Licensure EXCHANGE

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Are NCEES exams too hard?

EPP chair answers tough questions about exams.

Just about everyone has an opinion about the Council's examination pass rates. Here is a sampling of thoughts on the subject recently expressed to me by Council members: "If we graded on the curve we could get those pass rates where they ought to be." "It might be interesting to participate in a standard-setting panel, but who wants to set themselves up to be embarrassed, or worse yet humiliated, by a bunch of Ph.D.'s who write examinations for a living?" "Now that we don't have essay questions, pass rates don't mean as much, since we can't get inside the candidates' heads." "Questions on the exams are just too hard." "Something's wrong with a system that passes 70% of those who take the Fundamentals of Engineering (FE) examination but passes only 50% or fewer of those who take the Principles and Practice of Engineering (PE) exam." All great comments! Each one deserves to be addressed.

There's nothing like opening an examination booklet and being overwhelmed by the first question you encounter. Can that feeling influence performance on the rest of the examination? You bet it can.

—Frank K. Loudon, P.E.

Why don't we grade on a curve? In school, teachers always graded on a curve. What's going on here anyway? The Council's examinations are not given in order for a student to get a grade but rather as one of the factors considered in granting an individual a license to practice as a professional engineer or surveyor. It is important that Member Boards and the public be assured that those who pass the Council's licensing examinations possess sufficient technical knowledge to provide professional services at a level of competence that protects the public from harm. To provide that assurance, examinee test scores are measured against a standard of performance called minimum competence. That standard is established by a standard-setting panel that evaluates the difficulty of each question on the examination and makes a judgment as to the likelihood that a minimally competent candidate would answer the question correctly. What's a minimally competent candidate? That's an individual with the education, experience, and knowledge to practice independently without harming the public. Licensing candidates are measured against that standard, rather than each other as they would be if the scores were "curved."

Do I need to be a Ph.D. to participate in a standard-setting panel? The fact is, if it takes a Ph.D. to set passing scores on the Council's examinations, the examinations have surely been written at a level above minimum competence. The very best standard-setting participants are those with ten years or less of practical experience, who have not participated in writing and reviewing questions or examinations, and who are willing to strongly voice their opinions about the level of difficulty of the questions.

What about this business of essay questions? Why did we get rid of them? Aren't they the best way to test practical experience, get into someone's head and really test judgment? Essay questions are no longer a part of the Council's examinations because scoring them is too subjective, and they are simply not needed to measure minimum competence of licensing candidates. Put another way, we don't need to "get inside someone's head" in order to measure examinee performance at the level of minimum competence.

Are the Council's examinations too hard, and does it really matter anyway since the standard-setting panel will arrive at a lower passing score if the questions are too difficult? There's nothing like opening an examination booklet and being overwhelmed by the first question you encounter. Can that feeling influence performance on the rest of the examination? You bet it can! The examination

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From the
PRESIDENT

Fairfield supports building bridges with licensure stakeholders

Ted C. Fairfield, P.E.
NCEES President

Nearly four centuries ago, English metaphysical poet John Donne conceived and published the insightful words, "No man is an island, entire of itself." This immortal truism has been with us ever since, and is often quoted at times of crisis and grief. I certainly don't have any intention of competing with Donne for immortality, nor do I suggest that this is a time of crisis or grief, but I do choose to share with you my well-considered opinion that just as "no man is an island," the National Council of Examiners for Engineering and Surveying is not and cannot be treated as an island, unaffected by outside interests and influences. My conviction of the truth of that statement is perhaps the strongest single conclusion that I have drawn from my presidency.

At its most basic level, the Council is nothing more than a "meeting place" for the 70 state and territorial boards that constitute its membership. However, that membership is valueless and devoid of effectiveness absent those members' ability and willingness to work together and proactively seek to create, implement, and update programs, criteria, and procedures having to do with licensure and the protection of the public health, safety, and welfare. Likewise, the Council cannot remain effective in its goals without resisting proposals by "others," whose separate goals are, at least in part, in apparent conflict with those of the Council. Both halves of this combined effort necessarily involve ever increasing levels of dealing with those who are not on our "island." Such efforts must increase geometrically with time, as all aspects of engineering and surveying are changing at a faster rate than ever before.

While the Council can correctly claim that its "island" is the focal point of engineering and surveying licensure within the United States, there are those who wish that this were not so, and there are others who, simply, could not care less. These realities require the Council to increase its efforts to both protect its island and to deal with those who would either purposely or unintentionally diminish the Council's autonomy. This cannot be done without building bridges to those "others," which by definition means that we will no longer be a distinct island! Such risks are inherent in this necessary bridge building.

Our efforts through the Engineering Licensure Qualifications Task Force are perhaps the best evidence of bridge building, that is, gathering the input and support of a large variety of stakeholders, even—perhaps especially—those who might not totally share our views about licensure. In a couple short years, we should learn the results of this major project.

Our increasing efforts to reach improved understandings with the Accreditation Board for Engineering and Technology (ABET) are also excellent examples of bridge building. A majority of ABET's Board of Directors is composed of representatives from the engineering branches that are typically aligned with the industrial exemption, who do not seek nor believe that they need licensure. Members of ABET's leadership often state, "Industry tells us that it is not interested in licensure." Ergo, ABET does not consider "licensure" something that rates highly in its programs—whether the need for professors to be licensed or the need to educate students

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Fairfield supports building.... *(continued from page 2)*

as to the value and the practical meaning of licensure in the context of public health, safety, and welfare. Nor has ABET yet embraced the use of our Fundamentals of Engineering (FE) examination for outcomes assessment, even though the FE is the only nationally normed examination appropriate for that purpose. As a result, ABET's program criteria [even as to its Engineering Accreditation Commission (EAC) accreditations] are becoming less meaningful and independently reliable, with respect to the NCEES mission to protect public health, safety, and welfare. Conversely, a group such as the American Council of Engineering Companies (ACEC), whose members are primarily focused on the "built environment" (nominally equivalent to the combined scopes of the NCEES Group I exams) and who necessarily rely upon licensure for virtually all of what they do, has no standing at ABET. In other words, this large and critical, private-practice part of the "engineering industry" has no direct representation in the ABET education equation. What irony!

The American Society of Civil Engineers (ASCE) has adopted/proposed its own "new licensure model," based upon the concept of a "Master's Degree or Equivalent." This is not necessarily a bad idea and is truly founded in the realization that an EAC/ABET degree is "not what it used to be."

The National Society of Professional Engineers (NSPE) has proposed its own licensure model that, at least initially, appears to run fundamentally contrary to NCEES's traditional/current model. The NSPE model tends to buttress the ABET philosophy that "it's all about education" and that perhaps examinations are not as relevant in terms of licensure as they used to be. Yet, it seems entirely possible that some judicious mixing and matching of the underlying elements of these diverse proposals could help lead ELQTF to "the answer."

At present, the statistical results from our FE exam lead us inescapably to the fact that examinations do an excellent job in screening out those whose educations just don't furnish them with minimally acceptable skills and knowledge necessary for the practice of engineering. In fact, NCEES examinations are probably more effective and essential than ever before, given EAC/ABET's increasingly flexible, less prescriptive approach to program (curricula) content.

In the meantime, NCEES has started on a much elevated effort of networking, promoting licensure within schools and elsewhere, furnishing and staffing NCEES "exhibits" (on licensure and comity and related issues) at national meetings of professional/technical organizations, and just generally making it clear to all licensure stakeholders that NCEES has recognized and is accepting its challenge to rise to an increased breadth and depth of duties. All three legs—education, experience, and examinations—of our world of engineering and surveying are being transformed, and the means, methods, and opportunities to practice these professions look very little like they did even ten years ago. The Council is doing its best to remain at the cutting edge of the changing demands. This acceleration will be felt by all, and it will take all of us to hang on, participate, and help steer.

Ted C. Fairfield, P.E.
NCEES President

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Headquarters
UPDATE

Online services get thumbs up

Besty Browne
NCEES Executive Director

With the April 2002 administration, NCEES debuted the Electrical and Computer Principles and Practice of Engineering (PE) examination in the breadth/depth format, the last of the three examinations tapped to transition to breadth/depth: Civil, Mechanical, and now Electrical and Computer. In October, the Mining/Mineral and Metallurgical examinations will be administered in the all-objectively scored format for the first time. The October administration will mark the end of a long road for examination development committees. Through thousands of hours of dedicated volunteer effort, all NCEES examinations (except Structural II, which was never designed for the objective format) will be given in the no-choice, multiple-choice format in October 2002.

Also in April, the Council's new service, ELSES, administered examinations in seven states, and in October ELSES will add four new jurisdictions to its fold. Because of its parent relationship with NCEES, ELSES staff members participate in the development of Council administration procedures and are intimately aware of security and professionalism concerns. We created ELSES to administer NCEES examinations in a standardized, uniform, and secure manner, and the ELSES team has proven itself capable of achieving this mandate through attention to detail and proactive planning.

President Fairfield referred to the NCEES version of March Madness in his April *Licensure Exchange* article—and I'm sure he would agree that the March whirlwind of committee reports also continued into April and May with our Zone Interim Meetings, three of which were held on back-to-back weekends. I had the privilege of visiting Baton Rouge, Chicago, Sun Valley, and Burlington, and, though I often woke up unsure of which hotel room I was staying in, the meetings were an excellent opportunity to interact with zone delegates, see old friends, and discuss the important issues that will come before the Council at its August meeting. Last year, Council membership voted to honor zone elections without a ratification by the Council delegate body. Therefore, I am able to announce the election of W. Gene Corley, Ph.D., P.E., S.E., as Central Zone Vice President and Kenneth R. White, Ph.D., P.E., as Western Zone Vice President. The NCEES Nominating Committee has received nominations from each zone for the offices of NCEES President-Elect and NCEES Treasurer and will include final nominations in its committee report to be printed in the *2002 Action Items and Conference Reports*.

Council delegates will have much to discuss at the 2002 Annual Meeting. You will receive a copy of the *2002 Action Items and Conference Reports* in early July, and I encourage you to take time to review the reports before our business sessions begin on Thursday, August 8. Of particular interest will be the reports given by the Engineering Licensure Qualifications Task Force and the Task Force on Model Law for Surveying. In addition to the business sessions, you will have the opportunity to attend several workshops on Wednesday, August 7, and Saturday, August 10, including the Examination Security Workshop, the ABET Training Workshop, and a workshop on professional ethics, offering two professional development hours (PDHs), and presented by Jimmy Smith, Ph.D., P.E., director of the National Institute for Engineering Ethics. The Engineers and Land Surveyors Forums will offer PDHs, as will the Cut-Scores Workshop, the Light Detection and Ranging (LIDAR) Workshop, and the Task Analysis (PAKS) Workshop. You will also have the opportunity to attend the Americans with Disabilities Act Accommodations Discussion, the Law Enforcement Program, the USCIEP International Registry Workshop, and the Outreach Speaker Recruitment/Training Workshop. NCEES's Gene Corley will speak at Saturday's luncheon about the outcomes of the Building Performance Study of the World Trade Center and Pentagon attacks.

I look forward to seeing you all in August. Join us at the 2002 Annual Meeting in La Jolla, a community just a side-step from San Diego. In addition to productive business sessions and insightful workshops, you will have the opportunity to enjoy warm sandy beaches, Old Town San Diego, authentic Mexican food, and Southern California's laid-back atmosphere. ¡Nos vemos en La Jolla!

Betsy Browne
NCEES Executive Director

USCIEP International Registry assists engineers seeking practice privileges in other countries

The USCIEP International Registry assists experienced professional engineers seeking professional recognition and practice privileges in countries that are members of the Asia-Pacific Economic Cooperation (APEC) Engineer project and/or the Engineers Mobility Forum (EMF): Australia, Canada, Hong Kong China, Indonesia, Ireland, Japan, Korea, Malaysia, New Zealand, the Philippines, South Africa, and the United Kingdom.

The United States Council for International Engineering Practice (USCIEP) has implemented the registry to function in a manner similar to the NCEES Records Program, but on an international scale. Being part of the USCIEP International Registry does not guarantee recognition or practice privileges in the other APEC or EMF member countries—engineers must meet the requirements of local jurisdictions—but it certifies that participating engineers have achieved the minimum requirements for membership in the APEC Engineering Registry and the EMF International Registry, as well as the requirements for U.S. licensure. Upon request, USCIEP will send a record of an engineer's qualifications to the country to which he/she is applying for practice privileges, aiding the international mobility process.

USCIEP is composed of four member organizations: the Accreditation Board for Engineering and Technology (ABET), the American Council for Engineering Companies (ACEC), NCEES, and the National Society for Professional Engineers (NSPE). USCIEP exists to identify constraints to engineering practice, promote interest in cross-border practice, and negotiate and recommend agreements for cross-border practice. USCIEP held its most recent meeting in Alexandria, Virginia, May 21, 2001.

Visit the USCIEP Web site at www.usciep.org for additional information on the International Registry, including requirements for admission and application forms.

Exam FOCUS

NCEES promotes FE at Engineering Deans Institute

Engineering faculty across the United States are grappling with how to meet the Accreditation Board for Engineering and Technology's expectations of quantitative outcomes assessment. NCEES develops and produces the Fundamentals of Engineering (FE) examination, a tool that can be "particularly useful" for outcomes assessment of engineering programs says Monte Phillips, Ph.D., P.E., professor emeritus at the University of North Dakota. Forrest Holly, Ph.D., P.E., professor of civil and environmental engineering and associate dean for academic programs at the University of Iowa, agrees that the FE "has a role to play in outcomes assessment in most engineering programs." Phillips and Holly attended the April 2002 Engineering Deans Institute to answer questions and share experiences in using the FE for outcomes assessment.

Monte Phillips, Ph.D., P.E.

Nearly half the engineering deans in the United States (approximately 170 people) attended the institute, sponsored by the Engineering Dean's Council (EDC), a division of the American Society of Engineering Education (ASEE). One of the objectives of the EDC is to "provide a forum for discussion and an information exchange concerning problems and experiences in engineering colleges and schools," and April 2002 was the first time NCEES has had a presence, however informal, at an EDC institute. NCEES representatives Phillips and Holly—familiar with using the FE for outcomes assessment at the University of North Dakota and University of Iowa, respectively—spoke one-on-one with engineering deans regarding the FE. "Most were receptive to the idea [of using the FE for outcomes assessment]," comments Holly. "Some were already using it; others were shrugging their shoulders, saying 'I'll have to be convinced.'" Phillips says that the majority of the people he spoke with were supportive of using the FE "because of the need to satisfy ABET's EC 2000," though he did run into a couple of people who were "antagonistic to the licensure process and consequently antagonistic to using the FE exam for assessment."

Forrest Holly, Ph.D., P.E.

Both Phillips and Holly are strong proponents of engineering licensure, and they say the belief in licensure is their primary reason for attending the Engineering Dean's Institute on behalf of the NCEES. "Taking and passing the FE six or more years out of school is a real hurdle," says Phillips. If most engineering schools encouraged or required senior students to attempt the FE exam, "it would go a long way toward promoting licensure and increasing the number of engineering graduates who become licensed," he explains. Holly considers taking the FE an important career move for senior engineering students. Passing the FE exam sets engineering graduates on the licensure path, moving them closer to career options that only licensure provides. "Taking the FE can only help our students," says Holly.

In other efforts to promote the FE for outcomes assessment, NCEES representatives also attended the ASEE Zone I Meeting and the ASEE Pacific Northwest Regional Meeting, where they made formal presentations on how the FE can be used for quantitative assessment, giving specific examples of its use in civil and electrical programs. The technical session presented at the Zone I Meeting was scheduled with seven competing sessions and drew nearly one third of the 200+ attendees. At the Pacific Northwest Regional Meeting, NCEES speakers were given a noncompetitive session time, allowing all participants to attend. The feedback from both audiences indicates a wider use of the FE

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For more information, call NCEES at 1-800-250-3196 to request a copy of the white paper "Using the Fundamentals of Engineering (FE) examination to Assess Academic Programs." Contact NCEES Director of Professional Services Mike Shannon to volunteer to be an NCEES representative at various society and technical meetings.

The President-Elect's
MESSAGE

By the time this issue of *Licensure Exchange* hits your mailbox, the Council's 2002 President's Planning Meeting will be complete. The meeting takes place in June after the President-Elect, in concert with other Council leadership, makes committee assignments and designates committee charges. It is a time for discussion and planning that sets the tone for the coming year. Though the 2001–2002 Council year will not ceremonially end until the close of the 2002 Annual Meeting in August, the President's Planning Meeting is a big step toward serving the Council as President, and I am taking seriously the responsibility you have given me.

Over the next year, I hope to see the culmination of the strategic planning process that evolved in 2001–2002. The outcomes from the 2002 Board Presidents/Member Board Administrators Assembly showed support for a change in the Council's name as well as changes to its mission and vision. I have charged the 2002–2003 Advisory Committee on Council Activities with reaching a consensus on the appropriate changes to be made and presenting them to the Council for a vote in 2003. We will have a workshop at the 2002 Annual Meeting in La Jolla where members can discuss these issues and provide their input. Please plan to participate.

I have also charged the Engineering Licensure Qualifications Task Force (ELQTF) with continuing its analysis of our current licensure model. ELQTF has addressed many important, as well as difficult, licensure issues, and task force members will present their findings thus far at La Jolla in August. In the next year or two, the task force will formulate its recommendations and present them to the Council for a vote.

Examination security is an ongoing concern, and the Examination Security Task Force will continue its work in the coming year. I have charged the task force with identifying the significant issues that must be resolved regarding security as well as the guidelines that the Council must adopt to protect the integrity of the NCEES examinations. Delegates to the 2002 Annual Meeting will have the opportunity to attend an examination security workshop where many of the issues to be explored by the task force will be discussed.

In addition to the above, some important questions we will consider over the coming year include the following: Have the required number of credit hours and/or the core engineering curricula been watered down too much? Do we as a profession need a professional school which requires a broader and maybe less technical education? Are educators conveying the importance of high ethical standards and professionalism in addition to technical subject matter? Is the accreditation of our engineering programs reasonably uniform? Are licensing exams necessary if our educational systems perform adequately? Are the NCEES exams relevant, either in their content or as some assessment of the educational experience? Are more stringent procedures required to ensure that licensure candidates have adequate experience?

Many of these questions and issues have been and will continue to be addressed by our task forces and committees, but the need for participation and involvement in these discussions goes beyond the Council's committees. Please consider some of these questions and pass along your ideas and suggestions to delegates attending the Annual Meeting, your Zone Vice President, a member of the Board of Directors, or me as your President-Elect. Your input and participation will help shape the long-range goals of the Council and may influence the development of our strategic plan.

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

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

Many of these questions and issues have been and will continue to be addressed by our task forces and committees, but the need for participation and involvement in these discussions goes beyond the Council's committees. Please consider some of these questions and pass along your ideas and suggestions.

NCEES promotes FE... *(continued from page 6)*

examination than when NCEES first began promoting the FE for outcomes assessment two years ago, as well as a greater desire to understand how to apply its results. Future efforts to promote the FE for outcomes assessment include a formal presentation to be given at the ASEE Annual Meeting in Montreal, Quebec, held June 16–19. E. Walter LeFevre, Ph.D., P.E., of the University of Arkansas and James D. Jones, Ph.D., of Purdue University will speak about using the FE in the engineering programs at their universities.

NCEES Staff

Committee
FOCUS

Board approves LPTF long-term plan

Research data indicated that engineering students lacked an understanding of licensure, its importance, and the qualifications required to become licensed.

Most students thought they would be professional engineers if they performed well in their careers after graduation.

After two years of research analysis and discussion, the Licensure Promotion Task Force (LPTF) has developed a long-term plan to increase the percentage of engineering students taking the Fundamentals of Engineering (FE) examination and embarking on the licensure track. The plan is outlined in the LPTF report that will be published in the *2002 Action Items and Conference Reports*. Highlights of the plan are included below. The LPTF plan will not be fully effective in enhancing the protection of the public by increasing the number of engineering graduates who pursue licensure unless all stakeholders—members and administrators of Member Boards, professional and technical societies—support the plan and its initiatives.

Appointed by Past President J. Richard Cottingham in 2000, LPTF spent its first year investigating the following questions. What is the perceived value of engineering licensure to engineering students, graduate engineers, engineering educators, and other stakeholders? What promotional efforts are in place to positively impact the perception of engineering licensure?

The task force found that there was little recognition of the value of licensure among stakeholders. Research data indicated that engineering students lacked an understanding of licensure, its importance, and the qualifications required to become licensed. In focus groups, students demonstrated confusion about the title "professional engineer" and what it signifies. Most students thought they would be professional engineers if they performed well in their careers after graduation. Research data showed that students had limited exposure to the process of licensure, including the FE or Principles and Practice of Engineering (PE) examinations. This fact was reinforced when as many as 30% of students surveyed indicated they had not heard of the FE examination.

Next the task force began a thorough evaluation of current licensure promotional materials available through NCEES and professional and technical societies, as well as the promotional efforts being implemented. The task force explored what additional materials and activities are needed to promote the use of the FE for outcomes assessment, to encourage students to take the FE in their senior year, and to increase the percentage of engineering graduates pursuing licensure. Once appropriate materials and activities were identified, the task force determined effective avenues of implementation. From these discussions, task force members reached consensus on a long-term plan of action in March 2002 and submitted it to the NCEES Board of Directors for adoption in May 2002. This plan calls upon the active support of Member Boards, volunteers, and coalitions of technical and professional societies for its success. Highlights of the plan include the following recommendations.

Long-Term Plan Recommendations

- Enhance the recognition and credibility of the examination development process by providing more information on NCEES development standards and qualified development volunteers.
- Provide more information to Member Boards on the organizational structure, procedures, services, and processes of NCEES in order for them to take full advantage of services, making NCEES a more effective organization with common goals and a common message.
- Promote the FE examination as an outcomes assessment tool by developing relationships with engineering educators, sharing information and testimonials, and answering questions posed by the academic community.
- Improve the understanding of licensure and the title professional engineer by circulating articles in the professional and academic community, sharing information at technical and professional society meetings, establishing a bureau of speakers who are equipped to make presentations on the importance of licensure, and working with Member Boards and student chapters of professional societies to distribute licensure information to students.
- Work with technical and professional societies to prevent duplication of efforts and increase sharing of licensure promotion materials when appropriate.

Current Activities

In support of the LPTF long-term plan approved by the NCEES Board of Directors in May 2002, the Council is moving forward in its commitment

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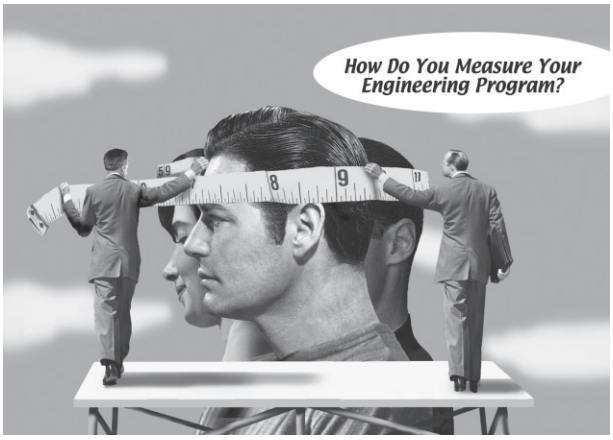
Board approves LPTF... *(continued from page 8)*

to the protection of the public and promotion of licensure. NCEES is recruiting licensed professionals who are willing to speak at university campuses. With materials provided by NCEES, volunteers have made presentations on taking the FE exam and beginning the licensure track to engineering students at the University of Florida at Gainesville, Louisiana State University, the University of Missouri-Rolla, and Pennsylvania State University. All presentations have received positive responses from students. NCEES continues to advertise the value of licensure on university campuses through poster and brochure distribution. NCEES recently recruited a professional to speak on the value of engineering licensure at the Women's Transportation Seminar held at the Career Advancement Fair in Boston, Massachusetts. NCEES representatives staffed a licensure display booth, answered questions, shared information, and gave away promotional materials at various society meetings, including the spring meeting of the American Council of Engineering Companies (ACEC) and the Engineering Dean's Institute. Representatives gave formal presentations on the use of the FE for outcomes assessment at two regional meetings of the American Society for Engineering Educators (ASEE) and the ASEE Annual Meeting, and there are plans for representatives to make presentations at future society meetings, such as the National Society of Professional Engineers (NSPE) Annual Meeting and the American Society of Civil Engineers (ASCE) Annual Meeting.

Members of the Licensure Promotion Task Force encourage stakeholders to recognize the results of research data analyzed by the task force: the majority of engineering students are not aware of engineering professional licensure, how to begin the licensure process, or the effect licensure can have on the protection of the public.

Members of the Licensure Promotion Task Force encourage stakeholders to recognize the results of research data analyzed by the task force: the majority of engineering students are not aware of engineering professional licensure, how to begin the licensure process, or the effect licensure can have on the protection of the public. After reviewing the promotional materials available and determining needed materials, the task force reached consensus on a long-term licensure promotion plan. The plan is in concert with the mission of NCEES and is designed to advance public health, safety, and welfare through increased education and awareness of the benefits of licensure, its process, and the protection of the public resulting from licensed professionals. NCEES is committed to the value-of-licensure message and the activities supporting it, and encourages all stakeholders to share in this commitment.

NCEES staff



NCEES uses a variety of marketing tools to promote licensure and the use of the FE examination for outcomess assessment.

The task force began a thorough evaluation of current licensure promotional materials available as well as the promotional efforts being implemented.

NCEES is recruiting licensed professionals who are willing to speak about licensing at university campuses.

On the Lighter
SIDE

You might be an engineer if....

L. Robert "Larry" Smith, P.E.

Recently a comedian was in vogue with a routine that began, "You might be a redneck if…." His success spurred the inevitable knock-offs on the Internet, including one spoofing engineers, saying, "You might be an engineer if…." I know I am an engineer. It is not just that I walk around with an engineer's scale and pens in my shirt pocket. (However, I don't use a plastic pocket protector.) I'm told that I do some things only engineers would do. People who don't know I am an engineer just think I am obsessive compulsive. I will leave it up to the readers to decide. A few of the pertinent cases follow.

You might be an engineer if you recognize the importance of exercising your circuit breakers—and do it on the day the time changes because the clocks will be messed up anyway. I wired my house some 25 years ago. In the time ensuing, I have had circuit breakers trip on fewer than half a dozen occasions. If circuit breakers go long periods of time without any usage, they can freeze-up. As a result, I regularly exercise my circuit breakers. I go to the board and work each breaker back and forth a number of times. The only problem with that is that digital clocks, microwaves, VCRs, TVs, etc., lose their settings when the power goes off. As a result, they then require a special trip around the house to reset all of them. Now, I exercise my circuit breakers only when Daylight Saving Time kicks in and kicks out. I have to reset everything then, anyway, so why not do it all at once? In truth, I have been known to exercise the breakers at other times: whenever the power goes out of its own volition.

You might be an engineer if you rotate your used and unused furniture according to the same pattern you rotate your non-radial tires. I live by myself. My kitchenette set has four chairs. I sit in one exclusively. When I have company, if it is one person, he or she will usually sit directly across from me. If it is four or more people, we will utilize the dining room. As a result, one chair gets heavy usage. A second gets light usage. The other two get almost no usage. A couple of years ago, I had to replace the chairs, because ONE had worn out. The new chairs I ordered came with casters. The first of every month I now rotate my kitchen chairs. I use the same rotation pattern that used to be utilized for non-radial tires, without using the spare. These chairs will be left to someone in my will.

You might be an engineer if, when building your dream home, you forgo kitchen cabinets in lieu of two dishwashers—one for clean dishes, one for dirty, to be rotated on the same schedule as your kitchenette chairs. When I built my house I wanted to install two dishwashers—one to go on either side of the sink. The biggest problem with a dishwasher, to my mind, is unloading the dishes after they are done. My plan was to not unload the clean dishes. I would just use them directly from the dishwasher. The dirty dishes would then go into the other dishwasher. When that was full, I would reverse the cycle. My beloved ex-wife-to-be, the general contractor, and the plumber all nixed that idea. I still think it a great plan. If I ever build another house, I plan to install two dishwashers.

You might be an engineer if you give the plants a drink with leftover water from your cat's dish. Twice a day, when I feed the cat, I change her water. She never finishes all the water I had previously given her. I utilize the leftover water by pouring it onto plants in the house.

You might be an engineer if, when putting things away in the closet, you ensure that all clothes and hangers match according to color. I have bachelorhood down to a science. I own about 60 dress shirts and probably the same number of casual shirts. I can go months without having to stop at the drycleaners. I hang the shirts on plastic hangers. The hangers are colored. I try to hang each shirt on a matching color hanger. This gets tough with plaids and stripes. If there is not one predominant color, I use brown hangers as a default.

As I said, I know I am an engineer. I am not sure the things that I have listed above are a result of my being an engineer. Perhaps obsessive compulsive is a better description.

L. Robert "Larry" Smith, P.E.
Chair, Committee on
Examinations for Professional Engineers
Rhode Island State Board of
Registration for Professional Engineers

Kentucky MBA says security is the issue

Security is the main reason that the Kentucky State Board of Licensure for Professional Engineers and Land Surveyors contracted with Engineering and Land Surveying Examination Services (ELSES) to administer the April 2002 NCEES examinations. "Not that we think using ELSES resolves every possible security issue, but we just felt more comfortable with ELSES [administering the examinations]," says David Cox, Executive Director of the Kentucky Board. "If you have professionals handling exam administration, you minimize the possibility of irregularities," he says.

ELSES is a division of the NCEES, an association charged with developing and producing licensing examinations for engineers and land surveyors. NCEES departments work closely with one another and strive to keep communication flowing among directors and staff. As a result, ELSES team members are intimately aware of the particulars of each new examination, answer sheet, security concern, and administrative procedure. When jurisdictions call NCEES Technical Assistants with questions about occurrences and circumstances particular to their examination sites, ELSES Director Susan Whitfield participates in many decision-making discussions and applies knowledge gleaned from those discussions to routine ELSES administration preparations.

In addition to security concerns, Cox says it's important to his board that Kentucky licensure candidates take NCEES examinations under the same conditions as examinees across the United States. He comments that a true national exam should be given in a standardized, consistent manner from state to state. Because of their participation in developing NCEES's national administrative procedures, ELSES team members understand the importance of ensuring that all candidates have the same opportunity to perform well on the examinations, with adequate seating, space to work calculations, and the like.

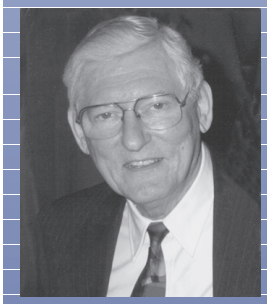
Another factor considered by the Kentucky Board was staff time. "[Using ELSES] costs us a little more," says Cox, "but we found that when we considered the time involved [in administering the exams ourselves], the actual cost for using ELSES was minimal. What we get security-wise for those dollars is money well-spent, and the bigger savings is in staff time." By using ELSES, Kentucky Board staff are able to provide services to licensees in a more expeditious manner, as well as work on projects like adding a roster to the board Web site, providing online applications, and so forth.

Although contracting with ELSES to administer examinations, the Kentucky Board retains all of its regulatory responsibility and authority. The board reviews all applications to take the engineering and land surveying examinations in Kentucky and approves qualified individuals. Often ELSES provides registration services in addition to examination administration, but the Kentucky Board chose to maintain the registration portion of the process, since it had the software and database to complete the job quickly and effectively. Cox comments, "We have to have the rosters prepared more quickly in order to get them to ELSES, and that heightened our approval process by a few days, but that was just an adjustment, and it worked pretty well."

Although contracting with ELSES to administer examinations, the Kentucky Board retains all of its regulatory responsibility and authority.

ELSES administered examinations for seven NCEES Member Boards in April 2002 and will add four more jurisdictions for the October 2002 administration. ELSES team members customize their services according to the needs of individual boards while maintaining high standards of examination security, proctor training, and professional treatment of examinees.

NCEES staff



Melvin Hotz, P.E.
Northeast Zone Vice President

In My
OPINION

Is it time to explore international mobility?

We have seen much positive activity regarding mobility accommodations. Judging by the response from most state boards, mobility across state borders is certainly a reality, and swift licensing for Model Law Engineers is already here. This move to improve interstate mobility has been accomplished without affecting our commitment to the "three E's" of licensure: education, experience, and examination.

But what about a similar movement internationally? To date, engineers with foreign credentials cannot straightforwardly become licensed in the United States, and conversely engineers from the United States are not able to become easily licensed in foreign countries. At this time, no one would propose a process that would deviate from our concept of the three E's. Currently, in most instances, when an engineer from the United States wants to work in a foreign country (Canada is as foreign as France in this issue), the interested party contracts with a locally licensed entity in order to work on a project. We see this in effect for foreign engineers when they work in the United States. It is virtually impossible under existing laws for a foreign licensed engineer to become licensed in a different country without beginning a licensing procedure that takes months to complete.

Is this a good practice? We see the same process in most other professions. Lawyers, doctors, accountants, and the like, from other countries cannot practice in the United States based upon their home country license. For the most part, except for certain situations where local law may impose local licensing restrictions, such as seismic considerations or weather issues, there may be a case made that an engineering license is an indication of education and experience; therefore, mobility across international boundaries ought to be easier to cross. Certainly, bridges are constructed in other countries, buildings are erected, dams do not breach, power plants are reliable, and so forth. After all, the same laws of science, mathematics, and physics govern all engineering disciplines. The language barrier may present a problem, though English is becoming a universal language. With modern communication, modern travel accommodations, and more and more interest in international commerce by government entities, it may be time to explore processes to accommodate mobility for engineers and land surveyors.

International licensing mobility is a subject that will become important to the world's financial communities as we progress into the first quarter of the twenty-first century. While Council activity on this issue is currently a low priority, now is the time to begin taking the initiative to preclude activities in this area by government agencies. The possibilities may appear remote, yet it was merely 10 or 11 years ago when the Model Law Engineer concept as a mobility vehicle had not been imagined.

Melvin Hotz, P.E.
Northeast Zone Vice President

Letters to the EDITOR

I read with great interest a recent article published in *Licensure Exchange* regarding the use of calculators during NCEES examinations. I believe that graphing calculators and the like are great assets to engineers; however, they are commonly utilized unethically in exam taking.

Having taught graduate courses to high school teachers and engineering technologies at a community college, as well as having made presentations at T3 International Conferences on graphing calculators, I have some concerns about the use of graphing calculators during the Fundamentals of Engineering (FE) and the Principles and Practice of Engineering (PE) examinations.

Several canned programs such as ME-PRO and EE200 are available and can be hidden in the memory of graphing calculators. Since advanced users may reprogram the operating system, one may use the clear memory function and see the message "memory cleared" without actually having cleared the memory. The only positive way to ensure that memory is cleared is to remove all the batteries—AA, AAA, and lithium batteries. Many graphing calculators have a set of batteries for operating and another set for memory storage. Both sets must be removed to truly erase the calculator's memory. This procedure should be done whenever an examinee brings a graphing calculator into the exam room, e.g., at the beginning of the examination and after lunch. In addition to clearing the calculator's memory, requiring examinees to list the keystrokes utilized for a problem or at least the procedure to solve the problem might be a way to deter the use of canned programs.

I've seen examples where canned programs, either developed by a student or downloaded from the Internet, were utilized during exams at a local community college. In one case, a student had a program, obtained via the Internet, that he utilized to analyze a statistics problem. Upon questioning of the student, it was obvious that he did not understand the concepts, though he could run the program. Another example occurred in a chemistry class. The exam was closed book, but calculators were allowed. Several students had a "cheat sheet" programmed into their calculators. Graphing calculators currently have up to 188KB RAM and 2.7MB FlashROM for the storage of data and text. Gone are the days of students writing notes on the palms of their hands. The professor changed the class policy, and students were no longer allowed to use graphing calculators during exams.

While I think the advantages of graphing calculators are enormous, the unregulated use of such calculators during the examination process has the potential of creating ethical problems.

Richard M. Beldyk, P.E.

Beldyk holds licenses in Delaware, Maine, Maryland, Michigan, Ohio, Oklahoma, Pennsylvania, and Virginia. He is a certified welding engineer, a certified plant engineer, and a member of the USCIEP International Registry.

I have some concerns about the use of graphing calculators during the Fundamentals of Engineering (FE) and the Principles and Practice of Engineering (PE) examinations.

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

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

Member Board NEWS

Arkansas
- Charles Tenney is a new appointee to the board.

California
- Arthur P. Duffy, David J. Fruchtman, Michael K. Welch, and Dale Wilson are new appointees to the board. The term of Vincent Di Tomaso has expired.

Delaware LS
- Roy B. Kemp III and Elton M. Murray are new appointees to the board. The terms of Don K. Miller and Douglas N. Wingate have expired.

Florida PSM
- The new executive director is Leon M. Biegalski, replacing Sherry Landrum.

Mississippi
- Nolan B. Aughenbaugh is a new appointee to the board.

Missouri
- Patti L. Banks, Robert N. Hartnett, Promod Kumar, and Kathleen A. Warman are new appointees to the board. The terms of Donald L. Hiatte, Paul R. Munger, and Victoria L. Noteis have expired. James S. Anderson is the new board chair; Josephine L. Emerick is the PE Division chair; and Thomas J. "Jim" Mathis is the LS Division chair.

Oklahoma
- William McVey, Jr., is a new appointee to the board. Ted Sack is the new board chair. The term of Ross Relph has expired.

South Carolina
- Gaye Garrison Sprague is a new appointee to the board. The term of J. Edward Britt has expired.

Texas PE
- James R. Nichols is the new board chair. The term of E. D. Dorchester has expired.

West Virginia LS
- The board's new e-mail address is WVBELS@mail.state.wv.us.

Wisconsin
- Francis R. Thousand is a new appointee to the board. The board's new director is Mary Forseth, not Forfeth, as was erroneously printed in the April 2002 issue.

Herman E. Smith, Jr., P.E., P.L.S., passed away on February 12, 2002, after a lengthy illness. He served on the Oklahoma State Board of Registration for Professional Engineers and Land Surveyors from 1972–1987 and was an emeritus member of the Oklahoma Board and the NCEES.

Smith served on and chaired various NCEES committees and attended nearly every NCEES Annual Meeting held during his 15 years of service to the Oklahoma Board. He was awarded the Southern Zone Distinguished Service award in 1981, the NCEES Distinguished Service Award in 1981, and the NCEES Distinguished Service Award with Special Commendation in 1991. For the 13 years after he went off the Oklahoma Board, Smith attended board meetings as an emeritus member, even during the past few years when it was difficult for him to travel. In addition to NCEES, Smith was active in other professional organizations. He was a member and past president of the Oklahoma Society of Professional Engineers; a member of the National Society of Professional Engineers; a Fellow for the American Consulting Engineers Council, for which he served as President and Director of the Oklahoma Section as well as a National Director; a fellow of the American Society of Civil Engineers; and a member of the American Society of Mechanical Engineers.

paraphrased from *The [Oklahoma] Board's Bulletin*, Spring 2002

Oklahoma requires continuing education

The Oklahoma State Board of Registration for Professional Engineers and Land Surveyors promulgated rules during this legislative session to require continuing education for engineers, beginning with their first renewal following July 1, 2004. (Oklahoma has had continuing education for professional land surveyors for several years.) The requirements are very similar to the NCEES Model Law. It was the board's goal not to make reciprocity cumbersome for the continuing education of engineers. The Oklahoma Board asks other boards that currently require continuing education for suggestions as to how to implement the administrative tracking process.

The Oklahoma Board asks other boards that currently require continuing education for suggestions as to how to implement the administrative tracking process.

Governor signs bill after two years of Ohio Board consensus building

The Ohio State Board of Registration for Professional Engineers and Surveyors requested the sponsorship of Sub. HB 337 in order to modernize and streamline its registration act. The bill becomes effective after August 7, 2002. It took more than two years of discussions between the Ohio Board and the statewide engineering and surveying associations as well as other stakeholders (such as the Associated General Contractors, the Ohio Home Builders Association, and the Ohio Bar Association) to reach a consensus.

Various revisions to the law contained in HB 337 are summarized as follows:

Revise the experience requirements to become a professional engineer or professional surveyor to allow up to two years of experience prior to college graduation. Current law allows credit for engineering experience after college graduation only, which unfairly penalizes cooperative and nontraditional students who alternate college studies with work experience in order to become more productive and well-rounded employees and to mitigate the financial concerns of a college education.

Delete the provisions allowing for registration as a professional engineer or professional surveyor by "eminence" without examinations or as a professional engineer with a "related science" degree such as math, chemistry, physics, geology, or oceanography.

Require a signature, date, and seal on all engineering or surveying work products and provide for the use of electronic seals. Current law requires only a seal, which can be easily copied. The additional requirement for a signature and date will help to ensure that the work was prepared by a properly registered professional. The use of electronic seals, with appropriate safeguards, will expedite the timing of approvals and bids and therefore the construction process.

Prohibit a public agency from accepting or using engineering or surveying plans that were not prepared by a professional engineer or professional surveyor. Current law gives such authority to "officers of the law of this state" only. An attorney general's opinion issued in 1999 advised that a public agency, under current law, does not have the authority to reject engineering plans not prepared by a professional engineer. Clearly, this needs to be corrected in order to protect the public safety.

Information provided by the Ohio State Board of Registration for Professional Engineers and Surveyors.

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

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

licensure EXCHANGE

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Upcoming EVENTS

DATE	EVENT	LOCATION
July 4	Holiday—Council Office Closed	Clemson, SC
August 7–10	NCEES Annual Meeting	La Jolla, CA
September 2	Holiday—Council Office Closed	Clemson, SC
September 27–28	Board of Directors Orientation	Clemson, SC

NCEES exams too hard... *(continued from page 1)*

committees work diligently, and in large measure successfully, to ensure that only questions of reasonable difficulty appear on examinations. However, with pass rates of first-time takers ranging from 55% to 100% for examinations in the multiple-choice/no-choice format, it's pretty clear that we must become more skillful at writing questions closer to the minimum competence level. Examinations with either a preponderance of questions below or above the minimum competence standard can't do an acceptable job of distinguishing, over the range of examination specifications, between examinees who are minimally competent and those who are not. It's pointless and disheartening to examinees when examinations are too hard.

Why are the pass rates for some of the Council's PE examinations so much lower than for the FE examinations? Part of the answer is that many of the questions on the PE examinations are truly "practice" questions. Answering them correctly requires experience as well as the application of some of the engineering principles learned back in school, and if that experience is lacking, examinee performance suffers. There is another and more disturbing concern about PE examination pass rates.

Please contact NCEES Director of Examination Development John Adams at johna@ncees.org if you would like to participate in a standard-setting panel or become involved in an examination development committee.

How can we be sure that the best and brightest engineering students, those who tend to score well on the FE examination, aren't finding employment in industrial or government positions that don't require professional licensing? Are they dropping out of the "licensing track" and if they are, how do we get them back on the track? Is a mentoring program the answer? What role, if any, should the Council play? More tough questions! I hope that with the participation of everyone in the Council we can find the answers.

Frank K. Loudon, P.E.
Chair, Committee on Examination Policy and Procedures
Nevada State Board of Professional Engineers and Land Surveyors

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