricity. The workers who are doing tree pruning activities or horticulture works at heights are required to wear head protection to prevent falling objects hazards. <u>Maintenance</u> The head protection equipment shall be inspected periodically for signs of damage like cracks, ductility, and expiry date.
Respirators (Air purifying, Air supplied respirators) 	Respirators protect the person from breathing in toxic, poisonous gases or vapours. Respirators should be cleaned and inspected by authorized persons. Face pieces should be cleaned in warm water and disinfected with dilute bleach solution. When wearing the respirator, ensure it fits correctly onto the face such that there is no gap around the nose and chin area. The bands should be wound over the ears. <u>Maintenance</u> The respirator should be replaced when it is soiled or damaged.
High Visibility Safety Vest 	The safety vest are worn to improve how well other people "see" them (their visibility), especially at the working areas located along the expressway or roadside. Vest material that is fluorescent lime-yellow or red-orange increases day time visibility while retroreflective material enhances night time visibility vests incorporating retro-reflective material should comply with recognised standards such as EN (Europe) or ANSI (US) for optimal visibility performance <u>Maintenance</u> Over time and with use, the retro-reflective materials and fluorescent dyes can fade with exposure to UV radiation from the sun. dull from wear and tear or become obscured by dirt and grime. Before use, check that the reflective materials does not fade. You can wash the vest with cold water and detergent and air dry to clean the vest.

Foot Protection 	Safety shoes, safety boots provides protection to the legs from impact of heavy objects falling from height, sharp tools, hot or wet surfaces, chemical spills, oily or slippery floor. Maintenance The shoes shall be washed and kept clean. Do not wear other people's shoes for hygienic reasons. Check the shoes regularly for damages. Ensure the shoes are comfortable to wear. Example, correct fit, enough space for front of leg.

In summary, when using personal protective equipment, a worker should:

- be able to recognize the hazards associated with the work involved
- be familiar with the best safety equipment available to protect against the hazards
- know the procedures for using the equipment - check if the equipment is in a good condition - correct ways of putting on the equipment - choose the correct type of equipment
- Keep equipment well-maintained and replace any worn-out equipment.

Workplace Safety Devices for Machinery and Equipment

What are Safety Devices

Safety devices are designed to protect operators from injury and to prevent accidents.

Examples of Safety Devices

1. Fixed Guards

A fixed guard is a physical barrier that prevents a person from coming into contact with dangerous moving parts of a machine. The guard may be shaped to fit the machine quite closely (enclosing guard), or it may be more like a fence around the machine (perimeter guard) and shall not be removed whilst machine is in motion. For maintenance of machine, example lubrication and adjustment, shall be done by trained person only.

2. Safety Barriers or Railing

Safety barrier is provided to prevent person from accessing to dangerous zone or hazardous area as well to prevent access to moving parts of the machine. Examples of safety barriers are:

a) Plastic Mesh Fence

The plastic mesh is used mainly to prevent the unauthorised pedestrians from entering the work area. It shall be kept at least 500mm from the edge of excavation. Plastic mesh fence shall not be used near deep excavations or steep falls where pedestrian movement is expected.

b) Plastic Barricades

Barricades are portable devices used to control pedestrian movement to prevent injury or interference with the work activity. These barricades shall not be used next to deep excavations or steep falls where pedestrian movement is expected.

c) Traffic Cone

Traffic cone is used for short duration delineation and channelling of traffic. The traffic cone shall be placed at least 300 mm away from the edge of the traffic lane. It will guide and direct the approaching vehicles smoothly and gradually to pass the work zone safely. Only the traffic cones approved by LTA can be used on site.

d) Roof Top Railing

The installation of roof top railing will prevent the workers from falling during installation, inspection, and maintenance activities at roof top.

3. Safety Covers

Safety covers provided on the machine is to prevent from traversing or moving parts of the machine hitting the person. Example, belt or conveyors, motors, scabbard for chainsaw. Safety cover can also protect a person from contact with hot surfaces.

4. Safety Signage

Safety signage is an important means of communication to state the type of hazard, procedures to follow and emergency information. There are different types of signage. Examples include Dangers signs, Caution signs, Emergency signs, Warning signs.

- Caution signs are generally yellow in colour
- Warning signs are in red
- Safety information signage is blue (e.g. PPE's)

Safety signs are fixed on the walls; onto the tanks, containers holding hazardous items; mounted on stands. Examples of Safety Signages:

a) Truck Mounted Attenuators

Truck mounted attenuator (TMA) is used when working on expressways and road with speed limit of above 70km/h. The TMA attached to the protective vehicle will provide warning signal to road users or motorist to ensure a safe rod environment.

b) Blinking Beacon Lights

Blinking beacon lights can be mounted on the top and rear of vehicles to warn road users, workers, or motorists. It will enhance the visibility of the temporary traffic control devices and work hazards within the work zone.

5. Emergency Button

Emergency buttons are provided on machine to switch off power during emergency situations. It shall be within reachable distance to person operating the machine or in the electrical panel. The emergency button must be tested once in a month

6. Lock Out Tag Out Devices

Lock out and tag out devices are used to protect against unexpected energizing equipment, to start-up or release of energy. Tags are in place to alert others that a repair or maintenance activity is going on, as well as the name(s) of person(s) at work, and that no one is to operate the machine.

7. Interlocks

Interlocks are provided to prevent machine damage by tripping itself or to the person when the machine is set to stop. Examples include electronic sensors and mechanical stoppers

8. Residual Current Circuit Breakers

A residual-current device (RCD) is an electrical wiring device that disconnects a circuit whenever it detects that the electric current is not balanced between the energized conductor and the return neutral conductor. These are previously known as earth leakage circuit breaker.

9. Circuit Protective Devices

Circuit protective devices are used to protect wires from being damaged by excessive current due to over current or short circuit. Fuses, relays and MCCB are few examples of circuit protective devices

Ensuring Effectiveness of Safety Devices

Maintenance is important to ensure all equipment and machinery are functional. Frequent inspection and replacement are to be carried out to ensure the effectiveness of these safety devices, e.g:

- check that safety devices such as fire extinguishers are valid (e.g., within expiry date, pressure meter shows that the pressure is within the green zone).
- check that equipment's safety features (e.g., safety covers, inter-locks, and emergency stop buttons) are working properly.

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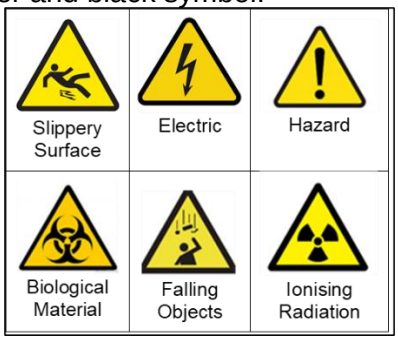
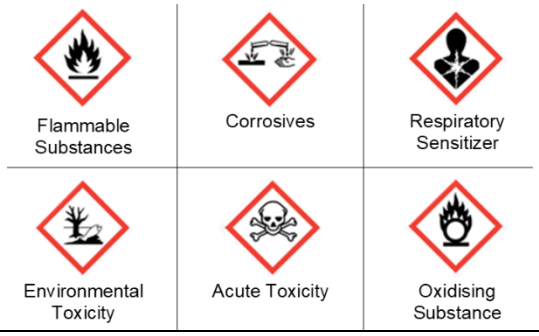
Interpret Common Safety Signs

The purpose of a safety sign is to alert persons to a specific hazard and how the hazard can be avoided. These signs ensure that people are aware of hazards or dangers and help to avoid injury. Safety signs provide information in a pictorial form so that any worker may identify them easily without fully understanding the language. Hence, it is important for workers to know the safety signs commonly located at their workplace.

Types of Safety Signs

Types of Safety Signs		Purpose
Prohibition sign	Colour: A red circular band with circular band with a diagonal cross bar on a white background 	Purpose: To indicate that a certain behaviour is prohibited. Meaning: You must not / Stop/ Do not
Mandatory sign	Colour: A blue circle with a white symbol  *Source: Health and Safety Executive*	Purpose: Indicates that a specific course of action must be taken. Meaning: Carry out instructions shown / You must / Do / Obey
Warning sign	Colour: A yellow triangle with a black border and black symbol. 	Purpose: To warn of any type of hazard. Meaning: Danger / Beware / Careful / Hazard / Caution
Safe Condition sign	Colour: A green oblong or square with a white symbol or text.	Purpose: To provide information about safe conditions. Meaning: The safe way/ Where to go in emergencies/ First aid

		
Globally Harmonised System (GHS)	Colour: A square with red outline and symbol or text. 	Purpose: A system for chemical classification and hazard communication Meaning: Illustrates the hazards, how to classify or handling of industrial and consumer chemicals.
Temporary Traffic Warning Signs	Colour: Orange square 	Purpose: Temporary traffic warning signs to bring the attention to potential hazardous conditions on or adjacent to a road. Meaning: Signals a possible encounter with construction or road maintenance ahead. Normally placed in advance of the site to warn road users of the obstructions or conditions caused by the works ahead.

Workplace Safety and Health Training

Workplace Safety and Health Training

The objective of workplace safety and health training is to equip work persons with the knowledge, skills and attitudes which will enable them to perform their duties in manner that does not represent a safety hazard.

When should workers be trained?

Workers should be trained:

- at the commencement of employment
- when reassigned or transferred to a new job
- when new equipment, processes or procedures are introduced
- when performance does not meet safety and health requirements
- when planning must be done for non-routine or irregular tasks

Besides the training on job procedure and work instructions, other work safety and health training can be mandatory for employees (certain job roles/industries) and may include the following:

a) Workplace Safety and Health Information

- Specific hazards - Falling from height; expose to radioactive materials; suffocation in a confined space, expose to flammable / corrosive chemicals
- Safety signs and symbol - No naked flame; wear PPE; Fire escape route; highly flammable; dangerous material; radiation (refer to PC 1.4 for details)
- Emergency response - Fire outbreak; explosion; chemical spillage; accident / incident; infectious disease outbreak
- Hazard identification, risk assessment and controls - the risk assessment shall be carried out before commencement of any activities.
- Use of personal protective equipment (PPE) - The use and maintenance of PPE

b) Workplace Safety Awareness Training

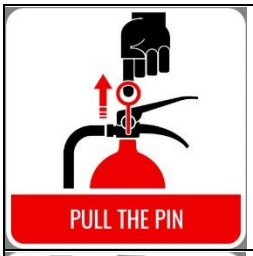
- Safety and health policy of the organization
- Roles and responsibilities in terms of Safety and Health
- Details of Safety and Health representative
- Incident reporting procedure
- Emergency response
- In-house rules and regulations
- Importance of safety and health and consequences of deviation

c) Applying First-aid

Trained first aiders are allowed to render first aid treatment for the deceased. The appointed first aiders shall attend occupational first aid course by approved training provider.

d) Use of Fire-fighting Equipment

Use PASS technique while using fire extinguisher:

	**P**ull the Pin at the top of the extinguisher.
	**A**im at the base of the fire, not the flames.
	**S**queeze the lever slowly. This will release the extinguishing agent in the extinguisher.
	**S**weep from side to side**.** Using a sweeping motion, move the fire extinguisher back and forth until the fire is completely out.
Remember: Aim at the base of the fire, not at the flames!!!!	

e) Use of PPE - Employees shall be trained in donning PPE. General information to be provided to all employees:

- PPE must be clean, serviceable, and readily available for use.
- PPE shall fit for purpose and be specific to substance that come in contact with.
- Use chemical resistance suits/ gloves / safety boots/ goggles when handling chemicals, mixing and loading, cleaning equipment
- Hard hats and safety helmets shall be liquid proof with wide brim, have no absorbent material
- Sequence of donning various PPE's
  - Gown first
  - Mask or respirator
  - Goggles or face shield
  - Gloves

f) Handling of Toxic and Flammable Chemicals

Chemicals can be hazardous if they are not handled or used properly. Manufacturers or suppliers must provide information on the chemicals in the form of a safety data sheet (SDS). Employees shall be trained in storage and handling of chemicals.

g) Handling of Spills

Employees shall be trained in responding to chemical spillage and use of spill kit. The SDS should be referred to for the proper clean-up of the spill.

h) Disposal of Chemical and Toxic Waste

The disposal of chemicals must not be taken lightly. Waste chemicals should be disposed properly to prevent pollution and endangering the safety and health of employees. The SDS should be referred to for the proper disposal method, and disposal should comply with the requirements stipulated by the National Environment Agency (NEA).

i) Safe Operations of Overhead Equipment

Only trained and authorized person shall operate the overhead equipment like cranes, hoist, mobile elevated work platforms.

j) Safe Operations of Powered Tools

Only trained and authorized person shall operate the powered tools, e.g., powered drill, chainsaw, water jet.

Organization are to provide refresher/retraining where required in line with statutory requirements (e.g., occupational first-aid, mobile elevated work platform).

Learning Unit 3: Conduct Risk Assessment in Accordance with Regulatory and Organizational Requirements

In this segment, we will cover the WSH Risk Management regulations and relevant legal requirements. We will review the equipment and tools used in landscape industry and hazards associated with it, their preventive measures as well as the control measures.

Learning Outcomes (LO)	Abilities (A)	Knowledge (K)
LO3 Participate in Risk Assessment activities including hazard identification, risk evaluation and risk control measures for the workplace	A3 Schedule daily work activities in accordance to organisational WSH procedures	K5 Organisational WSH procedures and Risk Assessment (RA)
	A4 Identify and monitor hazards by conducting WSH checks on work areas, safety signage, safety devices and equipment	K6 Types of hazards on work area, safety signage, safety devices and equipment.
	A5 Seek appropriate advice for monitoring hazard checks	K7 Common manufacturing hazards and risk controls

Risk Assessment at Workplace

Definition of Risk

A 'risk' means the likelihood that a hazard will cause a specific harm or injury to persons or damage to property.

Persons At Risk

At workplace, there will persons that may be affected by the works that is being carried out. They can be:

i. Persons directly involved in the work operations OR
ii. Persons not directly involved in the work operations, i.e.
   - Visitors of the workplaces
   - Members of the public

What is Risk Management (RM)?

RM involves assessment of risks associated with any work activity or trade. It also includes control and monitoring of such risks, as well as communicating these risks.

The key components of the RM process are: Preparation, Risk Assessment, Implementation, Record-keeping and Review.

Risk Assessment Process

Risk Assessment is the process of identifying safety and health hazards associated with work, assessing the level of risks involved, and incorporate appropriate measures to eliminate or minimize risks following the hierarchy of control.

Risk Assessment (RA) is key to reducing workplace risks. Three steps in RA:
1. Identification of hazards associated with such workplace activities
2. Evaluate the risk levels through **SEVERITY** of hazards and **LIKELIHOOD** of occurrence
3. Implement WSH control measures to eliminate or minimum the risk

Identification of Hazards at Workplace

Definition of Hazards
Hazard means anything with the potential to cause harm or danger such as death, injury, ill health or damage to property.

Hazards Identification
To start identifying hazards, consider the following:

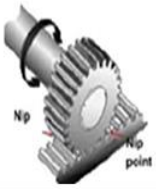
1. Source of hazards

WSH Hazards Classification	Examples
Physical Hazard	• Working at height • Slips and trips hazards • Falling objects • Prolonged exposure to extreme of temperature • Exposure to excessive level of noise • Accidentally contact with sharp objects
Chemical Hazard	• Accidentally contact with / exposure to corrosive, flammable, carcinogenic chemicals • Improper storage and handling of chemicals
Mechanical Hazard	• Contact with sharp point/pinch point • Equipment operated by non-competent persons • Faulty machinery and equipment safety devices, e.g. absence of safety guard • Poor maintenance of machinery and equipment
Electrical Hazard	• Overloaded plug • Exposed wire • Un-insulated wires • Use of faulty equipment • Electrical installation without tripping devices
Ergonomic Hazard	• Awkward / static posture • Repetitive work • Over-stretching
Biological Infectious disease outbreak	• Bitten by animals; stung by insects; contact with poisonous plants • Exposure to bacteria; fungi • Outbreak of contagious disease: Avian flu, seasonal flu
Radiation hazard	• Expose to radiation like alpha particles, beta particles, gamma rays, X-rays, neutrons

Fire and explosion	• Incompatibility of activities, e.g., presence of naked flame in vicinity with the storage of flammable materials • Incompatibility of storage of chemicals • Obstruction to the ventilation of heaters, machinery, or office equipment
Psychosocial	• employees' poor mental well-being, stress, fatigue, work overload
Environment	• Confined space • Lack of ventilation • Poor housekeeping, e.g., untidy workstation

2. Hazards Associated with Tools, Equipment, Materials and Machines

Expose to sharp or cutting edges



Exposed to nip points

Exposed to protruding objects

Exposure to high powered machine

3. Hazards associated with Work Processes/Activities, Workplace Conditions and Environment

a) **Hazardous Conditions –** *Other that tools and equipment, there are other external factors that can contribute to hazards at work, such as:*

i. **Working in Confined space** – confined space is area which is both enclosed, or largely enclosed, and which also has a reasonably foreseeable risk to workers of fire, explosion, loss of consciousness, asphyxiation, or drowning.

ii. **Improper Storage of toxic or flammable substances** - there are chemicals and gases found in the environment we work in. These chemicals can be hazardous. Refer to the Safety Data sheet for instructions before working with the chemicals

iii. **Poor Housekeeping (includes unstable stacking of materials) -** Good housekeeping helps to maintain a safe and clean work site and prevent accidents. Problems associated with poor housekeeping - slip, trip and fall, Mosquito breeding, Poor fire safety, Low productivity, poor work quality, Health problems, Lost of tool

iv. **Working at unbarricaded floors –** risk of trip and fall

v. **Slippery floors** – risk of falls

vi. **Excessive noise -** Workers should not be exposed to noise levels exceeding 85dBA for eight hours a day or its equivalent. Prolonged exposure to excessive noise can lead to noise-induced deafness. Refer to WSH (Noise) Regulations 2011, Part IV, The Schedule for noise limits.

vii. **Unguarded Machines** - risk of others being injured

b) Hazardous Atmosphere

i. **Lack of oxygen –** when supply of air is inadequate, or is likely to be reduced to be inadequate, for sustaining life (oxygen deficiency, less than 19.5% vol oxygen) can cause breathing problems.

ii. Improper storage of chemicals - Chemicals can be hazardous if they are not handled or used properly. Refer to information on the chemicals in the form of a safety data sheet (SDS).

iii. **Poor Indoor air quality** - refers to the air quality within and around buildings and structures. Poor air quality affects occupants.

iv. **Presence of mist, fume or dust in poor ventilated area** – high concentration of those in an enclosed space can cause explosion.

c) Work Conditions or environment that expose person(s) to risks

i. **Working during lightning -** working outdoors in open spaces, near tall objects or near conductive materials such as metal have significant exposure to lightning risks. If there are signs of approaching thunderstorms occur, workers should not begin any task they cannot quickly stop.

ii. **Working under hot sun** - Heat stress is the buildup in the body of heat generated by the muscles during work and from heat coming from the hot work environment. When the body is overheated, less blood flows to the brain, muscles and other organs. Workers and supervisors should be trained in the prevention, recognition and treatment of heat stress.

iii. **Working in work environment that has lack of Personal Protective Equipment** – risk of falling from height if there is no proper safety harness, risk of inhalation of chemicals if there is no respirators, risks of cuts if there are no gloves, etc.

iv. **Irregular floor surfaces** – lead to fall, trips, or hit by flying objects

v. **Inclement weather** - Wet weather and windy conditions can pose additional workplace risks for workers – e.g. forested area - tree fell, lightning; electrical risks slips, trips, and falls.

Wet Weather Safety - what to do during wet weather?

- Take shelter immediately in dry sheltered areas
- Not using power tools in the rain or under wet conditions
- Avoiding work at heights until the weather improves
- Looking out for slip and trip hazards, especially in wet work areas;
- Wearing the appropriate personal protective equipment (anti-fog eye protection, insulated gloves, safety boots, etc.)

d) At Risk behaviours

Most injuries in the workplace are caused by at-risk behaviour. An at-risk behaviour is taking a chance or ignoring an established safety policy or procedure. To reduce injuries, we must increase safety awareness and eliminate at-risk behaviours. Unsafe practice can refer to:

- human action, resulting NOT adhering to prescribed hazard controls, job procedures or practices.
- an action causing a person unnecessary exposure to a hazard.

Examples of **At-Risk behaviours:**

- **Struck by or Struck Against Objects** - be aware of the surrounding or other workers handling tools/equipment that could potentially cause harm to you. e.g.- Standing below suspended load or on top of unsecured load

- **By-passing safety procedures -** e.g. Safety harness are not being used or not secured properly before start working at heights. Another unsafe practice would be to allow workers to perform work at height without installing barricades at edges.

- **Untrained or unqualified persons to person an operation** - e.g. allowing a chainsaw to be operated by a person not trained or not authorized to operate the chainsaw.

- **Disabling or bypass safety design features** - e.g. - Removing chain brake from chainsaw or bypassing limiting switches in a crane.

- **Taking short cuts** - e.g. - In tree pruning, do not employ a one cut method to remove the whole branch or climbing trees without proper ladders, tools, PPE.

- **Inappropriate tools/equipment to carry out tasks** - e.g. - Using a chainsaw when other types of saws are more suitable. Another example would be using water type fire extinguisher to extinguish a fire caused by electrical fault.

Other factors to consider when identifying hazards:
- proximity of hazardous activities to one another
- non-routine work activities and situations

4. Individual and Work Organisational Factors

i. Work Organisation - Poor work organisation such as work overload, prolonged working hours, poor communication between supervisors and staff could lead to hazards at work. Tasks at work could be organised in a manner that underlying causes of unsafe behaviour and ill health are reduced, so that work can be carried out safely. Hazards that may arise from poor work organisation.

Poor Work Organisation	Impact on poor work organisation leads to decrease in	Poor Work Organisation leads to increase in
• Work overload with unrealistic deadlines; • Lack of influence or control over how day-to-day work is done; • Prolonged working hours that may lead to fatigue and loss of concentration on the job; • Employees returning to work after recovery from injury/illness • Lack of training or preparation to do the job; • Ambiguity in job responsibilities or unclear expectations; • Poor communication among superiors and colleagues;	• Attention & vigilance • Reaction time • Memory recall • Decision-making ability • Ability to do complex tasks • Productivity &performance • Ability to handle stress • Ability to communicate	• Error in judgment • Tendency for risk-taking • Forgetfulness • Accident rate • Absenteeism

ii. Individual health factors - Older employees, employees with pre-existing health conditions, obese employees are also the factors to look at when assessing risks at work. Proper work organisation should be in place to manage individual with conditions.

Situational Awareness

Apart from hazards identification, individuals must make careful, safe decisions when faced with a potentially unsafe scenario. Situational awareness is the practice of actively monitoring surroundings in the workplace and identify threats before they occur, therefore having time to react.

Examples of Situational Awareness on the job

- Truck drivers need to watch out for hazards that could lead to an accident, such as inclement weather, unsafe drivers in surrounding lanes, or debris on the road
- Forklift operators are responsible for maintaining a reasonable speed, safely balancing the loads they're carrying, and watching for people or objects in their path

Improving Situational Awareness at Workplace:

1.	Adopt a **structured situational awareness framework**, i.e: SLAM Technique I. **Stop** and think before proceeding II. **Look** around your work environment for safety hazards III. **Analyse** the risks present and whether you're prepared for them IV. **Manage** the situation, and if necessary, halt work until you can mitigate the risks
2.	Stay **focused**: • Limit electronic device usage • Discourage multitasking • Manage disruptions - Employees who work with heavy equipment or dangerous substances need absolute focus.
3	Watch out for **fatigue**: stress, heat, and overexertion, both physical and mental can also lead to fatigue.
4	Be **vigilant**
5	Management, supervisors are to encourage **clear and thorough communication**
6	Use **visual and auditory signalling devices**. Examples of signals that promote situational awareness: • Flashing lights on heavy machinery when it's in operation • Clear, loud beeping when vehicles such as trucks or forklifts are backing up • Brightly coloured barriers, cones, or fences around non-obvious hazards like oil slicks, ice, or chemical spills
7.	Supervisors are to **reinforce situational awareness safety tips** until they become second nature.

SG Secure

What is SG Secure?

SGSecure is a national movement to sensitise, train and mobilise our community to play a part to prevent and deal with a terrorist attack. It is to ensure that whole of Singapore can come

Vigilance	Cohesion	Resilience
•Stay Alert - to ever present security threats	•Stay United - as one people during peacetime and in crisis	•Stay Strong - to be resilient and bounce back quickly in a crisis.
✓ Train workforce to be alert to unusual behavior or items in surroundings ✓ Know how to report these to authorities	✓ Imbue the need to cherish and safeguard Singapore's multi-racial and multi religious social fabric	✓ Enable workforce to protect themselves and others during an attack. ✓ Strengthen preparedness through exercises

Do Your Part

1) Download the SGSecure app. With the app, you can:
   a) receive alerts during emergency
   b) subscribe to localised area alerts
   c) report suspicious articles or persons, or an on-going attack
   d) make geo-tagged emergency calls and SMS using a quick access button
   e) Access SGSecure e-learning resources

2) Report when you see anything suspicious (Abnormal, Irregular, Strange or Unusual), e.g. unattended articles, suspicious human behaviour or vehicles. Call the Police immediately and provide information.

3) In event of a terrorist attack,
   - RUN away from danger
   - HIDE if you can't escape, hide
   - TELL inform the police

Evaluating Risk

Evaluating risk is dependent on severity of risk and likelihood of hazards occurring.

severity X likelihood = risk level

- Severity of Hazard - the degree or extent of injury or harm caused by the hazards, or as a result of an accident. The severity is classified into five categories
- Likelihood of occurrence of an accident or incident or ill health

Guide to Severity Rating

Level	Severity	Description
5	Catastrophic	Death, fatal diseases or multiple major injuries.
4	Major	Serious injuries or life-threatening occupational diseases (includes amputations, major fractures, multiple injuries, occupational cancers, acute poisoning, disabilities and deafness).
3	Moderate	Injury or ill-health requiring medical treatment (includes lacerations, burns, sprains, minor fractures, dermatitis and work-related upper limb disorders).
2	Minor	Injury or ill-health requiring first-aid only (includes minor cuts and bruises, irritation, ill-health with temporary discomfort).
1	Negligible	Negligible injury.

Guide to Likelihood Rating

Level	Likelihood	Description
1	Rare	Not expected to occur but still possible.
2	Remote	Not likely to occur under normal circumstances.
3	Occasional	Possible or known to occur.
4	Frequent	Common occurrence.
5	Almost Certain	Continual or repeating experience.

Risk Level can be Low, Moderate or High. The table shows the recommended action to manage risks.

Risk Level	Risk Acceptability	Recommended Action
Low Risk	Acceptable	No additional risk control measures may be needed. However, frequent review may be needed to ensure that the risk level assigned is accurate and does not increase overtime.
Medium Risk	Moderately Acceptable	A careful evaluation of the hazards should be carried out to ensure that the risk level is reduced to as low as is practicable within a defined time period. Interim risk control measures, such as administrative controls, may be implemented. Management attention is required.
High Risk	Not Acceptable	High Risk level must be reduced to at least Medium Risk before work commences. There should not be any interim risk control measures and risk control measures should not be overly dependent on personal protective equipment or appliances. If need be, the hazard should be eliminated before work commences. Immediate management intervention is required before work commences.

Learning Unit 4: Implement Risk Control

In this segment, we will learn how to implement risk control measures on the identified hazards and communicate the identified hazard, risk evaluated, and implemented risk control measures to relevant stakeholders.

Learning Outcomes (LO)	Abilities (A)	Knowledge (K)
LO4 Apply risk control measures according to the risk management plan and explain implemented risk control measures to stakeholders	A6 Perform risk controls	K8 Types of risk control measures
	A7 Report any abnormalities and problems encountered in complying with WSH requirements	
	A8 Provide constructive suggestions to apply WSH practice	
	A9 Contribute ideas to enhance WSH programmes	
	A6 Perform risk controls	

Risk Control

Controls are the measures put in place to decrease the likelihood or consequences from an unwanted event. They can:

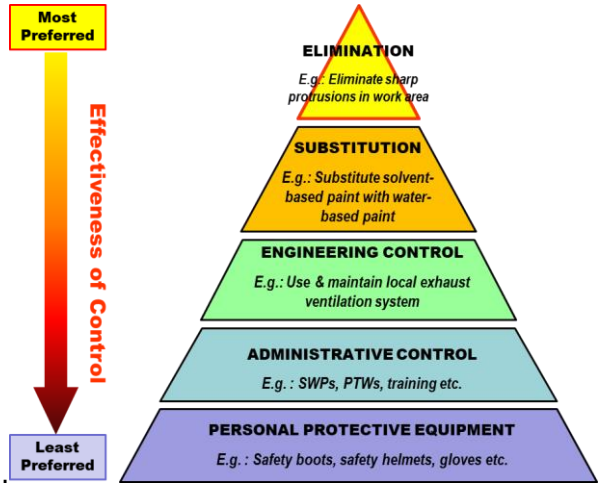
- prevent the unwanted event or reduce the loss of control of the hazard (e.g., reduce or contain energy release)
- reduce the effects (e.g., provide shield from hazard; event has happened, but emergency response and medical treatment reduce the severity and duration of consequences).

Using Hierarchy of controls to Lower the Risk Levels

Controlling the safety and health risks in a workplace is necessary to prevent injury and illness.

After identifying and assessing the risks, decide on the best way to control (i.e. remove or reduce) them, by applying the Hierarchy of Control.

The control of hazards and reduction of risks can be done by following the Hierarchy of Control:



- Elimination - elimination is the most preferred option in controlling hazards and preventing injury and ill-health in a workplace.
- Substitution - replace a hazard with one that has a lower risk potential.
- Engineering Control - physical means introduced to limit a hazard, such as, isolation, structural changes, noise absorber.
- Administrative Control - reducing hazard by adherence to procedures, instructions and safe work practices
- Personal Protective Equipment -using personal protective equipment is the last consideration of risk control measures. Usually, it is used as an additional means of personal protection against hazards and risk to safety and health.

Risks Associated with Assigned Tasks and Recommended Risk Controls

Tasks	Hazards	Possible Injury	Risk	Risk Control Measures
Use of hazardous chemicals	Potential health concern	Burns	High	• Replace with less hazardous chemicals (Substitution) • Proper storage, handling of chemicals (Administrative control) • Use of suitable personal protective equipment (PPE)
Carry of heavy items	Potential backache due to improper posture or repetitive movement	Injury to back	Medium	• Use of trolley (Engineering control) • Buddy system (Administrative control)
Using ladder to access high area	Potential falling from the ladder due to broken rung	Fall from height	Medium	• Use of mobile elevated work platform (Engineering control) • Check the conditions of ladder before using (Administrative control)
Using of chainsaw for tree pruning	Potential noise induced deafness due to exposure of excessive noise	Deafness	High	• Use of proper hearing protection (PPE)

Implementation of Risk Control

Obtain Employer / Management Approval. They are to:

- Approve RA form
- Prepare an action plan to implement the measures
- Implement the recommended risk control measures
- Monitor the action plan

Risk Communication

Communicate the hazards identified and their controls - Communication is important for RM to be effective. There should be two-way communication between the employers or management and employees. Hazards and their controls must be communicated to the employee performing the work activity. The employer or manager who oversees the work area, function, or activity where risks exist must ensure that all persons exposed to the risk are informed of:

- nature of risks involved
- Measures to mitigate and control risks (how to apply them properly)
- Safe work procedures implemented (who, what when, and how)
- Management of change (e.g., equipment, work procedures, personnel)

Who to inform?

All the stakeholders, including:

1. Persons performing the work
2. Persons exposed to the risks
3. Supervisors
4. Management staff
5. Customers
6. Contractors/suppliers
7. visitors

Helping to Resolve Hazards and Risks in Your Organisation:

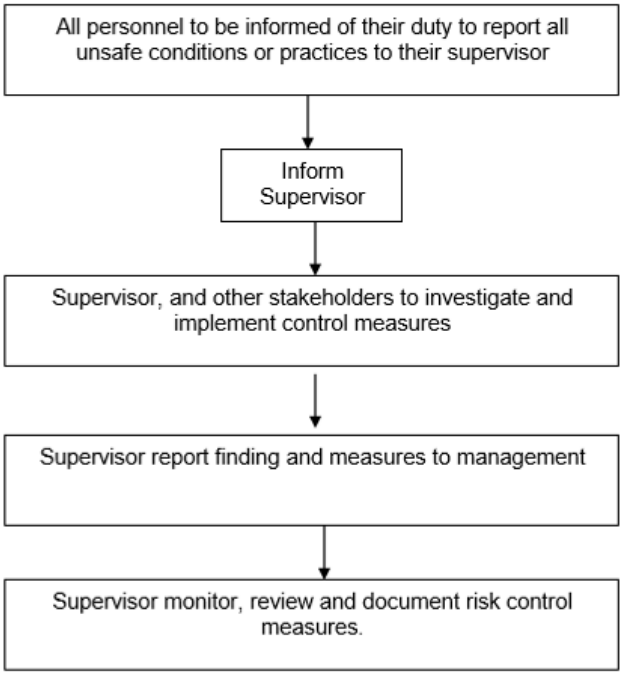
There are various ways to help your organisation to minimise hazards and risk. Employees can feedback unsafe conditions and practices at work to improving organizational WSH and reporting WSH issues through the following avenues:

What to report

Once you spot an unsafe condition, you can immediately report it to your supervisor so that the necessary action can be taken to remedy the condition (make the condition safe) before an accident happens. Things that you need to take note of and to be reported:

- Date and time
- Nature of abnormality / problem
- Location
- Equipment / personnel involved

Flow Chart for Reporting of WSH Issues



Record Keeping

Risk Assessment records must be available upon request. Employer/Manager are to:

- Ensure RA records to be readily available upon request
- RA records include:
- RA forms
- RA Register
- Risk control measures records
- Safe work procedures
- Training records

Learning Unit 5: Coordinate Workplace Emergency Response Procedures

This section looks at the roles and responsibilities of emergency response team members and the importance of following instructions in an emergency.

Learning Outcomes (LO)	Abilities (A)	Knowledge (K)
LO5 Demonstrate the proper emergency procedures when dealing with emergencies at workplace	A10 Follow organisational emergency and evacuation procedures in the event of emergencies or drills	-

Workplace Emergency Response Procedures

Definition of Emergency

An emergency is a situation that poses an immediate risk to health, life, property, or environment. Most emergencies require urgent intervention to prevent a worsening of the situation, although in some situations, mitigation may not be possible, and agencies may only be able to offer palliative care for the aftermath.

All employees and the management are to comply with the WSH Act and its subsidiary legislations. Workers are required to respond to workplace emergencies. They can do this by:

- following emergency procedures
- following instructions from authorized persons and participating in emergency exercises

The Relevant Regulatory Bodies for Emergency Guidelines

Ministry of Manpower

- Workplace Safety and Health Act
- WSH (General Provisions) Regulations
- WSH (Risk Management) Regulations
- WSH (Incident Reporting) Regulations
- WSH (First Aid) Regulations.

Singapore Civil Defence Force

- Fire Safety Act
- Fire Safety (Building Fire Safety) Regulations (Regulations 24)
- Guidelines for Emergency Response Plan, SCDF
- Maintenance of firefighting and fire protection systems, SCDF

National Environment Agency

- Environmental Protection and Management Act

Role and Responsibilities of General Worker in Emergency Situation

The responsibilities of a general worker in response to types of emergencies at the workplace include:

- Checking if colleague / buddy is safe and is aware of the emergency
- Leaving the workplace in an orderly manner via the nearest exit
- Evacuating to the designated evacuation assembly area
- Responding to roll-call when name is called
- If qualified to do so, assisting in the emergency where required
- Providing information as best as possible

Each organization will have procedures to handle different emergencies. These procedures can include knowing:

a) where emergency equipment are located and how to use them,
b) evacuation procedures, and
c) the duties and authorities of the emergency response team.

Types of Emergencies at Workplace

There are various types of emergencies that can happen at the workplace. They can be:

Non-Emergency Incidents

- Near miss, close call
- Small cut / bruises due to slips & trips

React to Emergencies at the Workplace

<u>Organisational procedures when responding to emergencies</u>

Every workplace has emergency response plans and designated emergency response teams. Each emergency response team is responsible to:

- Assess and manage emergencies,
- Mobilise resources to deal with the situation
- Conduct rescue and evacuation, and Conduct crowd control and roll calls at assembly areas

They also have to:

- Coordinate with external emergency response teams
- Present reports; and
- Ensure security of the area

Emergency Response Plan

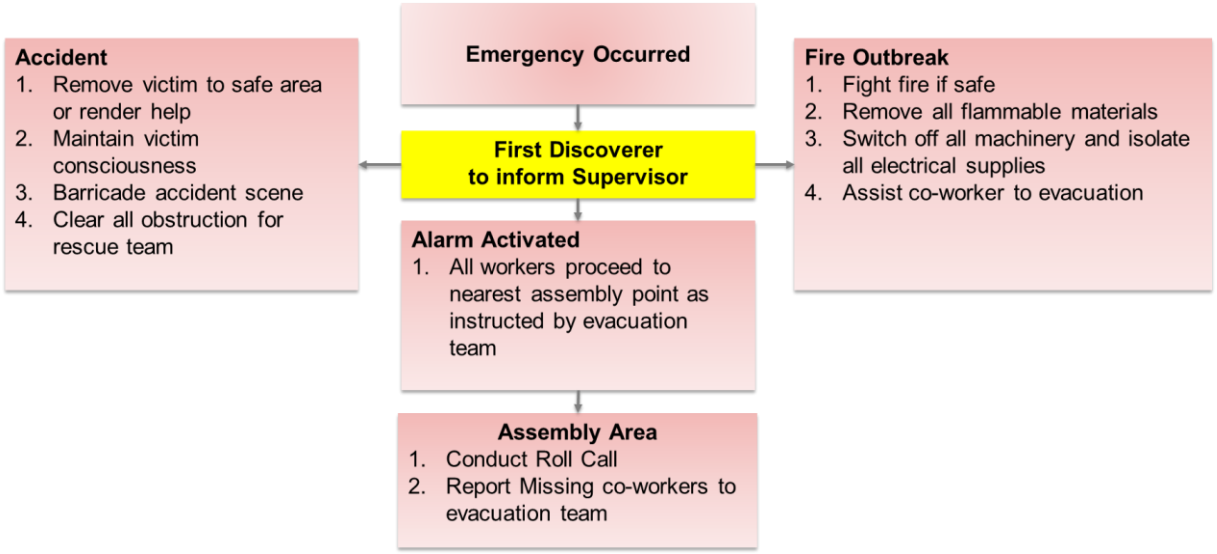
The organization will have emergency response plan elaborating on the following:

- Potential emergency situation
- Emergency response procedure
- Details of Fire fighting team, First aid team
- Information on authorities like NEA for Chemical spill; SCDF, Police; MOM; Ambulance services, nearby medical facilities

All the staff must follow according to the organizational emergency response plan. Emergency exercises where you can be involved in are:

- Fire fighting
- Rescue operation
- Containment of chemical
- Hazardous material release
- Medical and first aid activities (if trained)

Flow Chart for Reacting to Emergency



Reporting Workplace Emergencies to Supervisors

When faced with emergency, the person involved must take note of the following in order to provide detailed reporting to the emergency services:

- Type of emergency
- Personnel involved - Who, how many people
- Injuries / fatalities sustained - E.g., burns, broken limbs, head injuries
- Hazard involved - E.g. unstable structure (after collapse), toxic gas
- Location - Place of the incident.
- Brief description of the incident

Activating Emergency Services

There are 3 main numbers to call in event of emergency:

Main police stations: 999
Fire or emergency ambulance: Call 995
Nonemergency ambulances: (1777)

Which number to call depends on the situation and you should follow organizational procedures when activating emergency services.

Circumstances to call 999:	When immediate police assistance is required, e.g: • A crime is in progress e.g., someone breaking into an office, witnessing a fight • Someone suspected of committing a crime is close by, or you know where the person is. 999 could also be called when: • someone is seriously injured or in danger, and • When you see suspicious characters, incidents or parcels unattended at public areas
Circumstances to call 995	There are many emergencies that require SCDF's assistance. They include: - Unconsciousness, - Difficulty in breathing or choking, - Severe chest pains - persistent severe abdominal pain, - Deep cuts or wounds with profuse bleeding - Dislocated or broken bones - Head injuries followed by drowsiness, vomiting, bleeding (from the ears, nose or mouth) or unusual behaviour - Injuries to chest, abdomen, pelvis or spine (which consists of the neck and backbone) - Fall from heights Other emergency situations include: - cases of poisoning, - severe allergies - Burns and scalds that is causing white or charred skin covering a large area bigger than size of a hand, or covering the face - Crushed injuries - Drowning - Burns caused by electric shock or by lightning
Circumstance to call 1777	Non-emergency medical cases. These are cases where treatment can be delayed. Examples includes: - slight abdominal pains, slight fever, coughs and colds - Aches and pains which have been present for a long time - Minor bruises, slight cuts or broken skin - Slight burns or scalds - Mild vomiting, diarrhoea

List of Essential Contact Numbers

The list below is a good practice for workplaces to display for easy reference and quick response:

Services	Number
SCDF (Ambulance and Fire Brigade)	@ 995
Police	@ 999
MOM OSD	@ 6317 1111
Police Hotline	@ 1800 2550 000
Ministry of Health Hotline	@ 1800 3339 999
Singapore Power Hotline	@ 1800 7788 888
Piped Gas Hotline	@ 1800 7521 800
Supervisor	@
Safety Officer	@
Guard House	@
HR Department	@
CEO or MD	@
Clinic or Doctor	@
First Aider	@

Resources Required for Workplace Emergency Response

There are different types and uses of equipment and materials required for workplace emergency response.

a) Personal Protective Equipment

Type of PPE	Examples	Functions
Respiratory protector	N95 and surgical masks, air purifier, powered air purifying, supplied air, self-contained breathing apparatus (SCBA)	To prevent inhalation of hazardous emission of gas, bacteria, viruses or dust. N95 respirators are disposable respiratory protectors. Respirators filter the air breathe in to help protect from microorganisms including bacteria and many viruses.
Eye protection	Face shield and goggles	To protect against incidental splashes to face and eyes.
Hand protection	Disposable gloves, leather gloves, heat resistant gloves	To protect against burns or exposure to e.g. hot surfaces, blood or bodily fluids.
Foot protection	Safety boots, anti-slip footwear	To protect against incidental struck by heavy objects and slip and fall due to wet condition.
Head protection	Hard hats/safety helmets	To protect head against falling objects or knock against objects.

Depending on the nature of the emergency, different types of PPE may be required.
For example, during an infectious disease outbreak, these are the PPE required:

- Disposable gloves
- N95 masks
- Disposable gowns
- Goggles
- Safety shoe covers

Whereas, these are the equipment needed to manage chemical spills:

- Chemical Protective Clothing
- Respirators
- Chemical Resistant Gloves
- And Safety Glasses or Splash Goggles

b) ***Fire Emergency*** - Fires are divided into five main classes: A, B, C, D, and K. The classification of a fire dictates the type of extinguisher required. *Note: Used only by trained personnel and for small fires*

Class Letter and Symbol	Pictogram	Description	Extinguishing requirements
Class A Fires 		Fires involving ordinary combustibles (e.g. wood, paper, cloth and many plastics)	Require the heat absorbing (cooling) effects of liquids and certain chemicals that retard combustion
Class B Fires: 		Fires involving flammable liquids, grease e.g. gasoline, paints and oils.	Require extinguishers that prevent these vapours from being released or that interrupt the combustion
Class C Fires: 		Fires involving energized (live) electrical equipment e.g. motors, switches	Nonconductive extinguishing agents are required to provide safety to the operator
Class D Fires: 	none	Fires involving certain combustible metals, such as magnesium, titanium, zirconium, sodium or potassium	Require a heat absorbing extinguishing medium that is not reactive with the burning material
Class K Fires: 		Fires involving commercial cooking equipment	Extinguishers work through saponification to extinguish flames completely

(Source: https://opentextbc.ca/workplacesafety/chapter/emergency-procedures/)

Other Equipment to Manage Fire

Fire Hose

- All factories, commercial and industrial buildings are equipped with enough fire hoses at each level. It is normally housed in fire hose cabinet.
- While using the hose, turn on the valve and release all the hose to its maximum length

Fire Alarm System

- Fire alarm system is activated at the call point.
- Manual call points are clearly identifiable and simple to use with instruction on it like “Break the glass and press to sound the alarm”.

Smoke Alarm System

- A fire detector installation is to detect the fire at initial stage when it starts smoking. The smoke reached the detection system and then will automatically trigger the alarm to notify the fire.
- The detectors then can significantly reduce the impact of the fire and property or material loss.

c) ***Barricades and Warning Sign****s* - used to forewarned hazards and prevent access and falling from height.

Barricades are installed to prevent people from entering an area that may be hazardous or high risky activity in operation. Example:

- Overhead activities
- Spillage due Use of chemicals / painting
- Collapse of building
- Fatal accident

Warning signs are to be provided to inform workers:

- Personal protective equipment required (e.g., respirators).
- Hazardous substances

d) **First-aid Kits -** First aid box is to be provided where there are more than 25 workers. Items in the box include:

Items in First-aid Box
• Individual wrapped sterile adhesives dressings • Crepe bandages Absorbent gauze Hypoallergenic gauze Triangular bandages Scissors • Safety pins • Disposable gloves • Eye shield • Eye pads • Resuscitation mask • Sterile water/saline Torchlight 

e) **Chemical Spill Kit -** contains chemical absorption materials or containments kits to contain and clean spills. Spillage kits offer a simple and effective way to deal with spillages of hazardous substances, for example cytotoxic drugs, blood and bodily fluids.

f) **Biological Hazard Protective Suit -** Biological hazard protective suit to protect against exposure to biological hazards.
- Provides protection against dual-use industrial biological warfare agents.
- Garment is designed for one operational use.
- Coverall must be disposed of after any chemical liquid or vapour exposure.

Responding to Emergency

Let's take a look at the various scenarios and the steps to take in event of:

Fire or Explosion 	On discovery of the fire or explosion: 1. Combat the fire if safe to do so. Make sure you have trained to use the fire extinguishers. 2. Raise the alarm by breaking the glass call point to activate the fire alarm. 3. Dial the in-house emergency number. 4. Escape route should be kept open should the fire escalate.

Fire alarm 	When you hear the fire alarm, 1. Evacuate using fire emergency exits 2. Proceed to the assembly area. 3. Wait for Role Call and Instructions of the Incident Site Commander 4. Find out the evacuation plan 5. Know where the assembly area is
Collapse of Structures or Equipment 	If there is collapse of any structures or equipment at your site, 1. Stop all work and switch off machines and equipment immediately. 2. Vacate the workplace and gather at the assembly area. 6. Do not run or carry any portable tools during evacuation
Hazardous Chemical Leaks or Spills 	If you are in contact or close contact with chemical leaks or spills, 1. Take a thorough shower. 2. Seek medical treatment immediately. 3. Place exposed clothing and shoes in tightly sealed containers. 4. Report to supervisor
Injured/Unconscious Person 	If your fellow colleagues are injured and unconscious, 1. Dial in-house emergency number. 2. Provide basic information which include: − The location − Person injured − Condition of the person injured. 3. Follow instructions given by person manning the emergency number
Heat Stroke 	Helping Someone with Heat Stroke - If you notice someone with signs of heat stroke, call 995 for an ambulance immediately. While waiting for the ambulance, you should: 4. Move the person to a shady or cooler area; 5. Loosen or remove the person's clothing; 6. Apply cool water and fan on the person; Place ice packs under the person's armpits and groin area

Fatality 	For accidents involving death, 1. Inform supervisor or security personnel immediately 2. Body of the deceased including immediate surroundings not to be moved or disturbed in any way.
Electrocution 	For accidents involving electrocution, 1. On finding a person in electric shock raise the alarm by calling for help from colleagues. 2. Switch off the power if possible. Push the person away from the conductor using a wooden object. 3. Call for ambulance
Fall from Heights 	For accidents involving falls, 1. Prompt rescue shall be provided for personnel who have fallen by contacting 999 or radioing for help. 2. No work shall be performed where an emergency cannot be immediately observed and prompt rescue assistance summoned. 3. Unless casualty is in a position which exposes him to further danger, do not attempt to move a patient with a suspected broken bones or injured joints. 4. Wait for medical attention to arrive.
Strike by Lightning 	1. If a person if struck by lightning, call 999 and get medical care immediately. 2. Cardiac arrest and irregularities, burns and nerve damage are common in cases where people are struck by lightning. 3. However, with proper treatment, including CPR if necessary, most victims survive a lightning strike. Unlike electrocution, you are in no danger helping a lightning victim. The charge will not affect you.

Infectious Disease Outbreak and Control

Infectious diseases are illnesses caused by harmful agents (pathogens) that get into your body. The most common causes are viruses, bacteria, fungi and parasites. Infectious diseases usually spread from person to person, through contaminated food or water and through bug bites

Common types of Infectious Diseases

- Flu (influenza).
- COVID-19.
- Stomach flu (gastroenteritis).
- Strep throat.
- Tuberculosis.

How do infectious diseases spread?

Diseases can spread through many ways. Some of the ways that diseases can spread are through the following:

- from person to person when you cough or sneeze. In some cases, droplets from coughing or sneezing can linger in the air.
- on surfaces like doorknobs, phones and countertops.
- through contact with animal with an infectious disease.
- from contaminated or improperly prepared food or water.
- from working with contaminated soil or sand (like gardening).

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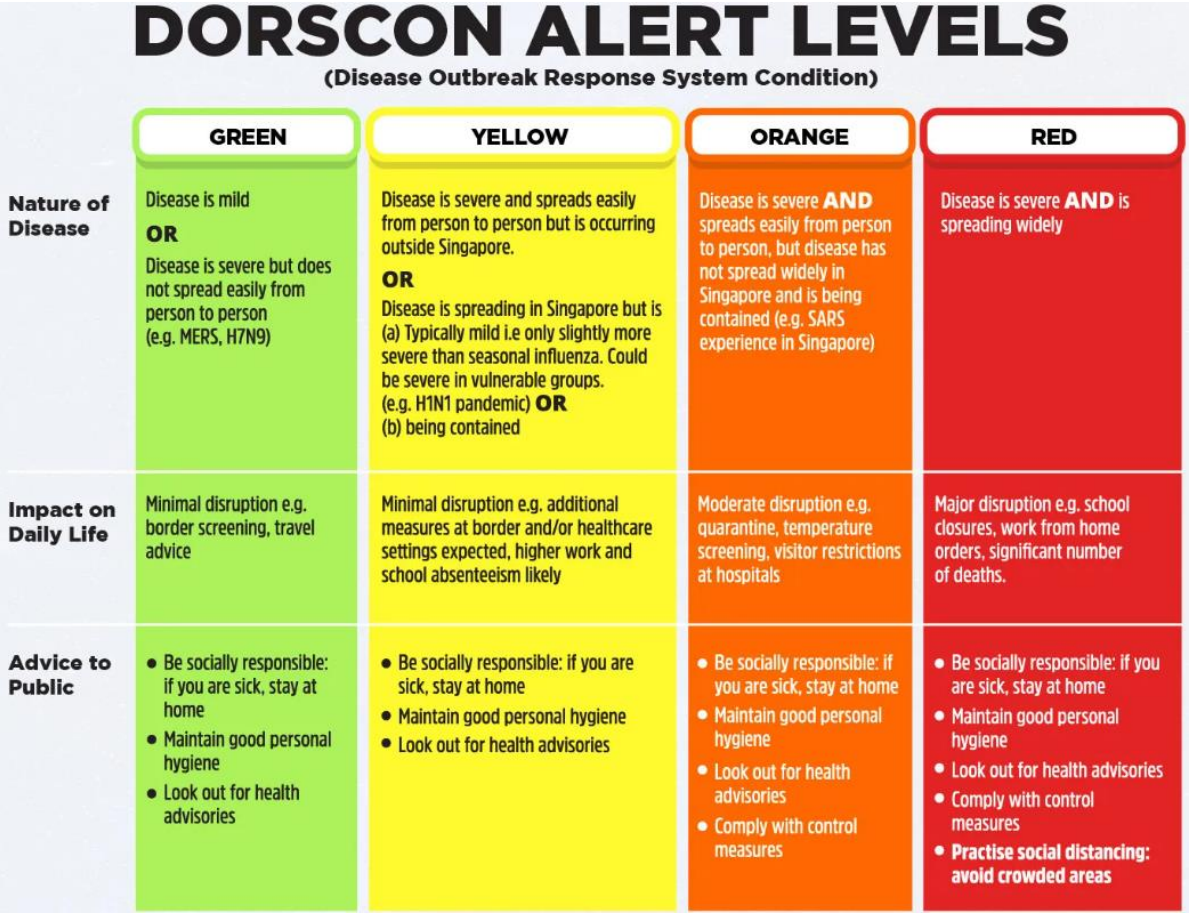
Precautionary Steps to Prevent Spread of Infectious Disease at Workplace

- Maintaining environmental cleanliness to minimise transmission of virus, including frequent disinfection of common areas.
- Advising employees to maintain high standards of personal hygiene, such as washing hands frequently with soap and water, and covering their noses and mouths with a piece of tissue paper when they cough or sneeze.
- Advising employees who are not feeling well to seek medical attention.
- Considering the needs of employees who might be at higher risk of severe illness and complications due to infectious disease and take appropriate steps to enable them to work, while minimising their risk of infection at the workplace.
- Considering taking precautionary measures such as staggering working hours.
- Urging employees on medical leave not to return to the workplace. This socially responsible measure would allow employees to recover fully, reduce the risk of infecting other colleagues, and minimise business disruptions at the workplace.
- Understanding the types of alert codes stipulated by Ministry of Health.

Understanding DORSCON Flu Alert Codes

DORSCON is a colour-coded framework that shows the current disease situation. The framework provides us with general guidelines on what needs to be done to prevent and reduce the impact of infections**.** DORSCON takes into account:

- The current disease situation overseas
- How transmissible the disease is
- How likely it is to arrive in Singapore
- What impact it may have on Singapore’s community



Source: https://www.gov.sg/article/what-do-the-different-dorscon-levels-mean

Responsibilities of General Worker to prevent the spread of Infectious Disease Outbreak

1. Seek medical attention when unwell or if you experience flu-like symptoms
2. If your suspect someone has Avian-Flu, take him/her to the nearest doctor.
3. If you developed flu-like symptoms, stay at home and call a doctor
4. Practice good hygiene in workplace which includes:
    - Use PPE as appropriate
    - Hand hygiene
    - wear surgical mask if unwell
    - conduct self-temperature check
    - Maintain contacts tracing log
    - Follow chain of command in reporting suspected cases at workplace
    - Conduct self-temperature check
    - Maintain designated isolation/empty room for suspected infectious disease case
    - Maintain anti-viral, disinfectants and PPE stockpile as appropriate

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Appendix A:

Learning Activity 1: Identify Personal Protective Equipment and Safety Devices

A2 Plan work activities to meet WSH requirements
K3 Types and usage of Personal Protective Equipment (PPE), safety devices and equipment
K4 Types and interpretation of safety signage

Session duration: 15 minutes
Instructional Method: Group Discussion

Delivery procedure

This activity will take place in a classroom.

Once at the designated location, learners are to form groups of 3-4 learners per group.

- Learners will be shown various activities commonly encountered in the landscape industry. Some sample activities are shown in the photos below. The activities encountered may vary, depending on the date and time of the learning activity.
- Observe the activities from a safe distance.
- In your groups, discuss the suitable PPE and safety devices to be used for the activities given and record your findings.
- Do not wander off without informing the trainer.
- For the last 10mins, each group will present the information compiled to the class.
- Ask questions and seek clarification of any points that are unclear.

Note: In the event the site visit is not possible, the learning activity will be conducted in the classroom, using the photographs/videos of activities for the discussion.

Work Activity	Recommended PPE and Safety Devices
a) Grass cutting 	
b) Using chainsaw for tree pruning 	
c) Handling of chemicals 	
d) Raking of leaves 	

Appendix B:

Learning Activity 2: Identify Hazards and Recommend Risk Control Measures.

A4 Identify and monitor hazards by conducting WSH checks on work areas, safety signage, safety devices and equipment
K6 Types of hazards on work area, safety signage, safety devices and equipment.
A6 Perform risk controls
K8 Types of risk control measures

Session duration: 30 minutes
Instructional Method: Group Discussion

Delivery procedure

- Arrange participants in groups of 3- 4. Provide each group with the pictogram below
- Identify the hazards, risks and suggest the risk control measures to take for the following tasks.

Working at Height	
	**Hazard –** **Risk** - **Control Measures-**

Works carried out in areas where there will be vehicular movement	
	**Hazard –** **Risk** – **Control Measures** –
Grass Cutting	
	**Hazard –** **Risk** – **Control Measures** –

No Proper Training in Equipment/Machinery	
	**Hazard –** **Risk** – **Control Measures** –

No Proper PPE	
	**Hazard -** **Risk** – **Control Measures** –

Appendix C:

Learning Activity 3: Report the WSH Issues

A7 Report any abnormalities and problems encountered in complying with WSH requirements

Session duration: 30 minutes
Instructional Method: Role Play

Delivery procedure

- Get into groups of 3-4 learners.
- Assign the role of supervisor, worker and observer in the group.
- Discuss the unsafe conditions and unsafe practices and record your findings.
- Ask questions and seek clarification of any points that are unclear.

Scenario

During work, you observe your co-worker who is standing on the work platform of crane does not secure the body harness on the designated anchorage. He is stretching his body to cut a branch. In addition, the work area is not barricaded. Identify the unsafe condition and unsafe work practice. Report the WSH issues to your supervisor accordingly.

Appendix D:

Learning Activity 4: React to Emergencies.

A10 Follow organisational emergency and evacuation procedures in the event of emergencies or drills

Session duration: 45 minutes
Instructional Method: Group Discussion

Delivery procedure

1. Get into groups of 3-4 learners.
2. Each group will be given ONE emergency situation.
3. Discuss the procedure in responding the emergency for the emergency situations given and record your findings.
4. For the last 10 minutes, each group will present the information compiled to the class.
5. Ask questions and seek clarification for any points that are not clear.

Fire or Explosion 	**Fire alarm** 
Injuries/Unconscious Person 	**Fatality** 
Fall from Heights