

Accident Investigation

The term "accident" can be defined as an unplanned event that interrupts the completion of an activity, and that may (or may not include injury or property damage. One can cite many reasons to conduct a workplace accident investigation, including:

- Fulfill a legal requirement;
- Determine the cost of an accident;
- Determine compliance with applicable safety regulations;
- Process workers' compensation claims.

Most importantly, accident investigations are conducted to determine the cause of accidents and to prevent similar accidents in the future. The investigation should focus on finding the root cause(s) of the accident rather than the investigation procedure itself.

Who Should Conduct The Investigation?

Ideally, an investigation should be conducted by an expert in accident causation who is experienced in investigative techniques and fully knowledgeable of the work processes, procedures, persons and industrial relations environment of a particular situation. Unfortunately, such experts are hard to find, especially in small organizations. Consequently, both workers and supervisors, often with little (or no) previous investigative experience, may be called on to participate.

Who & How Many People Should Be Involved?

The best team to conduct an accident investigation includes the injured worker, the supervisor and a safety representative. It is critical that the injured worker's supervisor be a member of the investigation team because this person will be the most knowledgeable about the work conditions and the people involved. Furthermore, the supervisor can usually take immediate remedial action if such a need is identified. Other members who are valuable include maintenance, engineering, process support and other technical staff members who have a good understanding of the incident and the corrective action.

Can You Ensure Impartiality?

An investigator who believes that accidents are caused by unsafe conditions will likely try to uncover conditions as causes. Conversely, one who believes they are caused by unsafe acts will attempt to find the human errors that are causes. Therefore, one must examine briefly some underlying factors in a chain of events that ends in an accident.

The important point is that even the most seemingly straightforward accident is rarely the outcome of a single cause. For example, an "investigation" which concludes that an accident was due to worker carelessness and goes no further, fails to seek answers to several important questions:

- Was the worker distracted? If so, why?
- Was a safe work procedure being followed? If not, why not?
- Were safety devices in order? If not, why not?
- Was the worker trained? If not, why not?

An inquiry that answers these and related questions will likely reveal conditions that are more open to correction than attempts to prevent "carelessness".

What Steps Are Involved In Investigating An Accident?

The accident investigation process involves the following steps:

- Report the accident occurrence to a designated person within the organization.
- Provide first aid and medical care to injured person(s).
- Investigate the accident.
- Identify causes.
- Report findings.
- Develop a corrective action plan.
- Implement the plan.
- Evaluate the effectiveness of the corrective action.
- Make changes for continuous improvement.

As little time as possible should be lost between the moment an accident or near-hit occurs and the investigation begins. This approach allows the investigator to observe conditions as they were at the time, prevent disturbance of evidence and identify witnesses. It is recommended that a pre-assembled "toolbox" be prepared. It should contain such items as pencils, paper, camera, film, tape measure, statement forms, etc. These items should be immediately available so that time is not wasted.

What Should Be Looked At As The Cause Of An Accident?

Many models of accident causation have been proposed, ranging from Heinrich's domino theory to the sophisticated management oversight and risk tree (MORT). A simple model attempts to illustrate that the causes of any accident can be grouped into five categories-task, material, environment, personnel and management. When this model is used, possible causes in each category should be investigated. Let's examine each category in more detail. Remember that these are sample questions only; no attempt has been made to provide a comprehensive checklist.

Category 1: Task

The actual work procedure being used at the time of the accident is explored. Investigation team members look for answers to questions such as:

- Was a safe work procedure used?
- Had conditions changed to make the normal procedure unsafe?
- Were appropriate tools and materials available? Were they used?
- Were prescribed safety devices working properly?
- Was lockout used when necessary?

For most of these questions, an important follow-up question must be asked: "If not, why not?"

Category 2: Material

To identify possible causes related to equipment and materials used, investigators might ask:

- Did equipment fail? If so, what caused it to fail?
- Was machinery poorly designed?
- Were hazardous substances involved?
- Were they clearly identified?
- Was a less-hazardous alternative substance possible and available?
- Was the raw material substandard in some way?
- Should personal protective equipment (PPE) have been used? Was it?

Again, each time the answer reveals an unsafe condition, the investigator must ask why this situation was allowed to exist.

Category 3: Environment

The physical environment and especially sudden changes to that environment are factors that need to be assessed. The situation at the time of the accident is what is important. For example, accident investigators may want to know:

- What were the weather conditions?
- Was housekeeping poor?
- Was it too hot or too cold?
- Was noise a problem?
- Was lighting adequate?
- Were toxic or hazardous gases, dusts

Category 4: Personnel

The physical and mental condition of those directly involved in the event must be explored as well. Although the purpose of investigating an accident is not to affix blame, the inquiry will not be complete unless personal characteristics are considered. Some factors will remain essentially constant while others may vary from day to day:

- Were workers experienced in the work being performed?
- Had they been adequately trained?
- Can they physically perform the work?
- What was the status of their health?
- Were they tired (e.g., how many hours had they been working)?
- Were they under stress (work-related or personal)?

Category 5: Management

Management holds the legal responsibility for workplace safety and, therefore, the role of supervisors and higher management must always be considered in an accident investigation. Answers to the preceding types of questions logically lead to further ones:

- Were safety rules communicated to and understood by all employees?
- Were written procedures available?
- Were they enforced?
- Was supervision adequate?
- Were workers trained to do the work?
- Had hazards been previously identified?
- Had procedures been developed to overcome them?

- Were unsafe conditions corrected?
- Was equipment maintained regularly?
- Were safety inspections conducted regularly?

This accident investigation model provides a guide for uncovering all possible causes and reduces the likelihood of looking at facts in isolation. Some investigators may prefer to place some sample questions in different categories; however, the categories are not important, provided each pertinent question is asked. Obviously, the categories overlap; this reflects the situation in real life.

How Are The Facts Collected?

You may want to take photographs—both of the general area and specific items—before anything is moved. Careful study of these may reveal conditions or observation missed previously. Sketches of the accident scene based on measurements taken may also facilitate subsequent analysis and will clarify any written reports. Broken equipment, debris and samples of materials involved may be removed for further analysis by appropriate experts. Even if photographs are taken, written notes about the location of these items at the accident scene should be prepared.

Background Information

A useful, although often overlooked, background source is information from documents such as technical data sheets, maintenance reports, past accident reports, formalized safe-work procedures and training reports. Any pertinent information should be studied to determine what might have happened and what changes might be recommended to prevent recurrence of similar accidents.

Why Make Recommendations?

The final step is to develop a set of well-considered recommendations designed to prevent recurrences. Once knowledgeable about the work processes involved and the overall situation in the organization, it should not be too difficult to devise realistic recommendations. Resist the temptation to make only general recommendations as a way to save time and effort.

Should the team be unable to determine the causes of an accident with any certainty—an unlikely occurrence—you have still uncovered safety weaknesses in the operation. It is appropriate to make recommendations to correct these deficiencies.

Remember, the purpose of an accident investigation is to determine the cause(s) of the incident and to implement corrective action in order to prevent similar events in the future. A thorough accident investigation is always worth the time and effort.

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