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# New practice exam part of proposed licensure model

## Task force recommends changes to education, exams, and experience requirements

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In the fall of 2000, Past President Richard Cottingham charged the Engineering Licensure Qualifications Task Force (ELQTF) with assessing the engineering licensure system. By spring 2002, the task force had gathered pertinent information, identified many questions and concerns, and established several concepts and ideas for possible change. This information was presented at the 2002 Board Presidents Assembly, the zone meetings, and the Annual Meeting at La Jolla. ELQTF also made presentations at numerous meetings of the organizations participating in the task force and posted its findings on the NCEES Web site.

These activities resulted in valuable feedback, allowing the task force to continue its work with a better understanding of where the profession stands on licensure issues. Now in spring 2003, the task force has completed its deliberations and will present its final report at this year's Annual Meeting in Baltimore, Maryland. In addition, the task force will offer a motion that the Council body receive the report and forward it to the Licensure Qualifications Oversight Group (LQOG) for study. This article discusses a few of the findings of ELQTF, and a future article will discuss LQOG and its role in the continuing process of assessing the engineering licensure system.

### Education

The task force has reached a broad consensus on education. The scope of engineering education is highly variable from institution to institution, and the variability is growing. More important, the reduction of credit hours required for graduation which has occurred over the past few decades has resulted in an inability to cover all of the technical and non-technical bodies of knowledge necessary for graduates to move effectively into practice. Many of the core courses required in the past for all disciplines (for example, statics, dynamics, materials, thermodynamics, fluid mechanics, and electrical circuits) have been dropped. Some upper-level technical courses that were once considered fundamental in certain disciplines have been lost or greatly reduced in scope and combined with others. Non-technical coursework that is so necessary for graduates to understand the world in which they will work has also suffered. With the world growing more technically and socially complex, task force members are concerned about the direction in which engineering education is moving.

To address these concerns, the task force recommends that additional coursework be added to the current bachelor's programs and that the bodies of knowledge required for each program be stipulated. Graduates moving into public practice would supplement their coursework to meet the educational requirements for professional licensure. The supplemental coursework could occur during or right after the bachelor's program or be acquired later. The task force believes implementation of this concept should be a long-term goal, perhaps occurring over a 15- to 20-year period. Task force members believe the ultimate goal should be the addition of a professional school to the engineering educational system.

### Examinations

#### *Principles and Practice of Engineering*

Many in the profession believe the current Principles and Practice of Engineering (PE) examinations are not relevant to all areas of the engineering profession. As time passes, the argument goes, engineers are becoming more and more specialized, thus the broad examinations offered today are less and less applicable. This is particularly true for engineers working in industry and other areas commonly exempted from licensure. The exams do not fit their expertise, so they decide not to take them. Thus, some argue, the PE exams

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## New practice exam...*(continued from page 1)*

themselves have become an unnecessary impediment to licensure.

In spite of the above, the task force does not recommend changes to the PE exam. ELQTF reached a strong consensus that the examinations offered today are valid and are an important part of the assessment of an individual's competency. Both the FE and PE examinations are developed by comprehensive processes that validate their content and provide a sound basis for the exams. The task force agreed that the PE exams reflect a broad cross section of the profession within each discipline and that this is a positive characteristic of the exams. With the current breadth and depth format, the PE exams can be tailored to address some levels of specialization. Though there are limitations to the number of modules that can be offered, the modules provide important flexibility. The task force agreed that this flexibility combined with the recommendation to allow the exams to be taken anytime after graduation (see the Industrial Exemption section of this article) should adequately address the concern about the relevance of the exams. In addition, for those moving into practice areas typically exempt from licensure, the task force recommends a new level of licensure that eliminates the PE exam requirement (see Industrial Exemption section). However, task force members hold that the broad nature of the exams is actually necessary for those who aspire to offer services directly to the public because such practice is generally broad by nature.

### *Fundamentals of Engineering*

Some individuals in the engineering community are also concerned about the Fundamentals of Engineering (FE) exam. Though the FE afternoon modules are discipline-specific, some feel they are too comprehensive and do not accommodate the variability in engineering educational programs. As discussed above under education, many of the core subjects that were common to all disciplines in the past have been dropped. Those that remain vary from program to program and from institution to institution, thus there is little commonality. Since not all subjects are taught, many parts of the exam are simply not relevant to all graduates.

Most of the task force felt that if the FE exam is too comprehensive for the current educational programs, perhaps the problem lies not with the exam but with the programs. If educational modifications are made as discussed earlier in this article, the FE relevance issue would be addressed. Short of that, the task force points out that the current comprehensive FE exam is the only means to document competency in the important core areas that are gradually being dropped from many programs. The task force recommends against changes to the FE exam although members did not shut the door on the possibility of combining the FE and PE exam.

### *New Practice Examination*

The task force also recommends that a new exam be implemented to address "practice" issues such as registration law, ethics, and contracts. Such an exam would be the final step in the PE licensure process and would not be taken until after the experience requirement is fulfilled. Canada has such an exam and the information the task force learned about the exam process made a compelling argument for such an exam in the United States. (The licensure model proposed by the National Society for Professional Engineers for the past several years also includes such an exam.)

## Experience

It has been said that of the three E's of licensure qualification (education, examination, and experience), the experience qualification is probably the weakest. Some believe that reinforcing the existing approach to evaluating experience would eliminate this weakness. Improve the experience guidelines and improve their application. Others believe that a more rigorous experience requirement is necessary. Some of those go on to say that the requirement could be strengthened to the point that it is more effective at demonstrating an individual's competency at the practice level than the PE examinations, thus allowing the exams to be eliminated and solving the exam relevance problem discussed previously.

One possibility examined by the task force was to implement a formal mentoring program similar to that used in Canada. Certainly, if the PE exams were to be eliminated, a comprehensive mentoring program with clear lines of accountability would be required. However, the task force felt it was unrealistic to think that a formal mentoring program could be effectively implemented in the United States. Business pressures and liability concerns would likely compromise such an approach, and its results would be inconsistent and unreliable. There

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was no support for implementing a program of this type with the sole purpose of eliminating the PE exams.

Instead, the task force felt the current experience guidelines should be reviewed and, if necessary, improved. In addition, the guidelines should be better communicated to individuals when they begin accruing qualifying experience. The recommendation is to transmit the guidelines with explanation when examinees are notified that they passed the FE exam. This procedure, coupled with an improved awareness by the profession of the importance of quality experience, would adequately strengthen the experience qualification.

## Industrial Exemption

The industrial exemption invokes strong opinions and at times strong emotion. Many feel it should be eliminated and that all engineers should be subject to licensure in its current form. Others feel the licensure process should be modified to remove "unnecessary impediments" that keep engineers who work in exempt areas from even attempting licensure. Still others feel that practice in the exempt areas is effectively regulated by means other than licensure and that licensure in such areas is not even workable. The only common ground is that everyone seems to have a strong opinion.

The task force feels strongly that the primary purpose of licensure is to protect the health, safety, and welfare of the public. Members could not reach a consensus on whether all engineers should be licensed, though many felt it would be a good idea. There were also differing opinions as to whether licensure should be used to strengthen the position of the engineering profession. There was a very strong consensus that all engineers offering services directly to the public must be licensed and that any significant reduction in the rigor of the current licensure system would reduce its effectiveness to an unacceptable level. Accordingly, only a few changes to the current system of qualifications were recommended to address the exemption.

One recommendation addresses the timing of the PE examinations. Though most task force members feel the content of the examinations is as it should be, they acknowledged that the PE exams are primarily knowledge-based and, as such, could be taken immediately after graduation without compromising the effectiveness of the licensure system. This was also thought to be one way to facilitate the licensure process for those moving on to practice in exempt areas after graduation.

A second recommendation is to establish a new level of licensure. After completing education and experience qualifications and passing the FE examination, engineers in the exempt areas could obtain a license without passing the PE examination that would provide for limited practice privileges. The license would allow practice in narrow fields (certainly industrial settings but also possibly education and government) but not in the public arena. Members think that the availability of such a license might be attractive to those in exempt settings with an eye toward public practice in the future and to those who simply desire to be a licensed professional but feel the PE is not relevant to their chosen field. The limited license would be voluntary and established simply to facilitate licensure in exempt areas.

## Conclusion

ELQTF, organized and sponsored by NCEES, includes active representatives from ten engineering organizations in addition to NCEES members. It is satisfying to report that, while deliberations were long and intense, the task force was able to reach a strong consensus in its conclusions and recommendations. It was clear from the start that each member came not only to make his or her positions and preferences known—both from an organizational perspective and a personal perspective—but also to listen to the thoughts and insights of others. Consequently, the task force recommendations reflect to a large extent the perspectives and positions representative of many organizations. This perhaps is the most important result of ELQTF. If this process of assessing the engineering licensure system is to be successful, it will take the profession to make it happen. An informed NCEES is also a must. I hope you will take the time to read the ELQTF report to be printed in the *2003 Action Items and Conference Reports* and prepare yourself to participate in the continuing assessment process.

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