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An official NCEES publication for the exchange of information, opinions, and ideas regarding the licensure of professional engineers and land surveyors.

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New practice exam part of proposed licensure model

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

Jon Nelson, P.E.
ELQTF Chair

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

(continued on page 2)

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

(continued on page 3)

The task force also recommends that a new exam be implemented to address "practice" issues such as registration law, ethics, and contracts.

Send letters to *Licensure Exchange* Editor *at* NCEES, P.O. Box 1686, Clemson, SC 29633 or lwilliam@ncees.org.

Please include your name and state of residence on the letter. Letters may be edited for clarity, brevity, and readability.

New practice exam...*(continued from page 2)*

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

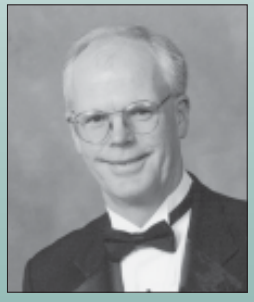
ELQTF, organized and sponsored by NCEES, includes active representatives from ten engineering organizations in addition to NCEES members. It is satisfying to report that, while deliberations were long and intense, the task force was able to reach a strong consensus in its conclusions and recommendations. 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.

Jon Nelson, P.E.
ELQTF Chair
Southern Zone Vice President

PE exams are primarily knowledge-based and, as such, could be taken immediately after graduation without compromising the effectiveness of the licensure system.

From the
PRESIDENT

President encourages future leadership



Robert C. Krebs, P.E., L.S.
NCEES President

Didn't Frank Sinatra sing a song that memorialized his remember-whens? Called "It Was a Very Good Year," it went sort of like this: When I was 51, it was a very good year, hair on my head and my face, with the NCEES Board of Directors the furthest thing from my mind. Well, maybe that's my own version. What little did I know was in store for me back then! After nearly four years on the Board, serving as Zone Vice President, President-Elect, and President, I can say it has been several very good years.

My term as President will end in August, and I encourage you to consider taking a leadership role in the Council. Growth into an NCEES leadership position involves understanding the role the Board of Directors plays in the operations and activities of the Council. Under the President's direction it appoints committees and task forces, laying the groundwork for action by the Council. This year the Board developed and ratified position statements on two significant issues: exam security and education.

Preparing for NCEES leadership also involves active participation at zone meetings and at the Annual Meeting where delegates vote on motions proposed by committees and task forces. Currently the Engineering Licensure Qualifications Task Force is finalizing its comprehensive report on licensure qualifications. The task force will hand off its recommendations to the Licensure Qualifications Oversight Group in August. The Advisory Committee on Council Activities will present the revised NCEES Strategic Plan, representing multiple studies, workshops, and input provided over the past several years. The Committee on Uniform Procedures and Legislative Guidelines will put forward revisions to the Model Law definition of surveying recommended by last year's special land surveying task force. The Structural Engineering Examination/Recognition Task Force has studied structural engineering and its unique qualifications and will propose additions to the definition of Model Law Engineer. And the Annual Meeting list goes on! The bottom line is, to be a good leader you must be informed, be prepared, and ask questions. Come to the Annual Meeting to express and share your opinions. I will be there to guide us through all of these issues, but you will make the final decisions.

One of the many things that I learned last year from then-President Fairfield is that there is no defined limit on your responsibilities as President of the Council, nor is there a gauge on your level of commitment. Much of what is accomplished is not measurable, and accomplishments are even more difficult to describe. In addition to communication with our own Member Boards, there are liaison responsibilities with other professional organizations and technical societies. Often the President or President-Elect attends the yearly meetings of these groups, including the American Society of Civil Engineers, the National Society of Professional Engineers, and the American Congress on Surveying and Mapping/National Society of Professional Surveyors. Occasionally separate leadership meetings are arranged to discuss education, licensure of professional educators, the promotion of licensure, resource advisory groups, and other important issues.

Serving the Council is a real honor, and I must say that the recognition for such a commitment is something that must be shared. So many individuals, including Council staff and consultants, dedicate themselves to the Council at the same level of commitment, and this year as President has allowed me to have more contact with those individuals and to appreciate all their hard work. In addition, I sincerely would like to thank all who have made that difficult decision to run for Council leadership positions. I encourage those who haven't made that step as of yet to consider extending their commitment to the Council and to consider pursuing leadership positions. NCEES is always in need of energetic and enthusiastic people to guide the Council. Sometimes, all you need to do is raise your hand and commit yourself to making a positive impact.

Robert C. Krebs, P.E., L.S.
NCEES President

PURPOSE

The purpose of this Council shall be to provide an organization through which state boards may act and counsel together to better discharge their responsibilities in regulating the practice of engineering and land surveying as it relates to the welfare of the public in safeguarding life, health, and property. The Council also provides such services as may be required by the boards in their mandate to protect the public.

Constitution Article 2, Section 2.01

Committee
FOCUS

UPLG charges illustrate diversity of topics before the Council

George A. Twiss, L.S.
UPLG Chair

Last year when President-Elect Krebs asked me to serve as chair to the Committee on Uniform Procedures and Legislative Guidelines (UPLG) I could not help but reflect on the past few Annual Meetings. Many of you will recall the lively and lengthy discussions that took place in response to the UPLG reports. Strong opinions for and against proposed changes to the *Model Law* and the *Model Rules and Regulations for Licensing Boards* were commonplace. Of course, that is understandable when you recognize the significance of the *Model Law* and *Model Rules* in directing the future of the Council and its Member Boards.

This year, UPLG is continuing its effort to reorganize the *Model Law* and *Model Rules* in, what we hope is, a more user-friendly structure. Gone is the section-type layout and in its place is a more consistent numeric indexing system patterned after many existing state laws. The *Model Law* now uses a 100-series numbering system, and the *Model Rules* will follow based on a 200-series system. The purpose is to enable readers to immediately recognize a citation as either law or rule depending upon the number used.

This year's charges also directed us to remove items from the *Model Law* that more appropriately belong in the *Model Rules*. Law should establish the basic authority and framework for an activity, and the corresponding rule should detail how that activity is applied or carried out. Following this premise, the UPLG report recommends the transfer of various items from *Model Law* to *Model Rules*. The changes do not diminish the importance of any item, but merely position items in a more appropriate location.

As you may recall from the 2002 Annual Meeting, the Task Force on Model Law for Surveying presented its report recommending several changes to the Model Law definition of land surveying. That report was accepted by the Council along with the motion that the recommendations be referred to the UPLG Committee. At the 2003 Annual Meeting, UPLG will move that the Council adopt the task force recommendations into the *Model Law* and/or the Model *Rules*.

Other UPLG items this year deal with changing the name *Model Rules and Regulations for Licensing Boards* to *Model Rules*; incorporating the *Model Rules of Professional Conduct* into the *Model Rules*; reviewing the Model Law qualifications to become an engineer intern or surveyor intern; handling document revisions after the application of seal, signature, and date; sealing electronic documents and hard copies produced from encrypted documents; and providing recognition of non-ABET-accredited education programs accompanied by supplemental experience requirements.

Throughout my history with the Council, which dates to 1987, I believe the *Model Law* and *Model Rules* have been in almost constant evolution. This year and probably the next will certainly be no different. However, the discussions stirred by such changes illustrate the diversity of ideas that are so beneficial to the Council. Delegates will be asked (by their votes) to chart the direction for the next round of changes to the *Model Law* and *Model Rules*. Whether you like or dislike the proposed changes is not as important as spending the time before the meeting to study the UPLG report and its recommendations. Like my predecessors, I will come to the meeting with an open mind and comfortable shoes.

George A. Twiss, L.S.
UPLG Chair
Executive Director
Washington Board of Registration
for Professional Engineers and Land Surveyors

Committee
FOCUS

Task force develops model law for structural engineers

Gregg E. Brandow, Ph.D., S.E.
SEERTF Chair

For over 100 years professional engineers have actively pursued the specialization of structural engineering, and finally there is a national effort to enhance public recognition of structural engineering and standardize requirements to practice. National structural engineering organizations—such as the Council of American Structural Engineers (CASE), National Council of Structural Engineers Associations (NCSEA), and Structural Engineering Institute (SEI)—and NCEES have recognized that structural engineering lacks recognition, uniformity of requirements, and a means to facilitate comity and mobility. In a recent publication of the *Engineering News-Record*, an article titled "Structural Engineering Groups Cooperate to Build Strength" describes the efforts of CASE, NCSEA, and SEI to develop uniform standards of practice for structural engineering across the United States. For two years, NCEES and the Structural Engineering Examination/Recognition Task Force (SEERTF) have been discussing professional practice and licensing with these organizations. SEERTF has responded with the development of the Model Law Engineer—Structural Engineering (MLE-SE) designation, which addresses many of the concerns raised by structural engineers.

> ***The inconsistent use of the Structural I and II exams by states and the use of state-specific structural exams is a problem that NCEES has not addressed until now.***

Past President Ted Fairfield established SEERTF in 2001 to address issues regarding structural engineering licensing, comity, qualifications, examinations, and recognition (for more information, refer to the April 2002 issue of *Licensure Exchange*). The task force concluded that there is a national "problem" with structural engineering licensing and recognition, and that NCEES is the appropriate organization to address the issues. At its 2002 Annual Meeting, NCEES approved the actions of SEERTF and directed the task force to proceed. President Robert Krebs continued SEERTF for the 2002–2003 administrative year with the charge to "develop and propose to the UPLG Committee a definition for Model Law Structural Engineer." The task force met in Phoenix, January 10–11, with members from states with structural engineering title acts (Arizona, California, Nevada), structural engineering practice acts (Hawaii, Illinois), and professional engineering licensing without designation (Louisiana, Maine, Missouri, New York). In addition, two observers from the National Council of Structural Engineers Associations and the Structural Engineers Association of Illinois joined the meeting. SEERTF prepared a consensus response and recommendation to the task force charges to be presented to the UPLG Committee in January and to the Council body at the 2003 NCEES Annual Meeting. SEERTF developed language for a Model Law Engineer specializing in structural engineering considering the needs and desires of the structural engineering profession as well as the complexities and constraints of state licensing systems. The consensus language reflects SEERTF's desire not to impose change on the current licensing system of any state but to begin the process of improving the current situation regarding comity and mobility for structural engineers as well as providing uniform qualifications and recognition through the NCEES Records Program. A professional engineer who qualifies as an MLE-SE would not be granted a title that can be used in lieu of a professional title nor does the designation grant this engineer any additional rights to practice, but it does attest to his/her qualifications. SEERTF recommends that the following language be adopted in the Model Law:

The term "Model Law Engineer—Structural Engineering" refers to a licensed engineer who:

a. Meets the following engineering education requirements:

   1. Is a graduate of an engineering program accredited by the Engineering Accreditation Commission of ABET

(continued on page 7)

Task force... *(continued from page 6)*

2. Has passed a minimum of 18 semester (27 quarter) hours of structural analysis and design courses; a minimum of 9 semester (14 quarter) hours must be structural design courses

b. Meets the following examination requirements:

1. Passes the 8-hour NCEES Fundamentals of Engineering (FE) exam

2. Passes 16 hours of structural examinations consisting of one of the following:

a. NCEES structural examinations, 8 hours of which are the Structural II exam

b. 16-hour state written structural examinations taken prior to 2004

c. NCEES Structural II exam plus 8-hour state written examination taken prior to 2006

c. Completes four years of acceptable structural engineering experience after confirmation of a bachelor's degree; a maximum of one year of credit may be given for a graduate engineering degree that includes at least 6 semester (9 quarter) hours of structural engineering (in addition to the 18 hours in a2 above)

d. Has a record clear of disciplinary action

SEERTF recommends that the Council's Records Program be modified to include Model Law Engineer—Structural Engineering. This will require new applications and forms, as well as a certificate issued to structural engineers meeting the qualifications of experience, education, and examinations.

The members of SEERTF believe that the MLE-SE designation is appropriate for a variety of reasons, including the following.

- Structural engineering is unlike other engineering disciplines in that, in many jurisdictions, it requires professional engineers to pass examination requirements above and beyond the PE examination, and yet under the current MLE definition structural engineers are not granted an MLE status that recognizes the additional structural engineering requirements.
- Structural engineering is a distinct practice of professional engineering emphasizing design of buildings and bridges. Students who desire to pursue structural engineering will probably attend a university that offers a discipline-specific structural engineering program or a civil engineering program with a major emphasis in structural design and analysis. Their experience will probably be gained at a firm or division of a firm that primarily performs structural design and analysis of buildings and bridges. Their professional affiliations will probably be with state or national structural engineering organizations. These professional engineers are structural engineers and should be recognized as structural engineers. The three national structural engineering organizations—CASE, NCSEA, SEI—and the active structural engineering organizations in 33 states are focused on achieving this recognition. The MLE-SE designation would not fragment the engineering profession, but would meet a significant need in a discipline that is well established.
- The MLE-SE designation will not require changes to the current examinations, since the Structural I and Structural II exams already exist and are used by a number of states to license structural engineers. The actual use of these exams should increase as more states make the exams available, especially with California's commitment to use national exams starting in 2004. The inconsistent use of the Structural I and II exams by states and the use of state-specific structural exams is a problem that NCEES has not addressed until now.

The public, business, and government look to structural engineers when requiring a professional engineer with structural engineering expertise and experience. Earthquakes,

(continued on page 8)

Task force... *(continued from page 7)*

extreme winds, and terrorist attacks are events that bring the structural engineer into the spotlight, and the expectation of the public is that these professionals are qualified to make important and often critical life-safety decisions. The task force believes it is important for NCEES to continue to respond to the needs of structural engineers and help alleviate the inconsistencies that currently exist in structural engineering licensing, comity, and recognition. Structural engineering licensure has been in existence in the United States for 88 years, and there are many states that currently license or recognize structural engineers. But, they all have different licensure requirements. The Model Law Engineer—Structural Engineering designation will be a significant step in solving this problem. If the problem isn't addressed through the Model Law for licensure, the structural engineering profession could focus its attention away from licensing and develop its own certification program. This may hinder the licensing process, delay any improvement to the recognition of structural engineers, and encourage the disparities in requirements, comity, and mobility.

Gregg E. Brandow, Ph.D., S.E.
SEERTF Chair
Member, California Board of Professional Engineers and Land Surveyors

NCEES OPERATING SUMMARY
For the Period Ending February 28, 2003

	Year-to-date	Budget Year-to-date	Budget Variance	2002–2003 Total Budget
INCOME				
Member Boards Revenue	$ 118,902	$ 181,170	–34.37%	$ 737,825
Examination Revenue	2,663,490	2,436,829	9.30%	5,313,735
Study Materials Revenue	312,780	395,235	–20.86%	1,036,200
Records Revenue	441,790	472,710	–6.54%	1,134,500
ELSES Revenue	500,025	175,000	185.73%	707,000
Total Income	$ 4,036,987	$ 3,660,944	10.27%	$ 8,929,260
EXPENSES				
Member Boards Expenses	$ 680,323	$ 761,171	–10.62%	$ 2,145,671
Examination Expenses	2,026,622	2,239,108	–9.49%	4,860,936
Study Materials Expenses	238,962	372,549	–35.86%	815,051
Records Expenses	213,900	247,407	–13.54%	569,624
ELSES Expenses	343,028	279,235	22.85%	647,098
Total Expense	$3,502,835	$ 3,899,470	–10.17%	$ 9,038,380
NET INCOME (DEFICIT)	**$ 534,152**	**$ (238,526)**	**–323.94%**	**$ (109,120)**

Changes to Structural II and land surveying exams underway

Betsy Browne
NCEES Executive Director

When I last wrote an article for *Licensure Exchange*, the Northeast was covered in snow and some Council members were having trouble getting home from the Board Presidents Assembly in Alaska. What a change in a couple of months! Currently my car is covered in pollen, the birds are singing, and it feels like spring. By the time you receive this issue, all the zone meetings—except the Western Zone Meeting, scheduled for May 15–17—will be history. The Southern Zone met early, March 20–22 in Charleston, South Carolina. The Central and Northeast Zones tried something new. They booked rooms and meeting space in the same Orlando, Florida hotel, far from cold and wintry weather. Central and Northeast zone members gained a weekend of warm sunshine and the opportunity to network and discuss Council issues with members of another zone.

> ***ELSES administered exams for 13 Member Boards to approximately 9,500 examinees in April. In October those numbers will increase to 19 Member Boards and 13,500 examinees.***

Also by the time you read this, the spring exam administration, April 11–12, will have come and gone. Whether your board uses an outside vendor or administers the exams via its own staff, no doubt you feel the same anticipation we do here at Council headquarters when each administration approaches. So much work goes into each "live" exam—for no two are exactly alike. The Council could not complete its mission of producing licensure exams for the engineering and surveying professions without dedicated volunteers donating time and energy to the development process. No doubt, they feel a special type of expectation when April and October roll around. Please read George Nishimura's article in this issue discussing the development of the Structural I exam. I hope it isn't entirely new information to you, but for many who have not participated on exam development committees, it may provide additional insight into the development process.

The first Principles and Practice of Engineering (PE) Architectural examination was administered April 11. Also on that day, the PE Chemical exam was given under new specifications developed from the Chemical Committee's last Professional Activities and Knowledge Study (PAKS). The Structural Committee has also completed its latest PAKS, and the Structural II exam will be administered in a new four-problem format in April 2004. The Land Surveying Committee will distribute its PAKS later this spring, and they plan to present new exam specifications in January 2004. We've made a news release available to Member Boards with which they may advertise the upcoming LS PAKS (see LS article in this issue). It's important for as many professionals as possible who receive the survey to complete and return it to NCEES. We appreciate your help in getting the word out about the survey and its significance.

April 2003 marks the third year of the Council's examination administration and registration service, ELSES. From a pilot program begun at the request of one Member Board, ELSES administered exams for 13 Member Boards to approximately 9,500 examinees in April. In October those numbers will increase to 19 Member Boards and 13,500 examinees. We are happy to provide Member Boards with this service, and we are proud that ELSES has proven itself to be worthy of your trust, registering exam candidates and administering exams in an efficient and secure manner.

Though now it is early spring, in no time we will gather at Baltimore's Inner Harbor for the 2003 Annual Meeting. You will discuss and consider issues that will affect the future of the engineering and surveying professions for years to come. If you cannot attend your spring zone meeting, please ask your board representative for information. This edition of *Licensure Exchange*, as well as the upcoming June edition, will include articles relating to motions that will be presented to Annual Meeting delegates. Make sure you are informed and up-to-date on the issues, especially regarding education accreditation and examination security. I look forward to seeing Western Zone members in May and the rest of you in August!

Betsy Browne
NCEES Executive Director

National ID numbers may decrease exam security issues

At the February 2003 meeting of the Committee on Examinations for Professional Engineers (EPE), members discussed exam security, the Group II Agreement, exam development, and a variety of other issues.

Bill Dickerson, chair of the Committee on Examination Policy and Procedures (EPP) and member of the Exam Security Task Force (ESTF), provided an update on the progress of ESTF, including how repeat exam takers affect security of exam items. While many examinees who take an NCEES exam more than once do so out of a sincere effort to pass, there are an ominous few whose repeat scores seem to indicate a lack of honest effort. These examinees may be taking the exam only to memorize questions and distribute them, perhaps for profit. The committee discussed the number of times exam candidates should be allowed to take an exam, in light of the fact that the pass rate of repeat examinees is significantly lower than the pass rate for first-time takers. The committee discussed a uniform candidate-identification numbering system as one way to track how many times an examinee takes an NCEES exam regardless of the jurisdiction in which the exam candidate registers.

Director of NCEES Exam Development Services John Adams shared the status of the Group II Agreement. At this time, only the Agricultural item bank has been transferred to NCEES headquarters. The remaining Group II societies have been asked to transfer their item banks by the end of April 2003. The Group II agreement outlines the responsibilities of NCEES and the societies that develop Group II examinations. For security purposes, Group II societies are required to house their item banks at NCEES headquarters.

Walt LeFevre, EPE Committee member, presented examples of fire protection codes and portions of the AASHTO Metric Manual. After discussion, the committee voted to recommend posting on the NCEES Web site the codes, standards, or federal regulations that might be used on exams. The EPE Committee charged exam subcommittee chairs to report at the August 2003 EPE meeting how they intend to handle codes, standards, and federal regulations as they relate to their disciplines. This may include developing pseudo-codes for use in exam items, a code supplied-reference manual, or incorporating codes into exam items.

Much of the EPE meeting consisted of reports on exam development status. Gene Montgomery, EPE Committee member, reported on NCEES exam statistics, explaining that all are above the psychometric-recommended level of reliability. Group I exam subcommittee chairs, Group II society representatives, and the Fundamentals of Engineering subcommittee chair reported on the performance of their exams during the October 2002 administration and their committees' progress in developing new exam items.

The EPE meeting held February 7–8, 2003, had 45 attendees, including Larry Smith, EPE Chair, Bill Dickerson, EPP Chair, Jay Breyer, NCEES psychometrician, Group I subcommittee chairs, Group II society representatives, the FE subcommittee chair, and EPE committee members. The next EPE meeting will be held in August 2003.

The EPE Committee governs the development of the Fundamentals of Engineering (FE) and the Principles and Practice of Engineering (PE) exams. PE exams are divided into two groups. Group I exams are developed under the direction of NCEES Technical Assistants and are Chemical, Civil, Electrical and Computer, Environmental, Mechanical, Structural I, and Structural II. Group II exams are developed by technical societies under NCEES guidelines and policy. They are Agricultural, Architectural, Control Systems, Fire Protection, Industrial, Manufacturing, Metallurgical, Mining and Mineral, Nuclear, Petroleum, and Naval Architecture/Marine.

NCEES staff

The LS pass rates were incorrectly reported in the February issue of *Licensure Exchange*. The October 2002 pass rates are:

PLS
First-time takers 62%
Repeat takers 22%

FLS
First-time takers 60%
Repeat takers 31%

Structural engineers build more than bridges

Fifty engineers, countless hours needed to develop structural exam

Conversations with members of the National Council of Structural Engineers Association reveal that the preparation process for the Principles and Practice of Engineering (PE) Structural I and II licensure examinations is not well known to many licensed engineers around the nation. The following explains the development of the PE Structural I examination, and a separate article at a later date will cover the preparation of the PE Structural II examination.

Examination Specifications

The specifications for the Structural I examination are based on a Professional Activities and Knowledge Study (PAKS) distributed by NCEES to licensed engineers throughout the United States working in the structural area. This survey is used to determine the activities a structural engineer should be able to perform and the knowledge a structural engineer should possess at the time of licensure. The PAKS is normally conducted at five-year intervals. NCEES distributed the last PAKS to approximately 6,000 licensed engineers, and approximately 2,000 survey forms were returned. Though NCEES strives to have the highest rate of return possible, psychometricians consider a 30% return rate a valid outcome. NCEES psychometricians review and analyze the survey results, and 12 licensed engineers, recruited by NCEES to represent different geographical and professional areas of practice, prepare the specifications based on the survey's statistical data. The specifications developed from the most recent survey results are as follows:

Analysis of Structures

Loads 7%
Lateral Forces 8%
Lateral Force Distribution 11%
Methods 5%

Design and Details of Structures

General Structural Considerations 7%
Steel 18%
Concrete 16%
Wood 9%
Masonry 9%
Foundations, and Retaining Structures 10%

Under each of these categories are many subcategories, which may be viewed on the NCEES Web site at www.ncees.org after the October 2003 examination.

Preparation of Examination Questions

The NCEES Structural Engineering Examination Committee, made up of volunteer licensed engineers, prepares questions for use on the Structural I examination. A volunteer who writes questions is referred to as an item writer. Two other volunteers (again, all licensed engineers) review the item writer's question to determine if it is appropriate for the examination. The reviewers may also make recommendations to improve the question. The Structural Examination Committee Chair then reviews the question and determines whether to accept it for the item bank. The committee chair assembles an upcoming examination by selecting questions from the item bank based on the current exam specifications. Two other committee members pretest the selected questions, or the "exam," as if they were examinees. The pretesters record the time it takes to solve each question, check to see if their solutions are consistent with the solutions prepared by the item writers, and provide feedback on each question and solution. Two additional committee members review the pretest results and incorporate the pretest comments, as appropriate, to finalize the questions for exam assembly. As a final check, a team of three reviews the assembled examination. Every examination administered—often referred to as a "live" examination—contains a different set of questions.

Examination Format

The PE Structural I examination has 80 multiple-choice questions. The examination's previous format consisted of eight one-hour essay problems. Some of the reasons for the transition to multiple choice are explained below.

Testing enough knowledge areas

A one-hour essay question can test three or four knowledge areas only. If NCEES uses the eight-problem one-hour format, only about 32 knowledge areas can be tested per examination. In contrast, an 80-question multiple-choice exam can test 80 knowledge areas per examination.

(continued on page 12)

George Nishimura, P.E.
Member
Structural Exam Committee

Please send your board news, including notice of board member changes, to the editor of *Licensure Exchange* at NCEES, P.O. Box 1686, Clemson, SC 29633 or lwilliam@ncees.org.

Structural engineers...*(continued from page 11)*

Scoring essay problems

Licensed engineers must volunteer to score the essay problems, and it is a time-consuming process. In the eight-problem one-hour format, each volunteer scores several hundred problems. Scorers must maintain scoring consistency throughout the process. Scorers have admitted that this is difficult to do over an extended period of time.

Volunteers follow a uniform scoring plan for each essay problem. Some of the scorers follow a strict interpretation of the scoring plan while others are more liberal. Examinees whose solutions are scored by liberal scorers have a better chance of passing the examination than those whose solutions are scored by stricter scorers.

At times, scorers recognize an acceptable alternate solution to a problem they are scoring and grant proper credit, alerting fellow scorers to the alternate solution. Though every effort is made to give all acceptable solutions the appropriate credit, those problems scored prior to the recognition of the acceptable alternate solution may not receive proper credit because of human error.

Scoring multiple-choice questions

Multiple-choice answer sheets are passed through an electronic scanner that marks incorrect answers. Scoring is quick, and there is no need to recruit licensed engineers for this process. When scoring is completed, staff gives the results to NCEES psychometricians for analysis.

If analysis reveals that a high number of examinees selected the same wrong answer, the question is scrutinized. If there is a plausible reason for selecting the "wrong" answer, the question may be scored with two right answers. The answer sheets will be re-scanned so that every appropriate answer will receive proper credit for the question.

Psychometricians are able to determine through statistics whether a multiple-choice examination is more or less difficult than prior multiple-choice examinations. The passing score can be adjusted for the differences in level of difficulty so that the minimum competency required of passing examinees is consistent among all examinations. This is impossible to accomplish with essay examinations, which is why the pass rates for essay examinations (in the format that NCEES administered in the past) varied greatly from one administration to another.

Who Prepares the Examinations?

NCEES examinations are developed through countless hours donated by licensed volunteers. The Structural Engineering Examination Committee is made up of approximately 50 licensed engineers from around the nation. Around 25 of these committee members assemble four times a year to write items for and assemble examinations. Two meetings are generally held at the NCEES headquarters in Clemson, South Carolina, and the other two are generally held in Atlanta, Georgia, and Reno, Nevada. These committee members volunteer their time, and the NCEES reimburses them for travel, hotel accommodations, and meals.

The NCEES is always looking for qualified volunteers for this committee. If you are interested in contributing to this effort, visit the NCEES Web site at www.ncees.org and submit a Volunteer Interest Form.

George Nishimura, P.E.
Structural Examination Committee Member
NCEES Emeritus Member

Does your board have a strong law enforcement program?

Carol Jean Smith
Consultant
Law Enforcement Committee

Having worked with the Alabama State Board of Licensure for Engineers and Surveyors for over 26 years, I continue to consider the practice of unlawful plan stamping to be one of the most egregious acts of licensees. Allowing this practice to continue is in total conflict with the mission of licensing boards to protect the public.

A licensee interviewed by an Alabama Board investigator denied giving an unlicensed person permission to use his surveying license number and other credentials. When reminded of his sworn testimony, he admitted to giving a non-licensee permission to use his license number but not to giving permission to sign his (the licensee's) name. The non-licensee admitted that he sometimes gave money to the licensee, calling the money "tips." The licensee then said to the investigator that he was tired of talking about the matter, and the board could just let him know what it decided to do.

A consent order was sent to the licensee providing for the revocation of his license to practice land surveying in the state of Alabama. He refused to sign the consent order, and the board filed formal charges. The licensee was charged with gross negligence, incompetence, violations of the rules of professional conduct, and misconduct in the practice of land surveying as a professional surveyor. He was also charged with violating the Administrative Code, Rules of Professional Conduct, and engaging in conduct that discredits or tends to discredit the profession of land surveying. In addition, he was charged with permitting or allowing his professional identification, seal, firm or business name, or his services to be used or made use of, directly or indirectly, or in any manner to make possible or create the opportunity for the unauthorized practice of land surveying. Other charges were knowingly associating with or permitting the use of his name when he knows or has reason to believe that a non-licensee is engaged in professional practices that violate any provision of the Alabama law.

The licensee was found guilty of all counts and fined $2,800. He had been a licensee since the early 1960s. He was required to turn in his wall certificate and pocket renewal card to the board. His license to practice land surveying was revoked, and he was ordered to cease and desist offering, performing, or otherwise holding himself out as qualified to perform land surveying until his license to practice land surveying is reinstated by the board.

The number of surveys involved totaled 1,400. Whether the land was prime land or ordinary land, the owners did not receive the services that were required by law. If licensing boards do not enforce the law, their service to the professions and to the public is diminished. If your board does not have a strong law enforcement program, please consider instituting a program now.

Carol Jean Smith
Law Enforcement Committee Consultant
Alabama Assistant Attorney General

For additional information,
call Carol Jean Smith at (334) 242-7344,
e-mail at cjsmith.ago.state.al.us,
or fax at (334) 353-9173.

Member Board NEWS

ARIZONA
- Richard Pawelko, Chet L. Pearson, and Joseph A. Gardner are new appointees to the board. The terms of Herbert W. Schneider and Claude V. Baker have expired. Board member Philip W. Dinsmore is deceased.

COLORADO
- The board's new phone number is 303-894-7784.

DISTRICT OF COLUMBIA
- Stephen Coleman is a new appointee to the board.

FLORIDA LS
- The term of Jim Davis has expired.

KENTUCKY
- Richard K. Sutherland is a new appointee to the board. David H. Dummer, Jr., is the new board chair. The term of William F. Marcum has expired.

MASSACHUSETTS
- Thomas L. McDonough is a new appointee to the board.

MICHIGAN
- Stephen Miller and Gwendolyn Hale are new appointees to the board.

MINNESOTA
- The term of Lawrence Greenberg has expired.

MISSOURI
- Jerany L. Jackson is a new appointee to the board.

MONTANA
- The board's new fax number is 406-841-2332.

NORTH DAKOTA
- The board's new e-mail address is brdofreg@btinet.net.

NORTHERN MARIANA ISLANDS
- Jeffrey L. Barr is a new appointee to the board.

PENNSYLVANIA
- Robert J. DeSousa and Theodore Tesler are new appointees to the board. George Roman is the new board chair.

SOUTH DAKOTA
- Hani F. Shafai and David St. Pierre are new appointees to the board. Wallace L. Larsen is the new board chair. The term of Dale A. Jans has expired.

TENNESSEE PE
- Mark Freeman is a new appointee to the board. The term of W. Vance Travis, Jr., has expired.

TEXAS
- The board's new Web site address is http://www.txls.state.tx.us/sect00/homepage.html.

UTAH
- Douglas Vilnius is the new board administrator. His e-mail address is dvilnius@utah.gov.

VERMONT PE
- The Vermont Board of Engineers has new contact information. Their address is 81 River Street, Heritage Building, Montpelier, VT 05602-1106 (phone: 802-828-3256; fax: 802-828-2368). Theodore McKnight is the new Board Administrator for the Vermont PE board. He replaces Carla Preston. McKnight's e-mail address is tmcknigh@sec.state.vt.us.

WASHINGTON
- The board's new mailing address is P.O. Box 9025, Olympia, WA 98507.

WISCONSIN
- Francis R. Thousand and Dale C. Zabel have resigned from the board.

LS PAKS needs full participation

In May 2003, the NCEES will distribute over 5,000 questionnaires as part of a land surveying Professional Activities and Knowledge Study (PAKS). The questionnaire asks recipients to rate the importance of statements describing tasks and knowledge required of a newly licensed land surveyor. Those who complete the survey will also have the opportunity to recommend examination content. A special NCEES committee will use the survey results to develop new specifications for the content of the Fundamentals and the Principles and Practice of Land Surveying examinations. The examinations with updated content are scheduled to be administered in April 2005. Only 10 percent of licensed land surveyors in the United States will receive the questionnaire. It is essential to the validity of this study that as many questionnaires as possible are completed and returned by those who receive them.

This year's PAKS comes at a crucial time. At the August 2003 NCEES Annual Meeting, the delegate body is expected to approve modifications to the Model Law for Surveying. The changes will result in a Model Law that includes the practice of photogrammetry and the use of Geographical Information Systems as tools to perform professional services that are included in the definition of land surveying. As a result, NCEES will invite individuals such as photogrammetrists and GIS specialists as well as licensed surveyors to participate in this PAKS. Their input will play an important role in the future of surveying licensure examinations for the next 5–7 years. Full participation from all parties is needed to obtain a complete articulation of the important tasks and knowledge of surveying under the proposed new definition of surveying.

The PAKS is an essential part of updating the Fundamentals and the Principles and Practice of Land Surveying examinations. The PAKS enables NCEES volunteers working on land surveying examinations to have information on the important continuing and emerging knowledge needed in modern practice. NCEES uses rosters provided by its member licensing boards and the American Congress on Surveying and Mapping to solicit participation from a cross-section of professionals across the United States, aiming for diversity in geography, practice, age, gender, and ethnicity.

If you have questions about the LS PAKS, contact Bert Webb, P.E., NCEES technical assistant for land surveying, at bwebb@ncees.org.

Upcoming EVENTS

Date	Event	Location
April 18	Holiday—Office Closed	
May 15–17	Western Zone Meeting	Red Lodge, MT
May 26	Holiday—Office Closed	
June 7	President's Planning Meeting	St. Louis, MO
July 4	Holiday—Office Closed	
August 13–16	Annual Meeting	Baltimore, MD

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Enforcement Exchange helps protect the public

Licensing boards across the country often state the need for a national database of violators. This was first addressed when NCEES developed the Law Enforcement Reporting System (LERS). While this was a good first step, the need to submit written reports to Council headquarters and enter that data into the system proved to be cumbersome. Consequently, LERS was underutilized.

In recent years, NCEES has transformed this database into an interactive Internet-based asset known as Enforcement Exchange. This new format allows each jurisdiction to enter its own data, make any appropriate changes to the data they have entered, and retrieve the data (read only) entered by other boards. For security reasons, access to the information is restricted to those who have been approved by their boards and issued the appropriate passwords.

The revised system has been accessed by 57 different boards. While the use of this system has risen with the upgraded technology, many jurisdictions have not yet begun to fully use this powerful asset. Each board should consider the advantages of this management tool. Is your board using Enforcement Exchange to address the needs below?

Enforcement Tool

Many jurisdictions now list their enforcement actions on Enforcement Exchange and regularly search the system to identify licensees who have been disciplined in other states. While not every violation warrants a reciprocal action, many do. This system allows boards to retrieve information at their convenience and initiate whatever action they determine is appropriate. As mobility becomes an ever greater issue across the nation, boards will be required to look beyond their own boundaries when seeking to fulfill their responsibility to protect the public. It is increasingly important to share information of this nature with our fellow boards. Enforcement Exchange provides a user-friendly method of meeting this need.

Application Review

Most boards require applicants to disclose any disciplinary action against them. However, most of us have no certainty that we have been provided correct information. By searching Enforcement Exchange, boards can compare their applications against the database. As we move closer to full participation in this system, boards will have an independent confirmation of the information provided by applicants.

We look forward to the time when all jurisdictions post their enforcement actions on Enforcement Exchange. Use at this level would enable a Council-wide check of any enforcement actions in an individual's background.

Robert Fentress, L.S.
Law Enforcement Committee Member
Assistant Director
Kentucky State Board of Licensure for Professional Engineers and Land Surveyors

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