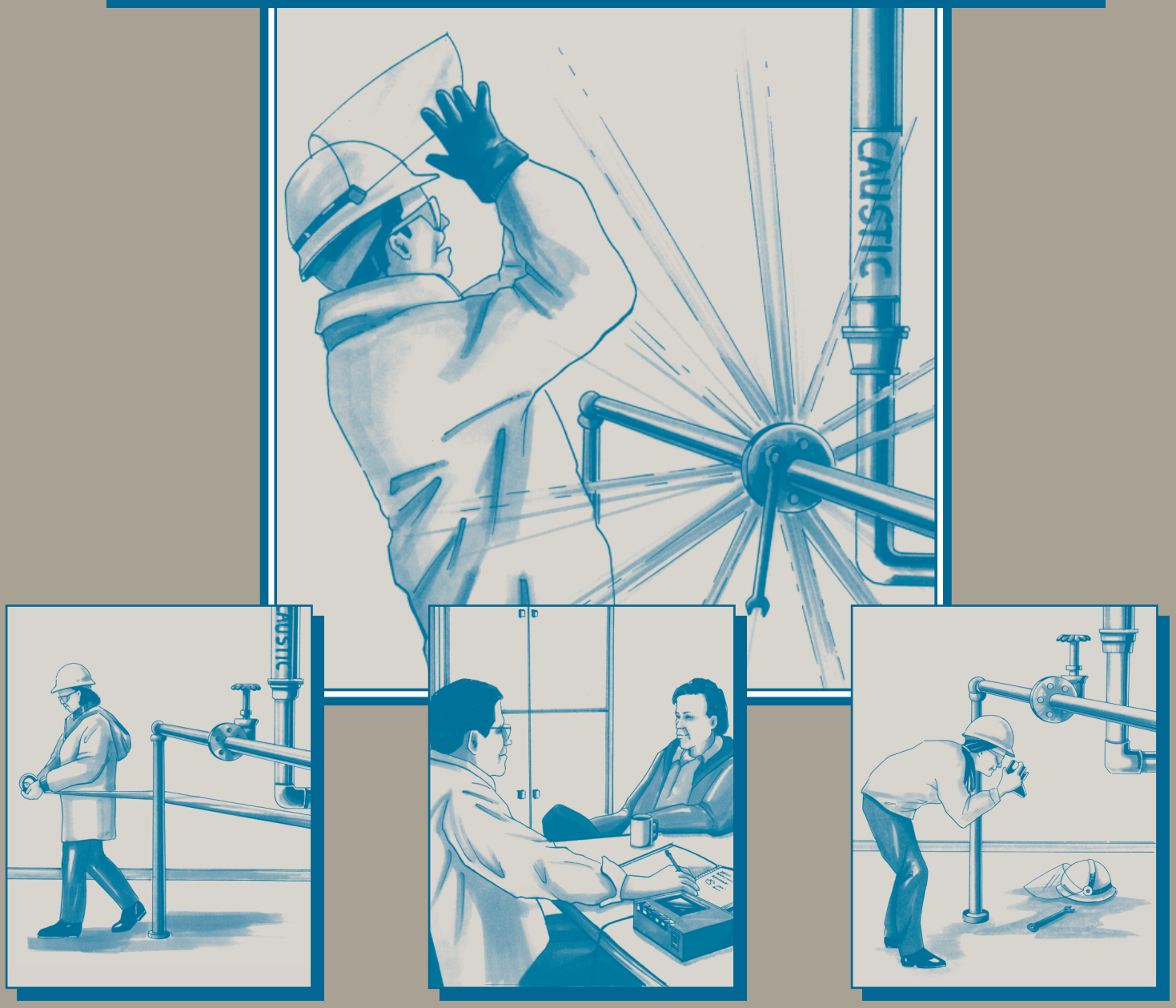
Incident Investigation



SUMMIT TRAINING SOURCE®, INC.

Facilitator Guide

Contents

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Overview

If an incident occurs at your facility, your team needs to be properly trained to conduct a thorough investigation into the causes of the incident and recommend corrective actions.

While there are many different philosophies concerning incidents and methodologies for investigating and analyzing them, the bottom line is to find out . . . WHO was involved, WHAT happened, WHERE it happened, WHEN it happened, HOW it happened, and WHY it happened.

It is the responsibility of a properly trained and knowledgeable investigation team to know the proper steps for conducting a productive incident investigation. This training program helps provide the skills and techniques for properly conducting a thorough investigation, including . . .

- ✔ **Taking Immediate Action**
  - -- Identifies steps to take immediately after an incident occurs.
- ✔ **Gathering Information**
  - -- Explains the three main sources of information
- ✔ **Interviewing**
  - -- Discusses skills and techniques for conducting effective interviews, including how to ask questions
- ✔ **Analyzing the Details**
  - -- Uses the *Accident Cause-Result Sequence* method to identify the factors that lead to an incident, including immediate and basic causes and system failures.
- ✔ **Recommending Corrective Actions.**
  - -- Explains the importance of recommending corrective action for every immediate cause, basic cause, and system failure identified.
  - -- Identifies information to be documented in the Incident Investigation Report

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Train the Trainer

Stress the purpose and goals of training.

Adults want training to solve a particular problem, to be practical, and to relate to everyday experiences. Adults are goal oriented. Because they want training to solve a particular problem, most adults are more concerned with learning specific topics that relate to them rather than broad or general subjects. State the purpose of training in a clear, specific manner -- whether it's to cut costs, increase production, improve quality, improve working conditions, etc. Review the goals and objectives of the training so adults know what is expected of them.

Organize training time efficiently.

In today's busy work climate, it can be difficult to find the time needed for training. Because of this, it is important that when you do schedule training sessions you are organized and well prepared to use your time efficiently. Whether you use Summit's suggested Lesson Plan or not, it is very important to have a game plan prepared that you can implement with relative ease. This ensures that time spent in training is productive and beneficial for everyone.

Capture their attention.

An adult's attention is often divided between family, work, friends, sports, and other people and activities. Training often needs to be interesting and compelling to compete with these outside interests. To help motivate learners, give them specific evidence that their effort makes a difference, and provide feedback on their progress. Also, remember that the first experience with a new subject usually forms a lasting impression on the learner. By making that experience a positive one, you can help ensure your audience retains the information learned.

Make new learning experiences pleasant.

For some adults, past experiences with education were unpleasant and not helpful. Adults learn best when they feel comfortable. By making the learning environment open and friendly, you can help adults to feel secure in their new learning experience. Also offer support and feedback as often as possible, and be ready to provide extra attention to those who may require it.

Answer questions.

When most adults learn new information that conflicts with what they already know, they are less likely to integrate those new ideas. It is very important to make sure participants fully understand the training and do not have any unresolved questions. Provide for a question and answer period so participants can resolve those questions and/or answer questions throughout the training session.

Room Setup

The key to any successful training program is to be well-organized and knowledgeable about your subject. These steps for ROOM SETUP are designed to help you prepare the training environment to get the best results for your training session.

Room and Supplies

- Will everyone be able to see the video from their seats? Try arranging the chairs in a half circle instead of in straight rows. Many education experts agree that the standard classroom setup with chairs arranged in rows and a lectern in front is least conducive to the learning environment.
- Is lighting adequate for reading the workbook? Poor lighting damages the eyes and can frustrate employees' efforts to participate.
- Is the temperature at a comfortable setting? A setting that is too cold or warm may cause participants to lose attention in the training session.
- Bring enough pens and pencils for all employees during the training session.
- Are all supplies and equipment in place and functioning properly (i.e., video player, monitor, blackboard, chalk, paper and pens/pencils, workbooks, etc.)

Video Equipment

- Make sure the monitor is hooked up properly to the video player. If you are using a television, is the TV on the right channel? It will operate on either channel 3 or 4, depending on the setting of your VCR.
- Adjust the color and volume to the right settings. Will everyone be able to hear the video from their seats?
- Do you have the correct format of videotape for the equipment you are using?
- Make sure the tape has been rewound.

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Lesson Plan

As a qualified trainer, your job is to effectively communicate a great deal of information in a well-organized manner. By preparing a lesson plan, you can ensure that each minute of the training session is productive. Summit has provided a suggested Lesson Plan for your use.

1. Introduce the topic and purpose of training

Research proves that audience retention is higher when programs are given a brief introduction before viewing them. Prepare an introduction which explains the reasons for training and what will be taught. Adult learning is very goal-oriented and adults learn best when they know the purpose of their training and what is expected of them. Sample introduction:

If an incident occurred at our facility, we must be prepared to conduct a thorough investigation to determine the causes of the incident and implement steps to prevent similar incidents from occurring. This video program will explain the skills and techniques for effectively conducting an investigation. After the video, we will discuss incident investigation for our facility.

2. Show the video: "Incident Investigation"

3. Discussion and Demonstration

The following topics are designed to increase participation in the training session and to help you relate the training to your facility. They can be used as discussion questions or as exercises to demonstrate skills learned.

- Provide a sample of an incident investigation report used at your facility and explain how to properly fill it out.
- Identify the specific steps for providing emergency response to any injured personnel at your facility.
- Identify / Explain what types of documentation may be useful information for an investigation at your facility. Provide samples of each type.

4. Use Handbooks to Reinforce Training

The handbooks increase comprehension and reinforce the information learned in the video program by explaining the main points and expanding on the original material. For increased employee retention, go over one section at a time and stop to answer questions. Each Employee Handbook includes a quiz at the back which can be used to test comprehension and document training. Answers to the quiz are provided on a separate page.

5. Questions and Answers

Frequently Asked Questions

What is the purpose of an Incident Investigation?

The purpose of an incident investigation is to identify the underlying causes of incidents and implement steps to prevent similar events from occurring. The objective is to systematically identify all contributing causes of an incident -- NOT to find fault, but to understand WHY.

What types of information should be gathered for an investigation?

The bottom line in an incident investigation is to find out WHO was involved, WHAT happened, WHERE it happened, WHEN it happened, HOW it happened, and WHY it happened.

There are three main sources of information about the incident: the scene of the incident; documentation related to personnel, equipment and the environment; and people. People include . . . anyone who witnessed events leading up to the incident . . . anyone involved in the incident . . . anyone who saw what happened . . . people who came on the scene immediately after the incident . . . and people who are knowledgeable about procedures or equipment related to the incident.

What information is included on an Incident Investigation report?

The report should provide a complete and accurate picture of WHAT happened, WHERE and HOW it happened, WHO was involved, WHEN it happened, and WHY it happened. It should also include the immediate and basic causes, system failures, and recommended corrective actions.

The report must be reviewed with all affected personnel whose job tasks are relevant to the investigation's findings. This includes contractors. Process safety incident reports must also be kept for at least five years.

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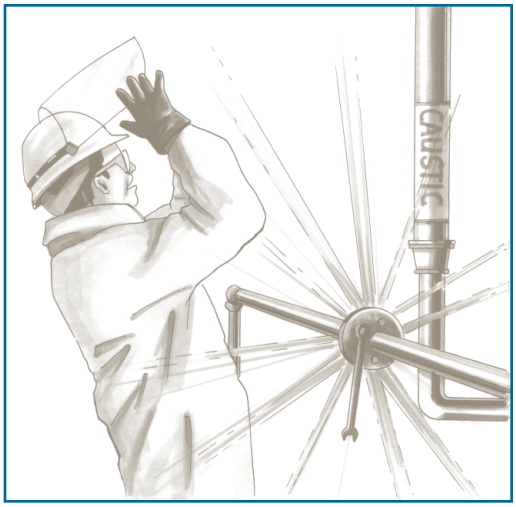
Employee Introduction

An incident is about to occur:

Steve and Mike need to perform maintenance on a pipe system. Steve forgot his lock, so only Mike's lock is used to lockout the system. As Mike is putting the last bolt on the flange, Steve leaves to re-energize the system. Mike is interrupted by a contractor who needs a question answered. Raising his face shield, Mike turns to the contractor and answers his question. As he turns back to finish the job, he notices the flange is on wrong. Mike unbolts the flange, and is sprayed with a hazardous substance.



WHY did this incident occur?

✔ Can you identify its immediate causes?

✔ Can you identify its basic causes?

✔ Can you prevent it from happening again?

As a member of an incident investigation team, it is your job to identify the true causes of incidents and determine what actions need to be taken to prevent similar incidents from occurring.

In this program, you will learn the skills and techniques to effectively conduct an incident investigation and properly identify the contributing causes of an incident through the following steps:

- **Taking Immediate Action** after an incident occurs
- **Gathering Information** about the incident
- Skills and Techniques for **Interviewing Witnesses**
- **Analyzing the Details**
- **Recommending Corrective Action.**

Incident Investigation Overview

If an incident occurs at your facility, it is important to know how to conduct a proper investigation.

What is an Incident Investigation?

Incident investigation is a systematic process of identifying the underlying causes of incidents and implementing steps to prevent similar events from occurring. A good investigation identifies both the immediate and basic factors of the accident, identifies corrective actions to prevent a similar incident from occurring, and recognizes problems in the management system and their solutions.

There are many different methods for investigating and analyzing incidents. No matter what method is used, the bottom line is to find out . . .

- **WHO was involved**
- **WHAT happened**
- **WHERE it happened**
- **WHEN it happened**
- **HOW it happened**
- **WHY it happened.**

What is the Objective?

The objective of an incident investigation is to systematically identify all contributing causes of an incident. Its purpose is NOT to find fault, but to identify and understand WHY.

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The Investigation Team

Incident investigation team members are selected on the basis of their training, knowledge and ability to contribute to the investigation.

One person should lead the investigation. This person is responsible for directing the team's efforts and utilizing the skills and knowledge of all employees and team members involved in the investigation.

If a contractor employee was involved, one person representing the contractor should also be on the team.

There are five basic elements of an effective investigation:

Take Immediate Action

Gather Information

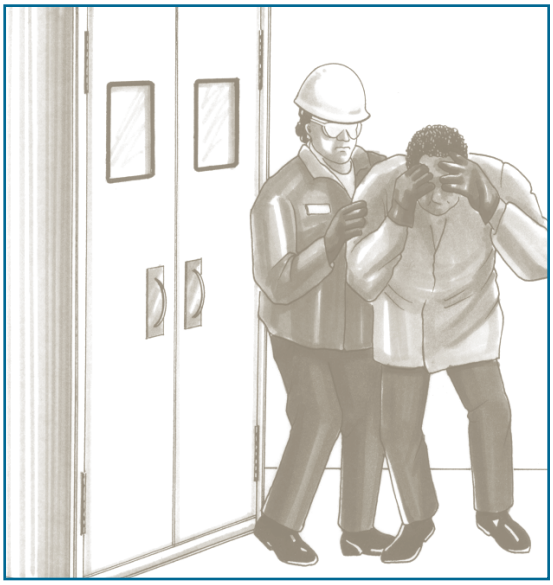
Conduct Interviews

Analyze Details

Recommend Corrective Actions.

Take Immediate Action

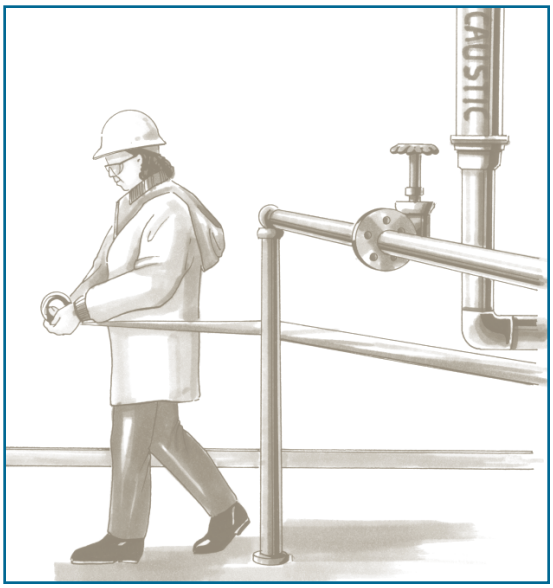
When an accident occurs at your facility, it is important to take immediate action. Your first priority is to provide assistance and emergency response to anyone injured.



You may also need to take steps to prevent further accidents, injuries or property damage from occurring. Depending on your training, this could vary from notifying the proper emergency response personnel to isolating electrical equipment or containing the release of hazardous chemicals.

Other actions that may then need to take place include . . .

- Secure, barricade or isolate the scene of the incident
- Collect any samples of evidence that may evaporate or deteriorate
- Assess the extent of damage
- Determine when operating functions can be safely restored.



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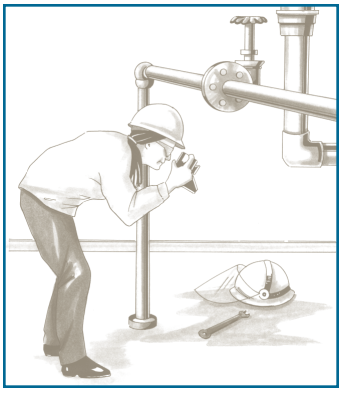
Gather Information

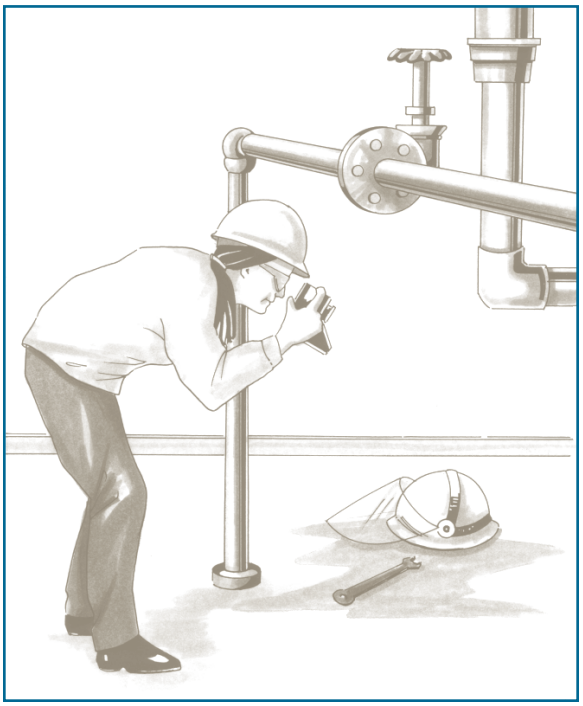
Fairness and impartiality are essential when gathering information. There are three primary sources of information about the incident:

- The scene of the incident
- Documentation related to personnel, equipment, and the environment
- People



The Scene of the Incident

The scene of the incident should be investigated before any physical evidence is disturbed and so it can be restored to safe operating functions as soon as possible.



- Collect samples of all substances in the area, such as chemicals, vapors, residues and dusts.

- Make a comprehensive record that visually documents the scene by videotaping, photographing, and even sketching the area. Include as much detail as possible. When videotaping or photographing the area, film from every angle possible. Include an object in the picture with known measurements that can be used as a future reference.

- If the mechanical integrity of a piece of equipment is suspected, it should be preserved at the scene or well-documented if it is analyzed, repaired or modified.

Gather Information
(continued)

Documentation

Records, logs and other forms of documentation can provide details such as. . .

- Who was trained and when
- Standard operating procedures
- Inspections and audits of equipment
- Procedures and environmental conditions
- Maintenance records
- Previous injury and illness logs.

Documentation can provide valuable insights to help determine why an incident occurred. It will NOT tell you what happened, but it can provide a previous history or expected procedures and results.

People

The third source of information, and probably the most informative about the incident, are people. This includes . . .

- Anyone who witnessed events leading up to the incident
- Anyone involved in the actual incident
- Anyone who saw what happened
- People who came on the scene immediately after the incident
- People who are knowledgeable about procedures or equipment related to the incident.

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Conduct Interviews

It is important that proper interviewing techniques be used to gather accurate information about the incident. People add a human element which can affect the results of the investigation if not handled properly.

When to Interview

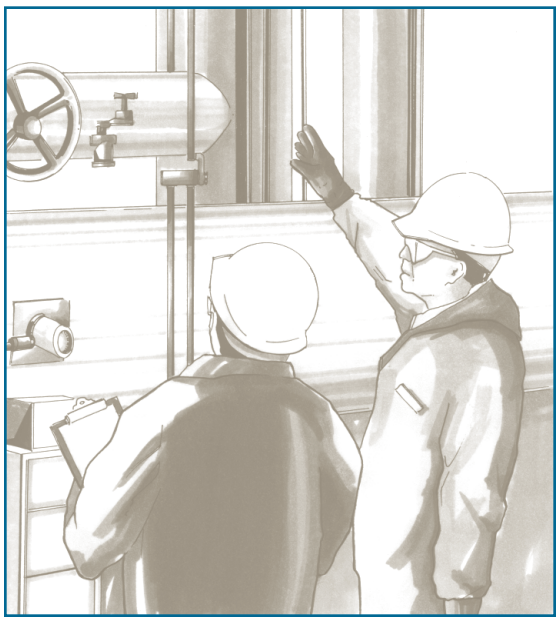
Interviews should be conducted as soon as possible after the incident. A person's recall of the incident is most accurate at this time. It also reduces the possibility of 1) the person subconsciously adjusting his or her story to protect a co-worker or provide what they think you want to hear, or 2) the person's statement being influenced by others.

Conduct Interviews as Soon as Possible

Before Interviewing

Before an interview, you should visit the scene of the accident and become familiar with the area. This helps you to better understand the witnesses' perspective.

Also, since an incident usually happens without warning, a witness may have only observed a few details or thought they saw something else; so it is important for the interviewer to be familiar with the scene of the incident.



Visit the Accident Scene Before Conducting Interviews

Conduct Interviews
(continued)

Conducting the Interview

Interviews should be conducted one at a time. The area where a witness is interviewed should be informal and private. This helps the witness to be comfortable with the surroundings and not intimidated. Take steps to minimize disruptions such as the phone ringing or someone entering the room.

State Your Purpose and Objectives

State the purpose of the interview and your objectives. The video provided a good example of this type of statement.

Interviewer:

"Steve, I really want to thank you for coming in to answer these questions. Our objective here is to get the facts of the situation -- to find out what happened that day so we can prevent it from happening again. Also, I want to make sure you understand that we're not trying to pin down any blame here. Okay?"

Recording the Interview

Let the witness know if you will be recording the interview with an audio recorder or video camera.

Make sure the device can be easily turned on so that you do not have to deal with it for the rest of the interview. Otherwise, it can be distracting.

Asking Questions

The key to interviewing is asking questions that allow a person to explain what he or she saw or knows about the incident. What you ask and how you ask it can influence the information you receive. Your questions should be neutral and focus on getting the facts from the witness, NOT his or her conclusions. The following are two examples of neutral questions that ask only for the facts:

Interviewer:

"What did you see that day?" or . . . *"What were you doing when the incident occurred?"*

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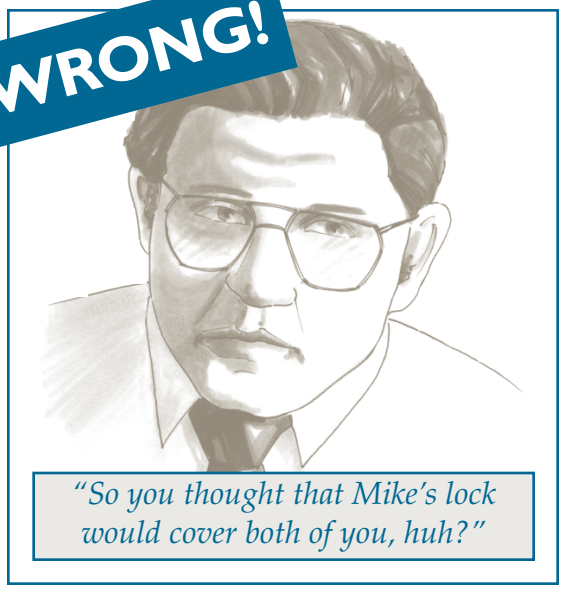
Other points to remember include . . .

- Avoid asking questions with YES or NO answers. Ask questions that will require a witness to provide specific details.
- Let the witness answer each question completely. If he or she mentions a detail you want to explore further, make a note to discuss it later. This allows the person to completely answer your question without being interrupted.
- Let the person continue at his or her own pace.
- Allow for periods of silence.
- Your tone, manner and body language can influence the interview as much as the questions you ask. Always maintain a calm and professional manner throughout the interview.

Tone, manner and body language can influence the interview.

- Avoid postures or mannerisms that could distract the person, or make them nervous or uncomfortable.
- Do not phrase questions in a manner that leads the witness or biases the answers.



Conduct Interviews
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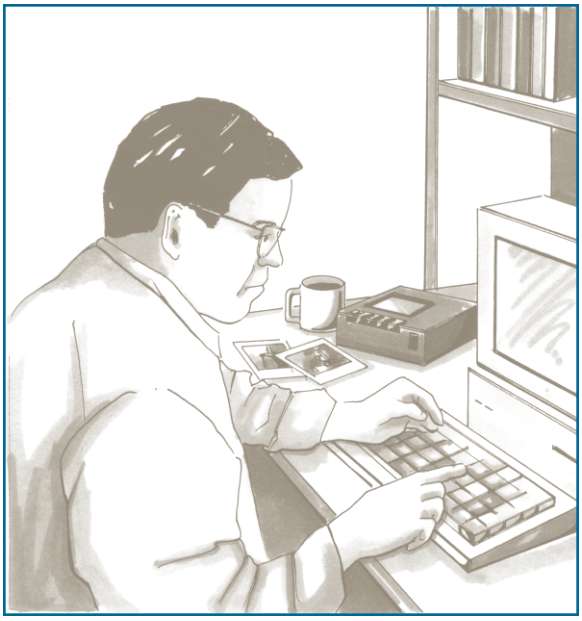
After Conducting Interviews

After conducting interviews, compare the information you have gathered. Make a note of any statements or evidence that disagree. Try to resolve any inconsistencies. If possible, validate the information from witnesses with your other sources of information.



Carefully document the sources of your information. Make sure you have gathered as much information as possible.

The quality and effectiveness of your analysis and recommendations will strongly be determined by the accuracy and thoroughness of the facts you have obtained.

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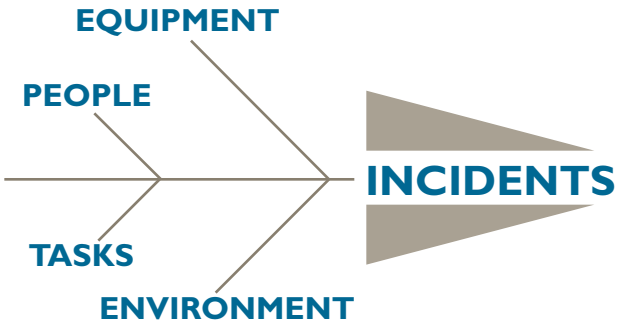
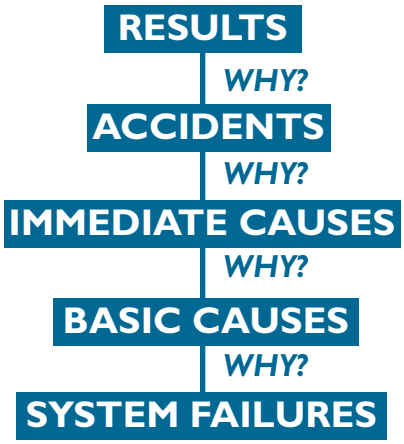
Analyze the Details

There are many different methods to analyze the information you have gathered. No matter what methodology you use, you will basically be analyzing the relationship between people, equipment, the environment and tasks performed. With any method, you first need to define the incident and then establish the events that led to it.



Accident Cause-Result Sequence Guide

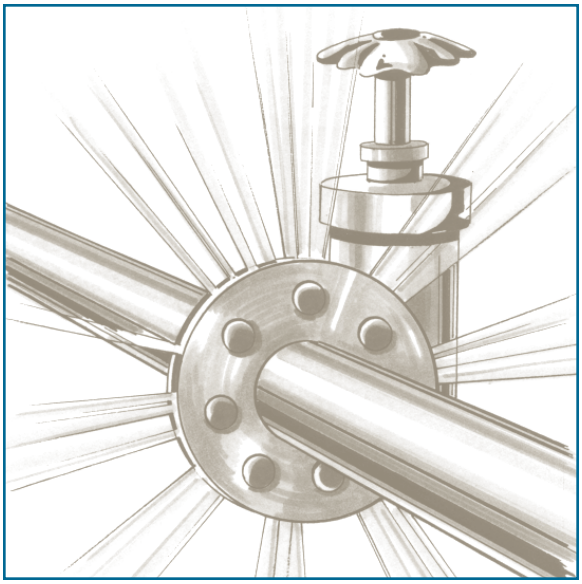


One way to systematically identify the factors that create an incident is the *Accident Cause-Result Sequence.* By continually answering the question "WHY" through each step of the process, you determine not only the immediate and basic causes of an incident, but the system failures that allowed the incident to occur, as well.

RESULTS

The first step of the *Accident Cause-Result Sequence* identifies the results of the incident. This includes the degrees of injuries, illnesses, and property damage -- or their potential.

Identifying WHY the results of the incident occurred leads us to the second step.



Analyze the Details
(continued)

ACCIDENTS

This step requires you to list the accident type from a list of 14 basic accident types. They are . . .

14 Basic Accident Types

1. Caught Between Machinery
2. Caught Between Objects
3. Contact with Caustics, Toxins, Pathogens, Radiation
4. Contact with Electrical Current
5. Contact with Temperature Extremes
6. Fall from Elevation
7. Fall from Same Level
8. Forklift or Plant Vehicle Incident
9. Overexertion
10. Repetitive Motion
11. Struck Against Object
12. Struck by Object
13. Vehicle Accident
14. Other: Explain

Continue answering the question "WHY . . . ?" For example, why was there contact with a caustic or toxic substance?

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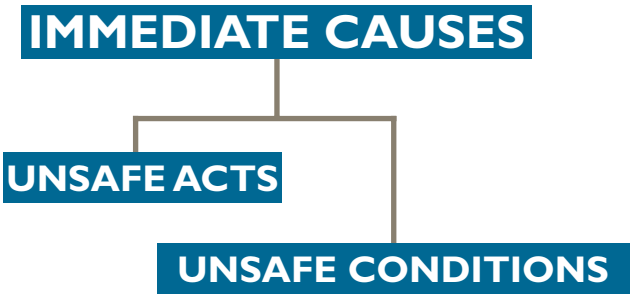
IMMEDIATE CAUSES

The third step involves determining the immediate causes of the incident. This is done by asking the question "WHY." For instance, using our sample incident from the video, we would ask: "WHY was the hazardous substance released?"



Immediate causes are the factors that were directly involved in the occurrence of the incident. They are divided into unsafe acts and unsafe conditions. It is not uncommon to have more than one unsafe act or unsafe condition, or a combination of the two.

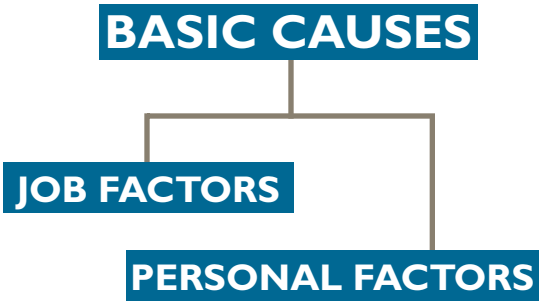
Failure to properly lockout an energy source is an example of an unsafe act.

BASIC CAUSES

After the immediate causes are established, you need to determine WHY the unsafe acts and/or conditions were allowed to exist.

Determining the basic causes provides you with the reason(s) why an unsafe condition was created, or why it was not prevented or eliminated. Basic causes also identify factors that caused a person to act in an undesirable manner or to fail to act in a desired manner.

Analyze the Details
(continued)



Basic causes are divided into two groups: personal factors and job factors.

Examples of personal factors could include lack of knowledge or skill, trying to avoid a task, or trying to save time or effort.

Examples of job factors could include no adequate work procedure, improper workstation design, a job that is repetitive in nature, or inadequate maintenance.

SYSTEM FAILURES

System failures identifies WHY the basic causes occurred. If every incident is preventable, it is management's responsibility to facilitate a work environment that prevents or eliminates immediate and basic causes.

Examples of system failures include an inadequate management program, inadequate standards and procedures or knowledge of them, or inadequate enforcement of the program.

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Recommend Corrective Actions

After determining why an incident occurred, you will need to recommend corrective actions. There should be at least one recommended corrective action for every item identified in the immediate causes, basic causes, and system failures. For example, using the incident that occurred in the video, the chart below identifies the findings and recommended corrective actions.

PROBLEM	RECOMMENDED CORRECTIVE ACTIONS
IMMEDIATE CAUSES: Unsafe act due to failure to follow proper lockout procedures.	Counsel injured employee Re-instruct appropriate personnel on proper safe work practices
BASIC CAUSES: Trying to save time.	Increase employee awareness of procedure Remove motivation for taking shortcuts
SYSTEM FAILURES: Lack of enforcement of standards and procedures	Increase supervisor monitoring of safe job performance Review accountability for safety with supervisor and department manager

Make sure you list all possible corrective actions for the immediate and basic causes and the system failures. If you do not list a possible solution because it seems costly or unfeasible, there will be no opportunity presented to management to make a decision.

Incident Investigation Report

After the investigation is finished, it should be documented and presented in a formalized report. The report should provide a complete and accurate picture of WHAT happened, WHERE and HOW it happened, WHO was involved, WHEN it happened, and most importantly, WHY it happened. It should also include the immediate and basic causes, system failures, and recommended corrective actions.

The report must be reviewed with all affected personnel whose job tasks are relevant to the investigation's findings. This includes contractors, if applicable. Process safety incident reports must also be kept for at least five years.

Notes

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NAME _____
I.D. # _____
DATE _____

Incident Investigation Quiz

1. The objective of an incident investigation is to . . .
   A. identify the causes of an incident.
   B. find out whose fault it is.
   C. implement steps to prevent further incidents.
   D. all of the above.
   E. both A and C.

2. The incident investigation team must include . . .
   A. a person who is knowledgeable in the process.
   B. the plant manager.
   C. a person who witnessed the incident.
   D. someone who was involved in the incident.
   E. all of the above.

3. When an incident occurs, your first responsibility is to . . .
   A. interview witnesses.
   B. gather information.
   C. take immediate action.
   D. videotape the scene.
   E. all of the above.

4. he three sources of information about an incident are: the scene of the incident, documentation, and people.
   A. True
   B. False

5. While investigating the scene of the incident, you should . . .
   A. collect samples.
   B. develop a visual record of the scene.
   C. recommend corrective actions.
   D. interview witnesses
   E. both A and B.

6. When conducting interviews, you should . . .
   A. state your purpose and objectives.
   B. avoid asking YES or NO questions.
   C. keep questions neutral.
   D. focus on getting facts, not conclusions.
   E. all of the above.

7. The factors directly involved in the occurrence of an incident are called . . .
   A. immediate causes.
   B. basic causes.
   C. system failures.
   D. personal factors.
   E. none of the above.

8. An example of a system failure is . . .
   A. an inadequate management program.
   B. inadequate standards and procedures.
   C. lack of knowledge of standards and procedures.
   D. poor enforcement of the program.
   E. all of the above.

9. There should be recommended actions for every immediate cause, basic cause, and system failure identified.
   A. True
   B. False

10. If an incident involved a contractor, the investigative team must . . .
   A. notify outside regulatory authorities.
   B. include a contractor representative.
   C. conduct its investigation in a public forum.
   D. none of the above.

11. Prior to interviewing witnesses, you should . . .
   A. wait a couple days.
   B. visit the scene of the incident.
   C. coordinate their schedule to meet as a group.
   D. both A and B.
   E. all of the above.

12. When recommending corrective actions, . . .
   A. always factor in the costs of recommendations.
   B. only make recommendations for job factors involved.
   C. recommend corrective actions for each cause identified.
   D. limit your recommendations to a maximum of three corrective actions.

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Quiz Answers

1. E both A and C.
2. A a person who is knowledgeable in the process.
3. C take immediate action.
4. A True
5. E both A and B.
6. E all of the above.
7. A immediate causes.
8. E all of the above.
9. A True
10. B include a contractor representative.
11. B visit the scene of the incident.
12. C recommend corrective actions for each cause identified.

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4170 Embassy Drive SE • Grand Rapids, Michigan 49546
(800) 842-0466 • www.safetyontheweb.com