

## New Structural II exam better for licensure candidates

### Changes will improve consistency and reliability

Beginning with the April 2004 administration, the eight-hour Structural II exam will be given in a new format. Instead of one four-hour problem in the morning and one in the afternoon, the exam will consist of two two-hour problems in the morning and two in the afternoon. In addition, Structural II examinees must pass both the morning and afternoon sessions of the same exam administration. Previously, Structural II examinees have been allowed to pass a morning or afternoon session and retake the failed session at a later administration.

NCEES develops the Structural I and Structural II exams through a committee of volunteers who are licensed to practice structural engineering. These volunteers make up the Structural Exam Committee, which develops and reviews problems for the structural exams and scores the Structural II exam. Participants come from all regions of the country and bring a varied perspective to the process. The committee is diverse in terms of expertise, ethnicity, age, and gender. Problems are typically authored by one committee member and then reviewed and reworked by two or three others. The final problem is then pretested by two independent, licensed, practicing engineers. Their comments and completion times are used to make any necessary modifications to the problem before it is finally placed on an exam.

#### Structural II content and scoring

Specifications for the new format of the Structural II exam, to be administered for the first time in April 2004, came out of the 2000 Professional Activities and Knowledge Study (PAKS). Practicing engineers responded to the PAKS and indicated the body of knowledge and abilities that a licensed structural engineer should have. The core knowledge required for the Structural I and Structural II exams is similar. The differences between the two exams lie mainly in the manner in which the core knowledge is tested, that is, their format and scoring process.

The Structural I exam is 100% multiple choice and machine scored. Each multiple-choice question measures examinees' understanding of discrete portions of the core of structural engineering knowledge. The Structural II exam is composed of essay problems designed to measure the ability to integrate structural knowledge. The essay format allows examinees to *demonstrate* engineering knowledge, ability, and judgment. It is this *demonstration* that is necessary to pass the Structural II exam.

The Structural II exam is scored in a workshop environment. For each problem, there is a coordinator, selected from the committee, who reviews a written problem statement, solution, and scoring criteria. At the beginning of the scoring session, the coordinator leads the scoring team—all of whom have previously received and reviewed the problem statement, solution, and scoring criteria—in a discussion of the item. The discussion is intended to ensure that all scorers have equal appreciation of the problem's content. After this discussion, each member of the scoring team grades the sample solutions that the coordinator has chosen. After each sample solution is scored, the scoring team discusses the grade. Scorers describe their thought processes and their reasons for marking the solutions the way they did. This step in the process is designed to develop and ensure consistency between the individual graders. The review of sample solutions prior to the actual grading session also helps to identify possible alternate solutions. Once the scorers have demonstrated that they have achieved consistency, the scoring of the individual solutions begins. Each solution is scored by two randomly selected graders. Sometimes a solution is scored differently by the two graders. In this case, a third grader scores the solution to determine its outcome. The third scorer has no prior knowledge of how the previous scorers graded the solution.

*(continued on page 2)*



Cheri Leigh, P.E.  
Structural Exam Committee  
Vice Chair



Edwin Huston, P.E., S.E.  
Structural Exam Committee

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## **New Structural II exam...***(continued from page 1)*

### **Structural II format**

Discussions held during the 2000 PAK study pointed out two possible shortcomings of the Structural II exam in its previous format. The evaluation of these possibilities led to the adoption by NCEES of the new format effective with the April 2004 administration. The first potential shortcoming was that examinees had the opportunity to pass the exam in parts. (Many state boards allowed their exam candidates to pass one four-hour session, either the morning or afternoon, at a time. If an examinee failed one four-hour session, the state board required that the examinee retake and pass only that session at a later exam administration.) Subject-matter experts pointed out that by allowing examinees to pass the exam in parts, an examinee's *breadth* of knowledge was not necessarily being demonstrated. For example, an examinee with sufficient knowledge of concrete design but insufficient knowledge of steel, wood, and masonry design takes an exam with a concrete problem in the morning and a steel problem in the afternoon. The examinee might pass the morning problem and fail the afternoon problem. This hypothetical examinee could repeatedly retake the afternoon session until that session contained a concrete problem and then pass that problem. This examinee could become licensed, even though knowledge of only *one* of the *four* common building materials had been demonstrated. Under the new format, this will no longer be possible. Since the exam will test a complete body of knowledge, examinees must pass both sessions at the same administration.

The second and related shortcoming is that the previous exam format contained different content from administration to administration. An exam offered in April may have had steel and concrete building problems while the October exam may have had steel and wood/masonry problems. To ensure that all licensees demonstrate equivalent knowledge, ability, and judgment, each exam administration should have the same content. This is not meant to imply that all examinees will do equally well on any given problem. However, if each exam administration has the same content, all examinees will have a "level playing field" on which to demonstrate their knowledge, ability, and judgment.

With the new format, whether an examinee takes an April 2004 or April 2005 Structural II exam, the examinee will be tested on the same core knowledge in the same way. This change should improve the consistency and reliability of the exam. While some fluctuation in pass rates between different examination administrations may occur, the Structural II Exam Committee anticipates that these format changes will bring more consistency to the pass rates.

The previous Structural II exam—given prior to April 2004—consisted of a choice between one four-hour building and one four-hour bridge problem offered in both the morning and afternoon sessions. There was seismic content in the afternoon problems, and all problems typically contained some level of structural analysis, the design of wood and masonry for buildings, and the design of concrete and steel for both buildings and bridges.

The new format offers examinees a choice between four bridge problems and four building problems. Examinees choose to solve all of the bridge problems or all of the building problems. This format change ensures that examinees demonstrate knowledge in more than one building material. Half the building problems and half the bridge problems will continue to have seismic content.

### **How can you participate in the exam process?**

NCEES is always looking for qualified volunteers—licensed engineers practicing in structural engineering—for the Structural Exam Committee. If you are interested in contributing to this effort, visit the NCEES Web site at [www.ncees.org](http://www.ncees.org) and submit a Volunteer Interest Form.

*Cheri Leigh, P.E.  
NCEES Structural Exam Committee Vice Chair*

*Edwin Huston, P.E., S.E.  
NCEES Structural Exam Committee*

Visit the NCEES Web site at  
[www.ncees.org](http://www.ncees.org)  
to view the new Structural II exam  
specifications and design standards.

# Past President Leon Clary is missed by NCEES, family, and friends

On behalf of the NCEES Board of Directors, members, and staff, both past and present, it is my honor to participate in this service to celebrate the life of Leon Clary—one of the Council's most respected leaders and supporters and my good friend and mentor for eight and a half years.

Leon gave tirelessly to the professions of engineering and surveying. Scores of people have been influenced by his example and have benefited from his contributions to the Council. They would be grateful, as I am today, for the opportunity to pay tribute to Leon.

Leon's involvement with NCEES began nearly 20 years ago. He worked at all levels of the organization, serving on seven standing committees and at least two special committees. In each role, he proved to be capable, respected, and knowledgeable. Attesting to his competence and leadership, he was elected by his peers to three national offices. He was elected Vice President of the Northeast Zone for two separate terms, the first from 1987 to 1989 and the second from 1991 to 1993. He is the only officer to have served two, non-consecutive terms as an NCEES Vice President. In 1994, Leon was elected to the highest national office, NCEES President.

The milestones that distinguish Leon's presidency continue to be important events in the Council's history. Under his guidance, the Council developed and adopted its first Strategic Plan and Vision and Mission Statements. Leon was instrumental in adding "Surveying" to the name of the Council. The NAFTA Mutual Recognition Document—a tripartite agreement between the United States, Canada, and Mexico—was signed during his tenure.

Leon's contributions did not go unnoticed. In 1991, NCEES presented Leon with the Distinguished Service Award. In 1997, he was honored with the most prestigious award bestowed by the Council, the Distinguished Service Award with Special

Commendation. This award is given to volunteers who have demonstrated outstanding service to their Member Board, their zone, and NCEES, as well as outstanding contributions to the advancement of licensure and the profession.



Leon H. Clary, P.E., L.S.  
NCEES Past President

Even after his term on the Board of Directors was completed and, despite his failing health, he continued to participate in Council business. He chaired one of the Council's most influential committees, the Advisory Committee on Council Activities, from 1999 to 2000. Because of his visionary and progressive thinking, he was tapped to serve as a consultant to the Special Committee on Governance from 1998 to 1999.

I would be remiss if I did not mention the admiration that Council staff and I have for both Leon and Marilyn. While members of Council staff appreciate the individual and unique contributions of all NCEES Presidents, staff members have a special fondness for the Clarys. Since Leon's illness began, we prayerfully followed his health reports out of concern for him and the family. Marilyn frequently wrote notes and sent pictures, and Leon kept in touch via e-mail. About 18 months ago, I had the opportunity to be a guest in their home and have a terrific visit with them.

NCEES and I are grateful that Leon chose to invest his talent and many of his years in the Council. While his expertise, diplomacy, and work ethic made him a valued and appreciated Council member, these were not the foremost reasons he was admired and beloved. Leon was a natural leader. His warm personality and calm demeanor evoked the best in people. The quiet confidence he had in himself, in others, and in the future motivated us all. He lived with integrity, and, by example, challenged us to do the same. We are all fortunate to have known him.

*Betsy Browne*  
NCEES Executive Director

*After a long illness, Past President Leon Clary, P.E., L.S., passed away on July 31, 2003. NCEES Executive Director Betsy Browne spoke at Clary's funeral on August 6. At the left is a portion of her eulogy.*



Donald L. Hiatte, P.E.  
NCEES President

## Calculators and new land surveying specs to get much attention in 2004

Over the course of this year, it is my intention to keep Council members informed of the various activities of the NCEES Board of Directors and committees. It still amazes me to witness the dedication and commitment of our volunteers. Thanks to each of you for what you have done and will do for our professions and those we serve.

The 2003–2004 Board of Directors met in November for its second meeting. We discussed the October 2003 and April 2004 exam administrations, the status of committees appointed for this year, meetings with technical and professional organizations, and other related issues.

For the October 2003 administration, Member Board Administrators, proctors, and NCEES staff indicate that most exams were administered without incident. Unfortunately, unforeseen problems do occur with even the most diligent planning and preparation. A fire on a university campus resulted in the loss of power at an exam site and other on-campus buildings. The number of examinees scheduled to take the exam prohibited finding another site at such short notice. The board rescheduled the exam for November. NCEES required that examinees take a different exam so as not to compromise the exam given in October. ELSEES, the Council's exam administration service, assisted 18 Member Boards with the October administration, and we anticipate that ELSEES will serve 25 boards for the April 2004 administration. For the April 2004 administration, Member Boards will strictly enforce NCEES Exam Policy 15, which prohibits from the exam room communicating calculators and any device that may compromise the exam, including text-editing calculators.

A number of our committees and task forces have already met and the remainder have been active via e-mail and conference calls. The Committee on Examination Policy and Procedures is working on a charge related to calculators and their use during NCEES exams. I have appointed a new group, the Exam Administration Task Force, to develop a standardized information packet to be distributed to all exam candidates at the time of application. The group will also review the Council's *Security and*

*Administrative Procedures Manual* and recommend any needed exam administration policies.

The Special Committee on PAKS—Land Surveying met in early fall to review the results of the survey distributed to licensed surveyors and those practicing in nonboundary surveying areas. Based on the survey, the committee determined which knowledge areas should be tested on the Principles and Practice of Land Surveying and the Fundamentals of Land Surveying exams. The committee linked those knowledge areas to required tasks. Committee members then established the final specifications for the exams. The PAKS—Land Surveying Committee will submit the specifications for approval to the Committee on Examinations for Professional Surveyors (EPS) at its January 2004 meeting.

NCEES has participated in a variety of national meetings over the past several months. Representatives have attended the annual meetings of the Council of Landscape Architectural Registration Boards, the American Society of Civil Engineers, and ABET, as well as a meeting of the Canadian Engineering Qualifications Board. Rita Lumos, L.S., chair of the EPS Committee, made a presentation on the value of licensure at a meeting of the Management Association for Private Photogrammetric Surveyors. The United States Council for International Engineering Practice (USCIEP), of which NCEES is a founding member, will meet in December. John Fenn, president of the National Society of Professional Surveyors (NSPS), has requested that USCIEP review the NSPS draft mutual recognition document between Canada, Mexico, and the United States.

The dedication of NCEES volunteers with regard to exam preparation, committee and task force responsibilities, and elected positions is outstanding. I would also like to recognize the commitment and effort of all those who serve on our Member Boards. What a resource our professions have! Thanks to all of you for contributing.

*Donald L. Hiatte, P.E.  
NCEES President*

# Financial scandal? Not at the Council

The accounting firm of Pope, Smith, Brown, and King completed the 2003 audit of the Council financial records. I spoke with a representative of the auditing firm, both to receive his input and to ask questions that arose out of the firm's report to management.

As is very clear from reading the report, there were no material weaknesses found in the audit. Again this year, the auditing firm complimented Council staff for providing a very satisfactory financial trail and for continuing to follow suggestions made by previous audits to improve methods and procedures in the finance department.

The audit points to the large uninsured cash balance held by Council because of the renovation of Council headquarters. However, auditors agree that this balance will decrease rapidly, shortly after the first of the year, and that it is held in a very large reputable bank with an almost nonexistent chance of failure.

Auditors also refer to potential changes in accounting procedures because of recent accounting scandals and the Sarbanes-Oxley Act. The NCEES Executive Director had previously brought these potential changes before the Board of Directors,

and officers discussed the implications to the Board and Council. Staff has begun looking into complying with some requirements of the act, even though the Council is not currently required to do so. The auditors commented that taking these steps could only help strengthen our financial reporting.

The Council has followed the recommendations from previous audits and implemented a total accrual system for income and expenses related to exam administration. Because the October administration is so close to the end of our fiscal year, it is extremely important to match particular expenses to related income. The auditors thought this had been done very efficiently and will benefit the Council in the future.

After reading the audit and talking with the firm's representative, I am satisfied that our staff is doing an excellent job of continuing to improve reporting and management of Council finances. We should give our Executive Director and her staff a hearty "well done" for excellent financial management.

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



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

## Upcoming EVENTS

DATE	EVENT	LOCATION
December 24–26	Office Closed	Holiday
February 20–21	BOD Meeting	Santa Fe, NM
March 21	NCEES Building Dedication	Clemson, SC
April 1–3	Western Zone Meeting	Las Vegas, NV
April 9	Office Closed	Holiday
April 16–17	Exam Administration	
April 22–24	Northeast Zone Meeting	Portland, ME
May 13–15	Southern Zone Meeting	Asheville, NC
May 19	BOD Meeting	St. Louis, MO
May 20–22	Central Zone Meeting	St. Louis, MO

## Exam security major topic again this year



Betsy Browne  
NCEES Executive Director

On October 6, Council staff squeezed their files, computers, and reference materials into the new addition to NCEES headquarters. We will occupy the new wing until the renovation of the rest of the building is completed sometime in February. Though conditions are tight, the building addition has many windows, allowing bright light to shine into our work spaces and providing a fresh atmosphere. The Council will dedicate the new building on March 21. All Past Presidents, emeritus members, and members of Member Boards are invited to join the Board of Directors for this event. You will hear more about the dedication ceremony in the coming weeks.

The Board of Directors met on November 7 and 8 for its second meeting of the fiscal year. Newest members Jim McCarter, Vice President of the Southern Zone, and Lou Raimondi, Vice President of the Northeast Zone, have settled in and are providing important input to the Board's deliberations. Board members reviewed their responsibilities as outlined in the 2003 Strategic Plan and continue to address them as part of an ongoing adherence to its guidelines. After approval at the February 2004 Board meeting, the minutes from the November meeting will be posted on CouncilNet via [www.ncees.org](http://www.ncees.org). Take a moment to familiarize yourself with the various issues facing the NCEES Board. I hope that the December Zone Update went a long way toward keeping you informed of the Board's actions at its second meeting.

The Council has spent a lot of time over the past year talking about exam security—at meetings of the Board of Directors, zone meetings, and the most recent Annual Meeting. President Don Hiatte has appointed a new Exam

Administration Task Force and continued the Exam Security Task Force from last year. This issue of *Licensure Exchange* reflects the ongoing discussions related to security. Please read the article we have reprinted from the California Board's Web site. Written by Nancy Eissler, an enforcement analyst, it describes the recent

prosecution and conviction of an exam "cheater" and reiterates the California Board's firm stand in preventing exam compromise. Bill Dickerson, the chair of the Committee on Examination Policy and Procedures, has written a persuasive piece regarding the use of calculators during exams, as has Peggy Abshagen, executive director of the Delaware Board for Professional Engineers. Both articles popped into our editor's

e-mail independently and unsolicited soon after the October exam administration. Interesting that two members of the regulatory community were both thinking in a similar manner regarding the calculator issue. An additional article describes the successful October administration in Mobile, Alabama. It explains steps the proctor took to ensure that exam books were secure and that examinees were comfortable and had the opportunity to perform their best on the exams.

Staff is currently in the throes of developing the proposed budget for the 2004–2005 fiscal year—always an exciting and nail biting time. NCEES members put careful thought into the initiatives and programs of the Council, and judicious monetary planning is essential in making it all successful. For this reason, we are proud of the results of the 2003 financial audit. Treasurer Martin Pedersen describes its outcome in his article in this issue.

*The Council will dedicate the new building on March 21. All Past Presidents, emeritus members, and members of Member Boards are invited to join the Board of Directors for this event.*

To view the October 2003 pass rates, visit the NCEES Web site at [www.ncees.org](http://www.ncees.org).

I'd like to welcome the Council of American Structural Engineers (CASE) and the Structural Engineering Institute (SEI) to the NCEES Participating Organizations Liaison Council (POLC). Representatives of POLC organizations meet once a year to discuss the issues at the forefront of the engineering and surveying communities. POLC meetings provide a means for NCEES leadership to hear of the deliberations and activities going on in other organizations, while providing an avenue for NCEES to present its goals and initiatives.

In his article, President Don Hiatte reviews some of the committee activities currently in progress at the Council. The Board will meet again in February, and by that time we will be speeding toward the spring zone meetings. Over the next few months, committee chairs and members will respond to charges, make recommendations, and write motions that will influence the future direction of the Council. The winter is also a

busy time for exam committees. Most weekends, our technical assistants are meeting with volunteers and facilitating item-writing sessions. The TAs are looking forward to March when they can meet with many volunteers in the comfort of a newly renovated Council headquarters and have easy access to exam files and reference materials.

I'm looking forward to all of the above, as well as the upcoming holidays. I wish you a joyous season of peace and giving. Reflecting on things larger than myself reminds me of the blessings inherent in working for an organization dedicated to service. Through working or volunteering for the Council, we each have an opportunity to give back to our national and even global community. Happy holidays!

*Betsy Browne*  
*NCEES Executive Director*

**NCEES OPERATING SUMMARY**  
**For the Period Ended October 31, 2003**

	<b>Actuals</b>	<b>Budget</b>	<b>Budget</b>	<b>2003-2004</b>
	<b>Year-to-date</b>	<b>Year-to-date</b>	<b>Variance</b>	<b>Total Budget</b>
<b>INCOME</b>				
Member Boards	\$ 34,805	\$ 35,234	-1.22%	\$ 669,300
Examinations	0	0	0.00%	5,614,830
Study Materials	30,604	77,614	-60.57%	1,034,850
Records	99,580	104,363	-4.58%	1,252,365
Exam Admin. Services	<u>960</u>	<u>2,600</u>	<u>-63.08%</u>	<u>1,694,000</u>
<b>Total Income</b>	<b>\$ 165,949</b>	<b>\$ 219,811</b>	<b>-24.50%</b>	<b>\$ 10,265,345</b>
<b>EXPENSES</b>				
Member Boards Services	\$ 115,365	\$ 125,583	-8.14%	\$ 1,907,662
Examinations	395,777	495,457	-20.12%	5,525,598
Study Materials	40,870	47,750	-14.41%	686,666
Records	65,452	56,441	15.97%	698,698
Exam Admin. Services	<u>82,315</u>	<u>128,762</u>	<u>-36.07%</u>	<u>1,679,592</u>
<b>Total Expense</b>	<b>\$ 699,779</b>	<b>\$ 853,993</b>	<b>-18.06%</b>	<b>\$ 10,498,216</b>
<b>NET INCOME (DEFICIT)</b>	<b>\$ (533,830)</b>	<b>\$ (634,182)</b>	<b>-15.82%</b>	<b>\$ (232,871)</b>

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# Are we moving in the right direction on calculators?



Bill Dickerson, P.E.  
Chair, Committee on  
Examination  
Policy and Procedures

**D**id we go the “wrong way” with calculators? Good question. It reminds me of the gentleman who was asked if he had a hard time making a decision. His response was, “Well, sometimes I do, and sometimes I don’t.” My thoughts are similar on prohibiting the use of some calculators in the exam room: it was both a good decision and a bad decision.

## Limiting calculators is a good idea

Last summer, the NCEES Board of Directors made the decision to strictly enforce Exam Policy 15, which prohibits in the exam room communicating calculators and all devices that might compromise the security of an NCEES exam. This includes calculators with text-entry capabilities. The decision made by the Board was absolutely the right thing to do, and it probably should have been done a long time ago. Rumors have persisted that examinees can share answers via calculators, and we now know that possibility to be true. Based on information obtained from the Internet, an NCEES staff member modified a typical high-end calculator, converting it to a wireless communication device. Surveyors who work on the Committee for Examinations for Professional Surveyors (EPS) have stated that party chiefs and other field personnel who use the HP48 and similar calculators become very proficient at entering text data. The Board really had no choice but to enforce the existing exam policy and ban from the exam room communicating calculators and those with text-editing capability.

## Banning calculators is not a good idea

Based on the reasoning explained above, the Council was asked at the 2003 Annual Meeting to approve limiting calculators permitted in the exam room to a list of specific models. Unfortunately, this motion failed by one vote—and made it necessary for NCEES to develop an illustrative list of calculators that have features prohibited in the exam room. Though not inclusive, this list serves as a guide to examinees and Boards about what cannot be brought into the exam room. This list will almost always be incomplete when NCEES examinations are given.

Rita Lumos, L.S., the chair of the EPS Committee, attended a meeting of the American Congress on Surveying and Mapping (ACSM) last spring where 10 new data collectors were previewed. Data collectors, by definition, are for entering data as

well as making calculations. Six of the data collectors had QWERTY pop-ups to assist with data entry, and eight had wireless communication capability. We have no way of tracking every new calculator that comes to the marketplace, and we predict that many of the newer calculators, not just data collectors, will have wireless capability. It would be nearly impossible to create an all-inclusive, up-to-date list of prohibited calculators.

Perhaps more important is the difficult situation we created for our proctors. NCEES recommends that the ratio of proctors to examinees be 1 in 24, and if this ratio is followed, we may have 1,600 or more proctors in any examination administration. Most of these proctors have little familiarity with scientific calculators and do not recognize the various models. We cannot expect our proctors to learn to recognize a long list of prohibited calculators, especially when that list will certainly grow for future examination administrations.

## An approved list is preferable

A few jurisdictions implemented a list of banned calculators for the October 2003 administration. Feedback from those jurisdictions indicates a desire for a list of approved calculators rather than a list of banned ones. In fact, one of the charges to the Committee on Examination Policy and Procedures (EPP) for this year is to revise EP 15, Materials Permitted in the Examination Room, to provide that only calculators specified by NCEES are permitted in the examination room. In response to this charge, EPP will ask subject-matter experts from the examination subcommittees to develop an approved list from their knowledge of calculator features required to work the NCEES exams, while considering fairness to examinees as well as proctors.

At the 2004 Annual Meeting, EPP will present a revision to EP 15 stating that only calculators approved by NCEES will be permitted in the exam room. Member Boards will have an opportunity to discuss this EPP motion and a proposed list of approved calculators at the upcoming spring zone meetings. If this motion passes at the Annual Meeting in August, an approved list will be implemented as soon as possible.

*Bill Dickerson, P.E.  
Chair, Committee on Examination  
Policy and Procedures*

# Make proctors' lives easier

## MBA asks Council to adopt a list of approved calculators

At the 2003 NCEES Annual Meeting, Member Boards considered a proposal to approve a select list of calculators for examinees to use in the exam room. The proposal was defeated by a narrow margin, and boards were left to continue with their status quo positions on which calculators may be used during examinations. Proctors were left to their own devices on how to monitor a seemingly infinite number of calculators in the exam room. Those of us who administer examinations wonder how that proposal could have failed.

NCEES did the next best thing to an approved list. Based on research and Exam Policy 15, Materials Permitted in Examination Room, the Board of Directors identified several models of calculators that will be prohibited in the exam room effective with the April 2004 exams. These calculators provide either communicating or text-editing capability or both. The Delaware Association of Professional Engineers looked at this information as a clarification of its existing policy that prohibits communicating devices of any kind in the exam room. Therefore, the Delaware Board notified all its examinees for the October 2003 administration of this clarification to our original policy.

Result? We received dozens of phone calls inquiring whether a specific model of calculator was acceptable, even asking for confirmation of

those calculators on the prohibited list. On exam day, we had to confiscate 10 to 12 calculators, which gave us the opportunity to get acquainted with these models.

*Publish a list of acceptable calculators and permit only those on the list in the exam room.... With an accepted calculator list, the proctors' load will be lightened significantly.*

Calculators are powerful tools, and the banned models clearly demonstrate the need to restrict the calculators permitted in the exam room. The question remains, however, where does a list of banned calculators stop? Who is going to keep up with all the new calculators that need to be added? The solution seems clear. Publish a list of acceptable calculators and permit only those in the exam room. The cost of a basic scientific calculator is minimal compared to the \$100+ examinees now spend on high-memory devices. With an accepted calculator list, the proctors' load will be lightened significantly. In addition, examinees will actually be calculating, instead of relying on the results produced by their calculating device. And our examination problems will remain in the data banks where they belong!

Approved Calculator + Examinee = Secure Exam. Sounds like a win-win concept to me!

*Peggy Absbagen  
Executive Director*

*Delaware Association of Professional Engineers*

### 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*

# Cheating results in jail time

## CA Board says exam subversion really is a crime

*An FE candidate was observed using a suspicious-looking calculator in an odd manner. Observers believed that he had altered his calculator for use as a scanner and was scanning questions to remove them from the exam site.*

Is exam subversion really that big a deal? What's the harm? That's the attitude a lot of people have when they hear about the California Board for Professional Engineers and Land Surveyors' strict rules and policies on exam security and subversion. Well, it is a big deal—and not just in terms of money. Yes, it does cost the board and NCEES a lot of money to develop and administer the exams, with very little of that cost being passed along to the candidates. But the bigger deal has to do with the board's main purpose—ensuring the public is protected from people who are not minimally competent to practice professional engineering or land surveying. If individuals pass the exam by cheating on it, are they really competent to practice? If they cheat on a licensing exam, what does that say about their professionalism and how they will deal with their clients and other professionals? In addition, exam subversion is a violation of the law—a violation that can lead to denial of an application for licensure, to disciplinary action against a licensee, and even to a criminal conviction and a jail sentence.

Cheating, or exam subversion, can take many forms. The most obvious ones that everyone agrees are wrong are copying answers from someone else or having the answers to the questions before the exam. But there are many others. The most common one that occurs during the exams is writing or erasing after time is called. All candidates are given the same amount of time to complete the exams; if candidates continue writing or erasing after time is called, they are getting an advantage that might help them pass the exam that none of the other candidates got.

One of the most serious forms of exam subversion is removing the secured exam questions from the exam site. Writing on nondesignated materials, using an electronic device that can scan or photograph the exam problems, even remembering the problems and telling someone else about them after the exam, including posting them on a review course provider's Web site—all of these are forms of exam subversion. The removal of secure exam problems from the exam site often leads to another form of exam subversion—the distribution of secure exam problems at exam prep/review courses. It is a violation of the law for someone to obtain secure exam problems by any means and then copy and distribute them in an exam review

course. The California Board has even taken disciplinary action against licensees who have published review books and used secure exam problems in teaching review courses. These people have had to reimburse the board for its costs in replacing the compromised exam problems. So, if someone asks you to tell about the questions that were on an exam, just remember that not only would you be violating the law by describing the questions, he or she would be violating the law by obtaining them from you. If you become aware that someone is attempting to obtain actual exam problems or is using actual exam problems in an exam review course, you should notify the California Board's Enforcement Unit as soon as possible.

Oh, and that mention of jail time at the beginning? Here's the story of a recent exam subversion incident that led to a jail sentence. During the April 2002 examination administration, an Engineer-In-Training (EIT) candidate was observed using a suspicious-looking calculator in an odd manner. The California Board representatives who observed him during the examination believed that he had altered his calculator for use as a scanner and was scanning the examination problems in order to remove them from the examination site. When confronted, he refused to let the board representative and an on-site police officer look at his calculator. Since the evidence indicated that he was attempting to subvert the examination, he was removed from the examination site and, of course, his examination was not scored.

Because we had reason to believe that the candidate might have removed secured examination questions from the examination site, the board turned this matter over to the Department of Consumer Affairs' Division of Investigation (DOI) to conduct a formal investigation. Through a search warrant, DOI seized one of the candidate's computers from his home, and the High-Tech Crimes Task Force was able to find items on the hard drive of the computer that were identified as actual problems from previous EIT exams.

Based on this evidence, the Sacramento County District Attorney's Office filed criminal charges against the candidate. On September 17, 2003, in Sacramento County Superior Court, he pled guilty to the criminal misdemeanor charge of examination

*(continued on page 16)*

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## No time to speak on licensure? Here's a solution

During my 30 and more years as a civil engineering professor, I have worked to promote licensure to students. I have often struggled to present the benefits of licensure in a convincing way. About 10 years ago, I became a member of the New Mexico Board of Licensure for Professional Engineers and Surveyors, and my opportunities to promote licensure greatly increased. However, I still struggled with making persuasive presentations. My efforts were generally limited to discussing the path to licensure, legal requirements, and a few career opportunities gathered from limited resources, mostly in civil backgrounds. This did not do much to convince electrical and chemical engineering students, since they often think licensure is just for civil engineers.

The NCEES Speaker's Kit is much more effective than the techniques I have used in the past. It consists of a PowerPoint presentation with excellent graphics—more effective than my “homemade stuff”—and an accompanying script. Also included are a licensure video and full-color materials that students may take home with them. The pamphlets reinforce the presentation message and point students to the NCEES licensure promotion Web site: [www.engineeringlicense.com](http://www.engineeringlicense.com).

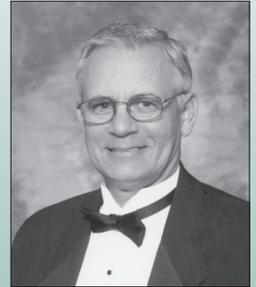
The Speaker's Kit does your homework for you. It makes it much easier to prepare for a presentation and provides documented statistics and information regarding engineering licensure, including the effects of licensure on career advancement, salary, opportunities, and the like. The package includes excellent testimonies from a wide variety of practicing professionals. The engineers explain why they chose to become licensed and how it has benefited them. The material also provides an excellent description of the licensure path, emphasizing that it requires four “steps” with providing a breakdown of each: education, the Fundamentals of Engineering (FE) exam, experience, and the Principles and Practice of Engineering (PE) exam. It explains the role of the state licensing board, and briefly mentions applications, registration deadlines, and the importance of gaining acceptable experience. The kit uses pass-rate statistics to encourage students to take the FE while in school, regardless

of their expected career path. It makes the argument that licensure “opens the door” for career changes later in life, making consulting a viable option. In short, with the Speaker's Kit, a professional, eye-catching, well-researched presentation is within easy reach. The time required to review the materials is a fraction of what it would take to develop them from scratch. The preparation time is important though; I would not recommend giving the presentation cold.

The Council will continue to update and improve the materials as needed. I expect that in the future the kit will provide a little more breadth in testimony—currently, it is a little heavy in the construction area—and more diversity in the people making testimonies. I suggest that the Council publish the statistics on the effectiveness of the presentations, based on the questionnaires given out at the end of the presentation. It would also be good to have statistics on the most receptive audiences, audiences of greatest conversion (that is, the percentage convinced to consider the licensure track), and the like.

Finally, I urge other members of the Council to use the Speaker's Kit. If you are experienced in making licensure presentations, you will be in for a pleasant surprise at how complete and well-planned it is. If you have never made a licensure presentation, citing lack of time to plan for one or lack of information, the Speaker's Kit will put all such excuses to rest. Any engineer who believes in licensure as protection for the public and a boon for the profession can make an effective presentation with the NCEES Speaker's Kit. As I have seen over and over again when speaking with students, and as NCEES has shown through focus groups, engineering students are often not aware that engineering licensure exists, much less how to achieve it, or the benefits of doing so. I encourage you to promote licensure to the engineering students in your local area. The Speaker's Kit makes it easy and effective.

*Ken R. White, Ph.D., P.E.  
Western Zone Vice President*



Ken R. White, Ph.D., P.E.  
Western Zone Vice President

*The Speaker's Kit does your homework for you. It makes it much easier to prepare for a presentation and provides documented statistics and information regarding engineering licensure.*

Member Board  
**NEWS**

**ALABAMA**

- ◆ Thomas F. Talbot is the new board chair.

**ARKANSAS**

- ◆ David R. Knowles is an appointee to the board. Bob Walters and Charles Tenney have been reappointed to the board. The term of Willard Reese has expired. H. James “Jim” Engstrom is the new board chair.

**CALIFORNIA**

- ◆ Robert L. Jones, Cindy Tuttle, and William Schock are new appointees to the board. The term of Andrew Hopwood has expired. Gregg Brandow is the board chair.

**COLORADO**

- ◆ Bryan M. Clark and Thomas P. Hawkinson are new appointees to the board. The terms of Wayne Clark and Donald Johnson have expired. The board is involved in the periodic sunset review process and will be subject to legislative hearings, review, and statutory changes in the coming months.

**DELAWARE LS**

- ◆ Victor Kennedy is a new appointee to the board.

**DELAWARE PE**

- ◆ John F. Mayan, Guy F. Marcozzi, and Paul E. Crawford are new appointees to the board. The terms of Gregory V. Moore, Robert A. Chagnon, Anne G. Reigle, and Larry J. Tarabicos have expired.

**FLORIDA LS**

- ◆ Louis Lebron and Sidney Greer are new appointees to the board. The term of John O’Neill has expired.

**HAWAII**

- ◆ Shaun Ushijima and Peter Dyer are new appointees to the board. The terms of Carol Sakata and Jay Ishibashi have expired.

**IDAHO**

- ◆ The term of Scott McClure has been extended. The term of James H. Milligan has expired. Clyde Porter is the board chair.

**KANSAS**

- ◆ Philip J. Meyer is a new member of the board. The term of William “Chip” P. Winslow has expired. The new board chair is Lawrence D. Hole.

**KENTUCKY**

- ◆ Mickey R. Wilhelm is a new appointee to the board. The term of Thomas R. Hanley has expired.

**MICHIGAN**

- ◆ Ronald Hausmann is a new appointee to the board. The term of Abe Munfakh has expired. The board chair is Ralph Hodek.

**MONTANA**

- ◆ Nic Cundy, David Gates, and James Hahn are new appointees to the board. The terms of Ronald Allen, Warren P. Scarrah, and Haley Beaudry have expired.

**NORTH DAKOTA**

- ◆ Rolly Ackerman is the board chair. The term of Monte Phillips has expired.

**NORTHERN  
MARIANA ISLANDS**

- ◆ Mitchell K. Aaron is a new appointee to the board.

**PENNSYLVANIA**

- ◆ Tara A. Egan is a new appointee to the board. The terms of Edward Becker, John M. Brinjac, Robert C. Grubic, David H. Widmer, and Richard J. Hudic Jr. have expired.

**TENNESSEE PE**

- ◆ The board has a new Web site: <http://www.state.tn.us/commerce/boards/ae/index.html>.

**TEXAS LS**

- ◆ The board now has nine members. The term of Raul Wong has expired. Douglas Turner is the board chair.

**VIRGINIA**

- ◆ J. Everette Fauber III, Vaughn B. Rinner, William H. Spell, and W.R. Stephenson Jr. are new appointees to the board. The terms of Robert A. Boynton, William A. Davenport, and John M. Elkin Jr. have expired. Ralph B. Higgins has resigned from the board. Richard N. Davenport is the board chair.

# Eliminate state-specific engineering exams

Licensure mobility. We are moving forward. Every couple of years or so, NCEES asks Member Board Administrators to complete a survey of their board's licensure laws, procedures, qualifications, and the like. The 2003 survey contains clear examples of the progress the Council has made toward facilitating interstate mobility. However, we must not become relaxed, thinking we have done all we can. The Council must continue to recognize impediments to mobility and work to eliminate them.

A total of 48 engineering boards responded to the 2000 Member Board Survey. Of those, seven indicated that they had a process to expedite licensure by comity. The most lengthy expedited procedure was 30–60 days, the second longest was one month, and the third longest was 21 days. Only three boards had expedited comity processes that took two weeks or less. Forty-nine engineering boards responded to the 2003 survey. Of those, 28 indicated that they had expedited comity processes. Three weeks was the longest processing time indicated. The great majority of boards had expedited processes measured in days. Eight boards had procedures that allowed them to process comity applications in three days or less. What an improvement!

The key to the above expedited comity is the designation Model Law Engineer (MLE). All engineering applications submitted to the NCEES Records Program are evaluated to determine if the Record candidates meet qualifications for MLE status. For 28 Member Boards, Record holders designated MLE are eligible for expedited comity. As of October 2003, the Records Program began reviewing all current land surveying Record holders to determine which are qualified for the Model Law Surveyor (MLS) designation. This review will be complete in December. At the 2003 Annual Meeting, the Council's delegate body passed a motion incorporating the definition of Model Law Engineer–Structural (MLE-S) into the *Model Rules*. With the help of Member Boards, the MLS and MLE-S designations have the potential to expedite the paperwork involved in the comity process.

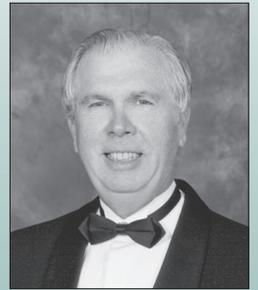
In spite of the progress we have made, there are impediments to widespread mobility. One of the most significant is the difference in education

qualifications required by Member Boards. The *Model Rules* requires individuals to have an accredited-engineering degree or the equivalent to be eligible for engineering licensure, but there are still a few states that, under certain circumstances, do not require a degree or accredited degree for licensure. Changing state law is not easy, but it is a worthwhile fight when the end result will facilitate licensure mobility.

State-specific exams are another impediment to comity. Because of the disparity in surveying laws and requirements, state-specific exams for surveying licensure will remain the status quo. For the surveying profession, such exams play an important role in protecting the public. However, there is a much higher degree of commonality in state laws regulating engineering licensure and practice. Instead of creating state-specific engineering exams that impede licensure mobility, Member Boards should work together to eliminate such exams already in existence. For example, many boards require engineering licensure applicants to pass a state law exam. Granted it is important for engineers to know and understand the law in the state where they are practicing, but is requiring a state-specific exam—delaying licensure by comity—the only way to ensure this? Some boards bypass a state-specific law exam by requiring that licensure applicants certify in writing that they have read the law and understand its meaning. Another example is a state-specific exam for structural engineering. The Council developed the Structural I and II exams to facilitate licensure by comity for structural engineers. Likewise, if state boards recognize the need for an exam above Structural II, we should work to develop a third national structural exam rather than impede mobility with individual state-specific exams.

The Council has made great strides in facilitating licensure by comity, but there is still much progress to be made. When all states adopt the same academic requirements for licensure and eliminate state-specific engineering exams, we will be much closer to the ideal of widespread mobility. Let the NCEES Board of Directors know what you think on these issues. With communication and cooperation, the Council will achieve more and more expedited licensure by comity.

*W. Gene Corley, Ph.D., P.E., S.E.  
Northeast Zone Vice President*



*W. Gene Corley, Ph.D., P.E., S.E.  
Northeast Zone Vice President*

*Instead of creating state-specific engineering exams that impede licensure mobility, Member Boards should work together to eliminate such exams already in existence.*

# No hitch in Mobile administration

## Chief proctor says preparation is the key

*Examinees are waiting to be admitted. There is no time to read the manual, to figure out what to do. To eliminate mistakes, all must be ready ahead of time.*

“Sorry, I’m not joking—it was yesterday,” says the admittance proctor in a calm, level tone. The young exam candidate stares in disbelief and then lets his head fall back, eyes closed in recognition of his mistake. He had arrived at 7:13 a.m., 32 minutes before the Fundamentals of Engineering (FE) exam was to begin. He never noticed that he was the only exam candidate wearing slacks, a collared shirt, carrying a suitcase full of reference materials. He had made an honest mistake, but one for which he would pay dearly. It would mean an additional registration fee and six months before he could take the next Principles and Practice of Engineering (PE) exam.

NCEES exams are administered twice a year in April and October. The PE and Principles and Practice of Land Surveying (PLS) exams are given on Friday, and the FE and Fundamentals of Land Surveying (FLS) exams are administered on Saturday. In some jurisdictions, there is a central exam site where all exams are given, and in some states, there are multiple sites. At the Mobile, Alabama, exam site, only engineering exams are administered. David Webber, P.E., chief proctor, stresses preparation as the key to a smooth exam administration—an administration with few or no honest mistakes. “It’s important to spend as much time preparing before the exam as the time you spend giving the exam,” he says. His preparation pays off on both Friday and Saturday in well-organized supplies, confident proctors, and examinees who are free to concentrate on the questions before them.

On October 24 and 25, examinees begin gathering outside the secure exam area as early as 6:40 a.m. By 7:00 a.m. on the 24th, the PE candidates stand outside in small clumps, talking quietly, their reference materials stacked beside them. All are serious, and few smile. By 7:00 a.m. on the 25th, the FE candidates are a loud, milling group. Because many attend this institution—the University of South Alabama—they are comfortable with one another. They crowd the admittance door, cracking jokes, holding clear plastic bags of snacks and slim black calculators. Managing even these two small groups of examinees—nearly 100 in total—requires forethought and planning.

Inside the exam room, Webber’s proctors know what to do. The FE handbooks are at every desk along with the distinctive NCEES mechanical

pencils. Seat cards are taped in the upper-left corner of the small tables, showing ascending seat numbers that snake along the rows, allowing proctors to move easily from table to table. Such setup is perhaps the “easy” part and was completed early that morning. The night before, Webber ensured that the tables were set up correctly and that there would be sufficient room between examinees. “I made sure every desk was stable, tightening legs if needed, and checked the lights and temperature,” comments Webber. The proctors review the piles of exam books that Webber and his assistant chief proctor Kendall Kilpatrick, P.E., have ready for them. Floor proctors must account for their group of exam books at all times. When the chief proctor has signed a stack of exam books—arranged by serial number—over to a floor proctor, the floor proctor signs a receipt for the books. Floor proctors then count the books and ensure that the correct number was assigned to them and that they have enough for their assigned examinees. (The desired ratio is 24 examinees per proctor.) After counting the books, proctors write an exam-book serial number next to each examinee’s name on their rosters. The names on the proctors’ rosters are in the same order as the examinees’ seat cards. When it is time to distribute the exams, the proctors will give each examinee his or her exam book, in accordance with the serial number written beside each examinee’s name. The proctor will place a check mark on the roster as each examinee receives his or her book. When collecting exams, the proctors will check off each name as the books are returned. When an examinee takes a restroom break, the floor proctor must collect the exam book and answer sheet from the examinee. Not brain surgery. Not engineering. And yet this observer has seen exam-morning confusions complicated enough to make the most cast-iron stomachs roll. Examinees are waiting to be admitted. There is no time to read the manual, to figure out what to do. To eliminate mistakes, all must be ready ahead of time.

“I think explaining the procedure to the proctors before exam day helps a lot,” says Webber. “Memos with specific duties, when to show up, what the routine will be—those make a difference. Preparation is essential.” Webber began proctoring NCEES exams three years ago. “A professor

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

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

at [University of South Alabama] called me about proctoring. NCEES had made it a policy that those conducting review courses couldn't administer exams, so they needed new proctors." Why give up your time for so little compensation? "It's a commitment to the profession," Webber says. "We all," he comments gesturing to the other proctors, "thought we were doing it for free. I was surprised to get the check in the mail the first year," he says with a grin. Webber is an Alabama Society of Professional Engineers—Mobile past president and is currently serving as president of the Mobile chapter of the American Society of Civil Engineers. "Promoting the profession is important. Engineers have a bad reputation nationally," he says. "The public hears about us only when a tragedy happens or something goes wrong. They think we don't care. The reality is that we do what we do to serve the public. Roads, bridges, water treatment, electricity—it's all for the public, so it makes

sense for us to be involved in the community." Webber digresses for a moment. "You know how to tell an extroverted engineer, right?" he says grinning. This observer did not. "He looks at your shoes when he talks to you." Webber chuckles at my surprised laughter. "You've never heard that? It's personality. Engineers tend to be quiet and concerned about calculations. The public doesn't know about us, what we do, or worse—they think we aren't concerned!"

On the weekend of October 24–25, 2003, Webber, Kilpatrick, and five other engineering professionals—two on Friday and three on Saturday—give back to their profession and community by ensuring a positive exam experience for nearly 100 examinees: 100 individuals with the potential to improve their part of the world through quality engineering. The exams rock along smoothly, without a hitch both Friday and Saturday, all because of preparation.

*NCEES staff*

## Society chapter provides lunch for stressed examinees

On exam day, lunch is rarely relaxing. NCEES recommends an hour, but sometimes that ideal is impossible. Examinees must find food, wolf it down, and regroup for another long four hours of calculations—usually an uncomfortably hurried affair. Lunch time at the Mobile exam site was very different. Examinees accepted free boxed lunches provided by the Mobile chapter of the Alabama Society of Professional Engineers. Examinees had no need to leave the site to eat, and with the amount of food provided, no one went hungry.

As members of ASPE-Mobile, Jody Poirier, P.E., and Dennis Frey, P.E., took two hours out of their work day to set up the meal on Friday. They began attending Mobile-ASPE meetings as students and joined after gaining their P.E. licenses. Why join and be active in a professional organization? "Engineering needs to

become more visible in society," says Poirier. "It's important for engineers to have a stake in the political process and the law." When asked if the lunches provide good advertising for Mobile-ASPE, they nod, but say that the real aim of the lunches is to provide a service to the examinees. "When I took the [Control Systems] exam," says Frey, "I was worried about going to McDonald's. This makes it easier and more relaxing for [the examinees]."

*Do you know of any board or society that does something extra on exam day to help make the exam experience a little less stressful for examinees? Write to the Licensure Exchange editor at NCEES, P.O. Box 1686, Clemson, SC 29633 or [lwiliam@ncees.org](mailto:lwiliam@ncees.org).*

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## Cheating results in jail time...*(continued from page 10)*

subversion. He has been sentenced to informal probation for three years with conditions. Under the conditions, he is required to submit himself and his property and possessions to search and seizure by any law enforcement or probation officer without his consent or a warrant and to forfeit the computer DOI had seized. He must also serve 360 hours of community service/work furlough after he has served 90 days in the county jail.

The moral of this story is that exam subversion is a big deal, and the California Board takes it very seriously. All exam candidates are required to sign a statement that they have read the laws relating to exam subversion, as well as the rest of the board's

exam administration and security policies and instructions, before they take the exams. These laws and instructions are posted on the California Board's Web site and are mailed to all candidates before the exam. We also strongly recommend that anyone planning to teach an exam review course carefully review Business and Professions Code 123 and 496 and Board Rule 442 before preparing the course materials.

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