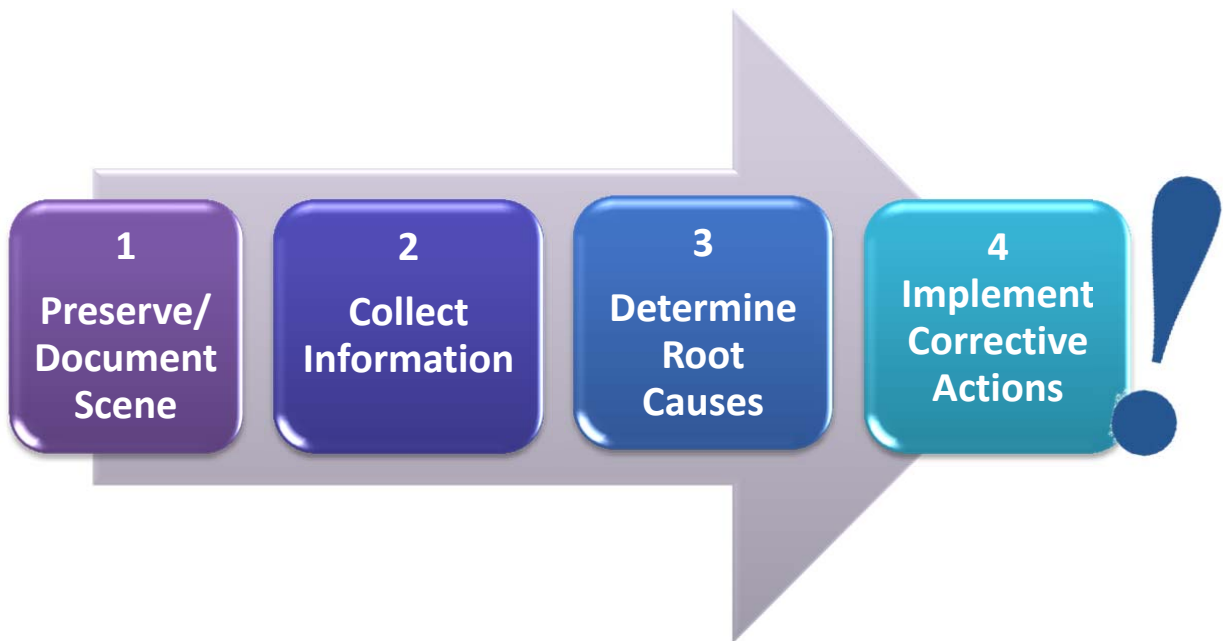


INCIDENT [ACCIDENT] INVESTIGATIONS: A GUIDE FOR EMPLOYERS



A SYSTEMS APPROACH TO HELP PREVENT INJURIES AND ILLNESSES



United States Department of Labor
Occupational Safety and Health Administration



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DISCLAIMER:

This guide was developed by OSHA's Directorate of Training and Education and is intended to assist employers, workers, and others as they strive to improve workplace health and safety. This guide is advisory in nature and informational in content. It is not a new standard or regulation and does not create any new legal obligations or alter existing obligations created by OSHA standards or regulations or the Occupational Safety and Health Act of 1970 (OSH Act). Pursuant to the OSH Act, employers must comply with safety and health standards and regulations issued and enforced either by OSHA or by an OSHA-approved state plan. In addition, the OSH Act's General Duty Clause, Section 5(a)(1), requires employers to provide their workers with a workplace free from recognized hazards likely to cause death or serious physical harm. Implementation of an incident investigation program in accordance with this guide can aid employers in their efforts to provide a safe workplace.

Your company experienced an incident that resulted (or almost resulted) in a worker injury or illness...Now what?

As a responsible employer, you need to react quickly to the incident with a prescribed investigation procedure for finding the root causes and implementing corrective actions. Quick and planned actions demonstrate your company's commitment to the safety and health of your workers, and your willingness to improve your safety and health management program to prevent future incidents.

PURPOSE OF THE GUIDE – WHY INVESTIGATE?

The purpose of this *Incident Investigation Guide* is to provide employers a systems approach to help them identify and control the underlying or *root* causes of all incidents in order to prevent their recurrence.

The Bureau of Labor Statistics reports that more than a dozen workers died every day in American workplaces in 2013, and nearly 4 million Americans suffered a serious workplace injury. And tens of thousands are sickened or die from diseases resulting from their chronic exposures to toxic substances or stressful workplace conditions. These events cause much suffering and great financial loss to workers and their families, and also result in significant costs to employers and to society as a whole. Many more “near misses” or “close calls” also happen; these are incidents that could have caused serious injury or illness but did not, often by sheer luck. Practically all of these harmful incidents and close calls are preventable.

WHY INVESTIGATE? *Incident investigations help employers:*

- Prevent injuries and illnesses
- Save lives
- Save money
- Demonstrate commitment to health and safety
- Promote positive workplace morale
- Improve management

All incidents – regardless of size or impact – need to be investigated. The process helps employers look beyond *what* happened to discover *why* it happened. This allows employers to identify and correct shortcomings in their safety and health management programs.

OSHA created this Guide to help employers conduct workplace incident investigations using a four-step systems approach. This process is supported by an *Incident Investigation Form*, found in Appendix A, which employers can use to be sure all details of the incident investigation are covered. Additional tools to assist with the investigation process are found in Appendices B through F.

PRINCIPLES OF INCIDENT INVESTIGATIONS

The Language of Incident Investigations

Employers will notice this Guide uses the term “incident”, not “accident”, to describe a workplace event. This is because the word “accident” has come to be considered as a random event that “oh, well, it just

happened” and could not have been prevented. However, the vast majority of harmful workplace events do not “just happen.” On the contrary, *most harmful workplace incidents are wholly preventable.*

In short, the basic principle is that incidents do not have to occur; they can be prevented by addressing the shortcomings in the programs that manage health and safety in the workplace.

The following are the key terms that are used throughout this guide:

- **Incident:** A work-related event in which an injury or ill-health (regardless of severity) or fatality occurred, or could have occurred.
- **Root Causes:** The underlying reasons why unsafe conditions exist or if a procedure or safety rule was not followed in a workplace. Root causes generally reflect management, design, planning, organizational or operational failings (e.g., a damaged guard had not been repaired; failure to use the guard was routinely overlooked by supervisors to ensure the speed of production).
- **Close Call:** An incident that could have caused serious injury or illness but did not; also called a “near miss.”

Investigating a worksite incident— a fatality, injury, illness, or close call— provides employers and workers the opportunity to identify hazards in their operations and shortcomings in their safety and health programs. Most importantly, it enables employers and workers to identify and implement the corrective actions necessary to prevent future incidents.

Incident investigations that focus on identifying and correcting root causes, not on finding fault or blame, also improve workplace morale and increase productivity, by demonstrating an employer’s commitment to a safe and healthful workplace.

Investigate All Incidents, Including “Close Calls”

OSHA strongly encourages employers to investigate all workplace incidents—both those that cause harm and the “close calls” that could have caused harm under slightly different circumstances. Investigations are incident-prevention tools and should be an integral part of an occupational safety and health management program in a workplace. Such a program is a structured way to identify and control the hazards in a workplace, and should emphasize continual improvement in health and safety performance. When done correctly, an effective incident investigation uncovers the root causes of the incident or ‘close call’ that were the underlying factors. Most important, investigations can prevent future incidents if appropriate actions are taken to correct the root causes discovered by the investigation.

Effective incident investigations are the right thing to do, not only because they help employers prevent future incidents, but because they help employers to identify hazards in their workplaces and shortcomings in their safety and health management programs. Investigations also save employers money, because incidents are far more costly than most people realize. The National Safety Council estimates that, on the average, preventing a workplace injury can save \$39,000, and preventing a fatality more than \$1.4 million, not to mention the suffering of the workers and their families. The more obvious financial costs are those related to workers' compensation claims, but these are only the direct

costs of incidents. The indirect costs are less obvious, but very commonly greater, and include lost production, schedule delays, increased administrative time (for emergency response, investigations, claim processing and others), lower morale, training of new or temporary personnel, increased absenteeism, and damaged customer relations and corporate reputation.

Investigate Programs, Not Behaviors

As stated previously, incident investigations that follow a systems approach are based on the principle that the root causes of an incident can be traced back to failures of the programs that manage safety and health in the workplace. This approach is fundamentally different from a behavioral safety approach, which incorrectly assumes that the majority of workplace incidents are simply the result of “human error” or “behavioral” failures. Under a systems approach, one would not conclude that carelessness or failure to follow a procedure alone was the cause of an incident. To do so fails to discover the underlying or root causes of the incident, and therefore fails to identify the systemic changes and measures needed to prevent future incidents. When a shortcoming is identified, it is important to ask why it existed and why it was not previously addressed.

For example:

- If a procedure or safety rule was not followed, *why* was the procedure or rule not followed?
- Did production pressures play a role, and, if so, *why* were production pressures permitted to jeopardize safety?
- Was the procedure out-of-date or safety training inadequate? If so, *why* had the problem not been previously identified, or, if it had been identified, *why* had it not been addressed?

“One central principle...is the need to consider the organizational factors that create the preconditions for errors as well as the immediate causes.”
-Sidney Dekker (2006)

A systems approach always looks beyond the immediate causes of the incident. If a worker suffers an amputation on a table saw, the investigator would ask questions such as:

- Was the machine adequately guarded? If not, why not?
- Was the guard damaged or non-functional? If so, why hadn’t it been fixed?
- Did the guard design get in the way of the work?
- Had the employee been trained properly in the procedures to do the job safely?

In a systems approach, investigations do not focus primarily on the behaviors of the workers closest to the incidents, but on the factors [program deficiencies] that prompted such behaviors. The goal is to change the conditions under which people work by eliminating or reducing the factors that create unsafe conditions. This is typically done by implementing adequate barriers and safeguards against the factors that cause unsafe conditions or actions.

Root causes often involve multiple deficiencies in the safety and health management programs. These deficiencies may exist, for example, in areas such as workplace design, cultural and organizational factors, equipment maintenance and other technical matters, operating systems and procedures,

staffing, supervision, training, and others. Eliminating the immediate causes is like cutting weeds, while eliminating the root causes is equivalent to pulling out the roots so that the weed cannot grow back.

Focus on the Root Causes, Not Blame or Fault

A successful incident investigation must always focus on discovering the root causes. If an investigation is focused on finding fault, it will always stop short of discovering the root causes. It is essential to discover and correct all the factors contributing to an incident, which nearly always involve equipment, procedural, training, and other safety and health program deficiencies.

Eliminating the immediate causes is like cutting weeds, while eliminating the root causes is equivalent to pulling out the roots so that the weed cannot grow back.

Addressing underlying or root causes is necessary to truly understand why an incident occurred, to develop truly effective corrective actions, and to minimize or eliminate serious consequences from similar future incidents.

Moreover, if an investigation is understood to be a search for “someone to blame,” both management and labor will be reluctant to participate in an open and forthright manner. Workers will be afraid of retaliation and management will be concerned about recognizing system flaws because of potential legal and financial liabilities.

Investigations that focus on identifying and correcting the real underlying causes not only prevent future incidents, but can also improve workplace morale and productivity, by demonstrating an employer's commitment to a safe and healthful workplace.

ESTABLISH AN INCIDENT INVESTIGATION PROGRAM

When a serious incident occurs in the workplace, everyone will be busy dealing with the emergency at hand. Therefore, it is important to be prepared to investigate incidents before they occur. An incident investigation program should include a clearly stated, easy-to-follow written plan to include guidelines for:

- How and when management is to be notified of the incident
- Notifying OSHA, which must comply with reporting requirements that are:
 - All work-related fatalities within 8 hours
 - All work-related inpatient hospitalizations, all amputations, and all losses of an eye within 24 hours
- Who is authorized to notify outside agencies (i.e., fire, police, etc.)
- Who will conduct investigations and what training they should have received
- Timetables for completing the investigation and developing/implementing recommendations
- Who will receive investigation recommendations

Effective Incident Investigation Programs:

- ✓ Clearly state easy-to-follow written procedures
- ✓ Provide for personnel to be trained on incident investigation and company procedures
- ✓ Offer collaboration between workers, worker representatives, and management
- ✓ Focus on identifying root cause(s), not on establishing fault
- ✓ Emphasize correcting root cause(s)
- ✓ Implement timely corrective actions based on investigation findings
- ✓ Provide for an annual program review to identify and correct program deficiencies and identify incident trends

- Who will be responsible for implementing corrective actions

Although a supervisor sometimes conducts incident investigations, to be most effective investigations should be conducted by a team in which managers and employees work together, since each brings different knowledge, understanding, and perspectives to an investigation. Working together will also encourage all parties to “own” the conclusions and recommendations and to jointly ensure that corrective actions are implemented in a timely manner.

Where the incident involves a temporary worker provided by a staffing agency, both the staffing agency and the host employer should conduct an incident investigation. Where the incident involves a multi-employer worksite, the incident investigation should be shared with each employer at the worksite. It is a fundamental principal that temporary workers are entitled to the same protections under the OSH Act as all other covered workers. Therefore, if a temporary worker is injured and the host employer knows about it, the staffing agency should be informed promptly, so the staffing agency knows about the hazards facing its workers. Equally, if a staffing agency learns of an injury, it should inform the host employer promptly so that future injuries might be prevented, and the case is recorded appropriately. Both the host employer and staffing agency should track and where possible, investigate the cause of workplace injuries.

As we now know, investigations are to focus on identifying root causes, not establishing fault. Employers can reinforce a systems approach by stressing it in their written program as well as their investigation procedures. Identifying and correcting root causes should always be the key objective.

CONDUCT INCIDENT INVESTIGATIONS – A FOUR-STEP SYSTEMS APPROACH

One of the biggest challenges facing the investigators is to determine what is relevant to what happened, how it happened, and especially *why* it happened. This involves conducting a systems approach incident investigation that focuses on the root causes of the incident to really help prevent them from happening again.

“Errors are seen as consequences rather than causes”
-James Reason (2000)

“Human error is not the conclusion of an investigation. It is the starting point.”
-Sidney Dekker (2006)

This section of the guide assists the employer to implement a four-step approach to conduct a successful incident investigation. Included is a set of appendices that can serve as tools for employers to use when conducting investigations. They are:

- Appendix A: *Incident Investigation Form* – previously introduced; will be used to walk the employer through the four incident investigation steps
- Appendix B: *Incident Investigator’s Kit* – lists the equipment recommended to have ready at all times to be prepared to conduct the investigation
- Appendix C: *Tips for Video/Photo Documentation*
- Appendix D: *Sketch the Scene Techniques*
- Appendix E: *Collect Information Checklist*
- Appendix F: *Sample Questions for Identifying Incident Root Causes* – Sample questions to ask in a systems approach process

The four-step systems approach in this guide is supported by the *Incident Investigation Form* [Appendix A] and other tools. This approach will assist employers through the incident investigation and help to ensure the implementation of corrective measures based on the findings.



The steps are:

1. PRESERVE/DOCUMENT THE SCENE [see Appendices A, B, C and D]
2. COLLECT INFORMATION [see Appendix E]
3. DETERMINE THE ROOT CAUSES – All the ‘Whys’ the incident occurred [see Appendix F]
4. IMPLEMENT CORRECTIVE ACTIONS – Prevent Future Incidents

Safety First

Before investigating, all emergency response needs must be completed and the incident site must be safe and secure for entry and investigation.



Incident Investigations: A Guide for Employers

With an effective safety and health management program in place, all the involved parties are aware of the roles they play during the investigation. This helps the transition from emergency response and site safety to preserving the scene and documenting the incident.

Now is the time an employer’s incident investigation program’s written plan goes into effect and the incident investigation begins.

Step 1. Preserve/Document the Scene

Preserve the Scene:

Preserve the scene to prevent material evidence from being removed or altered; investigators can use cones, tape, and/or guards.

Document the Scene:

Document the incident facts such as the date of the investigation and who is investigating. Essential to documenting the scene is capturing the injured employee’s name, injury description, whether they are temporary or permanent, and the date and location of the incident. Investigators can also document the scene by video recording, photographing and sketching.

Tools provided to help with Step 1 are:

- Appendix A: *Incident Investigation Form* [applicable sections pictured at all steps]
- Appendix B: *Incident Investigator’s Kit*
- Appendix C: *Tips for Video/Photo Documentation*
- Appendix D: *Sketch the Scene Techniques*

Form Section	Systems Approach										
Section A: Information	Step 1										
Company Name: _____	Date: _____										
Investigator (or) Team Name (s) and Titles:											
<table border="1"> <thead> <tr> <th>Name</th> <th>Title</th> </tr> </thead> <tbody> <tr><td>_____</td><td>_____</td></tr> <tr><td>_____</td><td>_____</td></tr> <tr><td>_____</td><td>_____</td></tr> <tr><td>_____</td><td>_____</td></tr> </tbody> </table>	Name	Title	_____	_____	_____	_____	_____	_____	_____	_____	
Name	Title										
_____	_____										
_____	_____										
_____	_____										
_____	_____										
	Section B: Incident Description/Injury Information										
	Step 1 and Step 2										
	1) Name and Age of Injured Employee: _____										
	Employee’s first language: _____										
	Employee’s Job Title: _____										
	Job at time of injury: _____										
	Type of employment: <input type="checkbox"/> Full-time <input type="checkbox"/> Part-time <input type="checkbox"/> Temporary <input type="checkbox"/> Seasonal <input type="checkbox"/> Other: _____										
	Length of time with Company: _____										
	Length in current position at the time of the incident: _____										
	Description and severity of injury: _____										
	2) Date and time of incident: _____										
	3) Location of Incident: _____										
	NOTE: Items 4, 5, and 6 are used for both Step 1 and Step 2										
	4) Detailed description of incident: Include relevant events leading up to, during, and after the incident. (It is preferred that the information is provided by the injured employee.)										

	Use additional pages if needed										

Step 2. COLLECT INFORMATION

Incident information is collected through interviews, document reviews and other means. Appendix E provides a checklist to use to help ensure all information pertinent to the incident is collected.

In addition to interviews, investigators may find other sources of useful information. These include:

- Equipment manuals
- Industry guidance documents
- Company policies and records
- Maintenance schedules, records and logs
- Training records (including communication to employees)
- Audit and follow-up reports
- Enforcement policies and records
- Previous corrective action recommendations

Interviews can often yield detailed, useful information about an incident. Since memories fade, interviews must be conducted as promptly as possible: preferably as soon as things have settled down a bit and the site is both secure and safe. The sooner a witness is interviewed, the more accurate and candid his/her statement will be.

An incident investigation always involves interviewing and possibly re-interviewing some of the same or new witnesses as more information becomes available, up to and including the highest levels of management. Carefully question witnesses to solicit as much information as possible related to the incident.

Since some questions will need to be designed around the interviewee, each interview will be a unique experience. When interviewing injured workers and witnesses it is crucial to reduce their possible fear and anxiety, and to develop a good rapport. When conducting interviews, investigators should:

- Conduct the interview in the language of the employee/interviewee; use a translator if needed
- Clearly state that the purpose of the investigation and interview is fact-finding, not fault-finding
- Emphasize that the goal is to learn how to prevent future incidents by discovering the root causes of what occurred
- Establish a climate of cooperation, and avoid anything that may be perceived as intimidating or in search of someone to blame for the incident
- Let employee know that they can have an employee representative (e.g., labor representative), if available/appropriate
- Ask the individuals to recount their version of what happened
- Not interrupt the interviewee

NOTE: Items 4, 5, and 6 are used for both Step 1 and Step 2

4) Detailed description of incident: Include relevant events leading up to, during, and after the incident. *(It is preferred that the information is provided by the injured employee.)*

5) Description of incident from eye witnesses, including relevant events leading up to, during and after the incident. Include names of persons interviewed, job titles and date/time of interviews.

6) Description of incident from additional employees with knowledge, including relevant events leading up to, during and after the incident. Include names of persons interviewed, job titles and date/time of interviews.

Use additional pages if needed

- Take notes and/or record the responses; interviewee must give permission prior to being recorded
- Have blank paper and or sketch available for interviewee to use for reference
- Ask clarifying questions to fill in missing information
- Reflect back to the interviewees the factual information obtained; correct any inconsistencies
- Ask the individuals what they think could have prevented the incident, focusing on the conditions and events preceding the injury

Step 3. DETERMINE ROOT CAUSES

The root causes of an incident are exactly what the term implies: The underlying reasons why the incident occurred in a workplace. Root causes generally reflect management, design, planning, organizational and/or operational failings (e.g., employees were not trained adequately; a damaged guard had not been repaired).

Section C: Identify the Root Causes: What Caused or Allowed the Incident to Happen? Step 3

The Root Causes are the underlying reasons the incident occurred, and are the factors that need to be addressed to prevent future incidents. If safety procedures were not being followed, why were they not being followed? If a machine was faulty or a safety device failed, why did it fail? It is common to find factors that contributed to the incident in several of these areas: equipment/machinery, tools, procedures, training or lack of training, and work environment. If these factors are identified, you must determine why these factors were not addressed before the incident.

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- ✓ Determining the root cause is the result of persistently asking “why”
- ✓ Determining the root cause is the most effective way to ensure the incident does not happen again

Finding the root causes goes beyond the obvious proximate or immediate factors; it is a deeper evaluation of the incident. This requires persistent “digging”, typically by asking “Why” repeatedly. Conclusions such as “worker was careless” or “employee did not follow safety procedures” don’t get at the root causes of the incident. To avoid these incomplete and misleading conclusions in the investigative process, investigators need to continue to ask “why?” as in, “Why did the employee not follow safety procedures?” If the answer is “the employee was in a hurry to complete the task and the safety procedures slowed down the work”, than ask “Why was the employee in a hurry?” The more and deeper “why?” questions asked, the more contributing factors are discovered and the closer the investigator gets to the root causes. If a procedure or safety rule was not followed, why was the procedure or rule not followed? Did production pressures play a role, and, if so, why were production pressures permitted to jeopardize safety? Was the procedure out-of-date or safety training inadequate? If so, why had the problem not been previously identified, or, if it had been identified, why had it not been addressed?

It cannot be stressed enough that a successful incident investigation must always focus on discovering the root causes. Investigations are not effective if they are focused on finding fault or blame. If an investigation is focused on finding fault, it will always stop short of discovering the root causes, because it will stop at the initial incident without discovering their underlying causes. The main goal must always be to understand how and why the existing barriers against the hazards failed or proved insufficient, not to find someone to blame.

The questions listed below are examples of inquiries that an investigator may pursue to identify contributing factors that, in turn, can lead to root causes:

- If a procedure or safety rule was not followed, why was the procedure or rule not followed? Was the procedure out of date or safety training inadequate? Was there anything encouraging deviation from job procedures such as incentives or speed of completion? If so, why had the problem not been identified or addressed before?
- Was the machinery or equipment damaged or fail to operate properly? If so, why?
- Was a hazardous condition a contributing factor? If so, why was it present? (e.g., defects in equipment/tools/materials, unsafe condition previously identified but not corrected, inadequate equipment inspections, incorrect equipment used or provided, improper substitute equipment used, poor design or quality of work environment or equipment)
- Was the location of equipment/materials/worker(s) a contributing factor? If so, why? (e.g., employee not supposed to be there, insufficient workspace, “error-prone” procedures or workspace design)
- Was lack of personal protective equipment (PPE) or emergency equipment a contributing factor? If so why? (e.g., PPE incorrectly specified for job/task, inadequate PPE, PPE not used at all or used incorrectly, emergency equipment not specified, available, properly used, or did not function as intended)
- Was a management program defect a contributing factor? If so, why? (e.g., a culture of improvisation to sustain production goals, failure of supervisor to detect or report hazardous condition or deviation from job procedure, supervisor accountability not understood, supervisor or worker inadequately trained, failures to initiate corrective actions recommended earlier)

Additional examples of questions to ask to get to the root causes are listed in Appendix F.

Step 4. IMPLEMENT CORRECTIVE ACTIONS

The investigation is not complete until corrective actions are implemented that address the root causes of the incident. Implementation should entail program level improvements and should be supported by senior management.

Note that corrective actions may be of limited preventive value if they do not address the root causes of the incident. Throughout the workplace, the findings and how they are presented will shape perceptions and subsequent corrective actions. Superficial conclusions such as "Bob should have used common sense," and weak corrective actions such as “Employees must remember to wear PPE”, are unlikely to improve the safety culture or to prevent future incidents.

Section D: Recommended Corrective Actions to Prevent Future Incidents	<i>Step 4</i>
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Section E: Corrective Actions Taken/ Root Causes Addressed	<i>Step 4</i>
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Incident Investigations: A Guide for Employers

In planning corrective actions and how best to implement them, employers may find that some root causes will take time and perseverance to fix. Persisting in implementing substantive corrective actions, however, will not only reduce the risk of future incidents but also improve the company's safety, morale and its bottom line.

Specific corrective actions address root causes directly; however, some corrective actions can be general, across-the-board improvements to the workplace safety environment. Sample global corrective actions to consider are:

- Strengthening/developing a written comprehensive safety and health management program
- Revising safety policies to clearly establish responsibility and accountability
- Revising purchasing and/or contracting policies to include safety considerations
- Changing safety inspection process to include line employees along with management representatives

***Implementing a systems approach will help ensure all incident investigations are successful.
Thank you for your commitment to the safety and health of the American workforce!***

RESOURCES

OSHA Training Institute Education Centers: <http://www.osha.gov/otiec>

The OSHA Training Institute (OTI) Education Centers are a national network of non-profit organizations authorized by OSHA to deliver occupational safety and health training to public and private sector workers, supervisors and employers on behalf of OSHA. Relevant courses are:



- **OSHA #7500 Introduction to Safety and Health Management**

Description: This course covers the effective implementation of a company's safety and health management system. The course addresses the four core elements of an effective safety and health management system and those central issues that are critical to each element's proper management. This course is an interactive training session focusing on class discussion and workshops. Upon course completion students will have the ability to evaluate, develop, and implement an effective safety and health management system for their company. Minimum student contact hours: 5.5

- **OSHA #7505 Introduction to Incident [Accident] Investigation**

Description: This course covers an introduction to basic incident investigation procedures and describes analysis techniques. Course topics include reasons for conducting incident investigations, employer responsibilities related to workplace incident investigations, and a four-step incident investigation procedure. The target audience is the employer, manager, employee or employee representative who is involved in conducting incident and/or near-miss or close call investigations. Upon course completion students will have the basic skills necessary to conduct an effective incident investigation at the workplace. Minimum student contact hours: 7.5

OSHA Website: www.osha.gov

Incident Investigation Webpage

<http://www.osha.gov/dcspproducts/topics/incidentinvestigation/index.html>

Injury and Illness Prevention Programs Webpage

<http://www.osha.gov/dsg/topics/safetyhealth/index.html>

- This webpage provides information relevant to Injury and Illness Prevention Programs in the workplace. To learn more about Injury and Illness Prevention Programs, refer to:

<http://www.osha.gov/Publications/OSHA3665.pdf> and

<http://www.osha.gov/dsg/topics/safetyhealth/OSHAwhite-paper-january2012sm.pdf>



OSHA's "Safety Pays" program

- This online tool can help employers assess the impact of occupational injuries and illnesses on their profitability. To learn more about OSHA's "Safety Pays" program, visit <http://www.osha.gov/dcsp/smallbusiness/safetypays/>



Other: UK Health and Safety Executive

Investigating Accidents and Incidents: A Workbook for employers, unions, safety representatives, and safety professionals. 2004. <http://www.hse.gov.uk/pubns/hsg245.pdf>

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- Dekker, S., *The Field Guide to Understanding Human Error*, Ashgate Publishing Company; 1 edition (June 30, 2006), English, ISBN-10: 0754648265; ISBN-13: 978-0754648260
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- Reason, J., *Human error: models and management*, BMJ 2000;320:768



APPENDIX A: INCIDENT INVESTIGATION FORM

Form Section

Systems Approach

Section A: Information

Step 1

Company Name: _____ Date: _____

Investigator (or) Team Name (s) and Titles:

Name	Title
_____	_____
_____	_____
_____	_____
_____	_____

Section B: Incident Description/Injury Information

Step 1 and Step 2

1) Name and Age of Injured Employee: _____

Employee's first language: _____

Employee's Job Title: _____

Job at time of injury: _____

Type of employment: Full-time Part-time Temporary Seasonal Other: _____

Length of time with Company: _____

Length in current position at the time of the incident: _____

Description and severity of injury: _____

2) Date and time of incident: _____

3) Location of Incident: _____

NOTE: Items 4, 5, and 6 are used for both Step 1 and Step 2

4) Detailed description of incident: Include relevant events leading up to, during, and after the incident. (It is preferred that the information is provided by the injured employee.)

Use additional pages if needed



Incident Investigations: A Guide for Employers

- 5) Description of incident from eye witnesses, including relevant events leading up to, during and after the incident. Include names of persons interviewed, job titles and date/time of interviews.

Use additional pages if needed

- 6) Description of incident from additional employees with knowledge, including relevant events leading up to, during and after the incident. Include names of persons interviewed, job titles and date/time of interviews.

Use additional pages if needed



Section C: Identify the Root Causes: What Caused or Allowed the Incident to Happen? *Step 3*

The Root Causes are the underlying reasons the incident occurred, and are the factors that need to be addressed to prevent future incidents. If safety procedures were not being followed, **why were they not being followed?** If a machine was faulty or a safety device failed, **why did it fail?** It is common to find factors that contributed to the incident in several of these areas: equipment/machinery, tools, procedures, training or lack of training, and work environment. If these factors are identified, you must determine why these factors were not addressed before the incident.

Use additional pages if needed

Section D: Recommended Corrective Actions to Prevent Future Incidents *Step 4*

Use additional pages if needed

Section E: Corrective Actions Taken/ Root Causes Addressed *Step 4*

Use additional pages if needed

APPENDIX B: INCIDENT INVESTIGATOR'S KIT

Sample list of items to use to conduct the investigation:

- ✓ Camera
- ✓ Charged Batteries (for phones, cameras, equipment, etc.)
- ✓ Video / Audio recorder
- ✓ Measuring devices in various sizes
- ✓ Leveling rod
- ✓ Clipboard and writing pad
- ✓ Pens, pencils, markers
- ✓ Graph paper
- ✓ Straight-edge ruler (Can be used as a scale reference in photos)
- ✓ Incident investigation forms
- ✓ Flashlight
- ✓ Strings, stakes, warning tape
- ✓ Photo marking cones
- ✓ Personal protective equipment: Gloves, hat, eyewear, ear plugs, face mask, etc.
- ✓ Magnifying glass
- ✓ High visibility plastic tapes to mark off area
- ✓ First aid kit
- ✓ Latex gloves
- ✓ Sampling [holding] containers with seals (Various types: bags, jars, containers, etc.)
- ✓ Identification tags
- ✓ Variety of tape: Scotch, masking, duct
- ✓ Compass
- ✓ Carpenters ruler
- ✓ Hammer
- ✓ Paint stick (yellow/black)
- ✓ Chalk (yellow/white)
- ✓ Protractor
- ✓ Clinometer

APPENDIX C: TIPS FOR VIDEO/PHOTO DOCUMENTATION

Note: Interviewees must be aware that they are being video recorded and/or photographed. It is recommended that investigators obtain permission from the interviewee prior to the interview.

Tips for Video Documentation:

- Video the scene as soon as possible; doing this early on will pick up details that may later add valuable information to the investigation
- Scan slowly 360 degrees left and right to establish location
- Narrate what is being taped, and describe objects, size, direction, location, etc.
- If vehicles were involved, record direction of travel, going and coming

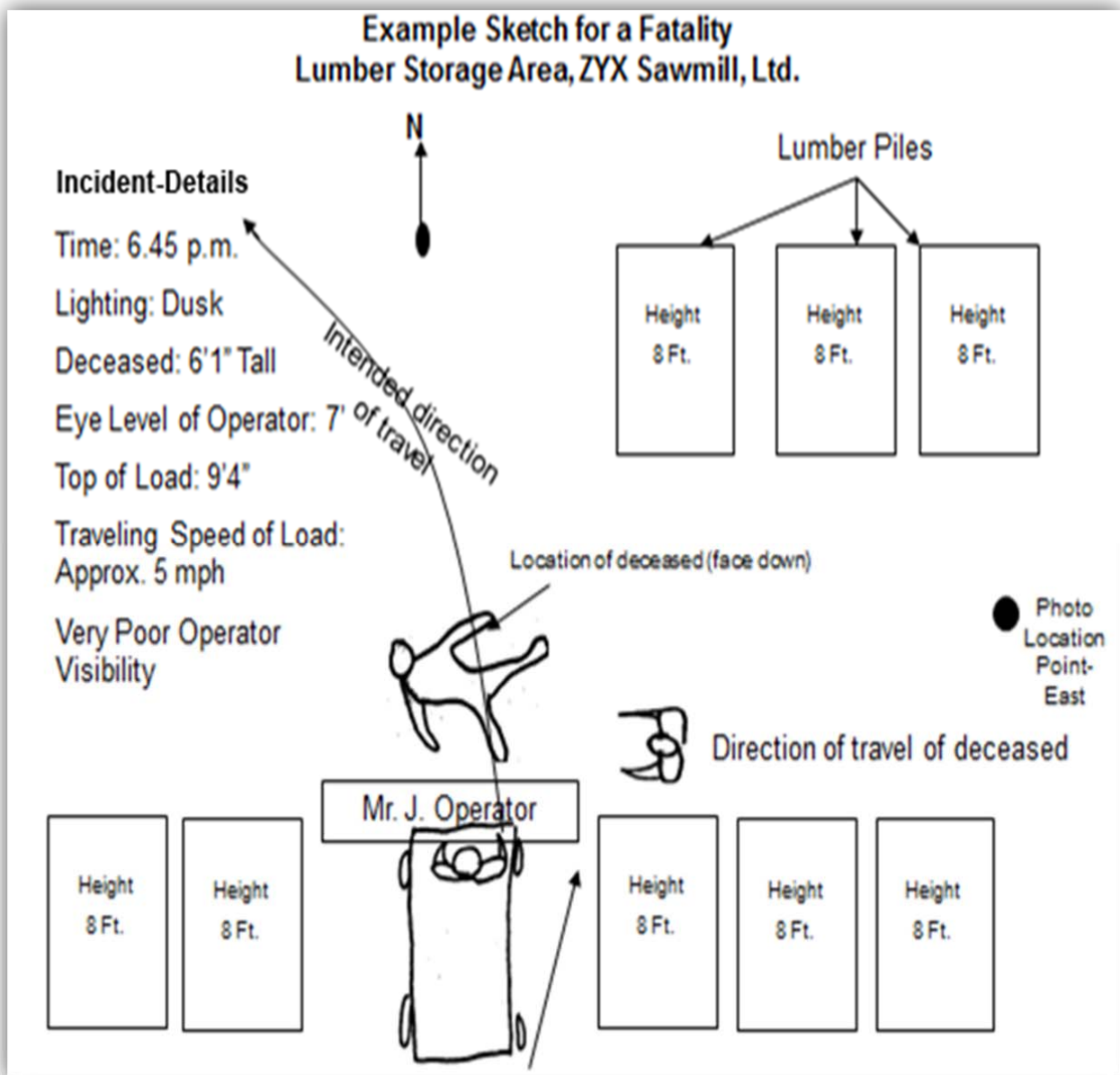
Tips for Photograph Documentation:

- Always make notes about the photos taken
- Start by taking distance shots first then move in to take closer photos of the scene
- Take photos at different angles (from above, 360 degrees of scene, left, right, rear) to show the relationship of objects and minute and/or transient details such as ends of broken rope, defective tools, drugs, wet areas, or containers
- Take panoramic photos to help present the entire scene, top to bottom - side to side
- Take notes on each photo; these should be included in the incident investigation file with the photos
- Identify and document the photo type, date/time/location taken, subject, weather conditions, measurements, etc.
- Place an item of known dimensions in the photo to add a frame of reference and scale (e.g., a penny, a pack of cards)
- Identify the person taking the photo
- Indicate the locations where photos were taken on sketches (See Appendix D)

APPENDIX D: SKETCH THE SCENE TECHNIQUES

1. Make sketches large; at least 8" x 10" and clear, be sure to print legibly
2. Include "Incident Details" (i.e., time, date, injured, location, conditions, etc.)
3. Include measurements (i.e. distances, heights, lengths, etc.) and use permanent points (e.g., telephone pole, building) to clearly present the measurements
4. Indicate directions – N= North; E= East; W= West; S= South
5. Make notes on sketch to provide additional information such as the photo location and/or where people were at the time of the incident

Note: The sketch can be used during interviews to help interviewees identify their location before, during or after the incident



APPENDIX E: COLLECT INFORMATION CHECKLIST

Investigators should be sure their investigation answers the following questions:

WHO?	WHERE?
<ul style="list-style-type: none"> <input type="checkbox"/> Who was injured? <input type="checkbox"/> Who saw the incident? <input type="checkbox"/> Who was working with the employee? <input type="checkbox"/> Who had instructed/assigned the employee? <input type="checkbox"/> Who else was involved? <input type="checkbox"/> Who else can help prevent recurrence? 	<ul style="list-style-type: none"> <input type="checkbox"/> Where did the incident occur? <input type="checkbox"/> Where was the employee at the time? <input type="checkbox"/> Where was the supervisor at the time? <input type="checkbox"/> Where were fellow workers at the time? <input type="checkbox"/> Where were other people who were involved at the time? <input type="checkbox"/> Where were witnesses when incident occurred?
WHAT?	WHY?
<ul style="list-style-type: none"> <input type="checkbox"/> What was the incident? <input type="checkbox"/> What was the injury? <input type="checkbox"/> What was the employee doing? <input type="checkbox"/> What had the employee been told to do? <input type="checkbox"/> What tools was the employee using? <input type="checkbox"/> What machine was involved? <input type="checkbox"/> What operation was the employee performing? <input type="checkbox"/> What instructions had the employee been given? <input type="checkbox"/> What specific precautions were necessary? <input type="checkbox"/> What specific precautions was the employee given? <input type="checkbox"/> What protective equipment should have been used? <input type="checkbox"/> What protective equipment was the employee using? <input type="checkbox"/> What had other persons done that contributed to the incident? <input type="checkbox"/> What problem or questions did the employee encounter? <input type="checkbox"/> What did the employee or witnesses do when the incident occurred? <input type="checkbox"/> What extenuating circumstances were involved? <input type="checkbox"/> What did the employee or witnesses see? <input type="checkbox"/> What will be done to prevent recurrence? <input type="checkbox"/> What safety rules were violated? <input type="checkbox"/> What new rules are needed? 	<ul style="list-style-type: none"> <input type="checkbox"/> Why was the employee injured? <input type="checkbox"/> Why and what did the employee do? <input type="checkbox"/> Why and what did the other person do? <input type="checkbox"/> Why wasn't protective equipment used? <input type="checkbox"/> Why weren't specific instructions given to the employee? <input type="checkbox"/> Why was the employee in the position? <input type="checkbox"/> Why was the employee using the tools or machine? <input type="checkbox"/> Why didn't the employee check with the supervisor when the employee noted things weren't as they should be? <input type="checkbox"/> Why did the employee continue working under the circumstances? <input type="checkbox"/> Why wasn't the supervisor there at the time?
WHEN?	HOW?
<ul style="list-style-type: none"> <input type="checkbox"/> When did the incident occur? <input type="checkbox"/> When did the employee start on that job? <input type="checkbox"/> When was the employee assigned on the job? <input type="checkbox"/> When were the hazards pointed out to the employee? <input type="checkbox"/> When was the employee's supervisor last check on job progress? <input type="checkbox"/> When did the employee first sense something was wrong? 	<ul style="list-style-type: none"> <input type="checkbox"/> How did the employee get injured? <input type="checkbox"/> How could the employee have avoided it? <input type="checkbox"/> How could fellow workers have avoided it? <input type="checkbox"/> How could supervisor have prevented it - could it be prevented?

APPENDIX F: SAMPLE QUESTIONS FOR IDENTIFYING INCIDENT ROOT CAUSES

QUESTIONS
1. Did a written or well-established procedure exist for employees to follow?
2. Did job procedures or standards properly identify the potential hazards of job performance?
3. Were there any hazardous environmental conditions that may have contributed to the incident?
4. Were the hazardous environmental conditions in the work area recognized by employees or supervisors?
5. Were any actions taken by employees, supervisors, or both to eliminate or control environmental hazards?
6. Were employees trained to deal with any hazardous environmental conditions that could arise?
7. Was sufficient space provided to accomplish the job task?
8. Was there adequate lighting to properly perform all the assigned tasks associated with the job?
9. Were employees familiar with job procedures?
10. Was there any deviation from the established job procedures?
11. Were the proper equipment and tools available and being used for the job?
12. Did any mental or physical conditions prevent the employee(s) from properly performing their jobs?
13. Were there any tasks in the job considered more demanding or difficult than usual (e.g., strenuous activities, excessive concentration required, etc.)?
14. Was there anything different or unusual from normal operations? (e.g., different parts, new or different chemicals used, recent adjustments/maintenance/cleaning on equipment)
15. Was the proper personal protective equipment specified for the job or task?
16. Were employees trained in the proper use of any personal protective equipment?
17. Did the employees use the prescribed personal protective equipment?
18. Was personal protective equipment damaged or not properly functioning?
19. Were employees trained and familiar with the proper emergency procedures, including the use of any special emergency equipment and was it available?
20. Was there any indication of misuse or abuse of equipment and/or materials at the incident site?
21. Is there any history of equipment failure, were all safety alerts and safeguards operational and was the equipment functioning properly?
22. If applicable, are all employee certification and training records current and up-to-date?
23. Was there any shortage of personnel on the day of the incident?
24. Did supervisors detect, anticipate, or report an unsafe or hazardous condition?
25. Did supervisors recognize deviations from the normal job procedure?
26. Did supervisors and employees participate in job review sessions, especially for those jobs performed on an infrequent basis?
27. Were supervisors made aware of their responsibilities for the safety of their work areas and employees?
28. Were supervisors properly trained in the principles of incident prevention?
29. Was there any history of personnel problems or any conflicts with or between supervisors and employees or between employees themselves?
30. Did supervisors conduct regular safety meetings with their employees?
31. Were the topics discussed and actions taken during the safety meetings recorded in the minutes?
32. Were the proper resources (i.e., equipment, tools, materials, etc.) required to perform the job or task readily available and in proper condition?
33. Did supervisors ensure employees were trained and proficient before assigning them to their jobs?