

# Collecting Data for Root Cause Analysis

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**F**actual evidence derived from data gathering activities is the basis for all valid conclusions and recommendations from a root cause analysis. Without effective data gathering, causal factors and root causes cannot be identified and the incident cannot be defined and solved.

A causal factor is an equipment failure or human error that caused a quality problem or allowed the consequences of a quality problem to be worse than they might have been. Each problem typically has multiple causal factors.

A root cause is the most basic cause: It can reasonably be identified, management has control to fix it, and effective recommendations for preventing its recurrence can be generated. A typical causal factor has multiple root causes.

## Types of Data

There are a number of different types and sources of data:

- **People:** witnesses and participants.
- **Physical:** parts and chemical samples.
- **Paper:** hard copies and electronic records.
- **Position:** location of people and physical evidence.

Data gathering must begin as soon as possible after the event occurs to prevent loss or alteration of the data. Data from people are the most easily altered or destroyed and need to be made a priority. Other forms of data are more stable; however, physical data need to be identified quickly to prevent their inadvertent loss or destruction.

To gather data from people, a root cause analyst must be a skilled interviewer (see Figure 1). He or she needs to plan for the interview to be sure to get the maximum amount of data from the interview. The analyst should ask open-ended questions and follow up with more detailed questions. At the conclusion of the interview, the analyst can use the data gathered to update the chosen data analysis technique, typically a causal factor chart or fault tree.

If the analyst cannot arrive at the event scene quickly, the witnesses should complete initial witness statements to aid the interviewing process.

Follow-up interviews using a more structured interview style may be needed to answer additional questions that arise during the course of the analysis.

## It is important to be aware of the different types and sources of data.

Physical data—parts, residues and chemical samples—must first be identified and preserved. Then test plans should be developed to ensure the required data are collected and the evidence is properly analyzed and is not inadvertently destroyed during the investigation.

Paper data—data on paper and data stored electronically that can be printed on paper—can often show manage-

ment system breakdowns. Root causes such as an inaccurate procedure, failure to provide required training or improper quality assurance reviews may become evident from paper data.

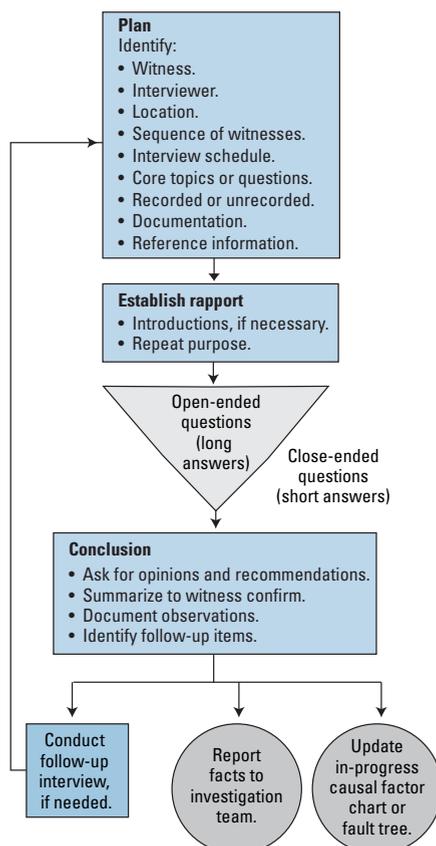
Position data consist of physical relationships among items and people at the scene and environmental factors, functional relationships among control and safety devices and time relationships that define the sequence of events and help identify cause and effect relationships.

Physical position data can be recorded with a camera to show an object's position. Functional relationships among systems and time relationships can be understood by analyzing other sources of data, such as engineering drawings or production records.

Acute incidents such as fires, explosions or defective product should be investigated promptly. Data not destroyed by an acute incident can usually be obtained after the incident.

Nonacute incidents need not be investigated immediately and can be logged into a database. Management can analyze the database and commission a root cause analysis if there is an unacceptable trend in the frequency of nonacute incidents, but the root cause analyst must recognize that much of the specific data for chronic incidents may no longer be available.

**FIGURE 1** Interview Process



## BIBLIOGRAPHY

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