

MAPPING SCIENTIST REGISTRATION AND CERTIFICATION REQUIREMENTS IN THE UNITED STATES OF AMERICA

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ABSTRACT

Some type of requirements for registration, licensing or certification for professionals has been mandated in United States of America (USA) for over one hundred years. It has been required ,but for not quite as long for the engineer, surveyor and others in the mapping sciences (Geomatics). Emphasis has increased in the past few years for Geomatics certification for the Photogrammetrist, Mapping Scientist Remote Sensing and Mapping Scientist Geographic Information and Land Information Systems (GIS/LIS). User of services from these professionals want criteria to evaluate various purveyors qualifications to provide professional services. States and local governments through the registration process want to qualify those whom legally can perform those professional geomatic duties , they justify these licensing and certification requirements under the guise of protecting the health and welfare of the public.

This report covers registration and licensing requirements and how they differ in the fifty State governments legislative rules for surveyors (including photogrammetric surveys) and it discusses projected changes in the legal requirement models used by the states. Existing certification programs of the American Congress on Surveying and Mapping (ACSM), American Society for Photogrammetry and Remote Sensing (ASPRS) are described.

The summary provides projected actions that can be anticipated in the next ten years of this century and the probable impacts that will be generated on those professionals that are already in and are anticipating entering the geomatics practicing arena

1 INTRODUCTION

Many use ,in an intermingled fashion, the terms Registration, Licensed and Certification with reckless abandon even though each has a quite separate definition and significance. Procedures for licensing and registration are usually required by a governing body and they can often have different parameters. In the United States they are not always the same or united. Certification is recognition from a professional or technical organization of practitioner in specific organization of occupational specialities. Certification can also be a requirement for a specific specialty after registration or licensing.

2 EXAMINATION

Written examinations are required for licensing, registration and certification in all geomatics activities with emphasis on engineers, surveyors and mapping scientist. The most influential in developing statutes and examinations are the model law and examinations developed by the National Council of Examiners for Engineering and Surveying(NCEES). They also maintain an updated item specific pool of questions that are available for use by State. NCEES works in close cooperation with the Engineering Accreditation Commission of the Engineering Board for Engineering and Technology (ABET). They credit educational institution's programs involved in engineering and technology education.

The American Society for Photogrammetry and Remote Sensing (ASPRS), the National Society of Professional Surveyors (NSPS) of the American Congress on Surveying and Mapping (ACSM) both have their own separate questions for their individual certification programs.

3 STATE REQUIREMENTS FOR LICENSING SURVEYORS

Each of the fifty State's requirements were reviewed and an analysis was made for specific requirements of important significance. Analysis results are in percent of the total States.

3.1 Each state has a policy and administrative Board that set policy, administrate and handle ethical violations concerned with registration of surveyors, engineers and others. Boards vary in size and consist of lay persons as well as representatives of the professions and are appointed for terms usually by the State Governor.

	Percent of States
a. Five or less members	16%
b. Six to ten members	72%
c. Ten or more	12%

3.2 Surveyors activities defined by state

a. Property boundaries surveys	98%
b. Topographic surveys	56%
c. Engineering (construction layout) surveys	36%
d. Route (streets, subdivision, layout) surveys	22%
e. Geodetic (control) surveys	22%

3.3 Comity, accepts other states documentation

a. Requires state statutes written examination	86%
b. Does not accept	14%

3.4 Ethics

a. Specific surveyors and engineer Code of Ethics	82%
b. Perform under general state Code	18%

3.5 Experience requirements

a. Eight years surveying practicing or equal	40%
b. Five to seven years	44%
c. Less than five years	16%

3.6 Requiring a four year college degree with experience

a. Degree in engineering or surveying	20%
b. Degree with experience (less)	30%
c. No degree requirements	50%

3.7 Written examination based on NCEES questions

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| a. Eight hour fundamentals | 28% |
| b. Twelve hours, fundamentals plus four | 72% |
| c. Four hours on States statutes | 86% |
| d. Four hours special geomatics after fundamental | 04% |

3.8 Fifty eight (58) percent of the states have requirements for continuing education credits to maintain license. Specific requirements and procedures vary by State. Education credits are changing as the technology becomes more sophisticated. The need is to keep current with technological developments.

4 CERTIFICATION

Certification is the process developed by all organizations that want to improve its membership knowledge and competence and to provide clients who use the membership services some degree of competency evaluation and assurance of their commitment to technical and ethical performance. This process can be developed by any organization and many are doing so. In 1990 the Council of Engineering and Scientific Specialty Boards (CESB) was founded, after several years of study, by 32 professional organizations. CESB objectives are to provide basic criteria and guidelines for the establishment and operation of specialty certification programs for engineers, technologists, technicians and related scientific professionals. they list over 60 organizations.

The following two organization are of a definite interest in the mapping sciences, spatial data or geomatics arena. They are the American Society for Photogrammetry and Remote Sensing (ASPRS) and the National Society of Professional Surveys (NSPS).

4.1 Certification Program of the ASPRS

This program is entirely voluntary and available to all. It was initiated in 1975 with the primary purpose and objectives to:

- Recognize those who after careful evaluation of their peers are considered to have met the requirements established by the Society to qualify for them to sit for the written examination.
- Provide a basis for weighing the validity of allegations and complaints involving a Certified person and for taking appropriate actions in connection therewith.
- Encourage those not yet fully qualified to strive towards qualification certification as a professional achievement.
- Encourage those certified, through the re-certification process, to continue professional development.

There are three Certification categories.

- Certified Photogrammetrist (CP)
- Certified Mapping Scientist, Remote Sensing (CMS,RS)
- Certified Mapping Scientist, GISLIS (CMS,GL)

Eligibility Requirements

All must qualify by peer review of experience prior to being eligible to sit for the written examination.

Peer Review Eligibility Minimums Requirements

- a. CP = six(6) years photogrammetry experience. Of which three(3) are in positions of professional responsibility.
- b. CMS,RS= Six(6) years experience, of which three(3) years are in cartography and or photogrammetry and three(3) years in remote sensing in positions of professional responsibility.
- c. CMS,GL= Six(6) years experience of which three(3) are in cartography and three(3) years in a position of professional responsibility.

Re-Certification

All certified personnel to keep on the Active Certification category must re-certify every five (5) years by applying and providing verification that they have received training or otherwise taken or participation in current technology applicable to their certification, for review and approval by a peer panel.

4.2 Certification Program of the NSPS

The rationale for NSPS having a certification program is to provide initiative for self improvement of the technician and allows their attainment of more responsible positions in the surveying technology community.

At this time they are offering four levels of Certified Technician.

- a. Level I
- b. Level II, Instrument person-field, office operation
- c. Level III, party Chief for boundary, construction surveys, office operation, chief computer operator, drafting supervisor
- d. Level IV, Chief of field operations, office manager

Eligibility Requirements.

- a. Level I, none
- b. Level II, 1.5 years or 3000 hours experience (750 hours can be accepted for education)
- c. Level III, 3.5 years or 7000 hours experience (1,750 hours can be educational) of which 4000 hours experience must be at Level II
- d. Level IV, 5.5 years or 11000 hours experience (2700 hours maybe educational) of which 7000 hours must be Level III experience

Certification Method

Must meet eligibility requirements and pass examination

- a. Level I, Four hours
- b. Level II, Six hours w/ 2nd specialty 7 hours
- c. Level III, Six hours w/2nd specialty 7 hours

Re-certification is required yearly.

5 SUMMARY

Registration, Licensing and or Certification has indicated that those persons holding such credentials have been recognized as having special skills and knowledge in their specialty. These requirements have allegedly been needed to perform tasks that are required for health and safety protection of the public. All States require boundary land surveys to be done by surveyor recognized by them and most professional civil engineering activities require State approval. Many States require Registered and Licensed engineer to be certified in specialties such as structures, geology, environmental and other disciplines

The next ten to twenty years will see technological change and political events that will happen will requiring more activity designed to protect the public health and welfare from the professionals providing them services.

- Professional registration requirements will become more encompassing
- More specialty certification will be required of those registered and holding licenses
- Programs will have stricter rules requiring professionals to keep updated and to assure competence through re-certification requirements such as continuing education
- Strong emphasis and lobbying will be made to develop standard Nationwide registration and certification to allow practice acceptance across state boundaries without individual state testing
- Special Federal legislation will be enacted that will require strict ethical standards of practice regarding invasion of personal privacy applied to remotely sensed data
- International pressures will require very strict procedures for professional to practice multi-nationally

Restrictions on professional practice in the future will be more demanding in professional practice and in the use of data that was until recently not imaginable in its application to the world.