





# **GUIDELINE ON**

## INVESTIGATION AND REPORTING OF WORKPLACE ACCIDENTS

**February 2024**

Department of Labour  
Ministry of Industry, Commerce and Employment

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Royal Government of Bhutan  
Ministry of Industry, Commerce and Employment  
Department of Labour



## Foreword

I am pleased to present this comprehensive Guideline on Investigation and Reporting of Workplace Accidents. Our team from the Labour Protection Division (LPD) has prepared it with the aim to foster a safe and secure working environment for all employees across various industries.

The importance of workplace safety cannot be overstated while it is our collective responsibility to ensure that every worker returns home safe at the end of the day. Accidents may occur in workplaces, but the efficiency and efficacy of our response to accidents can significantly mitigate their impact.

This guideline aims to serve as a valuable resource for employers, safety officers, and employees alike, providing a structured framework for the thorough investigation and reporting of workplace accidents. By adhering to these guidelines, organisations can identify the root causes of accidents, implement corrective measures, and prevent recurrence, thereby fostering a culture of continuous improvement in occupational safety. I appreciate the efforts of the experts and labour staff who contributed to the development of this guideline.

I encourage all relevant parties to embrace these guidelines within the framework of their workplace safety protocols. Let us together strive to create workplaces that prioritise the safety and well-being of employees, reduce workplace accidents, and contribute to the overall productivity of our workforce.

I extend my gratitude to everyone involved in this initiative and trust that this guideline will be a valuable tool in our collective pursuit of safe and productive workplaces.

Tashi Delek.

A handwritten signature in black ink, appearing to be 'Lham Dorji'.

Lham Dorji  
Director



## Message from Chief Representative, JICA Bhutan Office

It is a great pleasure to see the introduction of the 'Guideline on Investigation and Reporting of Workplace Accidents', as it marks a significant milestone in commitment of the Royal Government of Bhutan to improving the safety in workplace.

As JICA's (Japan International Cooperation Agency) vision of improving human security and quality growth, I am extremely happy that this document will contribute towards the promotion of the culture of safety, in workplace across all industries.

I would also like to congratulate the officials of the Department of Labour, and all the contributors, for their dedication and hard work for coming up with this guideline. The guideline represents a culmination of extensive research, industry best practices, and collaborative efforts from various experts in the field across several organizations including the private sector.

The safety and well-being of employees should always be at the forefront for all organizations. As organizations evolve and industries advance, so must the responsibility to creating environment, that prioritize the health and safety of every individual who contribute to their collective success.

I believe that this guideline will serve as a comprehensive framework designed to empower, every member of all the workforce, across all industries to actively contribute to a safer workplace across Bhutan.

Finally, I also hope that the guidelines will serve as a platform for all the stakeholders to encourage to report all workplace accidents, so that it would enable better understanding of the causalities, which will provide appropriate recommendations to avoid workplace accidents in the future.



Tomoyuki Yamada  
Chief Representative





# Acknowledgment

The Department of Labour is profoundly grateful for the invaluable support received from the JICA Bhutan Office in bringing this document to fruition. Their unwavering dedication and collaborative spirit were instrumental in expediting the document's completion. Without their partnership, achieving this milestone within the envisioned time frame would have been considerably more challenging.

We are deeply indebted to Dr. Asish Mettal for his exceptional generosity in volunteering his expertise to refine this document. His commitment went above and beyond, as he selflessly dedicated a week in Bhutan to work on this document at our request. This speaks volumes about his dedication to the cause and his genuine desire to support our endeavours.

Heartfelt appreciation is also extended to Mr. Kishna Subba, Chief Program Officer, JICA office Bhutan, for his extensive and multifaceted contributions throughout the project. From meticulous planning and budgeting to ensuring its seamless execution, he has been a pillar of strength and a driving force behind the project's success.

We are eternally grateful to the dedicated drafting team, whose invaluable contributions have shaped this document into a truly exceptional piece of work. Their unwavering dedication, meticulous attention to detail, and tireless efforts have significantly elevated the quality of our work, exceeding all expectations.

Equally deserving of our heartfelt thanks is the document validation team. Their keen eyes and insightful feedback have been invaluable in refining the document, adding immense value, and ensuring its accuracy and efficacy.

We are truly humbled by the unwavering support and collaborative spirit demonstrated by all parties involved. This collective effort has been truly enriching and has solidified our belief in the power of teamwork and collaborative spirit.



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## Abbreviations

CLA	Chief Labour Administrator
DNMW	Daily National Minimum Wage
ROHSW	Regulation on Occupational Health, Safety and Welfare
PPE	Personal Protective Equipment
SOP	Standard Operating Procedure
FTA	Fault Tree Analysis
DoL	Department of Labour

## Definition

For the purpose of this guideline unless the context indicates otherwise, the words, phrases and acronyms are defined as follows:

**Accident** means any unintended or unforeseen event or mishap arising from work activity that results in death or injury to an employee.

**Act** means the Labour and Employment Act, 2007 and includes any other regulations issued under the Act.

**Chief Labour Administrator** means for the purpose of this Act, the Head of the Secretariat of the Ministry of Industry, Commerce and Employment or an officer of the Royal Civil Service recruited, selected and appointed under the Bhutan Civil Service Rules to exercise the functions and powers in Sections 22 to 24 of this Act.

**Dangerous Occurrence** means an unintended or unforeseen event or mishap occurring from work activity of such nature as may be prescribed occurs, whether causing any bodily injury or disability or not.

**Death** means the end of life, the permanent cessation of all bodily functions.

**Employee** means a person employed under a contract of employment.

**Hazard** means anything with the potential to cause bodily injury, and includes any physical, chemical, biological, mechanical, electrical or ergonomic hazard.

**Immediately** means within 12 hours of any accidents or dangerous occurrence that occurs at a workplace. Incident is referred to as a work-related event(s) in which an injury or ill health (regardless of severity) or fatality occurred, or could have occurred.

**Injury** means any physical, mental, or emotional deprivation or damage to a person resulting from an accident or exposure to risk over a period of time as, for example, with hearing loss.

**Risk Assessment** means the process of evaluating the probability and consequences of injury or illness arising from exposure to an identified hazard, and determining the appropriate measures for risk control.

**Risk** means the likelihood that a hazard will cause a specific bodily injury to any person.

**Safety officer** means a person who is appointed by the employer to look after the occupational health and safety aspects of the workplace.

**Workplace** means any place, whether a building or structure, open space, home, office or factory, where an employee works.

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# Preliminary

## 1.1 Introduction

This comprehensive guide is designed to empower safety personnel, including labour officers, with essential skills to conduct thorough investigations into occupational accidents and other undesirable accidents. The aim is to equip you with the tools necessary to unravel the intricacies surrounding workplace accidents, such as dangerous occurrences, near misses, and accidents that have the potential to cause harm to workers or the public.

This guide is tailored to emphasise the preventative aspect of safety management, highlighting the significance of conducting effective investigations. By delving into the root causes and identifying key factors, these investigations go beyond mere analysis; they unveil actionable insights and preventative measures that could have averted the accident in question.

This guide does not merely stop at investigation methodologies; it extends its reach to emphasise the pivotal role of compiling detailed reports. These reports serve as invaluable documentation, offering a comprehensive overview of the accident and facilitating a nuanced understanding of the contributing factors. This, in turn, enables safety personnel to collaborate with employers, management, and worker representatives in identifying and implementing targeted prevention and risk control measures.

Workplace safety is a paramount concern for both employers and employees, emphasising the need for a robust framework to investigate and report accidents. This set of guidelines serves as a comprehensive resource to facilitate the systematic and thorough examination of workplace accidents, ensuring that the necessary information is gathered, analysed, and reported in a timely manner.



## 1.2 Purpose

The aim is to establish a standardised approach for investigating and reporting workplace accidents, with the primary objective of fostering a safer work environment and ensuring legal compliance. The structured process outlined in the guide seeks to enhance transparency and accountability in accident management within an organisation. Specifically designed for safety personnel, the guide equips them with the necessary skills to investigate occupational accidents, and other undesirable events effectively. Emphasising the preventability of such accidents, the guide underscores the importance of identifying causal factors and preventive measures through a suggested methodology. Overall, it provides valuable information on the significance of conducting thorough investigations and compiling comprehensive reports to enhance workplace safety.

## 1.3 Scope

The scope of this guideline is defined to address the needs of diverse industries and organisations committed to ensuring workplace safety. The intended users include safety officers, investigators, management personnel, medical professionals and any stakeholders involved in maintaining a secure/ safe work environment. This guideline is applicable across various organisational levels, regardless of the industry or sector, aiming to provide a comprehensive framework for accidents investigation and reporting.

## 1.4 Legal Requirement

This section outlines the legal framework governing accident and occupational disease investigation and reporting. Complying with these legal requirements is crucial for organisations to ensure adherence to applicable laws and regulations. Understanding and following legal protocols not only mitigates legal risks but also contributes to a safer and more responsible workplace.

### 1.4.1 Regulatory Framework

- (1) Labour and Employment Act of Bhutan, 2007
- (2) Regulation on working condition, 2022
- (3) Regulation on occupational health, safety and welfare, 2022
- (4) Regulation on occupational health and safety in construction industry, 2022

### 1.4.2 Non-compliance Consequences

Section 40 of the Act (Improvement Notice) states that

*“Where a Labour Inspector is of the opinion that a person:*

- (a) is contravening any provision of this Act or its regulations; or*
- (b) has contravened a provision in circumstances that make it likely that the contravention will continue or be repeated, the inspector may issue to the person an improvement notice requiring the person to remedy the contravention or likely contravention.*

*The Labour Inspector shall specify a day that is more than 7 and less than 35 calendar days after the day the notice was issued, before which the person is required to remedy the contravention or likely contravention.”*

The Labour Inspector would issue Improvement Notices to relevant sections where non-compliance to improvement notices shall be liable for a penalty minimum of 90 times the DNMW to maximum of 360 times the DNMW.

Section 43 & 44 of the Act (Prohibition Notice) states that

*“43. If a labour inspector is of the opinion that there is occurring or may occur any activity at a workplace involving an immediate risk to the health and safety of any person, the*

*inspector may issue a prohibition notice to the person who has or may be reasonably presumed to have control over the activity, to prohibit the activity.*

*44. If a Labour Inspector is of the opinion that at the workplace there is occurring or may occur an activity which involves or will involve an immediate risk to the health and safety of any person, the inspector shall specify the reason for that opinion."*

The labour inspector would issue Prohibition Notices to relevant sections where non-compliance to notices shall be guilty of an offence which shall be:

- (a) a misdemeanour; or
- (b) if aggravated circumstances exist, a felony of the fourth degree.

## 1.5 Confidentiality and Privacy

Maintaining confidentiality during accident and occupational disease investigations is crucial for various reasons, encompassing both legal and ethical obligations:

### 1.5.1 Legal Importance

- (1) **Legal Compliance:** Many jurisdictions have laws and regulations mandating confidentiality regarding employee's health and personal information. Violating these laws can lead to legal consequences for the company or individuals involved.
- (2) **Employee Privacy Rights:** Workers have a right to privacy regarding their health conditions and personal information. Breaching this confidentiality can lead to legal action against the company for violating these rights.

- (3) **Protection Against Discrimination:** Revealing personal health information might lead to discrimination against the affected employees, which can result in legal issues for the organisation.

### 1.5.2 Ethical Importance

- (1) **Trust and Employee Relations:** Maintaining confidentiality builds trust between the employer and employees. Employees are more likely to cooperate in investigations if they trust that their privacy will be respected.
- (2) **Respect for Individuals:** Respecting confidentiality demonstrates a commitment to respecting individuals' personal and sensitive information, fostering a positive and respectful work environment.
- (3) **Avoiding Stigmatisation:** Disclosure of health-related issues can stigmatise individuals, affecting their morale and reputation within the workplace.

### 1.5.3 Moral Obligations

- (1) **Avoiding Stigmatisation:** Disclosure of health-related issues can stigmatise individuals, affecting their morale and reputation within the workplace.
- (2) **Protecting Dignity:** Upholding confidentiality safeguards the dignity of individuals affected by accidents. It shows respect for their personal situations and ensures their dignity is preserved.
- (3) **Responsibility towards Employees:** Employers have a moral obligation to protect the well-being and privacy of their employees, even during investigations.

# 1.6 Skills required by Investigators

For safety personnel engaged in accident investigation, a diverse skill set is imperative to ensure a comprehensive and effective analysis of accidents. These skills collectively empower safety personnel to conduct accident investigations with precision and diligence, ultimately contributing to the improvement of occupational safety and the prevention of future accidents.

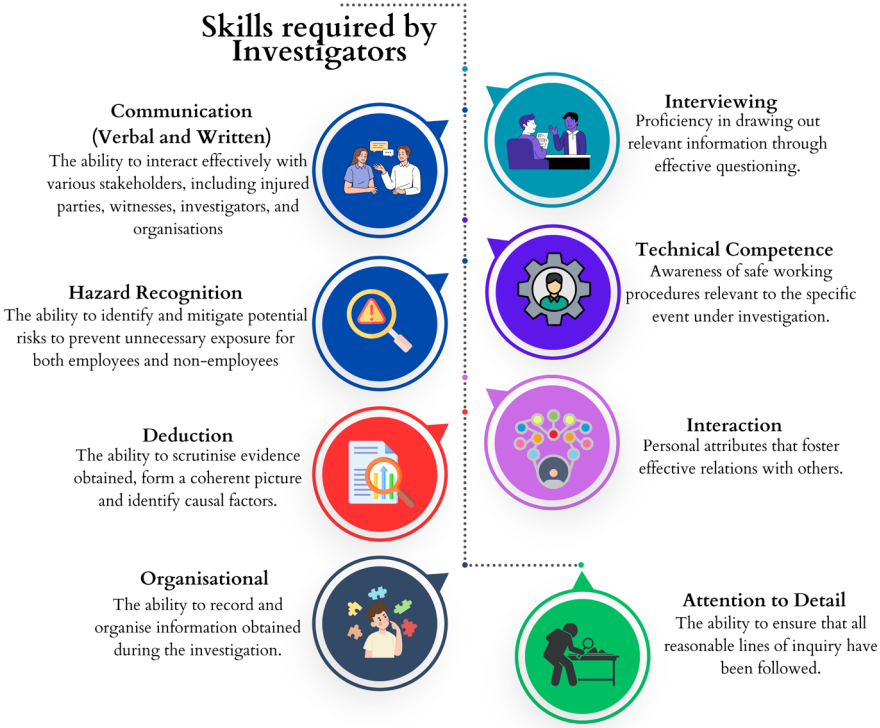


Figure 1: Skills required by investigators

## 1.7 When should an investigation be conducted?

- (1) ***As soon as possible, after the accident occurs or is reported:***  
Conducting an investigation promptly is crucial to capture accurate and timely information. The immediate aftermath of an accident provides a window of opportunity to gather fresh and unaltered evidence, ensuring the investigation is based on the most reliable data.
- (2) ***Before the scene of the accident is disturbed or changed:***  
Preserving the integrity of the accident scene is paramount. Investigating before any alterations or disturbances occur helps maintain the original context, making it easier to identify and analyse evidence. This ensures that the investigation is conducted in an environment as close as possible to the conditions at the time of the accident.
- (3) ***Before the victim(s) and witnesses forget what happened:***  
Memories can fade over time, leading to potential inaccuracies or omissions in witness statements. Conducting an investigation promptly helps capture the details while they are still fresh in the minds of victims and witnesses, improving the accuracy and completeness of the information gathered.

By initiating an investigation promptly, before the scene is altered, and while memories are still vivid, investigators increase the likelihood of obtaining comprehensive and reliable information. This approach enhances the overall quality of the investigation and contributes to a more thorough understanding of the accident's causes and contributing factors.

# Accident Investigation Process

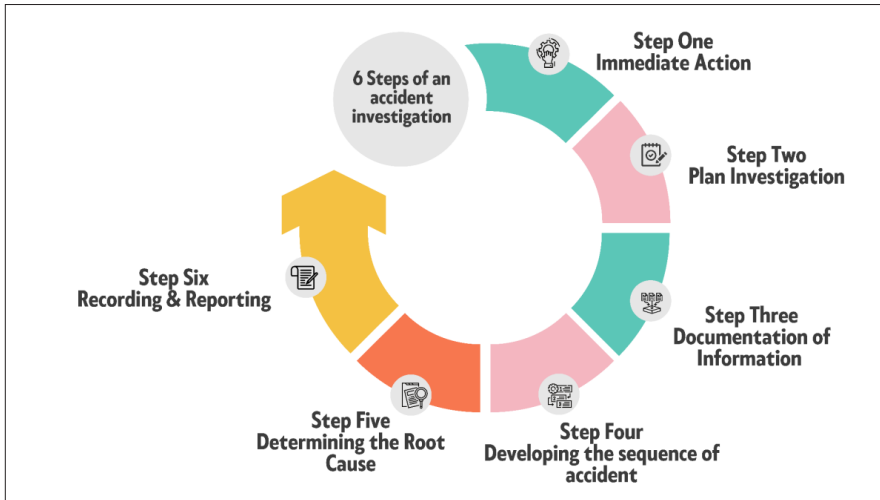


Figure 2: The overview of the accident investigation and reporting procedures.

## 2.1 Step One: Immediate Action

### 2.1.1 Victim's identification and assistance

This action is to be taken by safety personnel in coordination with the health professionals (if any). In order to identify and assist victim, consider the following:

- (1) The first step is to identify all of the people who may have been involved in the accident. This includes anyone who was in the area at the time of the accident, as well as anyone who may have been exposed to hazards as a result of the accident.
- (2) Once all of the potential victims have been identified, they need to be assessed for injuries. This includes checking for visible injuries, as well as for any signs or symptoms of internal injuries.

- (3) If any victims are found to have injuries, consider applying first aid or refer to nearby health facilities depending upon the seriousness of the injury.

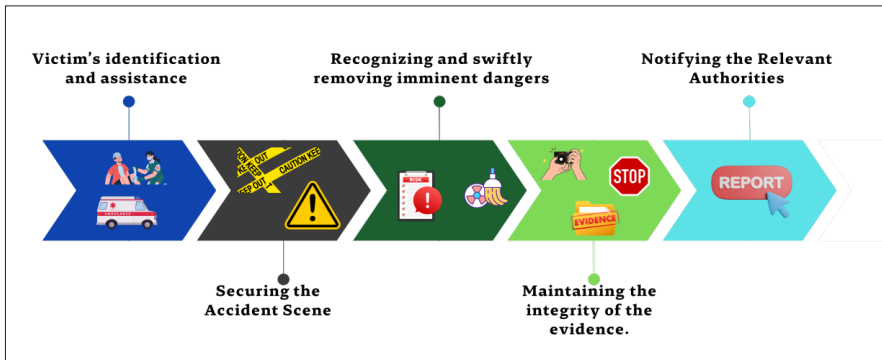


Figure 3: Immediate Action

### 2.1.2 Securing the Accident Scene

This action is to be taken by safety personnel. The primary goal of securing the accident scene is to ensure no one else gets hurt, minimize the damage and safeguard the evidence. In order to secure the accident scene, consider the following:

- (1) Set up a boundary around the accident location to deter unauthorised access and maintain control over the area;
- (2) Take a measure to isolate potential hazards, such as damaged equipment, to prevent any further harm or risks; and
- (3) Use warning signs, barriers, or alternative methods to distinctly indicate and define the boundaries.

### 2.1.3 Recognizing and swiftly removing imminent dangers

This action is to be taken by safety personnel. In order to recognize and swiftly remove imminent dangers, consider the following:



- (1) Perform a rapid assessment to spot potential dangers, such as exposed wires, leaking fluids or gases or unstable structures;
- (2) Take immediate steps to neutralize or alleviate the risk, either by shutting off the power source or implementing stabilising measures; and
- (3) Prioritise addressing hazards that present an imminent danger to both individuals and surrounding environments.

#### **2.1.4 Maintaining the integrity of the evidence.**

This action is to be taken by safety personnel. In order to maintain the integrity of the evidence, consider the following:

- (1) Minimise unnecessary disruptions to the accident scene, refraining from disturbing it without a valid reason;
- (2) Capture photographs or videos of the scene, including pertinent details;
- (3) Identify and secure physical evidence for later analysis;
- (4) Request approval from top management to halt the work until thorough investigations are done.

#### **2.1.5 Notifying the Relevant Authorities**

This action is to be taken by safety personnel. In order to notify the relevant authorities, consider the following:

- (1) Section 154 of the Act requires you to notify the Department of Labour immediately of the accident through call and online (<https://www.blmis.gov.bt/accident-reporting>).
- (2) Notify the relevant authorities or emergency services to give essential information about the accident immediately.

## 2.2 Step Two: Plan Investigation

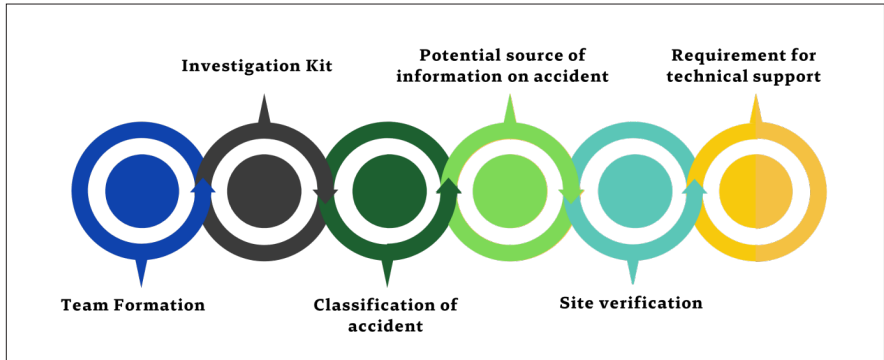


Figure 4: Plan Investigation

### 2.2.1 Team Formation

Following an accident and the immediate actions outlined in Step One, it falls on the employer, safety committee, or safety personnel to deliberate on forming an Accident Investigation Team. While not always required, this team primarily focuses on investigating the root cause of an accident and implementing preventive measures.

### 2.2.2 Investigation Kit

The investigation team must identify the necessary items, including tools and equipment, required to conduct the investigation effectively. To ensure, the team doesn't miss crucial details due to a lack of tools, it's essential to have an investigator's kit readily available. Here's a suggested list of kit:

- (1) Camera
- (2) Tape measure
- (3) Clipboard, paper, pencil
- (4) First aid kit
- (5) Flashlight

- (6) Personal protective equipment suitable for your specific industry
- (7) Report forms
- (8) Paper/plastic bags with ties
- (9) Sketching/Drawing Template
- (10) Warning/barricade tape
- (11) Video Equipment (optional)
- (12) Duffle bag for convenient storage

Regularly test equipment for their functions. Additionally, consider utilising alternative devices for photos and videos as a handy alternative.

### **2.2.3 Classification of accident**

This action is to be taken by safety personnel. Accident classification is a standardised method in accident analysis by which the causes of an accident, including the root causes, are grouped into categories. It is a crucial aspect of accident prevention and safety improvement, as it helps in identifying patterns, trends, and underlying factors that contribute to accidents. By understanding the causes of accidents, we can develop effective strategies to prevent them from happening in the future.

For the classification of types of accidents to determine the cause, refer to Annexure VI which provides classification of the accidents.

### **2.2.4 Potential source of information on accident**

Conducting effective interviews to gather critical information is an important component of accident investigation. The information gathered can provide valuable insights into the sequence of

events, contributing factors, and potential root causes of the accident. Thus, compiling a comprehensive list of individuals as a potential source holds significant importance:

- (1) **Witnesses:** To gather detailed accounts of the accident from those present during any part of the accident.
- (2) **The victim:** To understand the actions taken by the victim leading up to and during the accident.
- (3) **Co-workers and individuals in similar roles or working near the victim:** To determine adherence to job safety protocols during the accident and establish standard practices for the task being performed.
- (4) **Direct supervisor:** To acquire background information on the victim and procedural details regarding the task.
- (5) **Management:** To discuss specific job-related policies and procedures followed, and consult the victim's supervisor regarding performance, concerns, or disciplinary actions.
- (6) **Safety committee members:** Investigate any history regarding safety issues relevant to the accident.
- (7) **Health and Safety Representative:** Investigate any history regarding safety issues relevant to the accident.
- (8) **Training department:** To collect information on the training quality and quantity received by the victim and others for the task related to the accident.
- (9) **Personnel department:** To gather work history, disciplinary records, and performance evaluations of the victim and others involved.
- (10) **Maintenance personnel:** To understand the equipment/machinery background and maintenance history related to the accident.

- (11) **Victim’s spouse and family:** To gain insight into the victim’s mental state or any issues affecting them on the day of the accident.
- (12) **Other individuals:** To include anyone else possessing information relevant to the accident.

### 2.2.5 Site verification

The investigation team should verify the exact accident site’s location and anticipate any challenges or hazards that could impact the investigation.

### 2.2.6 Requirement for technical support

In the planning phase, assessing the potential requirement for technical experts to support the investigation based on the accident’s severity is crucial. While external expertise might not always be essential, the decision could hinge on the available in-house capabilities and the complexity of the accident.

## 2.3 Step Three: Documentation of Information

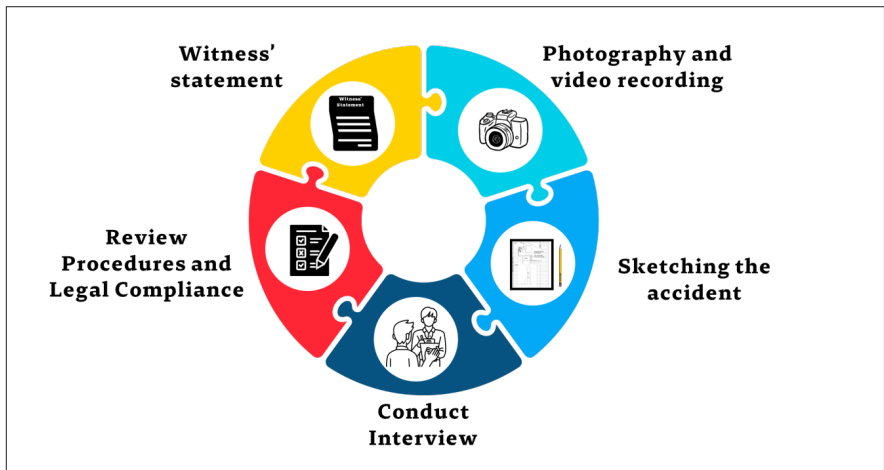


Figure 5: Documentation of Information

These actions are to be taken by safety personnel.

### **2.3.1 Witness' statement**

A witness statement is a formal account of what a witness saw or heard in connection with a workplace accident. It is an important piece of evidence in an accident investigation, as it can help to determine the cause of the accident and identify any contributing factors.

#### **Purpose of a Witness Statement**

- (1) To gather information about the accident from people who saw or heard it happen;
- (2) To corroborate or refute other evidence;
- (3) To identify potential hazards or unsafe conditions;
- (4) To develop recommendations for preventing future accidents

#### **Who Should Complete a Witness Statement**

- (1) Any person who saw or heard the accident happen;
- (2) Any person who has information about the accident or the conditions that led to it;
- (3) Any person who has knowledge of the injured worker's job duties or the equipment they were using.

#### **What Should Be Included in a Witness Statement?**

- (1) The witness's name, contact information, and date of statement
- (2) The date, time, and location of the accident
- (3) A description of what the witness saw or heard happen

- (4) Any other relevant information, such as the weather conditions, the condition of the equipment, or the actions of the injured worker
- (5) All the aforementioned information should be countersigned by the interviewer.

How to Complete a Witness StaBuild rapport with the witness?

Explain the purpose of the interview and assure them that their information is confidential.

- (1) The witness should be interviewed by an investigator as soon as possible after the accident.
- (2) Conduct interviews in a private and comfortable setting.
- (3) The investigator should ask the witness open-ended questions and allow them to tell their story in their own words.
- (4) The witness should be encouraged to provide as much detail as possible.
- (5) The witness should review the statement for accuracy and sign it.

### **2.3.2 Photography and video recording**

Photography and video recording are crucial in accident investigation as they provide visual documentation, preserve evidence, offer detailed views of the scene, aid in analysis and reconstruction of events, serve as valuable evidence, and facilitate effective communication among investigators and stakeholders. Refer to Annexure III (1) Photography and video recording.

### 2.3.3 Sketching the accident

Sketching the accident scene in accident investigation is vital because it creates a clear, visual record that helps reconstruct events, preserves crucial details before changes occur, supports analysis for determining causation, serves as evidence, aids communication among stakeholders, and contributes to improving safety measures by identifying potential hazards. Refer to Annexure III (2) Sketching.

### 2.3.4 Conduct Interview

Interviews provide crucial insights that help investigators determine the reasons behind an accident, leading to better safety measures and ultimately a safer workplace. Conduct interviews of the individuals listed during the Investigation planning phase. Refer to Annexure III (3) Interview Checklist

**Table-1: Reason for conducting interviews**

Sl. No.	Topics	Description
1	Gathering information	<ul style="list-style-type: none"><li>(i) Witnesses provide firsthand accounts of the accident, revealing details not readily apparent from physical evidence.</li><li>(ii) Interviews help identify the sequence of events and contributing factors, including unsafe conditions or actions.</li><li>(iii) They can uncover information about potential training gaps or safety violations.</li></ul>



2	Identifying root causes	<p>(i) Analysing witness statements helps uncover underlying causes beyond immediate events.</p> <p>(ii) Interviews can reveal systemic issues with procedures, equipment, or management practices.</p> <p>(iii) This information is vital for implementing effective corrective actions and preventing future accidents.</p>
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### 2.3.5 Review Procedures and Legal Compliance

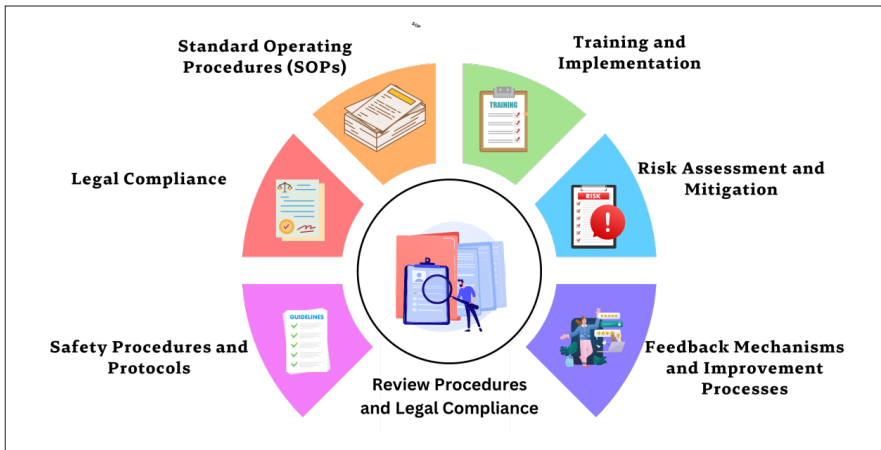


Figure 6: Review Procedures and Legal Compliance

When conducting an accident investigation, it's crucial to examine various procedures to determine their effectiveness and adherence.

**Table-2: Topics to be consider during review**

Sl. No.	Topics	Description
1	Safety Procedures and Protocols	<ul style="list-style-type: none"><li>(i) Adherence to Established Procedures: Evaluate whether employees followed established safety protocols during the accident. Check if safety equipment was utilised correctly.</li><li>(ii) Procedure Effectiveness: Assess the efficacy of existing safety procedures. Determine if they adequately mitigate risks or if modifications are necessary for enhanced safety.</li></ul>
2	Legal Compliance	<ul style="list-style-type: none"><li>(i) Regulatory Compliance: Ensure that all safety procedures align with local, national, and industry-specific regulations. Confirm compliance with laws related to workplace safety, equipment usage, and environmental standards.</li><li>(ii) Documentation and Record-Keeping: Review if there is proper documentation of safety measures and compliance records. Ensure that necessary permits or certifications are up to date.</li></ul>
3	Standard Operating Procedures (SOPs)	<ul style="list-style-type: none"><li>(i) Clarity and Accessibility: Evaluate the clarity and accessibility of SOPs for employees. Ensure that procedures are well-documented, easily understandable, and readily available to all relevant personnel.</li><li>(ii) Relevance and Currency: Check if SOPs are up to date with current industry practices, technological advancements, and regulatory changes. Identify any outdated or ineffective procedures.</li></ul>

4	Training and Implementation:	<ul style="list-style-type: none"> <li>(i) Employee Training: Assess if employees are adequately trained in the SOPs and safety procedures relevant to their roles. Determine if additional training or refresher courses are necessary.</li> <li>(ii) Consistency in Implementation: Investigate if there are discrepancies between documented procedures and their actual implementation. Look for areas where procedures are inconsistently applied or overlooked.</li> </ul>
5	Risk Assessment and Mitigation	<ul style="list-style-type: none"> <li>(i) Preventive Measures: Analyse whether the existing procedures sufficiently address potential risks identified through risk assessments. Determine if there are gaps in addressing specific hazards.</li> <li>(ii) Corrective Actions: Identify whether previous accidents led to the implementation of corrective actions and ascertain their effectiveness. Evaluate if these actions were integrated into updated procedures.</li> </ul>
6	Feedback Mechanisms and Improvement Processes	<ul style="list-style-type: none"> <li>(i) Reporting and Feedback Loops: Check if there are mechanisms for employees to report safety concerns or suggest improvements in procedures. Evaluate how this feedback is processed and incorporated.</li> <li>(ii) Continuous Improvement: Determine if there's a structured process for reviewing and updating procedures based on accident investigations, regulatory changes, or industry best practices.</li> </ul>

## 2.4 Step Four: Developing the sequence of accident

The actions specified in Step Four are to be taken by the investigation team.

### 2.4.1 Identify the key elements

Determine the key elements of the accident, such as the people involved, the machineries, process, vehicles or objects involved, and the location of the accident.

### 2.4.2 Establish the timeline

Start by establishing the overall timeline of the accident. This includes determining the date and time of the accident, as well as the sequence of events leading up to the accident.

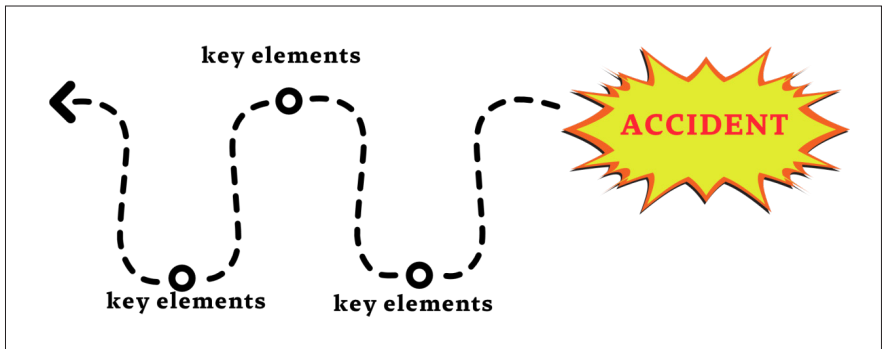


Figure 7: Developing the sequence of accident

### 2.4.3 Apply the 5W and 1H framework

Use the 5W and 1H framework to organise the information you have gathered. 5W and 1H stands for Who, What, When, Where, Why, and How. Refer to Annexure II

Table 3: 5W1H framework

5W 1H	Question	Description
Who	Who was involved in the accident?	Identify the individuals involved, including those directly and indirectly related to the accident. This encompasses both individuals and entities involved in the event.
What	What happened in the accident?	Detail the specific actions or events that took place leading up to and during the accident. This involves understanding the activities, tasks, or processes that occurred.
When	When did the accident happen?	Establish the timeline of events. Specify the exact date and time or the sequence of events leading up to the accident.
Where	Where did the accident happen?	Pinpoint the location of the accident. Understand the physical setting or environment where the event occurred.
Why	Why did the accident happen?	Determine the reasons or causes behind each action or event. This involves analysing motivations, circumstances, or contributing factors that led to the accident.
How	How did the accident happen?	Explore the methodologies or mechanisms involved in the accident. This includes understanding the processes, procedures, tools, machineries, chemicals or equipment used and how they contributed to the event.

## 2.5 Step Five: Identifying Underlying Factors

The root cause is the underlying reason why the accident happened, and it is often different from the immediate cause (the event that directly triggered the accident). Identifying underlying factors in workplace accident investigations is crucial for preventing recurrence, promoting continuous improvement, managing risks, ensuring legal compliance, and reducing costs. Once the information is gathered and the sequence of events leading up to an accident using the 5W and 1H framework is recorded, it is essential to determine the root cause. Please refer to Annexure IV

## 2.6 Step Six: Recording and Reporting

This section outlines the steps for recording and reporting accident investigations, meeting both internal needs for preventative and corrective action and legal requirements of the Department of Labour for Annexure I submission.

### 2.6.1 Recording (Documentation of Findings)

The documentation of findings in workplace accident investigations is crucial for legal compliance, risk management, and continuous improvement. It facilitates transparent communication, supports targeted training efforts, aids in root cause analysis, and allows for the evaluation of existing policies and procedures.

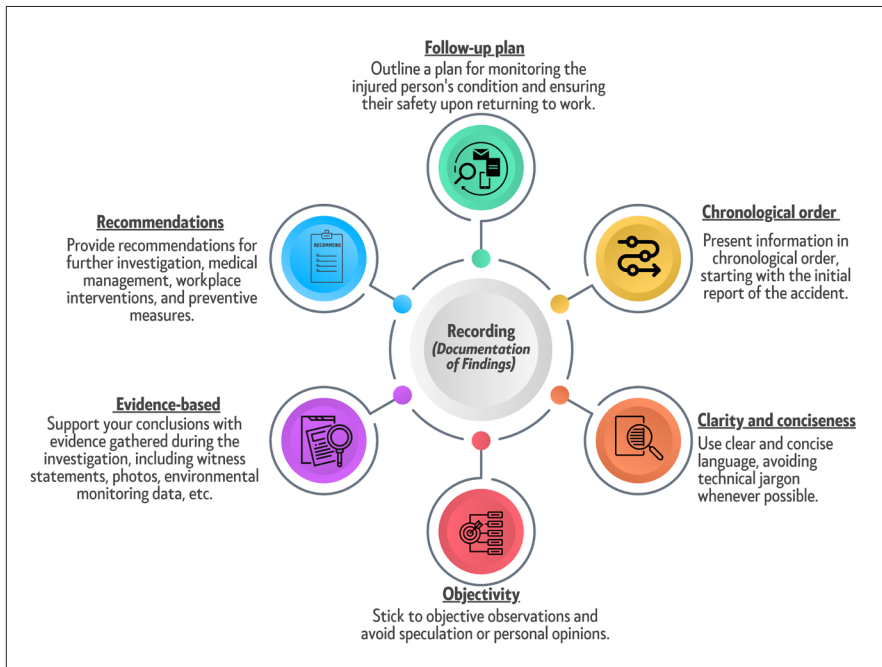


Figure 8: Tips for recording

Moreover, well-documented findings inform future prevention strategies, guide management decision-making, and contribute to overall workplace safety and organizational resilience.

## 2.6.2 Reporting

### (1) Internal Report

Develop a comprehensive report for the organization considering accident investigation procedures from Step one to Step five as prescribed in this guideline.

### (2) External Report

As per the Regulation on Occupational Health, Safety and Welfare (OHSW) 2022, following accidents must be reported to the Department of Labour.

- Death (as per Section 459 of Regulation on OHSW, 2022)
- Specified injuries specified under the Section 461 of Regulation on OHSW, 2022
- Loss of working days (more than 3 consecutive days) - as per Section 462 of Regulation on OHSW, 2022
- Dangerous Occurrence (as per Section 463 of Regulation on OHSW, 2022)
- Occupational Disease (as per Section 464 of Regulation on OHSW, 2022)
- Accident to non-employee (as per Section 465 of Regulation on OHSW, 2022)

Section 460 of OHSW, 2022 (timeline for detailed written report) requires the employer to provide a detailed report within 5 calendar days to the Department of Labour. To provide detailed report, refer annexure I (form 8) (<https://www.blmis.gov.bt/accident-reporting>). Supplement the annexure I with internal report as mentioned as section 2.6.1.

***Remember:** Accurate and timely reporting of accidents is crucial for protecting employee health, ensuring workplace safety, and upholding legal compliance. By following these procedures, safety personnel can effectively contribute to this vital process.*



# Annexures

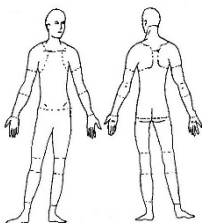
## Annexure I: Workplace Injury and Disease Reporting and Recording Form 8

1. Name of the Enterprise/workplace: .....
2. Nature of Business: .....
3. Contact person: .....
4. Address/ Location: .....  
Tel: ..... Fax: ..... E-mail: .....
5. Incident Investigation

*Instructions: Complete this form as soon as possible after an incident that results in serious injury or illness. (Optional: Use to investigate a minor injury or near miss that could have resulted in a serious injury or illness.) Individual incident investigation form should be filled up for every person involved in incident or accident.*

This is a report of a: <ul style="list-style-type: none"> <li>• Death</li> <li>• Lost Time Injury</li> <li>• First Aid Only</li> <li>• Dangerous Occurrence</li> </ul>	Date of incident: This report is made by: <ul style="list-style-type: none"> <li>• Employee</li> <li>• Supervisor</li> <li>• Safety Officer</li> <li>• Other .....(Please specify)</li> </ul>
--	--

### Step 1: Injured employee (complete this part for each injured employee)

Name:	Sex: <ul style="list-style-type: none"> <li>• Male</li> <li>• Female</li> </ul>	Age:
Department:	Job title at time of incident:	
Part of body affected: (shade all that apply)  	Nature of injury: (most serious one) <ul style="list-style-type: none"> <li>• Abrasion, scrapes</li> <li>• Amputation</li> <li>• Broken bone</li> <li>• Bruise, Burn (heat)</li> <li>• Burn (chemical)</li> <li>• Concussion (to the head)</li> <li>• Crushing Injury</li> <li>• Cut, laceration, puncture</li> <li>• Hernia, Illness</li> <li>• Sprain, strain</li> <li>• Damage to a body system:</li> <li>• Other: .....</li> </ul>	This employee works: <ul style="list-style-type: none"> <li>• Regular full time</li> <li>• Regular part time</li> <li>• Seasonal</li> <li>• Temporary</li> </ul> Months with this employer:  Months doing this job:

## Step 2: Describe the incident

<b>Exact location of the incident:</b>	<b>Exact time:</b>
What part of employee's workday? <ul style="list-style-type: none"> <li>• Entering or leaving work</li> <li>• Doing normal work activities</li> <li>• During meal period</li> <li>• During break</li> <li>• Working overtime</li> <li>• Other _____</li> </ul>	Names of witnesses (if any):

<b>Number of attachments:</b>	<b>Written witness statements:</b>	<b>Photographs:</b>	<b>Maps / drawings:</b>
What personal protective equipment was being used (if any)?			
Describe, step-by-step the events that led up to the injury. Include names of any machines, parts, objects, tools, materials and other important details.			
Description continued on attached sheets:			

## Step 3: Why did the incident happen?

<b>Unsafe workplace conditions: (Check all that apply)</b> <ul style="list-style-type: none"> <li>• Inadequate guard</li> <li>• Unguarded hazard</li> <li>• Safety device is defective</li> <li>• Tool or equipment defective</li> <li>• Workstation layout is hazardous</li> <li>• Unsafe lighting</li> <li>• Unsafe ventilation</li> <li>• Lack of needed personal protective equipment</li> <li>• Lack of appropriate equipment / tools</li> <li>• Unsafe clothing</li> <li>• No training or insufficient training</li> <li>• Other: _____</li> </ul>	<b>Unsafe acts by people: (Check all that apply)</b> <ul style="list-style-type: none"> <li>• Operating without permission</li> <li>• Operating at unsafe speed</li> <li>• Servicing equipment that has power to it</li> <li>• Making a safety device inoperative</li> <li>• Using defective equipment</li> <li>• Using equipment in an unapproved way</li> <li>• Unsafe lifting</li> <li>• Taking an unsafe position or posture</li> <li>• Distraction, teasing, horseplay</li> <li>• Failure to wear personal protective equipment</li> <li>• Failure to use the available equipment / tools</li> <li>• Other: _____</li> </ul>
Why did the unsafe conditions exist?	

Why did the unsafe acts occur?
Is there a reward (such as “the job can be done more quickly”, or “the product is less likely to be damaged”) that may have encouraged the unsafe conditions or acts? <ul style="list-style-type: none"> <li>• Yes</li> <li>• No</li> </ul> If yes, describe:
Were the unsafe acts or conditions reported prior to the incident? <ul style="list-style-type: none"> <li>• Yes</li> <li>• No</li> </ul>
Have there been similar incidents or near misses prior to this one? <ul style="list-style-type: none"> <li>• Yes</li> <li>• No</li> </ul>

#### Step 4: How can future incidents be prevented?

What changes do you suggest to prevent this incident/near miss from happening again? <ul style="list-style-type: none"> <li>• Stop this activity</li> <li>• Guard the hazard</li> <li>• Train the employee(s)</li> <li>• Train the supervisor(s)</li> <li>• Redesign task steps</li> <li>• Redesign work station</li> <li>• Write a new policy/rule</li> <li>• Enforce existing policy</li> <li>• Routinely inspect for hazard</li> <li>• Personal Protective Equipment</li> <li>• Other: _____</li> </ul>
What should be (or has been) done to carry out the suggestion(s) checked above? <p style="text-align: right;">Description continued on attached sheets:</p>

#### Step 5: Who completed and reviewed this form? (Please Print)

Written by:	Title:
Department:	Date:
Names of investigation team members:	
Reviewed by:	Title:                      Date:

## Annexure II: Information collection Checklist

WHAT	WHERE	
<ul style="list-style-type: none"> <li>• What was the incident?</li> <li>• What was the injury?</li> <li>• What was the employee doing?</li> <li>• What had the employee been told to do?</li> <li>• What tools was the employee using?</li> <li>• What machine was involved?</li> <li>• What operation was the employee performing?</li> <li>• What instructions had the employee been given?</li> <li>• What specific precautions were necessary?</li> <li>• What specific precautions was the employee given?</li> <li>• What protective equipment should have been used?</li> <li>• What protective equipment was the employee using?</li> <li>• What had other persons done that contributed to the incident?</li> <li>• What problem or questions did the employee encounter?</li> <li>• What did the employee or witnesses do when the incident occurred?</li> <li>• What extenuating circumstances were involved?</li> <li>• What did the employee or witnesses see?</li> <li>• What will be done to prevent recurrence?</li> <li>• What safety rules were violated?</li> <li>• What new rules are needed?</li> </ul>	<ul style="list-style-type: none"> <li>• Where did the incident occur?</li> <li>• Where was the employee at the time?</li> <li>• Where was the supervisor at the time?</li> <li>• Where were fellow workers at the time?</li> <li>• Where were other people who were involved at the time?</li> <li>• Where were witnesses when the incident occurred?</li> </ul>	
	<th data-bbox="584 587 992 639">WHEN</th> <ul style="list-style-type: none"> <li>• When did the incident occur?</li> <li>• When did the employee start on that job?</li> <li>• When was the employee assigned on the job?</li> <li>• When were the hazards pointed out to the employee?</li> <li>• When was the employee's supervisor last check on job progress?</li> <li>• When did the employee first sense something was wrong?</li> </ul>	WHEN

WHY	WHO
<ul style="list-style-type: none"> <li>• Why was the employee injured?</li> <li>• Why and what did the employee do?</li> <li>• Why and what did the other person do?</li> <li>• Why wasn't protective equipment used?</li> <li>• Why weren't specific instructions given to the employee?</li> <li>• Why was the employee in the position?</li> <li>• Why was the employee using the tools or machine?</li> <li>• Why didn't the employee check with the supervisor when the employee noted things weren't as they should be?</li> <li>• Why did the employee continue working under the circumstances?</li> <li>• Why wasn't the supervisor there at the time?</li> </ul>	<ul style="list-style-type: none"> <li>• Who was injured?</li> <li>• Who saw the incident?</li> <li>• Who was working with the employee?</li> <li>• Who had instructed/assigned the employee?</li> <li>• Who else was involved?</li> <li>• Who else can help prevent recurrence?</li> </ul>
	<p style="text-align: center;"><b>HOW</b></p> <ul style="list-style-type: none"> <li>• How did the employee get injured?</li> <li>• How could the employee have avoided it?</li> <li>• How could fellow workers have avoided it?</li> <li>• How could the supervisor have prevented it - could it be prevented?</li> </ul>

## Annexure III: Documentation of Information

### (1) Photography and video recording

Photography and video recording are essential tools in accident investigation for several reasons:

Sl. No.	Topic	Description
1	Preserving the Scene	Photographs and videos can accurately document the accident scene as it was found, providing a permanent record of the conditions and evidence present. This is crucial because the scene may be altered or disturbed as the investigation progresses, and physical evidence may be lost or damaged.
2	Documenting Details	Photographs and videos can capture fine details that may be overlooked during the initial examination of the scene. This includes details such as skid marks, tire impressions, damage patterns, and the location of objects. These details can be crucial for reconstructing the events of the accident and identifying contributing factors.
3	Communication and Analysis	Photographs and videos can be easily shared among investigators, experts, and stakeholders, facilitating communication and collaboration. They can also be used for training and education purposes, demonstrating accident scenarios and illustrating important safety concepts.
4	Evidence	Photographs and videos can be used as evidence, providing visual representation of the accident scene and supporting the testimony of witnesses and experts. They can help to clarify complex details and convey the severity of the accident to the jury.
5	Reconstruction and Simulation	Photographs and videos can be used to reconstruct the events of the accident using specialised software. This can help investigators to determine the factors that contributed to the accident and identify potential design flaws or safety hazards.

Sl. No.	Topic	Description
6	Prevention and Safety	The analysis of accident photographs and videos can help identify patterns and trends that contribute to accidents. This information can be used to develop preventive measures, improve safety standards, and design safer products and environments.

## (2) Sketching

Sketching is a valuable technique in accident investigation for several reasons as given below.

- (1) **Visualisation of the Scene:** Sketches provide a visual representation of the accident scene, helping investigators and stakeholders understand the spatial relationships between various elements. This can include the positions of vehicles, objects, and individuals involved in the accident.
- (2) **Recording Details:** Sketching allows investigators to document specific details that might be crucial in understanding the sequence of events leading to the accident. This can include the location of evidence, skid marks, road conditions, and the placement of relevant objects.
- (3) **Communication:** A well-drawn sketch can effectively communicate the accident scene to others, including those who were not present during the investigation. This is especially important when presenting findings to stakeholders, legal professionals, or during training sessions.
- (4) **Analysis and Reconstruction:** Accident reconstruction often involves creating a detailed timeline of events leading up to the accident. Sketches aid in this process by serving as a reference for analysing factors such as vehicle trajectories, speeds, and impact points.

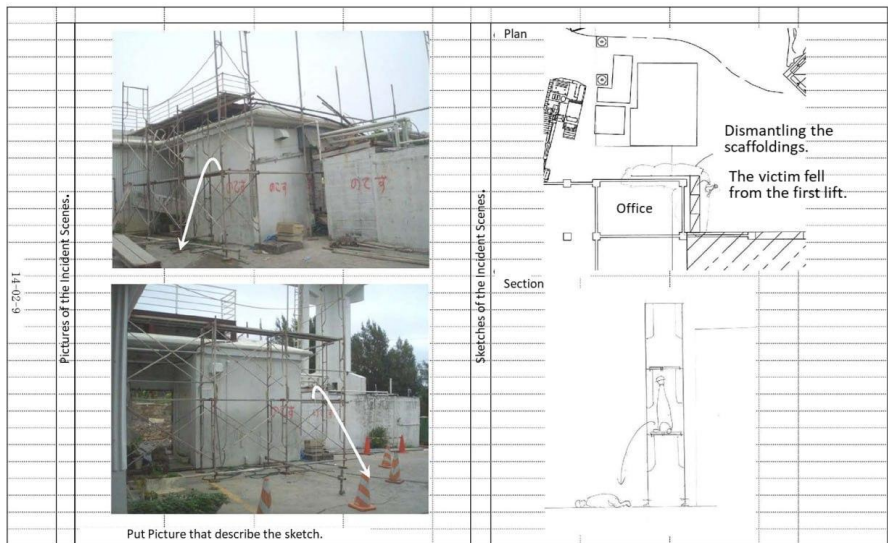
- (5) **Documentation:** Sketches become part of the official documentation of the accident investigation. They complement written reports and photographs, providing an additional layer of information that can be referenced later during legal proceedings or when reviewing the case.
- (6) **Memory Aid:** Sketching can help investigators organise their thoughts and recall details more effectively. It serves as a memory aid, ensuring that crucial aspects of the accident are not overlooked during the investigation.
- (7) **Training and Education:** Accident investigation sketches are valuable for training purposes. They can be used to educate investigators, law enforcement, and other professionals about the principles of accident investigation and the importance of capturing and representing scene details accurately.

### *Tips to make sketch*

- Make sketches large; at least 8" x 10" and clear, be sure to print legibly
- Include "Incident Details" (i.e., time, date, injured, location, conditions, etc.)
- Include measurements (i.e. distances, heights, lengths, etc.) and use permanent points (e.g., telephone pole, building) to clearly present the measurements
- Indicate directions - N= North; E= East; W= West; S= South
- Make notes on sketch to provide additional information such as the photo location and/or where people were at the time of the incident



*Note: The sketch can be used during interviews to help interviewees identify their location before, during or after the incident*



*Source: Construction Development Corporation Limited*

### (3) Interview Checklist

What to ask relates to the character of the accidents?

#### 1. Fall incident.

- a. Work immediately before the fall
- b. Conditions: height, working position, structure and size of work area, etc.
- c. Implementation or use of fall prevention equipment (main lines, safety nets, vertical protection nets, handrails, etc.)
- d. Contents of safety meetings or toolbox meetings, including the change of plan and publicization to the workers.

- e. The reason for the unsafe behavior (if the victim is still alive)
- f. The reason for the action if it is due to the unsafe action of other workers of the victim.
- g. Deficiencies in machinery, equipment, etc.
- h. Confirm the implementation status of tentative plans, etc., using the assembly drawings.
- i. Work environment conditions (lighting, lighting, noise, vibration, temperature, humidity conditions)
- j. Clothes, footwear, gloves, and safety belts.
- k. Others

## **2. Landslide**

- a. Structural check; planning drawings and calculation sheets for earth shoring,
- b. Awareness of the geotechnical characteristics of the collapse at the disaster site
- c. Perception of the signs just before the collapsed
- d. Work details just before the collapsed
- e. Excavation status (depth, excavation angle, excavation machine used, etc.)
- f. Presence of earth shoring, implementation status, stability of shoring
- g. Geological features that lead to collapse.
- h. Weather conditions from the day before the disaster, especially wind and rain conditions
- i. Conditions of the landslide (vibration, load on the edge, slant degree, etc.)

- j. Awareness of underground structures (buried piping, etc.,)
- k. Executed preventive measures for the landslides in advance.
- l. Estimation of direct cause

### **3. Heavy Machine Accident**

- a. Work immediately before the accident.
- b. Arrangement: Layout of machines and victims, material stock, margins, etc.
- c. The operator's site of view
- d. The presence of guides, alarm systems, etc.
- e. Trespassing method or measures
- f. Advanced work planning
- g. Safety work meeting

### **4. Flying/falling objects**

- a. Work immediately before the accident.
- b. Causes of flying and falling, such as unsafe conditions and unsafe actions
- c. Instructions that lead the work directly above or below others.
- d. Possibility of flying or falling due to wind or vibration
- e. Presence of prevention measures such as fix or protective measures.
- f. Use of PPE

## 5. Collapse of structures

- a. Work immediately before the accident.
- b. Presence of the signs; abnormal noise, displacement, etc.,
- c. Confirmation of safety in planning drawings of temporary structures.
- d. Instruction on the planned direction of collapse or the maximum load.
- e. Instability study on the structure: horizontal loads, etc.
- f. Load condition and the deformation study
- g. Inappropriate planning, defects in members, inappropriate assembly methods, etc.
- h. Immobility or subsidence of the ground or foundation
- i. Insufficient quantity of supports and wires to the plan.
- j. If there is a place that escaped the collapse, check the above items to identify the cause.
- k. Presence of transmissive vibration on the structure
- l. Weather factors

## Tips for review procedure and legal compliance

### (1) Dos

Time	Action	What to do
Before the interview	Prepare	<ul style="list-style-type: none"> <li>Review the accident report and witness statements.</li> <li>Develop a list of questions targeted to each witness.</li> <li>Plan the interview structure and flow.</li> </ul>
	Create a comfortable environment	<ul style="list-style-type: none"> <li>Choose a quiet, private location</li> <li>Offer the witness refreshments and ensure their comfort.</li> <li>Explain the purpose of the interview and reassure them of confidentiality.</li> </ul>
	Actively listen	<ul style="list-style-type: none"> <li>Pay close attention to the witness's responses</li> <li>Use nonverbal cues like nodding and eye contact</li> <li>Ask clarifying questions to ensure understanding.</li> </ul>
During the interview	Use open-ended questions	<ul style="list-style-type: none"> <li>Avoid leading questions that suggest a desired answer</li> <li>Encourage the witness to provide details and elaborate on their experiences.</li> </ul>
	Focus on facts	<ul style="list-style-type: none"> <li>Avoid asking questions that require speculation or assumptions.</li> <li>Stick to the specific details of the accident and what the witness observed.</li> </ul>
	Be patient and understanding	<ul style="list-style-type: none"> <li>Allow the witness to take their time and answer questions to the best of their ability.</li> <li>Avoid interrupting or rushing them</li> </ul>
	Take accurate notes	<ul style="list-style-type: none"> <li>Capture key points and verbatim quotes whenever possible.</li> <li>Organise your notes for future reference and report writing.</li> </ul>

Time	Action	What to do
After the interview	Thank the witness for their time	<ul style="list-style-type: none"> <li>Express your appreciation for their cooperation.</li> <li>Explain the next steps in the investigation process.</li> </ul>
	Review and analyse your notes	<ul style="list-style-type: none"> <li>Identify any discrepancies or inconsistencies in witness statements.</li> <li>Look for patterns and recurring themes</li> <li>Use this information to guide your investigation further</li> </ul>

## (2) Don'ts

Actions	Way of Doing
Make assumptions or jump to conclusions	<ul style="list-style-type: none"> <li>Allow the evidence and witness statements to guide your investigation.</li> <li>Avoid forming opinions before gathering all the facts.</li> </ul>
Accuse or blame the witness	<ul style="list-style-type: none"> <li>The focus is on understanding the accident, not assigning blame.</li> <li>Create a safe space where witnesses feel comfortable sharing information freely.</li> </ul>
Be judgemental or dismissive	<ul style="list-style-type: none"> <li>Respect the witness's perspective and experiences.</li> <li>Avoid making any discriminatory or insensitive remarks.</li> </ul>
Share confidential information	<ul style="list-style-type: none"> <li>Ensure the witness's anonymity and protect their privacy.</li> <li>Only disclose information with authorised individuals on a need-to-know basis.</li> </ul>
Fail to document everything	<ul style="list-style-type: none"> <li>Keep detailed records of the interview, including questions asked and answers received.</li> <li>This information is crucial for legal and investigative purposes.</li> </ul>

### (3) Way of asking questions

Ways of asking questions	Way of Doing
Open-ended questions	<ul style="list-style-type: none"><li>• "What happened?"</li><li>• "Tell me about what you saw."</li><li>• "Can you describe what you heard?"</li></ul>
Closed-ended questions:	<ul style="list-style-type: none"><li>• "Did you see anyone else in the area?"</li><li>• "Was the equipment being used properly?"</li><li>• "Have you received any training on this specific task?"</li></ul>
Probing questions:	<ul style="list-style-type: none"><li>• "Can you tell me more about that?"</li><li>• "What do you mean by..."</li><li>• "Could you elaborate on that point?"</li></ul>

# Annexure IV: Methods to determine the root cause of an accident

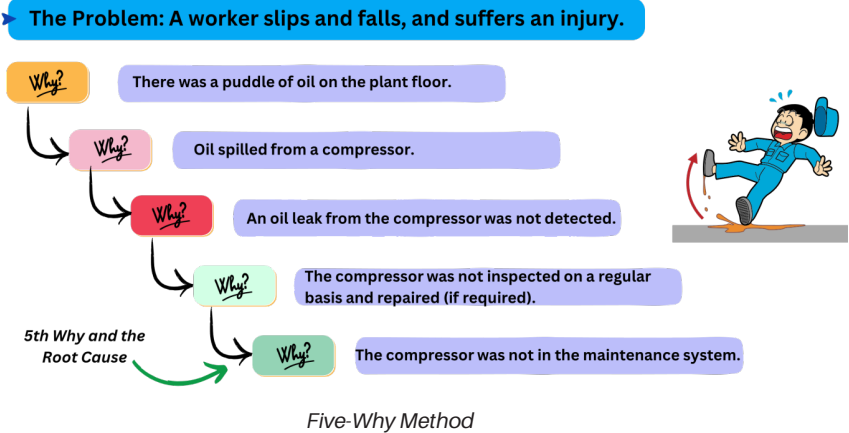
## Method One: 5 Whys

The 5 Whys is a simple but effective method for drilling down to the root cause of a problem. It is based on the idea that by asking “why” five times, you can eventually reach the underlying reason for the problem.

Here is an example of how to use the 5 Whys to analyse a car accident:

- Event: Car ran a red light.
- Why: Driver was distracted.
- Why: Driver was using their phone.
- Why: Driver was not paying attention to the road.
- Why: Driver was in a hurry.

In this example, the root cause of the accident is that the driver was in a hurry. This led to them using their phone and not paying attention to the road, which ultimately caused them to run a red light. Here is an example of an Five-Why Method for slip and fall accident:



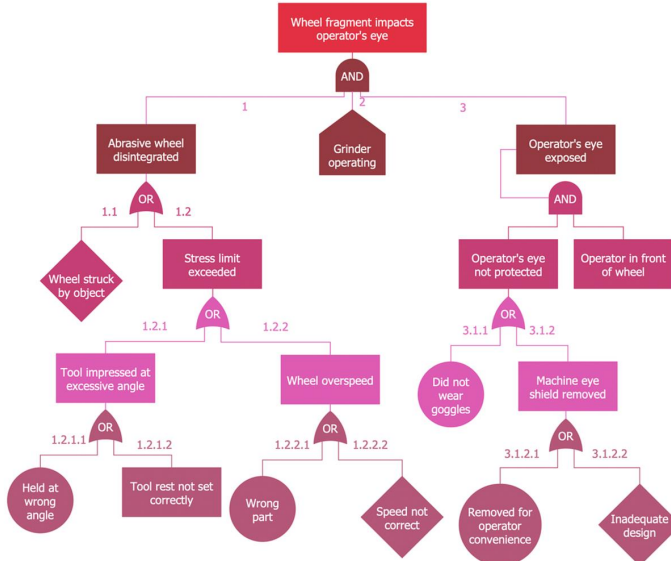


## Method Two: Fault Tree Analysis (FTA)

Fault Tree Analysis (FTA) serves as a valuable method for conducting in-depth root cause analysis, aiming to pinpoint and scrutinise the underlying factors contributing to accidents. This deductive, top-down approach is employed to identify the origin of a particular undesirable event within a complex system. FTA entails dissecting the root cause of a failure, deconstructing it into its constituent elements, and illustrating these components through a graphical representation known as a fault tree.

This fault tree serves as a visual tool, aiding managers, safety officers, and engineers in comprehending potential failure modes and assessing the likelihood of each mode occurring. By employing FTA, professionals can conduct thorough safety and reliability analyses, allowing for a comprehensive understanding of the factors leading to accidents.

Here is an example of an FTA for Struck by object accident:



Example of an FTA for Slip and Fall accident

## **Method Three: Cause-Effect Diagram (Ishikawa Diagram)**

The Cause-Effect Diagram, also known as the Ishikawa Diagram or Fishbone Diagram, is a visual tool used to systematically analyse the potential causes contributing to a specific problem or effect. It's particularly useful in root cause analysis for workplace accidents because it helps identify and organise potential causes across various categories, facilitating a comprehensive understanding of contributing factors.

Importance in Workplace Accident Analysis:

1. **Structured Analysis:** The diagram provides a structured approach, categorizing causes into distinct segments. This aids in organising thoughts and systematically exploring potential root causes.
2. **Visual Representation:** Its visual nature makes it easy for teams to understand and collaborate. By illustrating causes and their relationships, it encourages a comprehensive examination of factors contributing to an accident.
3. **Identifying Multiple Causes:** It allows for the exploration of multiple causes across different categories, highlighting potential systemic issues contributing to accidents.

### **Example:**

Let's consider a workplace accident involving machinery malfunction leading to an employee injury.

**Incident/Accident:** Employee Injury due to Machinery Malfunction Causes (Using 4M Method):

#### **1. Man (Human Factors):**

- Lack of proper training on machinery operation and safety protocols.
- Fatigue or distraction of the operator due to long working hours.

## 2. Management:

- Inadequate maintenance schedules for the machinery.
- Lack of clear communication about safety procedures and protocols.

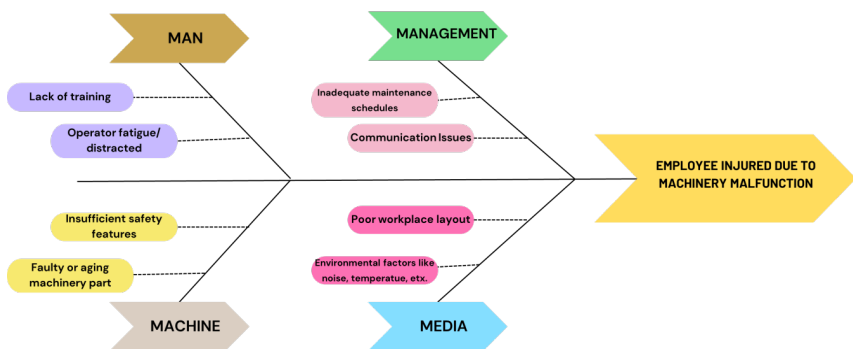
## 3. Machine (Equipment):

- Faulty or aging machinery parts not regularly inspected or replaced.
- Insufficient safety features or guards on the machinery.

## 4. Media (Environment):

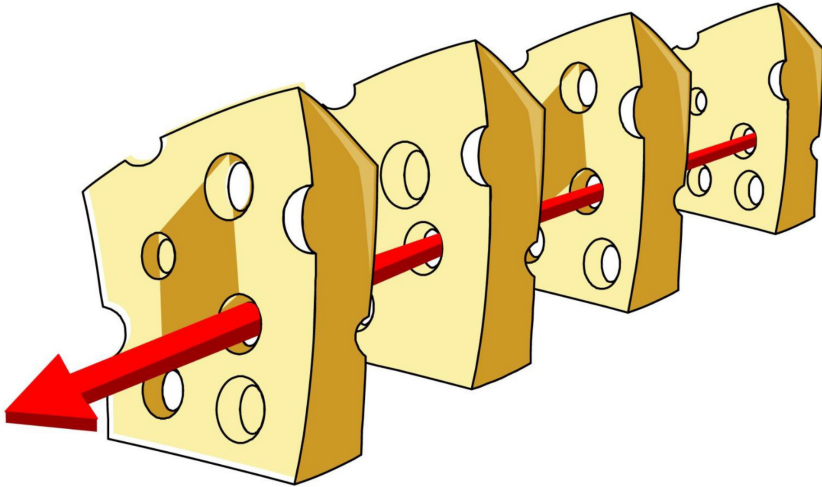
- Poor lighting or improper workspace layout leading to difficulties in operating the machinery safely.
- Environmental factors like noise or temperature affecting operator concentration.

Fishbone Diagram:



Example for Cause-Effect Diagram (Ishikawa Diagram)

## Swiss Cheese Model



The Swiss Cheese Model is a widely used conceptual framework in risk management and accident investigation. Developed by James Reason, it illustrates how accidents occur as a result of multiple layers of defenses (represented by slices of cheese) with occasional holes. When these holes align, they create a pathway for accidents to happen. The model emphasizes that accidents are rarely caused by a single factor but rather by a combination of failures at different levels within an organization's systems.

### **(1) Core Principles**

1. Defense Layers: Imagine various "slices" of Swiss cheese, each representing a defensive barrier against accidents (e.g., policies, procedures, training, equipment). These layers are imperfect, containing "holes" signifying vulnerabilities or failures.

2. Alignment of Holes: Accidents transpire when holes across multiple layers coincidentally align, allowing an “active failure” (immediate cause) to bypass all protections and trigger the event. This emphasizes the complex interplay of factors contributing to accidents.
3. Emphasis on Systems: The SCM focuses on systemic and organizational factors as crucial contributors to accidents. It encourages analyzing not just immediate actions but also underlying latent failures (basic and root causes) embedded within the system.
4. Dynamic Nature: The model acknowledges that “holes” (vulnerabilities) are dynamic, opening and closing over time due to various influences. This necessitates constant vigilance and adaptation of safety mechanisms.

## **(2) Application of the Swiss Cheese Model**

1. Immediate Cause: Immediate causes are the most visible factors directly preceding the accident. They represent the final holes in the cheese, the last line of defense that failed to prevent the incident. Identifying immediate causes is crucial for understanding the sequence of events leading up to the accident.

*Example: In a workplace accident where a worker falls from a ladder, the immediate cause might be the ladder slipping or the worker losing their balance.*

2. Basic Cause: Basic causes correspond to the layers of cheese behind the immediate cause. They represent underlying systemic or organizational failures that created vulnerabilities. Addressing basic causes helps to close the holes in the cheese and prevent similar incidents in the future.

*Example: In a ladder fall accident, a basic cause could be inadequate training on ladder safety or a lack of proper inspection procedures for equipment.*

3. **Root Cause:** Root causes are the inherent flaws or vulnerabilities within the entire block of cheese, representing deeper systemic issues that allow the basic causes to exist. They are often broader and more fundamental, requiring comprehensive analysis and changes to organizational culture, management systems, or resource allocation to address.

*Example: A root cause might be a lack of a comprehensive safety management system within the organization, including ineffective safety policies, insufficient resources allocated to safety training, or a culture that does not prioritize safety.*

By applying the Swiss Cheese Model, organizations can systematically identify and address the various layers of vulnerabilities that contribute to accidents, ultimately strengthening their overall safety defenses.

## Annexure V: Classification of Workplace Accident

1. **Falls of person:** This category encompasses incidents where a person loses their balance and falls from a height or falls at a same level, potentially suffering injuries.
  - 1.1 Falls of a person on the same level due to slips and trips. Fall due to losing footing on slippery surfaces, uneven terrain, or tripping over obstacles.
  - 1.2 Falls of a person from heights (ladders, scaffolds buildings, trees, machines, vehicles and into depths (wells, ditches, excavations, holes in the ground, openings in floors or roofs)
  
2. **Stuck by falling objects:** This category involves objects falling from a height and striking or injuring workers below.
  - 2.1 Slides and cave-ins (earth, rocks, stones, snow)
  - 2.2 Collapse (building, walls, scaffolds, ladders, piles of goods)
  - 2.3 Struck by falling objects during handling (loading/unloading)
  - 2.4 Struck by fall objects, not elsewhere classified
  - 2.5 Collision with moving objects: Forklifts, cranes, or other equipment dislodging or dropping objects.
  
3. **Stepping on, striking against objects:** This category includes incidents where workers come into contact with stationary objects, causing injuries.
  - 3.1 Stepping on objects (stepping on Protruding beams, sharp edges, or unmarked obstacles in walkways)
  - 3.2 Striking against stationary objects (except impacts due to a previous fall)

- 3.3 Striking against moving objects
  - 3.4 Struck by moving objects (including flying fragments and particles) excluding falling objects
4. **Caught in or between objects:** This category involves situations where workers become physically stuck or entangled in machinery, equipment, or materials.
- 4.1 Caught in an object
  - 4.2 Caught between a stationary object and a moving object
  - 4.3 Caught between moving objects (except flying or falling objects)
5. **Overexertion or strenuous movement:**
- 5.1 Overexertion in lifting objects
  - 5.2 Overexertion in pushing or pulling objects
  - 5.3 Overexertion in handling or throwing objects
  - 5.4 Strenuous movement
6. **Confined Spaces**
- 6.1 Entering tanks, bins, or silos without proper safeguards or training (e.g., lack of oxygen monitoring, inadequate ventilation, improper rescue plan).
  - 6.2 Working in confined spaces with hazardous atmospheres (ex. toxic fumes, combustible gases, confined liquid spaces).
7. **Contact with Temperature Extremes**
- 7.1 Heat Stress: Working in hot environments without proper hydration, cooling measures, or heat stress prevention programs.



- 7.2 Cold Stress: Working in cold environments without proper clothing, protective gear, or adequate warming facilities.
- 7.3 Burns: Contact with hot surfaces, liquids, or gases due to equipment malfunctions, improper handling of materials, or lack of thermal protection.
- 7.4 Frostbite: Exposure to extreme cold causing skin and tissue damage due to inadequate clothing, poor blood circulation, or prolonged exposure.

## 8. Contact with Electrical Current

- 8.1 Injury due to contact with live electrical parts
- 8.2 Electrocution

## 9. Exposure to Harmful Substances

- 9.1 Chemical Exposure: Inhalation, ingestion, or skin contact with hazardous chemicals due to spills, leaks, inadequate ventilation
- 9.2 Biological Exposure: Contact with viruses, bacteria, or toxins from contaminated materials, animal bites, or exposure to biological agents

## 10. Fires and Explosions

- 10.1 Fires: Fire caused due to flames spread, arc flashes and electrical fires
- 10.2 Explosions: Includes sudden bursts of energy leading to a release of pressure or violent expansion, posing significant risks.

## 11. Human Factors

- 11. Workplace Violence: Involves incidents of physical or verbal aggression, harassment, or threatening behavior in

the workplace.

- 11.2 Stress-related Illnesses: Refers to health issues arising from prolonged exposure to stressful work conditions.

## 12. Miscellaneous

- 12.1 Drowning Incidents: Refers to accidents where individuals are submerged in water.

- 12.2 Others

## References and further reading

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