



STOREMASTA®

Key steps in a HAZCHEM incident investigation

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Documenting and investigating workplace incidents plays an important role in keeping your workers, your property, and the environment safe from harm.

More specifically, having an established HAZCHEM incident investigation process can help you and your organisation:

- Take corrective actions to prevent an incident from happening again.
- **Identify chemical hazards** that have never been fully understood and have no risk controls in place.
- Identify and correct issues of non-compliance.
- Ensure that notifiable incidents are properly documented and submitted to the Regulator in your state or territory.
- Process worker's compensation and insurance claims.

A proper incident investigation looks beyond a single, isolated cause and seeks to establish the full sequence of events that occurred immediately before the incident. Then identifying everywhere a failure occurred in the system.

Outline and key takeaways

Key steps in a HAZCHEM incident investigation was written to help HSE Managers and other WHS professionals establish an incident investigation process — particularly if hazardous chemicals were involved. The eBook uses real-world examples relevant to workplaces operating in Australia, New Zealand, and Southeast Asia and details each step in the HAZCHEM investigation process.

There are nine clear steps:

1. Securing the incident scene — taking additional precautions when hazardous chemicals have been involved.
2. Ensuring affected workers and key witnesses complete incident reports (even for near-misses and close calls).
3. Preserving, gathering, testing, and storing physical evidence.
4. **Interviewing witnesses** and recording their testimony.
5. Sourcing and reviewing documents from the workplace as well as industry authorities.
6. Collating and evaluating all the data to determine the sequence of events that occurred immediately prior to the incident.
7. Establishing root causes by identifying everywhere a failure in the system occurred.
8. Determining corrective actions to address system failures and issues of non-compliance.
9. Preparing an actionable report and submitting to senior management.

Use our eBook now to review and refine your own HAZCHEM incident investigation process.

1. Securing the scene

Your initial priority after a workplace incident is securing the scene and making sure that everyone is safe and accounted for. When hazardous chemicals are involved you may also have to manage a range of chemical hazards including spilled fuel and liquid chemicals, flammable vapours, toxic fumes, dusts, smoke, or corrosive gas clouds. The release of compressed gases and other chemicals into a confined space can also create asphyxiation hazards.

REAL WORLD EXAMPLE

A worker was measuring the inside of a railcar after it had been cleaned. Realising something was wrong the worker climbed to the top of a ladder inside the railcar and reached to their co-worker for assistance. Unable to get a solid grip, the worker fell back into the railcar. The second worker then entered the railcar to help their workmate, but was immediately overcome by the hazardous atmosphere. Both workers died.

It is critically important that securing the scene doesn't lead to further injuries.

Before you can begin your investigation you need to ensure each of these steps is addressed:

1.

Ensuring safety at the scene

Ensure the scene is safe for emergency responders and medical practitioners to treat or evacuate injured workers. There are so many tragic instances of first responders becoming seriously injured or dying because they failed to recognise a chemical hazard (see example above). As much as you want to get going with your investigation, don't risk the safety of yourself or other members of the investigation team if a flammable atmosphere or an asphyxiation hazard exists.

2.

Isolating chemical hazards

If any chemical hazards exist, they must be isolated and cleaned up as soon as possible. You might need to fit the response team with emergency PPE and brief them on the nature of the chemicals present in the area.

3.

Notifying important people

Once the scene of the incident is secured you will have a number of important people to notify. Families and emergency contacts of injured or deceased workers will need to be contacted, and (in the case of a notifiable incident) the Regulator in your state or territory. If chemicals could be released onto neighbouring properties, or into drains and waterways you may need to warn affected landowners, Councils and the EPA.

4.

Protecting critical evidence

As soon as you are given clearance to access the scene you'll want to protect important evidence. This includes preserving the settings on machinery, placement of tools and equipment, condition of PPE and protective clothing.

5.

Restricting site access

To protect the integrity of evidence at the scene (as well as ensure full respect for any victims) you'll want to restrict access to the worksite. This may include family members, media representatives and the general public. If there are ongoing chemical hazards these restrictions will also protect bystanders from harm.

IMPORTANT: Make sure you have permission from government agencies before starting your incident investigation. In some circumstances Regulators or police may need to conduct their own investigations before anyone is allowed to access the scene.

2. Obtaining incident reports

Once the scene is secured and you are authorised to move about and talk with witnesses, you'll want everyone involved to complete an incident report. This includes injured workers, witnesses, and anyone else involved in the event – delivery drivers, customers, supplier reps, site visitors, maintenance contractors etc. You should already have in place an official procedure (including an Incident Report Form) for recording the details.

We suggest the following as a minimum:

- Date, time, and location of the incident.
- Description of what happened (who, what, how, why, where)
- Outline of the tasks or procedures being completed immediately before, and during the incident (including the machinery and tools being used).
- Names of people involved as well as any bystanders who witnessed the incident.
- Where everyone (including witness) was located during the incident and what they were doing.
- Details of chemicals, substances and other materials being used.
- Details of injuries, first aid treatment and medical care.

Incident reports are a critical part of your investigation and will help you determine who needs to be interviewed as well as provide an official account of notifiable incidents or for insurance/workers compensation purposes.

***REMEMBER:** Incident reports often uncover people like customers or delivery drivers who were present at the time and didn't initially come forward to provide an account of what they saw.*

3. Gathering physical evidence

You should start gathering physical evidence as soon as possible after the incident. Physical evidence is extremely vulnerable as it can quickly deteriorate, be deliberately altered, or even erased. Sometimes unintentionally.

The evidence you need may not appear important to a worker or the company cleaners, so part of securing the scene (which we spoke about in Section 1) is isolating the area and making sure nothing is touched, moved, or thrown away. **Most especially:**

- Leaving machine settings as they were at the time of the incident.
- Keeping damaged, soiled, or burned uniforms and PPE.
- Not immediately clearing away spilled chemicals and debris from broken containers and receptacles.

Begin by holistically appraising the incident site before moving into specific location points. Write down your observations, draw sketches, and take photographs or video from different angles. Make notes to support each photograph or piece of evidence, ensuring that all the items are properly identified, labeled, and catalogued.

IMPORTANT: One of your first questions when arriving at the incident site will be whether anyone removed items, disturbed, or altered the scene in any way.

Suggested Evidence List

EVIDENCE TYPE	CONTRIBUTION TO INCIDENT	CORRECTIVE ACTIONS
Machinery tools and equipment	- What machines and tools were in use during the incident? - Were safety guards in place? - Were there any makeshift tools or implements? - Were machines within test dates and property tagged? - Were power tools connected to a safe power source?	Note the settings of tools and machinery. Tag and test dates.
PPE, uniforms, and personal effects	- What was the worker wearing at the time of the incident? - Were they using PPE? - Was the PPE appropriate for the task? - What condition was the clothing/PPE ie, holes, tears, burns etc? - Did it fail in anyway? - Was the safety shower used properly?	Record/photograph state condition of clothing/PPE. Note any chemical burns, holes, tears, shattering etc.
Substances	- What hazardous substances were present at the incident scene? - What containers were they stored in? - Were the containers or storage cabinets appropriate for the hazard class? - Were they labelled correctly? - Were any substances past their expiry date? - Were there any unknown substances?	Record the condition of chemical containers, safety cabinets, decanting stations. Take samples of chemical spills, residue, dust, and other substances.

EVIDENCE TYPE	CONTRIBUTION TO INCIDENT	CORRECTIVE ACTIONS
Pieces of broken tools, containers and debris.	• Did any tools or equipment break or shatter? • Did a chemical container break or crack? • Did componentry fall from a machine?	Preserve items like damaged hand tools, defective electrical equipment, bolts, bits, fragments, debris, broken containers.
Site conditions	• What was happening onsite at the time of the incident? • Was there a blackout or power interruption? • Was it noisier than normal? • Were there additional delivery vehicles or site visitors? • How was the weather that day? eg, raining, very windy, 40+ degree heat, snowing.	Record the overall conditions of the job site at the time of the incident.
Time of day	• What time of day did the incident occur? • What factors were occurring at the time? eg, blinding afternoon sun, breaking dawn, during shift change.	Record anything that could have contributed to the incident.
Housekeeping	• Was the area clean/tidy and in accordance with standard housekeeping practices? • What obstacles or vehicles were in the work zone. • Were signs and warning placards in place? • Were workbenches clear or piled up with loose tools, chemicals, and sundry items?	Photograph and record the overall state of work areas, taking note if signs or labels were missing.

EVIDENCE TYPE	CONTRIBUTION TO INCIDENT	CORRECTIVE ACTIONS
CCTV and video footage	- Was the incident captured on CCTV, dash cam, or a personal mobile? - Does the footage support individual testimony? - Are there new witnesses that have not yet come forward? - Can the incident be viewed from different angles?	Ensure files are copied and secured, remembering that CCTV footage at some organisations has a limited lifespan.

After you've created notes, photos and video records, items of evidence can be removed for testing and closer examination. This may require sending samples away to industry experts like chemists or machine manufacturers.

REMEMBER: When gathering evidence you may be walking over a scene where workmates and colleagues have been seriously injured or died. Be respectful when photographing the positions of people, and when viewing CCTV footage.

4. Interviewing witnesses

Interviewing witnesses can be the most challenging part of an incident investigation. Incidents involving hazardous chemicals often involve fires, explosions that cause debilitating injuries, property damage, and sometimes fatalities. Witnesses could be suffering PTSD (post-traumatic stress disorder) or other emotional stresses; they are often very afraid to open up about the incident.

Arranging an interview

As far as possible, interview witnesses as soon as you can while the incident is still fresh in their minds. Arrange to interview each person separately reducing contact between witnesses while the interviews are taking place. You might bring workers in for interviews on their days off and not all at the same time.

Take your time to read the incident report completed by the witness before the interview and plan the questions you'll be asking. You might take into consideration if any of the account they wrote on the form differs from other workers or from the physical evidence you have gathered.

***REMEMBER:** There might be times when workers attempt to deliberately corroborate a story, but often when there are gaps in a person's understanding of an incident their memories may be influenced by someone else's version of events. Particularly if that person is their immediate supervisor.*

Conducting the interview

Interviewers need excellent interpersonal skills as well as empathy and compassion. Begin the interview by putting the witness at ease, explaining that their testimony will be used to determine the cause of the incident and hopefully assist in the implementation of more effective safety measures.

Before you start your questions you should introduce the witness to the interview panel and anyone else present in the room (eg, administrative staff who are documenting the proceedings). Explain the confidentiality requirements of the interview and remind them of their legal responsibility to give accurate testimony.

Questioning witnesses

Frame your enquiry around the incident reports (which you should have read earlier) and use questions that encourage detailed responses. And always avoid using narrow questions that can be answered with a single 'yes' or 'no' response.

FOR EXAMPLE, DO NOT USE A NARROW QUESTION LIKE:

Did you see your co-worker carry out their pre-operational safety checks before mixing the acid?

A better question would be...

What pre-operational safety checks did your co-worker carry out before using the acid?

Every time you ask a question, give your witness time to think and answer the question in full. Listen carefully, allowing plenty of silence (which can trigger the witness to add more details). Collectively your questions to the witnesses should be verifying facts to help you understand:

- What systems of work were being carried out at the time of the incident and whether the system was suitable for the task.
- What instructions or training had been given to the workers involved.
- If there was any variation from instructions or standard work practices. And if so, the reasons for the variation.
- Overall conditions at workplace at the time of the incident (eg, lighting, floor surfaces, stair treads and handrails, warning signs, temperature and weather).
- Precise location of the incident
- What chemicals or materials were in use or being handled.
- If any type of transport, machinery or equipment was in use.
- Whether adequate supervision was provided.

At the end of the interview you can ask the witness for their opinion on what may have caused the incident. Your role at this time is to record individual responses and establish facts — not jump to conclusions. Always remain impartial during an interview.

5. Reviewing documentation

An important part of your investigation is to consider other sources of information which may help you understand what happened.

And by this we don't mean to unnecessarily bog down the investigation in red tape, but consider documents which actively:

- Support witness testimony (eg, contractors claim to have received no supervision, timesheets indicate supervisors were on a break at the time of the incident).
- Contradict, or highlight unsupported testimony (eg, Site Supervisor claims to have given safety instructions to a group of contractors, but there are no training records to support this).
- Identifies issues of non-compliance (eg, cylinders left unrestrained without safety caps; this does not comply with Australian Standard AS4332-2004 - The storage and handling of gases in cylinders).

Let's consider the example below and the type of documents you might review during your investigation.

REAL WORLD EXAMPLE

More than 80 cylinders of argonite were standing in a storeroom at a construction site — the cylinders were waiting to be fitted to the fire protection system. None of the cylinders had safety caps in place, and they were not restrained in anyway. There were no warning signs on the outside of the storeroom. Somehow one of the cylinders fell over and the neck was shorn off.

The force of the compressed gas suddenly being released from the cylinder launched it into the air like a torpedo. This set off a chain reaction, and 66 other cylinders were also knocked over, broken, and launched into the air. Just as this was happening 7 contractors enter the storeroom.

All of them are seriously injured and 1 workers died at the scene from horrific injuries. At the same time there was significant property damage. Each of the 66 cylinders were 2 metres high, weighed more than 140kg, and were flying at speeds of more than 170 miles per hour.

Incident Investigation — documentation review summary

DOCUMENT	CONSIDERATIONS	EXAMPLE
Safety Data Sheets (SDSs)	Were chemicals correctly labeled? Were they being used or stored according to their hazard class and physical properties?	No warning signs on the outside of the storeroom. Asphyxiant hazard kept in a confined space without proper ventilation.
Equipment manuals	Was machinery being operated within the manufacturers guidelines?	N/A
Maintenance	Had routine maintenance been carried out? Were lockdowns in place?	N/A
Company policies and procedures	Were workers following safe work procedures and other company policies?	There were no safe procedures or policies in place.
Site inspections and audit reports	Had hazards and contributing factors been noticed on a previous shift?	Nothing had been carried out.
Training records	Had workers received sufficient site inductions, job specific training and follow ups?	Absence of records. Contractors claimed they had not received site inductions or any training.
Rosters and timesheets	Did workers have enough supervision? Had workers received sufficient rest breaks? Were there enough workers on shift to complete the tasks safely?	Timesheets indicate site supervisor was on a break when the contractors arrived.

DOCUMENT	CONSIDERATIONS	EXAMPLE
Sick leave records	Could any of the workers involved in the incident been in an impaired state due to stress, illness, medication, or previous injury?	N/A
Incident reports	Had similar incidents or near-misses occurred previously?	Absence of incident reports.
Risk Assessment Reports and Audits	Had chemicals hazards been identified? What control measures were in place? Had corrective actions been recommended and implemented?	Nothing carried out.
Australian Safety Standards, WHS Regulations and other legislation	Were hazardous chemicals being used, stored, and handled according to Australian Safety Standards?	Cylinders should have been individually restrained, and stored with safety caps in place.

REMEMBER: Sometimes the fact that a document, training record, policy, or safe working procedure does not exist is a hazard in itself.

6. Evaluating data

By now you will have gathered a range of physical evidence, testimony, and documents from various sources. The next stage of your investigation is about bringing all that data together and structuring the chain of events (incident sequence) that preceded what happened.

Your list of data should look something like this:

- Physical evidence gathered at the scene of the incident: apart from physical items, you will have sketches and drawings, handwritten notes, photographs, and video footage which documents all aspects of the scene.
- Eye witness accounts from the people involved: this will include completed incident report forms, transcripts from interviews, signed witness statements, and possibly video records of the interviews.
- Footage from video surveillance: you should have accessible copies from CCTV, dash cam, personal mobiles. You may have extracted fragments of key footage eg, 3 minutes of the actual event taken from 3 hours of recordings.
- Results of scientific tests: any samples you sent for testing like drug and blood alcohol tests, chemical concentration levels, machine integrity tests.
- Key documents that add meaning to testimony and physical evidence: all the policies, procedures, training records that we listed in Section 5.

Framing the incident sequence

As you work through the data, we recommend starting from the moment the incident occurred and then work your way back, listing every item in the order it happened. This exercise will highlight any gaps in your understanding, as well as evidence and testimony which don't support each other. Let's use the following example to demonstrate.

REAL WORLD EXAMPLE

A worker was cleaning the walls of a service pit with a flammable solvent cleaner. The solvent vapours ignited, causing a flash fire in the service pit which totally engulfed the worker. The worker died.

Imagine now you want to create an incident sequence based on the data you already have. Working your way back from the time the incident occurred, your incident sequence might look something like this.

PLEASE NOTE: This incident did happen in the USA, but the event sequence is a fictional account we've created to demonstrate a process. This is not intended to undermine the memory of the worker who died in this incident or the integrity of any of their colleagues.

DRAFT Incident Sequence

- Fire is extinguished but WORKER A is already deceased.
- WORKER B hears shouts and runs back to the service pit.
- WORKER A is engulfed in flames inside the service pit.
- Solvent vapours ignite and create a huge wall of flames.
- Heat from delivery vehicle ignites the vapours.
- WORKER C enters the area in a delivery vehicle without realising WORKER A is in the service pit. WORKER C claims to have not seen the signage.
- WORKER B leaves the area unattended and is gone approximately 2 minutes.
- WORKER B is feeling unwell and needs to use the toilet, he advises WORKER A he will return in 2-3 minutes.
- WORKER B stands watch while WORKER A begins cleaning.
- WORKER B prepares the external perimeter with signage.
- WORKER A gathers cleaning chemicals and puts on breathing apparatus, gloves and other protective clothing.
- WORKER A and WORKER B are directed to clean out the service pit by their supervisor.
- The site is in maintenance lock-down and have 4 staff and one supervisor are onsite.

Once you have an initial draft incident sequence you can look for gaps or contradictory items. It is not uncommon to carry out follow-up interviews with witnesses, or to verify data integrity. From the example above you might want to see if you can find other evidence which supports WORKER B's claim of only being gone 2 minutes. Eg, did CCTV indicate they were actually gone 7 minutes.

You might also get WORKER B to recreate the scene by placing signs and equipment exactly where they were purported to be at the time. You might use another worker or a mannequin to act as WORKER A in the pit. After setting up the scene you might drive the delivery vehicle exactly as WORKER C had on the day and check if the signage and WORKER A were indeed visible to the driver. Maybe you also need to check why WORKER C was driving the delivery vehicle at all.

At the same time you might then review the operating procedures and match these against the testimony of the supervisor who gave the original instructions. It is very common for witnesses to be re-interviewed, documents double-checked and fragments of CCTV footage reviewed by a panel to corroborate evidence. You'll keep doing this until you have a complete incident sequence.

7. Establishing root causes

Your completed incident sequence will become the foundation of a causal analysis — meaning you'll be looking for system failures that may have contributed to the incident

Here at **STOREMASTA** we recommend **applying a causation model** to this process because it presents an established framework and working methodology.

To demonstrate the process, we're going to use a simple model that groups causal factors into five areas:

1.

Task

The task group looks at the work procedures being conducted at the time of the incident, then assesses their application and suitability.

2.

Material

The materials group considers the materials, equipment and substances being used during (or immediately preceding) the incident.

3.

Environment

This group evaluates environmental considerations, like the weather, time or day, or the state of housekeeping.

4.

Personnel

The personnel group considers the people involved, their level of training and experience, as well as their fitness/health, and if they were distracted.

5.

Management

Finally consider if management provided enough supervision, if risk assessments had been carried out, and if safe working procedures were implemented and enforced.

One of the key benefits of using a causation model (even this simple one) is that it helps you recognise that incidents rarely have a single isolated cause. Use the model and you can find contributing factors in just about every area. Let's again consider the example of the worker who died from the flash fire in the service pit.

Establishing root causes of a workplace incident

CAUSATION GROUP	DETAILS
TASK	There were three tasks which contributed to this incident: 1. Preparing and isolating the area. 2. The cleaning of the pit itself. 3. The entry of the delivery vehicle The focus here is the task itself, and each should be evaluated to the suitability for the location and environmental conditions and how many times it had been carried out previously.
MATERIAL	There would be four different considerations in this grouping. 1. Signage and isolation equipment setup by WORKER B. 2. PPE being worn and used by WORKER A. 3. Cleaning solvent and any other chemicals at the scene. 4. Vehicle being driven by WORKER C. In this group you might review and test the suitability and effectiveness of the signage and isolation equipment.
ENVIRONMENT	The main ENVIRONMENTAL consideration would be that the site was in maintenance lockdown. WORKER A & B may have considered it almost impossible that another person would enter the service pit area on lock-down day.
PERSONNEL	In this group consider every person involved and how they may have contributed. 1. WORKER A - doing the cleaning 2. WORKER B - preparing the area, standing watch and being physically unwell. 3. WORKER C - driving the vehicle into the area 4. SUPERVISOR - giving the directions From this angle you consider whether each worker was following procedures, whether they were distracted/stressed, or suffering a medical condition that could have impacted their performance.

CAUSATION GROUP	DETAILS
MANAGEMENT	There are four areas of consideration in the MANAGEMENT group. 1. The level of supervision provided to the workers. 2. The amount of training each worker had received. 3. What standard operating procedures were in place and whether they were properly enforced. 4. Any risk assessments had been conducted previously. You'll look now from a management angle, determining the way operating were developed, delivered, and enforced.

Using this causation model you can see you actually assess the same element from a number of different angles. Your review here might identify a number of system failures including:

- WORKER A and WORKER B commencing work without following a full isolation and signage procedure.
- WORKER B leaving WORKER A alone in the pit.
- Insufficient supervision because site was in lock-down mode.
- WORKER B being sick and allowed to commence their shift instead of being sent home.
- WORKER C entering the area in their vehicle without authorisation.

8. Developing corrective actions

Now you know why the incident happened, the final stages of the investigation will be to determine what corrective actions you need to take to prevent future incidents. At the same time you may need to address issues of non-compliance.

You will probably find it more effective to have your entire investigation team review each causal factor and discuss suitable corrective actions. Even the largest organisation still has limited scope to implement corrective actions and control measures, so your key considerations during exercise will be:

- The legislation and Safety Standards which impact the organisation. (Eg, mandatory signage)
- Operational needs of the organisation (including limitations). (Eg, regional job sites in operating in remote areas)
- Available resources and budget (Eg, available workforce as well as cash flow)
- What can be reasonably accomplished (Eg, how many projects can be run simultaneously?)

REMEMBER: *The considerations above are to help you determine the best course of action, but are never an excuse for inaction.*

When determining your corrective actions you can continue to group your recommendations using your causation model. Let's return to our earlier example and focus on corrective actions to address WORKER A and WORKER B commencing work without following a full isolation and signage procedure.

Here are some possibilities.

CAUSAL GROUPING	CONSIDERATIONS	CORRECTIVE ACTION
TASK	Corrective actions to address issues in the TASK group will focus on changing operating procedures and work methods.	Introduce a roping procedure which ensures the service pit area is roped off during maintenance.
MATERIAL	Corrective actions in the MATERIAL group focus on repairing or replacing machinery, tools, and equipment. Or using different chemicals.	Provide larger signs, witches hats, and high-vis chain/ropes which physically surround the entrance to the service pit area.

CAUSAL GROUPING	CONSIDERATIONS	CORRECTIVE ACTION
ENVIRONMENT	ENVIRONMENTAL corrective actions can change physical conditions (eg, introducing a ventilation system) or even psychological and stressful conditions (eg, lowering production schedules).	Look into ways to change the workplace culture of 'nobody's around on lockout days' so we don't need to follow normal procedures.
PERSONNEL	Actions in the PERSONNEL group are likely to be staff training, counselling, increased supervision, and area reassignment.	Provide refresher training to all onsite staff about entering the service pit area.
MANAGEMENT	Corrective actions to address issues in the MANAGEMENT group focus on improving supervisory skills, conducting risk assessment, and reviewing operational procedures.	Increase the number of supervisors working on maintenance days.

REMEMBER: The priority (and practicality) of corrective actions will always be determined by legislation, the business needs of the organisation, as well as your budget.

9. Documenting the findings

The last step in the investigation is to prepare an actionable report to submit to Senior Management; these are the people capable of enacting change by introducing control measures. The purpose of your report is to provide an accurate description of the incident and enable the decision makers in your organisation to clearly understand why it happened and what they need to do to immediately address the compliance and safety issues at the job site.

This is one way you could set out your report:

Section 1 - description of incident

Begin your report with a description of what happened. Your description only needs to be a few paragraphs, and we always recommend using headings, bullet points, and tables as this makes it easier to read.

Outline the facts only and use job titles rather than a person's name.

FOR EXAMPLE

The Site Supervisor ordered the entire job site in maintenance lockdown, only three workers were rostered for the day. They were Warehouse Supervisor, and two members of the Maintenance Crew.

Section 2 - root causes

In this section you will list each of the root causes you have identified and detail how they contributed to the incident. For example (from the example earlier):

- **WORKER B leaving WORKER A alone in the pit.** Both workers had carried out this routine task once per week for the last two years. The fact the site was in lockdown meant that no one should have been entering the area. In fact, this had never happened before and WORKER B had no way of knowing WORKER C was even on the job site. WORKER B was sick but had been asked to complete their shift and just stand watch while WORKER A carried out the cleaning. WORKER B needed to use the toilet suddenly etc.

Root causes should be described according to the facts, and outline the logic and reasoning behind your conclusions. They should be directed at collaborative system failures rather than at blaming individual people.

Section 3 - corrective actions

Section 3 outlines your recommendations for corrective actions. When outlining your recommendations, clearly link each action to a root cause, hazard, or compliance issue. Some root causes may have more than one corrective action.

ROOT CAUSE	CONTRIBUTION TO INCIDENT	CORRECTIVE ACTIONS
WORKER B leaving WORKER A alone in the pit.	When WORKER C brought the delivery vehicle into the cleaning area. WORKER C had no way of knowing WORKER A was in the service pit.	1. Implement minimum staffing levels on maintenance days. 2. Introduce a roping system which physically segregates the area with highly visible barriers. 3. Provide refresher training and follow up sessions.

SUGGESTION: You may want to add a fourth section to your report which has a detailed action plan to prioritise compliance issues and assign key dates as well as responsibility levels.

10. Next Steps

Having an established HAZCHEM incident investigation process can help you and your organisation take corrective actions and introduce chemical controls to prevent an incident from ever happening again. We hope our eBook has given some practical ways to review and refine the way you investigate incidents involving hazardous chemicals.

Chemical hazards are complex, and we encourage you to browse through our **Online Knowledge Centre** which contains a plethora of informative articles to help you manage, store, and use Hazardous Chemicals and Dangerous Goods Safely.

Feel free to contact our professional team at **STOREMASTA** if you require further assistance with the management and storage of your hazardous chemicals.

Visit our website **www.storemasta.com.au/contact-us** or phone us on **1300 134 223**.

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