

Core Competency and the Life Cycle of Professional Practice

Framing the Focus Area

At the present time there are no internationally recognized qualifications for the global practice of occupational hygiene. AIHA convened a working group to develop the set of core competencies that were forwarded to IOHA. The working group commented on the core competency document developed by their committee. Currently, the revised document is out for ballot to the IOHA member organizations

The next step may well be to develop a continuum or matrix that maps out the knowledge and skill set needed by an industrial hygiene professional to advance throughout various stages of his or her career.

Opportunity/Challenge:

Fundamental educational and professional practice requirements as established by the American Board of Industrial Hygiene exist for early career professionals. Beyond that, there is very little mutually agreed upon guidance for professionals and they progress through their career.

Current Status:

As the global marketplace continues to expand and less developed countries begin to industrialize, it becomes increasingly important that competent professionals are available to meet those needs worldwide.

A 2007 survey of multinational corporations, conducted by DeLoitte, showed a strong demand for occupational hygiene (OH) in many parts of the world. The study also reported difficulties faced in many developing countries in recruiting and training qualified individuals.

At the present time there are no internationally recognized qualifications for the practice of OH. Cultural diversity has a great impact of the definition of and practice of OH as do differing education and skill requirements from one country to another.

In March of 2008, Lindsay Booher (AIHA President at the time) formed a working group to draft and define the core competencies underlying the practice of OH. The working group, chaired by Gayla McCluskey is comprised of members of AIHA, ACGIH, ABIH and the Academy. This group developed a core set of skills that were necessary for the practice of OH in North America and worldwide. This consensus was forwarded to the National Accreditation Committee (NAR) of the IOHA, the group charged with developing this type of guidance for international acceptance.

NAR included most of the working group's recommendations in its draft document that it forwarded out for comment last summer. The working group provided additional comments and a final guidance document was sent out to IOHA members for approval this spring. At the AIHCE, NAR chair advised Gayla McCluskey that few member organizations had replied causing the vote to be delayed until the IOHA meeting in the fall of 2010.

With core competencies established and the existing educational and practice requirements that are set by AIBH, the standard of practice is set for the early career professional. Thereafter, there is little concrete guidance for IH/Oh professionals as they advance in their career.

There are many options open to those in our profession. One can specialize in some particular subset, of industrial hygiene, practice general industrial hygiene, taken on safety or environmental responsibilities, or become a manager of those professionals. These are the traditional options. However, other professionals may expand out into related fields, new or old, while still performing industrial hygiene work.

What additional disciplines and competencies will impact and possibly define the future of our professional practice? Is it time to delineate a Life Cycle of Professional Practice to both guide our members as they progress throughout their careers and to attract others to join our profession?

1. North American Core Competency Document (attached)
2. Career Guide to the Safety Profession http://www.bcsp.org/pdf/2007_Career_Guide.pdf
3. ASCE Body of Knowledge for the 21st Century
http://www.asce.org/uploadedFiles/Leadership_Training_-_New/BOK2E_%28ASCE_2008%29_ebook.pdf
4. Example Career Ladder
http://www.careeronestop.org/CompetencyModel/careerpathway/ReviewCareerPathways/Enrgy_CPW.pdf

Core Competencies for the Practice of Industrial/Occupational Hygiene

May 10, 2009

Background

The Academy of Industrial Hygiene at the request of AIHA formed a working group to draft and define the core competencies underlying the practice of occupational hygiene. This was as a result of the discussions at previous IOHA, BOHS, and AIOH meetings where professionals from multinational companies have expressed the need to develop occupational hygiene programs in the developing world to control occupational health risks. The working group was comprised of representatives from AIHA, ACGIH, ABIH, and the Academy and included:

Dan Anna
Patricia Brogan,
David Hicks
Theodore Hogan
Nicole Greeson
Dan Lacey
Perry Logan
Marie Martin
Gayla McCluskey
Torey Nalbone
Shamini Samuel
Robert Wheaton

Our hope is the global occupational hygiene profession can reach agreement on the appropriate set of underlying competencies so that, as the profession expands throughout the world, it will be based on a firm and consistent foundation.

Please address questions to Gayla McCluskey at gayla@globalenv.com and 610-688-7110.

Occupational Hygiene Core Competency Document

Air Sampling and Instrumentation

Determine appropriate sampling strategy. Select and describe the advantages and disadvantages of using the various types of air sampling instruments and the collection of full-shift, task-based and grab samples. Demonstrate knowledge of instrument calibration and quality assurance practices.

Analytical Chemistry

Describe principles and application of laboratory analytical procedures and methods of detection for sample analyses such as gas chromatography, infrared, visible and ultraviolet spectrophotometry, high performance liquid chromatography, mass spectroscopy, atomic absorption spectrophotometry and wet chemical analyses.

Basic Science

Know and apply scientific concepts from the fields of general chemistry, organic chemistry, biochemistry, analytical chemistry, biology, anatomy, physiology, physics, mathematics, and statistics. Describe physical properties of substances such as reactivity, combustibility and flammability. Perform calculations related to gas laws, airborne concentrations, units of measures and conversions, and pressure and temperature adjustments.

Biohazards

Identify biological agents such as viruses, bacteria, fungi, molds, allergens, toxins, recombinant products, bloodborne pathogens, and infectious diseases that are potentially harmful to humans and other biological organisms.

Biostatistics and Epidemiology

Demonstrate knowledge of the principles and techniques used in epidemiology to study the distribution of occupationally induced diseases and physiological conditions and factors in workplaces that influence their frequency. Interpret and evaluate prospective and retrospective studies, morbidity and mortality and animal experimental studies using data and data distribution knowledge of statistical and non-statistical data.

Community Exposure

Describe general and technical topics related to ambient air quality, air cleaning technology, emission source sampling, atmospheric dispersion of pollutants, ambient air monitoring, health and environmental effects of air pollution. Be familiar with peripheral disciplines such as emergency planning and response, water pollution, hazardous waste and environmental fate and transport.

Engineering Controls/Ventilation

Recommend and apply local exhaust ventilation, dilution ventilation, isolation, and process change engineering principles to control chemical, biological, and physical exposures. Application of these principles requires knowledge of the mechanics of airflow, ventilation measurements, design, in-plant air circulation and recirculation, air-cleaning technology and related calculations.

Ergonomics

Identify, evaluate and recommend controls to mitigate ergonomically stressful jobs using principles from anthropometry, human factors engineering, biomechanics, work physiology, human anatomy, occupational medicine and facilities engineering for the purpose of preventing injuries and illnesses.

Health Risk Analysis and Hazard Communication

Demonstrate knowledge of the principles of health risk analysis: establish an exposure assessment strategy; collect basic characterization information (workplace, workforce and agents); assess exposures to the workforce; prioritize health risks; implement monitoring and control strategies for unacceptable exposures; schedule and perform periodic reassessments as necessary; document and communicate health risk exposures.

Management

Describe methods to acquire, allocate, and control resources to accomplish anticipation, recognition, evaluation and control of workplace hazards in an effective and efficient manner. Apply principles of auditing, investigation methods, data management and integration, establishment of policies, planning, delegation of authority, accountability, business acumen, risk communication, organizational structure and culture, and decision making. Follow a Code of Ethics.

Noise and Hearing Loss Prevention

Demonstrate knowledge of and apply principles of the physics of noise and vibration to conduct appropriate measurements to evaluate worker exposure, to identify situations with the potential to cause noise-induced hearing loss or vibration-related injury, and to recommend methods to eliminate or control excessive exposure. Demonstrate knowledge of the anatomy and physiology of the ear with respect to the development of impaired hearing. Evaluate audiograms and audiometric testing programs.

Non-Engineering Controls

Recommend and evaluate use of personal protective equipment to control exposures using the principles governing selection, use, care, and limitations of the equipment. Apply knowledge of respirator fit testing, breathing air specifications, material permeability, eye protection, training and the use of worker rotation as an administrative control.

Ionizing Radiation

Apply knowledge of the physical characteristics and health and biological effects associated with exposure to alpha, beta, gamma, neutron and x-radiation to recommend controls based on measurement and evaluation of exposure.

Nonionizing Radiation

Apply knowledge of the physical characteristics, potential hazards, and health effects of exposure to electromagnetic fields, static electric and magnetic fields, lasers, radio frequencies, microwaves, ultraviolet, visible, infrared radiation and illumination to recommend controls based on measurement and evaluation of exposure.

Thermal Stressors

Describe heat-strain pathophysiology and hypo- and hyperthermic enviromarkers and biomarkers, recommend comprehensive heat strain prevention programs, and recognize special human risk factors for heat-related disorders and deaths.

Demonstrate knowledge of medical/first aid care in case of emergency.

Toxicology

Demonstrate knowledge of the principles of toxicology including symptomatology, pharmacokinetics, mode of action, additive, synergistic and antagonistic effects, routes of entry, absorption, metabolism, excretion, target organs, toxicity testing protocols, aerosol deposition, clearance in the respiratory tract, carcinogenic, mutagenic, teratogenic and reproductive hazards. Apply the toxicological principles to evaluating and predicting health effects from exposures to single contaminants, mixtures of contaminants, and natural and synthetic agents.

Work Environments and Industrial Processes

Anticipate, recognize, evaluate and control exposures associated with specific industries and/or processes. Apply knowledge to topics such as confined space entry, spray-painting, welding, abrasive-blasting, vapor-degreasing, foundry operations, hazardous waste site remediation, and indoor environmental conditions.