PUBLIC

ABU DHABI PUBLIC HEALTH CENTRE | مركز أبوظبي للصحة العامة

Abu Dhabi Occupational Safety and Health System Framework

(ADOSH-SF)

ADOSH-SF Technical Guideline

OSH Incident Notification, Investigation and Reporting

Version 4.0

July 2024

Table of Contents

1. Introduction

(a) This technical guideline provides additional information to assist entities to comply with the requirements of *ADOSH-SF - Element 7 – Monitoring, Investigation and Reporting* and *ADOSH-SF – Mechanism 11 – OSH Incident Notification, Investigation and Reporting*. The contents of this technical guide are not mandatory; however adopting the information within this guide will assist entities in compliance to the requirements of the Element and Mechanism.

(b) The majority of information contained within this guidance note has been taken from Investigating Accident and Incidents – HSG245 – ISBN 978 0 7176 2827 8: https://www.hse.gov.uk/pubns/hsg245.pdf.

(c) Where information has been changed or altered this has been done to reflect current legislative requirements or specific requirements from the ADOSH-SF.

2. Definitions

(a) An **incident** has been defined within the *ADOSH-SF* as an event or chain of events which has caused or could have caused fatality, injury, illness and/or damage (loss) to assets, the environment, entity reputation or third parties.

(b) An **adverse event** has been defined within the *ADOSH-SF* as an event that leads to an incident

(c) **Root cause** has been defined within the *ADOSH-SF* as the initiating event that begins the chain of events that leads to an incident.

(d) An **immediate cause** has been defined within the *ADOSH-SF* as the most obvious reason why an adverse event happens, e.g. the guard is missing; the employee slips etc. There may be several immediate causes identified in any one adverse event.

(e) An **underlying cause** has been defined within the *ADOSH-SF* as the less obvious 'system' or 'organizational' reason for an adverse event happening, e.g. pre-start-up machinery checks are not carried out by supervisors; the hazard has not been adequately considered via a suitable and sufficient risk assessment; production pressures are too great etc.

(f) A site recognizance/review shall be undertaken prior to establishing a monitoring plan to gain information on the site characteristics and to provide input into the sampling / monitoring plan.

3. OSH Incident Investigation Procedure

(a) Under the requirements of *ADOSH-SF - Element 7 – Monitoring, Investigation and Reporting- Section 3.2,* each entity is required to develop a procedure that defines how incident investigations will be undertaken and managed.

(b) The entity OSH Incident Investigation Program shall address, at a minimum:

(i) process of recording, investigating and analyzing OSH incidents;
(ii) ensure investigations are performed by competent person(s) in consultation and coordination with relevant stakeholders;
(iii) ensure investigations are performed in a timely manner;
(iv) process to determine the root causes of OSH incidents;
(v) identify opportunities for corrective and preventative actions; and
(vi) ensure effective communication of the outcomes of the investigation to relevant stakeholders.

(c) Entities shall also ensure that the requirements of *ADOSH-SF – Mechanism 11 – OSH Incident Notification, Investigation and Reporting* are also considered when developing their internal procedures.

4. Causes of Incidents

(a) Incidents have many causes. What may appear to be bad luck (being in the wrong place at the wrong time) can, on analysis, be seen as a chain of failures and errors that lead almost inevitably to the adverse event. (This is often known as the Domino effect see figure 1)

(b) These causes can be classified as:

(i) immediate causes: the agent of injury or ill health (the blade, the substance, the dust etc.);
(ii) underlying causes: unsafe acts and unsafe conditions (the guard removed, the ventilation switched off etc.); and
(iii) root causes: the failure from which all other failings grow, often remote in time and space from the adverse event (e.g. failure to identify training needs and assess competence, low priority given to risk assessment etc.).

(c) To prevent adverse events, the entity needs to provide effective risk control measures which address the immediate, underlying and root causes.

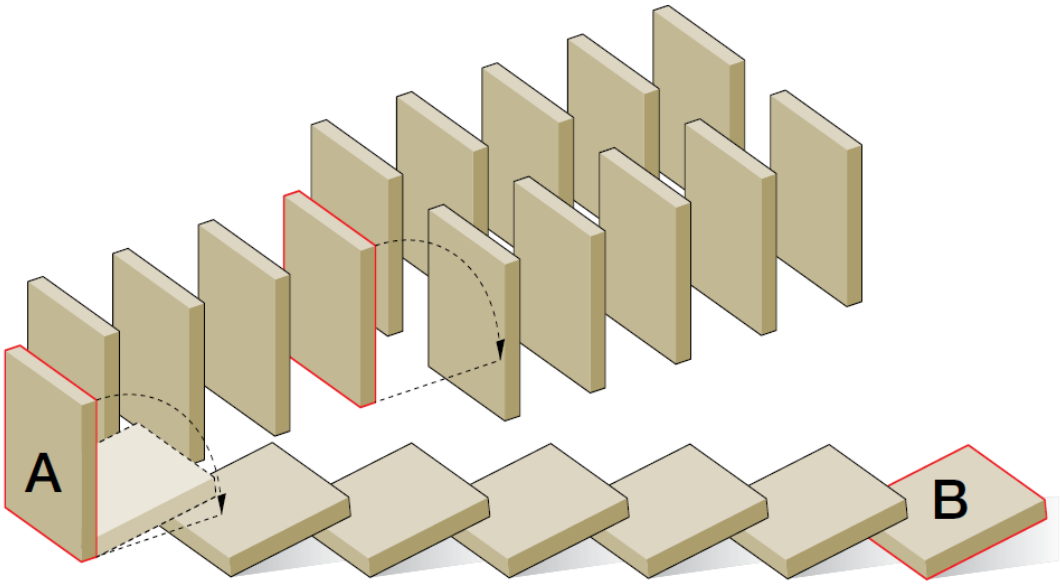

Figure 1 – Sequence of Domino's

(d) Each domino represents a failing or error which can combine with other failings and errors to cause an adverse event. Dealing with the immediate cause (B) will only prevent this sequence. Dealing with all causes, especially root causes (A) can prevent a whole series of adverse events.

5. Incident Investigation Fundamentals

5.1. Why Investigate Incidents

(a) There are hazards in all workplaces; risk control measures are put in place to reduce the risks to an acceptable level to prevent accidents and cases of ill health. The fact that an adverse event has occurred suggests that the existing risk control measures were inadequate.

(b) While the argument for investigating accidents is fairly clear, the need to investigate near misses may not be so obvious. However, investigating near misses is as useful, and very much easier than investigating accidents.

(c) It is often pure luck that determines whether a near miss translates into an accident. The value of investigating each event is the same.

(d) An investigation is not an end in itself, but the first step in preventing future events. A good investigation will enable the entity to learn general lessons, which can be applied across the entity.

(e) 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.

5.2. Which events should be investigated?

(a) Under *ADOSH-SF – Mechanism 11 – OSH Incident Notification, Investigation and Reporting,* entities must investigate all work related incidents, including near misses and dangerous occurrences; however the level of investigation should be determined by the entity.

(b) It is the potential consequences and the likelihood of the adverse event recurring that 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. When making a decision, the entity must also consider the potential for learning lessons. For example if there have been a number of similar adverse events, it may be worth investigating, even if each single event is not worth investigating in isolation. It is best practice to investigate all adverse events which may affect the public.

5.3. Who should carry out the investigation?

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

(b) This joint approach will ensure that a wide range of practical knowledge and experience will be brought to bear, and employees and their representatives will feel empowered and supportive of any remedial measures that are necessary. A joint approach also reinforces the message that the investigation is for the benefit of everyone.

(c) In addition to detailed knowledge of the work activities involved, members of the team should be familiar with OSH good practice, standards and legal requirements. The investigation team must include people who have the necessary investigative skills (e.g. information gathering, interviewing, evaluating and analyzing).

(d) 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.

5.4. When should it start?

(a) The urgency of an investigation will depend on the magnitude and immediacy of the risk involved (e.g. a major accident involving an everyday job will need to be investigated quickly).

(b) In general, adverse events should be investigated and analyzed as soon as possible. This is not simply good practice; it is common sense – memory is best and motivation greatest immediately after an adverse event.

5.5. What does it involve?

(a) An investigation will involve an analysis of all the information available, physical (the scene of the incident), verbal (the accounts of witnesses) and written (risk assessments, procedures, instructions, job guides etc), to identify what went wrong and determine what steps must be taken to prevent the adverse event from happening again.

(b) It is important to be open, honest and objective throughout the investigation process. Pre-conceived ideas about the process, the equipment or the people involved in an adverse event may blind the investigation to the real causes. Question everything. Be wary of blaming individuals.

5.6. What makes a good investigation?

(a) It is only by carrying out investigations which identify root causes that entities can learn from their past failures and prevent future failures.

(b) Simply dealing with the immediate causes of an adverse event may provide a short-term fix. But, in time, the underlying/root causes that were not addressed will allow conditions to develop where further adverse events are likely, possibly with more serious consequences. It is essential that the immediate, underlying causes and root causes are all identified and remedied.

(c) Investigations should be conducted with incident prevention in mind, not placing blame. Attempting to apportion blame before the investigation has started is counterproductive, because people become defensive and uncooperative. Only after the investigation has been completed is it appropriate to consider whether any individuals acted inappropriately.

(d) Investigations that conclude that operator/human error was the sole cause are rarely acceptable. Underpinning the 'human error' there will be a number of underlying causes that created the environment in which human errors were inevitable. Examples could include:

(i) inadequate training and supervision;
(ii) poor equipment design;
(iii) lack of management commitment; and
(iv) poor attitude to safety and health.

(e) The objective is to establish not only how the adverse event happened, but more importantly, what allowed it to happen.

(f) The root causes of adverse events are almost inevitably management, organizational or planning failures.

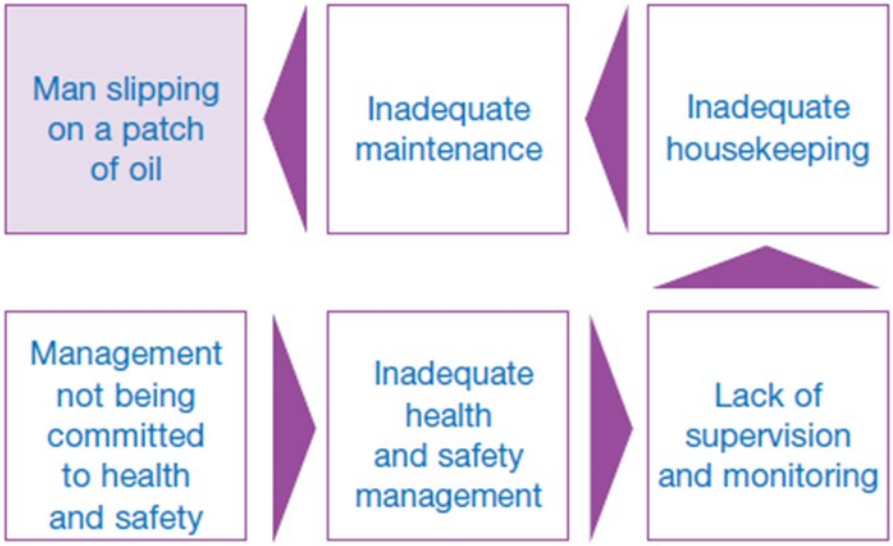

Figure 2 - Root Cause

(g) Look carefully at the OSH policy and how it is reflected in the workplace. Do employees understand the safety and health message in general and in particular those parts that relate to their work? Is something missing from the policy? Is it implemented, or is management failing to ensure that health and safety measures remain in place and are effective at all times? If not, the health and safety policy needs to be changed.

(h) The investigation should be thorough and structured to avoid bias and leaping to conclusions. Don't assume the answer and start finding solutions before the investigation is completed. A good investigation involves a systematic and structured approach.

5.6.1. Information Gathering

(a) Includes:

(i) explores all reasonable lines of enquiry;
(ii) is timely; and
(iii) is structured, setting out clearly what is known, what is not known and records the investigative process.

5.6.2. Analysis:

(a) Includes:

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

5.6.3. Risk Control Measures

(a) Includes:

(i) identify the risk control measures which were missing, inadequate or unused;
(ii) compare conditions/practices as they were with that required by current legal requirements, codes of practice and guidance;
(iii) identify additional measures needed to address the immediate, underlying and root causes;
(iv) provide meaningful recommendations which can be implemented. But woolly recommendations such as 'operators must take care not to touch the cutters during run-down' show that the investigation has not delved deep enough in search of the root causes.

5.6.4. Action Plan and Implementation

(a) Includes:

(i) provide an action plan with SMART objectives (Specific, Measurable, Agreed, Realistic and Time scaled);
(ii) ensure that the action plan deals effectively not only with the immediate and underlying causes but also the root causes;
(iii) include lessons that may be applied to prevent other adverse events, e.g. assessments of skill and training in competencies may be needed for other areas of the entity;
(iv) provide feedback to all parties involved to ensure the findings and recommendations are correct, address the issues and are realistic;
(v) should be fed back into a review of the risk assessment.
(vi) communicate the results of the investigation and the action plan to everyone who needs to know;
(vii) include arrangements to ensure the action plan is implemented and progress monitored.
(viii) The last three steps, though essential, are often overlooked. But, without them, the full benefits of the investigation will not be realised and in the long term nothing will change.

6. Techniques for Analysing Adverse Events

(a) There are many tools and techniques for structuring the investigation, analyzing adverse events, and identifying root causes. ADPHC does not endorse any one method – it is for the entity to choose which techniques suit the entity. These techniques are simply tools, not an end in themselves.

(b) For large, complex or technically demanding investigations, these techniques may be essential in determining not only how the adverse event happened, but also what the root causes were.

(c) However, provided a methodical approach with full employee participation is adopted, a less complicated approach, such as that set out in this publication, will be appropriate.

7. A Step-by-Step Guide to Safety and Health Investigations

(a) Listed below are a number of steps that should be considered when undertaking an investigation. Each investigation will differ and the entity should ensure that they gather sufficient information from each to ensure they are in a position to make an informed decision regarding the actual failings that led to the incident.

(b) Further, the level of investigation required will also differ depending on the severity and likelihood for reoccurrence. The entity should ensure that the level of investigation is in line with the incident.

(c) The steps set out below, provide best practice information on area's that may have been a factor leading to the incident. As highlighted in point (a), it is for the entity to ensure decide if this is a factor and the level of investigation required.

7.1. Initial Steps to Take Following an Adverse Event

7.1.1. Emergency response:

(a) take prompt emergency action (e.g. first aid); and

(b) make the area safe (in some cases this may need to be done first).

7.1.2. Initial report:

(a) preserve the scene;

(b) note the names of the people, equipment involved and the names of the witnesses; and

(c) report the adverse event to the person responsible for OSH who will decide what further action is needed.

7.1.3. Initial assessment and investigation response:

(a) Report the adverse event to the regulatory authority if appropriate. (Refer to *ADOSH-SF – Mechanism 11 – OSH Incident Notification, Investigation and Reporting*).

7.2. The Investigation - Step One - Gathering the Information

(a) Find out what happened and what conditions and actions influenced the adverse event. Begin straight away, or as soon as practicable.

(b) It is important to capture information as soon as possible. This stops it being corrupted, e.g. items moved, guards replaced etc. If necessary, work must stop and unauthorized access be prevented.

(c) Talk to everyone who was close by when the adverse event happened, especially those who saw what happened or know anything about the conditions that led to it.

(d) The amount of time and effort spent on information gathering should be proportionate to the level of investigation. Collect all available and relevant information. That 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 being completed later. These notes should be kept at least until the investigation is complete.

7.2.1. Gathering detailed information: How and what?

(a) Discovering what happened can involve quite a bit of detective work. Be precise and establish the facts. There may be a lack of information and many uncertainties but keep an open mind and consider everything that might have contributed to the adverse event.

(b) Many important things may emerge at this stage of the process, but not all of them will be directly related to the adverse event. Some of the information gathered may appear to have no direct bearing on the event under investigation. However, this information may provide a greater insight into the hazards and risks in the workplace. This may enable the entity to make the workplace safer in ways that may not have previously considered.

(c) Describe the chain of events leading up to, and immediately after, the event. Very often, a number of chance occurrences and coincidences combine to create the circumstances in which an adverse event can happen. All these factors should be recorded here in chronological order, if possible. Work out the chain of events by talking to the injured person, eye witnesses, line managers 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 adverse event. Be objective and, as far as possible, avoid apportioning guilt, assigning responsibility or making snap judgements on the probable causes.

(d) Plant and equipment that had a direct bearing on the adverse event must be identified clearly. This information can usually be obtained from a nameplate attached to the equipment. Note all the details available, 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 adverse event. This information may help spot trends and identify risk control measures. Consider approaching the supplier if the same machine has been implicated in a number of adverse events. Be precise. Shop floor process and layout changes are a regular occurrence. Unless the entity precisely identifies plant and equipment, they will not detect, e.g. that a machine or particular piece of equipment has been moved around and caused injuries on separate occasions, in different locations.

7.2.2. What activities were being carried out at the time?

(a) The work that was being done just before the adverse event happened 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 the way they were behaving etc.

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

(a) Adverse events 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 to normal, why was this?

(b) 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.

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

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

(a) Adverse events often happen 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 - had to play in the adverse event. What was it about 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.

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

(a) It is important to note which parts of the body have been 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, say so. Precise descriptions will enable the entity to spot trends and take prompt remedial action. For example it could be that what appears to be a safe piece of equipment, due to the standard of its guarding, is actually causing a number of inadvertent cut injuries due to the sharp edges on the guards themselves.

(b) 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.

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

(a) Where an accident is relatively straightforward, it may seem artificial to differentiate between the accident itself and the mode of injury, but when the accident is more complicated the differences between the two aspects become clearer and therefore precise descriptions are vital.

(b) The mode of injury concerns two different aspects:

(i) the harmful object (known as the 'agent') that inflicted the injury; and
(ii) the way in which the injury was actually sustained.

(c) The object that inflicted the injury may be a hand-held tool like a knife, or a chemical, a machine, or a vehicle etc. The way in which it happened might, e.g., be that the employee cut themselves or spilt chemicals on their skin.

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

(a) 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. Note what is said and who said it, so that potential gaps in the communication flow may 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.

(b) The existence of a written risk assessment for the process or task that led to the adverse event will help to reveal what was known of the associated risks. A judgement can be made as to whether the risk assessment was 'suitable and sufficient', and whether the risk control measures identified as being necessary were ever adequately put in place.

7.2.8. Did the organization and arrangement of the work influence the adverse event?

(a) The organizational arrangement sets the framework within which the work is done. Here are some examples; there are many more:

(i) standards of supervision and on-site monitoring of working practices may be less than adequate;
(ii) lack of skills or knowledge may mean that nobody intervenes in the event of procedural errors;

(iii) inappropriate working procedures may mean certain steps in the procedures are omitted, because they are too difficult and time-consuming;
(iv) lack of planning may mean that some tasks are not done, are done too late or are done in the wrong order;
(v) employees' actions and priorities may be a consequence of the way in which they are paid or otherwise rewarded; and
(vi) high production targets and piecework may result in safety measures being degraded and employees working at too fast a pace.

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

(a) Lack of maintenance and poor housekeeping are common causes of adverse events. Was the state of repair and condition of the workplace, plant and equipment such that they contributed to or caused the adverse event? 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 programme of preventative maintenance? What are the instructions concerning good housekeeping in the workplace? Observe the location of the adverse event 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:

(i) 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;
(ii) a noisy environment may prevent employees hearing instructions correctly as well as being a possible cause of noise-induced hearing loss;
(iii) uneven floors may make movement around the workplace, especially vehicle movements, hazardous;
(iv) badly maintained lighting may make carrying out the task more difficult;
(v) poorly stored materials on the floor in and around the work area will increase the risk of tripping;
(vi) ice, dirt and other contaminants on stairs or walkways make it easier to slip and fall; and
(vii) tools not in immediate use should be stored appropriately and not left lying around the work area.

7.2.10. Were the people involved competent and suitable?

(a) 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 that they have the necessary skills or experience to do it safely. This is particularly the case when the normal routine is changed, 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 follow:

(i) a lack of instruction and training may mean that tasks are not done properly;
(ii) misunderstandings, which arise more easily when employees lack understanding of the usual routines and procedures in the entity;
(iii) a lack of respect for the risks involved, due to ignorance of the potential consequences;
(iv) problems due to the immaturity, inexperience and lack of awareness of existing or potential risks among young people (under18).The risks to young people must be assessed before they start work;
(v) poor handling of dangerous materials or tools, due to employees not being properly informed about how things should be done correctly.
(vi) people should also be matched to their work in terms of health, strength, mental ability and physical stature.

7.2.11. Did the workplace layout influence the adverse event?

(a) 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. Or, the workplace may be organized in such a way that there is not enough circulation space. Or, it may be impossible to see or hear warning signals, e.g. during fork lift truck movements.

(b) 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, eg. providing a clear walkway around machinery will discourage people from crawling under or climbing over it.

7.2.12. Did the nature or shape of the materials influence the adverse event?

(a) As well as being intrinsically hazardous, materials can pose a hazard simply by their design, weight, quality or packaging, e.g. heavy and awkward materials, materials with sharp edges, splinters, poisonous chemicals etc.

(b) 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 accidents.

7.2.13. Did difficulties using the plant and equipment influence the adverse event?

(a) Plant and equipment includes all the machinery, plant and tools used to organize and carry out the work. All of 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 carry out. 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 that requires its operator to follow a complicated user manual is a source of risk in itself.

7.2.14. Was the safety equipment sufficient?

(a) The entity should satisfy itself that any safety equipment and safety procedures are both 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:

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

(b) Make a note of whether the safety equipment was used, whether it was used correctly, whether or not it was in good condition and was working properly etc.

7.2.15. Did other conditions influence the adverse event?

(a) 'Other conditions' is intended to cover everything else that has not been reported yet, but which might have influenced the adverse event. For example:

(i) disagreements or misunderstandings between people;
(ii) the weather;
(iii) unauthorised interference in a process or job task;
(iv) defective supplies or equipment;
(v) deliberate acts, such as trespass or sabotage.

7.3. The Investigation - Step two - Analysing the information

(a) An analysis involves examining all the facts, 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 are actually carried out side by side. As the analysis progresses, further lines of enquiry requiring additional information will develop.

(b) To be thorough and free from bias, the analysis must be carried out in a systematic way, so all the possible causes and consequences of the adverse event are fully considered. A number of formal methods have been developed to aid this approach.

(c) The analysis should be conducted with employee representatives and other experts or specialists, as appropriate. This team approach can often be highly productive in enabling all the relevant causal factors to emerge.

7.3.1. What were the immediate, underlying and root causes?

(a) It is only by identifying all causes, and the root causes in particular, that the entity can learn from past failures and prevent future repetitions.

(b) The causes of adverse events often relate to one another 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 it has been given serious consideration. The emphasis is on a thorough, systematic and objective look at the evidence.

7.3.2. Analysis

(a) There are many methods of analysing the information gathered in an investigation to find the immediate, underlying and root causes and it is for the entity to choose whichever method suits best.

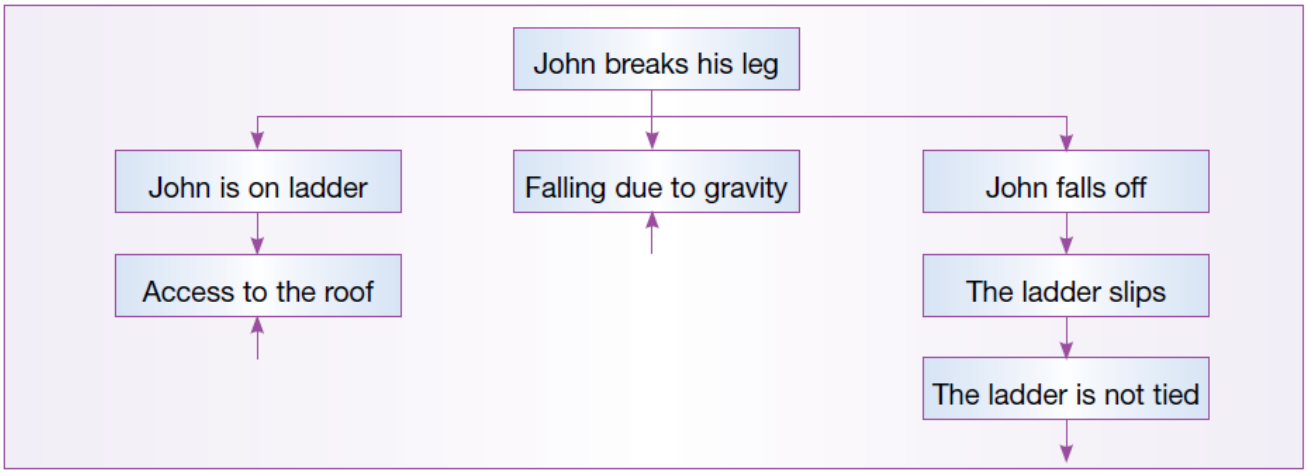

Figure 3 - Sequence of Events

7.3.3. What happened and why?

(a) The first step in understanding what happened and why is to organize the information that has been gathered. This guidance uses the simple technique of asking 'Why' over and over, until the answer is no longer meaningful (see Figure 3). 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:

(i) the vulnerable person, e.g. John on a ladder;
(ii) the hazard, e.g. falling due to gravity;
(iii) the circumstances that brought them together, e.g. John fell off the ladder.

(b) 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.

(c) Do not be concerned at the number of times the question, 'Why?' is asked because by doing so you will arrive at the real causes of the adverse event. Some lines of enquiry will quickly end, e.g. 'Why was the hazard of falling present?' Answer: 'Gravity'.

(d) Having collected the relevant information and determined what happened and why, the entity can now determine the causes of the adverse event systematically.

7.3.4. What if 'human failings (errors and violations)'[10] are identified as a contributory factor?

(a) If the investigation concludes that errors or violations contributed to the adverse event, consider carefully how to handle this information.

(b) Not addressing the 'human' factors greatly reduces the value of the investigation. The objective of an investigation is to learn the lessons and to act to prevent recurrences, through suitable risk control measures. The entity will not be able to do that unless the workforce trusts them enough to co-operate with them.

(c) Laying all the blame on one or more individuals is counter-productive and runs the risk of alienating the workforce and undermining the safety culture, crucial to creating and maintaining a safer working environment.

(d) Speak to those involved and explain how the investigation suggests their action(s) contributed to the adverse event. Invite them to explain why they did what they did. This may not only help the entity better understand the reasons behind the immediate causes of the adverse event, but 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.

(e) Human failings can be divided into three broad types and the action needed to prevent further failings will depend on which type of human failing is involved. See Figure 4.

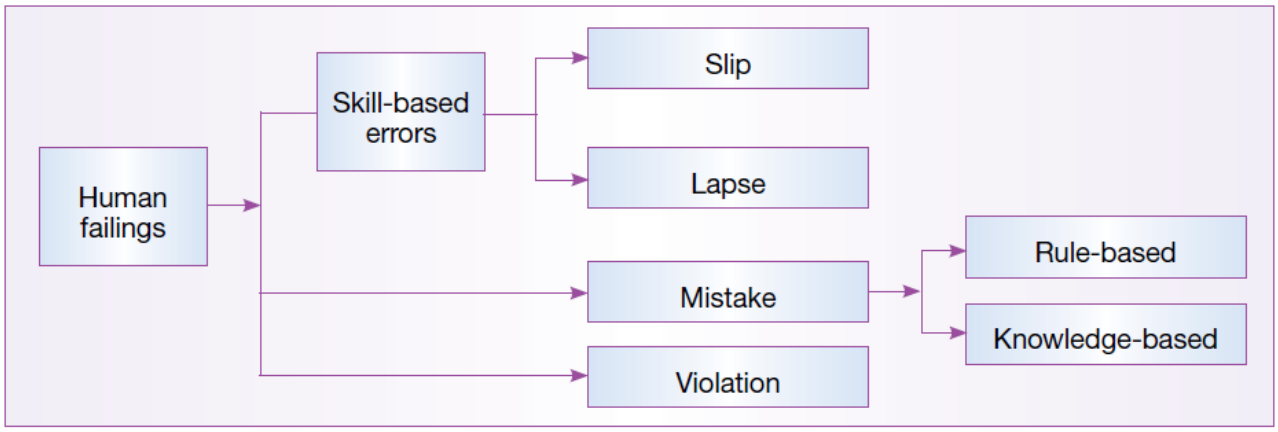

Figure 4 – Human Failings

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

(a) Slips happen when a person is carrying out familiar tasks automatically, without thinking, and that person's action is not as planned, e.g. operating the wrong switch on a control panel.

(b) Lapses happen when an action is performed out of sequence or a step in a sequence is missed, e.g. a road tanker driver had completed filling his tanker and was about to disconnect the hose when he was called away to answer the phone. On his return he forgot that he hadn't disconnected the hose and drove off. These types of error can be foreseen and measures can be taken to prevent or reduce their likelihood, eg colour coding, a checklist, an interlock etc.

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

(a) rule-based mistakes happen when a person has a set of rules about what to do in certain situations and applies the wrong rule.

(b) Knowledge-based mistakes happen when a person is faced with an unfamiliar situation for which he or she has no rules, uses his or her knowledge and works from first principles, but comes 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.

(c) Training, comprehensive safe working procedures and equipment design are most important in preventing mistakes.

7.3.7. Violation (rule breaking):

(a) 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.

(b) 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.

(c) When considering how to avoid human failings, bear in mind the fact they do not happen in isolation. If human failings are identified as a cause of an adverse event, consider the following factors that can influence human behaviour.

7.3.8. Job factors:

(a) Includes:

(i) how much attention is needed for the task (both too little and too much can n lead to higher error rates)?
(ii) divided attention or distractions are present;
(iii) inadequate procedures; and
(iv) time available.

7.3.9. Human factors:

(a) Includes:

(i) physical ability (size and strength);n
(ii) competence (knowledge, skill and experience);n
(iii) fatigue, stress or morale.

7.3.10. Organizational factors:

(a) Includes:

(i) work pressure, long hours;
(ii) availability of sufficient resources;
(iii) quality of supervision;
(iv) management beliefs in health and safety (the safety culture).

7.3.11. Plant and equipment factors:

(a) Includes:

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

7.4. The Investigation - Step three - Identifying suitable risk control measures

(a) 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 prioritized as a risk control action plan, which sets out what needs to be done, when and by whom. Assign responsibility for this to ensure the timetable for implementation is monitored.

7.4.1. What risk control measures are needed / recommended?

(a) The analysis of the adverse event will have identified a number of risk control measures that either failed or that could have interrupted the chain of events leading to the adverse event, if they had been in place. The entity should now draw up a list of all the alternative measures to prevent this, or similar, adverse events.

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

(c) Evaluate each of the possible risk control measures on the basis of their ability to prevent recurrences and whether or not they can be successfully implemented.

(d) In deciding which risk control measures to recommend and their priority, choose measures in the following order, where possible:

(i) measures which eliminate the risk, e.g. use 'inherently safe' products, such as a water-based product rather than a hydrocarbon-based solvent;
(ii) measures which combat the risk at source, e.g. provision of guarding;
(iii) measures which minimise the risk by relying on human behaviour, e.g. safe working procedures, the use of personal protective equipment.

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

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

(a) Having concluded the investigation of the adverse event, consider the wider implications: could the same thing happen elsewhere in the entity, on this site or at another location? What steps can be taken to avoid this?

(b) Adverse events might not have occurred at other locations yet, but make an evaluation as to whether the risks are the same and the same or similar risk control measures are appropriate.

7.4.3. Have similar adverse events happened before? Give details.

(a) If there have been similar adverse events in the past why have they been allowed to happen again? The fact that such adverse events are still occurring should be a spur to ensure that action is taken quickly. The entity will be particularly open to criticism if they ignore a series of similar accidents.

(b) 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.

7.5. The Investigation - Step four - The action plan and its implementation

7.5.1. The risk control action plan

(a) 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.

(b) 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.

(c) Deciding where to intervene requires a good knowledge of the entity 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.

(d) Not every risk control measure will be implemented, but the ones accorded the highest priority should be implemented immediately. In deciding the priorities be guided by the magnitude of the risk ('risk' is the likelihood and severity of harm). Ask '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, act immediately.

(e) The entity may be subject to financial constraints, but failing to put in place measures to control serious and imminent risks is totally unacceptable. The entity must either reduce the risks to an acceptable level, or stop the work.

(f) For those risks that are not high and immediate, the risk control measures should be put into an action plan in order of priority. Each risk control measure should be assigned a timescale and a person made responsible for its implementation.

(g) It is crucial that a specific person, preferably a director, partner or senior manager, is made responsible for ensuring that the action plan as a whole is put into effect. This person doesn't necessarily have to do the work him or herself but he or she should monitor the progress of the risk control action plan.

(h) Progress on the action plan should be regularly reviewed. Any significant departures from the plan should be explained and risk control measure rescheduled, if appropriate. Employees should be kept fully informed of the contents of the risk control action plan and progress with its implementation.

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

(a) All relevant risk assessments and safe working procedures should be reviewed after an adverse event. The findings of the investigation should indicate areas of the risk assessments that need improving. It is important that to take a step back and ask what the findings of the investigation identify about the risk assessments in general. Are they really suitable and sufficient?

7.5.3. Have the details of adverse event 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 adverse event cost?

(a) In addition to the prompt notification to the relevant SRA, the entity should ensure that they keep their own records of adverse events, their causes and the remedial measures taken. This will enable the entity to monitor the health and safety performance and detect trends, the common causes of adverse events and so improve the overall understanding and management of risk.

(b) It is also useful to estimate the cost of adverse events to fully appreciate the true cost of accidents and ill health to the entity.

(c) The step by step approach that is set out in this guide is only one of a number of possible approaches. It is for the entity to decide which approach suits the business best.

8. Document Amendment Record

Version	Revision Date	Description of Amendment	Page/s Affected
4.0	*15th July 2024*	*System acronym updated from OSHAD-SF to ADOSH-SF to accurately reflect document title*	*Throughout*
		Change from OSHAD to ADPHC	
		Change of Logo	
		Minor editorial changes throughout the document without changing requirements.	

PUBLIC

مركز أبوظبي للصحة العامة
ABU DHABI PUBLIC HEALTH CENTRE

امسح رمز الاستجابة السريعة لزيارة منصات التواصل الاجتماعي الخاصة بنا
Scan the QR code to visit our social media platforms