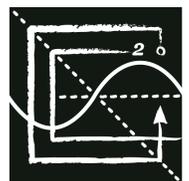


# MINUTES OF THE PARTICIPATING ORGANIZATIONS LIAISON COUNCIL

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March 2018



**NCEES**



**Participating Organizations Liaison Council**  
*Patrick Tami, P.L.S., Chair*

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The annual meeting of the Participating Organizations Liaison Council (POLC) was held Saturday, March 10, 2018, at the Atlanta Airport Marriott Gateway. NCEES President Patrick Tami, P.L.S., presided.

The following were present:

- Patrick Tami, P.L.S., NCEES President
- James Purcell, P.E., NCEES President-Elect
- Jerry Carter, NCEES Chief Executive Officer
- Davy McDowell, P.E., Chief Operations Officer
- Sherrie Saunders, CAP-OM, CEO Executive Assistant
- Joseph Cramer, Ph.D., P.E., AIChE—American Institute of Chemical Engineers
- Stanley Levinson, Ph.D., P.E., ANS—American Nuclear Society
- Curtis Weller, Ph.D., P.E., ASABE—American Society of Agricultural and Biological Engineers
- Monte Phillips, Ph.D., P.E., ASCE—American Society of Civil Engineers
- Robert Luna, Ph.D., P.E., ASME—American Society of Mechanical Engineers
- David Soukup, P.E., ASME—American Society of Mechanical Engineers
- Frank Taylor, P.S., ASPRS—American Society for Photogrammetry and Remote Sensing
- E. Ross Curtis, P.E., CESB—Council of Engineering and Scientific Specialty Boards
- John Cronin Jr., P.E., CESB—Council of Engineering and Scientific Specialty Boards
- H. Bland O'Connor, CAP, CESB—Council of Engineering and Scientific Specialty Boards
- William Anderson, P.E., CESB—Council of Engineering and Scientific Specialty Boards
- Michael Behnke, P.E., IEEE-USA—Institute of Electrical and Electronics Engineers - USA
- Gerald Wilbanks, P.E., ISA—International Society of Automation
- Martin Gordon, P.E., NAFE—National Academy of Forensic Engineers
- Arthur Schwartz, J.D., NAFE—National Academy of Forensic Engineers
- Alan Kirkpatrick, P.E., NCSEA—National Council of Structural Engineers Associations
- Mark Golden, NSPE—National Society of Professional Engineers
- Tom Roberts, P.E., NSPE—National Society of Professional Engineers
- William Coleman, P.L.S., NSPS—National Society of Professional Surveyors
- Victoria Valentine, P.E., SFPE—Society of Fire Protection Engineers
- Randall (Randy) Bernhardt, P.E., S.E., SEI—Structural Engineering Institute of ASCE

The following 11 societies could not attend:

- AAEEES—American Academy of Environmental Engineers and Scientists
- ACEC—American Council of Engineering Companies
- AEI—Architectural Engineering Institute of ASCE
- ASEE—American Society for Engineering Education
- ASHRAE—American Society of Heating, Refrigerating, and Air-Conditioning Engineers
- CLSA—California Land Surveyors Association
- IISE—Institute of Industrial and Systems Engineers
- MSPS—Michigan Society of Professional Surveyors
- SME—Society for Mining, Metallurgy, and Exploration
- SNAME—Society of Naval Architects and Marine Engineers
- TMS—The Minerals, Metals, and Materials Society

President Patrick Tami, P.L.S., called the meeting to order and welcomed all attendees.

POLC member organizations submitted the following reports:

#### **American Institute of Chemical Engineers**

The NCEES Principles and Practice of Engineering (PE) Chemical Exam Committee continues to write, review, edit, and approve new questions for inclusion on future exams. The PE Chemical Exam Committee is the first Group I committee to transition to computer-based testing (CBT). The exam began to be administered in CBT format on January 2, 2018. The final pencil-and-paper examination was given in April 2017. The test results with CBT based on psychometric measures and results from experience with the CBT presentation of the Fundamentals of Engineering (FE) exam are expected to be commensurate with the hard-copy format. A task force of the exam committee prepared the supplied reference handbook for use on the CBT exams. The final PDF version was uploaded on the NCEES website in July 2017. Presently, the exam committee is conducting a Professional Activities and Knowledge Study (PAKS). AIChE has supported NCEES in this effort by requesting input from licensed chemical engineers to participate in the knowledge and skills survey, the results of which will provide the basis for future exam content. The survey, which takes only about 30 minutes to complete, was open until February 28, 2018.

During 2017, the FE Chemical exam team continued preparing questions for the FE exam. In addition to preparing the traditional four-option multiple-choice questions for the test bank, the team also submitted a number of alternative item types. An alternative item type is any test item that is not a four-option multiple-choice question and includes drag and drop, multiple correct option, and various select-the-correct-area type and fill-in-the-blank questions. The full team meets twice a year, usually in January and August, for a two-day meeting. NCEES continues to support a skeleton crew, including the chair and two other members, to attend off-cycle meetings, usually held in April and May. This system has been effective in keeping everyone on the committee informed on changes and has been sufficient in creating new material while keeping overhead low. The trend for the number of FE chemical examinees continues to increase from the low numbers encountered during the initial implementation of the CBT exam and is now almost back to pre-CBT numbers. The team strongly encourages the continued implementation of programs encouraging chemical engineers to obtain engineering licensure and AIChE continues to promote this to its student members. The FE exam blueprint/specification office is now working on the creation of an FE survey. A meeting to initiate this effort was held in early February at the NCEES offices. The survey should open by late April.

Service on both the FE and PE Chemical committees is considered to be service to AIChE. In addition, AIChE follows closely the work of the NCEES Committee on Examinations for Professional Engineers (EPE) and sends at least one AIChE representative to each EPE meeting. It also has a representative attend the NCEES annual meeting.

AIChE continues to oppose any implementation of a requirement for a master's-or-equivalent (MOE) to be a prerequisite for initial professional engineer (P.E.) licensure. AIChE and 10 other professional societies remain active in a group named Licensing that Works. The group believes that the master's-or-equivalent requirement is unnecessary to protect the public's health, safety, and welfare and is actively opposing the implementation of this requirement by any licensing jurisdiction. Recent efforts to adopt an MOE position or some form of the NCEES current position statement stating that additional education should be required to take the PE exam were unsuccessful in Vermont and New Jersey. AIChE and the Licensing that Works group still strongly believe that individuals currently meeting licensing requirements possess the technical breadth, flexibility, and intellectual skills to adequately protect the public and be in responsible charge of engineering. This is in agreement with the general consensus of the working group that prepared AIChE's Body of Knowledge (BOK) to the effect that graduating Bachelor of Science (B.S.)-degreed chemical engineers were well qualified technically for initial assignments but that various forms of continuing education throughout a career were a necessity and dependent upon specific career paths. The Licensing that Works consortium continues to closely monitor developments related to the requirements to take the PE exam.

AIChE's Licensing and Professional Development Committee, created in 2014, is still working to find effective ways to inform college seniors about licensure and encourage them to take the FE exam while in school or shortly after graduation. This is part of a larger long-term AIChE effort to expand services for its member P.E. s. AIChE continues to offer programming on the FE exam at the AIChE annual student meeting attended by about 1,500 undergraduate chemical engineering students. Similar presentations are also presented from time to time

at student regional conferences. AIChE has enhanced and will continue to maintain its licensure webpage to promote licensure and serve licensed members.

AIChE is actively continuing to implement projects designed to serve the interests of its more than 38,000 professional and young professional members and over 60,000 total members worldwide and also plans to continue to publish articles of special interest to P.E.s or prospective P.E.s in its membership magazine, Chemical Engineering Progress. The AIChE Academy also has plans to develop a PE preparation refresher course.

AIChE continues to expand the number of technical conferences and virtual offerings (webinars, online proceedings, online blogs, etc.) that it offers. AIChE offers them both alone and in partnership with other professional societies and government entities such as AAPS, SPE, Air and Waste Management Association (A&WMA), DECHEMA, the Food and Drug Administration, and AES. It is also increasingly reaching out to the international chemical engineering community and expanding the global reach of AIChE by extending offerings throughout the world. The creation of new international local sections and significant increases in the number of international student chapters are part of this continuing global growth. With members now in over 105 countries, AIChE anticipates that international outreach will continue to accelerate in the future. Just one year ago, the U.S. Department of Energy announced the formation of Rapid Advancement in Process Intensification Deployment (RAPID) Manufacturing Institute of AIChE as the tenth member of the nation's network of Manufacturing USA institutes.

Since then, AIChE established RAPID's infrastructure and governance, developed roadmaps for technical focus areas and workforce development, and selected 25 projects for funding, all with significant contributions of time and talent from AIChE membership. To date, RAPID has 57 members and the number continues to grow!

The AIChE Institute for Sustainability is launching a program that offers engineers and other qualified professionals a specialized credential in sustainability. The institute is well-positioned to establish a baseline definition of what sustainability entails, and will prepare a BOK in the field of sustainability. Additionally, in 2016, the AIChE Center for Process Safety began to offer a professional credential-certifying competency in chemical process safety. Through AIChE's Doing a World of Good campaign and in conjunction with the Center for Chemical Process Safety, industry and academia have come together to launch a major global initiative to improve and accelerate process safety education at the university level. As a part of this, AIChE has updated and redesigned the Safety and Chemical Engineering Education Certificate Program with new interactive learning modules and a dynamic curriculum that makes incorporating process safety education easy, engaging, and free for student members.

### **American Nuclear Society**

The ANS Professional Engineering Examination Committee (PEEC) has been responsible for encouraging professional licensure of nuclear engineers and maintaining consistent and reasonable standards for the content of the PE Nuclear exam since 1973. To ensure adequate turn-over and effective leadership, the chair of the PEEC is designed as a three-year commitment. John Bennion, Ph.D., P.E., is the current chair; the vice-chair is Joshua Vajda, P.E., who will assume the chair in June 2019.

### **Encouraging professional licensure**

The ANS actively encourages professional licensure of nuclear engineers through a number of avenues. In the past, the primary method of communicating with its members on a regular basis was *ANS News*; however, in recent years, new e-services such as broadcast e-mail, online collaboration tools, and the ANS Café blog have offered new approaches for the PEEC to promote licensure. The PEEC maintains a dedicated webpage ([www.ans.org/pe](http://www.ans.org/pe)) on the ANS website that identifies the advantages of P.E. licensure and provides the pathway to P.E. licensure. Links to recent articles about the PE Nuclear exam are also provided.

The Board of Directors of the ANS maintains a supporting position on professional licensure. ANS provides financial support for one PEEC member to travel to the ANS student conference each year. This person typically hosts a lunch-and-learn session on licensure, participates in the career fair, and often acts as a judge for student research presentations. This year, the PEEC will again sponsor a session at the ANS Student Conference, which will be held at the University of Florida in Gainesville on April 5–7, 2018. Additionally, the ANS provides financial support for a PEEC member to attend the annual POLC meeting.

ANS invested in changes to both the membership and conference registration process to allow the collection of data on P.E.'s within the ANS. ANS sponsored a PEEC effort to acknowledge accomplishment and promote visibility of licensure within ANS by adding a Professional Engineer ribbon to licensed conference attendees' name badges. The pilot program was well-received and continues to be a great way to illustrate to students and young professionals the number of licensed professionals within ANS.

An ANS staff liaison has been appointed to provide communication between the working elements at the ANS offices and the PEEC. The ANS staff liaison has assisted the PEEC in the development of a dedicated webpage ([www.ans.org/pe](http://www.ans.org/pe)) specifically for the promotion of nuclear licensure. Additionally, ANS has helped design and distribute new PE-related marketing materials during the semi-annual ANS meetings, during the annual ANS Student Conference, and through participation of PEEC members in the North American Young Generation in Nuclear (NA-YGN) conference. The ANS staff liaison is also assisting with the publication of the NUC Handbook for the PE Nuclear exam and in transitioning its face-to-face PE examination preparation workshop into an online review course. An exam preparation workshop was held at the annual ANS meeting on June 11, 2017, in San Francisco. (The online exam preparation modules are expected to be available in 2019.) The next workshop is planned for June 16, 2018, in Philadelphia at the 2018 ANS Annual Meeting.

### **Computer-based testing**

The PE Nuclear exam will be the first Group II exam to transition to CBT. The committee is on track to offer the first CBT exam on Friday, October 19, 2018 (Registration opened on Thursday, February 1, 2018). A dedicated sub-group of PEEC members have worked diligently to develop the single-reference NUC Handbook, which has been completed and has been turned over to NCEES for the necessary preparation to be ready for the October 2018 CBT exam, and for public distribution in the March 2018 timeframe. A draft version of the NUC Handbook was available as an optional reference for the 1710 PE Nuclear exam. The examinee feedback was used in the final edits to the handbook; comments were received from nine examinees.

### **Examination development**

PEEC members attended two meetings at NCEES headquarters in Clemson, South Carolina, on April 20–22 and August 24–26, 2017, to complete the review of the NUC Handbook and compare the NUC Handbook against the existing exam bank. At that time, several items were found to be trivial using the NUC Handbook; these items have been removed from the exam bank. On February 22–24, 2018, PEEC members attended a meeting at NCEES headquarters that focused on writing new items (especially alternative item types, or AITs, and items to fill critical needs), reviewing bad pair analysis, and reviewing the linear fixed form (LFF) CBT exam. Beginning in fiscal year (FY) 2018, NCEES assumed all exam development responsibilities for the PE Nuclear exam.

### **PAKS planning**

The PEEC is now planning for a PAKS to take place during the last quarter of 2018. NCEES has budgeted funding for this endeavor for fiscal year 2018–19. The first planning meeting is scheduled for June 2018.

### **Thanks**

ANS thanks NCEES for its support and interest, especially in the matter of ensuring examination quality. It appreciates the NCEES-sponsored opportunities over the last several years for Group II exam committee meetings at NCEES. These meetings have offered invaluable access to the bank to correct apparent documentation deficiencies and allowed us to make significant progress in the transition to CBT.

## **American Society of Agricultural and Biological Engineers**

### **ASABE membership profile**

ASABE currently has 7,239 members, including 2,160 undergraduate and graduate students. Approximately 33 percent of nonstudent members hold P.E. registration in one or more states.

### **Conferences that are venues for licensure discussions**

- ASABE Education, Outreach, and Professional Development (EOPD)—414 Winter Item Writing Workshop, February 5–6, 2018, Clemson, South Carolina
- ASABE Annual International Meeting, July 29–August 1, 2018, Detroit

### **Global initiative**

ASABE continues to make strides in its Global Initiative launched in 2014 with the aim of providing a platform for leadership and engagement in the food-energy-water nexus. A white paper was published in 2017 capturing the primary ideas and recommendations that emerged from the first Global Initiative conference held outside

the United States, Engineering and Technology Innovation for Global Food Security, in Stellenbosch, South Africa. A second conference focusing on global water security will take place in Hyderabad, India, on October 3–6, 2018 (asabewater.org).

### **Standards and codes**

As of June 22, 2017, all new agricultural machinery sold in the United States is expected to be compliant with 49 *CFR Part 562, Lighting and Marking on Agricultural Equipment*. This requirement, as written by the U.S. Department of Transportation, directly points to the specifications and content of two ASABE standards: *ASAE S279.14, Lighting and Marking of Agricultural Equipment on Highways* and *ASAE S390.4, Definitions and Classifications of Agricultural Field Equipment*.

In addition, ASABE is providing leadership to the feed-machinery industry as administrator of the U.S. technical advisory group for ISO/TC 293. The U.S. Department of Commerce has committed funding to help subsidize costs associated with ASABE's engagement in this industry sector, an area that previously has not been actively involved in standardization. Over the next five years, the department's Market Development Cooperator funds, along with strong support from the American Feed Industry Association, will give a huge boost to U.S. engagement in this work.

The Standards program of ASABE continues to thrive, thanks to the efforts of dedicated committee members and with the longstanding support of industry partners. The 2017 ASABE Standards CD included 264 standards, 52 of which are adoptions of International Organization for Standardization (ISO) standards. Just 15 years ago, the 2002 Standards CD contained 218 standards, only 3 of which were ISO adoptions. In that same time span, ASABE increased its role in ISO standards adoption to now coordinate the U.S. input in 14 distinct formal ISO committees; in 2002 ASABE coordinated the activities of just two.

ASABE continues to strengthen its ties with industry groups and peer organizations. Alignment with Canadian organizations remains a priority, along with improved procedures and communication tools. It is quite common for the initiation of a new standards project, or even a new technical committee, to be prompted by one of ASABE's partners. While there has been interaction with the Canadian Standards Association and the Agricultural Manufacturers of Canada for many years, there is now interest in developing binational standards on agricultural field machinery and sustainability.

### **Publications**

In ASABE's role as a leading source of research publishing for the profession of agricultural and biological engineering, it is striving to balance the needs of the society, its authors, and the publishing community in making federally funded research accessible. Certain recent journal articles are now marked for public access, some for a limited time, in the ASABE Technical Information Library. These articles may be downloaded without a site license, but may not be posted to other websites, except as allowed by ASABE's copyright policy. Optional open access rights may be purchased per article.

### **EngineeringCAS**

In an effort to better serve its academic community, ASABE is collaborating with Liaison International and ASME in the creation of EngineeringCAS, a centralized service that streamlines marketing and application processing for graduate-level programs across multiple disciplines. Applicants will benefit from the service's user-friendly, streamlined application process and a single portal to discover all available graduate programs in their field. Admissions officers will find value in an expanded global applicant pool and administrative task support that creates more time for holistic application review. EngineeringCAS was launched in August 2017.

### **Continuing education**

ASABE trained more than 2,000 participants in conferences and webinars in 2017. ASABE training complies with International Association for Continuing Education and Training (IACET) standards. Through IACET, ASABE can offer continuing education units (CEUs) that qualify under American National Standards Institute and IACET standards. ASABE continues to offer a number of free services for PE exam takers and continues to provide economic incentives to both first-time and repeat test takers.

### **Examinations**

The majority of students and graduates from Accreditation Board for Engineering and Technology-accredited agricultural and biological engineering programs sit for the FE Other Disciplines exam. Two society members participate on the FE Other Disciplines Exam Development Committee. FE Other Disciplines exams had an

80 percent pass rate for the January/February/March and April/May/June 2017 administrations and an 81 percent pass rate for the July/August/September and October/November/December 2017 administrations. Historically, the FE Other Disciplines exam has had pass rates ranging from 77 percent to 85 percent for first-time takers. There were 36 and 28 individuals self-reporting to be from an agricultural engineering program, respectively, for the time periods shown above. Pass rates for first-time takers were 69 percent and 82 percent, respectively. The number of individuals self-reporting to be from a biological (non-biomedical) engineering program was less than 25 for each of the time periods.

ASABE EOPD-414, the committee that develops the PE Agricultural and Biological Engineering exam, has built the last three pencil-and-paper exams. It is actively capturing relevant material from references on its suggested reference list as it assembles a draft supplied reference handbook and continuing to build up the bank of active exam items. The first computer-based offering of the PE Agricultural and Biological Engineering exam is slated for fall 2021.

### **Committee assignments**

The chair of the ASABE Professional Engineering Institute is Anissa Purswell, P.E., while Naomi Bernstein, P.E., chairs the ASABE EOPD-414 Professional Licensure Committee and Van Kelley chairs the ASABE EOPD-204 ABET Accreditation Committee. ASABE past-president Mary Leigh Wolfe, head of the Department of Biological Systems Engineering at Virginia Tech, is the ABET president-elect.

### **K–12 Science, Technology, Engineering, and Mathematics (STEM) programs**

ASABE reaches out to students and educators throughout the year through staff- and member-led activities. The society produces a variety of printed and digital career-related materials that includes flyers, brochures, and special issues of *Resource* magazine that focus on career options in agricultural and biological engineering and technology. ASABE members are encouraged to use these materials in local engineers weeks and other STEM-related events.

In addition, ASABE supports DiscoverE and the National Future Farmers of America (FFA) Organization. Through DiscoverE, ASABE participates in Discover Engineering Family Day and the Future City Competition and supports other programs, including National Engineers Week, Introduce a Girl to Engineering Day, and the Global Marathon. At the annual FFA Expo, ASABE recruits judges for engineering-related competitions. The society also hosts an impressive exhibit that engages ASABE student and professional members with FFA members and their educators and advisors. The exhibit always includes displays, materials, and hands-on activities that illustrate the varied and impactful work carried out by agricultural and biological engineers throughout the world.

### **American Society of Civil Engineers**

Supporting professional licensure is integral to ASCE's mission to advance civil engineering and protect the public health, safety, and welfare. Some of ASCE's programs to further that mission are described below.

#### **Promoting P.E. licensure**

ASCE strongly supports professional licensure and actively encourages all civil engineers to become licensed. ASCE has numerous programs to support licensure to provide for the public's health, safety, and welfare. Some of these include the following:

- Educational webinar—ASCE's webinar to educate students and engineers early in their careers on the importance of licensure and the steps to achieve licensure continues to be available on demand to members through ASCE's website.
- Policy statements—ASCE has many policy statements that address various aspects of licensure and help it to promote licensure. All of ASCE's policy statements can be viewed on our website at [www.asce.org/public\\_policy\\_statements/](http://www.asce.org/public_policy_statements/).
- ASCE's Committee on Licensure—This committee promotes the licensure of civil engineers; collaborates with others involved in professional licensure; and monitors, supports, and encourages licensure activities.
- Published resources—Copies of publications may be requested from [professional@asce.org](mailto:professional@asce.org). They include the following:
  - "Guidance on Licensing and Ethical Responsibilities for Civil Engineers" provides guidance on the licensing process, the importance of licensure, and technical and ethical responsibilities of licensed civil engineers.

- Guidelines to pre-licensure experience are intended to be a resource for both engineer interns and their employers and mentors. The guidelines note that, while not required by licensing boards, the capabilities described are important for career development.
- Accreditation—Through its membership in ABET, ASCE supports accreditation of engineering degrees, a vital component of licensure requirements in many jurisdictions. ASCE is the lead society for all civil engineering, architectural engineering, construction engineering, civil engineering technology, architectural engineering technology, and construction engineering technology programs accredited through ABET. This means that ASCE develops and proposes program criteria for programs in those areas, as well as recruits and coordinates volunteer program evaluators to visit and evaluate each program on a regular schedule.
- Recognition—ASCE’s Walter LeFevre Award is given annually to a program at an academic institution that offers an ABET-accredited civil or related undergraduate engineering program. Recipients are recognized for their actions in promoting licensure, ethics, and professionalism, and ASCE membership is not a consideration for this award. In addition, many of ASCE’s awards require the individuals who are recipients to be licensed.
- Dream Big Content—The film *Dream Big: Engineering Our World* that opened in 2017 continues to be shown at theaters around the country. It includes specific reference to professional engineers, and a companion web video and lesson plan describe the role of professional licensure in protecting the public health, safety, and welfare. The educators’ guide also includes information about licensure as part of the section on becoming an engineer. See more at [www.dreambigfilm.com/education/](http://www.dreambigfilm.com/education/).

### **Vision for the future of the civil engineering profession**

*The Vision for Civil Engineering in 2025:* In June 2006, a diverse group of civil engineering and other leaders, including international participants, gathered to articulate a global vision for the future of civil engineering. An aspirational global vision was developed that sees future civil engineers as being entrusted by society to create a sustainable world and to enhance the global quality of life.

The full vision report was published in early 2007 and can be found at [www.asce.org/vision2025/](http://www.asce.org/vision2025/). It is intended that this report will guide policies, plans, processes, and progress within the civil engineering community and beyond, including around the globe. A report addressing implementation of this bold vision, *Achieving the Vision for Civil Engineering in 2025: A Roadmap for the Profession*, was published in August 2009 and is also available at the same link.

### **Civil Engineering Body of Knowledge for the 21st Century**

The second edition of ASCE’s *Civil Engineering Body of Knowledge for the 21st Century* (BOK2) defines the knowledge, skills, and attitudes necessary for entry into the professional practice of civil engineering. It is comprised of outcomes accomplished through both formal education and experience. The outcomes expected to be achieved through formal education include knowledge beyond that included in the typical bachelor’s degree in civil engineering. The BOK2 establishes standards for education and experience that address the educational reform discussed in *The Vision for Civil Engineering in 2025* and *Achieving the Vision for Civil Engineering in 2025: A Roadmap for the Profession*. It also reinforces the need for enhanced educational requirements for the professional practice of civil engineering, as advocated in ASCE’s Raise the Bar initiative.

A free electronic copy of the BOK2 is available at [www.asce.org/CE-Body-of-Knowledge/](http://www.asce.org/CE-Body-of-Knowledge/). The BOK2 has been discussed at many of the major gatherings of ASCE members since its publication and has served as a useful reference to others developing their own bodies of knowledge, such as NSPE. Many civil engineering university programs within the United States use elements of the BOK2 to design and implement their undergraduate curricula.

ASCE convened a task committee in October 2016 to review the BOK2 to determine if changes are warranted, and, if so, to propose changes. The committee is expected to complete its charge by October 2018. Updates on the committee’s progress can be found at [www.asce.org/civil\\_engineering\\_body\\_of\\_knowledge/](http://www.asce.org/civil_engineering_body_of_knowledge/).

### **Raise the Bar**

A primary ASCE strategy to achieve ASCE’s vision for the future of the civil engineering profession is the pursuit of enhanced educational requirements for the professional practice of civil engineering so all civil engineers can fulfill ASCE’s Civil Engineering Body of Knowledge for the 21st Century. This strategy, better known as the Raise the Bar initiative, targets the implementation of ASCE Policy Statement 465 through the adoption of the *Civil*

*Engineering Body of Knowledge for the 21st Century* as the professional standard for civil engineering education and training.

The full Policy Statement 465 is posted at [www.asce.org/issues-and-advocacy/public-policy/policy-statement-465---academic-prerequisites-for-licensure-and-professional-practice/](http://www.asce.org/issues-and-advocacy/public-policy/policy-statement-465---academic-prerequisites-for-licensure-and-professional-practice/). The society continues to refine this policy and any further changes will be posted to this website.

### **Civil Engineering Technologist Body of Knowledge**

ASCE recognizes the civil engineering professional, the civil engineering technologist, and the civil engineering technician as important members of the civil engineering project team, and defines each of those in its Policy Statement 535, available at [www.asce.org/issues-and-advocacy/public-policy/policy-statement-535---defining-the-civil-engineering-team/](http://www.asce.org/issues-and-advocacy/public-policy/policy-statement-535---defining-the-civil-engineering-team/).

While there is a well-developed civil engineering body of knowledge that defines the knowledge, skills, and attitudes needed for professional civil engineering practice, there is no equivalent description of the body of knowledge that a civil engineering technologist should have to be considered competent in that role. ASCE is currently developing the Civil Engineering Technologist Body of Knowledge, and its initial report is expected to be completed in late 2018.

### **Specialty certification for civil engineers**

Civil Engineering Certification, Inc. (CEC), a separately incorporated and wholly owned subsidiary of ASCE, was established in August 2004 to support professional certification academies for civil engineering specialties. The American Academy of Water Resources Engineers, the Academy of Geo-Professionals, and the Academy of Coastal, Ocean, Port, and Navigation Engineers were created and are led by CEC.

Diplomate credentials are awarded by these academies to professional engineers who demonstrate fulfillment of the specialized bodies of knowledge in their respective areas of civil engineering. Requirements include licensure as a professional engineer, a post-undergraduate degree, eight years' experience beyond the first P.E. license, and a commitment to professional development and ethics.

Information on the specialty certifications and their requirement can be found at [www.asce.org/professional\\_certifications/](http://www.asce.org/professional_certifications/).

The new Sustainable Infrastructure Certificate Program offered by ASCE provides knowledge, tools, and techniques needed to design, build, and manage sustainable projects and to take a leadership role in making our infrastructure sustainable.

All courses in the certificate program are offered online and can be accessed 24 hours a day, seven days a week, providing flexibility to take the courses at times that are most convenient. Completion of four core courses and at least one elective course is required to earn the Sustainable Infrastructure Certificate. Information on the program is at [www.asce.org/sustainable-infrastructure-certificate-program/](http://www.asce.org/sustainable-infrastructure-certificate-program/).

The new Construction Engineering Certificate Program provides knowledge, skills, and techniques needed to take a leadership role in construction project management.

The program includes asynchronous online video lectures as well as synchronous online interactive sessions with an instructor. Completion of four core courses and two elective courses is required to earn six CEUs and the construction engineering certificate. Information on the program is included at [www.asce.org/continuing-education/construction-engineering-certificate-program/](http://www.asce.org/continuing-education/construction-engineering-certificate-program/).

### **Other ASCE initiatives**

ASCE state government relations staff monitors legislative and regulatory trends in the states. In particular, they watch for new developments in recent efforts to erode all occupational and professional licensure. ASCE headquarters staff work with local ASCE groups and members to oppose new state legislative proposals that could weaken the contribution of P.E. licensing to the health, safety, and welfare of the public.

ASCE maintains its commitment to ensuring a sustainable future and continues to develop and provide sustainability resources, support and promote the Institute for Sustainable Infrastructure's Envision program, and bring together world thought leaders through its international conferences focused on sustainability.

A book containing the body of knowledge for sustainable civil engineering practice, *Engineering for Sustainable Communities*, is now available in ASCE's online bookstore at [www.asce.org/booksandjournals/](http://www.asce.org/booksandjournals/).

### **ASCE's Grand Challenge to civil engineers and the industry**

ASCE has taken on the challenge to find ways to significantly enhance the performance and value of infrastructure projects over their life cycles by 2025 and to foster the optimization of infrastructure investments for society in its Grand Challenge initiative.

ASCE's Industry Leaders Council continues to lead the effort to advance this strategic initiative to help influence major policy changes and infrastructure funding levels, as well as encourage civil engineers to focus on innovation, rethink life cycle costs, build in resilience, adopt performance-based standards, and drive transformational change. Details are at [www.ascegrandchallenge.com](http://www.ascegrandchallenge.com).

March 1, 2018, is the deadline to submit entries for ASCE's third Innovation Contest. Developed as part of the ASCE Grand Challenge, it is an avenue to bring together the best ideas, projects, and theories and has already developed a track record of reaching a worldwide audience and attracting industry attention.

### **ASCE annual convention**

ASCE's 2018 convention will be held in Denver on October 12–15, 2018.

### **American Society for Engineering Education**

#### **Leadership letter**

The 2017 fiscal year, our 124th, was another successful one for the organization. We finished the year on solid financial ground; brought to completion a Strategic Doing process where we gathered useful feedback from members; and remained a trusted partner of major Washington-based funders such as the National Science Foundation (NSF), the Department of Defense, and the Office of Naval Research, among others. In addition, our core group of dedicated premier corporate sponsors continue to find value in working with ASEE to create durable relationships in our community.

The 2017 ASEE Annual Conference and Exposition, our showcase event, was held in Columbus, Ohio, a great college town within driving distance for many ASEE members. In addition to the “fun stuff” like appearances from some of the Columbus Zoo's animal stars, the Taste of Columbus food truck event, and a session on adapting toys for special needs children, the conference presented an exciting and well-received talk from NSF Director France Córdova, hundreds of technical sessions, and the always-popular Distinguished Lecture series. Our event even rated a visit from the popular local morning show, *Good Day Columbus*, which broadcast live from our exhibit hall.

The ASEE leadership team made a concerted effort to get in front of more members this year, with board members and senior staff attending constituent meetings and events. We made it to section and zone meetings, giving updates on headquarters activities and, most importantly, listening to what our members want and need from ASEE. In addition, we attended events and meetings in the Azores, Chile, Cuba, Japan, Korea, and Norway.

Among items you'll read about in this annual report are our continued efforts to diversify the engineering education community; ASEE's increased activity in representing our members on important public policy matters; and our stewardship of reports, events, and fellowships, among other things. Our dedicated and passionate collection of members, along with our talented and hard-working headquarters staff, allows ASEE to continue to thrive.

While the fundamentals of engineering may only change slowly, we must continue to push the frontiers of engineering discovery, instruction, and application through our own work and through the work of our students and stakeholders. ASEE remains the intellectual laboratory, if you will, where we all develop, test, and share new ideas. We are inspired and driven by the knowledge that our collective efforts contribute to improving the human condition. ASEE is honored to be entrusted by our members with providing them the structure and support needed to be successful.

ASEE recognizes that our members operate in an increasingly interconnected world, with relationships and information-sharing across borders more important with each passing year. In the United States, the students we teach and the colleagues with whom we work often come from a variety of countries. Many of our institutions

have campuses on multiple continents, and our students frequently study abroad. In 2016–2017, ASEE continued to help our members build these bridges.

Our international forum at the ASEE annual conference and exposition had sessions on corporate-academic partnerships for deploying game-based learning around the world and forging a collaborative relationship between U.S. and Cuban engineering institutions, among many others.

ASEE once again held a Global Colloquium (last held in 2010 in Singapore) in the Azores, co-located with the European Society for Engineering Education annual meeting.

We sent representatives to engineering education meetings in Japan, Korea, and Norway.

ASEE will be an engaged participant this year in developing the program for the November 2018 World Engineering Education Forum in Albuquerque, New Mexico, the first time this event has been held in the United States.

Lastly, speaking of Cuba, several of our deans took a three-day trip to the island nation following the Engineering Deans Institute, where they met with university faculty members and took part in a number of cultural events. Several of our members are scheduled to take a trip to Cuba in early 2018 (more about that in next year's annual report).

### **Policy leadership**

ASEE was vocal in FY2017 on public policy issues, educating policy makers and advocating for the interests of our individual and institutional members. As the only professional society concerned with engineering education at all levels and across all disciplines, our members' needs and desires are diverse, so ASEE targeted its focus here in areas related to

- Funding for engineering and engineering technology education
- Furthering recognition and opportunities for engineering technology students
- Supporting institutions in their efforts to educate students from around the world

In late 2016, ASEE joined eight organizations in sending a letter to the transition team for President-Elect Trump to highlight the importance of investment in STEM education. ASEE's Norman Fortenberry said in the statement, "A quality STEM education is important for the continued prosperity and safety of the United States. With this letter, ASEE and our peer organizations strongly encourage the Trump administration—and Congress—to continue the momentum that STEM education has gained in the last several years, from funding sources to initiatives and legislation."

ASEE's Public Policy Colloquium in February welcomed speakers from both sides of the political aisle, with Congressman Bruce Westerman (R-AR) and Senator Maggie Hassan (D-NH) addressing attendees. As part of this event, deans from dozens of institutions visited their congressional representatives to advocate for their colleges and engineering education broadly.

ASEE continues to be engaged with the Alliance for Science and Technology Research in America, the Committee for National Science Funding, the STEM Education Coalition, STEM on the Hill, and other bodies that allow us to expand our reach and find effective ways to represent our members through relationships with similarly focused organizations.

### **Mission, vision, goals, and member communications**

In 2016–17, we saw the culmination of a multiyear Strategic Doing process, where our members thought through how ASEE can continue evolving as an organization, better serving members now and for the next several decades. Feedback gathered in these forums is leading to more active and ongoing communication from ASEE leadership, with an emphasis on transparency and openness.

From this process came the creation of our new mission, vision, values, and goals:

- Our mission—ASEE advances innovation, excellence, and access at all levels of education for the engineering profession.
- Our vision—ASEE is the preeminent authority on the education of engineering professionals.
- Our values—Excellence, engagement, innovation, integrity, diversity, and inclusion

- Our goals—ASEE recognizes the term “engineering education” to encompass the full academic spectrum of instruction, research, scholarship, practice, and service. ASEE also has an enduring commitment to continuous improvement.

In the context of the above two statements, ASEE pursues the following goals:

- Innovation—ASEE will advance the development of innovative approaches and solutions to engineering education.
- Excellence—ASEE will advance excellence in all aspects of engineering education while continuously improving the member experience.
- Access—ASEE will advocate for equal access to engineering educational opportunities for all.
- Advocacy and public policy—ASEE will be the leading advocate for advancing the broad interests of engineering education.
- Communities—ASEE will cultivate an inclusive community that engages all members and values the contributions of all stakeholders.
- Communication—ASEE will implement a robust and transparent communication strategy effectively linking all stakeholders.
- Diversity and inclusion—ASEE will promote diversity, broadly defined, by modeling equity and inclusion through its policies and practices.
- Internal organization—ASEE will be a strategic and dynamic organization, with a knowledgeable and responsive staff, that enhances stakeholder engagement.

### **Impact**

ASEE has been the intellectual home for advances in academic education for over a century, with the seminal Wickenden (1923), Hammond (1940), and Ginter (1955) reports. The 21st century has seen ASEE continue this contribution to the community with *Creating a Culture for Scholarly and Systematic Innovation in Engineering Education* (2009) and *Innovation with Impact* (2012).

ASEE is currently engaged in an ambitious project entitled *Transforming Undergraduate Education in Engineering*, a four-phase report that will identify critical components of undergraduate curricula, pedagogy, and educational culture necessary to support the education of engineers over the next decades of the 21st century. The project, supported by the National Science Foundation, will catalyze change by building broad consensus within the community on a shared vision of the future of undergraduate engineering education, enumerating critical steps for the vision to be achieved.

Norman Fortenberry co-chaired a workshop in late 2016 called *Enhancing Teachers’ Voices in Policy Making Related to K-12 Engineering Education*. The activity is a project of the National Academies of Science, Engineering, and Medicine’s Teacher Advisory Council and the National Academy of Engineering. He co-led a committee that planned a two-day national event that explored how to empower classroom teachers as leaders in policy decisions, identifying and strengthening pathways for teachers to be involved in policy without removing them from the classroom.

For decades, ASEE has managed a number of fellowship and research opportunities for federal agencies. These range from programs providing summer internships for high school students to research programs for faculty members. ASEE provides support tasks that include outreach and promotion activities, application processing support, application review activities, and administration of stipend and tuition payments for program participants. Our successful oversight of these programs helps strengthen the future domestic engineering workforce.

**Impact on diversity** ASEE’s Engineering Deans Council members launched the Deans Diversity Initiative website in 2017, a follow-up to a 2015 White House letter, now signed by over 200 deans, making a pledge to diversify their faculties and student bodies. The website showcases examples of how deans are following through on their pledge.

In the summer of 2017, ASEE won an award from NSF, led by 2017–2018 ASEE President-Elect Stephanie Farrell, to look at Virtual Communities of Practice for members and allies of the LGBTQ community. The project uses research to generate new knowledge about developing a community of practice to promote LGBTQ inclusion in engineering, how the members of the community develop into change agents, and what strategies

are effective in reshaping norms and increasing LGBTQ inclusion in engineering departments. The funded project will last for two years, but the hope is that the activity will persist for much longer.

### **Prism magazine**

*Prism* magazine is ASEE's flagship publication and the way our members best stay in touch with the engineering education community and headquarters activities. The magazine's marriage of sleek design and solid, in-depth reporting on important topics makes it one of the best publications of its kind among peer organizations.

Accordingly, it receives numerous awards each year. Some of these include:

- APEX 2017 Award of Excellence, Education and Training category: February 2016 Teaching Toolbox, "Made to Measure"
- APEX 2017 Award of Excellence, Design and Layout category

From the Communicator Awards:

- An Award of Excellence for feature article writing
- Five Awards of Distinction honors for overall design of a feature story
- An Award of Distinction for cover design
- Three Awards of Distinction honors for writing of a feature article

"This magazine for engineering professionals features an elegant, contemporary form, with crisp, clean spreads and appealing visuals and typography—all of which set the stage for some very well written, thought-provoking feature articles and shorts. The package is much more than the sum of its parts. A first-class effort." APEX 2017 Grand Award for Publication Excellence

ASEE launched the *Prism* podcast this year, further exploring stories in *Prism* across a new media platform, reaching new and different audiences.

### **News-making ASEE members**

Each year numerous ASEE members receive significant recognition for their contributions to the profession through career advancement and honorifics. Below are the ASEE members who became university provosts or presidents:

- Persis Drell, former dean of engineering at Stanford University, was named Stanford's provost. Debra Larson, former dean of engineering at California Polytechnic State University, San Luis Obispo, was named provost at California State University, Chico.
- Nagi Naganathan, former dean of engineering at the University of Toledo, was named president of the Oregon Institute of Technology.
- Ian Waitz, former dean of engineering at the Massachusetts Institute of Technology (MIT), was named MIT's vice chancellor.
- Gary May, former dean of engineering at Georgia Institute of Technology, was named chancellor at the University of California, Davis.

Below are those ASEE members elected to the National Academy of Engineering:

- David Allen, Ph.D., University of Texas, Austin
- Daniel Hastings, Massachusetts Institute of Technology
- Paul Turinsky, North Carolina State University

ASEE member Rebecca Richards-Kortum of Rice University was among the recent MacArthur Fellows.

Below are those ASEE members who received Presidential Early Career Awards for Scientists and Engineers:

- Shawn Jordan of Arizona State University and Randy Ewoldt of the University of Illinois, Urbana-Champaign, received this award from President Obama, the highest honor bestowed by the U.S. government on science and engineering professionals in the early stages of their careers.

And, of course, the class of incoming ASEE members elected to the grade of fellow in 2017:

- Kristen P. Constant
- Ted Eschenbach, Ph.D., P.E.

- Craig J. Gunn
- Michael T. Harris
- Beth M Holloway
- Nelson A. Macken
- Lance Perez, Ph.D.
- Stephen J. Ressler
- James R. Rowland
- Cheryl B. Schrader, Ph.D.
- Susan E. Walden

### **Data analysis**

ASEE is the go-to source for extensive data on our member institutions, most notably presented annually in our Profiles of Engineering and Engineering Technology Colleges, produced by our department of Assessment, Evaluation, and Institutional Research (AEIR). Data in Profiles of Engineering and Engineering Technology Colleges is widely quoted in the media, used by U.S. News and World Report, and accessed and used frequently by government agencies.

ASEE has expanded its data publishing in recent years. “*Smaller*” *Engineering Schools by the Numbers* is of relevance to colleges of engineering with fewer than 10,000 students. AEIR is an evaluator for the University of the District of Columbia Community College Transportation Academy program. Lastly, we are currently working toward publishing a report on experiences of the maker community.

### **Advances in Engineering Education**

Documenting and disseminating true advances informed by research into engineering education practices and pedagogy is the purpose of the peer-reviewed *Advances in Engineering Education* (AEE). A unique attribute of AEE is that authors are encouraged to submit papers incorporating the creative use of media, including animation, audio, graphics, and video. This marked AEE’s seventh year; the journal has received over 800 submissions, with an acceptance rate of approximately 20 percent and an increasing number of submissions from overseas. Two issues of the journal were published this year with a total of 18 papers. Topics addressed included “Thermodynamics in High Rhythms and Rhymes: Creative Ways of Knowing in Engineering,” “Selling Technical Sales to Engineering Learners,” and “Large Lecture Transformation: Improving Student Engagement and Performance.” Upcoming issues will feature the entrepreneurial mindset, the midyears’ education experience, and engineering ethics. Summaries of AEE articles now appear as “Advances from AEE” columns in ASEE’s *Prism* magazine.

### **Journal of Engineering Education**

Sharing quality education research in a way that reflects the diversity of experiences and perspectives of the engineering community is at the core of ASEE’s *Journal of Engineering Education* (JEE)—widely recognized as the premier journal in its field. Published quarterly, the journal receives about 300 new submissions annually from authors from more than 40 countries. The journal, published by John Wiley and Sons, has an international editorial board that coordinates the peer review process. In the first half of 2017, under the editorship of Michael Loui, the College of Engineering at the University of Illinois, Urbana-Champaign, generously supported JEE. During the last half of the year, Lisa Benson took over as editor, and the College of Engineering, Computing, and Applied Sciences and the Department of Engineering and Science Education at Clemson University picked up the support of JEE. Last year the journal published articles on the need for faculty to receive comprehensive training in gender equity to advance engagement and learning among all students, not just those who traditionally succeed; on how undergraduate engineering experiences relate to engineering students’ leadership skills; on factors affecting graduate teaching assistants’ motivation to teach; and on the challenges faced by engineering professionals who return for advanced study after significant time in the workforce. Summaries of these and other articles have appeared as “JEE Selects” columns in ASEE’s *Prism* magazine.

## **American Society of Mechanical Engineers**

### **ASME membership profile**

ASME currently has 130,000 members, including 32,000 student members. Approximately 29 percent of non-student members hold P.E. registration in one or more states.

### **Conferences that are venues for licensure discussions**

- International Mechanical Engineering Education Leadership Summit, March 14–17, 2018, San Diego
- ASME Annual Meeting, June 1–6, 2018, Vancouver, British Columbia, Canada
- International Mechanical Engineering Congress and Exposition, November 10–15, 2018, Pittsburgh
- ASME Student Conferences (EFests), March 23–25, 2018, Pomona, California, and April 13–15, 2018, in State College, Pennsylvania

### **Vision 2030 project survey**

From the ASME Vision 2030 project survey involving over 2,500 experienced mechanical engineers and engineering managers in practice in the United States:

- 51 percent of the respondents were licensed professional engineers
- 79 percent did not agree that increasing the educational requirements from a bachelor's degree to a master's or equivalent requirement for professional engineer registration was needed. (57 percent did not agree and another 22 percent were unsure.)
- The study brought out a perception gap relative to where entry-level mechanical engineers meet, exceed, and fall short of the needs of industry practice among surveyed industry managers, young engineers in industry, and university mechanical engineering department heads for Vision 2030.

The following four high-level recommendations have officially become part of the ASME Engineering Education advocacy strategy:

- Richer practice-based engineering experience for students
- Increase student exposure to practicing engineers and their experiences
- Increase student design/build project experiences in all four years of their degree program
- New balance of faculty research/practice skills within a program
  - Increase the employment of full-time professor of practice positions for professors with significant industry experience.
  - Increase legacy faculty expertise in professional practice
- Greater innovation and creativity
  - Increase active, discovery-based learning; teaming; open-ended problems; and problem formulation
  - Promote collaboration and innovation as fundamental tenets of an engineering education
- Increased curricular flexibility
  - Include more technical electives and areas of concentration within undergraduate master's programs
  - Include explicit bridging pathways to professional master's degree studies

### **Actions during the year to support the ASME Vision 2030 include:**

- National Institute of Standards and Technology grant award: Eight educational modules were completed in August 2017 for use throughout all four years of Master of Engineering (ME) and mechanical engineering technology (MET) degree programs and are applicable to multiple industries. All the modules have been successfully piloted at least once by the faculty developer's respective schools, and, in some cases, multiple times.
- Transforming Engineering Culture to Advance Inclusion and Diversity (TECAID) grant award: The NSF-funded TECAID grant is currently working on the logic model and learning modules to be disseminated to the mechanical engineering department head community. This is a more focused effort on institutionalizing the work within ASME engineering education. In May of 2017, the Women in Engineering ProActive Network, Inc. (WEPAN)-sponsored TECAID website went live. This website provides information about TECAID's background, people, and outcomes—and provides an online path to TECAID's dissemination products (re: research and practice).

The website link is [www.wepan.org/mpage/TECAID](http://www.wepan.org/mpage/TECAID).

In May 2017, TECAID created a three-minute video about the TECAID project for submission to the 2017 NSF STEM for All Video Showcase: Research and Design for Impact. The video can be viewed at: [stemforall2017.videohall.com/presentations/1038](http://stemforall2017.videohall.com/presentations/1038). TECAID received the event's Facilitators' Choice recognition award for this dissemination product.

### **Licensing That Works Coalition**

As reported at POLC meetings annually since 2008, ASME and a number of other professional societies remain unconvinced that an MOE as the minimum education requirement for a P.E. license is a remedy to any current or projected public safety concern or is in the best interests of either the public or the profession.

The ASME board of governors has issued a policy statement that describes the ASME position. That position has been formally endorsed by the following organizations:

- American Institute of Chemical Engineers (AIChE)
- American Society of Agricultural and Biological Engineers (ASABE)
- American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE)
- American Society of Plumbing Engineers (ASPE)
- Illuminating Engineering Society (IES)
- Institute of Industrial and Systems Engineers (IISE)
- International Society of Automation (ISA)
- Society for Mining, Metallurgy, and Exploration, Inc. (SME)
- Society of Naval Architects and Marine Engineers (SNAME)
- The Minerals, Metals, and Materials Society (TMS)

In addition to the membership societies listed above, the executive board of the ASEE Engineering Deans Council has endorsed the position statement. IEEE-USA and the American Council of Engineering Companies have also taken their own positions against MOE.

A coalition of these societies, called Licensing That Works, has been formed to support this position. The coalition is prepared to address the MOE issue jurisdiction-by-jurisdiction if it comes before individual legislatures and/or licensing boards, as was done in February 2015 in Vermont and in February 2008 in Nebraska. In both of these cases, the Licensing That Works team prevailed.

The coalition mobilized in New Jersey when it learned of efforts to require a master's degree for all disciplines as the education requirement for licensure. Additional information can be found at the Licensing That Works website ([LicensingThatWorks.org](http://LicensingThatWorks.org)).

It is unlikely that the New Jersey State Board of Professional Engineers and Land Surveyors will endorse this legislation. Its records state, "At the current time the Board was of the general opinion it does not support the need to increase the education requirement for licensure as a professional engineer. The Board has not observed a significant volume of complaints filed against licensees based upon a lack of competency in their academic training. Thus, it does not appear that the consumers in the State of New Jersey are being harmed or damaged as a result of its current education law set forth in N.J.S.A. 45:8-35."

In contrast to a depiction of B.S. credit hours linearly declining through 2025, an analysis of the change in credit hours between the 1950s and 2010s is on the site. It shows that the linear extrapolation of the decline in credit hours to the year 2025 shown in one organization's website is incorrect and that the decrease in the number of credit hours has leveled off. It also shows that that the technical content of the bachelor's degree now is about equal to or greater than the technical content of the bachelor's degree 60 years ago.

There has been and will continue to be an exploding body of engineering knowledge. This has been and will continue to be addressed through curriculum changes and modernization of pedagogical technology.

The outcomes-based assessment of the content of engineering programs used to accredit engineering programs has resulted in better, more focused coursework. Most of the decrease in credits is a result of the removal of physical education, Reserve Officer Training Corps, and basic math and science courses that are now taught in high schools.

After the *Model Law* raising the educational requirements for obtaining a land surveying license passed, the number of individuals taking the Fundamentals of Surveying (FS) and Principles and Practice of Surveying (PS) exams dropped significantly.

ASME opposes NCEES Position Statement 35, which outlines pathways for implementing MOE and, in particular, the 2017 change that adds an overly stringent and logically flawed alternative to formal education requirements for MOE. Instead, the LTW recommends that PS-35 be amended to read:

NCEES endorses lifelong learning and encourages engineers to pursue graduate degrees in engineering where needed to pursue professional growth in a specialty technical field. Engineers who wish to advance in their careers should continue their education either through formal study or through the various types of continuing education opportunities offered by technical societies, industries, and educational institutions.

A degree in engineering from an Engineering Accreditation Commission (EAC)/ABET-accredited bachelor's program will continue to be the standard for meeting the education requirements to attain licensure as a professional engineer, as noted in NCEES Position Statements 8, 13, and 19.

### **Codes and Standards**

In keeping with the results of the ASME Vision 2030 survey calling for richer practice-based engineering experience for students, eight teaching modules have been developed relating to the value and use of codes and standards.

All eight modules were completed during the 2017–2018 academic year. Faculty are being sought from up to 50 institutions to field test material that has been developed and to enhance and revise it, as needed. After field testing, the modules will be made available to reach and assess impact on as many faculty and students as practical worldwide and to determine the next set of standards and courses for development.

While all the modules have been successfully piloted by the respective faculty developers, the challenge is to provide sufficient material for a faculty member at another engineering school, who may have limited knowledge of industry standards development, to readily access and easily apply the module in his or her own course with minimal help. To address this situation, the ASME Standards Infusion Project Team agreed to have the following materials typically contained in each module:

- Instructor's guide with module learning objectives and outcomes, module format, suggested approach and preparation, class time required, student prerequisite material, and included materials
- ABET criteria for both ME and MET degree programs
- Lecture slides in Microsoft PowerPoint format with notes
- Homework or exam problems with solutions
- ASME standards excerpts within ASME policy of less than 25 pages or 10 percent of the standard
- Supplementary materials, including other documents, drawings, or videos, as applicable

Furthermore, plans are underway to reach out to engineering schools that have been visited by ASME Standards and Certification volunteers and staff over the last few years to obtain their interest in also field testing the module materials. Finally, two international organizations are interested in using the modules, including translation, as a result of recent briefings about the ASME Standards Infusion Project.

### **Continuing education**

The ASME Education Sector trained more than 10,000 participants in FY2017. ASME training complies with IACET standards. Through IACET, ASME can offer CEUs that qualify under ANSI/IACET standards.

### **Examinations**

The NCEES FE Mechanical Exam Development Committee has consistently prepared exams with high psychometric measures. FE Mechanical exams had an 80 percent pass rate for July–December 2017. Historically, the FE exam has had pass rates ranging from 77 percent to 85 percent for first-time takers. The 2,512 individuals who took the exam represent 30 percent of the total who took an FE exam, which represents an increase over the 26 percent of the total who took an FE exam in 2013–14.

For the PE Mechanical exam, the volume of examinees increased 12 percent in 2017 to 4,506. The pass rates for the three mechanical exams for first-time takers ranged from 67 percent to 77 percent and for repeat takers, 31 percent to 45 percent.

NCEES has directed that all PE exams be moved to computer-based delivery as soon as feasible. The PE Mechanical Exam Development Committee is working toward this by continuing to build up its bank of active exam questions and by developing the *PE Mechanical Supplied Reference Handbook*.

For the October 2017 PE Mechanical Machine Design and Materials exam, ASME set up a pilot virtual study group. There were two ASME volunteers who already had P.E. licenses who served as technical facilitators and Managing Director Dave Soukup served as the administrator. The hour-long sessions averaged five individuals for the five weeks it was offered. Three of the individuals let us know that they passed the exam. In addition to the web conferences, individuals could post problems they were having. If a problem could not be solved during the web conference, the solution could be posted later. There was at least one individual who was taking the Thermal and Fluid Systems exam who participated. Our next pilot will be for the April 2018 Thermal and Fluid Systems exam. We are also considering a pilot for the FE exam. The website for the study group is at: [community.asme.org/pe\\_exam\\_study\\_group/default.aspx](http://community.asme.org/pe_exam_study_group/default.aspx).

### **Committee assignments**

ASME Past President Amos Holt and Dave Soukup of the ASME staff are ASME's representatives to the American Association of Engineering Societies Professional Licensure Working Group.

### **K–12 STEM programs**

ASME INSPIRE instructional modules are now used in 897 schools across the United States reaching 45,000 middle and high school students. The existing Pre-College Community site is being leveraged to promote attributes of the INSPIRE program, its progress, and dialogues regarding implementation and avenues for volunteer engagement (a subdomain of [go.asme.org/precollege](http://go.asme.org/precollege) has been established for ease of access). A new scholarship is available to graduating high school students who have completed the INSPIRE modules.

ASME provides 10 \$5,000 scholarships to graduating high school students who were involved in the For the Inspiration and Recognition of Science and Technology (FIRST) Robotics Program for their freshman year in any mechanical engineering undergraduate program. Nominations must come from an ASME member or student member.

### **American Society for Photogrammetry and Remote Sensing**

#### **Photogrammetric licensure updates**

Texas—The proposed language is well written and includes licensure via comity and a grandfather period for experienced ASPRS-Certified Photogrammetrists. This is planned to be brought up in the 2018 legislative calendar.

Georgia—The draft language has been completed and is in the review process. The path to licensure follows the NCEES *Model Law* and is similar to the processes of South Carolina and Virginia. One of the primary reasons behind this legislation is to combat unauthorized/illegal drone operators.

The Professional Practice Division (PPD) maintains a licensure status map on the ASPRS website.

### **Certifications**

The ASPRS certification program is fully accredited by CESB.

The unmanned autonomous/aircraft systems (UAS) Certification is now available at both the certified mapping scientist level and the technologist level. At the Commercial Unmanned Aerial Vehicle (UAV) Expo, 16 candidates took the exam, 14 of whom passed. There has been very strong interest in this program.

Six of the current certifications are CESB accredited (professional and technologist level): certified photogrammetrist, certified mapping scientist—remote sensing, and certified mapping scientist—geographic information system/laboratory information system (GIS/LIS). ASPRS will be applying for this accreditation for

the certified mapping scientist—light detection and ranging (CMS-LiDAR) certification later this year and most likely for the UAS certification next year.

Interest in the certification program is growing: the society processed more applications last year.

### **General news**

**Conferences:** The annual conference was co-located this year with the International LiDAR Mapping Forum conference last month in Denver. The conference was a tremendous success. The combined conference had over 1400 attendees, 95 exhibitors, and over 200 presentations/posters, as well as 14 workshops. The 20th annual Pecora conference was held in November 2017 in Sioux Falls, South Dakota. Pecora was established by the United States Geological Survey and National Aeronautics and Space Administration in 1970 as a forum to foster the exchange of scientific information and results derived from applications of Earth observing data and to discuss ideas, policies, and strategies concerning land remote sensing.

ASPRS is an active participant of the Future of Surveying Forum through NCEES/NSPS.

**Executive director:** Jesse Winch is serving as the interim executive director. **New board of directors:** Anne Hillyer is the new president, Tommy Jordan is the president-elect, and Jeff Lovin is the newly elected vice president.

### **General notes**

ASPRS encourages licensure by promoting our certification program. Each state (North Carolina, South Carolina, Virginia, Florida, and Oregon) that has made it a requirement to be licensed as a photogrammetric surveyor required the applicant to be an ASPRS certified photogrammetrist with at least six years of experience in that role.

ASPRS maintains a database of certified professionals (active only) which is available on the website.

At the past conference, ASPRS offered two workshops directly related to certification, one specifically for the CMS-LIDAR and one for the General Knowledge portion of the test which covers all certifications. These have also been available as online workshops.

ASPRS offers webinars, or Geobytes, for professional development hours (PDHs) as well as accepts credits for industry webinars and conference attendance (ASPRS, State Surveying and Engineering Conference, GIS conferences). It also accepts credits for active roles in the society, such as division director.

The PPD of ASPRS deals specifically with licensure. Within the PPD there is the Photogrammetric Licensure Plan Committee comprised of several past directors and certification/evaluation committee members that advise, review, and monitor each process.

ASPRS actively promotes the NCEES *Model Law* as a basis for licensure.

### **Council of Engineering and Scientific Specialty Boards**

During the past 12 months, CESB operations expanded slightly. Following are key highlights:

#### **CESB status**

CESB membership includes 17 member boards and two associate member organizations. Some of these boards are expanding the certification programs they operate to respond to market needs. These boards operate a total of 52 accredited programs.

#### **Accreditation activities**

The primary mission of CESB is to accredit certification programs operated by organizations serving the engineering profession and allied specialties. Accreditation assures the public and employers that certification programs are administered consistent with recognized credentialing practices. Accreditation of certification programs by CESB is a separate action from membership and is available to only member boards.

CESB accredits certification programs in four categories: licensed engineers, graduate engineers, scientific specialties related to engineering, and engineering technicians. Accreditation is granted for periods of two to five years maximum. The 52 accredited certification programs, according to their categories, consist of:

Licensed engineers	9
Graduate engineers	1
Engineering-related specialties	21
Engineering technicians	21

Certification programs and the accreditation thereof are totally separate from the licensure of professional engineers. Certification of professional engineers under a program accredited by the CESB is attestation to specialty qualifications of the engineers in addition to professional licensure or registration. However, all CESB accredited certification programs for licensed engineers require professional licensure.

CESB remains the only organization offering certification program accreditation specifically tailored to the unique needs of engineering and engineering-related certification programs. Additionally, its operating philosophy—include and improve—continues to increase the quality of the certification programs of its member boards and certification in the profession.

The CESB has a policy requiring extensive annual reporting on all accredited programs. These reports are reviewed by the Accreditations Committee and help ensure that all programs remain in compliance with CESB's accreditation guidelines during the period that accreditation applies.

#### **Member services**

Operating certification programs is complicated. Each year CESB hosts symposiums and workshops to assist member boards. The next symposium on March 21, 2018, will focus on improve office operations to facilitate accreditation reviews, improve efficiency, and improve ease of operations by staff and accredited individuals.

CESB has a Certification Program Administrators Committee, organized and modeled on the NCEES Member Board Administrators Committee. It has proven to be very helpful to all certification program administrators. The committee meets the day before the annual meeting of the CESB board of directors.

#### **Future members**

Accreditation is voluntary. Therefore, not every organization is willing to subject its certification activities to independent evaluation. However, those that do find the process improves the quality of its operations and the value of its certification program(s). Once accreditation is achieved, it provides a valuable mark of distinction that separates accredited programs from their competitors in the marketplace.

#### **Institute of Electrical and Electronics Engineers—USA**

IEEE-USA, an organizational unit of the Institute of Electrical and Electronics Engineers, Inc., created in 1973, advances the public good and promotes the careers and public policy interests of the nearly 200,000 engineering, computing, and allied professionals who are U.S. members of the IEEE. IEEE-USA continued its strong support for NCEES in 2017 by providing item writers and subject matter experts for the FE and PE exam programs and volunteering leaders for related NCEES policy committees. Key events and developments of special interest to IEEE's U.S. members include the following:

#### **NCEES annual meeting**

IEEE-USA President Karen Pedersen, P.E., was unable to attend the 2017 NCEES annual meeting.

#### **POLC**

One member of the IEEE-USA Licensing and Registration Committee (LRC) continues to attend the annual POLC meetings. Michael Behnke, P.E., will represent IEEE-USA at the March 2018 POLC meeting.

#### **EPE Committee**

The October 2017 and January 2018 EPE meetings were each attended by IEEE-USA LRC members Steve Barrett, Ph.D., P.E., Electrical and Computer Engineering (ECE) Exam Committee chair; David Vickers, P.E., Software Engineering (SWE) Exam Committee chair; and Glenn Parker, Ph.D., P.E., representing IEEE-USA.

### **ECE PE exam**

The ECE Exam Committee met twice in 2017 to review and update the three PE Electrical and Computer Engineering exam modules: 1) Computer; 2) Electronics, Controls, and Communications; and 3) Power. The bank of test questions was also updated. There are currently five completed ECE exams, with two ready for administration and three under review. IEEE-USA LRC member Steve Barrett, Ph.D., P.E., serves as ECE Exam Committee chair.

In January 2017, new exam specifications for all three modules were approved by EPE, and the anchor exam under the new specs will be administered in April 2018. Cut-score workshops for all three modules have already been scheduled for May 18–19, 2018, in Clemson, South Carolina.

The PE Electrical and Computer Engineering exams are working towards migration to CBT. Projected launch dates are January 2021 for the Power module, which will be administered in linear on-the-fly (LOFT) format, and April 2021 for the Computer and Electronics/Controls/Communications modules, which will be LFF. The exam committee decided in 2017 to develop separate supplied reference manuals, one for each module, for use by CBT examinees. Reference material for the Power module has already been supplied to the NCEES publications department, and corresponding material for the other two modules will be submitted later this year, with anticipated publication in early 2019. Publishing of the supplied reference manuals in advance of CBT launch will allow the committee to begin receiving examinee feedback for at least the last two paper-and-pencil exam cycles before this document becomes the sole reference to which an examinee will have access under CBT.

### **SWE professional licensure exam**

The SWE Exam Committee met once in 2017 for cut score determination and exam review and will meet twice in Clemson, South Carolina, in 2018. There have now been five annual exam offerings, but the number of examinees remains lower than expected. There were 15 first-time takers in 2017. IEEE-USA LRC member David Vickers, P.E., is the current SWE Exam Committee chair.

The SWE exam is scheduled to convert to CBT in 2019, but this has been postponed pending an agreement between NCEES and IEEE-USA on whether to continue administering the exam considering recent examinee volume. IEEE-USA and its original funding co-sponsors (NSPE, the IEEE Computer Society, and the Texas Board of Professional Engineers) were unable to provide funding for a 2018 cut score panel, so the April 2018 passing point will be determined through other means that satisfy NCEES psychometric criteria.

### **Position on educational requirements for licensure**

IEEE-USA continues to oppose NCEES Position Statement 35, which promotes a future requirement that engineers complete additional engineering coursework beyond that of an accredited bachelor's degree educational program to become eligible for licensure. Our position is that EAC/ABET, with significant input from IEEE-USA, will continue to adapt its educational program accreditation criteria to meet the evolving needs for an electrical and computer engineering career path.

### **Education and outreach initiatives**

The IEEE-USA Licensing and Registration Committee continues to write and publish articles informing IEEE members and other interested professionals on current issues concerning licensure on an approximately bimonthly basis in the online publication IEEE-USA InSight. As examples, recent articles have addressed topics including use of the title engineer with respect to *Järnlström v. Oregon Board of Examiners for Engineering and Land Surveying*, licensure across state and national borders, and use of the FE exam as an outcomes assessment tool for university engineering programs.

### **Institute of Industrial and Systems Engineers**

The Institute of Industrial and Systems Engineers is the world's largest professional society dedicated solely to the support of the industrial and systems engineering profession and individuals involved with improving quality and productivity. Founded in 1948, IISE is an international nonprofit association that provides leadership for the application, education, training, research, and development of industrial engineering. Industrial and Systems Engineers (ISEs) figure out a better way to do things and work in a wide array of professional areas, including management, manufacturing, logistics, health systems, retail, service, and ergonomics. They influence policy and implementation issues regarding topics such as sustainability, innovation, and Six Sigma. And like the profession, ISEs are rooted in the sciences of engineering, the analysis of systems, and the management of people.

The institute has over 13,000 members, comprising of students, practicing professionals, and academics, as well as retired members. Institute members come from over 32 countries throughout the world.

The PE Exam Development Committee is chaired by Mike Graul, Ph.D., P.E., with co-chair Joe Michels, Ph.D., P.E., C.P.L.

The PE Exam Development Committee met three times in 2017: in March at NCEES offices in Clemson, South Carolina; in May at the IISE annual conference, held in Pittsburgh; and in October in Clemson, South Carolina. Meeting dates for 2018 include February, June, and October at NCEES offices in Clemson, South Carolina.

The committee has worked diligently on the development of a computer-based professional engineers reference manual for the PE Industrial and Systems exam. The committee's goal was to use the designed and developed reference manual for pretesting of the ISE/PE 1704 and 1804 exams to be reviewed in February 2017 at NCEES headquarters in Clemson, South Carolina. Necessary adjustments and additional material required to successfully complete the examination were added during committee meetings in 2017. The goal is to have a complete ISE/PE reference manual available for use during the administration of the 2019 examination. The committee will use the computer-based reference manual in February 2018 to provide both validation and verification of the manual for use on the PE Industrial and Systems exam.

The PE Industrial and Systems exam is currently slated for computer-based administration in the 2020 timeframe. We continue to work hard and diligently toward insuring precision and accuracy of the reference manual.

The Industrial and Systems Exam Development Committee conducted a 45-minute panel discussion at the IISE annual conference, held in Pittsburgh in May 2017. Approximately 45 individuals attended, including practicing engineers, students, and newly assigned faculty members. Many of the panel attendees did not know, recognize, or understand anything about professional engineering licensure. Some of the attendees had successfully completed the FE exam but were unaware of rule changes in some jurisdictions that provide for testing for both the FE and PE exams without attaining the requisite four years of experience before the P.E. license is awarded. We felt that this panel discussion was worthwhile.

A four-day intensive IISE/PE review course for the PE examination was conducted by professional staff at IISE headquarters in February 2017; another one is planned for February 2018. This course is part of the extensive training suite that IISE provides to engineers worldwide. This course can also be taken in an online digital format.

The Council of Industrial Engineering Academic Department Heads met with Michael Graul, Ph.D., P.E., during the IISE annual meeting. Michael Graul, Ph.D., P.E., explained the benefits of professional engineering licensure to the academic department heads and solicited their support for further encouragement of graduating seniors to take and successfully pass the NCEES FE exam.

A new PAKS for the PE Industrial and Systems exam was developed and administered in 2017. Initial planning work was completed to enrich and enhance the breadth and depth of industrial/system participants in this 2017 study. With the increased emphasis on systems as well as industrial engineering, we wish to ensure that the new examination specification is as comprehensive, encompassing, and complete as possible. The survey responses were open in August 2017 and currently remain open, with a closing date of May 2018. We have received approximately 400 responses to this PAKS, with a bulk of those responses coming from members of the Society of Manufacturing Engineers. The reason for the extended response period is to increase the number of respondents as well as hopefully achieve a greater breadth and depth of respondents.

The ISE/PE Exam Development Committee has reviewed and discussed the master's-or-equivalent proposal that is in the NCEES *Model Law* and does not support this measure. The committee feels that the addition of 30 upper division/graduate credits as a requirement for sitting for the PE exam will not provide any greater safeguard for public safety, health, or welfare. The practical work experience gained by an engineer during the first four years of involvement in the industrial and systems discipline is more relevant and germane than additional educational hours for successful completion of the exam and to assure competent practice for the professional engineer candidate in the industrial and systems engineering field of practice.

Joe Michels, Ph.D., P.E., C.P.L., is the IISE and the IISE/PE development committee member working with NSPE's Project Lead The Way addressing the various issues arising in some jurisdictions on increasing the number of credit hours a candidate must attain in order to become a licensed professional engineer. IISE is one of several professional engineering societies making financial contributions to NSPE to fight increased academic credit requirements to become a licensed professional engineer.

### **International Society of Automation**

ISA is the primary technical association for professionals involved with the automation, instrumentation, and control fields of work. With over 30,000 members in over 80 countries of the world, ISA has five primary core interests of certification, training, standards, publishing, and technical conferences. ISA was established in 1945 as the Instrument Society of America and changed the official name at its annual meeting in October 2008.

ISA promotes and encourages professional engineer registration and license by participating in the activities of NCEES and supporting the PE Control Systems Engineering exam process. The volunteer leadership and professional staff provide funding, people, and efforts to enhance the value and need for the licensure of engineers working in process control and automation. To this end, ISA is active with the EPE Committee, POLC, state registration boards, and other professional societies. Also, ISA is a major supporter of National Engineers Week, both on a national level and at the local section level. This includes recognitions of outstanding engineers, local displays at schools, and assistance with other promotions.

One of the primary areas of interest is the maintenance and improvement of the PE Control Systems Engineering exam. The ISA PE Control Systems Exam Committee conducts an annual meeting of practicing engineers to develop new exam items and review the testing procedure and results. The content of each exam is audited for quality purposes and has shown steady improvement over the past four years. The number of engineers taking the PE Control Systems Engineering exam has increased each year and continues to gain in popularity among automation professionals. The control systems professional engineer exam is the most popular of the Group II exams offered by NCEES based on the 2017 statistics, with 292 test takers.

The most recent PAKS survey was performed in 2016 under the direction and guidance of the EPE Committee of NCEES. ISA provided the funds, personnel, and resources for the survey, which was conducted electronically in May and June of 2016. The results were used to establish a new exam specification for the test content and this specification was approved by the EPE Committee at the 2017 fall meeting in Atlanta. This specification is used to inform prospective examinees of the exam content and is now posted on the NCEES website. The new exam specification will be incorporated into the ISA training materials and will be effective for the first time with the October 2019 exam administration.

The PE Control Systems Engineering exam committee conducted an item writing session in Houston on January 26–27, 2018, in preparation for the October 2018 administration. The plan calls for similar meetings, with new members being enlisted to update the exam and maintain the quality of the final results. Also, the PE Control Systems Engineering Exam Committee continues to work toward computer-based testing for the control systems professional engineer exam, with a current target date of 2022.

The Professional Development Department of ISA has developed and operates a certification effort for those in the automation field. This is the certified automation professional, which has been accepted as the means to display the qualifications for someone in this area of work. The testing is available at any time during the year using computer-based testing techniques. ISA develops the exams, establishes the qualifications, evaluates the applications, provides training sessions, and awards the certificates. Also, a certification is offered to practicing technicians in the automation field and it is called the certified control system technician. This is a computer-based test that is administered at various test centers located throughout the country.

ISA offers a broad range of continuing education courses to those in the automation and controls field. These classes are offered at the ISA headquarters in Research Triangle Park, North Carolina, and in regional locations around the country. These training classes are complemented with a wealth of published books, reference materials, and technical information exchanges. In addition, there has been an increase in the distance learning classes offered by the society and this is expected to continue to increase in the future. The training and educational activity is conducted by a segment of ISA known as the ISA Training Institute.

The PE Control Systems Engineering exam is supported with various training and educational endeavors by ISA. A study guide has been developed, published, and made available in its fifth edition to provide information and

practice problems for those preparing for the exam. This study guide was updated to reflect the new 2011 specification for the exam and was updated in 2017 as the modified fifth edition with corrections. The Publications Department of ISA has several books that are designed to provide assistance to prospective registrants. In addition, the three-day PE Control Systems Engineering Exam Review Course was offered four times in 2017, with sites in North Carolina, Texas (two sites), and California.

Also, a new instructor-assisted online training class was developed in 2014 that consists of 20 one-hour pre-recorded sessions, which may be viewed by the participant at any time convenient to his or her schedule. Each offering occurs over a twelve-week period and includes five teleconference sessions with the instructor and the participants. This is a major step in the distance learning initiative and the course was offered two times in 2017 with good reviews and excellent participation.

The training and education plans for 2018 remain the same as 2017, with four or five offerings of the three-day instructor-led review class (North Carolina, Texas, California, Illinois, and Pennsylvania). The online, instructor-assisted course is being offered two times in 2018, starting in April and June. This is a 12-week course with five call-in sessions for problem solving and discussions among the participants. Plans call for a two-week live virtual instructor-led training class to be held in June 2018, with six four-hour sessions to cover the breadth of the PE Control Systems Engineering exam specification.

The ISA executive board has reviewed and discussed the MOE proposal that has now been removed from the NCEES *Model Law*, and does not support this type of measure. ISA feels that the current educational requirement, combined with the continuing education requirement of professional development hours each year, will provide the necessary safeguard for public safety, health, and welfare. The practical work experience, gained by an engineer during the first four years of involvement in the control systems field, is more necessary than additional educational hours for successful completion of the exam and to assure competent practice for the professional engineer candidate in the control systems engineering field of practice. For that reason, ISA does not favor or encourage individuals to take the professional engineer exam until the four years of experience have been obtained.

#### **Michigan Society of Professional Surveyors**

MSPS has 23 persons serving on the state board. The state board is made up of an executive board including a president, first vice president, second vice president, treasurer, secretary, and past president, as well as 6 directors elected at large and 10 chapter representatives. In 2017, there were 330 professional members, 28 affiliate members, 27 associate members, 12 student members, 7 sustaining members, and 165 life members. In 2018, we are expecting a slight increase in membership.

The executive director resigned in January 2017. At that time, the board of directors retained the services of AMR Management Group. AMR was already working with MSPS to manage the 2017 annual meeting.

#### **Teaching with Spatial Technology (TwiST)**

In 2017, NCEES and MSPS teamed up to sponsor approximately 24 teachers in Michigan to participate in the TwiST. The teachers met at Michigan Technological University (MTU) in Michigan's Upper Peninsula in a week-long workshop intended to provide 6th through 12th grade teachers with basic aspects of special technology in the global environment. It helps educate teacher about the profession of survey engineering. The teachers were given:

- Course hands-on teaching materials
- Garmin GPS receiver
- PC cable for downloading data
- Esri GIS software for teachers
- Two-gigabyte thumb drive loaded with lesson plans
- Handheld compass
- Additional training materials

In 2018, the course will be offered at two Michigan universities: MTU from June 25–29 and Ferris State University from June 18–22. This program has been approved by the State of Michigan Board of Education for 25 contact hours and 25 state continuing education clock hours.

### **Future City Competition and other events**

MSPS participates in the Future City Competition, providing exposure of the surveying profession to middle schools. This is sponsored by NCEES and the winner is presented the NCEES Best Land Surveying Practices Award.

Trig-Star—This year we had nine surveyors sponsor the Trig-Star exam in 10 schools in Michigan. There were 281 students exposed to the test. By sponsoring a local high school Trig-Star exam, you can interest an entire classroom of kids.

Road Scholar Science Olympiad—This is a competition for middle school children throughout counties in Michigan. The competition tests students on their knowledge of mapping, topography, data collection, and data interpretation.

### **Annual meeting**

In 2017, MSPS celebrated our 77th annual meeting.

- Our theme is to protect, promote, and educate on behalf of all surveyors in Michigan.
- The final registration shows 473 total paid attendees
- This is an increase of six percent from last year.
- We also had an increase in exhibitors.

### **Protect**

AESLC is currently working on legislation for quality-based selection and state bills related to surveying, engineering, and architectural issues.

MSPS was the host sponsor on behalf of AESLC for the March 7, 2017, Legislative Day in Lansing, Michigan.

MSPS met with Geospatial/Land Information System, MiCamp, and Improving Michigan's Access to Geographic Information Networks to discuss the need for a coalition around geospatial data issues at a state level, regarding both the acquisition of data and the use of this data.

### **Promote**

MSPS works hard to promote the Young Surveyors Council. The MSPS Young Surveyors Council was actively represented this past year at the board of director meetings by Brett Hollandsworth and Scott Roth. They continue to network with young surveyors throughout the state and other councils at the national level. Many of our professional members, including the Young Surveyors Council, took the time to support and exhibit at the Construction Career Days event held in Howell, Michigan, and the Michigan School Counselors Association event held in Lansing, Michigan.

MSPS is promoting the Trig-Star and TwiST programs.

### **Educate**

The MSPS Communications Committee has continued to provide a top-notch publication, the *Michigan Surveyor*, that includes current information impacting our profession. There were three publications of the magazine in 2017. The Communications Committee has also introduced a blog to the website where members are able to interact around various issues impacting our profession. The Seminar Committee continues to provide quality programs to educate our members and assist in meeting the requirements of the continuing education required for licensure.

### **Public awareness**

- Detroit Gold Cup Hydroplane Boat Races
- International Hydroplane Races
- Quake on the Lake Hydroplane Boat Races

## **National Academy of Forensic Engineer**

NAFE was formed to identify and bring together professional engineers with qualifications and expertise as practicing forensic engineers to further their continuing education and promote high standards of professional ethics and excellence of practice. It seeks to improve the practice, elevate the standards, and advance the cause of forensic engineering. Full membership in the academy is limited to registered professional engineers who are also members of NSPE. They must also be members in an acceptable grade of a recognized major technical engineering society. NAFE also offers affiliate grades of membership to those who do not yet qualify for member grade. NAFE is formally affiliated with NSPE, but is an independent organization incorporated in the state of Virginia.

The National Academy of Forensic Engineers and its members are committed to

- Serving the public by advancing the ethical and professional practice of forensic engineering
- Serving the jurisprudential system by certifying individuals having achieved expertise in forensic engineering
- Serving academy members and furthering the development of forensic engineers through education and the publication of peer-reviewed technical literature

### **Programs and activities**

Twice each year, NAFE members meet in different locations around the United States for two full days of forensic engineering seminars. Fourteen hours of continuing education credits are available, along with the opportunity to network with others in the field of forensic engineering.

- The 2018 NAFE Summer Conference will be held at the Hyatt Regency Buffalo, Buffalo, New York, on July 27–29, 2018.
- The 2019 NAFE Winter Conference will be held at the Wyndham Grande Orlando Resort Bonnet Creek, Orlando, Florida, on January 4–6, 2019.
- The 2019 NAFE Summer Conference will be held at the Westin Denver Downtown Hotel, Denver, on July 26–28, 2019.

NAFE is accredited by CESB. NAFE's diplomate forensic engineer (DFE) certification program has been reaccredited by CESB until the end of 2021.

Since its establishment in 1982, NAFE has published the NAFE Journal, a compilation of papers presented by NAFE members on technical as well as professional issues relating forensic engineering practice. The NAFE Journal is available online by visiting [www.nafe.org](http://www.nafe.org).

For more information about NAFE membership, conferences, publications, or other information, please visit [www.nafe.org](http://www.nafe.org).

While many if not most NAFE members are licensed as professional engineers in multiple jurisdictions in addition to their state of residence or employment, on occasion, some NAFE members are offered opportunities to conduct forensic investigations and testify in courts in jurisdictions in which they may not be currently licensed. Because of the unique role forensic engineers play within the nation's judicial system, NAFE believes that states and territories should provide enhanced comity/reciprocity flexibility for forensic engineers performing these functions.

### **NCEES questions**

What is your organization doing to promote/encourage licensure? Response: NAFE requires P.E. licensure for all of its DFE categories: NAFE fellow, senior member, and member.

Does your organization track which members are licensed? Response: Yes, the NAFE database tracks all of its licensed categories: NAFE fellow, senior member, and member. In addition, some NAFE affiliates are licensed professional engineers or registered architects.

Does your organization offer review courses for preparation for the NCEES exams? Response: NAFE is an NSPE chartered affinity group and NAFE supports NSPE's strong encouragement of licensure as well as NSPE's

offering of various PE preparation course options. See <https://www.nspe.org/resources/education/exam-review-and-preparation>.

Does your organization offer continuing professional competency (CPC) activities that can be used for licensure renewal? Response: In January and July of each year, NAFE conducts a two-day regular and special education conference offering technical and professional continuing education for conference attendees (14–16 PDHs per conference). NAFE educational sessions are approved for PDH by New York and other state licensing authorities.

Does your organization have any type of committee or working group that deals specifically with licensure? Response: Forensic engineering licensing issues are addressed by the NAFE board of directors and special committees/task forces where required.

What assistance can NCEES provide to promote licensure within your organization? Response: NAFE licensure priorities include (1) the need for greater licensure mobility/comity/reciprocity among states for forensic engineering practice as well as (2) the need for more state law and regulation uniformity to permit NAFE members to comply with state PDH requirements.

### **National Council of Structural Engineers Associations**

#### **Mission**

NCSEA advances the practice of structural engineering by representing and strengthening its member organizations.

#### **Vision**

The National Council of Structural Engineers Associations will be recognized as the leading advocate for the practice of structural engineering.

NCSEA is the parent organization and coordinating council for 44 state structural engineering associations. The activities of these member organizations are coordinated and represented by NCSEA in activities such as building code development and simplification, continuing education, licensure, participation in the structural engineering emergency response program, and promotion of the structural engineering profession to students as well as the public at large.

NCSEA continues to actively

- Provide practicing engineers access to the development and revision process for codes and standards
- Advocate positive changes in the build code development process
- Convey accurate information to the general public relative to structural-engineering—related events
- Educate elected officials about the importance of structural engineers in order to gain their support of legislation for structural engineer (S.E.) licensure, Good Samaritan acts, mandatory peer review, and QBS
- Educate the media to encourage them to seek structural engineers for commentary on issues that pertain to structural engineering.
- Educate other design professionals about the role, value, and importance of structural engineers
- Develop publications to assist engineers with difficult or poorly understood areas of practice
- Advocate for structural engineering degree programs
- Provide meaningful, practical, and convenient continuing education opportunities at reasonable prices
- Provide national support for pursuing structural engineer licensure on a state-by-state basis
- Pursue improvement in the level of competence and standard of practice of the structural engineering profession throughout the United States
- Work toward establishing a national structural engineering emergency response network
- Publish STRUCTURE, the leading monthly publication for, by, and about structural engineers and their practice
- Participate in ASCE's Professional Activities Committee to develop common goals for structural engineers
- Participate in the development of revisions to the International Building Code, International Residential Code, and International Existing Building Code (IEBC)
- Provide online review/refresher courses, specifically designed for the NCEES Structural Engineering (SE) exam, twice a year

## **NCSEA Licensure Committee**

The committee remains committed to tracking the latest licensure activities, setting meaningful goals, and empowering states to adopt consistent licensure laws. Currently there are 23 states with some form of structural licensure distinction and 13 that have an active S.E. licensure effort. The committee has set goals to understand the unique set of conditions and stakeholders in each state and to help others recognize the collective importance of holding structural engineers to a higher standard of practice.

In October 2016, the committee met during the NCSEA summit in Washington, D.C., where each represented state gave a comprehensive report on its progress. The annual meeting provided an excellent forum for the exchange of ideas, which fostered many meaningful discussions about current licensure activities. Among the issues discussed was a common definition for significant structures. These structures are generally viewed as those which pose a significant risk to the public due to their size, importance, or complexity. NCSEA has been collaborating with ASCE/SEI to develop standards for significant structures based on risk categories recognized by the International Building Code and ASCE's published design criteria.

Other issues discussed at the summit included

- Committee successes in 2017
- Positive trends in structural licensure
- Cooperative efforts with ASCE to recognize structural licensure

Momentum from the summit helped shape our priorities for 2018. Our first goal is to continue helping states that are pursuing structural licensure. The committee has deep knowledge on issues that relate to structural licensure and endeavors to share the objectives of structural licensure with all stakeholders, including outside organizations. Next, we are continuing to develop a model definition for significant structures. Cooperation with ASCE in this exercise has been extremely important to the success of this goal and the committee remains fully engaged in moving the process forward. Finally, we are encouraging state organizations to become more active with local politicians. Improving our position in public forums requires effective communication with those outside of the engineering industry, and this effort frequently involves positive interaction with state lawmakers.

The next summit will be in Chicago. The committee continues to work on meaningful articles that provide insightful points for anyone who wants to become a persuasive voice in his or her community. We will visit member organizations that are not pursuing S.E. licensure to discuss efforts moving forward and hope to pick up some new members along the way. Our goal is to draw feedback from these visits so that we can better address our goals for 2018 and, after the next summit, refine our goals for 2019.

## **Structural Engineering Certification Board (SECB)**

SECB is an independent national board certification program for structural engineers originally established by NCSEA, but now operating as an autonomous body. SECB was established because

- Structural engineering is indeed a recognizable profession,
- Competent practice of structural engineering is essential to protection of the public, and
- Generic engineering licensing laws adopted by some states that do not recognize structural engineering as a unique discipline fail to protect the public to fullest extent possible.

Although the SECB licensing requirements reflect the NCEES *Model Law* structural engineer criteria, they also establish more rigorous goals for primary structural engineering education, continued structural practice, and continuing professional development. They are intended eventually to serve as the basis for national uniformity in the qualifications required for S.E. licensure.

## **National Society of Professional Engineers**

Being a licensed professional engineer, regardless of your area of practice, means more than just holding a certificate and possessing technical competence. It is a commitment to hold the public health, safety, and welfare above all other considerations. NSPE's more than 80-year history has focused on this core principle, which professional engineers in all disciplines and practice areas hold in common.

Consistent with its mission, as a multi-tiered (national, state, and local) federation representing licensed professional engineers in all disciplines, NSPE is currently proactively addressing a wide range of issues.

In order to expand the base of the licensed engineering community, NSPE is constantly seeking to strengthen long-standing relationships, building on a history of collaboration with NCEES, ABET, and the technical societies to strengthen relationships and increase productivity of advocacy efforts.

Key areas of NSPE focus are summarized below.

### **Efforts to erode and eliminate occupational licensure**

The debate over the role of government in regulating occupations and professions has recently come to the forefront. According to the Bureau of Labor Statistics, occupational licensing directly affects nearly 30 percent of U.S. workers. While the work of professional engineers—like that of doctors, registered architects, and attorneys—clearly affects the public health, safety, and welfare, it is not uncommon for highly educated and trained P.E.'s to be incorrectly grouped with barbers and cosmetologists in the debate over eliminating occupational licenses.

The common narrative is that all licensing requirements are barriers to entry and should be removed. A more informed examination shows that those professions that are necessary to protect the public health, safety, and welfare, such as engineering, need licensing requirements to ensure that only technically and professionally qualified individuals are practicing in their fields. The narrative around licensure needs to change and recognize the vital role played by our regulatory system in protecting the public health, safety, and welfare. NSPE, in partnership with our state societies, has been vigorously tracking and opposing any effort to undermine or potentially eliminate the P.E. license.

NSPE has created an interactive map for everyone to use that shows the latest threats.

- [www.nspe.org/resources/issues-and-advocacy/action-issues/threats-professional-licensure](http://www.nspe.org/resources/issues-and-advocacy/action-issues/threats-professional-licensure)

We are tracking legislation and regulations in states across the country that pose a potential threat. Since late 2015, 26 states have introduced legislation and/or regulations, and we expect that number to continue to rise in 2018. We have been working continuously to educate our members about this existential threat to their profession and ability to practice, and members are very engaged on this issue.

On January 10, 2018, NSPE hosted a webinar with NSPE Executive Director Mark Golden, NCEES CEO Jerry Carter, and Arizona Board of Technical Registration Executive Director Melissa Cornelius Esq. to address the growing attacks on licensure. There was a record-breaking response to the webinar.

This will continue to be NSPE's top priority and it is an issue that we all must work together to address. We must be vigilant to oppose any threats that would harm our profession and the public safety. NSPE, through its Committee on Policy and Advocacy (COPA), develops positions on public policy issues that affect the public health, safety, and welfare as it relates to the professional practice of engineering and engineering licensure. COPA and staff look forward to continued collaboration on this vital issue.

NSPE is interested in collaborating with NCEES and members of POLC to create a clear message distinguishing the engineering profession from those that are often being targeted in the media and by legislators. NSPE, NCEES, and members of POLC are working together to set forth specific initiatives or methods that are being undertaken to establish the engineering profession as the gold standard and to demonstrate that P.E.'s should not be negatively impacted by all of the proposed changes to licensure could help change the narrative.

### **The future of the profession**

In 2016, NSPE established a task force to identify areas in which professional engineers must be prepared to change to be successful and sustainable moving forward. The task force's mission was based on the ideas in the book *The Future of the Professions*, among other resources. As the book explains, all the professions (legal, financial, medical, and engineering) and licensure are facing fundamental change. In its March 2017 interim white paper, the task force analyzed the current state of the engineering profession, the delivery of its services, and how these methods may evolve or need to change, including mobility of the license.

The task force is currently working toward a detailed report expanding upon the threats and opportunities identified in the interim white paper and a July 2017 final report. Main topics to be covered are

- Emerging technology
- Industrial exemption
- Public policy and professional engineering

- Engineering education
- Licensure model and mobility
- International licensure
- Role of certified engineering technologists and computed tomography
- Alternative delivery methods
- Public sector engagement

### **Deregulatory efforts targeting the professional engineer**

NSPE has continuously advocated for an increased role for professional engineers in federal requirements to strengthen safety standards. In 2016, our regulatory advocacy initiatives yielded strengthened requirements for professional engineers in engineering projects across the country, particularly in the Environmental Protection Agency and the Department of the Interior. Unfortunately, the Trump administration, as part of a larger deregulatory movement, has been targeting many of the critical regulations that were enhanced to protect public safety. These proposed regulation rollbacks pose a grave threat to the public and undermine the professional engineer's role.

- [www.nspe.org/resources/issues-and-advocacy/latest-news/nspe-fights-back-against-epa-proposal-undermines](http://www.nspe.org/resources/issues-and-advocacy/latest-news/nspe-fights-back-against-epa-proposal-undermines)

For example, NSPE is opposing the Department of the Interior's proposed rollback of essential regulations implemented in response to the Deepwater Horizon disaster in 2010. The department finalized rules after a comprehensive multiphase rulemaking process in 2016. NSPE actively advocated for an enhanced role for professional engineers to protect the public health, safety, and welfare, and these provisions were included in the final 2016 rule. The department is now proposing to eliminate many of the provisions in the 2016 rule, including several specific requirements for professional engineers. NSPE is urging the department to retain all of the requirements for P.E.'s in its revised rulemaking. The existing rules were implemented to ensure that P.E.'s use their engineering skills to achieve compliance and incorporate the necessary safety measures that will mitigate the likelihood of future disasters like the Deepwater Horizon explosion.

- [www.nspe.org/resources/issues-and-advocacy/latest-news/nspe-fights-interior-department-s-proposed-rollback](http://www.nspe.org/resources/issues-and-advocacy/latest-news/nspe-fights-interior-department-s-proposed-rollback)

NSPE is actively opposing these and similar attempts to undermine the role of the P.E.

### **Attempts to erode QBS of engineering services**

Qualifications-based selection is a procedure whereby service providers are retained on the basis of qualifications, rather than price factors. Under the QBS method, the procuring agency reviews the qualifications submitted by interested individuals and firms, ranks respondents, and then negotiates with the most qualified respondent for a mutually agreeable contract. The federal Brooks Architect-Engineers (A/E) Act (PL 92- 582), enacted in 1972, requires federal agencies to use QBS procedures when procuring design services.

Forty-six states have implemented some sort of QBS law, and numerous localities have also adopted laws (known as Mini-Brooks Acts) modeled after the federal statute. They require states and localities to use QBS procedures when procuring design services. Other states and localities have adopted regulations or executive orders that accomplish the same objectives as the statutes. QBS is vital to the public health, safety, and welfare and ensures the best engineering outcomes. Any attempts to erode QBS must be defeated.

In recent years, we have seen threats at the state level and have already seen several new threats in the 2018 session. President Trump's infrastructure plan opens the door to overhauling current procurement methods, which could endanger the Brooks Act and QBS. We must be vigilant and coordinated in opposition to any such attacks.

- [www.nspe.org/resources/issues-and-advocacy/action-issues/qualifications-based-selection-engineering-services](http://www.nspe.org/resources/issues-and-advocacy/action-issues/qualifications-based-selection-engineering-services)

### **Engineering judgment threatened by piping legislation**

Legislation introduced in a growing number of states would limit the professional engineer's independent judgment when making decisions regarding technical matters, including the proper type of piping used on a project. Professional engineers select piping materials based on the internal pressures that the pipes must withstand, as well as various external conditions and environmental factors. The professional engineer—using his or her own sound judgment based on experience, expertise, qualifications, and the applied knowledge of engineering principles—should determine the type of pipe that is used in any situation. Legislation that creates a

preference or requirement that specific materials be used violates this principle. Disconcerting legislation has been introduced in state legislatures and is now being proposed at the federal level. Coordinated advocacy efforts to educate policymakers about the need to retain the current laws will benefit the entire engineering profession.

- [www.nspe.org/resources/issues-and-advocacy/latest-news/nspe-fights-federal-legislative-attempt-undermine-pe](http://www.nspe.org/resources/issues-and-advocacy/latest-news/nspe-fights-federal-legislative-attempt-undermine-pe)
- [www.nspe.org/resources/issues-and-advocacy/latest-news/nspe-ohio-society-oppose-piping-bill-treading-pe-expertise](http://www.nspe.org/resources/issues-and-advocacy/latest-news/nspe-ohio-society-oppose-piping-bill-treading-pe-expertise)
- [www.nspe.org/resources/issues-and-advocacy/latest-news/nspe-south-carolina-society-oppose-piping-legislation](http://www.nspe.org/resources/issues-and-advocacy/latest-news/nspe-south-carolina-society-oppose-piping-legislation)
- [www.nspe.org/resources/issues-and-advocacy/latest-news/nspe-michigan-society-stand-against-legislation](http://www.nspe.org/resources/issues-and-advocacy/latest-news/nspe-michigan-society-stand-against-legislation)

### **Autonomous vehicles**

NSPE has been working on multiple fronts to promote and protect the public health, safety, and welfare in the development and deployment of autonomous vehicle technologies. Embracing its Grand Challenge to foster ethical innovation, NSPE has taken action to give professional engineers a leading voice in ensuring that the same attention to safety and reliability that went into the nation's built transportation infrastructure is incorporated into autonomous vehicles and smart transportation systems.

NSPE is collaborating with Congress, the Department of Transportation, the National Highway Traffic Safety Administration, state departments of motor vehicles, state societies, and national organizations to take a comprehensive and informed approach to testing, development, and deployment of autonomous vehicles, incorporating the key role of the licensed professional engineer. NSPE is impacting both federal and state legislation and regulations. NSPE's Autonomous Vehicles Task Force is currently developing a white paper to take a leadership role in benchmarking key performance standards for autonomous vehicles. Key components and concepts of the white paper include risk assessment, ethics, accountability, redundancy, verification, standardization, training, security, and safety features.

- [www.nspe.org/resources/issues-and-advocacy/action-issues/autonomous-vehicles](http://www.nspe.org/resources/issues-and-advocacy/action-issues/autonomous-vehicles)

### **Mobility and comity**

It is NSPE's longstanding position to support license mobility. NSPE Professional Policy 122, Continuing Professional Competency, specifically states, "NSPE strongly supports comity among licensing jurisdictions to provide practice mobility of professional engineers."

In furtherance of this policy and as stated in NSPE Position Statement 1737, Licensure and Qualifications for Practice, "NSPE endorses enactment of uniform licensure laws in all jurisdictions. The National Council of Examiners for Engineering and Surveying (NCEES) has developed the *Model Law* as a guide for use by engineering licensure boards and legislatures in the interest of achieving uniform laws for the licensure of engineers in all jurisdictions." NSPE works closely with NCEES and ABET in furtherance of these goals.

To facilitate licensed engineers in navigating the rules in different jurisdictions, NSPE has created a series of state-by-state summaries on such topics as:

- When can I take the PE exam?
- Continuing education requirements for professional engineers
- Defining the practice of engineering
- Education and experience requirements for professional engineers
- Exemptions to engineering licensure laws
- State licensing fees for professional engineers
- [www.nspe.org/resources/issues-and-advocacy/reports-state-pe-laws-and-rules](http://www.nspe.org/resources/issues-and-advocacy/reports-state-pe-laws-and-rules)

### **Education and examination offerings**

NSPE offers its members resources for examination preparation and continuing education. NSPE partners with Cognistar, Brightwood, the Minnesota Society of Professional Engineers, and Professional, Publications, Inc., to provide FE and PE exam preparation materials. NSPE's PE Institute provides a robust offering of live educational events, on-demand webinars, and conferences to professional engineers. NSPE membership includes fifteen free online seminars that you can view from your home or office. NSPE tracks members' licensure status.

- [www.nspe.org/resources/pe-institute](http://www.nspe.org/resources/pe-institute)

## **National Society of Professional Surveyors**

NSPS continues to expand its collaboration with other groups to address issues of common interest. Included among those efforts are: 1) participation with the Uniform Law Commission on the topic of adverse possession; 2) establishment of an online discussion forum related to the National Flood Insurance Program; 3) expansion of the certified floodplain surveyor certification program; 4) monitoring proposed federal legislation on utility locates; 5) a pipeline surveyor certification program initiated by the Association of Professional Pipeline Surveyors; 6) the proposal to license hydrographic surveyors as proposed to NCEES during its 2017 Annual Meeting; and 7) coordinating with other member organizations of the Coalition of Geospatial Organizations to address the issues related to a new proposal from an entity known as Ligado (formerly LightSquared). In furtherance of its relationship with the Property Records Industry Association (PRIA), NSPS will provide a presentation during PRIA's annual meeting on March 1 in New Orleans. This collaboration is intended to foster better understanding by the two organizations' members regarding roles both play in contribution to and the development of property records.

National Surveyors Week 2018 will be March 18–24. Annually, the event occurs the week following the third Sunday in March. NSPS is working with its state affiliate organizations to promote the profession during the week and acquire proclamations from national, state, and local governing bodies. NSPS also coordinates with the U.S. National Geodetic Survey (NGS) to promote the NGS GPS on Benchmarks program. March 21 will mark the first-ever Global Surveyors Day with a gathering during the Land and Poverty Conference in Washington, D.C. This conference is sponsored by the World Bank.

Workforce development efforts continue within NSPS, including continuation of successful visits with the National School Counselors Conference where use of “the Sandbox” has been effective. Several NSPS state affiliate societies are also attending school counselors conferences in their respective states, holding local events, and developing websites for workforce development. The Future of Surveying Forum continues its work through collaboration of representatives from a variety of organizations in defining and orchestrating a variety of activities. The NSPS Young Surveyors Forum continues its good work, and they will host a meeting of the International Young Surveyors Forum in the fall of 2018 during a joint meeting of the Maryland Society of Surveyors and NSPS.

NSPS continues to monitor and encourage efforts to include distance learning among the options for gaining education leading to a license as a professional surveyor. Great Basin College in Nevada continues its program along with other schools that have developed some version of distance learning. A recent study by the University of Maine (whose ABET-accredited program is quite successful) has encouraged the University of Maine to seriously consider the distance learning option. NSPS always supports efforts intended to increase educational opportunities in surveying.

NSPS will continue its successful Day on the Hill program on April 11, 2018. A significant number of NSPS members from across the country attend this annual event. The program has been successful in promoting and shaping federal legislation and rule-making. Of particular interest is perpetuating the QBS for procurement of professional services. Some among the organizations in the overall geospatial community seek to undermine, and even eliminate, this long-standing provision. This is evidenced by their efforts to keep the QBS concept out of the important Geospatial Data Act which is currently being debated in the U.S. Congress.

Another issue in which NSPS is engaging is a proposal from the governor of South Dakota to allow cross-border practice of professional services for a period of 18 months before being required to hold a license in South Dakota. The recently introduced legislation is being supported by the governors of the abutting states. NSPS has expressed its support for the efforts of the surveying society in South Dakota in opposing the legislation. NCEES has been aware of this overall movement and continues to monitor it. NCEES Chief Executive Officer Jerry Carter recently appeared on the NSPS weekly web-radio program to discuss the issue, and its possible implications nationwide.

The NSPS Foundation, through its Disaster Relief Fund, and the generous donations from a multitude of surveying individuals, companies, and others, has been able to assist a large group of surveyors, their families, and their employees who were affected by the 2017 hurricanes and wildfires.

In May, NSPS will make its formal proposal to FIG to sponsor the 2022 FIG International Congress in Orlando, Florida.

The NSPS annual meeting will take place in Las Vegas from February 20–22, 2018. Our annual student competition will take place in conjunction with the annual meeting.

### **Society of Fire Protection Engineers**

SFPE would like to thank the dedicated staff at NCEES for all their hard work in supporting the PE Fire Protection exam and the fire protection engineering profession. Over the last year, SFPE completed the following activities that promoted licensure and the profession of fire protection engineering:

#### **New fire protection specification for the 2018 exam**

SFPE and its volunteers worked closely with NCEES to update the fire protection engineering specification. At the NCEES EPE Committee meeting on November 10–11, 2017, a new specification for the PE Fire Protection exam was approved. The updated specification certainly does resemble the previous version. However, the modifications to produce this new specification are based on the PAKS conducted through SFPE. The specification will become effective for the October 2018 exams and moving forward from there.

#### **Industry core competencies**

SFPE is dedicated to defining a fire protection engineer on a global level. It sounds so simple to outline the core competencies one would need in order to be a fire protection engineer. Most people can agree on general concepts that need to be learned such as fire dynamics, human behavior in fire, egress and life safety, fire suppression, and risk management to name a handful. However, to put words on the page that can be globally understood to define the minimum competencies someone would need in order to call themselves a fire protection engineer is where the challenge arises.

The SFPE professional competency and credentialing subcommittee has been diligently working to establish the minimum core competencies. A draft document is approaching completion. It naturally aligns with the specification utilized in licensing fire protection engineers across the United States, yet it offers global reach for areas that do not have the same licensing structure. It can guide agencies that are looking at implementing licensing criteria as to the minimum information a fire protection engineer would need to qualify. It may also be a guide to an engineer who has interdisciplinary practices and would like to round out his or her knowledge base to practice as a fire protection engineer.

#### **Pathways to a career in fire protection engineering**

The seventh edition of the SFPE career guide was distributed with the third quarter Fire Protection Engineering magazine. There are many useful components in the guide for those aspiring to join the fire protection industry. To highlight a few, there is a description of what fire protection engineering is, what the typical day would look like in a few different types of jobs, and compensation information. There is also a section that discusses what it means to have a professional engineering license and its importance to the community.

#### **Higher education participation**

SFPE continues to remain active with higher education for fire protection engineering. It serves as part of the Industry Advisory Boards for Oklahoma State University and Eastern Kentucky University fire protection engineering technology programs. In addition, SFPE continues to work with ABET, and this year participated with the reaccreditation of the University of Maryland fire protection engineering program. As part of that effort, four new evaluators were added to the SFPE ranks.

#### **PE Fire Protection exam**

SFPE continues to promote the PE Fire Protection exam. In 2017, the society sponsored a web-based preparation course for the fire protection exam. Approximately 100 students participated in this course. In addition, SFPE used the NCEES Speaker's Kit to make presentations on the FE and PE exams at the University of Maryland Department of Fire Protection Engineering. Additionally, in 2017, seven SFPE chapters sponsored PE exam problem writing sessions across the nation.

### **Structural Engineering Institute of ASCE**

#### **Organization vision for licensure**

SEI is an institute of ASCE. Currently we have over 35,000 members.

The Structural Engineering Institute has licensing as a prime focus in the vision for the future. Our vision recognizes that there are and will be challenges to licensing, and that the challenges need to be anticipated, planned for, and met head-on. Following is one of the SEI vision focuses:

- Strategic issue: Increases in complexity of structural design responsibility, including advances in building codes and standards, design aids and tools such as computer programs, project delivery methods, and construction materials, could undermine the profession's ability to protect the health, safety, and welfare of the public from unqualified and inexperienced professionals designing inadequate structures.
- Desired outcomes: Enact legislation for structural engineering licensure requirements in all jurisdictions by creating a plan for working proactively with local engineers, stakeholders, and engineering organizations, and developing resources such as statistical data, white papers, and case studies to support the efforts of local structural engineers.

### **Committees on licensure**

Licensure issues are discussed at the board of governors level, but primarily at the committee level in the Professional Activities Committee. This committee has the goal of addressing licensing, regulation, and educational issues for the structural engineer. This committee works on developing policy statements relating to licensure, addressing rationale issues for licensing, and developing papers and presentations to promote licensing. Recently the committee developed a policy for the use of the title structural engineer, which is currently under review. The committee also developed a paper on the definition of significant structures that would require structural engineering licensure. A couple of papers were proposed to address the topic of competency and how it relates to the PE and SE exams. The committee has members that serve on the ASCE Committee on Licensure, the NCEES Structural Exam Committee, and SELC.

ASCE and SEI have endorsed state initiatives that promote continued education and professional licensure by providing letters of positions to state jurisdiction. This past year, ASCE and SEI have supported these positions in Georgia and Oklahoma.

### **Coordination with other organizations regarding licensures**

SEI has established ties with other organizations to address many issues, including licensing.

SELC consists of four organizations: SEI, NCSEA, the Council of American Structural Engineers, and SECB. The SELC has developed a position statement regarding licensure and plans and participates in activities promoting licensure across the United States. Recently SELC began discussions with NSPE to come to some common understanding regarding structural engineering licensure.

The Institute of Structural Engineering in the UK has reached out to SEI to develop ties. SEI and IStructE are collaborating on pilot program of offering chartered membership supplementary examination for attendees at the SEI 2018 Structures Congress.

### **Global efforts on licensure**

SEI and its Global Activities Division is leading initiatives to enable global credentials interoperability to improve commonality in licensures. The pilot program with IStructE is its current initiative.

### **NCEES**

SEI participated in the first Structural Engineering Caucus that was held at the NCEES annual meeting in August 2017.

### **Position on continuing education**

SEI promotes continuing education for engineers. Every year members may receive 5 PDHs free from the list of numerous webinars on structural engineering topics and courses on preparing for PE and SE exams. SEI has numerous webinars, seminars, and conferences that offer continuing education.

### **The Minerals, Metals, and Materials Society**

The PE Metallurgical and Materials exam written to the new exam specifications (2015) performed well according to exam indicators and experienced a 42 percent increase in exam takers. Although the reason for the increase in exam takers cannot be identified definitively, there are factors that may have contributed. The possible factors are the new exam specifications, the offering of the TMS exam review short course, and the decoupling of the exam and experience where NCEES and some state boards allow examinees to take the exam before completing the required experience. In these cases, the order is reversed with the required experience to be gained after passing the exam.

TMS offered the third PE Metallurgical and Materials Exam Review Course in August 2017 in downtown Pittsburgh. Eighteen people attended the course and five instructors collaborated to present the teachings in a three-and-a-half-day course. In the course evaluations, 75 percent of the course attendees said they were planning to take the exam in 2017. The course will be offered again in summer 2018 in Pittsburgh.

The Professional Registration Committee (exam development committee) continues to meet to write, review, and edit questions for future exams. The committee met twice in 2017 in conjunction with the TMS annual meeting and Materials Science and Technology 2017. Members also met at NCEES headquarters once for concentrated work on the supplied reference handbook that will be implemented when the exam moves to a computer-based format. This reference will be an electronic reference resource for exam takers.

The TMS Professional Registration Committee continues its participation in the Licensing That Works Coalition of engineering societies that opposes increasing the educational requirements for professional engineering licensure beyond a four-year EAC/ABET accredited bachelor's degree. The TMS Professional Registration Committee supports maintaining the current four-year degree requirement.

TMS continued its collaboration with four professional societies (the Association for Iron and Steel, the American Ceramic Society, ASM International, and the National Association of Corrosion Engineers) at the Materials Science and Technology 2017 Conference held in October in Pittsburgh.

The Accreditation Committee continues as the lead ABET member society in the accreditation of university metallurgical and materials engineering programs. The committee assigned program evaluators to 19 university programs in fall 2017.

#### **National Council of Examiners for Engineering and Surveying**

NCEES President Patrick Tami, P.L.S., gave the following highlights on current NCEES activities:

As you're aware, NCEES is made up of the licensing boards that regulate the engineering and surveying professions in the United States. Since its founding in 1920, NCEES has been committed to advancing licensure for engineers and surveyors in order to safeguard the health, safety, and welfare of the public.

Each of you has a copy of the 2017 NCEES annual report, which highlights our activities for the past year. You also have a copy of *Squared*, the official NCEES source for engineering and surveying licensure statistics. This issue features data from the 2016–2017 fiscal year, including the number of U.S. licensees and the pass rates and volumes for NCEES exams.

#### **Computer-based testing (CBT) update**

NCEES is continuing to transition our licensing examinations to computer-based testing (CBT). The Fundamentals of Engineering (FE) and Fundamentals of Surveying (FS) exams moved to CBT in 2014. The Principles and Practice of Surveying (PS) exam transitioned to CBT in 2016, and the first Principles and Practice of Engineering (PE) exam—the PE Chemical—moved to CBT in January 2018.

All of these exams are offered year-round at Pearson VUE test centers. They use a linear-on-the-fly testing (LOFT) format, in which examinees each have a unique set of exam questions that are similar in difficulty.

They also use a new testing component—alternative item types (AITs)—to provide new ways to test candidates' competence. AITs are items other than traditional multiple-choice questions with one correct answer. They include fill-in-the-blank and point-and-click questions, which require examinees to click on part of a graphic to answer.

The conversion to CBT for the PE exams is an ongoing initiative for the Council, and the exam development committees for the other 24 PE exam disciplines are working toward this goal. NCEES has released a tentative conversion schedule for these exams. It is posted on our website at [ncees.org/CBT](http://ncees.org/CBT). The next exam to move to CBT is the PE Nuclear exam in October 2018.

#### **Exam updates**

In addition to focusing on the CBT transition, NCEES conducted PAKS for several PE exams to keep them relevant to current professional practice. These studies are used to update exam specifications. NCEES updated

specifications for two modules of the PE Mechanical exam in April 2017. We will also introduce new specs for the PE Fire Protection exam in October 2018.

NCEES lowered the price of the FE and FS exams by \$50 at the beginning of this year. The fee is now \$175. NCEES and our member boards are committed to reducing barriers to licensure. Moving to year-round computer-based testing for these exams—which gives candidates greater scheduling flexibility—was an important part of those measures. We are now taking the additional step of lowering the price of these exams to ensure that cost is not a prohibitive factor in starting on the path to licensure.

#### **NCEES committee/task force updates**

NCEES standing committees and task forces are addressing a range of issues this year.

The Committee on Member Board Administrators is working with NCEES staff to develop a communications plan and long-term strategy to promote actions to increase licensure mobility and reduce barriers to licensure. As we approach our centennial celebration in 2020, NCEES remains committed to fostering cooperation among member boards and facilitating mobility.

NCEES continues to work toward improving diversity in our exam development committees. The Committee on Examinations for Professional Engineers and the Committee on Examinations for Professional Surveyors are reviewing our exam development policy to determine if we should set term limits for NCEES exam committee volunteers and if the diversity on these committees should reflect student, licensee, or U.S. population. NCEES recognizes the benefits of a diverse population of licensed engineers and surveyors in shaping the future of professional licensure, and we are similarly striving for diversity in our exam development committees.

#### **International activity**

NCEES continues to see an increase in international activity. It now has agreements with 16 foreign entities to administer NCEES exams in 9 countries. In 2017, NCEES began offering the FE exam in Saskatchewan, Canada, through an agreement with the Association of Professional Engineers and Geoscientists of Saskatchewan.

NCEES is continuing its work with the International Engineering Alliance (IEA), an umbrella organization that coordinates seven international agreements for engineering education and mobility. NCEES represents the United States in two of these agreements: the International Professional Engineers Agreement (IPEA) and the Asia-Pacific Economic Cooperation (APEC) Engineers Agreement.

In 2017, NCEES Past President Patty Mamola, P.E., was reelected to a second two-year term as deputy chair of APEC, and CEO Jerry Carter was elected to a two-year term as deputy chair of IPEA. As officers of the two mobility agreements, they serve on the Executive Committee of IEA, which comprises 36 jurisdictions in 27 countries.

NCEES will continue to support member boards as they evaluate international candidates as well as engineers and surveyors who are licensed in the United States and want to practice overseas. Making it easier to practice around the world promotes the exchange of ideas and accelerates advances within the professions.

#### **Engineering/surveying awards**

Since 2009, NCEES has promoted licensure to engineering educators and students through the NCEES Engineering Award for Connecting Professional Practice and Education. During this time, NCEES has awarded more than \$560,000 in prize money to recognize engineering programs that encourage collaboration between college students and professional engineers. The Dordt College Engineering Department won the \$25,000 grand prize for 2017, and five other winners received \$7,500 awards.

For the second year of the NCEES Surveying Education Award, we introduced a new prize structure. This award recognizes surveying and geomatics programs that best reflect the NCEES mission to advance licensure for surveyors in order to safeguard the health, safety, and welfare of the public. The University of Maine Surveying Engineering Technology program received the \$25,000 grand prize. Three additional programs received \$15,000 awards, and three received \$10,000 awards to assist with their efforts to promote licensure.

### **Surveying Exam Module Task Force**

At the 2017 annual meeting, NCEES delegates voted to authorize the development of one or more depth modules to supplement the PS exam. The proposed modules relate to the U.S. Public Land Survey System (PLSS) and/or the Metes and Bounds survey system.

This is a long-range project to ensure that NCEES exams continue to meet the needs of professional surveying licensure. The Surveying Exam Module Task Force is evaluating the current PS exam specifications to determine if they sufficiently cover the PLSS- and Metes-and-Bounds–related content. It is examining current methods of testing this content on state-specific exams. It is also evaluating potential impacts on mobility and safeguarding the public, as well as the exam volumes that would be required to ensure the exam remains psychometrically sound and economically feasible.

### **Technology Task Force**

For the past several years, NCEES has formed a Technology Task Force to consider new technologies in regard to regulating the practice of engineering and surveying. This year, the Technology Task Force is continuing to evaluate the process of building information modeling and the ability of multiple professionals to work on design plans simultaneously. It is developing guidelines for how each professional providing design services accepts responsibility for his or her work and how the finished product denotes each professional's work. The task force will recommend changes to the *Model Law* or *Model Rules*, as needed, to address professional responsibility related to the signing and sealing of work products that evolve from a BIM environment.

### **CPC Registry**

NCEES is committed to improving licensure mobility, and we launched a CPC Registry in 2016 to make it easier for people licensed in multiple states to keep track of and meet the various CPC requirements. This web-based service provides a place for professional engineers and surveyors to track continuing education credits and store supporting documentation.

As of March 1, there are more than 6,000 account holders tracked and approximately 68,000 completed CPC courses in the system. This year, the NCEES Committee on Education is evaluating the use of the CPC Registry and assisting staff with developing a plan to encourage member boards and individual licensees to use the service.

### **NCEES board of directors leadership visit project**

As part of its strategic plan, NCEES is working to increase effective participation of members and member boards to increase national engagement. To this end, NCEES launched a board visitation program in September 2016. The board of directors extended invitations to all member boards to have a member of NCEES leadership or senior staff attend a member board meeting at no cost to the board. The goal is to improve communication, increase awareness of the range of services and leadership opportunities within the organization, and address questions.

Since the program started, members of the board of directors, the chief executive officer, and the chief operating officer have visited 33 boards across the country. The program has been extended to 2017–2018, with additional visits scheduled for 2018.

### **Threats to licensure**

In 1950, about five percent of professions in the United States required a license or certificate to offer services. Today, that number is nearly 30 percent. There is an ongoing effort in the United States to deregulate a number of professions. This effort is based on a perception that licensure requirements are burdensome and create artificial barriers to practice.

The learned professions—such as engineering, architecture, and geology—are being grouped with professions such as barbering, auto repair, and pet grooming. Various U.S. state legislatures have introduced bills that, if passed, would significantly limit requirements for licensure and provide greater portability of the license with limited control by the licensing agency. Licensed professionals within these jurisdictions have expended significant political effort to get amendments offered to remove the engineering profession from the proposed legislation.

The effort toward deregulation reflects the current mood in the United States that prioritizes economic freedom over protection of the public. NCEES is working with affiliated organizations to limit the impact of any changes

to current licensure requirements and to better educate the public on the important role that professional licensure plays in protecting the public.

### **Exam volunteers**

NCEES depends on our volunteers to fulfill our mission of advancing licensure for engineers and surveyors. Developing and maintaining our exams requires the work of over a thousand licensed professionals who volunteer their time and expertise. We need a cross-section of professionals in terms of geography, years of experience, and practice areas. One demographic that we could especially use more participation from is young professionals—those who have been licensed less than five years. I ask you to encourage the young professionals in your organization to help us with this important work. It's a unique opportunity to strengthen their profession while meeting colleagues from a variety of professional backgrounds and earning professional development hours.

It's really simple to volunteer. Just click on the Volunteer link on our homepage, [ncees.org](http://ncees.org). Exams are at the heart of our work at NCEES, and we need your members to keep our exam development program strong.

### **NCEES president-elect's report**

President Patrick Tami, P.L.S., called upon President-Elect James Purcell, P.E., to address the group.

Purcell introduced himself to the group, giving the attendees a description of his experience in engineering from his teenage years working in his father's firm, highlights of his career, and involvement with NCEES. Purcell particularly mentioned his involvement with engineering societies since college, having formed the student chapter of NSPE at the University of Connecticut, and said that he has continued his membership to this day.

Purcell remarked that almost everything talked about today is going to be a continuing focus during his tenure. The priority is the threats to licensure and what NCEES can do to stem those threats. These threats are an opportunity, since NCEES has existed for 98 years for the purpose of making licensure mobile. He said that we seem to have gotten farther apart than we ever were but we now have an opportunity with the threats to challenge NCEES member boards to figure out how they can modify their rules to make it easier for licensees to cross state lines and become licensed in other jurisdictions. Purcell recounted his efforts in New Jersey to modify the board regulations there to conform more closely to the NCEES *Model Rules* and will be asking member boards to take a hard look at their rules to see if there are requirements in them that do not conform to their enabling statute—and to see if there are unnecessary restrictions that could be considered barriers to licensure and are not defensible.

He stated that another focus will be speaking about the importance of licensure. He said that members speak all the time, mostly to college students, and mostly to seniors or juniors who are already on their way to a career in engineering. Most of the presentations are about how to get licensed, but, in conjunction with the efforts of the POLC members in pushing STEM as viable careers, there is an opportunity to have NCEES member boards speak to high school and middle school students on the importance of engineering and surveying as licensed learned professions. Purcell recounted an experience with a presentation made by middle school students that was better than the presentations made by his freshman students. He said that he will be asking the member boards to take up this challenge to go out and talk with these students.

In conjunction with this initiative, Purcell said he would ask that we make an effort to speak to audiences who are not traditionally considered: government agencies and those disciplines that do not believe it to be important to be licensed. He stated that NCEES has a wonderful speaker's kit that can be tailored for these audiences.

Purcell said that NCEES has been involved internationally and that that arena will continue to grow. In conjunction with ABET's efforts in accrediting programs overseas, NCEES believes its ability to administer exams in those countries fosters relationships globally that lead to better (more compatible to U.S. requirements) education for foreign candidates and a greater confidence for member boards to license them. While many of them are taking the FE exam (and some the PE exam) to become credentialed in their own countries, that should not dissuade them from becoming licensed in the United States.

Finally, he pointed out that the survey examination changes that are currently being studied is a long-term effort and will be continued. The need for state-specific exams is a difficult issue and this is another barrier to licensure that needs to be removed. As the NCEES task force moves toward developing separate divisions for public lands

surveys, Metes and Bounds surveys, photogrammetry, and geomatics, he hopes that this effort will lead to states recognizing that separate state-specific exams are no longer necessary.

#### **Adjournment**

With no new business to be brought before the group, President Patrick Tami, P.L.S., thanked all attendees for their participation. The next POLC meeting will be held March 9, 2019, in a location to be determined..