

## Strengthening the education leg of licensure

Education. Examinations. Experience. The soundness of licensure rests upon the strength of all three. But what happens when one leg of what we often call the three-legged stool of licensure is weakened? Does it lessen the effectiveness of licensure in protecting the health, safety, and welfare of the public? Absolutely.

NCEES has grappled with these issues for years with regard to education. Does a bachelor's of science degree in engineering still provide the breadth and depth of knowledge needed to practice competently? How much education should be required for licensure? At last year's Annual Meeting, the Council decided to increase education requirements when it passed a motion to charge the Committee on Uniform Procedures and Legislative Guidelines (UPLG) with incorporating into the *Model Law* and *Model Rules* language requiring additional engineering education for licensure. In September, the Council will vote on adopting this language.

### Support for change

Over the past five years, NCEES has devoted considerable time and resources to analyzing the adequacy of education requirements.

The Engineering Licensure Qualifications Task Force (ELQTF) was established in 2001 to evaluate the U.S. licensure system. It was made up of representatives from NCEES, engineering professional practice, government, industry, and education. At the 2003 Annual Meeting, ELQTF presented the following evaluation of education as part of its comprehensive report.

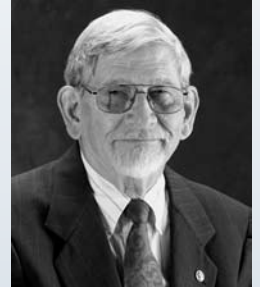
"Engineering education is falling behind other professions in preparing students for practice. There has been a persistent decrease in the credit hours required for an engineering degree over the past several decades. At present, the nominal (but nonuniform) requirement is

128 semester hours, corresponding to an 8-semester (4-year) program of 4 to 6 courses per semester. Based on national averages, 128 semester hours represent the low point on a downward trend—driven partly by a state-centered desire to make the educational process as cost-efficient as possible and to compete for students across state lines . . . This inexorable decrease in credit hours . . . represents a net national loss in the depth of engineering education in core subjects."

The task force concluded that additional education would be necessary in the future to prepare students for engineering practice at the professional level. (To view the entire ELQTF report, go to [www.ncees.org](http://www.ncees.org) and click on the "NCEES studies of the licensure process" link.)

About the same time ELQTF submitted its report, the American Society of Civil Engineers (ASCE) published similar conclusions in *Civil Engineering Body of Knowledge for the 21st Century*. For more than 10 years, ASCE has been implementing a program to encourage "raising the bar" in engineering education. The society adopted Policy Statement 465 to formally advocate additional education beyond the bachelor's degree as a prerequisite for professional licensure. It based its conclusions on the steady decline in credit hours for graduation, from 150 a few decades ago to about 128 today. ASCE pointed out that increased requirements in nontechnical areas have further reduced the number of technical subjects required. Moreover, while requirements are decreasing, the body of knowledge (BOK) required to practice engineering is exponentially growing, as much as doubling every 10 years.

In 2004, the Licensure Qualifications Oversight Group (LQOG) was formed to study the ELQTF report, assess the



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## UPDATE

## Council prepares for Annual Meeting action



Betsy Browne  
NCEES Executive Director

The Annual Business Meeting is still six months away, but Council committees and staff are already busy preparing for it. Committees have spent many hours investigating and meeting about their charges, which range from additional requirements for engineering education to the growing issue of managing continuing professional competency. This issue of *Licensure Exchange* is largely dedicated to discussions of committee findings and the resulting recommendations.

The upcoming zone meetings will offer Member Boards an opportunity to become familiar with these and other issues the Council will vote on at the Annual Meeting business sessions. Dates for the meetings appear on the facing page.

Last year's Annual Meeting in Memphis ended just two days before Hurricane Katrina struck the Gulf Coast. It's fitting that one of the workshops at this year's Annual Meeting will be "The Gulf Coast 2005—How Jurisdictions Deal with Disaster." The session will focus on how Member Boards along the Gulf Coast coped with the aftermath of the hurricanes, including the influx of requests for comity licensure. (This issue also features a story on this subject, beginning on page 4.) The Annual Meeting will offer this and many other forums and workshops. Be sure to read about them and other scheduled events when you receive your invitation and registration packet, which will be mailed at the end of April.

The Annual Meeting is just one of many services NCEES provides Member Boards. Over the past few months, the Council has also enhanced two of its other services—institutional reports and exam security.

### Institutional reports

For more than 15 years, NCEES has provided institution-specific reports detailing the performance of students taking the

Fundamentals of Engineering (FE) exam. The Council sends these reports to institutions with ABET-approved engineering programs to assist them in the process of outcomes assessment. (For more information on this subject, see "Using the FE examination to assess academic programs," in the February 2006 issue of *Licensure Exchange* at [www.ncees.org](http://www.ncees.org).)

Earlier this year, the Council sent the institution reports for the October 2005 exam administration. This was the first time that they were sent exclusively via e-mail. In addition to the FE exam results, the Council sent reports detailing examinee performance on the Principles and Practice of Engineering (PE) exam for the first time. This information will help institutions broaden the perspective of their outcomes assessment, enabling them to evaluate their graduates' performance years after graduation.

The Council has also added institution reports for ABET-approved surveying programs. There are far fewer institutions offering surveying programs, and in the past gathering this information was not feasible. But NCEES staff has recently added this capability to the scoring database and is now able to apply it to the Fundamentals of Surveying and Principles and Practice of Surveying exams as well.

### Exam collusion investigations

To protect the integrity of the licensing process, the Council has established procedures to identify potential security breaches during NCEES exam administrations. As part of this effort, the Council has employed a third-party contractor to analyze statistical data from exam scores. Such information may indicate collusion if examinees' responses to test questions (particularly incorrect responses) are significantly similar. The analysis itself does not confirm the collusion, but it does suggest that there is reason to question the validity of the score achieved by at least one of the examinees involved.

The October 2005 administration marked the beginning of this particular analysis, and instances of potential collusion have been reported to the appropriate Member Boards. NCEES Security and Compliance Manager Bob Whorton, P.E., will be presenting more information about collusion analysis in a workshop at the Annual Meeting. Our goal is for Member Boards to understand this procedure and the information that can be gathered from statistical analysis.

responsible for coordinating development of the Fire Protection and the Electrical and Computer PE examinations. He also oversees both NCEES surveying exams. Before working at NCEES, Charles was vice president of engineering and maintenance at Chemical Products Corporation in Cartersville, Ga. A chemical engineering graduate of Clemson University, he is a licensed professional engineer in Georgia and has more than 30 years' experience in chemical engineering.

**New staff**

Finally, I would like to introduce one of the Council's newest employees. In January, Charles Rutland, P.E., joined NCEES as an exam development engineer. Charles is

*Betsy Browne*  
*NCEES Executive Director*

Upcoming  
**EVENTS**

<b>DATE</b>	<b>EVENT</b>	<b>LOCATION</b>
April 27–29 . . . . .	Southern Zone Meeting . . . . .	Savannah, Ga.
May 18–20 . . . . .	Northeast Zone Meeting . . . . .	Charleston, W.Va.
May 30–June 1 . . . . .	Board of Directors' Meeting . . . . .	Santa Fe, N.Mex.
June 1–3 . . . . .	Joint Central/Western Zone Meeting . . . . .	Santa Fe, N.Mex.
September 13 . . . . .	Board of Directors' Meeting . . . . .	Anchorage, Alaska
September 13–16 . . . . .	Annual Meeting . . . . .	Anchorage, Alaska

# Gulf Coast 2005: How Member Boards deal with disaster

**B**roken glass, leaves, and hundreds of sheets of paper—these were some of the unexpected objects that Rosemary Brister encountered when she finally reached her fifth-floor office on September 1, 2005. Located more than 150 miles from the coast, the Mississippi Board of Licensure for Professional Engineers and Surveyors was hit hard by Katrina. Although their buildings may not have been physically damaged, other Gulf Coast Member Boards also felt the blow of the 2005 hurricanes. Now, a full seven months later, some of these boards relate their experiences in dealing with disaster.

## **A debilitating scenario**

How would your board deal with the effects of disaster? No electricity—and therefore no access to computers and no means of purchasing fuel from gas stations. A communications network that's completely down—no phones, no e-mail, no Internet. A postal system that remains severely debilitated for several weeks.

And all of this results from an event that actually increases your board's workload. Professional engineers and surveyors from other states inundate your office with requests for comity licensure. Some who are not licensed even respond.

In addition to these duties, you have annual renewals to obtain from professionals in your state. But many of them have been displaced and cannot be reached at the addresses or phone numbers that you have on file. Your office is shorthanded because board and staff members have been personally affected by the disaster, and in just about two months, you have an exam administration to organize.

These scenarios were reality for the boards affected by the storm surges of Hurricanes Katrina and Rita.

## **The storm's aftermath**

The licensing boards of the Gulf Coast certainly anticipated an increase in applications and transmittals, but what they actually experienced far surpassed any expectations. The annual figures shot up for the Louisiana Professional Engineering and Land Surveying Board: transmittals increased by 35 percent for engineers and 38 percent for surveyors over the previous year.

*Because catastrophic events are not limited to hurricanes, Gulf Coast Council members encourage all Member Boards to evaluate their procedures in light of potential disaster.*

The Mississippi Board also saw a huge increase. Normally staff members process approximately 300 applications per year, but in the five months following Katrina, they processed about 360 applications. To accomplish this, the board processed applications every Friday for three months.

“At the end of a typical month, we issue about 30 comity licenses for professional engineers,” says Rosemary Brister, executive director of the Mississippi Board. “In September

and October, though, we issued 136 P.E. comity licenses.”

“People would call us and expect the board to issue licenses immediately,” says Brister. “Many of them assumed that we would disregard the process because of the disaster. We expedited the process, but we didn't set it aside. In fact, it was of the utmost importance that our licensure requirements stayed intact so that we could protect the public. People had already lost so much. We wanted to be sure that they wouldn't be harmed further by being exposed to substandard practice.”

Unfortunately, complications slowed even an expedited process. In Louisiana, for example, the incapacitated postal system severely delayed the arrival of transcripts, work records, and other mandatory licensure documentation. Such setbacks greatly increased the time it took to issue licenses.

According to Donna Sentell, executive director of the Louisiana Board, issuing comity licenses took about twice the amount of time it did before the hurricanes. Applications for regular comity licensure stretched out for 12 weeks or longer. The processing time for Model Law Record applications, on the other hand, increased to just four weeks. The NCEES Records Program had already compiled the information for these professionals, and the board could access the Records electronically, a process that takes only three to five days.

Although handling the huge influx of requests for licensure remains a top priority, the boards are also contending with significant enforcement challenges. “Now we’re dealing with the second wave of work—cases of unlicensed practice,” says Brister.

The Louisiana Board is wrestling with the same problem. “Our enforcement staff experienced a considerable increase in their workload,” says Sentell. “We’ve received many complaints from the public, including objections against engineers involved in insurance adjustments and claims of unlicensed practice.”

### Planning for the worst

Because catastrophic events are not limited to hurricanes, Gulf Coast Council members encourage all Member Boards to evaluate their procedures in light of potential disaster. Dale Beebe Farrow, executive director of the Texas Board of Professional Engineers, recommends that each board implement a disaster recovery plan. Although not significantly affected by the hurricanes, the Texas PE Board was able to use its emergency procedures to help engineers relocated because of Hurricane Katrina.

“Along with their disaster plan, boards need a mechanism in place to allow for emergency rule-making or another type of authorization so that engineers can go to work quickly in an emergency situation,” she says. “Our procedures enabled us to make an emergency ruling that allowed relocated engineers licensed in the affected states to get temporary licenses in Texas.”

Boards can also prepare by developing a system of storing backup files in a safe, offsite location. The Louisiana Board recently contracted with a company that offers Web-based regulatory software systems. The board is in the process of converting all documents to electronic files, which are easily stored and accessed through the database. Its contract also provides offsite storage for backup files.

This is a solution that resonates with the Mississippi Board as well. “Our board began storing important documents and backup systems offsite after 9/11,” Brister says. “And after the damage that our building incurred from Katrina, we will definitely keep adding to those files.”

The recovery effort continues in the Gulf Coast, and these boards have already begun preparing for the next hurricane season. Other Member Boards may not have such a deadline looming before them, but all of them can improve their current emergency plans, glean insight from those who have truly weathered the storm.

*Desiree Talbert  
NCEES Editor*

## Sharing ideas about recovery

After the hurricanes, the MBA Listserv operated as an excellent means of communication. Member Board administrators from across the country offered assistance and encouragement to those affected by the hurricanes. If you are a Member Board administrator who would like to learn more about the boards’ experiences, the MBA Listserv could be a good forum to discuss disaster recovery plans, emergency procedures, and other topics related to preparing your board in case of disaster.

On September 13, one of the Annual Meeting workshops will be devoted to this subject. At this workshop, you can hear first-hand reports from a panel of those affected by the hurricanes. The panel will also discuss the recovery effort, how long it’s projected to take, and how much it will cost to implement.

# MESSAGE

## Including Canada



Martin A. Pedersen, L.S.  
NCEES President

As working across borders becomes more common, NCEES continues to evaluate international comity. This issue is especially pressing as it relates to our northern neighbor, Canada. Are Canadian professional engineers good engineers? Yes. Is the quality of their work equal to that of U.S. professional engineers' work? Yes, I believe it is. I don't think that they should be treated differently than U.S. professional engineers.

It's time to look at making comity easier for qualified individuals. The proposal? Waive the FE exam for eligible Canadian professional engineers (P.Eng.).

I said in my inaugural speech that I wish to establish an agreement between NCEES and the Canadian Council of Professional Engineers (CCPE) that would begin the process of facilitating comity between our two countries. NCEES held informal talks with CCPE President Colin Smith, P.Eng., and Chief Executive Officer Marie Lemay, P.Eng., in September 2005, and convened a formal meeting this past January. At this meeting, I discussed comity with Smith, Lemay, and CCPE President-Elect Ken McMartin, P.Eng., as well as NCEES President-Elect Lou Raimondi, P.E., and NCEES Executive Director Betsy Browne.

### The facts about Canadian licensure

Canadian registration differs from U.S. licensure in that a graduate of a program accredited by the Canadian Engineering Accreditation Board (CEAB) does not take the technical exams that are required of U.S. engineers. Instead, CCPE relies on the exams engineering students take in school to prove their knowledge. After graduation, engineering interns work for a minimum of four years under a mentor and then take a two-hour, closed-book professional practice examination on law, ethics, and business practice to become a professional engineer.

In Canada, CEAB-accredited programs at all schools are equal: they all use the same criteria, and students at a CEAB-accredited program at

one school follow the same courses as those in another part of the country. This equivalency is a result of the agreement between CCPE and the deans about what each program must contain. Graduates of non-CEAB programs or of nonequivalent foreign programs must pass the professional practice exam as well as a series of technical exams, which are similar to our PE exam.

Here is the sticking point: since the inception of licensure in the United States, applicants have had to prove their ability by passing an examination. The U.S. system of licensure is based on education, experience, and examination. After a four-year degree, the FE exam provides verification that a candidate has knowledge in basic areas of engineering principles, and after four years of progressive experience, the PE exam provides the same in practice and design issues.

If a jurisdiction requires a graduate of an EAC/ABET-accredited program to take and pass examinations, then the same should be required of any other applicant. However, many jurisdictions have a clause that allows them to waive the FE exam for applicants with a certain number of years of experience, a number that varies from state to state.

Based on these provisions, the Council should consider waiving the FE exam for Canadian P.Eng.'s who have graduated from a CEAB-accredited program and gained the necessary experience.

### Proving the system

To demonstrate that the Canadian graduates are mastering the FE exam concepts, Council consultants prepared a psychometrically sound program to present to the Canadian delegation. For five years, at least 10 percent of the entire graduate population from CEAB-approved programs (which is currently about 10,000 per year) would take the FE exam. These graduates would need to represent at least 10 programs in each of the following engineering disciplines: civil, electrical, mechanical, chemical, industrial, environmental, and general. Civil

## MISSION

The Mission of NCEES is to coordinate with domestic and international organizations to promote licensure of all engineers and surveyors.

NCEES Strategic Plan

students would take the civil exam, electrical students the electrical exam, and so forth. CCPE would provide the class rank and GPA for each examinee to ensure that a cross section is being tested, and the examinees would need to pass at an overall rate of at least 80 percent.

In return, if the graduates met the 80 percent pass rate and other criteria, then NCEES would push for an amendment to the Model Law that would advocate waiving the FE exam for a Canadian professional engineer who graduated from a CEAB-accredited program and had a certain number of years' experience. If the CCPE accepts this, I will present it at the Annual Meeting in Anchorage for a Council vote.

Remember, this proposal applies only to experienced engineers who are already licensed in Canada. Nothing would prohibit recent

graduates of Canadian CEAB-accredited programs from sitting for the FE exam and pursuing U.S. licensure the same way our graduates do.

Alberta began offering the FE exam in 2003 and New Brunswick in 2005 apart from this proposal. These are not selected students, merely candidates who wish to take the exam. To date, nearly 99 percent of the candidates have passed the exam. Any results gathered before an agreement is signed would not be considered part of the agreement. But based on the outcomes so far, it does look like the Canadian graduates are extremely well qualified.

*Martin A. Pedersen, L.S.  
NCEES President*

## The perils of power lines: aging infrastructure, aging workforce

*The following article is an excerpt of a presentation Western Zone Vice President Jill Tietjen, P.E., gives to engineering society student chapters to encourage students to pursue licensure and to help them understand some of the issues engineers deal with in the electric utility industry.*

Fifty million people lost electric service in the northeastern United States on August 14, 2003. The 2003 blackout followed two blackouts in the western United States in the summer of 1996, a 1977 blackout in New York City, and the Great Northeast Blackout of 1965. After each blackout, U.S. citizens were promised that another one would not occur.

Unfortunately, I believe that there will be more blackouts before we as a nation find the will to fix the electric utility infrastructure. We know what is needed to fix the situation, and we are capable of doing it. But the process won't be easy or quick with the current public mindset and the length of time that the solutions

themselves take. There are also significant issues concerning the demographics of the related workforces: very large percentages of those workforces will be eligible to retire within the next 5 to 10 years.

### An aging infrastructure

The electric utility infrastructure has three major components: power plants (generation), transmission, and distribution. In its 2005 infrastructure report card, the American Society of Civil Engineers (ASCE) gave the U.S. energy infrastructure, including electric utilities, a grade of D, down from the D+ in both 2003 and 2001. This D means that the generation, transmission, and distribution have gotten old, and serious steps need to be taken to update and upgrade them.

The U.S. fleet of over 900,000 megawatts (MW) of generation is aging rapidly, and a significant percentage is more than 30 years old (the original design life). Most nuclear units

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*Jill S. Tietjen, P.E.  
NCEES Western Zone  
Vice President*

*Colleges are producing few graduates with either the skills or the interest for a career in the electric utility industry.*

*The perils of power lines: aging infrastructure, aging workforce (continued from page 7)*

were constructed in the 1970s and 1980s and are now in the process of getting their operating licenses extended for another 10 or 20 years. Because of their emissions, many older coal-fired units are under attack by the Environmental Protection Agency. With an average size of approximately 250 MW for natural-gas-fired combined cycle units and 500 MW for coal units, replacing 200,000 MW or more of aging generating capacity would mean the construction of 400 to 800 new generating units.

Most major transmission lines were built in association with the power plants, so they are old as well. Not only are the physical components (power plants and wires) old, but the technology itself is also old.

The last significant advance for the transmission system occurred in the 1970s when 765-kilovolt lines were introduced. The last significant advance for conventional large central station power plants also occurred in the 1970s when 1300-MW facilities were introduced. There have been advances in materials associated with natural-gas-fired facilities (aero-derivative combustion turbines) and electronics for control systems, but basically we are dealing with 30- to 40-year-old technology across the entire spectrum of electric utility operation.

The blackout of 2003 forced the industry and its regulators to acknowledge the need for national, mandatory electric reliability standards. The Energy Policy Act, passed by Congress in 2005, authorizes the Federal Energy Regulatory Commission to approve standards for reliable operation of the bulk power system. Much activity is ongoing as of early 2006 to establish the rules for a national Electric Reliability Organization as well as the procedures for the establishment, approval, and enforcement of associated electric reliability standards.

But the forces of NIMBYism (not in my back yard)—and her sisters BANANA (build absolutely nothing anywhere near anyone), NOPE (not on planet Earth), and NIMTOO

(not in my term of office)—further complicate the situation by making the construction of power plants as well as transmission and distribution lines increasingly difficult. Yet houses continue to be built, and with them comes the demand for electricity to provide light, comfort, cooking, and entertainment. New companies and the creation of jobs also increase the need for electricity.

### **An aging workforce**

Electric utilities and associated industries face the prospect of the retirement of a huge proportion of their workforce in the next 5 to 10 years. Companies differ, but the percentages range from 30 to 70 percent. Rural electric cooperatives report that the average age of their line workers is 48 years old—meaning that a large percentage are approaching retirement age. More than half of the coal miners in the United States are over 45 years old. Projections are that 50 percent of the underground coal mining workforce will retire in the next 5 to 7 years.

Because many utilities didn't hire new employees during the 1980s and early 1990s, there is a tremendous gap in people able to fill the ranks decimated by retirement. College programs in power engineering and related fields suffered during these years—many were disbanded and no longer exist. Thus, colleges are producing few graduates with either the skills or the interest for a career in the electric utility industry.

Yet the demand for electricity nationwide keeps growing at a rate of just under 2 percent per year. As Winston Churchill said, "Americans can always be counted on to do the right thing . . . after they have exhausted all other possibilities." I hope that we will find our way and fix our electric utility system. I further hope this happens before the ASCE has given the energy infrastructure an F and before the electric utility infrastructure in the United States has deteriorated to the point that it is no longer the world's finest.

*Jill S. Tietjen, P.E.  
Western Zone Vice President*

# FOCUS

## Examining the cut-score process

The exam-development process involves a substantial amount of the Council's resources and requires thousands of hours of volunteer work. One step of this process, determining the cut score, occurs only once every six to eight years, but it is perhaps the most critical function in the exam-development process and one of the most important services the Council provides to its Member Boards and to the public.

This year, President Pedersen created the Cut-Score Task Force to review and evaluate the Council's procedures for establishing cut scores for NCEES exams. After reviewing a substantial amount of literature regarding methods of standard setting, the task force observed and evaluated two cut-score workshops to gain additional insight into the current methods employed by the Council and its psychometric consultants.

### How it works

The Council currently uses what is known as the modified Angoff procedure to set cut scores. Unlike many methodologies related to the judgment of the actual examinee, the modified Angoff method can be classified as an item-related judgment process. It is based on the activities of a facilitated panel of judges.

The appropriate exam committee, assisted by NCEES staff, selects the panel of qualified and independent judges. Panelists must be practicing licensed professional engineers or surveyors familiar with the level of knowledge a minimally competent practitioner should have. Panelists must also possess interpersonal and teamwork skills that allow them to work through this challenging process.

The first task of the panel is to define and establish a written standard of minimum competence. This process is often confusing because panelists must first visualize this abstract concept and then form a written definition of minimum competence that then guides them in their evaluation of the exam.

Each panelist independently completes the entire exam under conditions similar to those experienced by the examinees. As panelists take the exam, they rate the difficulty of each question by estimating the percentage of minimally competent candidates who would answer it correctly.

Later, panelists receive their exam scores and the results of their collective difficulty rating. They discuss each item, taking time to revise their individual ratings as necessary. These final ratings are combined with one further element known as the Beuk adjustment, which asks panelists to estimate the percentage of first-time examinees they expect to pass the test. These figures are all factored together with the assistance of a psychometric consultant to develop the panel's recommended cut score.

### Recommendations

As a result of its investigations, the task force will offer a number of revisions and additions to the current cut-score procedures.

- ◆ In general, the task force agrees that the modified Angoff procedure is the best methodology for the Council's purposes.
- ◆ To find the best people to serve as judges, NCEES must devote more time and care to the panel-selection process. Exam committees should be more involved in this matter.
- ◆ The Council can improve the cut-score process by developing a training program for cut-score subcommittee members and panelists. Through the program, NCEES would train and assess future panelists in the complete cut-score process. The program would ensure that subcommittee members are familiar with exam history and development, understand the cut-score process, and attend the cut-score panel workshop for the exam under consideration.
- ◆ Greater consistency in methods for establishing, writing, and applying the definition of minimum competence is necessary to improve this process.



Robert C. Krebs, P.E., L.S.  
Chair, Cut-Score Task Force

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- ◆ The Council should establish a standardized definition of minimum competence as it relates to the standard-setting process. The Cut-Score Task Force will propose an outline definition of minimum competence. The group envisions that the definition will be a living document that will continue to be improved as more information becomes available. Task force members unanimously agree that a concise and consistent definition of minimum competence is necessary and that cut-score panelists should be allowed only a small expansion (within the guidelines of the test specifications) of that definition in order to facilitate their understanding and translation of that concept into standard-setting guidelines.
- ◆ This outline definition of minimum competence should be included in the materials that all cut-score panelists receive prior to the meeting and should be used in the cut-score training program. It should also guide exam committee members and volunteers who write items for NCEES exams.

From these investigations and from previous experience with the Council's cut-score workshops, the task force will come forth with additional findings and recommendations in its Annual Meeting conference report, which will detail possible improvements to this vital process.

*Robert C. Krebs, P.E., L.S.  
Former NCEES President and  
Chair, Cut-Score Task Force*



Forrest M. Holly Jr., Ph.D., P.E.  
Chair, CPC Task Force

## Task force promotes national CPC standard

The variability in continuing professional competency (CPC) requirements and practices presents a record-keeping and renewal challenge for engineers and surveyors licensed in multiple jurisdictions. Some jurisdictions will always have local stipulations that necessitate special requirements, but national standards could greatly assist licensees in meeting CPC requirements. Standardization could also support boards in ensuring the viability of continuing professional competency.

Since the Annual Meeting last August, the Continuing Professional Competency Task Force has been carrying out its charges by analyzing the current system of CPC requirements for engineers and surveyors and looking for ways to improve it. At the heart of these charges is the need for unification among jurisdictions—unification in CPC requirements themselves as well as in how candidates report to jurisdictions.

The task force's first charge is to recommend measures to facilitate recognition of licensees' completion of CPC requirements in various jurisdictions. One of the most significant obstacles to this goal is the variety of definitions of CPC requirements. Boards typically describe acceptable courses in terms of their

format rather than their content, and definitions vary widely between jurisdictions though most reflect the general structure presently contained in the *Model Rules*.

### Online summaries

As part of its answer to the first charge, the CPC Task Force recommends that NCEES provide online descriptions of nationwide CPC requirements. To ensure a consistent presentation, the task force suggests that a Web site be created and maintained by NCEES staff based on information provided by the boards. These descriptions would provide a useful starting point for multiple-jurisdiction licensees as they plan their CPC activity.

### Changes to Model Rules

In reviewing the *Model Rules*, the task force agreed with most of the current requirements and restrictions. But the task force did see the need to clarify certain requirements, including those that pertain to learning associated with regular work duties, publishing articles, and faculty presentations and special teaching assignments. These recommendations will be explained fully in the committee report.

One recommendation deals specifically with language in the *Model Rules* concerning comity among jurisdictions. The CPC Task Force recommends the following changes to the *Model Rules* and the addition of a CPC renewal standard.

### Section 240.30 Continuing Professional Competency

~~I. Comity/Out-of-Jurisdiction Resident  
The CPC requirements for <jurisdiction> will be satisfied when a non-resident certifies to be licensed in and having met the mandatory CPC requirements of any jurisdiction approved and listed by <jurisdiction>.~~

#### I. Requirements for renewal

To renew a license, an applicant must either (a) meet the requirements of <jurisdiction>, or (b) meet the requirements of the NCEES CPC Renewal Standard for the number of consecutive reporting periods corresponding to the CPC requirements of <jurisdiction> (i.e. biennium or other). A reporting period for the NCEES CPC Renewal Standard is defined as January 1 to December 31 of one calendar year.

#### L. NCEES CPC Renewal Standard

The NCEES CPC Renewal Standard requires licensees to acquire 15 PDH in one calendar year in compliance with the provisions of A, B, C, D, E, and J above. Licensees meeting this standard must document their CPC activities on the NCEES CPC Standard Reporting Form (SRF).

(Provisions A, B, C, D, E, and J contain the substance of the CPC requirements in the *Model Rules*.)

The task force set out to generate a clear working definition of residents and nonresidents but concluded that such a definition is not needed in a clarified Section 240.30 (I) of the *Model Rules*. Similarly, the task force found the notion of comity to be misplaced in the context of CPC. Meeting CPC requirements is a question of licensure renewal, whereas comity is relevant to initial application for licensure.

Therefore, the task force proposes that Section I be changed as shown to encapsulate a jurisdiction's CPC requirements for all of its licensees, regardless of their primary residence and location of practice.

An important feature of this proposal is that rather than recognizing another state's CPC requirements as equivalent to its own, a jurisdiction could simply require that a renewing licensee meet an NCEES CPC Renewal Standard (further defined in the proposed new Section L) for the appropriate number of calendar years corresponding to the length of the renewal term. Licensees of multiple jurisdictions could fulfill a single set of CPC requirements that would satisfy all jurisdictions that adopted this proposal. Such licensees would still need to meet the additional state-specific statutory CPC requirements in some jurisdictions if applicable.

The NCEES CPC Renewal Standard would simply be 15 professional development hours (PDH) per calendar year, following the specific guidelines in the *Model Rules*. Note that this standard includes no carryover of PDH from one year to the next and thus strengthens CPC requirements through annual compliance. According to the proposed Section I, a licensee could always choose to meet a jurisdiction's specific requirements, including carryover, if he or she wished.

The current *Continuing Professional Competency Guidelines* (available on the NCEES Web site) presents the relevant sections of the *Model Law* and *Model Rules* and provides useful background material and guidance to licensees and boards. The task force further recommends that these guidelines be modified to be consistent with the *Model Rules* once any changes are adopted.

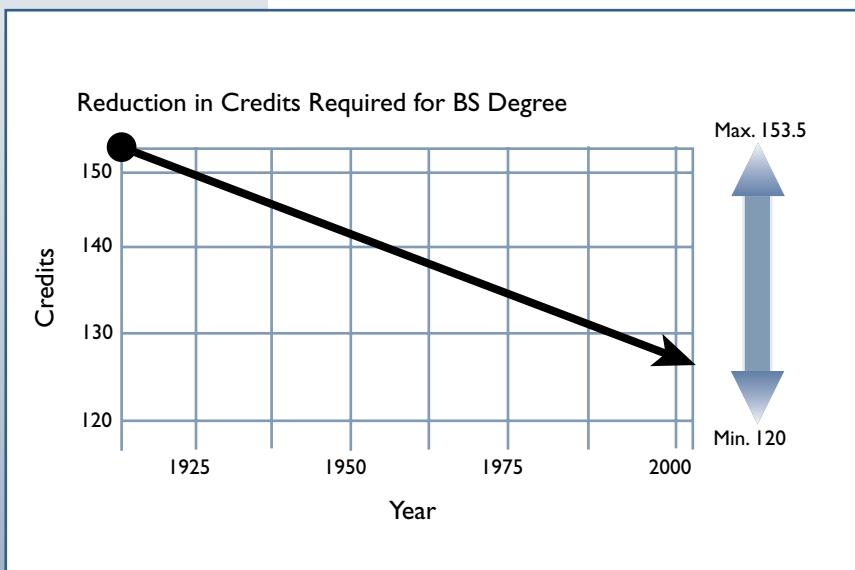
At the Annual Meeting, the task force will also present a standard reporting form that it has created, and it will move that Position Statement 10, Continuing Professional Competency, be modified to more strongly encourage uniformity of CPC requirements.

Forrest M. Holly Jr., Ph.D., P.E.  
Chair, CPC Task Force

The number of credit hours required for an engineering bachelor's degree has steadily decreased over the years, and the curriculum emphasis has shifted. These changes have resulted in a decrease in core engineering courses, a decrease in technical breadth and depth, and an increase in general studies.

recommendations from the NCEES and Member Board perspectives, and prepare recommendations for consideration by the Council. LQOG supported the ELQTF conclusion that additional engineering education was needed and presented a motion at the 2005 Annual Meeting that UPLG be charged with incorporating recommended language requiring additional engineering education into the *Model Law*. The LQOG motion passed by a narrow margin.

This is where the work of this year's UPLG Committee began.



### Proposed changes to the *Model Law*

The UPLG recommendations are based on the research, conclusions, and recommendations of ELQTF and LQOG. The LQOG suggested language approved by the Council last year is as follows: “Graduation with a bachelor’s of science degree from an engineering program of 4 years or more accredited by EAC/ABET, or equivalent, plus 30 additional credits from an approved course provider(s) in upper-level undergraduate or graduate-level coursework in professional practice and/or technical topic areas.”

UPLG started with this wording and then looked for how to fit it in the *Model Law*. The most appropriate place is in *Model Law* Section 130.10, which describes the qualifications needed to sit for the PE exam.

Currently, the *Model Law* specifies that an “engineer intern or an individual with a doctorate in engineering acceptable to the board and with a specific record of an additional four years or more of progressive experience on engineering projects ...” may sit for the PE exam. (As defined by *Model Law* Section 130.10, to be qualified for certification as an engineer intern, you must be a graduate of an engineering program of four years or more accredited by EAC/ABET, or the equivalent, and have passed the FE exam.)

The subcommittee assigned to this charge studied the question of the distribution of credits and recommended to let the students choose the appropriate upper-level or graduate-level credits to best fit their areas of specialization. The change to the *Model Law* that UPLG will propose is to add a requirement for students with a bachelor’s degree in engineering to earn 30 additional credits to sit for the PE exam. The motion will also say that a master’s of science degree satisfies the requirements, as does a Ph.D.

Under the current *Model Law* and *Model Rules*, engineer interns who possess an M.S. may waive one year of the required four years’ experience. Engineer interns with Ph.D.’s may waive two years. But Ph.D.’s who are not engineer interns—that is, doctorates who waive the FE exam in qualifying to sit for the PE exam—must still have four years’ experience. Because of the possibility for confusion in interpreting experience requirements, the UPLG Committee feels that the new language should clearly describe all avenues for qualifying to sit for the PE exam, including master’s and doctoral degrees (see box on facing page).

### Approved course providers

The LQOG language gave us the term “approved course providers.” The UPLG Committee will recommend that an appropriate committee be charged with specifically defining what constitutes both “approved credits” and “approved course providers.”

The UPLG Committee’s intent behind this year’s proposed language is to leave the wording flexible enough to allow as many avenues as possible to the additional education without compromising the quality of that education.

In its investigations, the UPLG Committee determined that only a handful of institutions at this time offer distance learning that would qualify as approved. The committee does believe that in time, as demand for additional education increases, many providers will begin offering acceptable credits that are affordable and easily accessed via correspondence, the Internet, evening and part-time classes, as well as other forms of distance learning.

Committee members feel that most of the additional education would initially be taken as a part of the normal degree process, perhaps as part of a five-year program. For this reason, UPLG will also move to add language to the *Model Rules* stating that graduates with a bachelor's of science degree in engineering from a five-year program may request that credits earned as part of their undergraduate work be applied to satisfy the requirements.

### Timing

The LQOG motion as passed stated that the additional education requirement should go into effect no sooner than 2010. Assuming that a student starts a degree program in 2007 and takes additional courses to get the 30 additional required credits, he or she would graduate in 2011. Four years of experience would enable the graduate to take the PE exam in 2015 at the earliest. Therefore, UPLG decided on January 1, 2015, as the earliest practical date to make the requirements effective.

This year, UPLG will present these motions to put additional education requirements into the *Model Law*. The committee strongly recommends that the Council accept this proposal. If approved, the language will begin answering a question the Council has spent years discussing. It is not the last question that will have to be answered, but it will bring NCEES one step closer to strengthening the education leg of licensure.

*Claude V. Baker, P.E., S.E., L.S.  
Chair, Committee on Uniform  
Procedures and Legislative Guidelines  
and  
Howard C. "Skip" Harclerode II, P.E.  
Subcommittee Chair, Committee on Uniform  
Procedures and Legislative Guidelines*

## New language for *Model Law*

UPLG will propose adding the following wording to *Model Law* Section 130.10:

### Licensure by Examination (Effective January 1, 2015)

The following individuals shall be admitted to an 8-hour written examination in the principles and practice of engineering:

- (1) An engineer intern with a bachelor's degree, with an additional 30 credits of acceptable upper-level undergraduate or graduate-level coursework from approved course providers, and with a specific record of an additional 4 years or more of progressive experience on engineering projects of a grade and a character which indicate to the board that the applicant may be competent to practice engineering.
- (2) An engineer intern with a master's degree in engineering from an institution that offers EAC/ABET-accredited programs, or the equivalent, and with a specific record of an additional 3 years or more of progressive experience on engineering projects of a grade and a character which indicate to the board that the applicant may be competent to practice engineering.
- (3) An engineer intern with a doctorate in engineering acceptable to the board and with a specific record of an additional 2 years or more of progressive experience on engineering projects of a grade and a character which indicate to the board that the applicant may be competent to practice engineering.
- (4) An individual with a doctorate in engineering acceptable to the board and with a specific record of an additional 4 years or more of progressive experience on engineering projects of a grade and a character which indicate to the board that the applicant may be competent to practice engineering.

# NEWS

## ALASKA

- ◆ Terry Gorlick, Charles A. Leet, Burdett B. Lent, and Daniel E. Walsh are new appointees to the board. Robert E. Gilfilian and Richard A. Hughes are no longer on the board.

## ARIZONA

- ◆ Dawn H. Garcia is a new appointee to the board, and Robert F. Roos is the new board chair. The term of William M. Greenslade has expired.

## ARKANSAS

- ◆ The board's new address is 623 Woodlane Drive, Little Rock, AR 72201.

## CALIFORNIA

- ◆ Richard N. Lyons is a new appointee to the board. Cindy Tuttle is the new board chair. William E. Roschen is no longer on the board.

## COLORADO

- ◆ Dan Corcoran is the new board chair.

## INDIANA PE

- ◆ John M. Beery and Jim Erb are new appointees to the board. The terms of Robert H. Guckien, Darryl D. Huyett, Cristine Klika, Jerry J. Marley, Anne M. Rearick, and Edwin Tinkle II have expired.

## KENTUCKY

- ◆ Deborah B. Moses is a new appointee to the board. The term of Valerie A. Hudson has expired. Richard K. Sutherland is the new board chair.

## LOUISIANA

- ◆ Mark H. Segura and Ali M. Mustapha are new appointees to the board. The terms of Bob J. Green and Bijan Sharafkhani have expired.

## MAINE PS

- ◆ Roderick H. Craib is a new appointee to the board. Elwood Ellis, Deirdra Perry, and Michael R. Sackett have been reappointed to another term. (The last issue of *Licensure Exchange* incorrectly reported that Ellis was reappointed to the Maine PE board.)

## MASSACHUSETTS

- ◆ John R. Duff and Maurice M. Pilette are new appointees to the board.

## OKLAHOMA

- ◆ The name of the board has changed to the Oklahoma State Board of Licensure for Professional Engineers and Land Surveyors.

## PENNSYLVANIA

- ◆ Joseph J. Resta is a new appointee to the board.

## UTAH

- ◆ The board's telephone number is 801-530-6396.

## WYOMING

- ◆ Christine Turk, the board's executive director, has a new e-mail address: [cturk@statewy.us](mailto:cturk@statewy.us).

# In Memoriam

## James O. Gordon

Funeral services for James O. “Pete” Gordon, P.E., were held on February 22, 2006. He served on the South Carolina Board of Registration for Professional Engineers and Land Surveyors from 2000–2005 and was licensed in South Carolina, Georgia, Mississippi, North Carolina, and Tennessee. He was also a member of the South Carolina Society of Professional Engineers and the American Council of Engineering Companies.

## Albert Wesley Hayes

Albert Wesley Hayes, L.S., died Friday, January 27, 2006. A former chair of the Land Surveyors Board for the Illinois Department of Professional Regulation, he was also a member of the American Council of Surveying and Mapping and served as past president of the Illinois Professional Land Surveyors Association. In his service to NCEES, Hayes participated as a member of or consultant to the Committee on Examinations for Professional Surveyors for 14 years. He also served on other committees, including the Committee on Finances and the Committee on Law Enforcement.

## Waldemar Stanley Nelson

Waldemar Stanley Nelson, P.E., died Tuesday, November 15, 2005. Licensed in 44 states, he practiced professional engineering for more than 65 years. When the Council voted to add the office of treasurer to the Board of Directors in 1976, it appointed Nelson as the first NCEES treasurer. During his lifetime, he served as chair of the Louisiana Professional Engineering and Land Surveying Board, as vice president of the National Society of Professional Engineers, and as president of the Society of Tulane Engineers.

## John C. Von Kaenel

John C. Von Kaenel, P.E., died Sunday, February 26, 2006. A former assistant professor at Clemson University and a development engineer, he worked 10 years as director of examinations for NCEES. He also served the engineering community as a member of the American Society of Mechanical Engineers and the American Society for Engineering Education and as past president of the Piedmont Chapter of the National Society of Professional Engineers.

Send letters to *Licensure Exchange* editor at NCEES, PO Box 1686, Clemson, SC 29633 or [dalbert@ncees.org](mailto:dalbert@ncees.org).

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

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Clemson, South Carolina

# Engineering the future

What do you get when you take 30,000 seventh and eighth graders, a video game, and the prospect of winning a trip to U.S. Space Camp? One spectacular competition—and a great blend of math, science, and creativity.

A vibrant part of National Engineers Week, the Future City Competition is in its 14th year and continues to grow. Groups of middle school students from 31 different regions across the country participated in the national finals held February 20–22 in Washington, D.C.

The competition is a four-phase project in which students design a future city using SimCity 3000 software, build a physical to-scale model of a portion of their future city, write an essay explaining their response to a specific engineering challenge, and communicate their results through a formal, timed presentation.

For the past three years, NCEES has sponsored the Best Land Surveying Practices Award, which recognizes the design that best

reflects the high standards used by surveyors to help protect the public. This year, the Council also sponsored the Best Essay Award. The essay focused on rehabilitation, asking students to create an engineering plan to revitalize a rundown strip mall. The winners

of these two awards are Anderson Home School in Abbeville, S.C. (surveying) and St. Bede School in Pittsburgh, Penn. (essay).

By participating in this event, the Council is able to emphasize the importance of licensure in these two professions. NCEES President Martin Pedersen, who judged the national finals, spoke to the students about licensure at the opening activities.

"I try to describe licensure in a way they can easily understand," explains Pedersen. "I ask the

students, 'What do you need to drive a car?' When they answer, 'A driver's license!' I explain that engineers and surveyors need to be licensed for the same reason—to protect public health, safety, and welfare."

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NCEES Staff

## Licensure

### EXCHANGE

PUBLISHED BY:  
National Council of Examiners  
for Engineering and Surveying

Betsy Browne,  
Executive Director and  
Publisher

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Manager of Corporate  
Communications

Desiree Talbert, Editor

Ragenia Thompson,  
Graphics and Print Coordinator

POSTAL NOTICE  
*Licensure Exchange* is published  
bimonthly by the National  
Council of Examiners for  
Engineering and Surveying,  
280 Seneca Creek Road,  
Seneca, SC 29678-9214.

Periodicals postage paid at  
Clemson, SC 29633.

Postmaster:  
Send address changes to  
*Licensure Exchange*

PO Box 1686  
Clemson, SC 29633-1686  
ISSN NO. 1093-541X  
Volume 10, Issue 2



National Council of Examiners  
for Engineering and Surveying  
PO Box 1686  
Clemson, SC 29633-1686

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