

Chapter 6

WHAT IS PROFESSIONAL REGISTRATION?

Traditionally, the professions of engineering and architecture have been regulated through each state. Registration is an administrative process encompassing education and/or training requirements that results in the issuance of a license to practice engineering or architecture within a specific state. The ultimate goal of licensure is the “Protection of life, health, and property of the public and promotion of the public welfare.” The National Council of Examiners for Engineering and Surveying (NCEES, <http://www.ncees.org>) notes six primary reasons why entry-level engineers should pursue licensure: jobs, promotions, money, credibility, respect, and security.

The first law requiring registration of engineers was passed in Wyoming in 1907. Since then, each of the 50 states, the District of Columbia, and many U.S. territories have enacted statutes requiring registration of engineers. Similarly, architectural registration boards have been established in all 50 states, the District of Columbia, Guam, the Northern Mariana Islands, Puerto Rico, and the Virgin Islands to regulate the practice of architecture.

While not mandatory, registration for PHS engineers and architects is strongly recommended as an important step in the ongoing process of professional development and to underscore professional recognition. Moreover, professional registration can be a requirement for certain engineering and architectural positions, particularly senior grade positions. Professional registration or an advanced degree is required for Commissioned Officers applying for the Regular Corps (see chapter-5 section-2 for more information). Approximately half of the Commissioned Corps engineers and slightly over a third of the Civil Service engineers and architects are registered.

A pamphlet published by the National Society of Professional Engineers (NSPE) states that professional registration is “...the prestigious step in professional development that allows the engineer to take his or her place in the mainstream of the engineering profession.” Registration reflects credit upon the individual while promoting solidarity in the engineering profession.

Registration is particularly important for engineers and architects in government practice. Federal engineers may work on assignments for which registration would be a prerequisite in the private sector. They may also be called upon to administer programs requiring the services of registered consultant engineers. Mutual confidence and respect are enhanced when all parties are registered.

From a legal standpoint, registration is an affirmation, usually by a state, that an engineer or architect has met certain prescribed qualifications and is, therefore, recognized under the laws of that state as an engineering or architectural professional.

The rewards of professional registration far outweigh the enormity of the task. A pamphlet distributed by the NCEES lists some of the tangible benefits to be gained from registration. These benefits include, but are not limited to:

- Proof that you possess the education and professional experience necessary to practice in the engineering profession,
- The right to publicly represent yourself as an engineer,
- The opportunity to seek reciprocity and practice engineering in other states,
- The chance to work as a consultant, thus enhancing future employment options,
- The respect of professional engineers and surveyors.

STATE REQUIREMENTS FOR ENGINEER REGISTRATION

Registration requirements vary from state to state; however, most states require a degree from a college or university with an accredited engineering curriculum, at least four years of related work experience, and successful completion of written examinations. Some states will accept extensive experience as a substitute for formal education.

Registration as a professional engineer (PE) in a specific engineering discipline is usually granted by a state. Although engineers may be registered in more than one discipline, experience requirements and questions on the PE examination differ for each discipline. A list of engineering disciplines for which examinations are offered through NCEES follows:

- Agricultural
- Building Architectural (starting in April 2003)
- Chemical
- Civil
- Control Systems
- Electrical
- Environmental
- Fire Protection
- Industrial
- Manufacturing
- Mechanical
- Metallurgical
- Mining/Mineral
- Naval Architecture/Marine Engineering
- Nuclear
- Petroleum
- Principals and Practice of Land Surveying
- Structural I
- Structural II

Although requirements for registration from state to state are now more uniform, there are still some states where requirements continue to be specific and unique. For example, the California PE examination for a Civil Engineer contains a mandatory question on earthquakes. To obtain a Civil Engineering license in Alaska, the applicant must complete an Arctic Engineering course offered by the University of Alaska or an alternative requirement. In addition, Massachusetts offers a PE license in safety

engineering where successful completion of a Board of Certified Safety Professionals (engineering related) examination is an acceptable substitute for the Principles and Practice of Engineering (PE) examination.

Registration is typically a two part examination process. First, you must pass the Fundamentals of Engineering (FE) Examination, which is a closed-book, multiple-choice test of fundamental knowledge.

Jurisdictional Boards evaluate education and experience as a prerequisite to an applicant's acceptance to take the FE examination. For information regarding specific requirements for licensure in a jurisdiction and the guidelines to the jurisdiction's administration of the NCEES uniform examinations, contact the jurisdiction board for the latest information. The names and addresses of jurisdiction boards may be obtained by writing the Executive Director of the NCEES, P.O. Box 1686; Clemson, South Carolina 29633-1686; by calling 864-654-6824; or through the NCEES home page, <http://www.ncees.org>.

The second and final part of the Professional Registration examination process is the PE or Principles and Practice of Engineering Examination. This examination is given once or twice a year, depending on the state and/or discipline. The PE examination is an eight hour test offered in each state in one of the many licensed engineering disciplines. Beginning with the October 2000 exam administration, the Civil Engineering PE exam adopted a breadth and depth format. The PE exams in electrical and mechanical engineering are the only other exams that will follow the lead of civil engineering in adopting this format.

An example of a breadth and depth exam is as follows. The morning portion of the exam focuses on the breadth of civil engineering; it is 100 percent multiple choice and candidates must answer all questions. The afternoon portion of the exam is also all multiple choice; however, candidates choose one of five modules that examine a civil engineering specialty area in depth. The candidate must answer all questions in the module that is chosen. All five depth modules are printed in the same exam booklet so that candidates can see all questions before deciding which module to choose, unless their local board requires that candidates declare beforehand. Always check with your local board prior to test date.

STATE REQUIREMENTS FOR ARCHITECT REGISTRATION

Historically, an apprenticeship under an architect for a specified number of years was necessary to qualify for registration examination. Today, the architectural registration boards of all 50 states, the District of Columbia, and the U.S. Territories make up the National Council of Architectural Registration Boards (NCARB, www.NCARB.org) which provides guidelines to the member boards on the rules, regulations, and practice laws and standards on education, internship, and examination.

Initial registration as a professional architect in most states is comprised of three requirements: (1) education, (2) training, and (3) examination.

EDUCATION REQUIREMENTS

To register as a professional architect in many states, the registration boards require a professional degree in architecture from a program accredited by the National

Architectural Accrediting Board (NAAB - www.naab.org). NAAB-accredited programs typically require between five and eight years of postsecondary education, and include the Bachelor of Architecture and the Master of Architecture programs. Four-year "pre-professional" degree programs such as the Bachelor of Arts in Architecture, Bachelor of Science in Architecture, or Bachelor of Environmental Design are not accredited by NAAB. Most of these programs are a component of a five-year Bachelor of Architecture or six-year Master of Architecture program. A list of NAAB-accredited programs is available by visiting the NAAB website under the "Architecture Programs" area of the site or through the American Institute of Architects (AIA) home page (<http://www.aia.org>).

Some registration boards accept other education assessed as equivalent to a NAAB-accredited professional degree. For current information on equivalency requirements, contact NCARB at (202) 783-6500 or visit their website at www.ncarb.org. Some registration boards do not require a NAAB-accredited degree or its equivalent. In some cases, a pre-professional degree in architecture is acceptable, while others require only a bachelor's degree in any subject or only a high school diploma.

TRAINING REQUIREMENTS

All state registration boards require a minimum period of training including some work experience under the direct supervision of a registered architect. This is sometimes referred to as an Intern Development Program (IDP). Nearly every state requires IDP training for initial registration. The IDP was developed to prepare interns for competent practice. The program provides a means for periodic review of career development; expedites initial registration application; becomes part of one's professional portfolio; and documents knowledge, skills and abilities for prospective employers. Further information is available at www.ncarb.org/idp/index.html

EXAMINATION REQUIREMENTS

The NCARB developed the Architectural Registration Examination (A.R.E., - www.ncarb.org/are/index.html) used by every state board to meet the examination requirements. Some states require additional information or examinations prior to licensure. For example, Alaska has a requirement related to cold weather construction, and the California examination contains a section on earthquake resistant design. Requirements for oral examinations may also vary from state to state; however, basic education and training requirements are consistent for all states.

The A.R.E. consists of nine divisions:

Multiple Choice

- Pre Design
- General Structures
- Lateral Forces
- Mechanical and Electrical Systems
- Materials and Methods
- Construction Documents and Services

Graphics Divisions

- Site Planning
- Building Planning
- Building Technology

Further information can be found at <http://www.ncarb.org/are/divisions.html>.

CONTINUING EDUCATION REQUIREMENTS TO MAINTAIN REGISTRATION

For engineers, as of January 2001, 19 states had Continuing Professional Competency (CPC) requirements for licensure renewal, with six other states having either voluntary reporting requirements or programs under development. For details, refer to <http://www.nspe.org/lc1-cpc.asp>. Each state has distinctly different requirements for CPC. Visit the www.ncees.org website under Professional Info, Contact Your Licensing Board links for each state's contact information.

For architects, nearly half the states have mandatory continuing education requirements for licensure renewal with many more working towards that end. For details, refer to www.ncarb.org/continuinged/index.html.

GOVERNMENT POSITION ON REGISTRATION

Professional registration may or may not be a requirement for employment as an engineer or architect with the federal government depending on the position. Many positions demand specific competence in a particular function or area. For such positions, agencies may use selective placement factors to identify those applicants whose records show evidence of the required capabilities.

Professional registration is an appropriate selective factor for appointment to certain, typically high level, engineering or architect positions. The key consideration is that registration must be essential for acceptable performance of the work needed to successfully fulfill the requirements of the position. See Chapter 5, Personnel Systems, for the specific Office of Personnel Management (OPM) criteria for both engineers and architects.

When an engineering position involves duties and responsibilities that clearly support a requirement for registration and such a requirement is subsequently established, the position description should document the basis for the requirement. According to OPM, it would be inappropriate to require registration for positions:

- With less responsibility than indicated in the specific criteria,
- That involve functions such as research and development, or
- For the sole purpose of improving the "image" of engineers or architects in the federal service.

Positions where registration is an appropriate requirement are characteristically filled by registered professional engineers or architects. If registration is newly identified as a requirement for a position that is already filled, typically the requirement is waived for the duration of the current employee's incumbency. However, it is important to remember that individual agencies have formulated policies that promote professional registration. An NSPE pamphlet notes that:

Registration for engineers in government is becoming increasingly significant. Many states and municipalities have statutes, ordinances, and rulings which require certain governmental engineering positions (particularly those considered higher level and responsible positions) be filled only by registered professional engineers. In addition, several federal agencies have adopted policies requiring registration for selected positions in responsible charge of engineering work.

Although increasing numbers of engineers working in federal, local, and state governments are obtaining registration, a significant percentage remains unregistered. This reluctance can be traced to a number of considerations, chief among them being:

- If professional registration is not a requirement, why bother?

Apart from a noticeable improvement in morale, registration enhances the prestige of the branch (or agency) for which the individual works. It also stimulates the possibility of advancement. An engineer who is sufficiently motivated to obtain registration in spite of the fact that it is not required is a more likely candidate for tasks (or positions) that require similar dedication and responsibility.

- Will registration automatically mean more money?

In the Federal government the direct answer to this depends on whether or not the engineer or architect is in a career ladder position with the potential for an automatic promotion. However, according to an NSPE brochure:

Registration is considered by many federal agencies, state, and local governments, and branches of the Armed Services as a major factor in evaluating employees for promotion, more responsible work, and more opportunities for individual thought and discretion. To this extent, registration will ultimately put more money in your pocket.

The PHS, and other federal agencies, traditionally do not pay for licensure examinations or renewal fees. Examinations and fees are the responsibility of the employee. However, agencies may provide administrative leave for the employee to take the examinations.

EPAC POSITION ON REGISTRATION

In a 1987 memorandum forwarded to the then Surgeon General C. Everett Koop, the EPAC position on professional registration for engineers was stated. That statement read, in part:

Incumbents in certain engineering positions within the Public Health Service perform functions where registration as a professional engineer should be required. Therefore, whenever the duties and responsibilities of an engineering position satisfy one or both of the following criteria, the position or billet description should require registration.

- The position involves responsibility for final approval of designs of major structures and facilities involving public safety where such compliance with state laws meets an essential need of the engineering organization to provide

objective evidence to agency management and the public that the work is performed by engineers of proven competence.”

- The position involves responsibility for engineering determinations concerning contract awards or other major aspects of design and construction work to be performed by engineers in the private sector where registration is essential to have their full confidence and respect to achieve cooperation on critical engineering issues.”

To accomplish this objective:

- Maximum use should be made of engineering registration as a selective placement factor for positions meeting the above criteria and as provided for under Civil Service qualifications standards for the professional engineering series.
- Commissioned Officer billet descriptions should establish registration as a mandatory requirement in the placement of any Commissioned Officer who will be responsible for performing duties meeting the above criteria.

The EPAC position on registration largely remains unchanged today. As part of their professional development, all PHS engineers and architects are encouraged to seek professional registration, certification, or licensure, as may be appropriate for their specialty.

HOW TO OBTAIN REGISTRATION

ENGINEERS

If you are unsure as to the state in which you wish to register, engineers should contact the NSPE for the following:

- State by State,” a pamphlet summarizing requirements for engineering registration in each state and the District of Columbia
- A list of State Engineering Registration Boards
- A Selected Bibliography on Professional Engineers and Fundamentals (Engineer in Training) Examination Preparation including Study Manuals and Home Study Courses.

Write or call:

The National Society of Professional Engineers
1420 King Street
Alexandria, Virginia 22314
(703) 684 2800

The NCEES publishes a flyer with information on registration fees and where to obtain study guides for the examinations. For those engineers who have obtained professional registration, the NCEES provides a service called the Council Record to simplify and expedite registration via comity/reciprocity in a majority of states. Most state boards will

accept the Council Record without further duplication of paperwork. Additional information is available on the NCEES home page (<http://www.ncees.org>) or you may:

Write or call:

The National Council of Examiners of Engineering and Surveying
P.O. Box 1686
State Road 210
Clemson, South Carolina 29633 1686
(803) 654 6824

ARCHITECTS

A current listing of NCARB member boards is available on the AIA home page (<http://www.aia.org>). If you are unsure as to the state in which you wish to register, contact the NCARB for their Member Board Requirements Chart. This chart provides a comparison of the current requirements for registration in all states and territories. NCARB also publishes four circulars that provide information on the NCARB, the registration examination, and their certification program.

- Circular No. 1 - An overview of NCARB
- Circular No. 2 - Architectural Registration Examination (A.R.E.)
- Circular No. 3 - Education Requirements and the Intern Development Program (IDP)
- Circular No. 4 - Architects Development Education Program (ADEP) (continuing education)

Write or call:

The National Council of Architectural Registration Boards
1735 New York Avenue NW - Suite 700
Washington, D. C. 20006
(202) 783-6500

Upon attaining initial licensing, architects may choose to acquire registration in other states, many of whom allow reciprocal licensing. This is not uncommon since many architects practice in several states. NCARB also grants a certificate to those licensed architects who meet its standards. NCARB certification facilitates registration through reciprocity among the member boards. The NCARB Certificate is recognized by all boards as qualification to receive licenses without additional requirements. Some states do require an oral or personal interview. NCARB certification should not be confused with registration. NCARB certification does not allow a person to practice architecture but rather facilitates acquisition of additional licenses. All boards grant licenses through reciprocity to architects who meet their qualifications. However, it should be noted, many boards only grant licenses to those architects with a NCARB Certificate.

WHAT IS CERTIFICATION?

While registration represents the granting of a license to practice engineering under the laws of a particular state, certification is a distinction of professional competence granted

by a self regulated national professional peer organization. For engineers, there are two types of specialty certification. The first is occupation specific. Occupation specific is not limited to engineers. For example, the American Board of Industrial Hygiene offers a Certification in Industrial Hygiene (CIH). The Board of Certified Safety Professionals of the Americas confers status as a Certified Safety Professional (CSP). Engineers may also become Certified Health Physicists or Certified Hazardous Waste Specialists.

The second type of specialty certification is engineer specific. The American Academy of Environmental Engineers offers board certification (diplomate status) in water and wastewater engineering. Certification in other engineering disciplines is available from several other organizations. Although professional specialty certification for engineers is currently limited, availability is expected to increase in all disciplines in the next decade.

CERTIFIED INDUSTRIAL HYGIENIST (CIH)

Industrial hygiene is the science of protecting human health through control of the work environment. The American Board of Industrial Hygiene (ABIH) confers status as a CIH in several categories or aspects. In addition to the core aspect, candidates must complete an examination in one or more of the following aspects:

- Comprehensive Practice
- Acoustical
- Air Pollution
- Chemical
- Engineering
- Radiological

The ABIH also offers sub-specialty aspect certification in indoor environmental quality.

For certification in the acoustical or radiological aspects, candidates must also be a member of the Institute of Noise Control Engineering or have been certified by and maintain active status with the American Board of Health Physics.

To become a CIH, a candidate must first pass the core examination after which the candidate may use the Industrial Hygienist in Training (IHIT) designation. This is followed by the Certified Industrial Hygienist (CIH) exam. Both are eight hour multiple choice examinations given each May at the American Industrial Hygiene Conference and Exhibition (AIHCE) or regionally each fall.

To maintain certification, each CIH must submit information on activities that demonstrate professional competence. Competence is demonstrated by attending conferences, serving on technical committees, participating in training opportunities, writing papers, and teaching.

Individuals may be certified in more than one category. For each additional certification, the candidate must file a new application, pay a new filing fee, and pay a separate fee for the examination; however, the candidate is only required to take (and pass) the CIH, or second level, of the examination in the specific category. The Board determines whether the education and experience of the first certification may be equally applicable to subsequent requests for certification in other categories.

Write to:

The American Board of Industrial Hygiene
4600 W. Saginaw - Suite 101
Lansing, Michigan 48917 2737

THE AMERICAN ACADEMY OF ENVIRONMENTAL ENGINEERS (AAEE)

The American Academy of Environmental Engineers (AAEE) has been providing specialty certifications since 1955. AAEE currently certifies professional engineers in the following environmental specialties:

- Air Pollution Control
- Industrial Hygiene
- Hazardous Waste Management
- Solid Waste Management
- Radiation Protection
- Water Supply/Wastewater
- General Environmental Engineering

To be considered for certification in General Environmental Engineering, the candidate must demonstrate experience and knowledge in public health engineering together with experience and knowledge in a minimum of three of the other certifiable specialties.

Applicants for certification by the AAEE in any of the above listed specialties must:

- Have a baccalaureate degree in engineering or a related field;
- Have achieved professional registration;
- Have 8 years of progressively responsible engineering experience of which 4 years were in a supervisory capacity and pass both a written and an oral examination, or have 15 years of experience of which 11 were in a supervisory capacity and pass an oral examination;
- Submit an application to the Academy Office in Annapolis, Maryland;
- Pass a Preliminary Screening by the Admissions Chairman and Staff;
- Be approved by the Admissions Committee for the written and/or oral examination;
- Pass the written examination (the examination can be waived if the candidate has 15 years of experience of which 11 were in a supervisory capacity);
- Pass the oral examination which has both professional and technical components; and
- Receive final approval from the Admissions Committee and the Board of Trustees.

Examinations, which take three hours and consist of approximately 100 multiple choice questions in the specific category, are given periodically depending on the number of candidates in a particular region of the country. Re-certification requirements include completion of forty professional development hours of work during the preceding two-year period and maintenance of a valid P.E. license. Diplomate environmental engineer status may be revoked by the Board of Directors of AAEE for fraud, revocation of an engineering license, etc.

Write or call:

The American Academy of Environmental Engineers
132 Holiday Court - Suite 206
Annapolis, Maryland 21401
(301) 266 3311