

1 SAFETY THROUGH DESIGN

QUIZ 1 (20 POINTS TOTAL)

True/False (6 points)

1. A safety through design program can be isolated from normal business planning.
 - a. true
 - b. false
2. Change is difficult and conformity is the norm.
 - a. true
 - b. false
3. Zero risk is an attainable concept, and something for which every company can strive.
 - a. true
 - b. false
4. Risk reduction costs should be considered separately from the hazard analysis/risk assessment exercise.
 - a. true
 - b. false
5. If the design of a work task is overly stressful, training and behavioral modification will reduce the frequency of injuries.
 - a. true
 - b. false
6. Assigning a quantitative hazard probability is generally not possible early in the design process.
 - a. true
 - b. false

Multiple Choice (6 points)

7. To understand how far an organization has progressed in safety through design, the safety practitioner should consider proposing a _____ as a standard of excellence against which other similar things are measured or judged.
 - a. checkpoint challenge
 - b. company history
 - c. benchmarking initiative
 - d. none of the above

8. As defined in the text, ____ is/are a set of perceptions, values, beliefs, and assumptions that determines how individuals see reality and affects how they behave.
 - a. culture
 - b. standards
 - c. focus
 - d. none of the above

9. In the design process there is one exceptionally important and highly variable factor that must be considered. What is that factor?
 - a. the cost of raw materials
 - b. the person who will use the product
 - c. the role of the safety practitioner
 - d. worker behavior

10. Because many companies still adopt a/an _____ mode in designing for safety, management and safety professionals tend to focus on behavior modification or training as solutions when the problem is workplace or work methods design.
 - a. proactive
 - b. reactive
 - c. behavioral
 - d. ergonomic

11. If the design of the work is overly stressful or if the work situation encourages employees to take risks, the causal factors of incidents are deemed to be _____.
 - a. employee errors
 - b. systemic
 - c. the result of unsafe acts
 - d. none of the above

12. The redesign of a manufacturing plant is the best time to _____ hazards.
 - a. eliminate
 - b. analyze
 - c. anticipate
 - d. all of the above
 - e. b and c only

Short Answer (7 points)

13. What is meant by the term safety through design?

- 14. In the Safety through Design Model, what aspects are considered “upstream”?

- 15. What are the benefits of safety through design?

- 16. Define risk and safety as used in the chapter.

- 17. What is a risk assessment?

- 18. What are some ways for modifying shock-concentrating surfaces?

- 19. List three objectives all companies should follow when developing a safety through design process.

Short Essay (1 point)

20. To achieve the greatest effectiveness in hazard avoidance, elimination, or control, companies should apply the Order of Design Precedence in all design and redesign processes. Name and describe (in order) these five priorities.

QUIZ 2 (20 POINTS TOTAL)

True/False (6 points)

1. In a proactive mode, companies look at design issues only after an incident has occurred.
 - a. true
 - b. false

2. A work situation is considered error provocative when people make more errors than they do with other work situations.
 - a. true
 - b. false

3. A company's resources will never be sufficient to eliminate every risk.
 - a. true
 - b. false

4. Companies can disregard ergonomics in the initial design process as such factors change over time.
 - a. true
 - b. false

5. A confined space should be designed so that maintenance and inspection can be performed from the outside.
 - a. true
 - b. false

6. A central point in the work of Alan Swain is that, "The improvement in system performance that can be realized from the redesign of equipment is usually greater than the gains that can be realized from the selection and training of personnel."
 - a. true
 - b. false

Multiple Choice (6 points)

7. The _____ method of hazard assessment utilizes a series of questions focused on equipment, processes, materials, and operator capabilities and limitations, including possible operator failures, to determine that the system is designed to a level of acceptable risk.
 - a. What Now
 - b. Who Me
 - c. What If
 - d. none of the above

8. According to the safety through design checklist, a _____ should be designed for continuous human occupancy, prompt egress, ease of ingress, and elimination of hazardous atmosphere wherever possible.
 - a. public rest room
 - b. confined space
 - c. washing facility
 - d. none of the above

9. When designing with an eye toward ergonomics, design for the _____th and _____th percentile.
 - a. 5 and 95
 - b. 10 and 90
 - c. 50 and 95
 - d. none of the above

10. If hazard analyses and risk managements are to be effectively made, those assigned the responsibility must be skilled in the use of the special analytical techniques available. At least _____ such hazard techniques have been developed.
 - a. 25
 - b. 250
 - c. 1,000
 - d. 1,500

11. Which of the following is considered a barrier to protect people, property or the environment from exposure to unwanted energy or hazardous material release?
 - a. slip-resistant work surfaces
 - b. using designs needing less maintenance
 - c. padding low overheads
 - d. directed venting

12. Which of the following is used to slow down the release of energy or hazardous material?
 - a. error-forgiving road margins
 - b. personal protective equipment
 - c. noise controls
 - d. rounded corners

19. In a design and equipment review, what are the responsibilities of the design engineer?

Short Essay (1 point)

20. In the space provided below, draw a figure of the safety through design model. Explain how such a model addresses hazards and risks in the design process.