



Accident Investigation

Purpose

Accident prevention is the key to eliminating possibility of injury to employees and property loss. Learning from past accidents is one of the key elements in accident prevention. This chapter addresses the procedures to be followed for all accidents resulting in employee injury or property damage.

Responsibilities

Management

Conduct accident prevention and investigation training for supervisors

Ensure all accidents and injuries are investigated

Ensure immediate and long term corrective actions are taken to prevent re-occurrence

Maintain Accident Reports permanently on file

Ensure proper entries are made on the OSHA 200 Log and First Report of Injury

Provide all necessary medical care for injured workers

Employees

Immediately report all accidents & injuries to their supervisor

Assist as requested in all accident investigations

Report all hazardous conditions and near-misses

Supervisor Involvement

In most cases, the area Supervisor conducts the investigation. Direct supervisors are familiar with employee's work environment & assigned tasks. The Supervisor is the person who must take the accident situation under control and immediately eliminate or control hazards to others.



Immediate Steps

1. Provide First Aid for any injured persons.
2. Eliminate or control hazards
3. Document accident scene information to determine the cause.
4. Interview witnesses immediately.

ACCIDENT PREVENTION

Accidents are usually complex. An accident may have 10 or more events that can be causes. A detailed analysis of an accident will normally reveal three cause levels: basic, indirect, and direct. At the lowest level, an accident results only when a person or object receives an amount of energy or hazardous material that cannot be absorbed safely. This energy or hazardous material is the **DIRECT CAUSE** of the accident. The direct cause is usually the result of one or more unsafe acts or unsafe conditions, or both. Unsafe acts and conditions are the **INDIRECT CAUSES** or symptoms. In turn, indirect causes are usually traceable to poor management policies and decisions, or to personal or environmental factors. These are the **BASIC CAUSES**.

In spite of their complexity, most accidents are preventable by eliminating one or more causes. Accident investigations determine not only what happened, but also how and why. The information gained from these investigations can prevent recurrence of similar or perhaps more disastrous accidents. Accident investigators are interested in each event as well as in the sequence of events that led to an accident. The accident type is also important to the investigator. The recurrence of accidents of a particular type or those with common causes shows areas needing special accident prevention emphasis.

INVESTIGATIVE PROCEDURES

The actual procedures used in a particular investigation depend on the nature and results of the accident. The agency having jurisdiction over the location determines the administrative procedures. In general, responsible officials will appoint an individual to be in charge of the investigation. The investigator uses most of the following steps:

1. Define the scope of the investigation.
2. Select the investigators. Assign specific tasks to each (preferably in writing).
3. Present a preliminary briefing to the investigating team, including:



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- a. Description of the accident, with damage estimates.
 - b. Normal operating procedures.
 - c. Maps (local and general), documents, note reports, etc.
 - d. Location of the accident site.
 - e. List of witnesses.
 - f. Events that preceded the accident.
4. Visit the accident site to get updated information.
5. Inspect the accident site.
- a. Secure the area. Do not disturb the scene unless a hazard exists.
 - b. Prepare the necessary sketches and photographs. Label each carefully and keep accurate records.
6. Interview each victim and witness. Also interview those who were present before the accident and those who arrived at the site shortly after the accident. Keep accurate records of each interview. Use a tape recorder if desired and if approved.
7. Determine
- a. What was not normal before the accident.
 - b. Where the abnormality occurred.
 - c. When it was first noted.
 - d. How it occurred.
8. Analyze the data obtained in step 7. Repeat any of the prior steps, if necessary.



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9. Determine
 - a. Why the accident occurred.
 - b. A likely sequence of events and probable causes (direct, indirect, basic).
 - c. Alternative sequences.
10. Check each sequence against the data from step 7.
11. Determine the most likely sequence of events and the most probable causes.
12. Conduct a post-investigation briefing.
13. Prepare a summary report, including the recommended actions to prevent a recurrence. Distribute the report according to applicable instructions.

An investigation is not complete until all data are analyzed and a final report is completed. In practice, the investigative work, data analysis, and report preparation proceed simultaneously over much of the time spent on the investigation.

FACT-FINDING

Gather evidence from many sources during an investigation. Get information from witnesses and reports as well as by observation. Interview witnesses as soon as possible after an accident. Inspect the accident site before any changes occur. Take photographs and make sketches of the accident scene. Record all pertinent data on maps. Get copies of all reports. Documents containing normal operating procedures, flow diagrams, maintenance charts, or reports of difficulties or abnormalities are particularly useful. Keep complete and accurate notes in a bound notebook. Record pre-accident conditions, the accident sequence, and post-accident conditions. In addition, document the location of victims, witnesses, machinery, energy sources, and hazardous materials.

In some investigations, a particular physical or chemical law, principle, or property may explain a sequence of events. Include laws in the notes taken during the investigation or in the later analysis of data. In addition, gather data during the investigation that may lend itself to analysis by these laws, principles, or properties. An appendix in the final report can include an extended discussion.



INTERVIEWS

In general, experienced personnel should conduct interviews. If possible, the team assigned to this task should include an individual with a legal background. In conducting interviews, the team should:

1. Appoint a speaker for the group.
2. Get preliminary statements as soon as possible from all witnesses.
3. Locate the position of each witness on a master chart (including the direction of view).
4. Arrange for a convenient time and place to talk to each witness.
5. Explain the purpose of the investigation (accident prevention) and put each witness at ease.
6. Listen, let each witness speak freely, and be courteous and considerate.
7. Take notes without distracting the witness. Use a tape recorder only with consent of the witness.
8. Use sketches and diagrams to help the witness.
9. Emphasize areas of direct observation. Label hearsay accordingly.
10. Be sincere and do not argue with the witness.
11. Record the exact words used by the witness to describe each observation. Do not "put words into a witness' mouth."
12. Word each question carefully and be sure the witness understands.
13. Identify the qualifications of each witness (name, address, occupation, years of experience, etc.).
14. Supply each witness with a copy of his or her statements. Signed statements are desirable.



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After interviewing all witnesses, the team should analyze each witness' statement. They may wish to re-interview one or more witnesses to confirm or clarify key points. While there may be inconsistencies in witnesses' statements, investigators should assemble the available testimony into a logical order. Analyze this information along with data from the accident site.

Not all people react in the same manner to a particular stimulus. For example, a witness within close proximity to the accident may have an entirely different story from one who saw it at a distance. Some witnesses may also change their stories after they have discussed it with others. The reason for the change may be additional clues.

A witness who has had a traumatic experience may not be able to recall the details of the accident. A witness who has a vested interest in the results of the investigation may offer biased testimony. Finally, eyesight, hearing, reaction time, and the general condition of each witness may affect his or her powers of observation. A witness may omit entire sequences because of a failure to observe them or because their importance was not realized.

PROBLEM SOLVING TECHNIQUES

Accidents represent problems that must be solved through investigations. Several formal procedures solve problems of any degree of complexity. This section discusses two of the most common procedures: Change Analysis and Job Safety Analysis.

Change Analysis

As its name implies, this technique emphasizes change. To solve a problem, an investigator must look for deviations from the norm. Consider all problems to result from some unanticipated change. Make an analysis of the change to determine its causes. Use the following steps in this method:

1. Define the problem (What happened?).
2. Establish the norm (What should have happened?).
3. Identify, locate, and describe the change (What, where, when, to what extent).
4. Specify what was and what was not affected.
5. Identify the distinctive features of the change.
6. List the possible causes.
7. Select the most likely causes.



Job Safety Analysis

Job safety analysis (JSA) is part of many existing accident prevention programs. In general, JSA breaks a job into basic steps, and identifies the hazards associated with each step. The JSA also prescribes controls for each hazard. A JSA is a chart listing these steps, hazards, and controls. Review the JSA during the investigation if a JSA has been conducted for the job involved in an accident. Perform a JSA if one is not available. Perform a JSA as a part of the investigation to determine the events and conditions that led to the accident.

Investigation Report

An accident investigation is not complete until a report is prepared and submitted to proper authorities. An accident report should be clear and concise. The purpose of the investigation is to prevent future accidents. The following outline has been found especially useful in developing the information to be included in the formal report:

1. Background Information
 - a. Where and when the accident occurred
 - b. Who and what were involved
 - c. Operating personnel and other witnesses
2. Account of the Accident (What happened?)
 - a. Sequence of events
 - b. Extent of damage
 - c. Accident type
 - d. Agency or source (of energy or hazardous material)
3. Discussion (Analysis of the Accident - **HOW; WHY**)
 - a. Direct causes (energy sources; hazardous materials)
 - b. Indirect causes (unsafe acts and conditions)



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- c. Basic causes (management policies; personal or environmental factors)
4. Recommendations (to prevent a recurrence) for immediate and long-range action to remedy:
 - a. Basic causes
 - b. Indirect causes
 - c. Direct causes (such as reduced quantities or protective equipment or structures)

Possible Causes

Obvious accident causes are most probably symptoms of a "root cause" problem. Some examples of Unsafe Acts and Unsafe Conditions which may lead to accidents are:

Unsafe Acts

Unauthorized operation of equipment

Running - Horse Play Not following procedures By-passing safety devices

Not using protective equipment

Under influence of drugs or alcohol

Unsafe Conditions

Ergonomic Hazards

Environmental hazards Inadequate housekeeping
Blocked walkways

Improper or damaged PPE

Inadequate machine guarding



Recommendations

As a result of the finding is there a need to make changes to:

Employee training

Work Stations Design

Policies or procedures

Records

All accident reports will be maintained on file permanently. They shall receive timely review by upper management to ensure proper corrective actions have been taken.

First Report of Injury and OSHA 200 Log entries will be made within 8 hours of notification of injuries or illnesses