Industrial Hygiene 101 for Employees
FACT SHEET

LENGTH: 15 MINUTES **Production Year: 2025**

PROGRAM SYNOPSIS:
Industrial hygiene is a program that seeks to reduce factors that can cause illness among workers and the general community. The four main components of the industrial hygiene process regarding hazards are anticipation, recognition, evaluation, and control. As an employee, you may be expected to interact with or assist an industrial hygienist. This program examines the role of employees in the industrial hygiene program.

PROGRAM OBJECTIVES:
After watching the program, the participant should be able to explain the following:
- What industrial hygiene is;
- The four principles of industrial hygiene;
- The process of recognizing and evaluating hazards;
- The role of sampling in the workplace;
- The hierarchy of controls when dealing with hazards.

PROGRAM OUTLINE:
INTRODUCTION
- Industrial Hygiene. As an employee of a safety-minded organization, you are probably familiar with the term but may not fully understand what it's all about and how it fits into your employer's other safety, health, and environmental efforts.
- Paraphrasing from OSHA, industrial hygiene is "that science and art devoted to the anticipation, recognition, evaluation, and control of workplace environmental factors or stressors, which may cause sickness, impaired health and well-being, or significant discomfort among workers or the citizens of a community."
- As stated in this definition, the four main components of the industrial hygiene process are anticipation of hazards, recognition of hazards, evaluation of hazards, and the control of hazards.
- As an employee, no one expects you to be a certified industrial hygienist, but you may be asked to interact with or assist the person that is. You may be asked to assist with air, water, or other sampling efforts or you may be selected to wear a monitor to measure concentrations of a potential contaminant.
- Just remember, the industrial hygienist, in partnership with management, is seeking to detect and control any hazards that negatively impact the health and well-being of workers and success takes a team effort, starting with the first principles of industrial hygiene, "anticipation."

ANTICIPATION OF HAZARDS
- You don't have to be an industrial hygienist to successfully anticipate the hazards of your workplace, but you do need to have experience in your industry and an understanding of the materials, processes and practices utilized. Here are some common examples of hazards that an industrial hygienist will be looking for.
- Chemical hazards: These may be solids, liquids, gases, mists, dusts, fumes, or vapors. Examples include asbestos, lead, and silica.
- Biological hazards: These include bacteria, viruses, fungi, and other living organisms that can cause acute or chronic infections or other health concerns.
- Physical hazards: These include the presence of excessive noise, extreme temperatures, or vibration, as well as the presence of ionizing or non-ionizing radiation.
- Ergonomic hazards: These stem from repetitive motion, poor posture, or exposure to excessive strain over prolonged periods of time.
- The various ways some of these hazards enter or impact our bodies are called "routes of exposure" and include inhalation, ingestion, absorption through the skin, needlesticks or other "sharps" exposure, and auditory exposure from harmful noise levels.
- In addition to anticipating any potential routes of entry, it's important to determine if the potential health effects would result from acute or chronic levels of exposure.

- Acute exposures to hazards typically involve a large quantity of a hazard over a short period of time, while chronic exposures typically involve a small quantity of a hazard over a long period of time.
- You employer will have a determination made as to which of these hazards may exist in your workplace and develop a plan to protect workers from harmful exposure. Doing so will involve the industrial hygiene principle of recognition.

RECOGNITION OF HAZARDS

- The hazard recognition step in the industrial hygiene process considers the list of anticipated hazards and makes a determination as to where in the workplace these hazards actually exist. This is where a cooperative effort is often required.
- A contracted industrial hygienist working on their own may have trouble recognizing the existence of various hazards due to a lack of familiarity with the workplace and its related processes.
- And even your supervisor, or other members of management, may have the same issues. They may not completely understand the step-by-step workflow you and your coworkers use to perform and complete your daily tasks.
- Ultimately, workers are the experts at their own jobs. Be sure to share your opinions and observations about the potential for hazardous exposures related to your job.
- In general, the cooperate efforts of management, employees, and industrial hygienists is required to recognize the existence of hazards. This process is often referred to as a "worksite analysis." Some common elements of a worksite analysis include interviewing workers and direct supervisors about any suspected hazards, observing the various job tasks and process as they are performed, taking note of the presence of any hazardous materials or substances related to the work, documenting the physical and health effects of any potential exposures, and reviewing past injury and illness statistics.
- Keep in mind that worksite analysis is not "one size fits all;" it should be tailored to the type of work being done and the environment in which the work is performed. If the worksite analysis confirms the presence of any anticipated hazards, the next step in the industrial hygiene process is an "evaluation."

EVALUATION OF HAZARDS

- After anticipating and recognizing the presence of hazards in the workplace, the next step is to evaluate the risk of exposure through an "Occupational Exposure Assessment." The most common evaluation method is taking measurements to detect whether or not a hazard is present, and if so, what concentration or magnitude is present.
- An exposure assessment identifies and characterizes workplace exposures, develops estimates of exposure levels, and evaluates the significance of exposures as well as the effectiveness of any current intervention strategies.
- The exposure assessment will typically involve the collection of data through various methods such as air sampling, personnel monitoring, and/or biological monitoring.
- This process of data collection as part of the industrial hygiene evaluation is known as "sampling." Both the Occupational Safety and Health Administration (OSHA) and the National Institute for Occupational Safety and Health (NIOSH) have provided employers with instructions on how to conduct industrial hygiene sampling. Sampling methods will vary based on the hazard or contaminant.
- The person who performs sampling should have specific knowledge of sampling procedures, including sampling media, recommended air volumes, and sample storage precautions.
- A person qualified to perform sampling will be able to select the appropriate sampling method, equipment, and media, calibrate the sampling equipment used, verify the air flow rate when air pumps are used, unpack, install, and utilize various types of sampling media, and explain to employees how to properly wear the sampling equipment and for how long.
- In addition, the person performing sampling must document the specific sampling equipment used with each employee and/or work area and accurately record the results of each sample, being sure to maintain and document the chain of custody for all samples throughout the process.
- Sampling can be performed by a trained in-house professional, such as a safety manager or an in-house industrial hygienist, or it can be contracted out and performed by a company specializing in industrial hygiene.
- The results of the exposure assessment, which include the sampling data, are useful for a variety of purposes including risk assessment (to calculate the exposure and/or dose of a hazard that workers may experience throughout the day), evaluation of control measures (to ensure efforts to reduce hazard exposures are effective), compliance (to ensure all operations and processes are following local, state, and federal regulations), and emergency response (to

identify the existence of an emergency situation, such as when conditions arise that are immediately dangerous to life and health). These types of conditions are known as “I-D-L-H” conditions.

CONTROLLING HAZARDS

- Of course, the purpose of the entire industrial hygiene process is to protect people from harmful exposure to hazards. And once those hazards have been recognized and evaluated, they must be controlled.
- When implementing industrial hygiene control measures, best practice is to follow the same “hierarchy of controls” used when controlling other workplace hazards as part of your overall safety and health program.
- As with all hazards, the first (and best) option is to eliminate the hazard if possible. Unfortunately, elimination is often not possible because it would mean removing a process or product that is typically necessary for production.
- If elimination is not possible, the next option in the hierarchy of controls is substitution. Substitution means replacing a hazardous or dangerous item or object with one that presents a lesser hazard.
- If substitution is not possible or doesn’t fully control the hazard, the next option in the hierarchy of controls is to control the hazard using engineering controls.
- Engineering controls are physical, chemical, or biological changes made to a process or product that reduce exposures to the hazard. Examples of engineering controls include using automation, so workers don’t have to be as close to the hazards, isolating the person from the process or hazard using physical barriers, using ventilation to draw contaminated air away from workers, and installing control equipment such as air filtration units to separate hazardous agents from the medium in which it is embedded.
- When hazard elimination and/or engineering controls are not feasible or effective, then the next the next option in the hierarchy of controls is to control the hazard using administrative controls.
- Administrative controls are procedures or work methods put in place that regulate how, when, how often, or by whom tasks are performed in order to reduce employee exposure to hazards.
- Examples of administrative controls include creating work procedures that reduce exposure levels, performing regular cleaning of work surfaces, utilizing proper hand washing techniques, conducting routine training including emergency drills, restricting access to areas that have potential hazards, and limiting work time to lessen the amount of time exposed to hazards.
- The final option in the hierarchy of controls is the use of personal protective equipment or “PPE.”
- According to OSHA, PPE should only be used as a control method when “exposure to hazards cannot be engineered completely out of normal operations or maintenance work, and when safe work practices and other forms of administrative controls cannot provide sufficient protection.”
- Examples of PPE include respirators, hearing protection, gloves, chemical suits and lab coats, and of course, safety glasses or goggles.
- As an employee, understand that it is your employer’s responsibility to provide you with any required PPE at no cost to you and provide you with the training in the selection, care and use of any personal protective equipment to be used.

CONCLUSION

- There are certain workplace hazards that require a more detailed control process than the traditional safety hazards that are more easily identified and corrected.
- Your employer will use the industrial hygiene process described in this program, in conjunction with your organization’s other processes for identifying and controlling hazards, to ensure a safe and healthful workplace for everyone.
- Whether your organization utilizes qualified in-house resources or hires outside industrial hygiene services, be prepared to assist in the anticipation, recognition, evaluation, and control of any workplace hazard that could impair the health and well-being of you or your coworkers.

INDUSTRIAL HYGIENE 101 FOR EMPLOYEES

ANSWERS TO THE REVIEW QUIZ

1. a
2. a
3. b
4. a
5. a
6. b
7. b
8. a
9. a
10. a

INDUSTRIAL HYGIENE 101 FOR EMPLOYEES

REVIEW QUIZ

Name_____Date_____

The following questions are provided to determine how well you understand the information presented in this program.

1. The four main components of the industrial hygiene process are anticipation of hazards, recognition of hazards, evaluation of hazards, and the control of hazards.

a. True
b. False

2. Ergonomic hazards stem from repetitive motion, poor posture, or exposure to excessive strain over prolonged periods of time.

a. True
b. False

3. A contracted industrial hygienist, working on their own, will immediately be able to recognize all the hazards of a job with no input from employees.

a. True
b. False

4. If the worksite analysis confirms the presence of any anticipated hazards, the next step in the industrial hygiene process is an "evaluation."

a. True
b. False

5. A person qualified to perform sampling will be able to select the appropriate sampling method, equipment, and media, and calibrate the sampling equipment used.

a. True
b. False

6. "I-D-L-H" conditions are not that serious and can be worked in with very little protection.

a. True
b. False

7. The first (and best) option in the hierarchy of controls is to provide workers with PPE.

a. True
b. False

8. If substitution is not possible or doesn't fully control the hazard, the next option in the hierarchy of controls is to control the hazard using engineering controls.

a. True
b. False

9. Administrative controls are procedures or work methods put in place that regulate how, when, how often, or by whom tasks are performed in order to reduce employee exposure to hazards.

a. True
b. False

10. It is the employer's responsibility to provide workers with any required PPE at no cost to the employee and to provide training regarding any PPE to be used.

a. True
b. False