Course Learning Outcomes for Unit I

Upon completion of this unit, students should be able to:

3. Explain the practice of industrial hygiene and how it fits within an environmental health and safety (EH&S) program.
   3.1 Define industrial hygiene.
   3.2 Explain the role of the industrial hygienist in an environmental health and safety program.

4. Discuss the management of issues from the perspectives of anticipation, recognition, evaluation, and control.
   4.1 Describe each of the five aspects of industrial hygiene and the best practices associated with each.
   4.2 Identify each step of a qualitative risk assessment.

7. Evaluate types of hazard controls, including elimination/substitution, engineering, administrative, and personal protective equipment (PPE).
   7.1 Determine the correct order of controls from best to least desirable within the hierarchy of controls.

Reading Assignment

Chapter 6: Best Practices

Unit Lesson

When beginning an industrial hygiene journey, a distinction must first be made between the terms occupational safety and occupational health. In today's world, it is not uncommon to see the acronym EH&S, which commonly stands for environmental health and safety.

A good way to look at the term environmental (E) is in the context of anything inside the plant that can affect something outside of the plant. Think of floor drains that eventually dump wastewater into a stream or river. Also, think of big plumes of effluent coming from a foundry and the potential impact on the atmosphere. In terms of an associated federal agency, the Environmental Protection Agency (EPA) is undoubtedly the most recognizable entity and is responsible for a plethora of regulations covering various aspects of the environment.

This is also a good time to think about the role of the safety professional or industrial hygienist relative to environmental issues. Depending on the type and size of the business, there may be a standalone environmental specialist on staff, or environmental duties may fall under the purview of the environmental health and safety manager. Most occupational safety curriculums will include a course or courses with some content related to environmental issues.

The next term to look at is safety (S). Most people in the general public use the term safety without realizing that it encompasses more than just the concept of preventing accidents. Traditional safety topics include electrical safety, lock out/tag out, ladder safety, confined spaces, and so on. As was stated earlier, most occupational safety specialists would say that they manage many programs that would not be traditionally considered under the umbrella of safety. Industrial hygiene is a great example.

The next term to discuss is health (H). An important part of health is hygiene. The word hygiene comes from the Latin term hygieina, which describes the science behind the preservation of health ("Hygiene," n.d.).
Sometimes, it might seem confusing or difficult to put a particular subtopic under either a safety or industrial hygiene umbrella. One guideline to use is the concept of exposure. Take noise as an example. If you are exposed to levels of noise that damage your ability to hear, this would traditionally be thought of as a health concern and would fit nicely under the umbrella of industrial hygiene. However, it is not always that easy. Some safety professionals are adamant that ergonomics belongs under the safety umbrella. However, others would view carpal tunnel syndrome or the more generic term repetitive stress injuries as a traditional safety topic. The American Industrial Hygiene Association (AIHA) (n.d.) defines industrial hygiene as follows:

Industrial Hygiene is a science and art devoted to the anticipation, recognition, evaluation, prevention, and control of those environmental factors or stresses arising in or from the workplace which may cause sickness, impaired health and well-being, or significant discomfort among workers or among citizens of the community. (para.1)

It is important to break down the definition and identify some very important key concepts. What does it mean to refer to something as both a science and an art? To most people, the term *science* implies a quantitative or numeric-based approach. A good example of a scientific discipline is mathematics. In math, you take a formula, plugs numbers into it, and you end up with an answer. There is nothing controversial about it. Either you get the correct answer or you do not. However, when the term *art* is considered, the connotation is more qualitative in nature than quantitative. A good term to review at this point is professional judgment.

In the world of medicine, a practicing physician gains clinical knowledge through treatment of patients. In some cases, there is no clinical test that can be done to explain why a patient feels ill. In this case, the physician must rely on knowledge and experience to make an official diagnosis. Put another way, the diagnosis is based on professional judgment. Clearly, the more clinical experience the physician possesses, the better able he or she is to make a professional judgment. This is also very true in occupational safety and industrial hygiene. For example, say that an industrial hygienist is asked to evaluate a potential exposure to a chemical. The employee involved is having the following symptoms: headache, fever, and general fatigue. The industrial hygienist is able to evaluate the employee’s work activities and determine that there is a potential exposure to an organic material that the employee is working with and inhaling on a daily basis. An air-sampling survey is conducted and concludes that the concentration of the chemical in the air is below the exposure limit published by the Occupational Safety and Health Administration or OSHA. What is the next step? Should the industrial hygienist tell the employee “everything is fine” or “based on the results, you should not be having any symptoms”? Regardless of the results, the industrial hygienist will need to recommend some sort of intervention that will help correct the problem and hopefully make the employee feel better.

The textbook does a nice job of defining and discussing the terms anticipation, recognition, evaluation, prevention, and control. However, the last half of the AIHA definition is worthy of consideration. Specifically, what do the terms well-being and discomfort mean? In an earlier example, you might say that the employee’s well-being is negatively impacted and that he or she is experiencing discomfort—even when the sampling results show the exposure to be at an acceptable level (from a regulatory point of view). Much of the field of industrial hygiene involves air-sampling results and exposure limits, so industrial hygienists must be savvy and apply their knowledge, expertise, and experience to solve occupational health problems.

Certainly, air sampling or assessing exposure is traditionally considered the classic practice of industrial hygiene. If you want to assess an individual worker’s exposure to a chemical via inhalation, the most common method used is air sampling using a pump and some type of media like a filter or a charcoal tube. Industrial hygienists receive formal training on how to conduct sampling during their education and training. The results of the sampling are then compared to recognized exposure limits published by the Occupational Safety and Health Administration (OSHA) or organization, and the hygienist is able to determine if there is an unacceptable exposure or not. Earlier, professional judgment and industrial hygiene were referred to as both a science and an art. Do not forget that most work environments are dynamic in the sense that work activities (and exposures) can change from day to day. There is a great opportunity to dig into an exposure assessment or air-sampling report in Unit IV.

References


**Suggested Reading**

To truly appreciate what the field of industrial hygiene encompasses, take a look at the following web page and the video titled *The Right Thing to Do – What is Industrial Hygiene?* from the AIHA.