WORKPLACE SAFETY & HEALTH COMMITTEE

Office of Safety, Health and Environment
Trainer Profile
Course Objective

4 core objectives:

1. Understand the responsibilities & duties of Workplace Safety & Health (WSH) Committee

2. Understand the requirements under the WSH Act & Regulations

3. Understanding of WSH Management System

4. How to conduct WSH incident investigation & WSH inspection
Course Outline

- Fundamentals of WSH Committee
- WSH Act and its Subsidiary Regulations
- WSH Management System
- WSH Incident Investigation
- WSH Inspection
- Group Exercise (NO EXAMINATION)
Why is WSH Committee Required?

• **WSH Act 2006**
  
  Section 29 (1) – Every workplace within the prescribed class or description of workplaces shall have appointed in respect thereof a Workplace Safety and Health Committee.
WSH (WSH Committees) Regulations 2008

• Reg. 4 – The duty of the occupier to appoint:
  • A WSH Committee and
  • A person as a Chairman of the WSH Committee

• Reg. 18 – Offences:
  • Maximum fine of $10,000 for the 1st offence.
  • Maximum fine of $20,000 and/or jail term up to 6 months.
Why is WSH Committee Needed?

- Safety is a tedious job.
- Not limited to a single safety manager or department.
- Composed of trained staff from various departments can provide a workplace with more eyes and ears to ensure on-the-job safety.
- “Nobody knows the hazards better than the people who work with them.”
Functions of WSH Committee

- Inspection of Workplace
- Accident Investigation
- Safety Promotion
- Issue WSH Guidelines
Functions of WSH Committee

Inspection of Workplace

- At least once a month
- Immediate after accident or dangerous occurrence
- Discuss & record in a report in the next meeting:
  - Observations,
  - unsafe conditions & unsafe acts,
  - recommendations on the remedial action to be taken.
Functions of WSH Committee

- Inspection the workplace
- Convene a Committee meeting
- Discuss the observations
- Record in a report:
  - Failure of any safety measures & cause of the accident
  - Recommendations on action to be taken.
Functions of WSH Committee

Safety Promotion
- Organize any contest, competition or other activities to promote the safe conduct in the workplace.

Issue WSH Guidelines
- Issue a set of guidelines to promote safety & health work in the workplace.
- Amend or revoke the guidelines.
- Publish the guidelines to ensure awareness.
Formation of WSH Committee

**Chairman:** the Occupier or his authorized person

**Secretary:** the WSH Officer or a member of WSH Committee in the absence of the WSH Officer

**Management Representatives** ≤ **Employees’ Representatives:** The number shall not less than that of management representatives.
Roles of WSH Committee

• Promote co-operation between management and employees in achieving and maintaining a safe and healthy working condition.

• Carry out regular inspections in a workplace in the interests of the safety and health of the persons employed and to inspect the scene of any accident or dangerous occurrence.

• Safety committee in the SMS@NUS manual
How Should the Role Be Fulfilled?

- Select effective & powerful Chairman for the Committee.
- Select the right Committee Members.
- Represent every department and shift.
- Include people with various levels of authority – ideally a 50/50 split of management and employees.
- Put up Safety Policy to define clearly the role of the Committee.
How Should the Role Be Fulfilled?

- Set target / goal for achievement by the Committee.
- Allocate adequate budget for the Committee.
- Provide training for the Chairman & Committee Members.
- Give recognition to Committee Members to encourage commitment.
- Implement Committee’s recommendations without delay.
Meeting of WSH Committees

- WSH Committee shall meet at least once in a month.
- Members should be allowed to attend WSH Committee meeting held during working hours without deductions from their salary.
- Non-member may attend the WSHC meeting, who has suffered bodily injury as a result of accident/dangerous occurrence in the workplace.
- Only matters relating to the Safety & Health of persons at work in the workplace shall be discussed.
Meeting of WSH Committees

- The secretary shall furnish a copy of the meeting minutes to:
  - every WSH Committee member,
  - the occupier,
  - the Commissioner as required;
- And keep as record for inspection.
Tips for Successful WSH Committees Meetings

- Develop action plans (Annual work plan, focus on significant hazards, statistics, etc.)
- Meet at least once a month, and keep meeting short – less than an hour.
- Prepare an agenda in advance.
- Take attendance and inform members whom can not attend.
- Update what has occurred since the last meeting
- Assign action items and require follow-up.
- Committee may break down into smaller group to tackle issues as they arise
- Maintain meeting minutes.
Safety Organization - OSHE in Relation to Rest of NUS

President

DP (Admin) / VP (CI)

OSHE

Admin Cluster

Academic Cluster (Lab-Based Faculties)

- Medicine
- Dentistry
- Engineering
- Science
- Design & Env

Research Institutes & Centres

- TMSI
- SSLS
- LSI
- SERIS
- NERI
- LAC / IACUC
- TL
- CRISP

Safety & Health Professionals

- OED
- UTD
- CFA/UCC
- UHWC

Safety Organization - OSHE in Relation to Rest of NUS
A GUIDE TO WSH ACT AND ITS SUBSIDIARY REGULATIONS
Major workplace accidents in 2004

20 April 2004:
Nicoll Highway – 4 deaths; 3 injured
Major workplace accidents in 2004

29 April 2004:
Fusionpolis – 2 deaths; 29 injured

17 May 2004:
One Raffles Quay – 2 deaths

29 May 2004:
Keppel Shipyard – 7 deaths

On 1 March 2006, the Workplace Safety and Health (WSH) Act replaced the 33 year old Factories Act.
Principles of New WSH Framework

**Principle 1: Reduce Risk at Source**
- Emphasize the importance of good Workplace Safety & Health Management System especially the need for comprehensive Risk Assessments
- Duties to address risks placed on those who create them. Assign liability to those who are in control of workplace risks.

**Principle 2: Promote Industry Ownership of Standards & Outcomes**
- Shift industry mindset from following the letter of the law to taking responsibility of standards and outcomes
- Moving from compliant mode to ownership mode

**Principle 3: Higher Penalties for poor Safety Management**
- Penalties must be sufficient to reflect the cost of poor safety management and to deter risk-taking behavior
- Moving away from stepped penalty regime based on actual harm done to one based on potential harm done
WSH Act – Interpretation & Meanings

**Workplace**
Any premises where a person is at work or is to work, for the time being works, or customarily works, and includes a factory.

Laboratories in NUS are workplaces.
The WSH Act will be extended to all workplace by 2011.
Workplace Safety & Health Act

✓ Preliminary
✓ Interpretation
✓ Administration of Act
✓ General Duties of Persons at Workplaces
✓ Powers of Commissioner
✓ Investigations, Inquiries and Reporting of Accidents, Dangerous Occurrences and Occupational Diseases
✓ Safety and Health Management Arrangements
✓ Codes of Practice
✓ Inspections and Other Powers of Enforcement
✓ Offences, Penalties and Proceedings
✓ General
WSH Act – Interpretation & Meanings

**Occupier**
The person who is the holder of the certificate of registration or who has the control of the premises regardless of whether he is the owner.

**Employer**
A person who, in the course of the person’s trade, business, profession or undertaking, employs any person to do any work under a contract of service.

**Employee**
Any person employed by an employer to do any work under a contract of service

*Include volunteers*
It shall be the duty of every occupier of any workplace to take, so far as is reasonably practicable, such measures to ensure that —

(a) the workplace,
(b) all means of access to or egress from the workplace,
(c) any machinery, equipment, plant, article or substance kept on the workplace

are safe and without risks to health to every person within those premises whether or not the person is an employee of the occupier.
WSH Act – General Duties of Employers

It shall be the duty of every employer to take, so far as is reasonably practicable, such measures as are necessary to ensure the safety and health of:

- Employees at work,
- Persons who may be affected by work carried out by him.
Every employee shall

- Use any suitable appliance, protective clothing, convenience or equipment provided in its intended manner;
- Co-operate with his employer or principal and any other person to such extent as to enable compliance with the WSH Act;
- NOT willfully interfere with or misuse any appliance, protective clothing, convenience, or equipment provided for securing the safety, health or welfare;
- NOT without reasonable cause does any act which endangers the safety or health of himself or others.
## WSH Act – Liabilities & Penalties

<table>
<thead>
<tr>
<th>Category of offender</th>
<th>Maximum fine</th>
<th>Maximum Imprisonment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any breach of duty under the Act</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Individual persons</td>
<td>$200,000</td>
<td>2 years</td>
</tr>
<tr>
<td>Corporate body</td>
<td>$500,000</td>
<td></td>
</tr>
<tr>
<td>Workers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>For failure to use personal protective equipment or misuse of any safety appliance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. 1st conviction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. 2nd or subsequent conviction</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

|                          |                    |                      |
| a. 1st conviction - $1,000            |                    |                      |
| b. 2nd or subsequent conviction - $2,000  |                    |                      |
## WSH Act – Liabilities & Penalties

<table>
<thead>
<tr>
<th>Category of offender</th>
<th>Maximum fine</th>
<th>Maximum Imprisonment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Repeat offenders for the same offence:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Individual</td>
<td>$400,000</td>
<td>2 years</td>
</tr>
<tr>
<td>Corporate body</td>
<td>$1 million</td>
<td></td>
</tr>
<tr>
<td>Person who fails to comply with a Remedial Order</td>
<td>$50,000 ($5000/day)</td>
<td>12 months</td>
</tr>
<tr>
<td>Person who fails to comply with a Stop Work Order</td>
<td>$500,000 ($20,000/day)</td>
<td>12 months</td>
</tr>
</tbody>
</table>

WSH Act allows the court to impose penalties taking into account all relevant circumstances, including the culpability of the offender, the potential harm that could have been caused, and the harm actually done.
WSH Act & Its Subsidiary Legislations

- Risk Management
- General Provision
- WSH Act
- Incident Reporting
- First Aid
Subsidiary Legislations from the Factories Act

Noise
Medical Examination
Asbestos
Operations of Crane
Scaffolds

Still apply
Information Source

MOM Link:
# WSH (General Provisions) Regulations

| General Provisions Related to Health | Overcrowding  
|-------------------------------------|---------------  
|                                     | Ventilation   
|                                     | Lighting      
|                                     | Reduction of vibration  
| General Provisions Related to Safety | Lock-out procedures  
|                                     | Dangerous fumes and lack of oxygen in confined spaces  
|                                     | Pressure vessels: steam boilers, steam receivers, air receivers  
|                                     | Lifting appliances and lifting machines  
| Special Provisions Related to Safety, Health & Welfare | Permissible exposure levels of toxic substances  
|                                     | Hazardous substances  
|                                     | Safety data sheet  
|                                     | Safety and health management system |
(R16) **Lock-out Procedure**

- **Lock-out Procedure** must be established and implemented for inspection, cleaning, repair, or maintenance of any plant, machinery or equipment.
- **Every person** carrying out such work should be fully instructed on the lock-out procedure before commencing that work.
Lockout procedure for electrical energy source

Figure 1 – Lockout procedure for electrical energy source
Examples of tagging devices
WSH (General Provisions) Regulations

(R19-R22) Lifting Equipment Inspection

• Hoist - once every 6 months.
• Lifting Gear - once every 12 months.
• Lifting appliances - once every 12 months.
• Lifting Machines - once every 12 months.
WSH (General Provisions) Regulations

(R27-R33) Pressure Vessels

• No pressure vessels shall be taken into use unless
  • An application is made to the Commissioner who may assign an authorized inspector to carry out examination and test on the pressure vessels.
  • A report of such examination and test by the authorized inspector is obtained.
• An air receiver shall be inspected by an authorized inspector once every 24 months.
• Pressure vessels include steam boilers, steam receivers, air receivers, etc.
(R41) Hazardous Substances

• All hazardous substance shall be placed under the control of a competent person who has adequate knowledge of the properties of the toxic substances and their dangers.

**WSH (General Provisions) Regulations**

**(R43) Safety Data Sheet (SDS)**

- Where any hazardous (toxic, corrosive or flammable) substance is used, handled or stored, the **SDS** of the substance must be obtained.
- Assess the information and ensure that substances is used safely.
- Make the SDS available to all persons who may be exposed to the substance.
WSH (General Provisions) Regulations

(R40) Permissible Exposure Levels (PEL)

- Specify PEL for about 600 substances.
- Industrial Hygiene monitoring programme is required.

- 2 types of PEL:
  - PEL (Long Term) – 8 hours working day
  - PEL (Short Term) – 15 minutes period
WSH (Risk Management) Regulations

- Came into operation on 1 September 2006
- Require employer, self-employed person and principal to conduct a risk assessment in relation to the safety and health hazards at the workplace.
Why Risk Assessment is Important?

This warning is written by Mr. Lee with his foot
- a victim of a construction site accident who broke both arms during a fall from the 4th storey in 2007.

IN REAL LIFE, THERE ARE NO SUPERHEROES.
WSH (Risk Management) Regulations

Every employer, self-employed person and principal shall take reasonably practicable measures to eliminate or minimize risks, following the hierarchy of control:
Moving to Performance-based regime

**Reasonably Practicable**

*Reasonably Practicable* means that degree of risk can be balanced against the time, trouble, cost and physical difficulty of taking measures to avoid the risk [Guide to WSHA]

**Practicable** – capable of being done

**Reasonable** – takes into account the following:

1. Severity of any risk of injury or harm to health that may occur
2. Likelihood of that risk of injury or harm occurring
3. How much is known about that hazard and the ways of managing it
4. Availability, suitability and cost of safeguards

1. Conduct Risk Assessment
2. Take measures to eliminate or control risks
3. Refer to common industry practices, best practices and codes of practices
If the risk can’t be eliminated,

- implement safe work procedures to control risks;

- specify the roles and responsibilities of persons involved in the implementation of the above measures,

- communicate the following information to persons who may be exposed to a risk:
  - the nature of the risk involved
  - any measure or safe work procedure implemented
Every employer, self-employed person and principal shall

- maintain a **record of risk assessment** conducted and measures or safe work procedures implemented for a period of not less than **3 years**.

- Review or revise the Risk Assessment:
  - At least **once in every 3 years**
  - After any **accident or serious incident** occurs
  - When there are **changes** in the Laboratory / Procedure / Process (Management of Change)
WSH (Incident Reporting) Regulations

- Effective from 1 March 2006
- Apply to every workplace, whether or not it is a workplace specified in the First Schedule of WSH Act
- Reportable cases to MOM
  - Workplace accident
  - Dangerous occurrence
  - Occupational disease

OSHE list of accident/incident categories link:
https://staffweb.nus.edu.sg/oshe/category.htm
WSH (Incident Reporting) Regulations

The employer of that employee shall, not later than 10 days after the accident, submit a report to the Commissioner.

Offences and Liabilities:
- First offence, to a fine not exceeding S$5000; and
- Second and subsequent offence, to a fine not exceeding S$10,000 or imprisonment not exceeding 6 months or to both.

Any person who knowingly makes any false notification or report to the commissioner, shall be fine not exceeding S$5000 or imprisonment not exceeding 6 months or to both.
Reporting

All incidents/accidents, big or small, MUST be reported centrally to OSHE via AIRS within 24 hours:

https://staffweb.nus.edu.sg/oshe/submit_airs.htm
Incident/Accident Reporting & Investigation Submission

- Interim investigation report submit to OSHE within 7 days from the date of the reported incident/accident.
- Complete final investigation report submit to OSHE within 14 days from the date of the reported incident/accident.

Refer OSHE SOP:
SOP-accidents-and-incidents-reporting.pdf

Every workplace shall be provided with the relevant first-aid box as follows:

(a) 1 Box A first-aid box: 25 persons or less
(b) 1 Box B or 2 Box A: 50 persons
(c) 1 Box C, 2 Box B or 4 Box A: 100 persons

1 Box B first-aid box = 2 Box A first-aid boxes
1 Box C first-aid box = 2 Box B first-aid boxes

The number of first-aid boxes required on a floor of the building in which the workplace is located shall be determined by the number of persons on that floor.
WSH (First Aid) Regulations

• Requirement of First Aider:
  ✓ 25 or more persons employed.

• Ration of First Aider:
  ✓ Employee applies to shift work schedule.

• Roles of First Aider:
  ✓ Provide emergency treatment to injured employees,
  ✓ Maintain treatment records
  ✓ Maintain treatment facilities

• Retraining every 3 years.
## WSH (First Aid) Regulations

<table>
<thead>
<tr>
<th>Contents</th>
<th>Box A</th>
<th>Box B</th>
<th>Box C</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Individually wrapped sterile adhesive dressings</td>
<td>20</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td>2. Crepe bandage 5 cm</td>
<td>1</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>3. Crepe bandage 10 cm</td>
<td>1</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>4. Absorbent gauze (packet of 10 pieces)</td>
<td>5</td>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>5. Hypoallergenic tape</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>6. Triangular bandages</td>
<td>4</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>7. Scissors</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>8. Safety pins</td>
<td>4</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>9. Disposable gloves (pairs)</td>
<td>2</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>10. Eye shield</td>
<td>2</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>11. Eye pad</td>
<td>2</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>12. Resuscitation mask (one-way)</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>13. Sterile water or saline in 100 ml disposable containers (only where tap water is not available)</td>
<td>1</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>14. Torch light</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>
Factories (Medical Examination) Regulations

Employees to undergo medical examination if work involves the following:

- Arsenic
- Cadmium
- Mercury
- Perchloroethylene
- Compressed air
- Raw cotton
- Benzene
- Lead
- Asbestos
- Silica
- Tar
- Noise
Factories (Medical Examination) Regulations

- Pre-employment medical examination
- Periodic medical examination
- Conducted by Designated Factory Doctor (DFD)
- To protect employees through prevention
Factories (Noise) Regulations

- Permissible Exposure Limit:
  85 dBA over an 8-hr work day.
- Noise monitoring
- Hearing protection programme
  - Provision, usage & maintenance
  - Warning signs
- Training
WORKPLACE SAFETY AND HEALTH MANAGEMENT SYSTEM (WSHMS)
WSH Management System

- WSH (Safety and Health Management System and Auditing) Regulations came into operation on 1 March 2010.

- Workplaces in the Second Schedule shall implement a Safety & Health Management System in accordance with relevant Singapore Standards, Code of Practices or Guidelines such as OHSAS 18001, SS506, etc.

- NUS OHS Management System Standard for Laboratories and ASHPA judging criteria are based on the framework of WSHMS and OHSAS 18001:2007.

- [NUS Safety and Health Policy](#)
WSH Management System

NUS Occupational Health and Safety Management Model (PDCA cycle)
NUS Occupational Health and Safety Management System
– SMS@NUS
OSHE

Faculty / Research Institute / Centre SMS
Faculty Safety Officer

Departmental SMS
Departmental Safety Co-ordinator

Laboratory SMS
NUS Occupational Health and Safety (OH&S) Management System Standard for Laboratories

PI/Laboratory Safety Lead
WORKPLACE SAFETY & HEALTH INCIDENT INVESTIGATION
Definitions

- **Incident**
  - Undesired events that *could have* caused serious injury and/or property damage
  - Referred to as near-miss

- **Accident**
  - Unplanned and undesirable event which causes injuries and/or property damage
  - Interrupts the completion of an activity
Characteristics

- Characteristics of ACCIDENTS / INCIDENTS:
  - Not isolated events
  - Have a triggering mechanism
  - May have several causes
  - Follow a sequence of events

- CAN BE PREVENTED
Common Misconception

- Accident can’t be prevented.
- We don’t have many accidents.
- Safety is expensive.
- We are insured anyway.
- There’s no hazards in my jobs.
- We are experienced.

- However, ......
Real Life Story – Safe Hands
$80,000 fine for unsafe workplace

Marina Bistro first to be convicted under Workplace Safety and Health Act for restaurants

INGAPORE — For the first time, a restaurant has been convicted under the Workplace Safety and Health Act since it was extended to cover restaurants from March 2008.

On Friday, in the Subordinate Courts, Raffles Marina Ltd was fined $80,000 for its failure to ensure workplace safety which resulted in the death of a worker on May 9 last year.

The incident happened at about 0.10pm at Marina Bistro Coffee House at 1 Tuas West Drive.

Mr Abdul Halim Allaudin, 19, a senior steward, employed by Raffles Marina Ltd, was at the dish washing area of the kitchen that night.

While carrying at least one plastic rack containing 25 glass wine goblets, he either tripped due to the slippery floor or fell when he stepped on one of several items thrown on the floor.

The wine goblets shattered, spreading shards of glass all over, cutting Mr Abdul on the neck area.

He got up, stumbled out of the washing area, but collapsed again.

He was rushed to hospital in an ambulance, where he was pronounced dead the same day.

There was poor housekeeping in the dish washing area where Mr Abdul worked and the shattered wine goblets (inset) had cut him in the neck area.

The cause of death was excessive loss of blood due to a deep cut on the neck.

Investigations by the Ministry of Manpower (MOM) showed the floor was wet, greasy and slippery. There was no anti-slip floor mat and damaged non-slip tiles had been replaced with those with less slip resistance.

The MOM said this showed the company had failed to provide a safe workplace for its employees.

Although the company had issued a pair of safety boots to Mr Abdul, it was not enough to prevent him from falling.

Mr Ho Siong Hin, Commissioner for Workplace Safety and Health, MOM, said the conviction sent a warning to all workplaces.

He said: "In this instance, the employer’s absence of risk assessment and the lack of workplace safety measures contributed to the tragic and unnecessary loss of a life. If the employer had conducted a risk assessment, they would have realised the slipping and tripping hazards present at the workplace."

"MOM reminds all employers, individuals and stakeholders of the importance of ensuring and adhering to proper safety measures."

Weekend Today, Straits Times, 10 – 11 July 2010
Costs of Accident

Insured Costs

Uninsured Costs
Near Miss Incident

Definition:
An unintended and unwanted event, in which energy was expended, which under slightly different conditions, would have had a negative effect on safety, health, security, property, or the environment.
Hazardous Condition vs. Near Miss Incident vs. Incident

Hazardous Condition:
Energy Stored. Potential for Incident or Near Miss Incident to occur.

Near Miss Incident:
Energy expended *without* negative effects on safety, health, security, property, or the environment.

Incident:
Energy expended *with* negative effects on safety, health, security, property, or the environment.
Accident Pyramid

Number of Accidents

- Near Misses (Incidents): 600
- Property Damage: 30
- Minor Accident: 10
- Major Accident: 1

Frank Bird Accident Triangle
Triangular Relationship

- Reducing the number of incidents or minor accidents reduces the possibility of major accidents to occur.
- It is important to record and investigate all incidents.
Accident Causation Models

- Various models:
  - Heinrich Domino Theory
  - Multiple Causation Theory
Heinrich Domino Theory

- W.H. Heinrich developed the Domino theory (1931)
- 98% of all accidents are caused by unsafe acts of people and actions and 2% by “acts of God”

| Social Environment | Fault of a Person | Unsafe Act / Condition | Accident | Injury |
Heinrich Domino Theory

- Injuries are caused by the action of preceding factors
- The fall of 1 domino on the left will result in the fall of others
Heinrich Domino Theory

- Removing a single domino in the row, the sequence would be interrupted, thus preventing the accident.
Unsafe Acts

- Committed by the injured employee, co-worker, or a supervisor
- Performed just prior to the accident
- Examples:
  - Failure to follow established safe work procedures
  - Removing machine guarding
  - Improper lifting techniques
  - Using a defective tool
  - Improper use of PPE – gloves
  - Take shortcut
Unsafe Conditions

- Hazardous characteristics of objects, substances or the environment
- Examples:
  - No Access To Fire Extinguisher
  - Defective tool
  - Asbestos environment
  - Water on Floor
  - Poor Housekeeping
  - Noisy environment
Heinrich Domino Theory

- Identify the immediate and direct causes of accident

- Weakness:
  - Does not identify the root cause(s) of accident
Multi Causation Theory

- In any single accident, there may be many contributing surface and root causes.
- This theory brings out the fact that rarely, if ever, an accident is the result of a single cause or act.
Multi Causation Theory

Identify as many factors as possible to give a clearer picture of how accident happened → Apply appropriate remedial measures
Heinrich vs. Multi Causation

A worker hurt himself while using a defective hammer

What would Heinrich’s Domino Theory say?

Unsafe Act: Using defective hammer
Remedial Action: Instruct worker not to use defective hammer

What would Multi Causation Theory say?

Why defective hammer was not identified during safety inspection?
Why supervisor allow worker to use defective hammer?
Was worker adequately trained?
Was worker supervised?
Was regular maintenance carried out?
Causal Factors

Events, situations, and conditions that result in accidents or incidents in the workplace
Direct Cause

- Accident occurs when a person or object receives an amount of energy or hazardous material that cannot be absorbed safely.
- This energy or hazardous material is the DIRECT CAUSE of the accident.
Basic and Indirect Causes

- Basic (root) cause
  - Reason behind the existence of the direct and indirect causes.
  - Usually traceable to poor management policies and decisions, personal or environmental factors.

- Indirect cause
  - Cause accident or incident in an obscure manner.
  - Unsafe act or condition or both.
# Direct, Indirect and Root Cause(s) - Examples

<table>
<thead>
<tr>
<th>DIRECT CAUSE</th>
<th>INDIRECT CAUSE</th>
<th>ROOT CAUSE</th>
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<tbody>
<tr>
<td>Machine started during servicing</td>
<td>Employee not aware on the use of Lock-Out-Tag-Out Program</td>
<td>Lack of training program (OJT)</td>
</tr>
<tr>
<td>Slip and fall</td>
<td>Uneven floor</td>
<td>No inspection or reporting procedures</td>
</tr>
<tr>
<td>Fall from height</td>
<td>Failure to wear safety harness</td>
<td>Lack of supervision on provided PPE or no effective PPE program</td>
</tr>
<tr>
<td>Exposure to chemicals</td>
<td>Did not wear gloves</td>
<td>Inadequate chemical exposure assessment</td>
</tr>
</tbody>
</table>
## Symptom Approach vs. Root Cause

Failure to identify the root causes of problems → waste of time and resources putting band-aids on the *symptoms* of the problem.

<table>
<thead>
<tr>
<th>Symptom Approach</th>
<th>Root Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Errors are often a result of worker carelessness.”</td>
<td>“Errors are the result of defects in the system. People are only part of the process.”</td>
</tr>
<tr>
<td>“We need to train and motivate workers to be more careful.”</td>
<td>“We need to find out why this is happening, and implement mistake-proofs so it won’t happen again.”</td>
</tr>
<tr>
<td>“We don’t have the time or resources to really get to the bottom of this problem.”</td>
<td>“This is critical. We need to fix it for good, or it will come back and burn us.”</td>
</tr>
</tbody>
</table>
Accident Reporting

Investigation Team

Fact Finding

Scene Investigation  Interview

Analysis & Evaluation

Probable Cause (s)  Liability

Corrective measures

Enforcement  Education  Engineering or system changes

Documentation
Investigation Team

Persons with knowledge on
- Accident investigation techniques
- Accident causation
- Work processes & procedures

Team approach
Members consist of:
- Line Supervisor
- WSH Committee
- Employees with knowledge of the work
- WSH Officer / Industrial Hygienist
- HR
- “Outside” experts
Responding to Incident Scene

- Inform the management
- Provide emergency rescue and medical help
- Take steps to minimize injury and property damage
- Control potential secondary accidents
- Secure accident scene to make safe and preserve evidence
- Identify potential witness
- Estimate the extent of damage
Incident Investigation – Necessary Equipment

- Pens and a note book
- Measuring tape
- Specimen containers
- Camera (preferably with a date)
- Tape recorder
- Copies of accident report forms, checklists
- Useful telephone numbers
- Red/white cordon tape
- Personal protective equipment.
Incident Investigation – Physical Evidence

• Careful studying and recording of accident scene
  ✓ positions of injured workers
  ✓ equipment being used
  ✓ part(s) of equipment damage (after accident)
  ✓ materials or chemicals being used
  ✓ safety devices or appliances in use
  ✓ position of appropriate guards
  ✓ housekeeping
  ✓ weather conditions
  ✓ lighting levels
  ✓ noise levels
Incident Investigation
– Interviewing Witness(es)

Purposes:
- Establish an understanding with the witness(es)
- Obtain witness’ own words describing the event

- Initiate as soon as possible
- Interview each person separately
- Do not allow witnesses to confer prior to interview
- Conduct in private
- NOT to apportion blame
Incident Investigation – Interview Technique DOs

DO:
- calm the witness, who may feel upset or traumatized
- let him or her know the real purpose of the interview
- let the witness describe what he or she saw
- confirm that you have the statement correct
- record in writing during the interview
- ask if it is okay to video-taping or tape-recording the interview, if necessary
- use sketches and diagrams to help the witness.
- concentrate on the facts
- close on a positive note
Incident Investigation – Interview Technique DON’Ts

Do NOT

- scare the witness
- come across as threatening or judgmental
- interrupt when the witness is talking
- show your emotions
- jump into conclusions
- ask leading questions
Types of Questions to Ask

**General Questions** - open-ended questions to help get the witness talking.

Can you tell me more of what you saw?

**Directed Questions** - for witness to focus on a specific subject, without biasing the answer.

Did you notice any lights on the vehicle?

**Specific Questions** - for specific information

Did you notice any lights on the vehicle? What color was the light?

**Summary Questions** - help witnesses organize their thoughts, restate what witness told you and verify.
Incident Investigation – Examples of Questions to Ask

Open-ended questions:

- What were you doing when the accident happened?
- What was your position or location?
- What did you see or hear?
- What were the injured victim doing at that time?
- How was the working environment at that time? (weather, light)
- In your own view, what caused the accident?
Incident Investigation – Recording

- Day or time of the accident
- Exact place of the accident
- Equipment or machinery, if any
- Hazardous substances, if any
- Injured person(s)
- Personal protective equipment (PPE)
Incident Investigation Techniques – Cause & Effect Diagram

- Fish-bone diagram (Ishikawa diagram)
Identifying Causal Factors

Material & Machine / equipment

- Were risk assessment and safe work procedures established?
- Were equipment regularly maintained?
- Was SDS available and communicated?
- Were PPEs needed?
- Were users trained?
Identifying Causal Factors

Manpower – People

- Were the employees trained?
- What was the skill and experience level of the employees?
- How was the physical state of the employees?
- How was the mental state of the employees?
- Were employees supervised?
Identifying Causal Factors

Methods – (Policies / Procedures)

- Were WSH rules established and communicated?
- Were employees aware of risk assessment and safe work procedures?
- Was there any WSH inspection procedure?
- What rectification actions taken to correct unsafe conditions or acts?
- Were employees trained and supervised?
Identifying Causal Factors

Environment - Not the “usual” environment

- What were the weather conditions?
- Was housekeeping an issue?
- Was there adequate light?
- How was the noise level?
- Were dangerous substances present?
Incident Investigation
– Action Plan

• Targeted at root cause(s) to prevent recurrences of similar incidents
• Address immediate and long term remedial actions
• Establish timeline
• Assign action officer
Incident Investigation
– Action Plan

Recommendations made must be SMART:

- Specific
- Measurable
- Achievable
- Realistic
- Timely
Incident Investigation – Action Plan

Follow-up action

- Assign responsible party
- To monitor implementation of recommended rectification actions
- To check on the effectiveness on the implementation
- To re-train employees at risk
Incident Investigation – Investigation Report

- Completed for both injury and non-injury incidents
- Submit to management, WSH Committee and OSHE
- Retained in employee’s personnel file
  - Work Injury Compensation
- Properly documented
Incident Investigation – Investigation Report

- **Introduction**
  - Purpose
  - Investigators

- **Description of incident**
  - What happened? – sequence of events, extent of damage / injury
  - Where and when?
  - Who and what were involved?
  - Operating personnel and witnesses
Incident Investigation – Investigation Report

- How was the accident investigation approached?
- How was evidence collected?
- Analysis of evidence and methodology used
  - Direct, indirect and basic causes
- Discussion of findings
- Recommendations
- Appendices
  - Documents
  - Interviewee’s statement
Incident Investigation – Remedial Actions

- Short and long-term plans
- Indication of which rules and procedures need modifications or improvements
- Means of correcting deficiencies in safety procedures and programs
- Need to update the hazard identification and risk assessment
Incident Investigation – Communication

- All relevant facts
- Basic and underlying causes
- Lessons learnt
- Corrective actions / recommendations taken
Incident Investigation – Summary

- Incident investigation is an important component of an accident prevention program.
- Apply appropriate tool to identify root cause(s).
- Unsafe acts and conditions that are left uncorrected are likely to result in catastrophic events.
- **CASE STUDY**
WORKPLACE SAFETY AND HEALTH INSPECTION
Purposes of WSH Inspection

- Examine workplace carefully and periodically with the purposes of:
  - identifying existing and potential hazards
  - identifying any hazards which require immediate attention
  - ensuring that existing control measures are functioning adequately
  - where appropriate or necessary, recommending corrective or preventive action

Ultimate GOAL

To prevent workplace accidents, injuries and illnesses
Types of WSH Inspections

**Statutory Inspections**
- Required under WSH Act
- Scaffolds
- Pressure vessels
- Lifting gears
- Lifting machines

**Formal WSH Inspections**
- A planned event
- Conducted in team
- A proper follow-up system
- spot inspections
- pre-operation checks
- critical parts inspections
- new equipment inspections
- regular planned inspections

**Informal WSH Inspections**
- Conducted by *everyone* at work – noticing a hazard and reporting to someone who is in the control to take action
- physical site inspections
- working condition inspections
- work practice inspections
Importance of WSH Inspection

- WSH inspection is needed as
  - equipment and machines wear out
  - conditions or working environment change
  - most activities involve some risk
  - employers have a legal responsibility to provide a healthy and safe workplace
WSH Inspection Program

- 4 essential steps
  - Planning
  - Inspection
  - Reporting
  - Monitoring

Tips: Effective WSH Inspections must be conducted regularly. Inspections are NOT “once-and-for-all” exercises
Step 1: Planning

- Planning of an effective WSH Inspection programs:
  - To establish clear and viable WSH Inspection policy and procedures
  - To gather background information
Step 1: Planning

- To establish appropriate WSH Inspection policy (related to the overall WSH program)
  - Commitment from top management
  - Objectives & goals
  - Role of inspections in attaining overall workplace safety and health objectives
  - Persons responsible for carrying out inspections
  - Roles and responsibilities of employers and employees to comply with the intent of the program as well as regulatory requirements
Step 1: Planning

- **Establish proper WSH Inspection procedures**
  - WSH Inspections carried out on regular basis – schedule
  - Persons conducting the inspection – establish inspection team
  - “Inspectors” have adequate knowledge, information and experience with work processes and inspection techniques
Step 1: Planning

- **Who to Inspect?**

  Inspection Team consists of:
  - WSH Committee members
  - WSH Coordinator / Officer, if any
  - Manager
  - Floor / area / department supervisor
  - Employee familiar with the work process
  - For special equipment or process inspection:
    - *Useful to have an appropriate specialist e.g., an engineer, electrician*
Step 1: Planning

- Where or what to inspect?
  - Laboratories
  - Workshops
  - Work stations
  - Store room
  - Office areas
  - Changing / washing facility
  - Equipment
  - Machineries
  - Working practices

Remember no part of a workplace can be entirely free of hazard
Step 1: Planning

- **How often?**
  - Number of different processes or operations and their scale
  - Types of hazardous equipment
  - Types of work processes
  - Number of shifts
    - Inspections should be conducted on every shift - nature of activity may vary from one shift to another
  - As and when necessary
    - New process or piece of equipment is introduced into the workplace
Step 1: Planning

- **Who to review inspection reports?**
  - WSH Committee members to discuss findings and brainstorm all possible solutions;
  - WSH Committee Chairman has the authority to take or plan for corrective action and to delegate;
  - Items which pose immediate danger should be reported to the responsible supervisor or manager immediately and action should be taken at once.

*Tip: Follow-up action and feedback to those conducting inspections is an important factor in motivation*
Step 1: Planning

- **Information / documentation references:**
  - Plant layout
  - Relevant legislations, Code of Practice and Singapore Standard
  - In-house rules and regulations
  - Manufacturer’s specification
  - Inventory of machineries / equipment / chemicals
  - Previous WSH inspection reports
  - Minutes of previous WSH Committee’s meetings
  - Accident / incident reports
  - Accident / incident investigation reports
Step 2: Inspection

- Preparation for WSH Inspection:
  - Proper dressing
    - Types of PPE
  - Preparation of recording and measuring devices
    - Measuring tape
    - Camera
    - Clip board
  - Inspection checklist
Step 2: Inspection

- **WSH Inspection Checklist:**
  - A guide to the structure of inspection
  - Helps to ensure a consistent and comprehensive coverage of workplace
  - To be continually reviewed and revised
    - New equipment / machine
    - New chemical
    - New process
    - Incident / accident occurred
Step 2: Inspection

- WSH Inspection Checklist covers:
  - Housekeeping
  - Fire protection
  - Tools, machineries, equipment
  - Personal protective equipment
  - Material handling equipment
  - Bulletin board
  - Unsafe practices
  - First aid
Step 2: Inspection

Dos and Don’ts of WSH Inspection:

Dos:
- Remember inspection is a fact-finding exercise
- Compliment good practices
- Point out immediate dangers for correction on the spot, note other items on the report
- Talk to people, ask about concerns
- Look outside the usual eye level – up, down, into closed rooms, behind, around
- Record all questionable items

Don’ts:
- Find fault with the workers or supervisors
- Engage in long conversation
- Unnecessarily disrupt the work activity
Step 3: Reporting

- **Inspection reports:**
  - To inform responsible party of existing problems and the necessary follow-up actions
    - The management
    - Plant manager
    - Line supervisor
    - Maintenance manager
  - To identify trends as part of overall monitoring of program effectiveness
  - Add-on the information database on the WSH situation of a workplace
Step 3: Reporting

- Inspection reports:
  - Consideration given to the recipient:
    - Professional background
    - Position of the recipient in the organization

Remember: Technical information that is straightforward to technical professionals may be difficult for non-technical persons

Tip: Good reports can help to gain support from management for the findings of inspections
Step 3: Reporting

- Inspection report contents:
  - Purpose of inspection
  - Areas covered
  - Description of hazard
  - Exact location
  - Recommendations
  - Designated person to follow-up
  - Time frame
Step 4: Monitoring

- Review inspection reports
  - WSH Committee Meetings or other meetings
- Take decisions as soon as possible as to the action required
  - Immediate action
  - Recommend action to the next level of supervision
  - Review or seek experts’ advice
- To ensure that there is timely feedback to those persons responsible for undertaking inspections
- Concern not shown makes persons doing the inspection feel pointless
Step 4: Monitoring

- Analysis of inspection findings or observations:
  - Highlight the need for training in certain areas
  - Establish priorities for corrective action
  - Assist in establishing or improving safe work practices
  - Indicate areas, equipment or activities which may require more in-depth risk assessment
  - Provide insight as to why accidents are occurring in particular areas
GROUP EXERCISE
Exercise Note

1. The class is divided into 4 groups;
2. Each group is required to write up its answer on the flip chart provided;
3. Each group will present afterwards.
Exercise 1:

WSH Inspection team had been formed and the team was visiting a laboratory. The following was observed during the inspection.

Write an inspection report to be presented on the upcoming WSH Committee Meeting. Come out a report format with the necessary details such as finding, correction action, action by, timeline, etc.
Exercise 2:

You are the secretary of a WSH Committee for your department. The Chairman of the committee requested for an agenda for the coming WSH Committee Meeting.

Prepared an agenda (at least 6 agenda items) for the coming meeting.

Write up an email format to be sent out to all committee members to inform them of the upcoming WSH Committee Meeting.
Exercise 3:

An incident had occurred in one of the laboratories in your department. A student was splashed by a chemical during his experiment work. No serious injury resulted from the incident, the student managed to wash himself up and clean up the spillage. Student subsequently raised AIRS report for the incident.

This investigation team was formed under the instruction of the WSH Committee Chairman. As members of the investigation team for the above incident. Do you think such investigation team formation is necessary for such a minor incident investigation?

If yes, Write up the necessary planning to be prepared prior to carrying out the investigation on site.
If no, why?
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Thank You