AIHA CareerWorks: Balancing Work, Health, Technology & Environment

Definition and Background of the Profession

Industrial hygiene is the anticipation, recognition, evaluation, and control of workplace environmental factors that may affect the health, comfort, or productivity of the worker. Industrial hygiene is considered a science, but it is also an art that involves judgment, creativity, and human interaction.

Although some occupations may appear more dangerous than others, potential short-term and long-term health hazards occur in every profession, whether a person is employed as a banker or as a construction worker. Industrial hygienists play an important role in ensuring that the workplace is as free from hazards as possible and workers and the community at large are protected from potential health threats. As our world moves through the "Information Age" and new, possibly hazardous technologies are emerging every day, the industrial hygienist’s job function becomes more valuable to the health and well-being of workers, the community, and the environment.

Some areas that industrial hygienists may get involved in include:

- **Asbestos**—testing for and possibly removing asbestos. This mineral fiber, which has fire-resistant capabilities and was used for insulation in buildings, is now known to cause cancer and other illnesses.
- **Biological Monitoring**—determining if toxic materials have reached a person by searching for them in the person's body and by evaluating the body’s “byproducts,” such as blood.
- **Biosafety**—ensuring that materials such as bacteria, viruses, used syringes and needles, etc., are handled safely so as not to infect workers.
- **Confined Spaces**—establishing procedures to safely enter closed spaces not designed for human occupancy, such as storage tanks.
- **Ergonomics**—helping to limit disabilities due to repetitive and/or prolonged movement, such as typing at a keyboard or sitting at a desk all day. One disability industrial hygienists frequently encounter is carpal tunnel syndrome, a common stress injury; another is lower back trauma.
- **Environmental Lead**—finding solutions to problems occurring from unsafe levels of lead found in old paint, contaminated water, and other materials.
- **Exposure Assessment Strategies**—measuring human exposures to toxins (i.e., solvents, asbestos).
- **Hazard Evaluation**—determining the real potential for ill health effects by performing such functions as testing for potentially hazardous gases and vapors, measuring noise levels, and evaluating results from such measurements and tests.
- **Indoor Environmental Quality**—ensuring inside air is safe and free from irritants and toxins, including problems such as sick building syndrome and second-hand tobacco smoke.
- **Radiation**—testing and controlling radiation emitted from power lines, electromagnetic fields, radioactive materials, etc.
- **Laboratory Health and Safety**—protecting workers involved in research and development.
- **Toxicology**—studying the nature and action of poisons and exactly how they cause ill health effects.
The Development of Industrial Hygiene as a Profession

Although the profession of industrial hygiene gained prominence in the last half of the 20th century as a result of the Occupational Safety and Health Act of 1970, evidence suggests the field of industrial hygiene began as early as the 4th century BC. It was at this time that Hippocrates, known as the Father of Medicine, recognized lead poisoning as an occupational disease when he identified a severe colic attack in a man who extracted metals and then recognized lead as a cause of the symptoms.

Moving ahead to the eighteenth century, Bernardino Ramazzini, the Father of Occupational Medicine, was an advocate of protective measures for workers and eventually encouraged factory safety and workmen’s compensation laws. He also wrote the book De Morbis Artificum Diatriba (On Disease of Tradesmen), which outlined the health hazards of irritating chemicals, dust, metals, and other abrasive agents encountered by workers in 52 occupations.

The Chimney Sweepers Act of 1788 and the English Factory Act of 1833, both passed in England, are considered the first effective legislative acts related to the field of industrial hygiene. The Chimney Sweepers Act recognized soot as the cause of a form of cancer occurring in chimney sweepers and made it illegal to employ children under the age of eight as chimney sweepers. The English Factory Act also dealt with child labor issues, proclaiming that children could not work until the age of 9.

In the early 20th century, a number of groups were formed to help protect the health and safety of workers and the public. In 1910, the U.S. Bureau of Mines was founded with a mission to conduct research and collect information concerning almost every activity involved in recovering minerals from the earth, making them into useful products, and recycling materials for future use. In 1912 the U.S. Public Health and Marine Hospital Service was changed to the Public Health Service. In the U.S. Public Health Service, commissioned officers served their country by controlling the spread of contagious diseases such as smallpox and yellow fever, conducting important biomedical research, regulating the food and drug supply, providing health care to underserved groups, and supplying medical assistance in the aftermath of disasters, as well as in a variety of other ways. One year later in 1913, the first state industrial hygiene programs were launched by the New York Department of Labor and the Ohio Department of Health.

Associations began to bring health and safety professionals together. In 1938, the American Conference of Governmental Industrial Hygiene (ACGIH) was established; one year later the American Industrial Hygiene Association (AIHA) was founded. The American Academy of Occupational Medicine followed in 1946.

The U.S. Congress also paid attention health and safety issues, passing the Metal and Nonmetallic Mines Safety Act of 1966, which defined health and safety standards for metal and non-metal mines. In 1969, the Federal Coal Mine Health and Safety Act was passed to provide additional health protection for miners.

These events culminated in 1970 with the passage of the Occupational Safety and Health Act, set forth to ensure safe and healthful working conditions and to preserve human resources. The goal of this legislation was to make sure employers provide their workers a place of employment free from recognized hazards to safety and health, such as exposure to toxic chemicals, excessive noise levels, mechanical dangers, heat or cold stress, or unsanitary conditions.

Today, the industrial hygienist’s role is proactive; instead of correcting problems after they occur, industrial hygienists work with management to anticipate problems that could occur and take action to prevent them before they happen. Industrial hygiene is a long-term, profitable investment with a powerful return: worker health and safety, lower risk, and improved productivity. Industrial hygienists unite management, workers, and all segments of a company behind the common goal of health and safety.

While continuing the efforts of Hippocrates, Ramazzini, and the advances of the industry in the twentieth century, the scope of the industrial hygienist has widened to encompass everything from environmental awareness to sustainability to social concerns worldwide. The events of September 11, 2001, also brought emergency response programs to the forefront of the industry. Local, state, and federal agencies are combining efforts to train first responders in the event of a natural or manmade disaster. Wherever workers or the community face health and safety risks, industrial hygienists are there to offer their expertise and find solutions.

The Federal Government’s Role
Industrial hygienists have played an important role in shaping and implementing government policy concerning worker health and safety. In 1970, Congress passed the Occupational Safety and Health Act, which formed the Occupational Safety and Health Administration (OSHA). OSHA, which is part of the U.S. Department of Labor, is responsible for setting and enforcing health and safety standards across the country. In addition, some special OSHA-approved offices that are administered by individual states also conduct health and safety inspections.

The National Institute for Occupational Safety and Health (NIOSH), a branch of the U.S. Department of Health and Human Services, was created to learn more about occupational illnesses and how to prevent them. Some of the most exciting research in the field of industrial hygiene is performed at NIOSH. NIOSH also aids in the training of industrial hygienists. A large number of industrial hygienists who received master’s degrees since 1970 earned graduate scholarships paid for by NIOSH.

**Job Diversity Within the Industrial Hygiene Profession**

Job diversity is a major benefit to consider when choosing a career in the environmental health and safety arena. A wealth of unique employment opportunities exists for industrial hygienists. Unlike many other professions, industrial hygienists are not limited to one particular type of industry; they are employed in a variety of organizations such as:

- Public utilities
- Government
- Labor unions
- Research laboratories
- Hospitals
- Hazardous waste companies
- Colleges and universities
- Insurance companies
- Consulting firms
- Chemical companies
- Manufacturing companies

Many industrial hygienists work for private corporations or federal and state government agencies as salaried employees. However, the fastest growing segment of the industrial hygiene profession is self-employment/consulting. As the world changes, the industrial hygiene profession is constantly faced with new challenges. The industrial hygienist will find that an even greater number of job opportunities will evolve as more government and corporate leaders realize the importance of health and safety in all phases of planning and daily operations.

Many of these opportunities will lead to upper management positions, as employers realize the industrial hygienist’s job is a multifaceted one that touches every aspect of an organization. The industrial hygienist acts as an adviser, making recommendations and setting standards to keep the workplace safe. This calls for working with employees at all job levels and requires a genuine commitment to caring about people and the environment.

**Preparing for a Career in Industrial Hygiene**

**Educational Requirements**

Although more schools are beginning to offer undergraduate programs in industrial hygiene, currently few schools have an industrial hygiene major. Industrial hygienists generally prepare for their careers by pursuing an undergraduate degree in one of the sciences, such as engineering, chemistry, biology, etc. Many then continue on to attain a master’s or doctoral degree in industrial hygiene.

Some colleges offer a one- to three-year associate’s degree and a certificate program that qualifies students as industrial hygiene technicians. A technician assists an industrial hygienist and other occupational health
and safety professionals in gathering and analyzing data and in ensuring that programs and regulations are
enforced.

According to a 2003 member survey by the American Industrial Hygiene Association (AIHA), which is
composed of more than 12,000 health and safety professionals, 93 percent of AIHA members are college
graduates, 60 percent have master’s degrees, and nearly 10 percent have doctoral degrees.

After you have worked in the industrial hygiene field for five years, you are eligible for certification. To
become certified, you must take a comprehensive one-day certification exam, similar in form and intensity to
the CPA exam that accounting professionals take. When the exam is passed and all requirements are met,
an industrial hygienist becomes a certified industrial hygienist, also known as a CIH. To maintain
certification, the industrial hygienist participates in continuing education programs. The certification process
distinguishes an industrial hygienist and also advances the profession in general. Regulatory agencies such
as the Environmental Protection Agency have recognized the special competency of CIHs in their
environmental regulations and many employers see the CIH designation as one of their selection and
promotion criteria.

**Salary and Other Benefits of an Industrial Hygiene Career**

If you are a self-starter who takes pride in your work and cares about people and the environment, industrial
hygiene may be the career for you. Because the field is so diverse, industrial hygienists are able to choose
among many types of work. Plus, there is always the opportunity to become a consultant or start your own
business if total employment freedom is your goal.

The salary you earn, of course, depends on many things, including education, tenure, and certification. [The
following figures are based on the 2008 AIHA Salary Survey.] For example, as of January 1, 2008, 25% of
the respondents earned $81,000 or less, and 25% earned $120,000 or more. The average mean salary for
all respondents was $94,947. The median was $90,000, and the maximum was $375,000.