

# PHASES OF THE PRESENT ENGINEERING ACT\*

*Presented by Newman E. Argraves  
Consulting Engineer and Member Board of Registration for  
Professional Engineers and Land Surveyors*

**M**Y talk tonight with the exception of the (tentative draft on corporations) will be my own personal opinion of the various phases of the present engineering registration Act, with comments on possible amendments.

I recommend for reading the article "Registration, Then, Now and Tomorrow" in the September 1954 issue of American Engineer, by Frank H. Prouty, member of the Colorado Registration Board and Chairman of the National Bureau of Engineering Registration. Some of the items below are excerpts from that article.

Registration has received universal acceptance by engineers. All States have engineering registration Acts. There are approximately 190,000 registered engineers in the United States, and approximately 150 colleges and universities having one or more accredited curricula. The founder societies support registration as shown by the fact that most of the major engineering societies have standing committees on registration and several regularly participate in the financial support of the National Council of State Boards of Engineering Registration. Their support is shown further by the fact that following the Illinois State Supreme Court decision, declaring the existing State Engineering law unconstitutional in 1944, every major engineering organization in the U.S. combined in preparing and approving a new model law. This law adopted in 1946 was the basis for a new law enacted by the Illinois State Legislature which to date has not been challenged.

Here are *some of the advantages* frequently cited for registration :

1. The Taft-Hartley law says professional men need not join a collective bargaining group, in which they form a minority.
2. Some States (and others will follow), list engineering registration as a requirement for some promotions.
3. In many States, engineering plans will not be accepted for filing unless the engineer is registered.
4. Engineering fees need not be paid by the owner unless the engineer is registered, as it is illegal practice.

---

\*Presented at Local Meeting on Surveying and Engineering Registration of the Connecticut Society of Civil Engineers, Inc., Hamden, Connecticut, December 9, 1954.

5. In most civil courts an engineer can not qualify as an "expert" unless he is registered.

6. Registration enables a person to legally serve as a consultant in an individual capacity at any time. This is an important aspect to persons working for organizations that are in the exempt category, for in many cases, engineers after years of experience with one company, retire and remain with the company in a consulting capacity. This may be done legally only if he is registered.

7. The person may transfer from an organization that is in the exempt category to one that is not exempt.

I think it will be easiest to explain interpretation of various phases of the Act by discussing details of a classification under which the applicant may apply.

First of all, under Class I, the requirements are: a graduate of an approved course in engineering in a school or college approved by the Board as of satisfactory standing and a specific record of an additional four years of active practice in engineering work, which shall be of a character satisfactory to the Board and a successful passing of a written or written and oral examination prescribed by the Board, the first part of which shall test the applicant's knowledge of fundamental engineering subjects, including mathematics and physical sciences, and the second part of which shall test the applicant's ability to apply the principles of engineering to the actual practice of engineering.

Let us explore the meaning of "*approved course.*" It is that compiled annually by the Engineers Council for Prof. Development. Obviously, it would be physically impossible for the Board to investigate every curriculum from which applicants have passed and evaluate their qualities. As a matter of fact, accreditation was started by E.C.P.D. mainly for the purpose of assisting the various State Boards of Engineering examiners by preparing a list of engineering schools that are doing a satisfactory level of work in the various fields of engineering. Any school may apply for accreditation. When requested by the school, for a standard fee an E.C.P.D. Committee visits the school, inspects their laboratories, facilities, as well as records of the alumni and professors, along with various other factors, and if they are up to standard, will accredit the course.

Let us consider next, the meaning of "*engineering work of a character satisfactory to the Board.*" This is a phase of the work of the application, which requires more of the member's time than any other phase, and requires the best judgment. The legislature, and the engineering profession who sponsored the Act, realized this, when they required that all members of the Board be engineers, since only engineers are competent to judge engineer-

ing ability and experience. The Act does not limit the engineer to the practice of any phase, such as design or supervision of construction, nor does it limit him to practice any branch of engineering other than that which he has qualified himself with the Board. Therefore, he has to be more or less self-disciplined and do only the work he knows he is competent to do. It is very important for the Board to ascertain whether the applicant has adequate knowledge in design and in the various phases of engineering, so that he can take full charge and responsibility. The Board must learn, of the applicants knowledge of standard practice and to the extent he would carry design of detail so that something won't be skipped over, for the reason that he doesn't know how to analyze it or to just what length standard practice would carry the analysis. In order to do this, the Board must have very detailed information as to what the applicant has done throughout his entire engineering career, not only his education but also the detailed experience, the responsibility, he has carried and whether he has been an administrative man or has worked in actual design. To aid the Board in evaluating all this, the "written examination" is of the utmost importance. In College, a great many of the problems encountered are stereotype problems and can be solved with mathematical exactness and consequently, a man has to acquire enough experience before registration to season him into doing the problems that can not be solved in a reasonable length of time or mathematically exact, so he can take short cuts without neglecting the important factors to have a safe and economical design. It is much the same way a mathematician takes a very long and involved calculus formula and cuts out a large percentage of the unessentials and still come out with an answer within the region of accuracy he is looking for.

Next let's consider the "successful passing of a written or written and oral examination prescribed by the Board." The oral examination or interview is given to help the Board appraise and evaluate the experience that the person has shown in his application forms. *An oral examination* is never given in lieu of a written examination. The first part of the written examination will test the applicants knowledge of the fundamental engineering subjects, including mathematics and the physical sciences. This is the same examination as is given to the applicant who has a degree in an accredited curricula, whether or not he has had additional experience. You may ask why we give an examination to a graduate who has obtained his degree recently. There are several reasons. One is that many of these graduates have forgotten the most of the subjects they had taken in the early stages of their college work and by taking this examination it is necessary for them to brush up on these subjects. Furthermore, examinations given by States like New York etc., have found that there is a wide variation of grades obtained in the examinations by these graduates, with the result that some schools can

use these results in determining the parts of their curricula that are not up to standard and devise means for correcting the deficiency.

*With regard to National registration.* Since registration is administered under local "police powers" and since police powers are State reserved and differ in each individual State, there can be no National registration law. However, there is a national certificate issued by the National Council of State Boards of Engineering Examiners, for a fee of \$35.00. Since the National Council is advisory only and has no actual power within the confines of any State, this certificate becomes a verified account of an engineer's education and experience. The verification is secured by the executive secretary of the Council and no application is accepted unless the engineer is first registered, in his home State. If a registered engineer expects to cross multiple State lines, this service avoids duplication of efforts and the embarrassment of requesting references to send in the same endorsement over and over again. The excellent reception given this National Certificate is attested by the fact that 85% of all State Boards give at least partial acceptance to such a certificate. Since the requirements for a National certificate are higher than those in the model law, some States grant full registration to anyone holding a national certificate of qualification.

There is only one phrase in the Section regarding reciprocity that should be emphasized I think, and that is "provided the requirements for the registration of Professional Engineers or Land Surveyors under which such certificate of qualification or registration was issued shall not conflict with the provisions of this Chapter and shall be of a standard not lower than that specified in Section 1755C." You will note that Section 1755C is the requirement for registration under the latest Act for new registrants.

*I would like to cover exemptions briefly.* The exemptions of officers and employees of any Public Utility Corp., whose operations are under the jurisdiction of the Public Utilities Commission. Officers and employees of the Government of the U.S. engaged in the practice of the profession of engineering or land surveying for said Government. I think the reason for these exemptions are twofold. One is that they are regulated by either the Public Utility Commission or the Interstate Commerce Commission or by the Federal Government. Second, these organizations transferring men from one State to another would encounter considerable difficulty, in that it would require each of these men transferred to be registered in every state in which he is to perform work, even though the work is on his own organization's property.

The exemption of employees of any manufacturing corporation, while engaged in the performance of their employment by such corporation, would generally be limited to engineering work on equipment etc., which the firm manufacturers.

The example below points up the need for means whereby large numbers of engineers may join in associations for the engineering of large projects.

The Board does not attempt to limit the breadth of the field of practice in engineering of a registrant. The reason for this is that except for the simplest and smallest projects, many branches of engineering are involved, for example the design of a pumping station requires knowledge to a certain extent of mechanical, electrical, structural, and sanitary engineering and the design of a highway requires knowledge of highway, structural, soils, construction and perhaps hydraulic, electrical and other engineering along with land surveying. Projects such as refineries, etc., require a much larger number of varieties of specialists. Therefore, it is very important that the registrant has learned his limitations, as well as to have the courage of his convictions. While the registrant has fulfilled the legal requirements, to practice in any branch, when he is registered in one, I believe the courts would view with added gravity, a case for example where a structural failure occurred, where the engineer was not and could not qualify for registration in the structural branch. The present Act is silent as to how or under what conditions companies or corporations may engage in engineering. This presents a difficult problem in making provisions which give maximum service to the public and yet adequately protect the public. The thought given to this problem by your two (2) Societies through the Committee of the Connecticut Technical Council is appreciated.

For partnerships, all members must be registered engineers, if they are to perform engineering services. If an individual is performing engineering under a company name, the Secretary of the Board makes certain that this individual is registered. As for corporations, registered individuals of the Corporation must be responsible for the engineering work. However, to make sure the Corporation takes due responsibility, the act should be clarified, particularly as to which corporation executives or employees must be licensed and which need not be.

Because of the difficulty in setting up safeguards, there is no agreement between the States as to what is reasonable. From the standpoint of the profession "rather than the public" our law should be restrictive to the extent that it does not encourage out-of-State firms from exerting unfair competition with our in-State engineers. Neither should it be too restrictive; assuming however, their State adopts the same law, would it unduly cramp the activities of each.

The registration acts of four (4) States, New York, Rhode Island, Ohio and Washington specify that new corporations may not practice engineering. Several others require that the Chief Executive officer of the corporation, along with all persons in responsible charge of engineering be registered, i.e. Florida and Illinois. Also, New York where the corporations were in the

practice of engineering, prior to the passage of the act (1935). Michigan requires that all officers and directors be registered. Pennsylvania and California require that directing heads be registered. Wisconsin requires the executive director and the holders of the majority of the stock, be registered. The Conn. registration Board "majority tentative draft" recommends that the chief executive officer and at least two (2) other principal officers, as well as all other persons in charge of engineering work in this State shall be registered. I would also wish to point out that this same majority report recommends that all senior partners in a partnership: shall be registered and all other persons in responsible charge of engineering work in this State in the partnership, be registered. It also includes the requirement that after this date, any firm or corporation shall not practice or offer to practice engineering in this State, nor shall it adopt a name using the term "engineer" or "engineering", or any derivation, thereof, until the State Board of Registration certifies that it meets the requirements of the Engineering Act.

I think with the above, sufficient control would be had over the corporations, and partnerships, as it would give a continuous line of authority from top to bottom. Furthermore, I believe the above requirements do not extend privileges to corporations to a greater extent, than it would to a partnership.

It has been suggested that the new act require that the majority of the Board of Directors or the majority of the principal officers be registered. This, I believe, would lead to confusion as to who in the organization must take the responsibility and sign and seal the plans, etc. With the latter, it might require an officer who is not the chief executive officer trying to get approval for administrative branch from the company's policy branch on the question of the adequacy of design or the feasibility of a project, which I believe would be too cumbersome to be effective and would defeat the purpose of obtaining a direct line of responsibility from bottom to top echelon.

As a matter of fact, the "tentative draft" of the Board would amount to the same thing as the majority of the officers registered in a small corporation, whereas the requirement for the large corporations would be that all persons in responsible charge of engineering work in this State, plus direct authority to the President or Chairman of the Board who would also be registered, would be had.

At the December 6th meeting of the Board, the following application, registration and renewal fees were tentatively approved, in order to make income meet operating costs.

For applications and registration, professional engineer raised from \$15.00 to \$25.00, Land Surveyor from \$10.00 to \$20.00, combined professional engineer and land surveyor from \$20.00 to \$30.00, E.I.T. from \$5.00 to \$10.00, reciprocal, \$10.00 to \$20.00, for firm co-partnership and corporation \$25.00. The annual renewal fees for individual registrants would be

raised from \$2.00 to \$2.50. After December 31st from \$3.00 to \$3.50, Engineer in Training not required. Firms, co-partnerships or corporations \$10.00. After December 31—\$15.00.

We are very fortunate to have with us tonight Mr. Russell Warner, who is Chairman of the Registration Board and Past President of the National Board of Engineer Examiners, whom I would like to have come up and assist me with any questions which you may wish to ask.

It has been a pleasure to speak to this distinguished group and thank you.