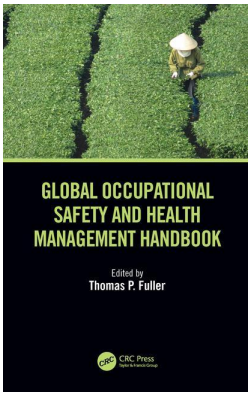

Global Occupational Safety and Health Management Handbook

Thomas P. Fuller

Credentialing Occupational Hygiene

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10 Credentialing Occupational Hygiene

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CONTENTS

10.1 INTRODUCTION

Broadly defined, credentials are anything that provides a basis for confidence, belief, or credit in the capabilities of someone or something. They may provide a form of status or entitlement. Credentials may be based upon education, experience, or other past actions that indicate the level of a person's commitment, understanding, and capabilities. They often represent a certain level of achievement in personal qualities or capabilities, and they are sometimes supported by documents or certifications awarded by organizations or institutions. It should be noted that many of the terms used and described in this chapter have significantly different meanings and definitions in various fields and professions. Credentialing has a range of meanings from knowledge-based training-based certificates to credentials based on actual practice and experiences.

Over the past several decades, credentialing and licensing of professions have increased significantly in many countries. In the United States, licensing has increased about 30% since the 1950s (Kleiner, 2013). Credentialing required by both governmental and nongovernmental organizations has increased significantly in the past decades and plays a major role in the supply and costs of services in many occupations (Sweetman, 2015). In a 1992 study, there were more than 800 different occupations licensed in at least one state, and more than 1,100 occupations either licensed, certified, or registered (Brinegar, 1992). In the United States, licensed occupations represent between 18% and 38% of the workforce (Kleiner, 2000, 2010).

In the United Kingdom, the percentage of workforce that requires a government license doubled between 1998 and 2010 (Bryson, 2010). In one study of 29 European and eastern European countries, 19 require the appointment of safety professionals, prepared through specific education, training, or credentialing, to protect workers (Hale, 2008).

In general, licensing tends to be more common in more educated workers, union members, and government employees. Professional credentialing can be offered by self-regulatory colleges, boards, or associations. Or they may be provided as a form of licensure by local, state, or federal governmental regulating bodies. In general, as the licensure requirements become more stringent, the benefits become more monopolistic.

Registration is generally considered the simplest form of credential, with often only requiring the provision of basic background information. This may also be referred to as "conformance licensing." Registration may include some basic educational minimum criteria, statements of agreement with ethical principles or codes of conduct, and possible criminal record assessment. In many professions, it is possible to practice the profession without registration, and in many professions, registration is voluntary. Registration in its simplest form involves having one's name placed

on a list. At the other end of the spectrum, registration requires having education through an accredited academic program, having supervised work experiences (in some cases also through and accredited program), and passing a standardized examination [e.g., Registered Nurses (RNs), Registered Pharmacists (RPHs), Registered Dietitians (RDNs), and Radiologic Technologists (RTs).]

Higher-level forms of registration often overlap with definitions of "certification," which typically require more stringent educational qualifications, experience levels, apprenticeships, or examinations. Maintenance of professional certifications may require ongoing professional development in the form of experience and education maintenance and associated periodic review by the accrediting body. Certification tends to be implemented and enforced through the control over the use of title (Hemphill, 2016).

Licensure is typically the most stringent form of professional credentialing. A license may be required to perform the given professional activities. Licensed professions may be broad and for fairly simple activities such as taxi driving, or they may be highly specific and complex such as prescribing pharmaceuticals. Licensure may be used as an efficient way to ensure the quality and accuracy of professional services, and as a way to build government revenues. Licensing is commonly used in economically developing countries as a replacement for regulatory oversight because of weak government oversight and inspection of industries (Ogus, 2005).

10.2 DEFINING PROFESSION

Professions can be described as work or vocation that requires certain specific training and experience and follows a particular code of practice in accordance with agreed upon standards of quality and efficiency.

Occupational hygiene is the anticipation, evaluation, measurement, and control of the work environment with the goal of minimizing safety and health risks to workers (Nash, 1953). Occupational hygienists work as part of a team with occupational medicine physicians, occupational health nurses, toxicologists, and industrial engineers to evaluate potential health effects to workers and minimize the associated risks.

10.3 THE GOALS OF PROFESSIONAL CREDENTIALING

We tend to think that the primary goal of professional credentialing, especially in occupational safety and health (OSH), would be to ensure professionals are competent to assess workplace risks and take actions to protect the workers from harm. This is true, but there are many other reasons for registration and licensing that are worth noting.

One of the most pervasively regulated industries in many cultures is for hairstylists. Although one might be able to find someone who died from a bad hairdo, safety is not a typical concern for licensing this profession. Although hairstylists come in intimate contact with the public, and there is some rationale to ensure certain levels of awareness regarding sanitation, other similar industries (e.g., tattooists and body modification professionals) do not have such requirements for licensing. Partly, hairdresser licensing is to ensure minimum levels of quality as a consumer

protection for the public. It is also used to ensure ethical codes of practice for stylists that they comply with common fair business practices and codes of conduct for their clients. This concept is worth noting and remembering because even safety professionals need to practice codes of conduct according to professional ethical standards.

Regulations and laws are often created for reasons of safety, health, and protection of the environment. In the private sector, organizations also find value in creating systems to evaluate conformity to enable comparability and ensure competitiveness. Accepted standards of practice are evaluated by conformity assessment bodies (CABs) to conduct inspection, testing, and certification. CAB assessments have become important to societal stakeholders including the public, regulators, businesses, and consumers. Accreditation bodies evaluate the CAB capabilities to perform assessments based on particular standards and normative guidelines, and award accreditations to competent CABs (ISO/IEC, 2004). A conceptual diagram of conformity assessment and accreditation processes is shown in Figure 10.1.

In ancient times, self-enforced guilds and third-party regulations were created to shift business from personal to impersonal transactions, and set requirements for competence and honesty. Regulations were seen as an economic benefit to society as a way to protect the public without clogging the judicial system with suits and torts after the fact. Regulations remain fundamental to modern economies today, and it might be acknowledged that the most advanced societies have the most advanced and numerous regulatory or credentialing systems. The credentials of professionals such as health-care providers, architects, and restaurant inspectors are just a few examples of what it takes to ensure a safe and healthy society.

In a U.S. study of low- to moderate-income occupations that required licensure, the average fee for a license was $209 and it required passing an examination, 9 months of education, and minimum age levels. In many cases, the strength of the licensure requirements was not particularly related to health and safety but instead was related to the lobbying prowess of practitioners in securing laws to shut out competition (Carpenter, 2015).

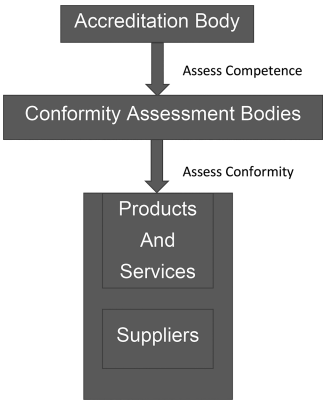

FIGURE 10.1 Conceptual diagram of conformity assessment and accreditation processes. (Adapted from ISO/IEC, 2004.)

Case

In one study it was shown that emergency medical technicians, who save people's lives, fell behind 66 other professions in terms of licensure requirements. These ambulance workers charged with the responsibility of treating injured patients and keeping them alive on their way to the hospital, had fewer licensure burdens than locksmiths, landscape workers, barbers, and manicurists. By comparison, the average cosmetologist requires 372 days of training, whereas the average EMT only needs 33 days of training.

(Carpenter, 2015).

10.3.1 Job Security and Higher Wages

One of the major reasons that professional organizations and their members appreciate credentialing and licensure is for protection and security of their jobs and positions. Access to the profession by potential entrants can be greatly reduced. Stringent credentialing requirements tend to restrict entrance into a given profession, thus reducing the supply of candidates. Another outcome is the support of higher wages for the profession by about 15% (Kleiner, 2013, 2010; Meehan, 2015; Timmons, 2008; Pagliero, 2013). In a study about de-licensing occupations in the United States, it was noted that attempts were met with stiff resistance by both those professionals who held licenses and the boards who granted the license. Each group found the license valuable in terms of finances and status (BLS, 2015).

Higher wages for licensed workers may be partly due to the monopolistic nature of the profession and barriers to entry that reduce supply. But it can also be argued that the added educational and experiential requirements for license holders ensure higher quality overall for those workers holding a license in a given profession. In a study by Kleiner (2010), it was demonstrated that occupational licensing is positively associated with higher educational levels as shown in Figure 10.2.

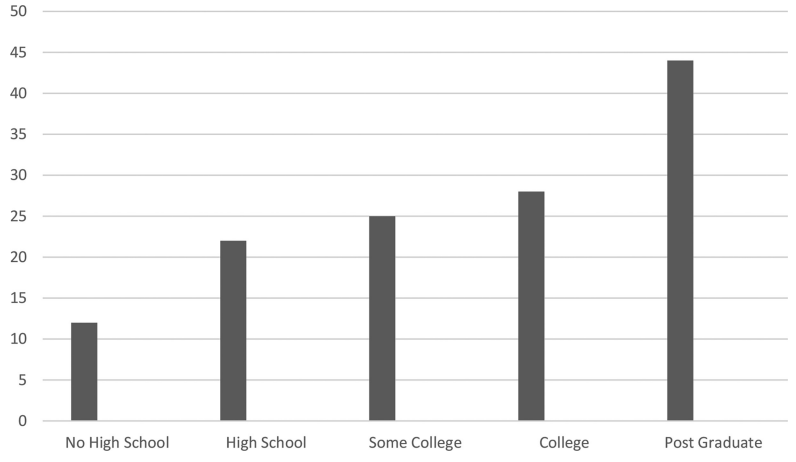

FIGURE 10.2 Percentage of professionals with occupational license by education. (Adapted from Kleiner, 2010.)

Despite professionals with higher educational levels, it could be assumed that the reduced pool of available professionals in this field would also then reciprocally increase costs to clients and employers.

In general, as the demand for professionals with certain credentials increases, the salaries to those professionals will increase. That said, the number of students enrolling into associated educational programs, or people entering the profession, would also be expected to increase. Salaries would be expected to adjust continually.

10.3.2 Clarification of the Profession

Credentialing can be a way to delineate the role and activities of a given profession. It can help clarify what the professionals are expected to know and be able to do. Credentials that are designed for public protection codify the role and activities of the profession. True credentials should be based on what professionals are doing currently through a job-task analysis process. A person gains the work experience and earns the associated credential. It is a way to communicate with the public and provide information on what should be expected for various professionals and what they should be able to do. This can also be useful for government officials. Through credentialing publications and professional meetings, the roles and actions, such as ethical responsibilities, of professionals in the field can be determined and clarified for its members.

10.3.3 Documentation

Credentialing and licensure programs can improve collaboration/identify transferable skills across professions/better connections/clarify responsibilities. In Australia, the development of a national accreditation body for several major fields such as medicine, nursing, engineering, and accounting has greatly increased the ability of workers to bypass regional requirements and migrate to different states to fill worker shortages (Hawthorne, 2011).

Within a profession, credentialing can be a means to ensure worker readiness for the job. Benchmarks of experience and education can be clearly delineated. Both foundational- and occupation-specific skills necessary to complete tasks expertly and safely can be identified within credentialing constructs. At the higher end of credentialing, it can be used to provide direction to a profession and create a vision for the future. Credentialing can be used as a form of leadership and help to mold future leaders.

Credentialing can be a means to differentiate between various levels of experience and competence in professionals. The American Association of Occupational Health Nurses (AAOHN) has identified three different competency levels for professionals using the categories of competent, proficient, and expert. Workers and employers can use the definitions of the competencies for each level to make determinations for assignments and career development and advancement and to indicate areas where more training may be needed (AAOHN, 2007).

As a benefit to society, credentialing can act as a guideline to the public for the minimum qualifications of quality. Licensure or certification of a group can provide valuable information about the qualifications of a professional that can be difficult to ascertain otherwise.

By helping to clarify and create individual professions of practice, credentialing can also provide a means to complete segmented research on the group. By understanding the practices and beliefs of the professionals in the group, it can reinforce standards of practice and ethical standards. It can provide valuable data about social needs as a means to track the working population in a field. It can be used to identify the growth of specialty areas. Information learned from research can be disseminated, furthering the growth of the profession. When a profession is distinct enough and large enough, it will result in both professional and technical journals. Professional journals can be used to communicate with the professional community. Technical journals in the field can be used to spread scientific and policy research results. As a profession becomes more advanced, it can lead to profession-specific educational pathways/programs. Credentialing can set standards for lifelong learning and professional growth. This is done in conjunction with accreditation in advanced professions. It can require and create opportunities for various forms of continuing education for practicing professionals in the field.

Credentialing and certification requirements can also work against migrants when external credentials are not recognized across borders. This often keeps potential migrant workers from entering existing job pools and reduces their overall earning potential (Augustine, 2015).

As licensure requirements can be a barrier to entry, it creates monopolistic conditions for those professionals with the credential. In some cases where licensed activities of one group overlap with another, there has been the potential to lead to turf wars between regulatory bodies and professional organizations (Brockman, 1996). Examples might include ophthalmologists and optometrists, or occupational therapists and physical therapists.

Training certificates may also be considered a form of credentialing, which often requires lower levels of formal education and shorter durations of associated training. Certificates in "short courses" on specific topics in OSH can be a way to bolster the qualifications and experience of a worker to be better prepared in OSH on the worksite. Certificate training programs offered by colleges, universities, and even for-profit consulting firms can be a way to improve hiring potential of graduates and raise wages and pay (Rosen, 2014). Typical college certification programs run 12–24 months. Training certificates have been identified as a practical, realistic, and necessary way to increase the numbers of practicing safety professionals (Alesbury, 2013).

10.4 ASSESSMENT OF CREDENTIALING

The International Standards Organization (ISO) is a specialized system of standardization whereby national bodies participate in the development of international standards of practice through expert technical committees established in various fields of endeavor. Various governmental, nongovernmental, and professional organizations collaborate in areas of mutual interest to derive international standards and guidelines of recommended practice in various areas.

ISO/IEC 17024:201 Conformity assessment—General requirements for bodies operating certification of persons is the ISO standard created to create globally

accepted benchmarks for organizations that award personal professional credentials (ISO, 2012). The main objective of the conformity assessments is to ensure objective criteria are used to measure competence and scoring of certification criteria and associated examinations. Conformity assessments such as ISO 17024 help to assure that well-planned and well-structured certification examinations are administered impartially, with minimal risk of conflict of interest.

The ISO certification via assessment can serve as a basis for the recognition of certification bodies, and the certification scheme under which persons become certified. Conformity assessment of the credentialing body under ISO facilitates recognition and acceptance at the national and international levels. Additionally, the international development and use of these conformity assessments and accreditations enhance harmonization of technical fields, including occupational hygiene. It helps in the development of recognition of the profession internationally and aids in the global exchange of professional personnel in the OSH labor force. The ISO standard and associated conformity assessments can serve, and often do serve, as the basis for government recognition of professionals.

10.5 INTERNATIONAL RECOGNITION OF ACCREDITING BODIES

The International Occupational Hygiene Association (IOHA) maintains a standing National Accreditation Recognition (NAR) Committee charged with the responsibility of establishing an international accreditation scheme of occupational hygienists. The purpose for the accreditation scheme is to promote respect for and recognition of occupational hygiene certification as a means to promote worker health and safety globally.

The IOHA philosophy is that there is a need for practicing occupational hygienists to meet and maintain a given minimum level of competency in order to safely practice the profession. Competency is achieved through the attainment of knowledge. Knowledge can be achieved through a combination of working experience and education. Through documentation of work experience and education, occupational hygiene professionals can demonstrate that they have met the minimum level of competent professional practice (IOHA, 2018a).

Demonstration of the mastery of occupational hygiene practice builds upon the minimum competencies and assures that the practicing professional is proficient in a wide variety of occupational hygiene topics. Certification methods can take different forms. It may require written examinations, oral examinations, or other review of experience and education. The NAR Committee reviews national certification schemes and processes and determines whether they meet the IOHA minimum standards. The NAR Committee does not review, however, the quality or content of the individual certification schemes. There are presently 16 countries approved by the IOHA accreditation scheme.

The primary areas of occupational hygiene IOHA competencies are exposure assessment, risk assessment, risk control, and occupational hygiene management. The basic educational requirements include a review of official transcripts of academic study and coursework to the level of bachelor of science (or equivalent) in a relevant science or occupational/industrial hygiene. Professional experience requirements include thorough review of records, references, work histories, and detailed

portfolios that indicate the individual has attained minimum levels of competent practice (IOHA, 2018b).

National accreditation processes and bodies currently recognized by IOHA include the following organizations: the American Board of Industrial Hygiene (ABIH), the Australian Institute of Occupational Hygiene (AIOH), the British Occupational Hygiene Society (BOHS), the Canadian Registration Board of Occupational Hygienists (CRBOH), the Dutch Occupational Hygiene Society (NVVA), the French Occupational Hygiene Society (SOFHYT), the German Society of Occupational Hygiene (DGAH), the Hong Kong Institute of Occupational and Environmental Hygiene (HKIOEH), the Institute of the Certification of the Figures of Prevention (ICFP), the Japan Association for Working Environment (JAWE), Malaysian Industrial Hygiene Association (MIHA), the Norwegian Occupational Hygiene Society (NYF), the Swedish Occupational and Environmental Certification Board (SOECB), the South African Institute for Occupational Hygiene (SAIOH), and the Swiss Society of Occupational Hygiene (SSHT).

10.5.1 American Board of Industrial Hygiene

The ABIH was created in 1960 as a means to evaluate the knowledge of practicing industrial hygienists. It is meant to provide a valid, reliable, and rigorous process to ensure competency of practitioners and thus the safety of workers and the public. The certification awarded by the ABIH, known as "Certified Industrial Hygienist (CIH)," is also a means for employers to ensure their employees meet the highest possible standards.

The CIH credentialing program by the ABIH is accredited by the American National Standards Institute (ANSI) under the standard ISO/IEC 17024—Conformity assessment—General requirements for bodies operating certification of persons. The ABIH CIH program is also accredited by the National Commission for Certifying Agencies (NCAA) under the Institute for Credentialing Excellence. These two designations are indications of the high quality of the CIH credential in terms of management, conformity, auditing, fairness, and other important aspects of the credentialing process.

The ABIH requires all CIH recipients to practice a particular code of ethics established by the organization. The code requires CIHs to follow specific practices and responsibilities towards clients, employers, the public, and to the profession itself. The ethical codes cover conduct regarding professional and legal standards, education and experience competency, and conflicts of interest.

To obtain a CIH, applicants must satisfy specific education and experience requirements, and then pass a written examination. The examination has 180 multiple-choice questions on a broad range of industrial hygiene topics. The test duration is 5.0 h. The examination pass rate for the years 2003 through 2017 ranged from 36.2% to 57.9% (ABIH, 2018a).

The ABIH CIH program was accredited to the ISO/IEC 17024 standard by conformity assessment completed by the ANSI March 13, 2009. ABIH has also received accreditation by the NCAA. NCCA is the accreditation body of the Institute for Credentialing Excellence. The NCCA accreditation process is used to ensure that professional certification programs meet modern standards of practice (ABIH, 2018b).

10.5.2 Australian Institute of Occupational Hygiene

The AIOH is a group of approximately 1,500 occupational hygiene professionals working to protect worker health and safety in Australia. The organization has a variety of technical committees that work on various projects and topics. The AIOH produces practice position papers and practical publications meant to assist working health and safety professionals to protect the well-being of Australian workers.

One function of the AIOH is the accreditation of university master's educational degree programs in Australia. There are currently three accredited master's degree programs in occupational hygiene in the country.

Another function of AIOH is the certification of occupational hygienists in Australia. The designation of Certified Occupational Hygienist (COH) recognizes that a person is professionally competent to practice occupational hygiene independently. This certification is recognized by the IOHA and benchmarked with other similar national credentials. Members who receive this credential must meet a strict set of educational, experiential, and competency requirements including an oral examination of their occupational hygiene capabilities (AIOH, 2018).

10.5.3 British Occupational Hygiene Society

The BOHS is the only UK-based examining board for qualifications in occupational hygiene. The highest qualification offered is the Diploma of Professional Competence in Occupational Hygiene (DipOH). In order to achieve the DipOH, one must complete 5 years of comprehensive professional experience in occupational hygiene and also hold a BOHS Certificate of Occupational Competence (CertOH), or hold a BOHS accredited postgraduate qualification (BOHS, 2018).

In order to attain a CertOH, a candidate must have 3 years of professional experience and complete six modules of Occupational Hygiene Training Association (OHTA), complete a Personal Learning Portfolio, and pass a 1-h oral examination. If a candidate has a degree from a BOHS-approved university in the United Kingdom, the OHTA certificate requirement is waived. A third option for candidates that have a degree from a non-BOHS-accredited university is to have 3 years of experience, complete a Personal Learning Portfolio, pass a 1-h oral examination, and then pass a 6-h core written examination (BOHS, 2018). The written examination is comprised of short-answer and essay questions. Subjects covered on both written and oral CertOH examinations include hazard recognition, risk assessment, measurement equipment and methods, interpretation of data, and control methods. These examinations also include questions regarding UK-specific occupational hygiene legislation (BOHS, 2016).

10.5.4 Canadian Registration Board of Occupational Hygienists

The CRBOH is a not-for-profit organization that implements a system to establish professional competence in the practice of occupational hygiene. The CRBOH confers two designations: the registered occupational hygienist (ROH) and the registered occupational hygiene technologist, indicating two different levels of professional competency.

The CRBOH promotes a particular code of ethics for professionals carrying its credentials. And the organization strives to improve and expand awareness and understanding of the practice of occupational hygiene. The overall goal is to provide safe working conditions for all Canadians and minimize workplace injury and illness.

Eligibility to become registered is dependent upon a specific set of requirements for formal university and postgraduate education and related combinations of experience. All candidates must sit for a half-day multiple-choice examination followed by a half-day essay format examination. Once passing the written examination, the candidates then sit for a half-day essay format examination (Verma, 1994). After successfully passing the written portions of the examination, candidates take a 1-h oral examination. Special exceptions to the normal examination process are allowed for professionals who hold certifications from other credentialing organizations endorsed by the IOHA NAR Committee and for graduates of particular Canadian postsecondary programs in occupational hygiene (CRBOH, 2017).

10.5.5 Dutch Occupational Hygiene Society

The NVVA is a professional group dedicated to safeguarding the health of workers and their descendants. They promote the science of occupational hygiene and raise awareness of the specialty.

Professionals can achieve a ROH designation based upon educational requirements and professional experience. The certification process in the Netherlands does not require a separate certification examination (NVVA, 2018).

10.5.6 French Occupational Hygiene Society

SOFHYT is the largest organization of occupational hygiene professionals in France and was created in 1991. They conduct regular meetings to present and discuss technical topics in occupational hygiene and to promote the understanding and awareness of the value of occupational hygiene in France. They have been a member of IOHA since 1991 and are also affiliated with the OHTA.

SOFHYT has been offering a professional certification in Occupational Hygiene Professional Certification since 2008. This credential was then approved and accepted to meet IOHA NAR designation in 2010. Candidates must meet a minimum level of education and experience before sitting for a written examination. In 2015, SOFHYT created an intermediate professional designation of "Certificate in Occupational Hygiene" (SOFHYT, 2015).

10.5.7 German Society of Occupational Hygiene

DGAH promotes knowledge and recognition of occupational hygiene and the maintenance of safe and healthy working conditions. The organization of professionals provides education and communication between professionals and organizations practicing occupational hygiene. The DGAH also defines a code of ethical practice for the profession.

Membership in DGAH requires the demonstration of completion of a strict set of educational and experiential competencies. Candidates must also successfully complete a written and oral examination before receiving the designation of occupational hygienists and membership to DGAH (DGAH, 2018). The DGAH professional designation and credentialing process is recognized by the IOHA NAR Committee.

10.5.8 Hong Kong Institute of Occupational and Environmental Hygiene

The HKIOEH administers a Certificate of Registered Professional Hygienist for work with hazardous chemicals, agents, and processes. Candidates must pass both written and oral examinations, possess a degree in a relevant subject, and have 5 years of experience to take the oral examination (HKIOEH, 2016a, b).

10.5.9 Institute of the Certification of the Figures of Prevention

The ICFP is the Italian occupational hygiene credential (ROHs) recognized by the IOHA NAR program. This program credentialing process includes specific requirements for education, experience, professional references, an oral examination, and a written examination (ICFP, 2018).

The Italian certification institution is accredited by the Italian National Unification Body. This is a private nonprofit association recognized by the European Union that develops and publishes voluntary technical standards for industrial and commercial sectors (UNI, 2018). The ICFP is reviewed and certified by the Unente Italiano di Normazione (UNI) to have met and be in compliance with ISO/IEC 17024:2003: General requirements for certifying bodies, published by the ISO.

The Italian credentialing body is not directly associated with the Italian Association of Industrial Hygiene (AIDII) and is an independent organization.

10.5.10 Japan Association for Working Environment

The JAWE is a nonprofit professional organization created in 1979 meant to provide a tripartite collaboration between employers, workers, and occupational hygiene experts to ensure safe and healthful working conditions in Japan. In 2003, JAWE became a member of IOHA.

JAWE offers credentials for a Work Environment Measurement Professional at two different levels. In order to receive the credential, the professional must pass an examination and complete program-associated registration courses. Topics covered by the Type 1. Course and examination include designing, sampling, and analyzing environmental hazards. The Type 2. Professional level includes the evaluation of work designs, in addition to sampling and analysis (JAWE, 2018). It is not clear what the examination entails, whether prior work experience is required, or whether the examination includes other OSH topics such as risk assessment, management, or ergonomics. The JAWE accreditation system is recognized by the IOHA NAR system.

10.5.11 Malaysian Industrial Hygiene Association

The MIHA is a nonprofit professional organization created in 2003. With more than 100 members, it is one of the largest worker health and safety organizations in Southeast Asia. Its goals are to promote professional development of industrial hygienists and provide timely and relevant ongoing education and training in occupational hygiene.

The MIHA offers a professional designation credential called the Certified Professional Industrial Hygienist (CPIH). The CPIH is governed by a board headed by the current MIHA President and follows a per-defined set of criterion. In order to achieve the CPIH designation, professionals must be full members of MIHA, be currently in the practice of industrial hygiene, meet academic and professional experience requirements, and pass an oral examination. The MIHA CPIH is recognized by the IOHA, and the MIHA is an affiliate member of IOHA (MIHA, 2017).

10.5.12 Norwegian Occupational Hygiene Society

The NYF is a professional association of occupational hygienists with the goal of protecting worker health and safety in Norway. They disseminate information about the benefits and practice of occupational hygiene and develop a set of ethical standards for practicing professionals in the field.

Within the NYF, a board called the Foundation Norwegian Occupation Hygiene Certification conducts a professional certification and credentialing scheme. Certification is based upon educational requirements for a minimum of 3-year technical-scientific studies at an approved university or academy, a minimum of 7-year work experience in occupational hygiene, and completion of both a written and an oral examination (NYF, 2018). This certification scheme has been acknowledged by the IOHA NAR.

10.5.13 Swedish Occupational and Environmental Certification Board

The SOECB is an independent certification agency that was established in 2001. The board provides a means to guarantee the qualifications of occupational and environmental hygienists according to criteria adopted by the Swedish Association of Occupational and Environmental Hygienists (SAOECB, 2003).

10.5.14 South African Institute for Occupational Hygiene

The SAIOH was created in 1983 to promote awareness and recognition of occupational hygiene as a professional discipline. In 1993, the Institute for Occupational Hygienists of South Africa (IOHSA) was created as a means to provide professional credentials to individuals who met appropriate standards for knowledge and practical experience in the area of occupational hygiene. In 2000, these two organizations merged to form the South African Institute for Occupational Hygiene (SAIOH).

Membership in SAIOH is provided at a variety of levels depending on education, experience, and examination. General membership is allowed for those interested in occupational hygiene, but not practicing. Then, levels progress from occupational hygiene

assistant, occupational hygiene technologist to the occupational hygienist designation. The highest level of occupational hygienist requires a bachelor's degree and 5 years of experience, or a master's or doctoral degree, and 4 years of experience. In addition, the successful completion of a 3-h written examination followed by a 1-h oral examination is required to receive the occupational hygienist designation (SAIOH, 2018).

10.5.15 Swiss Society of Occupational Hygiene

The SSHT represents professionals who practice the discipline of anticipation, determination, verification, and communication of hazardous working conditions. They are dedicated to the wellness and safety of workers and the general community (SSHT, 2018a, b).

The Committee de Certification des Hygiénistes du Travail (CCHT) is a group within SSHT responsible for the certification of hygienists in Switzerland. This committee is charged with administering written certification examinations and maintaining a list of hygienists that hold the SSHT certification (SSHT, 2018a, b).

10.6 OTHER REGULATED PROFESSIONS AND OCCUPATIONS RELATED TO OCCUPATIONAL HYGIENE

In this chapter about global credentialing of occupational hygiene, it is worth noting other closely related professions that interact or overlap with occupational hygiene credentialing.

10.6.1 Occupational Safety

10.6.1.1 European Network of Safety and Health Professional Organizations

European harmonization of safety educations and the profession began as early as 1970 initiated by the International Social Security Association (ISSA) Safety Training Section. This harmonization process has since been assumed by the European Network of Safety and Health Professional Organizations (ENSHPO).

The ENSHPO was established in 2001 in order to bring together health and safety professional organizations from across Europe. The main objectives of ENSHPO are to

- Ensure participation from all of the professional organizations across Europe and represent the views, opinions, and concerns of this group.
- Operate as a dialogue partner with relevant national and international authorities.
- Cooperate with other organizations, institutions, and federations within Europe and beyond.
- Act as a forum where practitioners can exchange information, experiences, and good practice on a wide variety of pertinent topics.
- Develop a European-wide recognition of OSH practitioner qualifications and training.

Current ENSHPO members include the following (ENSHPO, 2016b):

- AEPSAL (Asociacion de Especialistas en Prevencion y Salud Laboral)—Spain
- AIAS (Associazionne professionale Italiana Ambiente e Sicurezza)—Italy
- Arbejdsmiljoraadgiverne (Danish Association of Occupational Health and Safety Consultants)—Denmark
- ARSSM (Romanian Association for Occupational Health and Safety)—Romania
- CIVOP (Occupational Safety and Health and Fire Prevention Chamber of the Czech Republic)—Czech Republic
- CySHA (The Cyprus Safety and Health Association)—Cyprus
- HZZZSR (Croatian Institute for Health Protection and Safety at Work)
- IOSH (Institution of Occupational Safety and Health)—the United Kingdom and Ireland
- IMRSS (Institute of Risk Management and Occupational Health & Safety)—Romania
- MOSHPA (Malta Occupational Safety and Health Practitioners Association)—Malta
- Suissepro (SGAS, SGIG, SwissErgo, SGARM, SGAH, GRMST)—Switzerland
- Tyoturvallisuuskeskus Centre for Occupational Safety—Finland
- VDSI Verband für Sicherheit, Gesundheit und Umweltschutz bei der Arbeit—Germany

Part of the ENSHPO focus has been on the safety and health educational programs in the European Union. Based on UK National Occupational Standards for health and safety, detailed competencies have been delineated for OSH professionals. These have been used as learning outcomes for professional courses under the European Qualifications Framework. These qualification schemes are now being compared and harmonized with health and safety codes of practice in North America, Asia, and Pacific countries (Hale, 2012).

ENSHPO has created an OSH certification standard as a means to ensure a minimum level of competence for practicing professionals in Europe. The goal is to provide employers with a mutually recognized system of competencies and qualification for occupational health professionals (ENSHPO, 2016a).

Certification in the ENSHPO scheme does not require passing an examination. There are two professional levels: the European Safety and Health Manager and the European Safety and Health Technician. Registration fees range from 250 to 450 euros. Certification is based primarily on meeting certain levels of experience and education. It also accepts designations from other recognized certification schemes from other countries that have applied to their program.

10.6.1.2 Board of Certified Safety Professionals

The Board of Certified Safety Professionals (BCSP) offers a variety of occupational safety registrations and certifications based upon experience, education, and examination. The highest level designation is the Certified Safety Professional, which requires 4 years of safety experience, graduation from 4 years of academic institution with a degree in safety engineering or closely related field, and passing

a comprehensive set of examinations on occupational safety and management. Covering slightly different rubrics than the CIH, this credential is also highly recognized globally (BCSP, 2018).

10.6.1.3 Occupational Health/Nursing/Medicine

Occupational health nursing is a profession arguably one of the closest to the practice of occupational hygiene. Occupational health nursing focuses on the promotion and restoration of health, prevention of illness and injury, case management, worker compensation programs, and protection from occupational hazards (AAOHN, 2007). The necessary competencies for these nursing professionals are set by the AAOHN. This specialty practice is built upon the foundations of nursing sciences, medical science, public health, safety, toxicology, ergonomics, and industrial hygiene.

The American Board of Occupational Health Nurses (ABOHN) was created in 1972 as a means to set standards for occupational health nurses. The board awards three different credentials:

- Certified Occupational Health Nurse (COHN)
- Certified Occupational Health Nurse—Specialist (COHN-S)
- Case Management (CM)

Certification is based upon a review of candidate professional experience and education in addition to passing a written examination. There are currently approximated 4,000 active certificants (ABOHN, 2018).

10.6.1.4 Radiation Protection

The American Board of Health Physics (ABHP) grants professional certification in the field of radiation protection and is accredited by the Council of Engineering and Scientific Specialty Boards. The Certified Health Physicist provides protection to workers from hazardous radiation sources. Certification examinations administered by the ABHP evaluate candidate's abilities in the areas of radiation measurement, selection of detection instruments, analytical techniques for radiation sampling, mathematical modeling of radiation exposure and control, analysis of data, and preparation of reports. Other general topics include the development of standard operating procedures for radiation fieldwork, emergency response, record keeping, and applicable regulations (ABHP, 2018).

10.6.1.5 Ergonomics

The Board of Certified Professional Ergonomists (BCPE) was incorporated in 1990 and is a nonprofit organization and is endorsed by the International Ergonomics Association (IEA). Federated societies of professional ergonomics, representing more than 50 countries, comprise the council governing body of IEA. BCPE provides professional certification for practitioners of human factors/ergonomics/user experience.

In Europe, the Centre for the Registration of European Ergonomists (CREE) harmonizes the certification practices of the ergonomics societies within numerous nations. The national certification methods are each approved by the CREE council, and the certificates are recognized internationally. There are currently 438 registered

FIGURE 10.3 Countries currently members of CREE. (www.eurerg.eu/ homepage, accessed July 4, 2018).

ergonomists in more than 30 CREE member countries (CREE, 2018). Countries that are currently members of CREE are shown in Figure 10.3. The structure and operations of CREE comply with the International Standard ISO/IEC 17024:2012(en).

Other countries with ergonomics credentialing bodies include the Canadian College for the Certification of Professional Ergonomists (CCCPE) (CCCPE, 2018) that has a certification process that leads to the Certified Canadian Professional Ergonomist (ACE, 2018). In Japan, the Japanese Ergonomics Society (JES) that was founded in 1964 and has more than 2,000 members also offers a certification credentialing process. JES is a member of the IEA (JES, 2018).

10.6.1.6 Laser Safety

The Board of Laser Safety offers the Certified Laser Safety Officer designation to professionals who have demonstrated skills, education, and experience in the practice of occupational laser safety. Related laser safety certification examinations include the topics of laser/optics fundamentals, radiation bioeffects, non-beam hazards, control measures, regulations and standards, hazard evaluation, laser measurements, and laser safety program administration (BLS, 2018).

10.7 CONCLUSIONS/RECOMMENDATIONS

Licensing and credentialing are important tools to support the development and clarification of a profession and the workers that practice the field. In the past few years, major advances have occurred in the field of occupational hygiene through the development of international recognition schemes. In order to take full advantage of these internationally recognized certifications, more work needs to be done to standardize the rubrics for each certification scheme, and ensure the administrative means are in place to verify that each certification is truly equal.

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