



TRIPOD Lite

A 'lite' tool for investigating simple incidents,
events and near misses



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Guidance (note: guidance can be accessed directly from the incident analysis diagram itself)

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User licence: visit [Tripod Lite | Tripod \(energyinst.org\)](#) for full terms and conditions for using and sharing *Tripod lite*, including if your company wishes to adopt *Tripod lite* or make changes (such as rebranding) to the tool.



Save a copy before you begin

Before you begin, save a new copy of the tool and leave the original file as a template to prevent overwriting.

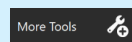
Export data when you finish

If you conduct your *Tripod lite* analysis through the PDF tool, you may wish to export your data into a CSV file for easier upload to your company database or similar. The following tutorial will copy all field responses into a single worksheet for further processing. **You will need access to Adobe Acrobat Pro to export the data in this way.**

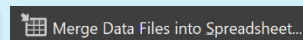
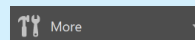
1. Ensure you have saved your completed analysis as a separate file from the template.
2. Use the 'Prepare Form' feature in Adobe Acrobat Pro. Tools are found on the right toolbar by default, and the feature is represented by this icon:



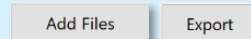
3. If the icon does not appear, navigate to the full Adobe toolkit by selecting 'More Tools' in the same toolbar, which looks like this:



4. Once active, the 'Prepare Form' toolbar will expand from the right-hand side. Please select the 'More' option, and choose 'Merge Data Files into Spreadsheet' from the drop down menu.



5. A data export dialog box will now open. Select 'Add Files' and choose the file you have been working on. Then, click 'Export'.



Also available in Microsoft Excel

For more advanced users, *Tripod lite* is also available as an Excel .XLSX file. The Excel version contains more barriers, more job factors and more organisational factors, for more complicated investigations, or more experienced investigators. Download the file by clicking [here](#).



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More from Tripod and the Energy Institute

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Tripod lite training courses

While *Tripod lite* requires minimal training, most people will benefit from attending our short training course. The course will provide you with experience of using *Tripod lite*, and you will learn more about investigation, barriers and human factors to apply the tool more effectively.

Please contact: tripod@energyinst.org

Visit our website at: [Homepage](#) | [Tripod \(energyinst.org\)](#)

Tripod Beta training courses

Tripod lite is intended for simple and minor incidents. Consider using its 'big brother', Tripod Beta, for more complex and serious incidents. Tripod Beta is a more powerful and adaptable methodology. Find an accredited Tripod Beta course at the website below:

Please contact: tripod@energyinst.org

Visit the webpage at: [Tripod Beta](#) | [Tripod \(energyinst.org\)](#)

Investigation insights

Leaders are instrumental for organisational learning – they need to engage with, and be engaged in, incident investigations. *Investigation insights* is a great tool for leaders, investigators and project teams to improve organisational learning.

Find out more: [Investigation Insights Toolkit](#) | [Tripod \(energyinst.org\)](#)

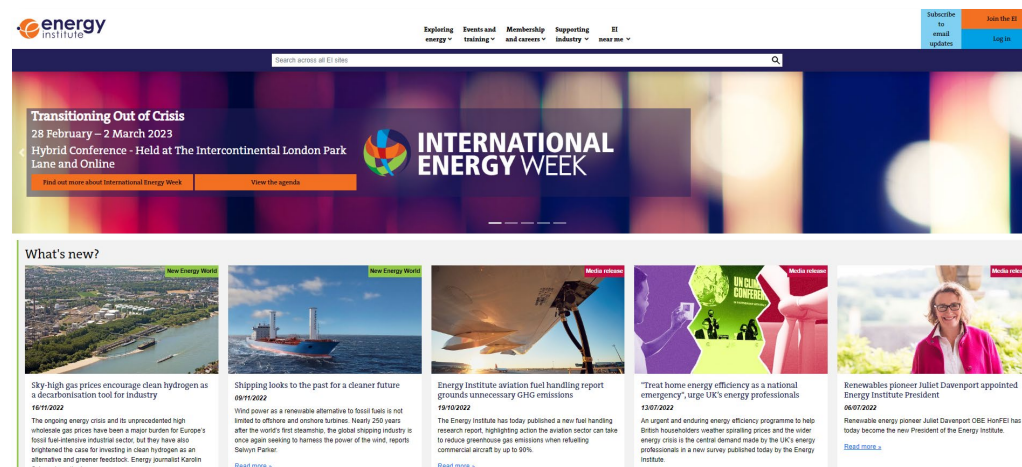
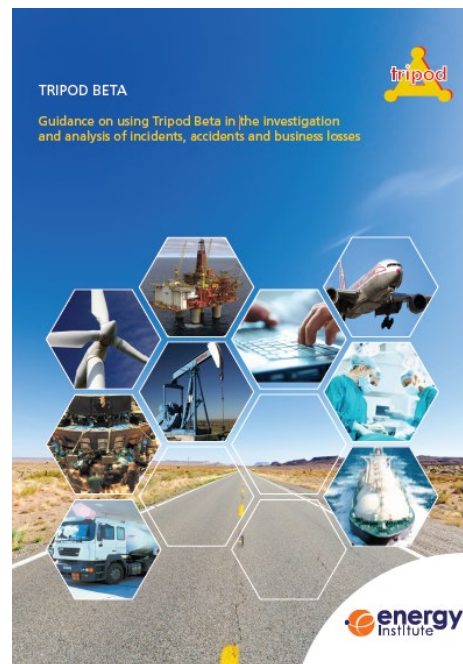
Learning from incidents, accidents and events

Together with the Tripod Foundation, the Energy Institute publishes a free guide on learning from incidents. The guide covers the entire learning from incidents process including reporting, investigation, and embedding learning.

Find out more: [Learning from Incidents](#) | [Tripod \(energyinst.org\)](#)

Energy Institute homepage: [Home](#) | [Energy Institute](#)

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Introduction

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What's the problem?

Organisations don't have the resources to carry out a full investigation of all incidents and near misses. Most near-misses or low level incidents are investigated quickly – often by filling in a simple accident report form. This means organisations don't effectively learn from the majority of incidents and near misses.

What's the solution?

Tripod lite is a simplified version of the Tripod Beta incident analysis tool. It is a simple to use and robust incident analysis tool that can easily be applied by supervisors, local managers and others who need to quickly investigate and learn from low potential events (i.e. incidents and near misses). Minimal training is required (however, some training will be beneficial), and step-by-step guidance is provided to walk the user through the investigation and analysis. *Tripod lite* can be used by anyone to investigate small to medium, 'everyday' incidents or near misses. These are often investigated by supervisors and local managers and are typically completed in 1-2 hours.

A Tripod lite analysis helps an incident investigator to uncover:

1. **What happened?** The events that led to an incident.
2. **How did it happen?** The barriers/safeguards that should have been in place to prevent the incident, but failed.
3. **Why did it happen?** What caused the barriers to fail?

Tripod lite provides a simple model that allows the investigator to identify:

- the sequence of events;
- barriers and controls that failed;
- human and job factors that made the incident more likely, and
- broader organisational factors.

For more information on Tripod methodologies, please visit our website at: [Homepage | Tripod \(energyinst.org\)](https://www.energyinst.org)

Why use?

Industry manages risk by putting in place barriers to control hazards. Unlike other methodologies, such as '5 whys', 'fault tree analysis', etc., *Tripod lite* specifically identifies the barriers that were not effective, allowing them to be fixed. It also allows categorisation of causes for analysis of multiple events.

Unlike other methodologies, *Tripod lite* is structured into **what**, **how** and **why**. This structure helps to direct the investigation, and keeps the investigation focused on 'why', and not on 'who to blame'.

Tripod lite specifically helps users uncover the human factors elements of incidents. These are key to understanding why an incident occurred and how it can be prevented in future.

Tripod lite is ideal for multi-incident analysis. Standardised drop down menus are used to identify types of mistakes and non-compliances, performance influencing factors, and areas of concern, so that organisations can trend issues for deeper investigation.

How to use?

Tripod lite is an interactive PDF. It contains a barrier-based visual representation of the incident (a Swiss cheese model), which the user can populate electronically or by hand in a printout.

By clicking on the numbered steps in the diagram, the tool provides all the guidance necessary to carry out an incident analysis.

There is also a Microsoft Excel spreadsheet version, which offers more flexibility for more advanced users, including the ability to customise the drop down menus and record more causes.



Investigation tips

Tripod lite also includes tips to help the user to investigate the incident. However, complementary training on how to investigate (interview techniques, data gathering etc.) will be beneficial.



The investigation

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A small *Tripod lite* investigation is intended to take from 1-2 hours to complete, with the investigator talking to 2-3 different people who were involved in the event. It can of course go much deeper than that.

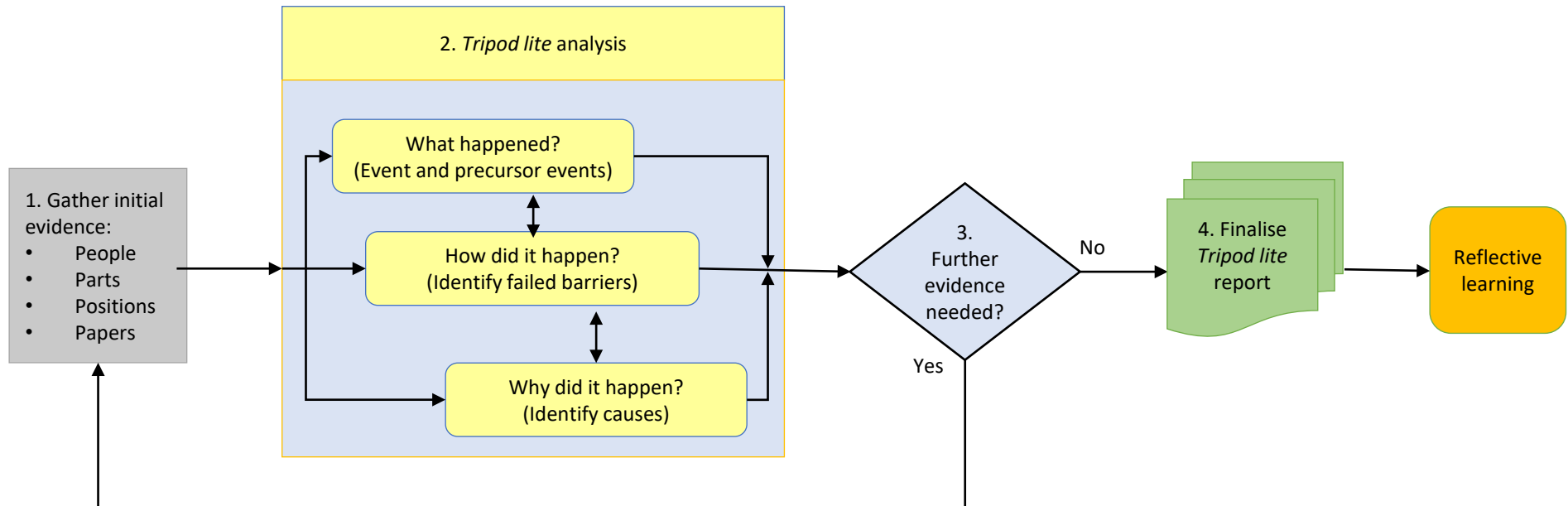
The investigation starts by gathering evidence:

- Who are the **people** involved? (Interview people)
- What **parts** (equipment, plant) were involved?
- What were the **positions** of the people and parts at the time? (e.g. take photographs of the site and the aftermath of the incident.)
- What **papers** (documentation) exist? (e.g. procedures, risk assessment, permit to work, etc.)

Using the evidence, fill in the *Tripod lite* diagram. This begins to build the model of the incident.

The model will likely have gaps in it. Look for the evidence to fill those gaps. For example, the procedures may tell you what the barriers are. Interviewing the people involved may help you understand the causes of the barrier failures. Refine the *Tripod lite* diagram using this new evidence. Do this as many times as needed until you are happy that the core diagram models the event with reasonable accuracy.

Once the *Tripod lite* report is finalised, think about 'what is next?' How will you ensure the organisation learns from this incident? Set up a reflective learning session with a team so that team can learn from this incident and put in place their own recommendations.





How to use

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You complete the diagram in numerical order, but you read the diagram from the left hand side to the right hand side and top to bottom. The diagram tells a story about a task that was being done (the context), and how a hazard led to an event that (potentially or actually) harmed someone or something. Then the diagram shows what 'barriers' should have prevented or mitigated the event or the harm, and finally the sequence of causes that led to each barrier failure.

Navigation buttons: click to see guidance on completing this part of the diagram.

Prevention barriers: these should have controlled the hazard (and maybe prevented the event from happening). If a barrier was effective, tick the box and do not fill in the causation path.

Mitigation barriers: these should have prevented or reduced harm. If a barrier was effective, tick the box and do not fill in the causation path.

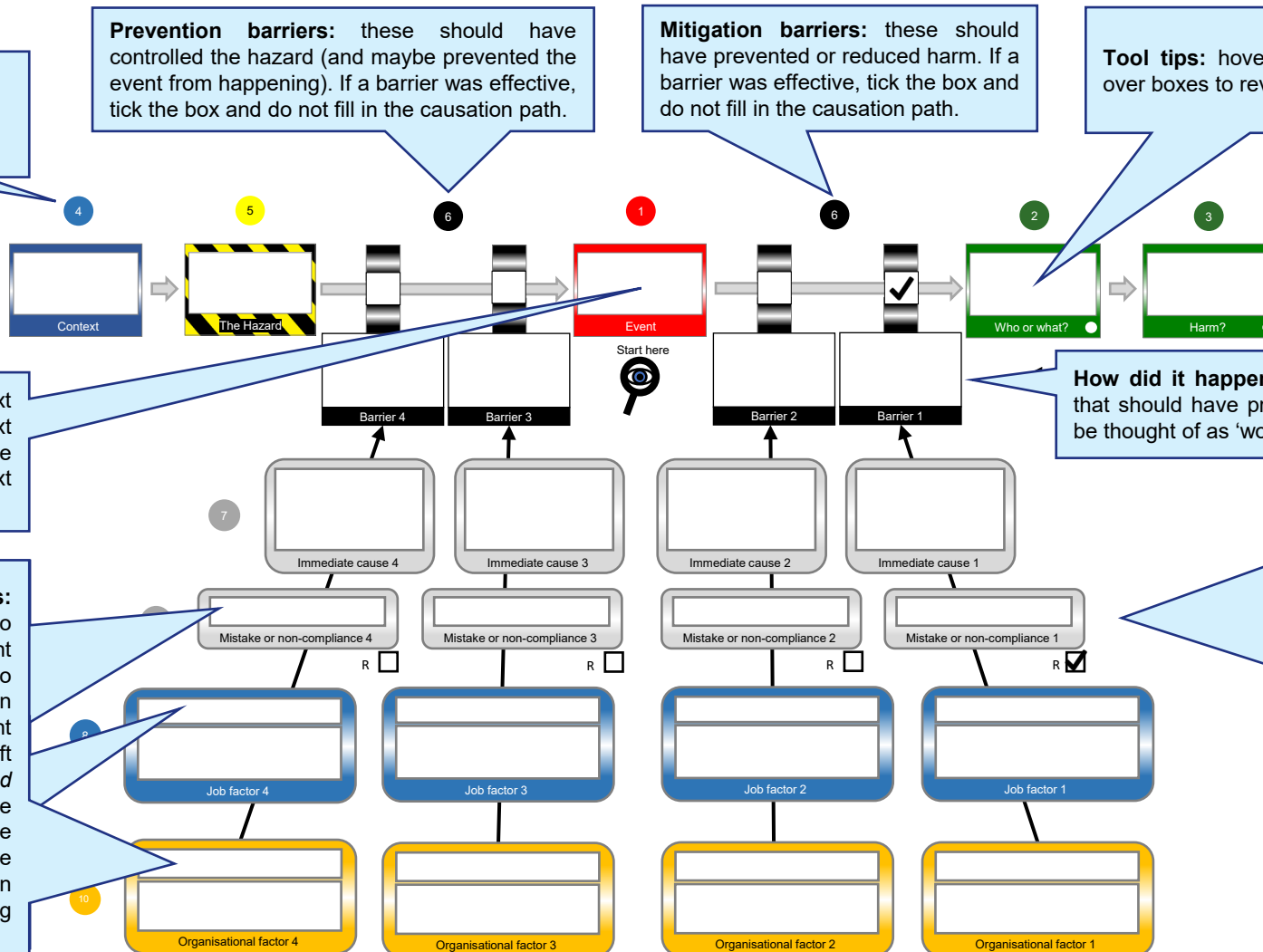
Tool tips: hover the mouse cursor over boxes to reveal tool tips.

What happened? This row shows the sequence of events. It is similar to a bow tie diagram.

How did it happen? This row shows the barriers that should have prevented the incident. This can be thought of as 'work as imagined'.

Why did it happen? The last four rows show the 'causation path', i.e. a sequence of causes that ultimately led to the failure of each barrier.

Each barrier has a single immediate cause ('work as done'), job factor and organisational factor. The Microsoft Excel version of *Tripod lite* allows for additional job and organisational factors to be recorded.



Free text: type text directly into boxes. Text will automatically resize based on how much text is included.

Drop down menus: these allow you to categorise the different types of causes (e.g. so the organisation can carry out multi-incident analysis). The Microsoft Excel version of *Tripod lite* allows for these categories to be customised (i.e. if the organisation has an existing way of doing this).



Description of incident

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Name of incident

Date of incident

Time of incident

Location of incident

Date of investigation

Investigation team
members

Internal incident reference or classification

Incident severity classification

Description of incident

Consequences

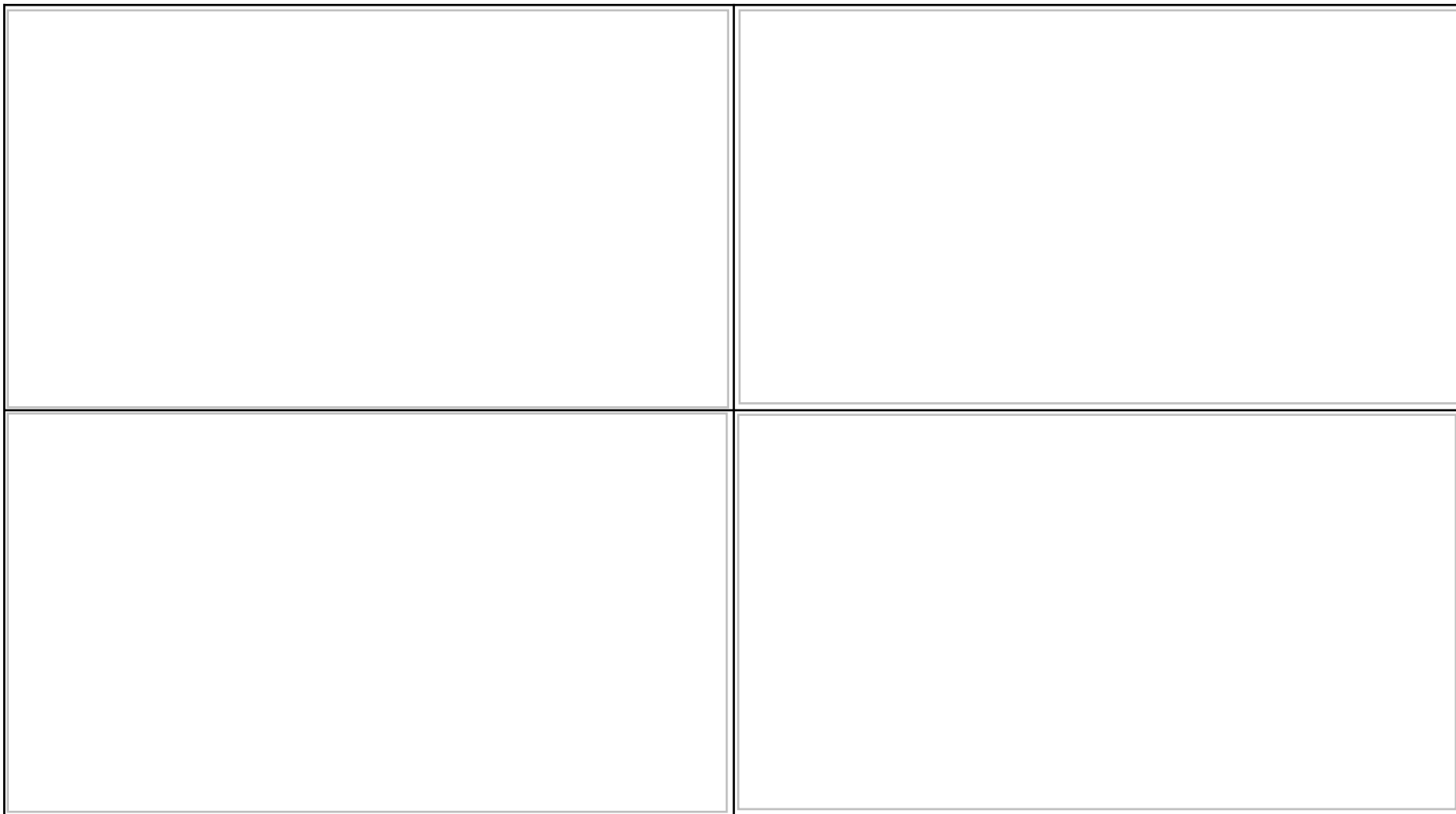
Other information



Incident images

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Incident images (if available)





Incident analysis diagram

Click me



1

Event

Start here



'Work as imagined'

'Work as done'

Tick if
repeated
mistake or
routine non-
compliance?

4

5

6

6

2

3

7

9

8

10

Context

The Hazard

Barrier 4

Barrier 3

Barrier 2

Barrier 1

Immediate cause 4

Immediate cause 3

Immediate cause 2

Immediate cause 1

Not applicable

Mistake or non-compliance 4

R ☐

Not applicable

Mistake or non-compliance 3

R ☐

Not applicable

Mistake or non-compliance 2

R ☐

Not applicable

Mistake or non-compliance 1

R ☐

Not applicable

Job factor 4

Not applicable

Job factor 3

Not applicable

Job factor 2

Not applicable

Job factor 1

Not applicable

Organisational factor 4

Not applicable

Organisational factor 3

Not applicable

Organisational factor 2

Not applicable

Organisational factor 1



Recommendations: barriers

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For each of the failed barriers identified, what action should be taken (and by whom) to restore the barrier, strengthen it, replace it, or provide additional barriers, to allow safe operation to resume, and ideally to prevent the same or similar incident happening again?

Barrier			Recommendation/s	Who should action this?
1				
2				
3				
4				



Recommendations: job and organisational factors

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For each of the job factors identified, what short term action should be taken to remove or reduce the issue?

For each of the organisational factors identified, what longer term actions could be taken to improve how the organisation manages this type of job factor?

Job factors		Short term recommendations	Who should action this?		Org. factors	Long term recommendations	Who should action this?
1	Not applicable			→	Not applicable		
2	Not applicable			→	Not applicable		
3	Not applicable			→	Not applicable		
4	Not applicable			→	Not applicable		



The Event: what incident/near miss/event is being investigated?

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What is it?

This is the incident or near miss that you are investigating. It may be a minor injury, a delay in a project or any other unwanted event.

In the box, write a short description of the Event

This is often how the incident was first described to you, for example:

A car reversed into
a shopping cart

Event

Worker tripped over
a bucket

Event

Potential: someone
could have hit
his/her thumb with
a hammer

Event

Do not just write 'person injured', try to be more specific. Including more detail now will help the investigation, including who/what has been harmed and what harmed them.

Actual incident or near miss?

Be clear if the Event actually happened or whether it was a near miss. A near miss is a 'potential' incident - this is something that could have happened but it was narrowly avoided. If the incident didn't actually happen, then write 'potential' or 'near miss' in front of the description.



Investigation tips

The Event is often how the incident or near miss was described when it was first reported:

'Sarah has been rushed to hospital with a broken leg!'

'What happened?'

'She was climbing down a ladder, slipped and fell.'

Talk to several witnesses, the injured person, and review CCTV footage (if available) to corroborate this.



Who or what was (potentially) harmed? (The 'Object' of the investigation)

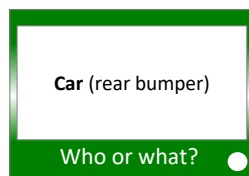
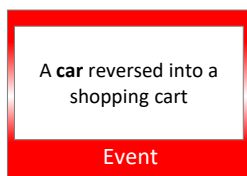
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What is it?

This is the person, equipment or something else (reputation, environment) that was (potentially or actually) injured, damaged or 'changed' during the Event. There should only be one 'Object', and normally this represents a single person or piece of equipment. However, in some cases the Object could represent a group of people, e.g. if two people were both struck by the same falling load.

In the box, describe who or what was injured, damaged or changed in the Event

This is the primary focus of the investigation. For example, if the Event was a car accident, you need to decide whether it was the person who was injured, the car that was damaged, or the obstacle the car crashed into that was damaged. This will influence the rest of the investigation. If you have done step 1 (defined the Event) correctly then the Object is probably already described in the Event box.



Was the Object the car, or was it the shopping cart? It may not matter, but try both to see which one makes the analysis easier.



It is better to be specific. Instead of just 'Worker', where was that worker and what were they doing just before the event occurred?



Investigation tips

Deciding on the Object of the investigation is important. It may not make any difference (in the car example, it probably doesn't matter whether the Object is the car or whether it is the shopping cart), but it may do. It may affect who you need to talk to, and what information you need to gather (e.g. procedures) etc.

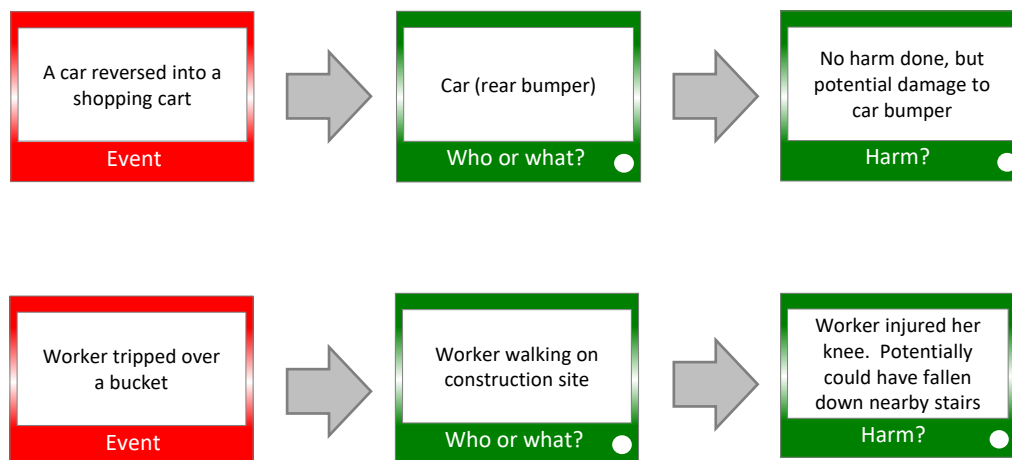


What harm (could have) occurred?

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In the box, describe what harm actually occurred. If no harm occurred, state the worst harm that potentially could have occurred.

The actual harm is the harm that occurred to the Object of the investigation. The potential harm is the worst that could have reasonably be expected to happen. If the incident actually occurred, you should describe the actual harm and, optionally, can include the potential harm as well. If the incident was a near miss then write 'No harm done', but you **must** include a description of the potential harm. The harm must have (potentially) happened to the object (i.e. who or what?). If the harm relates to something else, then it is likely that you have gotten the Object (i.e. who or what was harmed) incorrect.



Investigation tips

As investigator, you might not know what harm could have occurred. Ask someone involved in the incident or in similar tasks. As investigator, you are not expected to be an 'expert' on the operations or activities you are investigating, but it will be hard to conduct the investigation without talking to people who are knowledgeable.

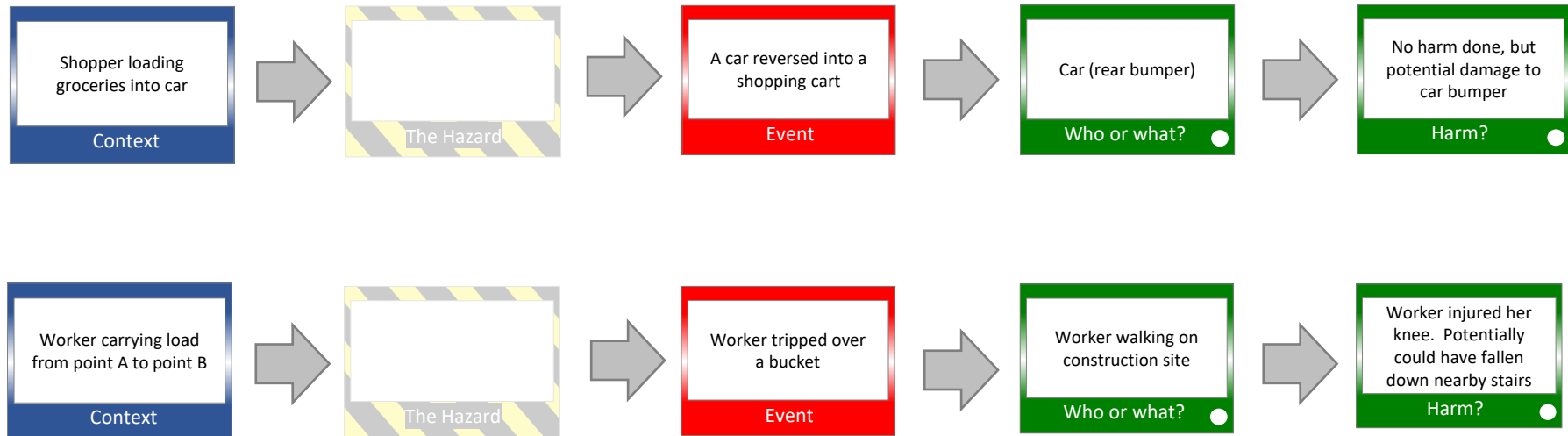


Context: what was the activity that was taking place just before the event occurred?

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What is it?

Presumably, the event happened as a result of some earlier event or as part of an activity. The context is the circumstance in which the event occurred. This context could have been a **normal** business activity, or it could have been an **unusual** occurrence. It helps explain, in a matter of fact way, the presence of the hazard or object. For example: what was the object of the investigation (the person or equipment that was harmed) doing just before the event occurred? Where was the person or equipment located? What task or activity was taking place that explains why the hazard or Object was present?



Investigation tips

Do not try to explain why the activity was taking place. Simply ask those involved what was happening at the time of the incident or near miss. What were they trying to do, and what were the circumstances? For simple incidents, this will usually be a normal activity (like walking from A to B, attempting to lift a box, etc.). However, if it is an unusual activity (such as outbreak of a fire) then this could become the focus of a new *Tripod lite* investigation.



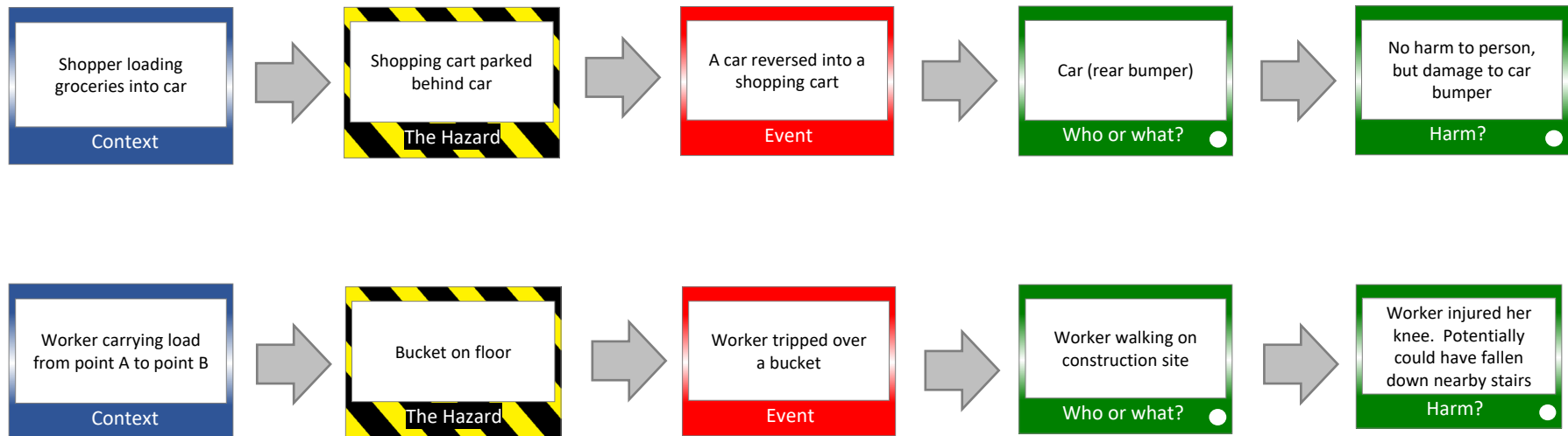
The Hazard: what (could have) caused the harm?

What is it?

The Hazard is the person, thing, force, situation or condition that did the harm. Typical hazards are things such as falling objects, a fire, a hazardous substance (such as acid), a trip hazard, a form of kinetic energy (e.g. the force of a car hitting an obstacle), or a damaged piece of equipment.

In the box, write a short description of the Hazard

The Hazard may be obvious from the Event description, however, only investigation will reveal what it actually was. The Hazard was probably doing something specific at the time or was in a particular place - e.g. if it is a fire, what is on fire and where is that fire? In short, try to describe this as a **hazardous situation**, not just a hazard.





Barriers: what should have happened (good practices) or been in place (physical defences) to control the Hazard or protect the Object?

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What is it?

Barriers may collectively be thought of as 'work as imagined', i.e. a barrier is basically what should have (or what was expected) to happen to **prevent** the event from occurring. A barrier is a **control**, **safeguard**, or **defence** that should have controlled the hazard or defended the object of the investigation.

In simple terms, a barrier must be either:

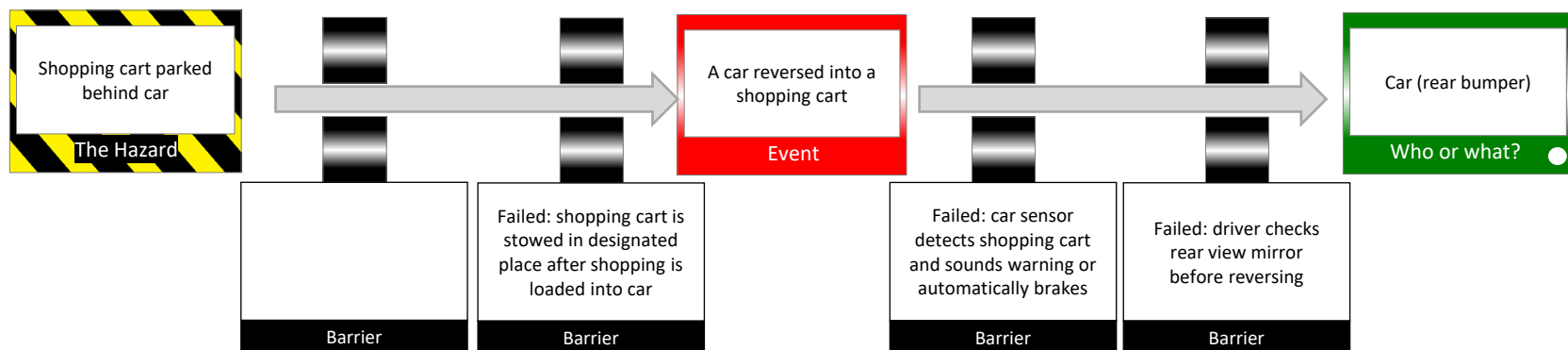
- a **physical defence** (e.g. a helmet, a fence, a wall, or other equipment);
- an **automatic process** (e.g. an automatic shutdown);
- a **human intervention** (e.g. a person carries out an action as specified in a procedure), or
- a combination of the above (e.g. an automatic alarm that notifies a person to press a shutdown button)

The next page gives a more detailed look at different barrier types.

Barriers are usually 'good practices' – they are what should have happened, and so are **described as if they had worked** in the diagram. The chronological order of the barriers doesn't matter – i.e. the barriers might have been enacted just before the incident, a week ago, or 5 years ago. Using *Tripod lite*, you can fit **up to four barriers** in the PDF diagram, but eight in the Excel version. Barriers are explored in more detail on *Tripod lite* and Tripod Beta training courses.

A barrier is not...

There are lots of things that help to make sure barriers are effective. Having **competent people**, **clear procedures**, having the **right tools**, etc. are all important, however, these are **not** barriers. They may, however, be related to the reasons why the barriers failed.

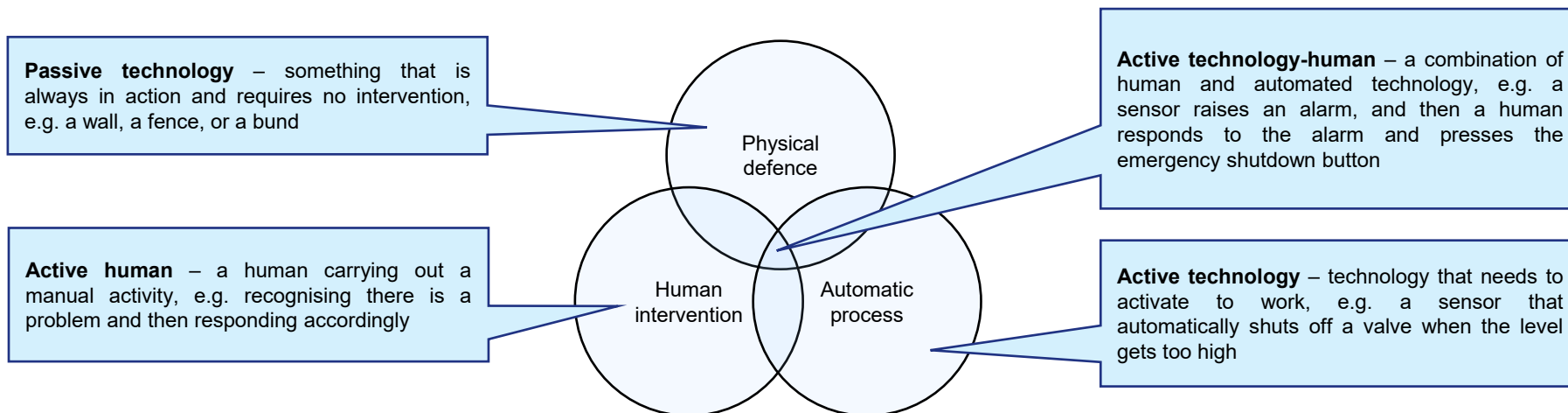




Further information on barriers

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According to good practice from EI, CCPS* and CIEHF**, barriers can be:



A **passive barrier** simply 'is', and will work so long as it is in place, undamaged, and designed correctly.

An **active barrier** always has to have three elements to be effective:

1. **Detect** – a problem has been seen, sensed, detected, smelt, electronically registered, etc.
2. **Decide** – a person or a computer (or other technology) has to correctly understand and **diagnose** the problem and **decide** on a course of action.
3. **Do** – the person or equipment has to carry out the correct action, e.g. press the right button, activate the right valve, follow the correct step in the procedure.

A barrier should usually be able to control the hazard and prevent or mitigate the event by itself. If it can't, then it is probably not a barrier, or the description of the barrier is incomplete.

*Energy Institute and Center for Chemical Process Safety (CCPS), *Bow ties in risk management: A concept book for process safety*

**Chartered Institute of Ergonomics and Human Factors (CIEHF), *Human factors in barrier management*



Better barriers

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Effective or failed?

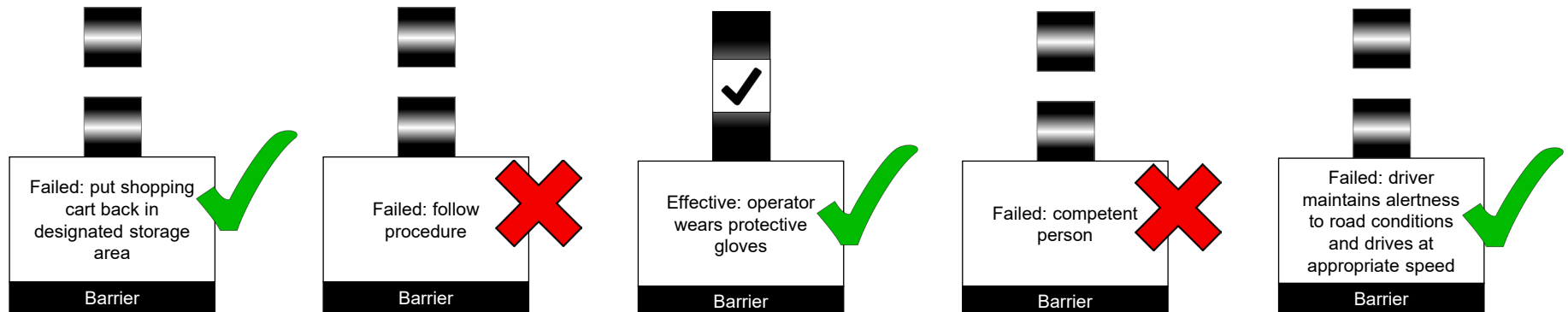
When investigating the incident, you are looking for the barrier/s that **failed**. However, when investigating near misses, then one of the barriers either didn't fail – it was an **effective barrier** – or it failed but the incident didn't happen because of 'luck' (e.g. an object drops to the floor from height, but no one is injured because no one was standing in that location at the time). Be clear whether this is a barrier that failed, or (if you are investigating a near miss/potential incident) whether it was effective. Effective barriers are barriers that worked as intended and prevented the incident from occurring, or mitigated the harm caused by the hazard. You can show a barrier was effective by clicking the checkbox in the middle of the barrier. For effective barriers, immediate causes, job factors and organisational factors do not need to be investigated, but they can if you want to find out why things 'went right'.

Barrier descriptions

Describe the barrier as if it worked correctly. If it is a passive barrier, clearly describe what the barrier aims to protect and how it accomplishes it. For active barriers, you can include the **detect**, **decide** and **do** elements in the barrier description.

Avoid unspecific descriptions. For example, 'follow procedure' is not a barrier. What is it in the procedure that needs to be followed? 'Follow manual handling good practice' is not a barrier. What practice is being referred to (lifting from the knees or something else)?

Be sure that the barrier, as described, can prevent the incident. For example, 'training' or 'competent person' are not barriers. Ask yourself: what is the specific task that a 'competent' person is expected to carry out (remember – detect, decide, do)?



Investigation tips

The barriers that should have prevented or mitigated the incident you are investigating are probably documented or known about by the people involved - documented in the procedure, the site safety rules, the permit to work or risk assessment. For safety critical tasks, the barriers may be documented in bow tie diagrams or in the site safety case. If the barriers are not documented, they may just be 'standard practice', well known by people who work on site.



Immediate cause: what was the action/inaction or condition that caused the barrier to fail? (for failed barriers only)

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What is it?

This is direct cause of the barrier failure. Just as barriers can be thought of as 'work as imagined', immediate causes may be thought of as 'work as done', i.e. what actually happened. Statistically speaking, in 70% of cases, it is an **action** or **inaction** of a person or group of people. In 30% of cases, it is a hardware failure or natural disaster, etc. – an 'unsafe condition'.

Note: it is **not** the reason for the action, inaction or unsafe condition. The immediate cause is purely a 'matter of fact' description of what action, inaction or condition caused the barrier to fail.

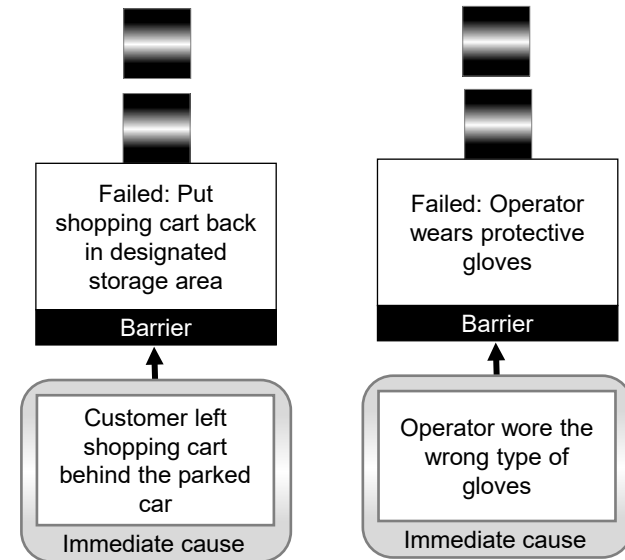
In the box, write what the immediate cause of the barrier failure was.

For **passive barriers**, the failure is a straightforward description of how it failed, e.g. 'water level exceeded the height of the sea wall'; 'bund wall not high enough, allowing the oil to overflow'.

For active barriers, the failure could have been in **one** of the three elements:

1. **Detect** – e.g. the sensor failed to register the overflow; the person didn't respond to the alarm; the driver didn't see the debris in the road.
2. **Decide** – e.g. the person misdiagnosed the problem; the person selected the wrong procedure.
3. **Do** – e.g. the automatic valve failed to open; the person missed a step in the procedure; the person didn't carry out the action in time to prevent the incident.

Try to describe an immediate cause as what was actually done, rather than what was not done. However, if that is too difficult, it is still valid to word an immediate cause in terms of what was not done (i.e. if the barrier is 'do x' then the immediate cause was probably 'x was not done', or better yet, 'y was done instead').





Job factors (preconditions, performance influencing/shaping factors)

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What are they?

In short, job factors are things that made the job harder to do. They are issues to do with the person, equipment, environment or procedures that make mistakes and non-compliances (and therefore the immediate cause) more likely to happen. Job factors are only obvious once you have talked to those involved in the event (see investigation tips). They are often known as 'performance influencing/shaping factors'. *Tripod lite* uses a simple classification system so that job factors can be recorded easily and consistently (see next page), and space to include a free-text description (see image below-right).

Tip: if you find yourself always choosing the same job factor for every barrier, e.g. 'habit patterns', then do a little more investigating. There are 31 job factors. Don't always focus on 'people', also consider the environment, the equipment and the procedures.



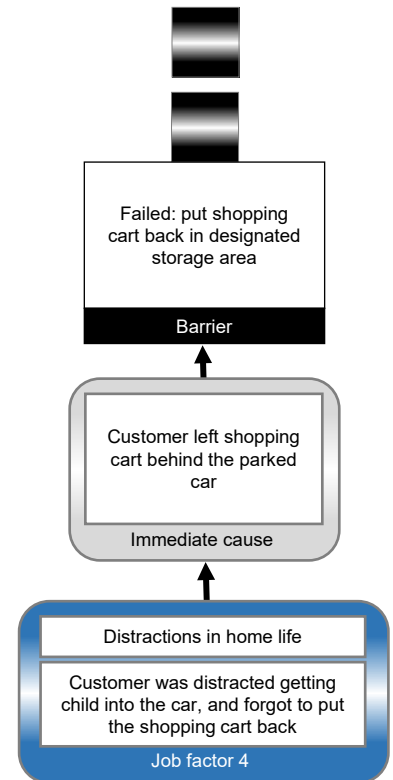
Investigation tips

'Why' can be answered through collecting evidence. Here is a good resource that lists the types of evidence to look for ([Incident Investigation : OSH Answers \(ccohs.ca\)](https://www.ccohs.ca/osh/answers/incident_investigation/)):

- **Task** – Was a procedure used? Had task conditions changed making the procedure unsafe? Were appropriate tools available?
- **Material** – Was there equipment failure? Was machinery poorly designed? Were hazards identified?
- **Work environment** – What were the weather conditions? Was poor housekeeping a problem? Noise? Light? Temperature?
- **Personnel** – Was the procedure followed? Were they trained? Could they physically do the work? Were they tired or under stress? Pressure to finish the task quickly?
- **Management** – Did a procedure exist? Were safety rules and procedures communicated and known to all? Adequate supervision? Regular maintenance? Past safety issues have been fixed?

Another way to find out 'why' is to ask the people involved in the incident – although asking 'why did you do that?' is probably not a good question to ask (it is quite confrontational, and people will often say 'I don't know'). When interviewing people involved in the incident, ask questions like:

- Where were you at the time of the incident?
- What were you doing at the time?
- What did you see, hear?
- What were the work environment conditions (weather, light, noise, etc.) at the time?
- What was (were) the injured worker(s) doing at the time?
- In your opinion, what caused the incident?
- How might similar incidents be prevented in the future?





Job factors: people

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The individual's physical capabilities, personality or other 'individual' factors.

Title	Description
1 Knowledge or experience	Knowledge or experience associated directly with the task is absent or incomplete, e.g. understanding of the hazards, or associated rules and procedures
2 Habit patterns	Where previous learned well practised habits interfere with task execution, e.g. driving a new car that has the indicator and windscreen wipers on the opposite side and selecting the wrong function when making a turn
3 Fatigue	Lacking sufficient sleep, long periods of wakefulness or body clock misalignment due to time zone or shift change
4 Stress / morale	Adverse reaction to excessive pressures or other types of demand placed on them resulting in degraded task performance, e.g. unrealistic deadlines, lack of resources to support goals, limited control over own work
5 Physical capabilities	Physical capabilities such as reach, strength, stamina, height cause challenges in completing a task
6 Use of drugs or alcohol	Substances (legal or otherwise) that adversely influence human performance
7 Team communication	Information between a team is not communicated or is misunderstood
8 Distractions in home life (family, finances, friends)	Life circumstances cause distractions such as reduced concentration and motivation
9 Personality conflict	Incompatibility between two or more individuals working together on a task causing team breakdown, e.g. dismissive of concerns, imposing authority over another
10 High workload	Unable to meet the pace of work resulting in reduced task performance. Unable to keep working at this rate for long
11 Boredom, underload	Where an individual experiences a loss of vigilance due to an unstimulating environment/task



Job factors: environment

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The environment the person was working in, and the conditions the job was being carried out under.

Title	Description
12 Error-free performance	A human error will result in an unacceptable risk of a serious injury or fatality, e.g. having to adopt a work position to avoid dangerous moving parts or failure to connect fall arrest harness will result in a fall
13 Unusual, infrequent, unfamiliar or novel situation	Departure from a well-established routine, way of working or agreed scope of work. Unfamiliar or unforeseen task or job site conditions that potentially disturb an individual's understanding of a task or equipment status
14 Distractions / interruptions	Conditions either of the task or of work environment that results in the operator having to stop and restart a task sequence because of their attention being diverted away from the task in hand
15 Time available	Urgency or excessive pace required to perform action or task. Manifested by shortcuts, being in a hurry, and an unwillingness to accept additional work or to help others. No spare time for task
16 Multi-tasking	Performing two or more activities, either mentally or physically, leading to divided attention, mental overload, or reduced vigilance on one or the other task
17 Repetitive actions / monotony	Inadequate level of mental activity resulting from performance of repeated actions; boring. Insufficient information exchange at the job site to help individual reach and maintain an acceptable level of alertness
18 Workspace	Workspace creates difficulties with access and egress, increasing postural stress or cramped conditions of work
19 Signage	Information such as safety signs not present but required to provide operators with key information
20 Weather	Fog, haze, snow, rain, smoke, etc., or when exposure to windblast affects the individual's ability to perform required duties
21 Lighting	Low or high levels of lighting due to time of day or workplace conditions, sudden changes in light levels from light to dark or vice versa, glare from artificial or natural sources
22 Noise	Noise levels interfere (e.g. ambient conditions or sudden loud noise inducing startle effect) with task performance such as causing team communication challenges or affecting an individual's ability to concentrate
23 Heat / cold	Hot, cold or humid conditions, including how they influence surface conditions



Job factors: equipment

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The quality, suitability or availability of tools and equipment.

Title	Description
25 Equipment availability	Where equipment/PPE is not available for the task leading to alternative equipment being used that is not suitable
26 Equipment condition	Equipment/PPE condition is such that the user experiences challenges or is exposed to additional risk, e.g. faulty, seized, worn out equipment
27 Equipment suitability	Specified equipment/PPE is not able to achieve the desired performance standard or exposes an individual to an unacceptable risk, e.g. high levels of noise or vibration, exposure to dangerous parts
28 Controls or display interactions	Design features of displays, controls and alarms that create confusion or difficulty in operation, examples include controls that are close to each other and that look and feel similar, poor labelling of displays and controls, false alarms, similar modes of operation, inconsistent operation of control and cluttered displays
29 PPE interference	Use of specified personal protective equipment creates problems in task performance, e.g. loss of dexterity



Job factors: procedures

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The quality and availability of procedures.

Title	Description
30 Procedure or other task document availability	Procedure or other document that is required to support task performance is not available, placing reliance on individual to perform the task from memory, e.g. checklist, method statement, safety datasheet, operating manual
31 Procedure or other task document suitability	Procedure or other document is not suitable because it is inaccurate, out of date, contains difficult to interpret requirements or cannot be implemented due to operational constraints
32 Procedure or other document usage	Environmental or other conditions create difficulty in the use of the procedure or other document condition, e.g. wet and windy conditions



Mistake or non-compliance

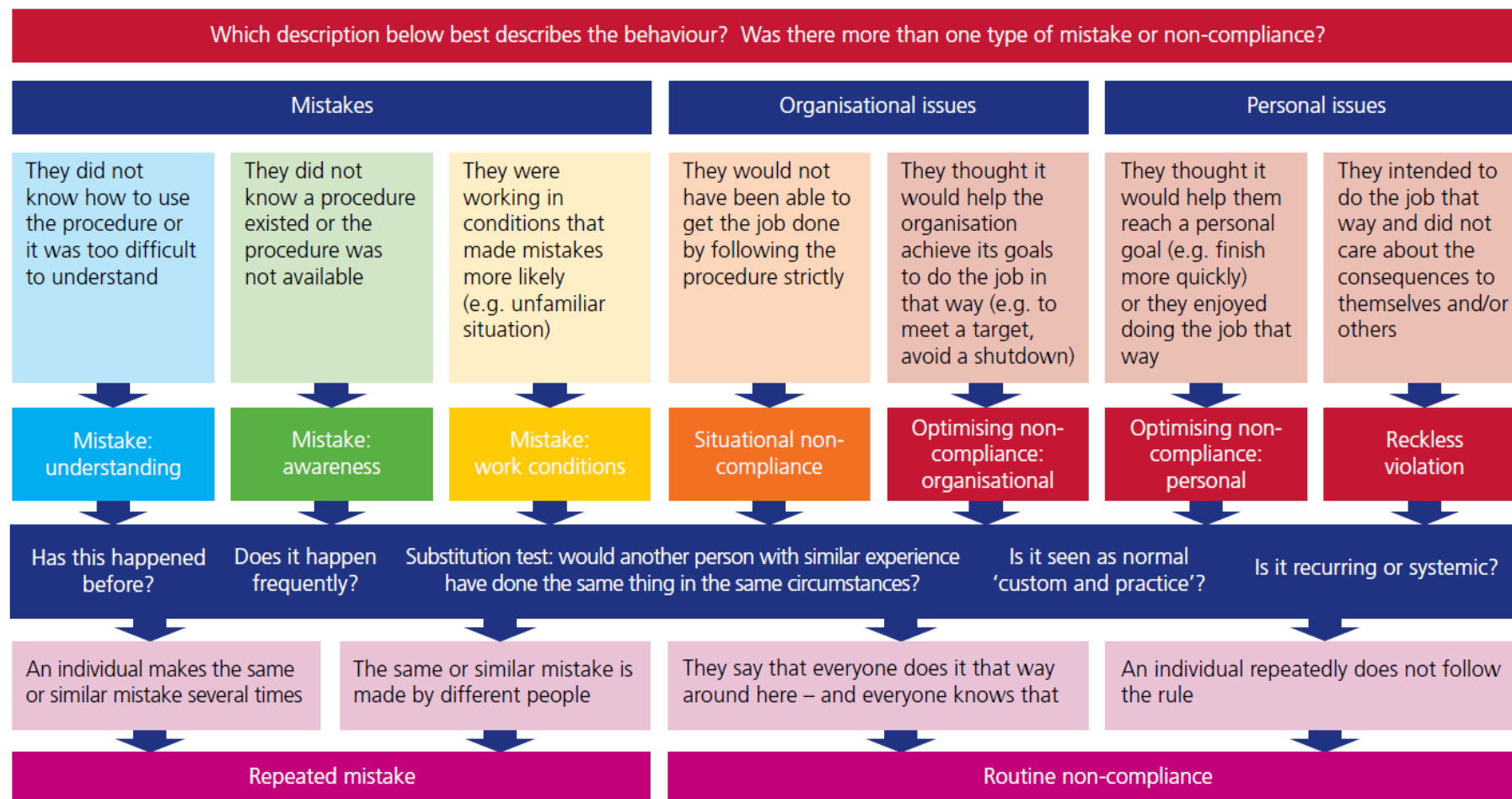
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What is it?

We can classify different types of human actions into several categories. This can help us determine the appropriate remedial action to take.

Option 1: Hearts and Minds decision chart

Taking into account the job factors, follow the decision chart and use the drop down menu in the incident analysis diagram to select the appropriate mistake or non-compliance.





Mistake or non-compliance

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Option 2: human behaviour taxonomy

This is a more traditional approach to classifying human behaviour, which includes slips and lapses. The remaining terms are identical to those in option one.

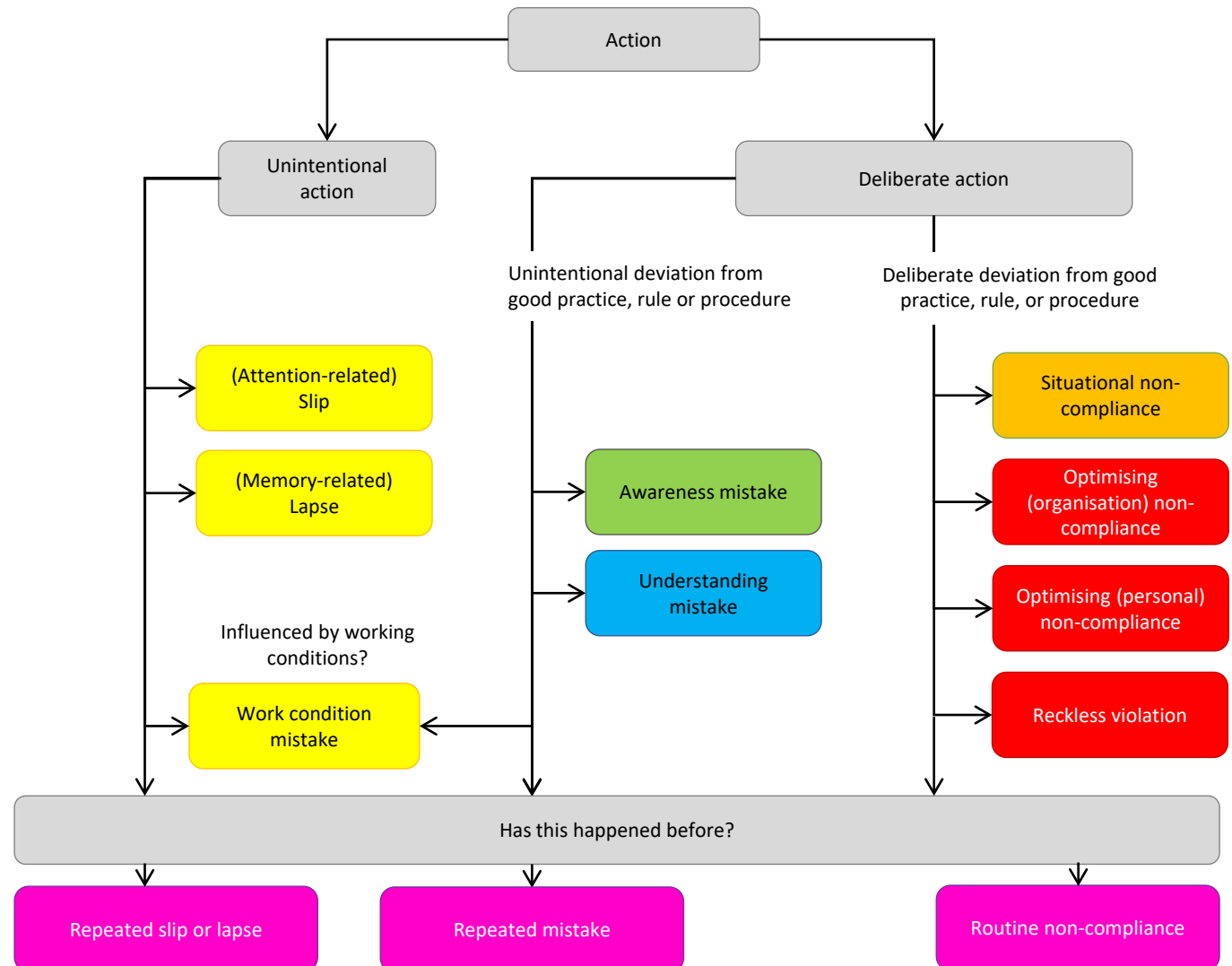
A **slip** is an unintended deviation from a correct plan of action. Slips are attention failures, which may be caused by distractions or mistiming. Examples of slips include:

- Moving a switch up rather than down, i.e. a wrong action on the right object.
- Taking a reading from the wrong instrument, i.e. a right action on the wrong object.

A **lapse** is an omission or repetition of a planned action. Lapses are memory failures that may stem from changes in the task nature or environment. Examples of lapses include:

- Forgetting to indicate at a road junction when driving a vehicle.
- Failing to secure scaffolding because of an interruption.

Both slips and lapses can occur due to normal human fallibility when working in skill-based activities, but their likelihood is increased by conditions that have a negative influence on people, e.g. tiredness, lighting and noise levels, sudden changes to routines, illogical design, etc.





Organisational factors

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What are they?

An organisational factor is a more general, wider, or prevailing issue in the organisation that helped cause, create or did not control the job factors. Ask yourself: what organisational 'system' or policy could have been responsible for managing that job factor?

Most job factors are **created** by the organisation. For example, the organisational culture (or the way its managers behave) may encourage short cuts. The shift arrangements may force people to work long hours and become fatigued. Budget cuts may mean the workforce don't have the right equipment or tools.

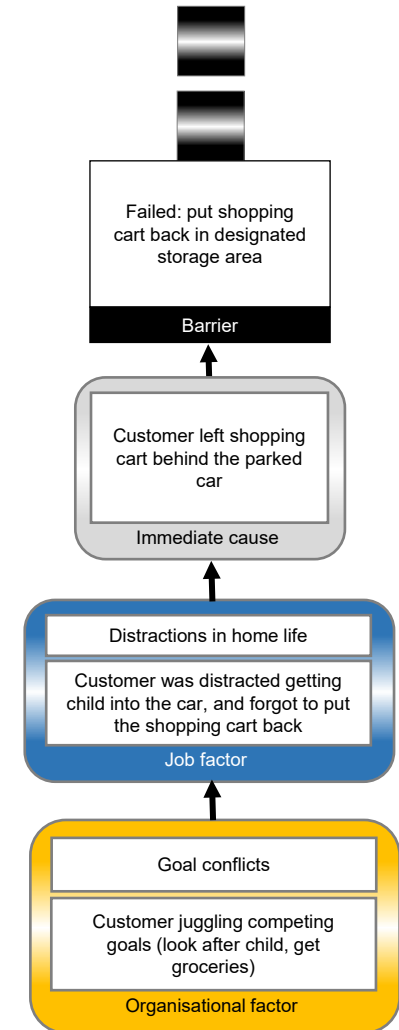
Some job factors are **external** to the organisation, however, the organisation may still have a responsibility to **control** them and make sure it does not have an impact on the safety of the organisation. For example, the organisation may have a policy or process so that drivers can report when they are fatigued, or policies on the working hours of new parents, or may provide day-care services. The organisation may have systems in place to manage the impact of inclement weather, e.g. flood defences.

On the next page is a list of common organisational factors. In the *Tripod lite* diagram, you can select one of the options using the drop down menu, and add free-text to provide more explanation.



Investigation tips

A *Tripod lite* investigation will likely not have the resources, time or remit to investigate the organisational factors fully. However, as the investigator, you or the people involved in the incident may be aware of broader issues in the organisation (they may experience these on a day to day basis) that probably had a role to play in the incident. You may be able to categorise the job factors into one or more of these organisational factors listed on the next page.





Organisational factors

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Broader organisational systems or resourcing issues that created, contributed to, or failed to control the job factors.

Title	Description
1 Contractor management system	Contractor management process (invitation, evaluation, award, management), including failure to follow the process contributes to challenges in task performance, e.g. appoint contractor with limited experience in operation
2 Customer management system	Where customer expectations, actions or conditions of work increases risk or complexity of the operation, e.g. last minute changes to planned scope of work
3 Management of change process	Changes to the policies, procedures and standards, organisational structure, roles and responsibilities or staffing levels result in confusion, work execution challenges, gaps in management system implementation
4 Procurement process	Procurement of plant, equipment, PPE and business services contributes to risk or task difficulty, e.g. appointment of unqualified contractors
5 Safety standards, procedures	Standard, procedure or code of practice within the safety management system is absent or does not meet benchmark good practice guidance, e.g. regulatory and published industry practice
6 Risk management system	Failure to implement risk management system or application of the hierarchy of control not applied to an acceptable level based on current and credible good practice guidance, e.g. regulation, industry or other professional body
7 Maintenance, inspection, testing system	Maintenance, inspection, testing process is absent, not implemented or erroneous resulting in degraded performance of plant, equipment and/or PPE
8 Training and competence management	Training and competence system does not provide necessary quality of training to support task performance such as a failure to provide task training (initial or refresher), training content/task requirement mismatch, training not updated in light of changes to practice
9 Leadership and management oversight	Monitoring of the effectiveness and/or implementation of the safety management system by leadership and management does not address implementation gaps, actions, findings and recommendations, e.g. investigation, audit and self-assessment, management review
10 Supervisory oversight	Assigning and monitoring local work creates or does not address unsafe conditions, e.g. faulty equipment, high workloads, poor procedures, unsafe practice
11 Safety climate	Shared perceptions of employees about the importance of safety within the organisation, division or local workplace result in low workforce engagement, fear of blame
12 Clarity of responsibility	Whether it is clear what the roles are when a task is being carried out (e.g. in an emergency, who is expected to take an overview of the situation?)
13 Goal conflicts	Expectations, targets and goals create a conflict with safety management, e.g. under-reporting of incidents, exceeding safety boundaries
14 Resources	Allocation of resources (people, financial, business structure) create challenges in executing, improving or maintaining safe systems of work, e.g. investment in new technologies, training, maintenance of equipment, staffing levels