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## ACCESSING SAFETY KNOWLEDGE (ASK) SHEET: *Root Cause Analysis*

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Following an incident, 'what' happened is often relatively evident through normal investigative techniques. Knowing what happened is important, of course. However, effective accident investigation aims to successfully identify the reasons *why* an incident occurred. Root Cause Analysis is a tool for solving problems and arriving at the most basic reasons for the occurrence of an incident or accident causing injury or loss. Its purpose is to aid in two ways: developing the understanding of a problem and the causes for same; and (2) identifying corrective measures that will eliminate or reduce risk to an acceptable or manageable level. Once we know why an accident occurred, the result should be a clearer understanding of the necessary preventative measures to avoid reoccurrence – another key element of a successful safety program.

Effective root cause analysis is usually the result of a team-approach to an investigative process done in a careful, systematic manner. The analytical process should establish a sequence of events or timeline leading to an understanding of the relationships between contributory or causal factors, root cause(s) and the defined problem or event to be prevented in the future. While it is possible that more than one root cause may be identified in the process, the key is to make sure that each conclusion and root cause is identified and supported by documentary evidence.

Accuracy is critical in the root cause analysis process. Because the manner used to define the problem or event is key to identifying causal factors. Witness interviews are a good example. A properly interviewed witness to an event may be guided into recalling a sound, smell or other subtle detail that can be critical in the identification of causal factors.

Root cause analysis techniques can be very simple or complex. One of the simpler classic root cause analysis methods includes what has been dubbed as the '5-whys'. This system questions the reasons something occurred in logical succession, breaking the event into small orderly portions. This approach, when done correctly, aids in setting up a set of relationships between cause and effect. Some root cause analysis techniques use a mathematical or otherwise logical structure. There are techniques that employ a looking backward from the point of the event to actions, conditions or situations leading to the situation under analysis. Other techniques use a similar approach in reverse, looking at conditions, procedures, or steps starting from the point when an event occurred. A number of these methodologies have been developed over the years including:

- **Fault Tree Analysis** - Is a systematic approach for establishing how systems can fail. The result is then used to identify the best ways of correcting existing or potential issues and reducing risk.
- **Event Tree Analysis** – Is a technique seeking to find, through algebraic calculation, strong evidence for the probability of factors leading to an event.
- **Failure Mode and Effects Analysis** – This technique involves considering as many components and systems as possible to identify failure, causes and effects.

Used effectively, root cause analysis can help contractors transform from a culture that reacts to problems into a forward-looking culture that reduce risk; and solves problems before they occur or escalate. More importantly, root cause analysis can be an effective tool in reducing incident frequency. The key is to make sure that the process of identifying the action, behavior, policy or procedure as the root cause of an incident is not used or perceived as a way of placing blame or as a punitive tool; but, rather as the effective tool of analyzing ways of improving even the most progressive safety programs.

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P.O. Box 924943 • Houston, Texas 77292 • 281.679.1877 • [asahouston.org](http://asahouston.org)

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