



WHAT IS THE DIFFERENCE BETWEEN LICENSING AND CERTIFICATION FOR ENGINEERING?

Many professions use some form of credentialing to recognize the competence or expertise of individuals offering or providing specified services. A number of terms are used in the credentialing processes to include accreditation, certification, certificates, licensure, registration, etc. While each term has a unique meaning, general understanding of and differentiation between terms by the public has been a challenge along with incorrect usage that proliferates misperceptions. This white paper intends to bring clarity to the terminology and usage in the credentialing processes.

In the field of engineering, the two commonly used terms used are licensure and certification. These terms are often times misunderstood and on many occasions used interchangeably. While both terms are employed to represent an attestation of qualification, competence, or expertise issued to an individual by a third party, there are significant functional distinctions between the two and the authority authorized by each.

It is also worthy to note that time limitations are generally present with both licensure programs and certifications. The incumbent must demonstrate ongoing knowledge and relevant experience to maintain the license or certification and prove such commitment through a renewal process with the awarding entity. Licenses and certifications are not normally awarded for life.

Engineers who are not certified or licensed, who practice under an industrial exemption, must be cognizant of the importance of safeguarding public safety, health and welfare through the use of product and service standards issued by government, industry groups, and AAES member societies.

LICENSURE

Licensure is the most restrictive form of credentialing and refers to the granting of a license by a governmental or delegated (e.g., regulatory) body to practice a profession. The primary purpose of licensure is to protect the health, safety and welfare of the public by restricting practice of the profession to individuals who possess the knowledge, skills and abilities required to do so safely and competently. Licensure is a regulatory process which grants permission to an individual to engage in an occupation if it is determined that an applicant has attained the necessary degree of competency required. Once a licensing law has been passed it becomes illegal for anyone to engage in that occupation or some restricted subset of that occupation unless he or she has obtained a license. Licensure prohibits anyone from practicing the profession who is not licensed, regardless of whether or not the individual has been certified by a private organization.

In the United States, the practice of engineering is regulated by the individual states. All 50 states, the District of Columbia, Guam, Puerto Rico and the U.S. Virgin Islands have licensing boards that regulate the engineering profession for that jurisdiction. These licensing boards constitute the membership of the National Council of Examiners for Engineering and Surveying (NCEES). In order to offer or to provide engineering services to the general public, an individual must become licensed as a Professional Engineer (PE). Each license is valid only for the state or territory for which it was granted so it may be necessary for a Professional Engineer to hold a license in multiple jurisdictions based on their field of practice.

There are variations to the requirements for licensure among the licensure boards but all use a model that incorporates education, experience and examination. The model that is recognized as the standard for licensure as a Professional Engineer in the U.S. is the NCEES Model Law. The Model Law is to

provide licensing boards with a uniform target and guide for their own laws. The Model Law currently requires:

- Graduation from a four-year engineering program, or equivalent, that has been accredited by the Engineering Accreditation Commission (EAC) of ABET, Inc.
- Successful completion of the NCEES Fundamentals of Engineering (FE) examination
- Completion of four years of progressive engineering experience
- Successful completion of the NCEES Principles & Practice (PE) examination

Many jurisdictions recognize that it is in their interest to adopt alternate pathways in their statutes and rules on licensure for applicants who do not meet the educational requirements of the Model Law. Some of these pathways include accommodating those with baccalaureate degrees in technology or science baccalaureate degrees. These alternative pathways apply in that jurisdiction, but do not necessarily apply in other jurisdictions. Consequently, individuals may become licensed in some jurisdictions without a four-year engineering degree from a program accredited by the Engineering Accreditation Commission (EAC) of ABET, Inc.

Some jurisdictions issue the PE license in specific disciplines of engineering based on an applicant's education and experience. The majority of the licensing boards issue a generic license which permits a PE to provide engineering services in any discipline where the PE is competent, again based on education and experience. Once licensed, all PEs are required to practice their profession adhering to a strict code of conduct that holds paramount the welfare of the general public and requires the licensee to offer their services in an ethical and professional manner.

Licensing provides a method of strict control of the behavior of those in a particular field of activity and presumes that working in this particular field of activity is a privilege. The privilege is given and may be withdrawn at any time by the issuing agency. Professional Engineers who fail to practice their profession in accordance with prescribed requirements may have their license revoked which would then legally prohibit them from offering engineering services. Most issuing agencies also require continuing professional education and development activities as a prerequisite for licensure renewal.

CERTIFICATION

Although the process used to develop a certification program can be as rigorous as that for a licensure program, certification is distinguished from licensure because it is generally non-governmental and voluntary. Unlike licensure, certification is not a permission to act. Certification does not involve the regulatory power of the individual states and does not grant the privilege to practice. Certification simply attests to certain qualifications possessed by an individual. A certification may be withdrawn by the issuing organization. However this does not restrict an individual from continuing to offer their services unless the entity for which they work requires that they hold a certain credential in order to perform certain tasks within that organization.

Certification typically refers to an earned credential awarded by a private sector, non-profit, professional association or independent board to those members who, through an assessment process, demonstrate mastery/competence of knowledge and skills required by the certifying organization. Certification provides more information to the consumer about the qualifications of an individual and their ability to perform their services in a competent manner. Portability of education and experience can also be part of the value proposition of a certification program allowing the certified expert to demonstrate to potential employers and vendors that he/she meets the minimum requirements even if their experience and/or education comes from another part of the world.

Certification programs are typically administered by professional associations which develop minimum eligibility requirements, typically in the form of coursework, degrees, and progressive experience. Some

programs also include examinations. Some engineering-related certifications (commonly called “specialty certifications”) also require licensure as a professional engineer as a prerequisite. The vast majority of associations/societies that are involved in the engineering profession offer certification programs to their members. Certification programs should not be confused with certificate programs that do not involve the same level of rigor or evaluation of competency. Certificate programs often award a “certificate of completion” without consideration for testing the knowledge or skill that was truly acquired.

A few examples of certification programs are listed below:

- Certified Automation Professional (CAP). Offered by the International Society of Automation (ISA), this certification does not require an engineering license to qualify. Generally requires an engineering degree.
- Certified Software Development Professional (CSDP). Offered by the Institute of Electrical and Electronics Engineers (IEEE), this certification does not require an engineering license to qualify but typically requires an engineering degree.
- Geometric Dimensioning and Tolerancing Professional (GDTP). Offered by the American Society of Mechanical Engineers (ASME), this certification does not require an engineering degree or license to qualify.
- Diplomate in Water Resources Engineer (D.WRE). Offered by the Environmental and Water Resources Institute of the American Society of Civil Engineering (ASCE), this certification requires an engineering degree and license to qualify.
- The National Institute for Certification in Engineering Technologies (NICET) offers the Certified Engineering Technician (CET) certification in graduated levels for a range of engineering technologies. These certifications do not require an engineering degree or license to qualify.
- Certified Diplomate in Forensic Engineering. Offered by the National Academy of Forensic Engineers (NAFE), this certification requires, among other requirements, that the certified member holds a current professional engineering license to qualify.

While the criteria for obtaining a certification vary by society, the benefits of certification are generally similar. The benefits of certification include:

- Certification recognizes the individual has specialized knowledge and skill in their field of engineering.
- When the certifications are post-licensure, they can be used to demonstrate advanced qualifications to clients, employers, peers and the public.
- Certification demonstrates attainment of a body of knowledge within a specialty area of engineering and commitment to stay current on new technological innovations.
- Certification may demonstrate a strong commitment to professionalism in those cases where ethics and continuing professional development requirements are associated with the certification allowing engineers to maintain significant input into the advanced credentialing process.
- Certification provides clients with a demonstration that they are engaging qualified participants on their projects.
- Certification supports the concept of Qualifications Based Selection (QBS).

CONCLUSION

Although both terms symbolize that an individual has taken action to distinguish themselves in a particular area of their profession, each is unique and distinctly different in terms of the authority that is granted. In many instances, both a license and a certification become a valuable part of the personal tool box for career success. Licensure and certification are not mutually exclusive, and many licensed engineers are certified in their specialty field.

While not always the case, it is generally true that requirements for licensure are based on standards of minimal competence whereas certifications often indicate the command of advanced or specialized knowledge and expertise. For this reason, the level of subject material appearing in licensure versus certification examinations varies from more basic and generalized subject areas to more narrow and specialized topics when comparing most licensure versus certification requirements.

As a synopsis:

Licensure: A process by which a governmental agency grants time-limited permission to an individual to engage in a given occupation after verifying that he or she has met predetermined and standardized criteria (usually education, experience, and examination) and provides the means to regulate the individual's practice after the license is granted.

- The goal of licensure is to ensure that the licensees have the minimal degree of competency necessary to ensure that public health, safety, and/or welfare are protected.
- To become licensed, one usually has to meet eligibility requirements and pass an assessment that covers a broad range of knowledge and skills, usually at the entry level.
- There are usually ongoing requirements that need to be met to maintain the license (CEUs, retests, physical exams, etc.).
- Licensure requirements usually include a code of conduct that one must follow or risk the loss of the privilege to practice.
- Typically, licenses are granted at the state level; if the individual works in multiple jurisdictions, then they must be licensed in each jurisdiction. Licensing requirements vary from jurisdiction to jurisdiction.
- NCEES routinely updates and publishes a Model Law to provide U.S. licensing jurisdictions with a guide of best practices to provide greater uniformity of qualifications for licensure.
- Professional associations do not grant licensure but can play a role in licensure activities, such as advocating for the license and collaborating with agencies responsible for the development and administration of licensing.

In most cases, the terms “licensure” and “registration” are used interchangeably. An example of this credential would be a registered architect or licensed professional engineer.

Certification: A voluntary process by which a non-governmental agency grants recognition to an individual after verifying that he or she has met predetermined and standardized criteria.

- To become certified, an individual must meet eligibility requirements and pass an assessment.
- Certification is voluntary and the individual does not need to be certified in order to engage in a given occupation. Certification has traditionally been an association activity in which a group of professionals determines the need to publicly state its standards through assessment of competence, quality, or specialized knowledge.
- The certification assessment may cover a broad area of knowledge and skills at entry, specialty, or advanced levels.
- Certificate holders usually have ongoing requirements, such as continuing education or retesting, to maintain the certification.
- A certificate program should not be confused with certification.

Appendix A is a listing of the links to AAES member society web pages where listings of certification programs can be found.

Glossary of Credentialing Terms

Accreditation – process by which an entity recognizes or vouches for a program as conforming to a standard

Certificate – a document certifying that one has fulfilled certain requirements, such as attending and/or completing a course of study

Certification – voluntary process by which an organization attests to an individual as having satisfied a standard

Credential – something that gives title to credit or confidence

License – a permission granted by a competent authority to engage in a business or occupation or in an activity otherwise unlawful

APPENDIX A
LINKS TO AAES MEMBER SOCIETY WEB PAGES FOR CERTIFICATION PROGRAMS

The American Institute of Mining, Metallurgical, and Petroleum Engineers (AIME)
Society of Petroleum Engineers — <http://www.spe.org/training/certification.php>

American Society of Civil Engineers (ASCE)
<http://www.asce.org/certification>

American Society of Mechanical Engineers (ASME)
<https://www.asme.org/shop/certification-accreditation/personnel-certification>

Institute of Electrical and Electronics Engineers (IEEE-USA)
IEEE Software Engineering Certification (IEEE Computer Society) —
<http://www.computer.org/portal/web/certification>
IEEE Wireless Communication Engineering Technologies (WCET) Certification (IEEE
Communications Society) — <http://www.ieee-wcet.org/>

International Society of Automation (ISA)
http://www.isa.org/Content/NavigationMenu/Products_and_Services/Certification3/Certification.htm

National Academy of Forensic Engineers (NAFE)
<http://www.nafe.org/>

National Society of Professional Engineers (NSPE)
<http://www.nicet.org/>

Adopted by the AAES Board on October 28, 2013.