

## 9 IDENTIFYING HAZARDS

### ANSWERS—QUIZ 1

1. b
2. b
3. a
4. b
5. b
6. d
7. d
8. a
9. a
10. c
11. c
12. The same problems that create the waste or cause the damage could also, under the right conditions, cause injuries.
13. The term for type of analysis is job safety analysis or JSA.
14. Identifying the hazards and potential injuries is the most critical step because only an identified problem can be eliminated.
15. Four factors to avoid are time consuming backtracking and repetitions, long walks between items, unnecessary interruptions of the production process, and distraction of employees.
16. TWA is the time-weighted average concentration for a normal eight-hour day or 40-hour week. It is believed that nearly all people can be exposed day after day to airborne concentrations at these limits without adverse effect.
17. Setting the action level at one-half the PEL helps to protect employees from overexposure with a minimum of burden to employers.
18. He or she must first eliminate or reduce an employee's fear and anxiety by establishing a good rapport with the individual.
19. The inductive method uses observable data to predict events and outcomes within a particular system. It postulates how the component parts of a system will contribute to the success or failure of the system as a whole. It considers a system's operations from the standpoint of its components, their failure in a specific operating condition, and the effect of that failure on the system.
20. The first type of report is the emergency report. It

is filed without delay when a critical or catastrophic hazard is probable. This report would include any items marked IA or IIA. A periodic report covers those unsatisfactory nonemergency conditions observed during the planned periodic inspection. It should be filed within 24 hours of the inspection and can be initial, follow-up, final, or a combination of all three. A summary report lists all items of previous periodic reports for a given time.

### ANSWERS—QUIZ 2

1. a
2. b
3. a
4. b
5. a
6. a
7. d
8. b
9. c
10. c
11. d
12. The six elements are identify hazards, assess risks, develop and evaluate control measures, make decisions and assume residual risk, implement control measures, and evaluate effectiveness of control measures.
13. For maximum benefit, the hazard analysis should be done while the new equipment is in the planning stages.
14. Critics believe that continuous inspections are erratic and superficial, that they do get into out-of-the-way places, and that they miss too much.
15. The five questions include the following: (1) What items need to be inspected? (2) What aspects of each item need to be examined? (3) What conditions need to be inspected? (4) How often must items be inspected? (5) Who will conduct the inspection?
16. Time-weighted average (TLV-TWA), short-term exposure limit (TLV-STEL), and ceiling (TLV-C).
17. The three phases are the problem definition phase, the problem analysis phase, and the solution phase.
18. The six main outcomes are to determine direct causes, to uncover contributing causes, to prevent similar injuries, to document facts, to provide information on costs, and to promote safety.
19. A good hazard inspector has knowledge of the

organization's incident experience, familiarity with incident potentials and with the standards that apply to his or her area, and the ability to make intelligent decisions for corrective action. A good inspector also can handle personnel and situations diplomatically and has an understanding of the organization's work-flow, systems, and products.

20. The acute effects of a toxic substance involve a short exposure time period. They can be the result of sudden and severe exposure, during which the substance is rapidly absorbed. They can also be related to an incident that disrupts ordinary processes and controls. Chronic effects are usually the result of exposure over a long period of time. When the chemical is absorbed more rapidly than the body can eliminate it, the chemical begins to accumulate in the body. If the level of the contaminant is relatively low, the effects may go unnoticed, even if they are serious and irreversible, for long periods because of latency, the time between exposure and the observed health effect.

incident (the undesired event), the investigator is able to reconstruct the system and pinpoint those elements responsible for the undesired event.

### **ANSWERS—CASE STUDY**

1. Fault trees are reverse images of positive trees, which show the requirements for success. Fault trees show ways troubles can occur. An analyst selects an undesired event, then diagrams in tree form all the possible factors that can contribute to the event. The branches of the tree continue until they reach independent factors. The analyst can then determine probabilities for the independent factors occurring. A fault tree requires a thorough analysis of a potential event and involves listing all known sources of failure. It is a graphic model of the various parallel and sequential combinations of system component faults that can result in a single, selected system fault. Fault trees are used more often than positive trees, which can easily become lists of "shoulds" and sound moralizing.
2. Analytical trees have three advantages: (1) They result in a thorough analysis without wordiness. Using known data, the analyst can identify the single and multiple causes capable of inducing the undesired event. (2) They make the analytical process visible, allowing for the rapid transfer of hazard data from person to person, group to group, with few possibilities for miscommunication. (3) They can be used as investigative tools. By reasoning backward from the