***Basics of Occupational Safety and Health***

**End-of-Chapter Review Question Answers**

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**CHAPTER 1: WHY ARE SAFETY AND HEALTH IMPORTANT?**

1. What is the simple definition of occupational safety?

*Answer: Occupational safety is concerned with identifying, assessing, and eliminating or controlling workplace hazards.*

1. How much do occupational illnesses and injuries cost American businesses each year?

*Answer: $53 billion*

1. What is an “Agreement” state?

*Answer: An “Agreement” state is a state that has taken on and enforced its own worker safety laws beyond what is required by OSHA.*

**CHAPTER 2: BUILDING ON WHAT YOU HAVE**

1. Why is it important to be able to put safety into financial terms, rather than just incident severity and frequency rates?

*Answer: The higher up a management chain you go, the concerns are overwhelmed with numbers and making money. This separation from the human resource element sometimes leaves safety decisions lacking. A good safety program can improve profitability.*

1. If you want to make a change to a safety program, why is it important to know how much the change will cost?

*Answer: You need to be able to weigh the costs versus the benefits. If the cost of a change is great and the actual benefits—monetary or the safety of the employees—are small or nonexistent, then the change might not be worth it.*

1. What are the three main direct costs associated with employee injuries?

*Answer: Medical costs; wage replacement to the injured employee; and cost to repair or replace damaged buildings, equipment, materials, or products*

1. List at least four indirect or hidden costs associated with employee injuries and illnesses.

*Answer: Loss of production; cost of replacing an employee; loss of management’s time in all the related dealings with the incident; cost of damaged equipment related to the incident; lost wages to employees; administrative costs related to the incident; supervisor time; training replacement workers; spoiled product; interrupted service; late fees and penalties*

1. What is meant by the term *safety culture,* and how is it instilled in the workforce?

*Answer: Safety culture is a state of being where all members of a company place importance on and take responsibility for the safety of themselves and others. This is instilled by setting up a system of policies, procedures, and penalties that address occupational safety concerns; all of a company’s employees (managers and subordinates alike) are expected to uphold the system.*

**CHAPTER 3: ANTICIPATION AND RECOGNITION OF HAZARDS**

1. List two professional organizations that can be used to provide information about various workplace hazards.

*Answer: American Society of Safety Engineers (ASSE), National Institute for Occupational Safety and Health (NIOSH), American Industrial Hygiene Association (AIHA), National Safety Council (NSC)*

1. What is an OSHA 300 log, and why is it used?

*Answer: The OSHA 300 log documents job-related injuries, illnesses, and any lost work days they cause and whether they require treatment beyond rudimentary first aid; the log is for employers with more than 10 employees. It also is a way for employers to calculate injury rates so they can see how they measure up compared with similar industries as posted by the Bureau of Labor Statistics.*

1. If you had 50 workers and they worked 40 hours per week, 50 weeks per year, what would the incidence rate be if you had 3 different on-the-job injuries?

*Answer: The injury rate is 6.*

*50 employees ((40 hours/week) 50 weeks/year) = 100,000 total work hours*

*3 injuries (200,000 work hours)/100,000 employee hours/year = 6 injury rate*

1. Why is it important to learn as much as possible about an industry before analyzing the hazards associated with it?

*Answer: Knowing about common safety problems within an industry can help in predicting and focusing on problem areas in any given workplace within that industry.*

1. What are some factors you would look at to analyze a business activity for workplace hazards?

*Answer: Going into any workplace, you want to know of any equipment, materials, or stations that have a history of injury/illness. You also want to make sure that any Safety Data Sheets provided to the company in relation to its resources, are readily available for employee/responder review. Also all necessary safety equipment must be known and available.*

*A business environment might have issues related to toner exposure or perhaps floors that become slick when cleaned or walked on during inclement weather. There also might be fire hazards in the way of blocked passage or poorly stored records/paper. Work areas/computer setups should be conducive to the type of work, e.g., standing on a hard surface all day or poor desk height lending to carpal tunnel.*

1. What does the term *risk mapping* refer to in hazard assessment?

*Answer: Risk mapping is a methodical plotting of work areas that contain hazards, identification of the hazards, and a what-to-look-for list to make sure the area is as safe as possible.*

**CHAPTER 4: HAZARD EVALUATION AND RISK ASSESSMENT**

1. Once the hazards in a plant or a process are mapped, it is possible to begin to analyze the levels of risk for different areas and activities. What two parameters are used to calculate risk levels?

*Answer: Risk is the product of the probability of a negative event times and the severity of the outcome.*

1. If a work activity included work practices and systems that had little opportunity for worker exposure, what would the hazard probability ranking be?

*Answer: 2*

1. If a worker could not return to work, and needed to be rehabilitated for a new career, what would the hazard severity ranking be rated?

*Answer: 4*

1. What would the risk ranking be for a work activity or area that had a probability ranking of 4 and a severity ranking of 4?

*Answer: 16; probable and critical; operation not permissible*

**CHAPTER 5: CONTROLLING THE HAZARD**

1. What is the first method that should be considered for eliminating or minimizing hazards?

*Answer: Design out the hazard. Reduce the hazard via design of machine/equipment, process, tools, or work-area layout.*

1. What are some examples of engineering controls that can be used to minimize hazards to workers?

*Answer: Automated shut down devices, machine guards, specialty ventilation systems*

1. What are machine guards, and how are they used to protect workers?

*Answer: Machine guards are physical barriers, or specialized operational requirements, that protect workers by making it impossible to accidentally and, in some cases, purposefully be injured by the machine/process (e.g., saw blade covers, screens or cages over fans or pulleys, or devices that need two hands pressing a button before the dangerous parts activate).*

1. What are some examples of administrative controls used to protect workers from hazards?

*Answer: Warning signs and labels, training programs, written procedures or policies*

1. Why is good housekeeping considered a workplace administrative control?

*Answer: Many aspects of good housekeeping are requirements of fire codes or OSHA regulations, and many aspects can be controlled by checklists or other procedural methods.*

1. When should personal protective equipment be assigned and worn by workers?

*Answer: Personal protective equipment should be worn when working in a place where associated hazards exist even after all engineering and administrative controls have been implemented. PPE is worn as a last resort to protect workers from remaining hazards.*

**CHAPTER 6: SUPERVISORY LEADERSHIP IN SAFETY AND HEALTH**

1. What responsibilities should workplace supervisors have for occupational safety?

*Answer: Supervisors should be responsible for hazard recognition and control, safe work practices, and timely and thorough communication. Supervisors motivate employees to work safely and hold them accountable for good safety performance. Supervisors ensure prompt correction of unsafe acts or conditions as they become aware of them.*

1. List four different means to communicate safety policies and practices to employees.

*Answer: Start of shift department meetings, safety committees, new-hire orientation, signs/banners*

1. Why should employees be encouraged to come forward with safety concerns and suggestions?

*Answer: Full cooperation and participation is necessary for an effective safety corporate culture.*

1. Sometimes the only way to deal with workers that continuously break safety rules is termination of employment. What would you use to build a case for the dismissal of workers in these cases?

*Answer: Document continued serious injuries/illnesses despite existing safety procedures and demonstration of understanding of said procedures; negative influence on coworkers’ safety behavior*

**CHAPTER 7: INVOLVING EMPLOYEES IN INJURY PREVENTION**

1. Why are safety committees a good way to promote and develop company safety programs?

*Answer: They are a display of employer commitment to safety, and they encourage employee participation.*

1. How should one go about selecting members for a safety committee?

*Answer: Look for employees that set a good safety example, are knowledgeable in company practices/procedures, are decent communicators, attend regularly, and stay on topic during safety meetings.*

1. Do you think it would be a good idea to bring people onto the committee who are generally against safety rules and policies as a way to get them more involved? Why or why not?

*Answer: Yes, to a point. Getting problem people involved in a committee is a good way for them to see the effects of a lack of safety and everything that goes into keeping them safe. If they continue to be unsafe, however, this could adversely affect the behavior of other workers or safety committee members.*

1. What do you think should be the most important topic on a safety committee meeting agenda?

*Answer: Review of previously identified completed vs. incomplete tasks. There is no point to having a safety committee if nothing actually gets accomplished. Safety committees also need to report on new safety projects and concerns. They should present educational information on timely technical topics.*

1. What are the differences between a safety committee and a safety circle?

*Answer: A safety committee is a group that meets regularly and addresses safety from a more general standpoint, whereas a safety circle is an action committee that has identified a specific problem and is seeking the solution. A safety circle could be a result of a safety committee meeting.*

1. Why is it important to include unions in the development and implementation of safety programs?

*Answer: Safety is in the best interests of both employers and unions. A union can help encourage employee participation in a safety committee/program. A union can also act as an intermediary in communicating issues that can be construed as conditions of employment.*

1. What are some useful methods to effectively communicate safety policies and rules to employees throughout the company?

*Answer: Bulletins, newsletters, memos, seminars, training (perhaps with periodic re-certification), e-mail lists, and meetings*

**CHAPTER 8: FORMALIZING THE SAFETY AND HEALTH PROCESS**

1. What are some programs that OSHA requires to be in writing?

*Answer: Hazard communication, confined spaces entry, blood-borne pathogens, and process safety*

1. Why is it useful to have safety and health programs, policies, and procedures in writing?

*Answer: A written safety and health plan can be referenced for review periodically to determine where the company stands on achieving its safety goals. It also can list who is responsible for which parts of the plan, and how they are to set out to enact the plan. A written plan formalizes a company’s commitment to safety, making that commitment more real; if cited for safety violations OSHA may take the existence and thoroughness of these plans into account when assessing fines.*

1. Who is responsible for the safety training of temporary workers?

*Answer: Both the host employer and the temporary agency are responsible. While the host employer is the obvious choice for job-specific training, the responsibilities should be determined, discussed, and included in any contracts between the employers.*

1. What is the International Standards Organization, and what do they do?

*Answer: The ISO is an organization that, through the partnership of over 100 countries’ national standards groups, sets worldwide standards, primarily in the fields of environmental and safety management.*

1. What is a safety management system?

*Answer: A safety management system is a system developed to provide a systematic approach to managing safety.*

1. Describe the six basic principles that a safety policy statement should meet.

*Answer: (1)The organization’s senior management should be fully committed; (2) all staff and management have shared responsibility for safety; (3) programs and procedures must be written to fully address all regulations and standards of practice; (4) resources and methods must be available to evaluate program effectiveness; (5) the safety culture must be appreciated and promoted throughout the organization; and (6) goals should be revised to reflect new objectives to ensure continuous improvement.*

**CHAPTER 9: TRAINING IN SAFE WORK PRACTICES**

1. List at least five different training programs that are required by OSHA.

*Answer: Fire prevention, asbestos handling, welding, bloodborne pathogens, first aid/CPR, emergency planning, lead, laboratory safety, cadmium, hazard communication*

1. When would the knowledge and experience of a training expert be necessary?

*Answer: When the subject at hand is technical or involves complicated OSHA regulations/procedures*

1. What types of training might a human resources department conduct?

*Answer: Company attitude toward safety, general non-position-specific safety policies, importance of adherence to safety policies, and where further safety information/reporting can be done*

1. Why should the safety office be involved in design of the safety training program?

*Answer: It is important for all safety-related documentation and training records to be located in one place. It is also important for everyone, employers and employees alike, to know exactly where they can find the answers/resources they need in regards to safety.*

1. What are some training responsibilities of supervisors?

*Answer: Supervisors are responsible for job-specific safety procedures (policies are an HR topic), including a complete description of their position, responsibilities, equipment, and acceptable and unacceptable methodology (for instance, if the employee hasn’t been trained in lockout/tag out maintenance, they should not attempt to do so). It is also the supervisor’s responsibility to conduct follow-up training to ensure understanding and compliance. They should also alert the employee of any potentially hazardous areas that are not part of their job but may still affect them.*

1. Who is responsible for the safety training of temporary workers?

*Answer: In most cases, safety training is the responsibility of the safety department and supervisors at the job site. Temporary placement agencies may provide various safety training programs due to either contract with the employing client, or if they frequently send workers into the same work environment.*

**CHAPTER 10: SAFETY AND HEALTH INSPECTIONS**

1. Why are planned safety inspections an integral part of an effective safety program?

*Answer: Inspections may spot hazards or unsafe practices before they actually cause an injury, thus creating a safer work environment. Inspections may also keep employees on their toes, whom otherwise would become complacent and perhaps overlook important safety policies/procedures.*

1. What are some examples of unsafe conditions that would be reviewed as part of a safety inspection?

*Answer: Defective equipment, lack of machine guarding, clutter/blocked passage, poorly built/maintained facilities.*

1. What are some examples of unsafe work practices that may be reviewed as part of a safety inspection?

*Answer: Inadequate or lack of adherence to training, improper/unauthorized use of machines, poor housekeeping, and a general lack of professionalism are all practices that may be reviewed by or cause a safety inspection.*

1. What is the difference between a safety audit and a program review?

*Answer: Audits are planned, specific, and detailed inspections focused on a certain period. Program reviews are comprehensive evaluations of the general/overall safety program; ensuring adherence to known standards and regulations.*

1. How often should safety inspections be conducted?

*Answer: Many organizations do monthly inspections, but timing between inspections should reflect the varying nature of the job or the company’s commitment to safety and a safety culture. There could also be different inspections at different times, e.g., a monthly general safety inspection, and weekly or daily inspections of designated heightened hazards. Audits are often conducted annually and cover different topics or functional areas from year to year.*

**CHAPTER 11: INCIDENT INVESTIGATION**

1. Why is incident investigation an important aspect of an environmental health and safety program?

*Answer: An investigation can help find the root of a safety hazard and any holes in your safety program that may have allowed for the incident to occur.*

1. What is the maximum amount of time that should pass before the formal incident investigation should be distributed to the first reviewers?

*Answer: 48 hours*

1. What individuals should be involved in incident investigations?

*Answer: The injured worker and their immediate supervisor should always be involved in an incident investigation. In some cases, additional participants could include safety committee members and coordinators, union representatives, workers comp carriers, insurance carriers, or higher levels of management. In difficult cases, a pertinent specialist is needed to help determine the root of the incident.*

1. In which cases should the incident scene be preserved for further investigation?

*Answer: Preservation and video/photo documentation of an incident is important if there is a severe injury or illness, a fatality, extensive property damage, or the possibility of nefarious or criminal activities that led to an incident.*

1. Why are photos or video recordings useful in incident investigations?

*Answer: Photo and video recording during an incident investigation can help reviewers identify aspects of the situation that may have been missed by the initial investigation. It may be deemed necessary at a later time to investigate more thoroughly or by another party. These forms of documentation can help not only with the investigation but future litigation.*

1. Why should witnesses to incidents be interviewed privately and separately?

*Answer: If allowed to discuss the incident or hear others’ accounts, a witness may change a story to not contradict another person’s, or to replace a point of potential confusion. Keeping your witnesses separate increases the likelihood of getting the whole truth, from each person, as they see it.*

1. What are the three key elements involved in an incident investigation follow-up?

*Answer: Who will do what in regard to preventing recurrence; when will the corrective actions occur; and what are the costs (equipment/property damage; downtime; workers comp; and medical, temporary or permanent employee replacement) of the incident*

1. What is a “near miss,” and why is it useful to complete incident investigations after them?

*Answer: A near miss is a situation that could have become an incident, but no one was harmed. It is important to investigate near misses because they are just as likely to point out a flaw in a safety program or safety practices. Even if someone does not end up hurt, the situation is no less important; next time someone may not be so lucky.*

**CHAPTER 12: IN THE EVENT OF EMERGENCY…**

1. What does OSHA require in terms of medical and first aid services for workplaces?

*Answer: OSHA requires that businesses be either within four minutes of a clinic/hospital emergency room or have persons with medical and first aid training on site at all times.*

1. Why are workers sometimes reluctant to report injuries or exposures to hazardous materials? What are some ways to overcome these difficulties?

*Answer: Some workers don’t report injuries because they are embarrassed or afraid of investigations, paperwork, or disciplinary actions. Ensuring that managers show concern for their employees and an openness to complaints, reports, and concerns without the fear of backlash; emphasis during training of the importance of reporting incidents; having a clean and efficient first aid staff and office; and counseling, comforting, and determining the reasons for non-reporting personnel are all ways to encourage reporting and participation of a safety program.*

1. What are five examples of written emergency action plans that are required when an employer has more than 10 employees?

*Answer: Escape routes/procedures; assignment of medical and rescue duties; marking exits with clearly visible signs; marking non-exit doors/passageways to reduce evacuation confusion; and having multiple exits at far enough distances that if one is blocked the other likely isn’t are some of the written emergency plans required of employers with more than 10 employees.*

1. What are three key features of OSHA-required fire prevention plans?

*Answer: OSHA requires a written fire prevention plan that lists major workplace fire hazards, handling and storage procedures, and the names and job titles of those responsible for maintenance of equipment or fuel sources.*

1. What are three physical means available to reduce the possibility of workers being injured by workplace violence?

*Answer: Better lighting and visibility; barriers such as bulletproof glass or size of a counter; and locked, restricted access to work areas are some of the ways workplace violence can be mitigated.*

1. What percentage of workplace fatalities are attributed to homicide?

*Answer: 17%*

**CHAPTER 13: WORKING WITH OSHA**

1. What kinds of workers are not covered under OSHA?

*Answer: The self-employed; family members of farmers with fewer than 10 employees; and employees that work in an environment in which the health and safety conditions are regulated by another federal agency*

1. When was OSHA created?

*Answer: 1970*

1. List four employee rights under the OSHA act.

*Answer: Access to one’s own exposure records; review of the OSHA 300 log; meeting with a compliance officer after an investigation; and the request of investigation of believed standards violations*

1. What does the OSHA General Duty Clause state?

*Answer: The OSHA General Duty Clause states that employers are required to provide a workplace that is devoid of known hazards that cause, or are likely to cause, death or serious injury.*

1. Why is recordkeeping such an important part of OSHA’s responsibilities and activities?

*Answer: The OSHA-required records help when doing research and calculating statistics on workplace hazards. They also provide written accountability of employers and employees in regard to incidents and hazards. These records can provide a basis for court cases, or for an employer to know which areas of operation need improvement.*

1. In order of decreasing priority, when does OSHA conduct inspections?

*Answer: Imminent danger situations, in which workers’ lives or physical well-being are in immediate danger; investigations caused by death or the hospitalization of three or more workers; worker complaints of violations or unsafe work conditions; expected inspections of high-hazard industries; and follow-up inspections*

1. What are the six main types of OSHA violations?

*Answer: Willful violations in which the employer is aware of a violation but makes no attempt to correct it; serious violations in which the employer should know that a hazard likely to cause death or injury exists; other-than-serious violations that pose a hazard but are not likely to cause death or serious harm; repeat violations; failure-to-correct-prior violations; and de minimus violations that have no direct impact on worker safety or health*

1. Explain the difference between a horizontal standard and a vertical standard.

*Answer: A horizontal standard applies to various different industries in which a similar hazard exists (e.g., asbestos handling or hazardous materials handling and storage). A vertical standard applies to a specific industry (e.g., construction or the long-shoring industry).*

1. If a company receives an OSHA violation, how long do they have to contest the citation in writing?

*Answer: The company has 15 working days from the time that the citation and proposed penalty are received.*

**CHAPTER 14: OCCUPATIONAL HEALTH**

1. What are some ways to reduce the likelihood and severity of back injuries and strains in the workplace?

*Answer: Use of machine-assisted lifting apparatuses, safe-lifting training, and availability of ergonomically designed chairs for prolonged sitting are some of the ways back injuries and strains can be avoided.*

1. What are three common causes of cumulative trauma disorders?

*Answer: Constant repetition of a particular motion, forceful repetition of a particular motion, and awkward positioning of the extremities are the most common causes of cumulative trauma disorder.*

1. What does the Hazard Communication standard require employers to do?

*Answer: Employers must provide a written inventory of hazardous chemicals; train their employees on the safe use of hazardous chemicals; provide Safety Data Sheets, labels, and signs to all potentially affected personnel; and maintain an up-to-date written hazard communication program.*

1. What are four routes of exposure to hazardous chemical agents?

*Answer: The four routes of exposure to hazardous chemicals are through inhalation, absorption through the skin, ingestion, and injection by infected needles or instruments.*

1. What types of workers are protected by the Bloodborne Pathogen standard?

*Answer: The Bloodboorne Pathogen standard is intended to protect (but is not limited to) workers in hospitals, nursing homes, blood banks, medical and dental offices, occupational medical departments, first aid personnel, and body modification professionals.*

1. What are three reasons why hearing loss from occupational overexposure is so tragic?

*Answer: Hearing loss from occupational exposure is tragic because of how easily identified hazardous levels of noise are; the dangers of noise exposure are well-known and documented; and finally, noise damage prevention is simple, through various engineering controls or simple personal protection equipment such as ear muffs/plugs.*

**CHAPTER 15: CONTINUOUS IMPROVEMENT AND MANAGEMENT SYSTEMS**

1. Why is continuous improvement an important aspect of an effective safety program?

*Answer: When a company stops trying to improve its safety measures, the program stagnates. Continuous improvement keeps both the safety professionals and the everyday worker involved in the safety process, and that is the key to a successful safety program.*

1. What is the most important incident prevention role of the safety coordinator?

*Answer: The most important job of a safety coordinator is acting as a resource that can provide information, assistance, and materials to line managers. While the line managers are predominantly occupied with production, the safety coordinator can take on the responsibility of investigating new processes and materials that could be used to replace active, more hazardous ones.*

1. Why are financial incentives and rewards an effective tool in a continuous improvement system?

*Answer: Rewarding employees for safe practices and hazard detection can be an effective tool for continuous improvement because it can increase morale, loyalty, and lead to a more proactive approach to the company’s safety program.*

1. What is one fallback of rewarding employees for having reduced injury and illness rates?

*Answer: Offering rewards based on injury and illness rates can encourage employees to not report incidents or seek treatment for fear of losing the potential reward.*

1. What do you think the best sort of safety recognition approach is? Why?

*Answer: Answers may vary. Possible answer: The best approach to safety recognition is not rewarding a lack of incident reports, as much as it is rewarding and acknowledging those acts and persons that prevent the potential incidents. Reward those people that discover a hazard, are seen encouraging proper safety techniques, or have suggestions for process improvement.*

1. Why is the systematic and continuous collection of performance metric data an important aspect of continuous safety program improvement?

*Answer: This data is the feedback that informs you of the effectiveness of your safety program. If you make a change in your safety program, the continued monitoring of this data will let you know if it was a positive, negative, or ineffectual change. This data can also give you a heads up if the program remains unchanged or that something else in the operation of the company has changed and needs to be addressed.*