Certification of Safety and Health Professionals

Professional certification is an excellent way to establish credentials in the safety, health, and environmental profession. The most widely pursued accreditations are

Certified Safety Professional (CSP), awarded by the Board of Certified Safety Professionals (BCSP)

Certified Industrial Hygienist (CIE), awarded by the American Board of Industrial Hygiene (ABIH)

Certified Professional Ergonomist (CPE), awarded by the Board of Certification in Professional Ergonomics (BCPE)

Certified Occupational Health Nurse (COHN), awarded by the American Board for Occupational Health Nurses (ABOHN)

Certified Safety Professional

To qualify for the CSP title, applicants must follow these steps:

Apply to the BCSP

Meet an academic requirement

Meet a professional safety experience requirement

Pass the Safety Fundamentals Examination

Pass the Comprehensive Practice Examination11

Academic Requirement

The model educational background for a candidate for the Certified Safety Professional (CSP) is a bachelor’s degree in safety from a program accredited by the Accreditation Board for Engineering and

Technology (ABET). Because many people enter the safety profession from other educational backgrounds, candidates for the CSP may substitute other degrees plus professional safety experience for an accredited bachelor’s degree in safety. A CSP candidate must meet one of the following minimum educational qualifications:

Associate degree in safety and health, or

Bachelor’s degree in any field

Experience Requirement

In addition to the academic requirement, CSP candidates must have four years of professional safety experience in addition to any experience used to meet the academic requirement. Professional safety experience must meet all the following criteria to be considered acceptable by the BCSP:

The professional safety function must be the primary function of the position. Collateral duties in safety are not considered the primary function.

The position’s primary responsibility must be the prevention of harm to people, property, and the environment, rather than the responsibility for responding to harmful events.

The professional safety function must be at least 50 percent of the position duties.

The position must be full time (defined by the BCSP as at least 35 hours per week).

The position must be at the professional level. This is determined by (a) evaluating the degree of responsible charge and reliance by peers, employers, or clients; (b) the person’s ability to defend analytical approaches used in professional practice; and (c) the recommendations made for controlling hazards through engineering or administrative approaches.

The position must have breadth of duties. This is determined by evaluating the variety of hazards about which a candidate must advise and the range of skills involved in recognizing, evaluating, and controlling hazards. Examples of skills are analysis, synthesis, design, investigation, planning, administration, and communication.

Examination Requirements

The process to achieve the CSP designation typically involves passing two examinations: Safety Fundamentals and Comprehensive Practice.

Safety Fundamentals Examination. The Safety Fundamentals Examination covers basic knowledge appropriate to professional safety practice. Candidates who meet the academic standard (achieve 48 points through an associate or bachelor's degree plus experience) may sit for the Safety Fundamentals Examination. Upon passing this examination, candidates receive the Associate Safety Professional title to denote their progress toward the CSP.

Comprehensive Practice Examination. All CSP candidates must acquire 96 points and pass the Comprehensive Practice Examination. To take this examination, a candidate must meet both the academic and experience requirements and have passed or waived the Safety Fundamentals Examination. The total credit for academic degrees at all levels plus the months of professional safety experience must equal or exceed 96 points. After passing this examination, a candidate receives the CSP title. The address, telephone numbers, and Web site for the BCSP are shown in Figure 4–4.

Certified Industrial Hygienist

In the mid-1950s, a group of industrial hygienists from a national organization recommended that a voluntary certification program be established for industrial hygiene practitioners. In 1960, an independent corporation was established from the two national membership organizations—the American Industrial Hygiene Association and the American Council of Governmental Industrial Hygienists—to establish a national examination process to certify a minimum level of knowledge in industrial hygiene.12 Because the program was voluntary, it did not restrict the practice of individuals calling themselves "industrial hygienists." Indeed, today there are many competent persons practicing the profession of industrial hygiene who have not even sought certification. However, since its establishment, the program has proven to be a hallmark of achievement that provides an indicator of success in the field. It measures to a defined standard the knowledge of a practicing industrial hygienist in 16 technical areas of practice (called rubrics).

The intended purpose of the examination for Certified Industrial Hygienist is to ensure that professionals working in this field have the skills and knowledge needed in the practice of industrial hygiene. The intent of the board is that the examinations are fair, reasonable, current, and representative of a broad range of industrial hygiene topics. Successful completion of the examination, meeting the educational requirements, and meeting the comprehensive, professional-level industrial hygiene experience requirements are the means by which the board attempts to identify those practitioners who have demonstrated the necessary skills to be an industrial hygienist.

Certification Process

What is the process for becoming certified? First, there is the obvious need for technical knowledge. There are various methods for gathering this information, but no one system has been identified as being the most effective. Review courses are available to prepare aspiring applicants. Conventional wisdom tends to support knowledge gained through experience and the watchful guidance of a competent mentor. Many individuals take the examination to find out their weak areas and study up on those until they manage to pass.

The professional reference questionnaire (PRQ) is important as well. The board's requirement for experience is based on activity on a professional or apprentice level. This causes a sticking point for many who find they are in a position with titles such as "industrial hygienist" or "project manager" when their scope of practice relies on strict adherence to a regulatory interpretation or exercise of very little independent judgment. Others with titles of "industrial hygiene technician" or "specialist" may be acting totally independently and practicing with a scope of extreme variability and many unknowns. This should be portrayed in the PRQ to be fair to the applicant. Details are important to the board in making their evaluation of an applicant.

The ABIH also has a process established for reviewing each application and preparing each examination. Examinations are prepared in minute detail. Each question is evaluated by a group of practicing CIEs to ensure its correctness and relevance to the practice of industrial hygiene. Each item is rated on difficulty for its target audience (CORE or Comprehensive), and this is used to set the passing score for each test. Each question is also rated by professional testers to ensure its validity as a question for an examination. Questions are selected for use on an examination based on the latest survey of the practice of industrial hygiene, in both rubric areas and domains of practice, to achieve a balance indicative of the current practice and some historical knowledge. After each presentation of the examination, questions are again reviewed for validity. The examination itself is the subject of an effort to ensure that it adheres to the standardized evaluation method.

Certification Maintenance

After a candidate has managed to meet the established standard for certification, maintenance becomes the issue. The board requires that all CIEs demonstrate that they are active in the field and have continued to improve their knowledge. Seven categories of practice are noted for the accumulation of "points" toward the 40 required every five years. Some portion of these points is gathered for active practice, technical committee work, publications, education and meetings, teaching, retest, or other work. This requires that some program of continuing education must be pursued. The address, telephone number, and Web site for the ABIH are shown in Figure 4–4.

Certified Professional Ergonomist

The examination for Certified Professional Ergonomist (CPE) is administered by the BCPE. Details concerning the examination are explained in the following paragraphs.13

To take the examination, individuals must meet the following requirements:

Academic requirements. Applicants should have graduated from a regionally accredited college or university with a master's degree, or equivalent, in one of the correlative fields of ergonomics, such as biomechanics, human factors/ergonomics, industrial engineering, industrial hygiene, kinesiology, psychology, or systems engineering. Not everyone trained in these fields necessarily has the capabilities required for certification. The board uses other criteria to determine whether an applicant's ergonomics education has been sufficiently broad.

Work experience. Applicants must have completed at least four years of ergonomic work experience. Appropriateness of work experience is determined from the applicant's employment history and evidence of participation in projects requiring ergonomic expertise.

Work product. One work sample must be submitted with the application. This work sample must demonstrate a breadth of ergonomic knowledge and the ability to use ergonomic methods successfully. The work sample must demonstrate, at a minimum, the candidate's capabilities in the application of ergonomic principles to the design of a product, system, or work environment. Allowable work products are technical reports, design papers, analysis reports, evaluation reports, patent applications, or a thorough written description of the project.

Associate-Level Certification

The Associate Ergonomics Professional category is a precursor to the CPE designation and is available to a candidate who

meets the education requirements for BCPE certification

has passed Part 1 of the examination (on basic knowledge of human factors ergonomics)

is currently working toward fulfilling the BCPE requirement of four years' practical experience as a human factors and ergonomics professional

Bachelor's Degree Certification

A credential is available that recognizes a candidate for achieving the following levels of knowledge, skills, and experience in ergonomics practice:

A bachelor's degree from a recognized university

At least 200 hours of ergonomics training

At least two full years practicing ergonomics

A satisfactory score on the four-hour, two-part, multiple-choice examination on ergonomics foundations and ergonomics practice methods

This certification may be obtained by candidates with a bachelor's in engineering, healthcare/rehabilitation, industrial hygiene, and psychology. The address, telephone number, and Web site for the BCPE are shown in Figure 4–4.

Certified Occupational Health Nurse

The ABOHN offers several certifications relating to safety and health:

Certified Occupational Health Nurse (COHN)

Certified Occupational Health Nurse–Specialist (COHN–S)

Certified Occupational Health Nurse/Case Manager (COHN/CM)

Certified Occupational Health Nurse–Specialist/Case Manager (COHN–S/CM)

Certified Occupational Health Nurse–Safety Manager (COHN–SM)

All the certifications offered by the ABOHN require that individuals first pass either the COHN or COHN–S certification tests. The other certifications are subspecialties.

Academic and Experience Requirements

In order to sit for the COHN certification tests, individuals must be registered nurses holding an associate degree or higher degree or their international equivalents. The focus of this credential is the nurse's role as a clinician, adviser, coordinator, and case manager. To sit for the COHN–S certification test, individuals must be registered nurses who hold a bachelor's degree or higher. The focus of this credential is on the nurse's role in direct care, management, education, consulting, and case management. The bachelor's degree required for this credential need not be in nursing.

In addition to the academic requirements, those who wish to achieve COHN or COHN–S certification must have 4,000 or more hours of work experience in occupational health and 50 or more contact hours of continuing education completed during the past five years. Additional testing is required for the various subspecialty credentials.

The newest certification offered by the ABOHN is the COHN–SM or safety manager credential. The focus of this credential is on occupational health nurses who plan, organize, implement, and evaluate hazard control activities to help organizations reduce or eliminate risks in the workplace. In order to sit for this subspecialty test, an individual must hold the COHN or COHN–S credential, hold a position that requires at least 25 percent of the time be spent on safety management activities, have completed 50 or more hours of safety-related continuing education during the past five years, and have 1,000 or more hours of safety management experience earned during the past five years.

Estimating the Cost of Accidents

Even decision makers who support accident prevention must consider the relative costs of such efforts. Clearly, accidents are expensive. However, to be successful, safety and health professionals must be able to show that accidents are more expensive than prevention. To do this, they must be able to estimate the cost of accidents. The procedure for estimating costs set forth in this section was developed by Professor Rollin H. Simonds of Michigan State College working in conjunction with the Statistics Division of the NSC.

Cost-Estimation Method

Professor Simonds states that in order to have value, a cost estimate must relate directly to the specific company in question. Applying broad industry cost factors will not suffice. To arrive at company-specific figures, Simonds recommends that costs associated with an accident be divided into insured and uninsured costs. 9

Determining the insured costs of accidents is a simple matter of examining accounting records. The next step involves calculating the uninsured costs. Simonds recommends that accidents be divided into the following four classes:

Class 1 accidents. Lost workdays, permanent partial disabilities, and temporary total disabilities

Class 2 accidents. Treatment by a physician outside the company's facility

Class 3 accidents. Locally provided first aid, property damage of less than $100, or the loss of less than eight hours of work time

Class 4 accidents. Injuries that are so minor that they do not require the attention of a physician, result in property damage of $100 or more, or cause eight or more work hours to be lost10

Average uninsured costs for each class of accident can be determined by pulling the records of all accidents that occurred during a specified period and by sorting the records according to class. For each accident in each class, record every cost that was not covered by insurance. Compute the total of these costs by class of accident and divide by the total number of accidents in that class to determine an average uninsured cost for each class, specific to the particular company.

Figure 2–5 is an example of how the average cost of a selected sample of Class 1 accidents can be determined. In this example, there were four Class 1 accidents in the pilot test. These four accidents cost the company a total of $554.23 in uninsured costs, or an average of $138.56 per accident. Using this information, accurate cost estimates of an accident can be figured, and accurate predictions can be made.

Figure 2–5 Uninsured costs worksheet.

Figure 2–5 Full Alternative Text

Other Cost-Estimation Methods

The costs associated with workplace accidents, injuries, and incidents fall into broad categories such as the following:

Lost work hours

Medical costs

Insurance premiums and administration

Property damage

Fire losses

Indirect costs

Calculating the direct costs associated with lost work hours involves compiling the total number of lost hours for the period in question and multiplying the hours times the applicable loaded labor rate. The loaded labor rate is the employee’s hourly rate plus benefits. Benefits vary from company to company but typically inflate the hourly wage by 20 to 35 percent. A sample cost-of-lost-hours computation follows:

Employee hours lost (4th quarter)×Average loaded labor rate=Cost386×13.48=$5,203.28

In this example, the company lost 386 hours due to accidents on the job in the fourth quarter of its fiscal year. The employees who actually missed time at work formed a pool of people with an average loaded labor rate of $13.48 per hour ($10.78 average hourly wage plus 20 percent for benefits). The average loaded labor rate multiplied by the 386 lost hours reveals an unproductive cost of $5,203.28 to this company.

By studying records that are readily available in the company, a safety professional can also determine medical costs, insurance premiums, property damage, and fire losses for the time period in question. All these costs taken together result in a subtotal cost. This figure is then increased by a standard percentage to cover indirect costs to determine the total cost of accidents for a specific time period. The percentage used to calculate indirect costs can vary from company to company, but 20 percent is a widely used figure.

Estimating Hidden Costs

Safety professionals often use the iceberg analogy when talking about the real costs of accidents. Accident costs are like an iceberg in that their greatest portion is hidden from view.11 In the case of icebergs, the larger part is hidden beneath the surface of the water. In the case of an accident, the larger part of the actual cost is also hidden beneath the surface.

There are many different models that can be used for estimating both the direct and indirect costs of accidents. Some of these models are so complex that their usefulness is questionable. The checklist in Figure 2–6 is a simple and straightforward tool that can be used to estimate the hidden costs of accidents.

Figure 2–6 Some accident costs that might be overlooked.

Milestones in the Safety Movement

Just as the United States traces its roots to Great Britain, the safety movement in this country traces its roots to England. During the Industrial Revolution, child labor in factories was common. The hours were long, the work hard, and the conditions often unhealthy and unsafe. Following an outbreak of fever among the children working in their cotton mills, the people of Manchester, England, began demanding better working conditions in the factories. Public pressure eventually forced a government response, and in 1802, the Health and Morals of Apprentices Act was passed. This was a milestone piece of legislation: It marked the beginning of governmental involvement in workplace safety.

When the industrial sector began to grow in the United States, hazardous working conditions were commonplace. Following the Civil War, the seeds of the safety movement were sown in this country. Factory inspection was introduced in Massachusetts in 1867. In 1868, the first barrier safeguard was patented. In 1869, the Pennsylvania legislature passed a mine safety law requiring two exits from all mines. The Bureau of Labor Statistics was established in 1869 to study industrial accidents and report pertinent information about those accidents.

The following decade saw little new progress in the safety movement until 1877, when the Massachusetts legislature passed a law requiring safeguards for hazardous machinery. This year also saw passage of the Employer's Liability Law, establishing the potential for employer liability in workplace accidents. In 1892, the first recorded safety program was established in a Joliet, Illinois, steel plant in response to a scare caused when a flywheel exploded. Following the explosion, a committee of managers was formed to investigate and make recommendations. The committee's recommendations were used as the basis for the development of a safety program that is considered to be the first safety program in American industry.

Around 1900, Frederick Taylor began studying efficiency in manufacturing. His purpose was to identify the impact of various factors on efficiency, productivity, and profitability. Although safety was not a major focus of his work, Taylor did draw a connection between lost personnel time and management policies and procedures. This connection between safety and management represented a major step toward broad-based safety consciousness.

In 1907, the U.S. Department of the Interior created the Bureau of Mines to investigate accidents, examine health hazards, and make recommendations for improvements. Mining workers definitely welcomed this development, since more than 3,200 of their fellow workers were killed in mining accidents in 1907 alone.10

One of the most important developments in the history of the safety movement occurred in 1908 when an early form of workers' compensation was introduced in the United States. Workers' compensation actually had its beginnings in Germany. The practice soon spread throughout the rest of Europe. Workers' compensation as a concept made great strides in the United States when Wisconsin passed the first effective workers' compensation law in 1911. In the same year, New Jersey passed a workers' compensation law that withstood a court challenge.

The common thread among the various early approaches to workers' compensation was that they all provided some amount of compensation for on-the-job injuries regardless of who was at fault. When the workers' compensation concept was first introduced in the United States, it covered a very limited portion of the workforce and provided only minimal benefits. Today, all 50 states have some form of workers' compensation that requires the payment of a wide range of benefits to a broad base of workers. Workers' compensation is examined in more depth in Chapter 7.

The Association of Iron and Steel Electrical Engineers (AISEE), formed in the early 1900s, pressed for a national conference on safety. As a result of the AISEE's efforts, the first meeting of the Cooperative Safety Congress (CSC) took place in Milwaukee in 1912. What is particularly significant about this meeting is that it planted the seeds for the eventual establishment of the NSC. A year after the initial meeting of the CSC, the National Council of Industrial Safety was established in Chicago. In 1915, this organization changed its name to the National Safety Council. It is now the premier safety organization in the United States.

From the end of World War I (1918) through the 1950s, safety awareness grew steadily. During this period, the federal government encouraged contractors to implement and maintain a safe work environment. Also during this period, industry in the United States arrived at two critical conclusions: (1) There is a definite connection between quality and safety and (2) off-the-job accidents have a negative impact on productivity. The second conclusion became painfully clear to manufacturers during World War II when the call-up and deployment of troops had employers struggling to meet their labor needs. For these employers, the loss of a skilled worker due to an injury or for any other reason created an excessive hardship.11

The 1960s saw the passage of a flurry of legislation promoting workplace safety. The Service Contract Act of 1965, the Federal Metal and Nonmetallic Mine Safety Act, the Federal Coal Mine and Safety Act, and the Contract Workers and Safety Standards Act, all were passed during the 1960s. As their names indicate, these laws applied to a limited audience of workers.

These were the primary reasons behind passage of the Occupational Safety and Health Act (OSH Act) of 1970 and the Federal Mine Safety Act of 1977. These federal laws, particularly the OSH Act, represent the most significant legislation to date in the history of the safety movement. During the 1990s, the concept of total safety management (TSM) was introduced and adopted by firms that were already practicing total quality management (TQM). TSM encourages organizations to take a holistic approach to safety management in which the safety of employees, processes, and products is considered when establishing safe and healthy work practices.

At the turn of the century, workplace violence including terrorism began to concern safety and health professionals. In addition, the twenty-first century saw a trend in which older people were returning to work to supplement their retirement income. This trend led to a special emphasis on the safety and health of older workers. A more recent trend is greater concern of U.S. companies for the safety and health of employees in foreign countries that manufacture goods that are sold in the United States.

The Superfund Amendments and Reauthorization Act was passed by Congress in 1986, followed by the Amended Clean Air Act in 1990; both were major pieces of environmental legislation. Another milestone that occurred in the decade of the 1990s was the trend toward safety professionals making ergonomics part of their overall approach for preventing accidents and injuries. Ergonomics involves fitting the work to the worker rather than the worker to the work. It is concerned with, among other things, the prevention of musculoskeletal disorders and injuries.

Figure 1–1 summarizes some significant milestones in the development of the safety movement in the United States.

Figure 1

–1 Milestones in the safety movement.

Parts of the Body Injured on the Job

To develop and maintain an effective safety and health program, it is necessary to know not only the most common causes of death and injury but also the parts of the body most frequently injured. The NSC stated the following:

Disabling work injuries in the entire nation totaled approximately 1.75 million in 1998. Of these, about 10,400 were fatal and 60,000 resulted in some permanent impairment. Injuries to the back occurred most frequently, followed by thumb and finger injuries and leg injuries.8

Typically, the most frequent injuries to specific parts of the body are as follows (from most frequent to least):

Back

Legs and fingers

Arms and multiple parts of the body

Trunk

Hands

Eyes, head, and feet

Neck, toes, and body systems

The back is the most frequently injured part of the body. Legs and fingers are injured with approximately the same frequency, as are arms and multiple parts of the body; the hands are next in frequency, followed by the eyes, the head, and feet; and neck, toes, and body systems. This ranking shows that one of the most fundamental components of a safety and health program should be instruction on how to lift without hurting the back (see Chapter 15).