حكومة رأس الخيمة
Government of Ras Al Khaimah

rakez
RAS AL KHAIMAH
ECONOMIC ZONE

Guidelines for Incident Reporting and Investigation

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1. Purpose

The purpose of these guidelines is to define the minimum requirements in the Ras Al Khaimah Economic Zone (RAKEZ) for the immediate notification of Incident reporting and for conducting the necessary investigation (after an EHS incident /hazard /near miss) to identify the root cause of the Incident and take the necessary corrective action(s) towards preventing a reoccurrence.

2. Scope

These guidelines are applicable to all types of incidents and near misses that may or could affect the Environment, Health, and Safety within RAKEZ jurisdictional areas, including clients, their employees, visitors, and contractors.

3. Roles and responsibilities

The client shall ensure that the Incident is investigated and reported to RAKEZ according to the HS&E regulations. The client shall:

- Ensure the implementation of the near-miss/Incident investigation and reporting process within their premises/facility.
- Communicate the investigating and reporting process to all levels of the campus.
- Ensure necessary resources are available for the effective implementation and maintenance of the investigation and reporting process.
- Ensure the availability of competent staff to investigate the incident(s) and identify the root cause(s).
- Ensure the necessary actions are taken following the investigation.
- Report to the relevant authorities based on applicable reporting requirements.
- Review the lessons learned from the implementation of the investigation and reporting process.
- Maintain, review, update, and enhance the investigation and reporting process to ensure effectiveness and integrity.

4. Definitions

A. **Employer:** any business, organisation, or individual (occupier/tenant/owner/licensee/lessee/developer) granted a legal licence/permission by RAKEZ and occupying and/or operating within RAKEZ jurisdictional areas.
B. **Incident:** any unplanned event resulting in or having a potential for injury, ill health, damage, or other loss.
C. **Investigation:** the formal process of identifying the causes of the incident to reveal its root cause.
D. **Near Miss:** an unplanned event or series of events that occurred in the workplace and which, although not resulting in an injury, illness, or equipment/property damage, had the potential to do so.
E. **Occupational Illness:** any abnormal condition or disorder, other than one resulting from an occupational injury, caused by exposure to factors associated with employment and/or work environment. this includes acute and chronic illnesses or diseases caused by inhalation, absorption, ingestion, or direct contact.
F. **Occupational Injury:** physical harm to a person resulting from a single exposure event involving chemical, physical or biological agents in the work environment.
G. **Root Cause:** the initiating event that begins the chain of events that leads to an incident.

Abbreviations:

A. **RAKEZ:** indicates Ras Al Khaimah Economic Zone
B. **HS&E:** indicates Health, Safety & Environment.

5. Duty to notify

The employer shall have a system for the notification of incidents reportable to RAKEZ and other concerned authorities in accordance with RAKEZ HS&E Regulations – Clauses 4.8 and 4.9.

6. The causes of incidents

Incidents have many causes. On analysis, the incident can be seen as a chain of failures and errors that lead almost inevitably to the incident. These causes can be classified as:

- Immediate causes: the agent of injury or ill health (the blade, the substance, the dust, etc.)

- Underlying causes: unsafe acts and unsafe conditions (the guard removed, the ventilation switched off, etc.)
- Root causes: the failure from which all other failings grow, often remote in time and space from the incident (e.g. failure to identify training needs and assess competence, low priority given to risk assessment, etc.)

To prevent incidents, you need to provide effective risk control measures which address the immediate, underlying, and root causes.

7. Incident investigation fundamentals

7.1. Why investigate?



There are hazards in all workplaces; risk control measures are put in place to reduce the risks to an acceptable level to prevent incidents and cases of ill health. The fact that an incident has occurred suggests that the existing risk control measures were inadequate. Learning lessons from near misses can prevent costly incidents. Incidents shall be investigated for the following reasons:

A. Ensure the organisation is operating within the law.
B. Provide essential information for insurers in the event of a claim.
C. Understand how and why things went wrong.
D. Understand the ways people can be exposed to substances or conditions that may affect their health.
E. Get a true snapshot of what really happens and how work is really done (i.e. workers may find shortcuts to make their work easier or quicker and may ignore rules).
F. Identify deficiencies in the current risk control procedures, thus improving the management of risk in the future.
G. Prevent further similar incidents.
H. Prevent business losses due to disruption, stoppage, lost orders, and the costs of criminal and civil legal actions.
I. Improve employees' morale and attitude to health and safety – i.e. they are involved in the decision and can see that problems are dealt with.

While the argument for investigating incidents is clear, the need to investigate near misses and undesired circumstances may not be so obvious. However, investigating near misses and undesired circumstances is as useful as investigating incidents and much easier too.

In general, the investigation should identify why the existing risk control measures failed and what improvements or additional measures are needed. More general lessons on why the risk control measures were inadequate must also be learned.

7.2. Which events should be investigated?



Having been notified of an incident and given basic information on what happened, a decision shall be made to proceed with the investigation and define its extent and depth.

The potential consequences and the likelihood of the incident recurring should determine the level of investigation, not simply the injury or ill health suffered on this occasion. For example: Is the harm likely to be serious? Is this likely to happen often? Similarly, the causes of a near miss can have great potential for causing injury and ill health in the future. When making your decision, you must also consider the potential for learning lessons. For example, if there have been several similar incidents, it may be worth investigating, even if the single events are not worth investigating in isolation.

7.3. Who should carry out the investigation?



For an investigation to be worthwhile, the management and the workforce must be fully involved. Depending on the level of the investigation (and the size of the business), supervisors, line managers, health and safety professionals, employee representatives, and senior management/directors may all be involved.

This joint approach will ensure that a wide range of practical knowledge and experience is utilised and employees and their representatives will feel empowered and supportive of any necessary remedial measures. A joint approach also reinforces the message that the investigation is for the benefit of everyone.

In addition to detailed knowledge of the work activities involved, members of the team should be familiar with health and safety good practices, standards, and legal requirements. The investigation team must include people with the necessary investigative skills (e.g. information gathering, interviewing, evaluating, and analysing). Provide the team with sufficient time and resources to conduct the investigation efficiently.

It is essential that the investigation team is either led by or reports directly to someone with the authority to make decisions and act on their recommendations.

7.4. When should it start?

The urgency of an investigation will depend on the magnitude and immediacy of the risk involved. In general, incidents should be investigated and analysed as soon as possible. This is not simply good practice, it is common sense – memory is best and motivation greatest immediately after an incident.

7.5. What does it involve?

An investigation will involve an analysis of all the information available. This will involve assessing physical (the scene of the incident), verbal (the accounts of witnesses), and written (risk assessments, procedures, instructions, job guides, etc.) evidence to identify what went wrong and determine steps to prevent the incident from recurring.

It is important to be open, honest, and objective throughout the investigation process. Preconceived ideas about the process, the equipment, or the people involved in an incident may blind you to the real causes. Question everything. Be wary of blaming individuals.

7.6. What makes a good investigation?

To get rid of weeds, you must dig up the roots, otherwise, the weed will grow again. Similarly, it is only by conducting investigations that identify root causes that organisations can learn from their past failures and prevent future failures.

Simply dealing with the immediate causes of an incident may provide a short-term fix. But, in time, the underlying causes that were not addressed will allow conditions to develop where further incidents are likely, possibly with more serious consequences. The immediate root causes must be identified and remedied.

Investigations should be conducted with incident prevention in mind, without placing blame. Attempting to apportion blame before the investigation has started is counterproductive because people then become defensive and uncooperative. Only after the investigation has been completed is it appropriate to consider whether any individuals acted inappropriately.

Investigations that conclude that operator error was the sole cause are rarely acceptable. Underpinning the 'human error', there will be several underlying causes that created the environment in which human errors were inevitable. For example, inadequate training and supervision, poor equipment design, lack of management commitment, and poor attitude to health and safety.



The objective is to establish not only how the incident happened, but more importantly, what allowed it to happen. The root causes of incidents are almost inevitably management, organisational, or planning failures.

In general, a good investigation involves information gathering, analysis, risk control measures, and action plan implementation.

A. Information gathering:

- explores all reasonable lines of inquiry
- is timely
- is thorough and structured, to avoid leaping to conclusions.

B. Analysis:

- is objective and unbiased
- identifies the sequence of events and conditions that led to the incident
- identifies the immediate causes
- identifies underlying causes (i.e. actions in the past that have allowed/caused undetected unsafe conditions/practices)
- identifies root causes (i.e. organisational and management health and safety arrangements – supervision, monitoring, training, resources allocated to health and safety, etc.).

C. Risk control measures:

- identify risk control measures that were missing, inadequate, or unused
- compare conditions/practices as they were with those required by current legal requirements, codes of practice, and guidelines
- identify additional measures needed to address the immediate, underlying, and root causes
- provide meaningful recommendations that can be implemented.

D. Action plan and implementation:

- provides an action plan with SMART objectives (Specific, Measurable, Agreed, Realistic, and Time scaled)
- ensures that the action plan deals effectively with the immediate and underlying causes and the root causes
- includes lessons that can be applied to prevent further incidents, e.g. assessments of skill and training in competencies that may be needed for other areas of the organisation.
- provides feedback to all parties involved to ensure the findings and recommendations are correct, address the issues, and are realistic
- should be fed back into a review of the risk assessment
- communicates the results of the investigation and the action plan to everyone who needs to know
- includes arrangements to ensure the action plan is implemented and progress monitored.

8. Steps to take following an incident

A. Emergency response:

- take prompt emergency action (e.g. first aid)
- make the area safe (in some cases this may need to be done first).

B. Initial report:

- preserve the scene
- note the names of the people, the equipment involved, and the names of witnesses
- report the incident to the person responsible for health and safety who will decide what further action (if any) is needed.

C. Initial assessment and investigation response:

- report the incident to the regulatory authority if appropriate (refer to RAKEZ HS&E REGULATIONS).

9. The decision to investigate

The table below will assist in determining the level of investigation appropriate for the incident. The worst potential consequences of the incident should be taken into consideration (e.g. a scaffolding collapse may not have caused any injuries, but it had the potential to cause major or fatal injuries).

	Potential worst consequences of adverse event

Likelihood of recurrence	Minor	Serious	Major	Fatal
certain				
Likely				
Possible				
Unlikely				
Rare				

Risk		Minimal		Low		Medium		High
Investigation level		Minimal level		Low level		Medium level		High level

A. In a minimal-level investigation, the relevant supervisor will investigate the circumstances of the incident and try to learn any lessons that will help prevent future occurrences.
B. A low-level investigation will involve a short investigation by the relevant supervisor or line manager into the circumstances and immediate, underlying, and root causes of the incident, to try to prevent a recurrence and to learn general lessons.
C. A medium-level investigation will involve a more detailed investigation by the relevant supervisor or line manager, the health and safety adviser, and employee representatives, looking for immediate, underlying, and root causes.
D. A high-level investigation will be a team-based investigation involving supervisors or line managers, health and safety advisers, and employee representatives. It will be conducted under the supervision of senior management or directors and will look for the immediate, underlying, and root causes.

10. A step-by-step guide to health and safety investigations

The four steps include a series of numbered questions. These set out in detail the information that should be entered into the incident investigation form. The question numbers correspond to those on the form.

10.1. Step one: gathering the information

Find out what happened and what conditions and actions influenced the incident. Begin straight away, or as soon as practicable. It is important to capture information as soon as possible to prevent it from being corrupted, e.g. items moved, guards replaced, etc. If necessary, work must stop and unauthorised access should be prevented.

Talk to everyone who was close by when the incident happened, especially those who saw what happened or know anything about the conditions that led to it. The amount of time and effort spent on information gathering should be proportionate to the level of investigation. Collect all available and relevant information. This includes opinions, experiences, observations, sketches, measurements, photographs, check sheets, permits-to-work, and details of the environmental conditions at the time, etc. This information can be recorded initially in note form, with a formal report completed later. These notes should be kept at least until the investigation is complete.

Discovering what happened can involve a lot of detective work. Be precise and establish the facts as best you can. There may be a lack of information and many uncertainties, but you must keep an open mind and consider everything that might have contributed to the incident. Hard work now will pay off later in the investigation. Many important things may emerge at this stage of the process, but not all of them will be directly related to the incident. Some of the information gathered may appear to have no direct bearing on the event under investigation. However, this information may give you greater insight into the hazards and risks in your workplace. This could enable you to make your workplace safer in ways you may not have previously considered.

Q.1 Where and when did the incident happen?

Q.2 Who was injured/suffered ill health or was otherwise involved in the incident?

Q.3 How did the incident happen?

Note any equipment involved. Describe the chain of events before and immediately after the incident. Very often, several chance occurrences and coincidences combine to create the circumstances in which an incident

can happen. All these factors should be recorded here in chronological order, if possible. Determine the chain of events by talking to the injured person, eyewitnesses, line managers, health and safety representatives, and fellow workers to find out what happened and who did what. In particular, note the position of those injured, both immediately before and after the incident. Be objective and, as far as possible, avoid apportioning guilt, assigning responsibility, or making snap judgments on probable causes.

Plants and equipment that had a direct bearing on the incident must be identified clearly. This information can usually be obtained from a nameplate attached to the equipment. Note all the details available, including the manufacturer, model type, model number, machine number and year of manufacture, and any modifications made to the equipment. Note the position of the machinery controls immediately after the incident. This information may help you to spot trends and identify risk control measures. You should consider approaching the supplier if the same machine has been implicated in several incidents. Be precise. Changes to the shop floor process and layout are regular occurrences. Unless you precisely identify plant and equipment, you will not detect details such as whether a machine or a particular piece of equipment has been moved around and caused injuries on separate occasions in different locations.

Q.4 What activities were being carried out at the time?

The work performed just before the incident can often cast light on the conditions and circumstances that caused something to go wrong. Provide a good description, including all the relevant details, e.g. the surroundings, the equipment/materials being used, the number of employees engaged in the various activities, the way they were positioned, and any details about how they were behaving, etc.

Q.5 Was there anything unusual or different about the working conditions?

Incidents often happen when something is different. When faced with a new situation, employees may find it difficult to adapt, particularly if the sources of danger are unknown to them or if they have not been adequately prepared to deal with the new situation. If working conditions or processes were significantly different from normal, why was this?

Describe what was new or different in the situation. Was there a safe working method in place for this situation, were operatives aware of it and was it being followed? If not, why not? Learning how people deal with unfamiliar situations will enable similar situations to be better handled in the future.

Was the way the changes were introduced, temporary or otherwise, a factor? Were the workers and supervisors aware that things were different? Were workers and supervisors sufficiently trained/experienced to recognise and adapt to changing circumstances?

Q.6 Were there adequate safe working procedures and were they followed?

Incidents often occur when there are no safe working procedures or where procedures are inadequate or are not followed. Comments such as ‘we’ve been doing it that way for years and nothing has ever gone wrong before’ or ‘he has been working on that machine for years and knows what to do’ often lead to the injured person getting the blame, irrespective of what part procedures, training, and supervision – or the lack of them –played in the incident. What was it about a normal practice that proved inadequate? Was a safe working method in place and being followed? If not, why not? Was there adequate supervision, and were the supervisors themselves sufficiently trained and experienced? Again, it is important to pose these questions without attempting to apportion blame, assign responsibility or stipulate cause.

Q.7 What injuries or ill health effects, if any, were caused?

It is important to note which parts of the body were injured and the nature of the injury - i.e. bruising, crushing, a burn, a cut, a broken bone, etc. Be as precise as possible. If the site of the injury is the right upper arm, midway between the elbow and the shoulder joint, provide these details. Precise descriptions will enable you to spot trends and take prompt remedial action. For example, what appears to be a safe piece of equipment, due to the standard of its guarding, could be causing several cut injuries due to the sharp edges on the guards themselves. Facts such as whether the injured person was given first aid or taken to hospital (by ambulance, a colleague, etc.) should also be recorded here.

Q.8 If there was an injury, how did it occur and what caused it?

Where an incident is relatively straightforward, it may seem unnecessary to differentiate between the incident itself (question 3) and the mode of injury, but when the incident is more complicated, the differences between the two aspects become clearer, and therefore precise descriptions are vital. The mode of injury concerns two different aspects:

- the harmful object (known as the 'agent') that inflicted the injury
- the way in which the injury was actually sustained.

The object that inflicted the injury may be a hand-held tool (e.g. a knife), a chemical, a machine, a vehicle, etc. The way in which the injury occurred might involve the employee cutting themselves or spilling chemicals on their skin.

Q.9 Was the risk known? If so, why wasn't it controlled? If not, why not?

You need to find out whether the source of the danger and its potential consequences were known, and whether this information was communicated to those who needed to know. You should note what was said and who said it, so that potential gaps in the communication flow can be identified and remedied. The aim is to find out why the sources of danger may have been ignored, not fully appreciated, or not understood. Remember, you are investigating the processes and systems, not the person.

The existence of a written risk assessment for the process or task that led to the incident will help to reveal what was known about the associated risks. A judgment can be made as to whether the risk assessment was 'suitable and sufficient', as required by law, and whether the risk control measures identified as necessary were adequately put in place.

Q.10 Was maintenance and cleaning sufficient? If not, explain why not.

The organisational arrangement sets the framework within which the work is done. The following are examples, but there are many more:

- standards of supervision and on-site monitoring of working practices may be less than adequate
- lack of skills or knowledge may mean that nobody intervenes in the event of procedural errors
- inappropriate working procedures may mean certain steps in the procedures are omitted because they are too difficult and time-consuming
- lack of planning may mean that some tasks are not done, are done too late, or are done in the wrong order
- employees' actions and priorities may be a consequence of how they are paid or otherwise rewarded
- high production targets and piecework may result in safety measures being degraded and employees working at too fast a pace.

Q.11 Was maintenance and cleaning sufficient? If not, explain why not.

Lack of maintenance and poor housekeeping are common causes of incidents. Was the state of repair and condition of the workplace, plant, and equipment such that they contributed to or caused the incident? Were the brakes on the forklift truck in good working order? Were spills dealt with immediately? Was the site so cluttered and untidy that it created a slipping or tripping hazard? Was there a program for preventative maintenance? What are the instructions concerning good housekeeping in the workplace? You should observe the location of the incident as soon as possible and judge whether the general condition or state of repair of the premises, plant, or equipment was adequate. Those working in the area, together with witnesses, and any injured parties, should also be asked for their opinion. Working in the area, they will have a good idea of what is acceptable and whether conditions had deteriorated over time. Consider the role the following factors may play:

- a badly maintained machine or tool may mean an employee is exposed to excessive vibration or noise and has to use increased force or tamper with the machine to get the work done
- a noisy environment may prevent employees from hearing instructions correctly as well as being a possible cause of noise-induced hearing loss
- uneven floors may make movement around the workplace, especially vehicle movements, hazardous
- badly maintained lighting may make carrying out the task more difficult
- poorly stored materials on the floor in and around the work area will increase the risk of tripping

- fluid, dirt, and other contaminants on stairs or walkways make it easier to slip and fall
- tools not in immediate use should be stored appropriately and not left lying around in the work area.

Q.12 Were the people involved competent and suitable?

Training should provide workers with the necessary knowledge, skills, and hands-on work experience to carry out their work efficiently and safely. The fact that someone has been doing the same job for a long time does not necessarily mean they have the necessary skills or experience to do it safely. This is particularly the case when the normal routine is changed and when any lack of understanding can become apparent. There is no substitute for adequate health and safety training. Some of the problems that might arise include the following:

- a lack of instruction and training may mean that tasks are not done properly
- misunderstandings, which arise more easily when employees lack an understanding of the usual routines and procedures in the organisation
- a lack of respect for the risks involved, due to ignorance of the potential consequences
- problems due to immaturity, inexperience, and lack of awareness of existing or potential risks among young people (under 18) – you must assess the risks to young people before they start work
- poor handling of dangerous materials or tools due to employees not being properly informed about correct procedures.

People should also be matched to their work in terms of health, strength, mental ability, and physical stature.

Q.13 Did the workplace layout influence the incident?

The physical layout and surroundings of the workplace can affect health and safety. Injuries may be caused by sharp table edges. Hazardous or highly inflammable fumes may be produced in areas where operatives work or where there are naked lights. The workplace may be organised in such a way that there is not enough circulation space. It may be impossible to see or hear warning signals, e.g. during forklift truck movements. Employees should be able to see the whole of their work area and see what their immediate colleagues are doing. The workplace should be organised in such a way that safe practices are encouraged. In other words, workplace arrangements should discourage employees from running risks, e.g. providing a clear walkway around machinery will discourage people from crawling under or climbing over it.

Q.14 Did the nature or shape of the materials influence the incident?

As well as being intrinsically hazardous, materials can pose a hazard simply due to their design, weight, quality, or packaging, e.g. heavy and awkward materials, materials with sharp edges, splinters, poisonous chemicals, etc. The choice of materials also influences work processes, e.g. a particularly hazardous material may be required. Poor quality may also result in materials or equipment failing during normal processing, causing malfunctions and incidents.

Q.15 Did difficulties using the plant and equipment influence the incident?

Plant and equipment include all the machinery, plant, and tools used to organise and carry out the work. All these items should be designed to suit the people using them. This is referred to as ergonomic design, where the focus is on the individual as well as the work task the item is specifically designed to perform. If the equipment meets the needs of the individual user, it is more likely to be used as it is intended – i.e. safely. Consider user instructions here. A machine requiring its operator to follow a complicated user manual is a source of risk.

Q.16 Was the safety equipment sufficient?

You should satisfy yourself that all safety equipment and safety procedures are sufficient and current for all conditions in which work takes place, including the provision and use of any extra equipment needed for employees' safety. For example:

- extra technical safety equipment at machines
- power supply isolation equipment and procedures
- personal protective equipment (PPE)
- building safety systems, e.g. an extract ventilation system.

Make a note of whether the safety equipment was used, whether it was used correctly, whether it was in good condition and was working properly, etc.

Q.17 Did other conditions influence the incident?

'Other conditions' covers everything not yet reported but which might have influenced the incident. For example:

- disagreements or misunderstandings
- the weather
- unauthorised interference in a process or job task
- defective supplies or equipment
- deliberate acts, such as trespass or sabotage.

10.2. Step Two: Analysing The Information

The analysis involves examining all the facts, and determining what happened and why. All the detailed information gathered should be assembled and examined to identify what information is relevant and what information is missing. The information gathering and analysis take place side by side. As the analysis progresses, further lines of inquiry requiring additional information will develop. To be thorough and free from bias, the analysis must be carried out systematically so that all the possible causes and consequences of the incident are fully considered. Several formal methods have been developed to aid this approach. One useful method for organising your information, identifying gaps, and beginning the analysis is Events and Causal Factor Analysis (ECFA). The analysis should be conducted with health and safety representatives and other experts or specialists, as appropriate. This team approach can be highly productive in enabling all the relevant causal factors to emerge.

Q.18 What were the immediate, underlying, and root causes?

Only by identifying all causes, and the root causes in particular, can you learn from past failures and prevent future repetitions. The causes of incidents often relate to each other in a complex way, sometimes only influencing events and at other times having an overwhelming impact due to their timing or the way they interact. The analysis must consider all possible causes. Keep an open mind. Do not reject a possible cause until you have given it serious consideration. The emphasis is on a thorough, systematic, and objective look at the evidence.

10.2.1. Analysis

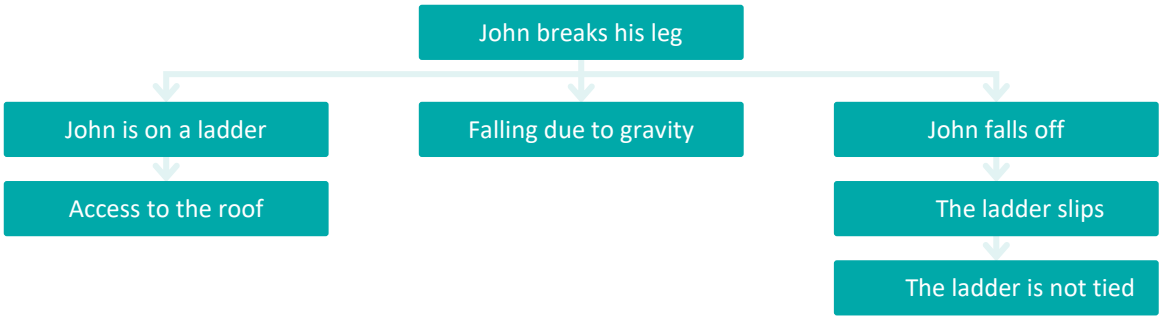
There are many methods of analysing the information gathered in an investigation to find the immediate, underlying, and root causes, and you should choose whichever method suits you best.

10.2.2. What Happened and Why?

The first step in understanding what happened and why is to organise the information you have gathered. These guidelines use the simple technique of asking 'why' over and over (see the Figure below). The starting point is the 'event', e.g. John has broken his leg. On the line below, set out the reasons why this happened. This first line should identify:

- the vulnerable person, e.g. John on a ladder
- the hazard, e.g. falling due to gravity

- the circumstances that brought them together, e.g. John fell off the ladder.



For each of the reasons identified, ask 'Why?' and set down the answers. Continue down the page asking 'Why?' until the answers are no longer meaningful.

Do not be concerned about the number of times you ask the question 'Why?', because by doing so you will arrive at the real causes of the incident. Some lines of inquiry will quickly end, e.g. 'Why was the hazard of falling present?', answer: 'Gravity'.

Having collected the relevant information and determined what happened and why, you can now determine the causes of the incident systematically.

10.2.3. Checklist/Question Analysis of The Causes

Using the incident analysis worksheets and checklist (in the Incident and Investigation Form), work through the questions about the possible immediate causes of the incident (the place, the plant, the people, and the process) and identify which are relevant.

Record all the immediate causes identified and the necessary risk control measures. For each immediate cause, the analysis suggests underlying causes that may have allowed the immediate causes to exist.

Consider the underlying/root cause questions suggested by the immediate causes. Record those that are relevant and note the measures needed to remedy them. The final step of your analysis is to consider the environment in which the health and safety organisation and planning were carried out.

This 'Management' section of the analysis must be conducted by people within the organisation who has overall responsibility for health and safety and the authority to make changes to the management system. Record the underlying failings in the overall management system (i.e. the root causes of the incident) and the remedial action required at the management level. The root causes of almost all incidents are failings at the managerial level.

10.2.4. What If 'Human Failings (Errors and Violations)' Are Identified As A Contributory Factor?

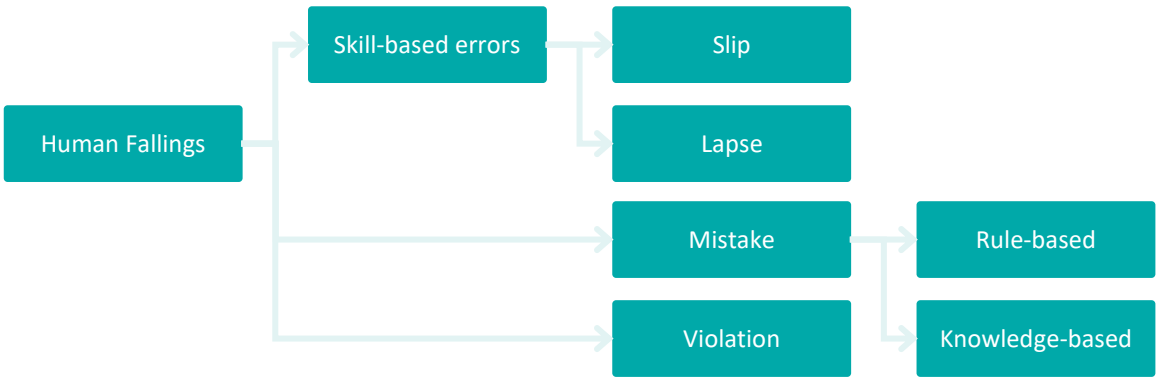
If your investigation concludes that errors or violations contributed to the incident, consider carefully how to handle this information. Not addressing the 'human' factors greatly reduces the value of the investigation. The objective of an investigation is to learn lessons and act to prevent recurrences through suitable risk control measures. You will not be able to do that unless your workforce trusts you enough to cooperate with you.

Laying all the blame on one or more individuals is counterproductive and runs the risk of alienating the workforce and undermining a safety culture crucial to creating and maintaining a safer working environment. Speak to those involved and explain how you believe their action(s) contributed to the incident. Invite them to explain why they did what they did. This may not only help you better understand the reasons behind the immediate causes of the incident, but it may offer more pointers to the underlying causes: perhaps the production deadline was short, and removing the guards saved valuable time; maybe the workload is too great for one person, etc.

Unless you discover a deliberate and malicious violation or sabotage of workplace safety precautions, it may be counterproductive to take disciplinary action against those involved. Will anyone be open and honest with

you the next time an incident occurs? What you should aim for is a fair and just system where people are held to account for their behaviour without being unduly blamed. In any event, your regime of supervision and monitoring of performance should have detected and corrected these unsafe behaviours.

Human failings can be divided into three broad types, and the action needed to prevent further failings will depend on which type of failing is involved (see the Figure below).



A. Skill-based errors: a slip or lapse of memory:

- Slips happen when a person is performing familiar tasks automatically, without thinking, and that person's action is not as planned, e.g. operating the wrong switch on a control panel.
- Lapses happen when an action is performed out of sequence or a step in a sequence is missed, e.g. a road tanker driver has completed filling his tanker and is about to disconnect the hose when he is called away to answer the phone. On his return, he forgets that he has not disconnected the hose and drives away. These types of errors can be foreseen, and measures can be taken to prevent or reduce their likelihood, e.g. color coding, a checklist, an interlock, etc.

B. Mistakes: errors of judgment (rule-based or knowledge-based):

- Rule-based mistakes happen when a person has a set of rules about what to do in certain situations and applies the wrong rule.
- Knowledge-based mistakes occur when a person is faced with an unfamiliar situation for which they have no rules, use their knowledge, and work from first principles, but come to a wrong conclusion. For example, when the warning light comes on indicating that the cooling system pump is overheating, is there a rule for what to do? If not, do you leave the pump on, turn it off, or shut down the whole unit?

Training, comprehensive safe working procedures, and equipment design are vital for preventing mistakes.

C. Violation (rule-breaking):

This involves deliberate failure to follow the rules, cutting corners to save time or effort, based on the belief that the rules are too restrictive and are not enforced anyway, e.g. operating a circular saw bench with the guard removed. This type of behaviour can be foreseen. The provision of training, simple practical rules, and routine supervision and monitoring of performance will reduce this type of behaviour. When considering how to avoid human failings, bear in mind that they do not happen in isolation. If human failings are identified as a cause of an incident, consider the following factors that can influence human behaviour.

D. Job factors:

- how much attention is needed for the task (both too little and too much can lead to higher error rates)?
- divided attention or distractions
- inadequate procedures
- time available.

E. Human factors:

- physical ability (size and strength)
- competence (knowledge, skill, and experience)
- fatigue, stress, morale, alcohol, or drugs.

F. Organisational factors:

- work pressure, long hours
- availability of sufficient resources
- quality of supervision
- management beliefs in health and safety (the safety culture).

G. Plant and equipment factors:

- how clear and simple to read and understand are the controls?
- is the equipment designed to detect or prevent errors? (For example, different-sized connectors are used for oxygen and acetylene bottles to prevent errors in connecting the hoses)
- is the workplace layout user-friendly?

10.3. Step Three: Identifying Suitable Risk Control Measures



The methodical approach adopted in the analysis stage will enable failings and possible solutions to be identified. These solutions need to be systematically evaluated, and only the optimum solution(s) should be considered for implementation. If several risk control measures are identified, they should be carefully prioritised as a risk control action plan, which sets out what needs to be done, and when and by whom. Assign responsibility for this to ensure the timetable for implementation is monitored.

Q.19 What risk-control measures are needed/recommended?

Your analysis of the incident will have identified several risk control measures that either failed or could have interrupted the chain of events leading to the incident if they had been in place. You should now draw up a list of all the alternative measures to prevent this, or similar, incidents.

Some of these measures will be more difficult to implement than others, but this must not prevent their listing as possible risk control measures. The time to consider these limitations is later when choosing and prioritising which measures to implement.

Evaluate each of the possible risk control measures based on their ability to prevent recurrences and whether or not they can be successfully implemented. In deciding which risk control measures to recommend and their priority, you should choose measures in the following order, where possible:

1. measures that eliminate the risk, e.g. use ‘inherently safe’ products, such as a water-based product rather than a hydrocarbon-based solvent
2. measures that combat the risk at source, e.g. provision of guarding
3. measures that minimise the risk by relying on human behaviour, e.g. safe working procedures, and the use of personal protective equipment.

In general terms, measures that rely on engineering risk control measures are more reliable than those that rely on people.

Q.20 Do similar risks exist elsewhere? If so, what and where?

Having concluded your investigation of the incident, consider the wider implications: could the same thing happen elsewhere in the organisation, on this site, or at another location? What steps can be taken to avoid this? Incidents might not have occurred at other locations yet, but evaluate whether the risks are the same and whether the same or similar risk control measures are appropriate.

Q.21 Have similar incidents occurred before? Give details.

If there have been similar incidents in the past, why have they been allowed to happen again? The fact that such incidents are still occurring should be a spur to ensure that action is taken quickly. You will be particularly

open to criticism if your organisation ignores a series of similar incidents. Remember that there is value in investigating near-misses and undesired circumstances: it is often only a matter of luck that such incidents do not result in serious injuries or loss of life.

10.4. Step Four: The Action Plan and Its Implementation

Q.22 Which risk control measures should be implemented in the short and long term?

10.4.1. The Risk Control Action Plan



At this stage in the investigation, senior management, who have the authority to make decisions and act on the recommendations of the investigation team, should be involved. An action plan for the implementation of additional risk control measures is the desired outcome of a thorough investigation. The action plan should have SMART objectives (i.e. Specific, Measurable, Agreed, and Realistic, with Timescales). Deciding where to intervene requires a good knowledge of the organisation and the way it carries out its work. For the risk control measures proposed to be SMART, management, safety professionals, employees, and their representatives should all contribute to a constructive discussion on what should be in the action plan. Not every risk control measure will be implemented, but the ones accorded the highest priority should be implemented immediately. In deciding your priorities, you should be guided by the magnitude of the risk (where 'risk' is the likelihood and severity of harm). Ask yourself 'What is essential to securing the health and safety of the workforce today? What cannot be left until another day? How high is the risk to employees if this risk control measure is not implemented immediately?' If the risk is high, you should act immediately. You will, no doubt, be subject to financial constraints, but failing to put in place measures to control serious and imminent risks is unacceptable. You must either reduce the risks to an acceptable level or stop the work. For those risks that are not high and immediate, the risk control measures should be put into your action plan in order of priority. Each risk control measure should be assigned a timescale and a person made responsible for its implementation. It is crucial that a specific person, preferably a director, partner, or senior manager, is made responsible for ensuring that the action plan is implemented. This person does not necessarily have to do the work themselves, but they should monitor the progress of the risk control action plan. Progress on the action plan should be regularly reviewed. Any significant departures from the plan should be explained and risk control measures rescheduled, if appropriate. Employees and their representatives should be kept fully informed of the contents of the risk control action plan and progress with its implementation.

Q.23 Which risk assessments and safe working procedures need to be reviewed and updated?

All relevant risk assessments and safe working procedures should be reviewed after an incident. The findings of your investigation should indicate areas of your risk assessments that need improving. You must take a step back and ask what the findings of the investigation tell you about your risk assessments in general. Are they really suitable and sufficient?

Q.24 Have the details of the incident and the investigation findings been recorded and analysed?

Are there any trends or common causes which suggest the need for further investigation? What did the incident cost? In addition to the prompt notification of reportable incidents to the regulatory authorities, you should ensure that you keep your own records of incidents, their causes, and the remedial measures taken. This will enable you to monitor your health and safety performance and detect trends, and the common causes of incidents and so improve your overall understanding and management of risk. It is also useful to estimate the cost of incidents to your business to fully appreciate the true cost of incidents and ill health. The step-by-step approach set out in this guide is only one of a number of possible approaches. It is for you to decide which approach suits your business best.