FACT SHEET
ADDITIONAL LICENSURE REQUIRMENTS FOR ENGINEERS

Purpose

The purpose of licensure in the United States is to protect the health, safety and welfare of the public. This is demonstrated by completion of an accredited engineering degree, passage of two examinations and a minimum of four years of experience under the direction of a licensed engineer. Within certain engineering disciplines and national organizations, there is an effort to require significant additional coursework for engineering graduates to obtain professional licensure.

The additional coursework would increase the cost and time commitment associated with licensure and could result in a decrease in licensed engineers while providing no additional benefit to protecting public health, safety and welfare. ASHRAE is opposed to these efforts and believes mechanisms already exist to assure engineers remain up-to-date on best practices and available technologies. ASHRAE members are encouraged to contact their state licensure boards and state societies of professional engineers.

Background

The National Council of Examiners for Engineering and Surveying (NCEES) maintains model laws for implementation of state licensure requirements for engineers. In 2006, NCEES added language to their model laws which requires an engineer intern with a bachelor's degree to have an additional 30 credits of upper-level undergraduate or graduate-level coursework in order to be admitted to the Principles and Practice of Engineering (PE) examination. Besides ASHRAE, the provision has been opposed by the American Society of Mechanical Engineers (ASME), the American Institute of Chemical Engineers (AIChE), and other engineering organizations.

NCEES claims that it was motivated to add additional credits due to the decline in university and college requirements for a bachelor's degree in engineering from an average of 144 credits 25 years ago to an average of 128 credits today. NCEES also notes the Department of Labor occupational rating for engineering professions is lower than other professions, including law, medicine, accounting, and architecture due to the diminishing educational requirements.

The First Professional Degree (FPD) in engineering has long been considered to be the degree needed for the practice of engineering. The FPD informs the public and licensing bodies about the minimum requirements that qualify an aspiring professional for practice. Since the 1920s, the FPD in engineering in most regions of the world has been a baccalaureate degree, requiring the equivalent of full time study of approximately four years.

Current engineering baccalaureate degrees typically require courses in mathematics; physical sciences and life sciences; fundamentals and practice of engineering; laboratory and design experience; metrology and experimentation; ethics and professionalism; and selected topics from other disciplines, including the liberal arts and business. Some programs also include industry-based experience in the form of cooperative education or internships.

Why States should avoid requiring additional coursework for licensure

States license engineers to protect the public health, safety and welfare. Efforts to increase licensure requirements can have significant effects on the engineering workforce with little or no improvement in public health, safety or welfare. Before implementing new licensure requirements, states should consider the following points:

- As concern grows about the nation's capabilities in science, engineering and technology, it is imperative that we expand our technological workforce. However, of the total degrees awarded annually, the percentage of engineering degrees has declined from a high of 7.7 percent in 1984 to only 5 percent today. Additional requirements will make it even more difficult to attract the highly capable students necessary to ensure technological growth. As countries such as China and India significantly increase their engineering graduates, the nation will be under increased pressure to remain a global leader in science and technology.
- For engineering graduates who enter the full time workforce immediately after completing their bachelor's degree, it is anticipated that it will take a minimum of five years to obtain the additional 30 credits. This adds an additional year or more between the FE and PE exam; again reducing the total number of engineers licensed to practice.
- For students who intend to complete all academic requirements prior to leaving campus, adding 30 additional hours of upper-level undergraduate coursework or graduate-level coursework will require a commitment to an additional academic year with the resulting tuition and room and board costs. Such expense, time and lost income is likely to be a significant deterrent to capable students (especially those from underrepresented groups) who may otherwise pursue an engineering degree.
- Further restricting the requirements for licensure may reduce the supply of licensed engineers who are able to practice in a state thus reducing the state's technological competitiveness and potentially raising the cost for engineering services.
- Existing mechanisms already are in place to assure the presence of highly competent professional engineers. ABET accredited bachelor's degree programs demonstrate the technical breadth and flexibility and intellectual skills necessary for engineering graduates to pass the Fundamentals of Engineering Exam, complete an internship under a licensed engineer, and pass the Principles and Practices Exam. Further, states have oversight mechanisms that can take action against individual engineers or parts of the system that have fallen short of professional expectations. Continuing education programs assure engineers remain up-to-date on new technologies and best-practices throughout their careers.
- While some baccalaureate degree programs have reduced the number of required hours over the past decades, this change has resulted in no drop in the test scores on engineering licensure exams. In order to produce such results, the approach to educating an engineer has had to become more efficient.

ASHRAE

Technology for a Better Environment

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RESOLUTION ON ADDITIONAL LICENSURE REQUIREMENTS

Whereas, The National Council of Examiners for Engineering and Surveying developed a model law requiring an additional 30 credit hours for obtaining licensure as an engineer.

Whereas, The typical scope of an ABET Accredited bachelor's degree can and has been demonstrated to accommodate technical breadth and flexibility and the intellectual skills necessary for engineering graduates to fulfill all requirements necessary to become licensed as a Professional Engineer.

Whereas, Committing an additional year to obtain an extra thirty (30) credit hours would be a very significant deterrent for many engineers who might otherwise pursue an engineering degree.

Whereas, The current system of examinations and supervision in practice are workable, effective and adaptable resulting in highly competent professional engineers.

Whereas, Technological change is continuous and must be maintained over a professional engineering career.

Whereas, Professionalism and continuous education across the decades of an engineering career are essential.

Whereas, ASHRAE will continue to develop educational programs that assure its members remain at the forefront of engineering practice and technologies.

Resolved, The ASHRAE Board of Directors opposes efforts to increase educational requirements for engineering licensure and encourages states and licensing boards to reject such proposals for the aforementioned reasons.

(Approved by ASHRAE Board of Directors on June 22, 2008)

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ASHRAE Insights

The Newspaper of the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.

ASHRAE Opposes Proposed New Licensure Requirement

ASHRAE and several other engineering societies are opposing an initiative that would require an additional 30 post-graduate credit hours as a prerequisite for obtaining licensure as an engineer.

ASHRAE says the measure would create an unnecessary hurdle to the profession when engineers are already in short supply.

The National Council of Examiners for Engineering and Surveying has developed a model law requiring the additional credit hours. The measure is known as the Bachelor's+30 initiative and would essentially require an engineering professional to obtain a master of science degree before being eligible to sit for the P.E. exam.

ASHRAE maintains that the typical scope of an ABET-accredited bachelor's degree has been demonstrated to accommodate technical breadth and flexibility and the intellectual skills necessary for engineering graduates to fulfill requirements necessary to become licensed as a professional engineer.

ASHRAE's Board of Directors recently approved a resolution against the additional requirement.

"ASHRAE feels that the requirement would be a significant deterrent to obtaining licensure." said ASHRAE Presidential Member Richard Hayter, who serves as the Society's liaison to the NCEES Engineering Education Task Force. "The current system of examinations and supervision in practice are workable, effective and adaptable, resulting in highly competent professional engineers."

"ASHRAE opposes efforts to increase educational requirements for engineering licensure and encourages states and licensing boards to reject such proposals," said ASHRAE President Bill Harrison. "ASHRAE will continue to develop educational programs that assure its members remain at the forefront of engineering practices and technologies."

2,000-Plus Take Part In Sessions in Mexico

MONTERREY, Mexico—The Monterrey Chapter contributed to the success of the AHR Expo-México 2008, held Sept. 23–25.

The chapter sponsored educational programs and workshops during the event on topics such as energy conservation, indoor environmental quality, guidance to achieve high-performing buildings, engineering and maintenance, and controlling devices.

More than 2,000 participants took part in the 42 programs, which offered more than 85 hours of instruction and maintenance.

The Expo set records with 355 exhibiting companies, 6,404 visitors, 2,624 exhibitor personnel, 9,028 total attendance ant 56,910 net square feet of exhibits.

Gabriel Covete (l.) and Guillermo Montemayor present a course on ultra-efficient cold water plants.

The next AHR Expo Mexico takes place Oct. 26–28, 2010, at the World Trade Center in Mexico City.

‘Wednesday Welcome’ at AHR Expo

Looking for a great way to celebrate New Year's Eve? Register for ASHRAE's 2009 Winter Conference in Chicago.

Advance registration for the ASHRAE event is open until Dec. 31. With the idea that resources must be conserved and environments respected even in urban settings, the ASHRAE Conference takes place Jan. 24–28 at the Palmer House Hilton. Held in conjunction with the meeting is the ASHRAE co-sponsored AHR Expo, Jan. 26–28, at McCormick Place.

For complete meeting information and to register, visit www.ashrae.org/chicago.

Meeting highlights include availability of more than 200 Professional Development Hour credits available through the technical program, with its theme of *Sustainable Urban Design,* and ASHRAE Learning Institute courses.

Seeking to create additional value for Expo and Conference attendees, ASHRAE is launching "Wednesday Welcome," at which all ASHRAE program sessions on Jan. 28 will take place at McCormick Place. Hands-on, applications-type programs are offered in the morning, leaving the afternoon open to tour the Expo.

ASHRAE's free public session is titled *Sustainability in Urban Development.* It focuses on how the industry is building on its efforts to increase energy efficiency and indoor environmental quality of buildings by furthering the sustainability of entire communities. It will be held at 3 p.m., Jan. 26 at McCormick Place.

Also featured in the technical program is the technical plenary speaker, Adrian Bejan, Ph.D., J.A. Jones Distinguished Professor of Mechanical Engineering at Duke University. Bejan developed the constructal theory,

See Winter Conference, Page 2

700 Attend ASHRAE NYSERDA Workshops

NEW YORK—Nearly 200 people attended the last of five ASHRAE workshops focused on data center energy efficiency and best practices. In all, nearly 700 people attended the workshops, funded through a grant from the New York State Energy Research and Development Authority (NYSERDA).

Implementation of the guidance and best practices information presented could result in a savings of at least an estimated $25 million for New York data centers over the next five years, with a 75% reduction in data energy use experienced in some data centers.

Instructor Roger Schmidt (r.) conducts a workshop at Baruch College in New York.

The workshops, held in various cities in New York State, were led by instructors who are data center authorities and who are active in ASHRAE Technical Committee 9.9, Mission Critical Facilities, Technology Spaces and Electronic Equipment.

189.1P

Standard Committee Reformed

As ASHRAE, the Illuminating Engineering Society of North America (IESNA) and the U.S. Green Building Council (USGBC) move forward in developing the nation's first standard for high-performance, green commercial buildings, membership on the committee developing the standard is being reconstituted.

Proposed Standard 189.1, *Standard for the Design of High-Performance, Green Buildings Except Low-Rise Residential Buildings,* will provide minimum requirements for the design of high-performance new commercial buildings and major renovation projects, addressing energy efficiency, a building's impact on the atmosphere, sustainability, water use efficiency, materials and resources, and indoor environmental quality.

To better address the areas covered in the proposed standard, a new committee is being appointed. A call for members closed on Dec. 4.

"The market will benefit from the lead taken by ASHRAE and its cosponsors in developing this most challenging standard, which addresses ever-evolving technology," said ASHRAE Presidential Member Kent Peterson, who has been named as chair of the Standard 189.1P committee. "As we have proceeded down this path, we recognized that the proposed standard would benefit from additional expertise and more involvement from interested parties. We are committed to developing this green building standard with accurate and appropriate technical content through a rigorous, transparent and fair standards development process."

ASHRAE, NEBB Sign MOU

GAITHERSBURG, Md.—ASHRAE President Bill Harrison (right) and NEBB President Jerry Bauers recently signed a memorandum of understanding between the two groups. The MOU will advance and promote the mutual interests of professionals engaged in the design, construction and operation of buildings.

ASHRAE FACTS & STATS

MISSION: Founded in 1894, the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) is an international nonprofit technical engineering society. ASHRAE fulfills its mission of advancing heating, ventilation, air conditioning and refrigeration (HVAC&R) to serve humanity and promote a sustainable world through research, standards writing, publishing and continuing education.

MEMBERSHIP: ASHRAE's technical foundation is built by its 55,000 volunteer members and a professional staff of 105. Across more than 130 countries, ASHRAE's membership in 170 chapters and 212 student branches includes consulting engineers (28%), contractors (11%) manufacturers (8%), manufacturing representatives/sales (7 %), and architects (5%).

EXPERTISE: ASHRAE's areas of expertise include energy efficiency, indoor air quality, codes and standards, and guidance for a safe environment during extraordinary incidents.

STANDARDS: ASHRAE – with 130 standard and guideline project committees that establish recommended design and operation practice – is one of only five standards-developing organizations in the U.S. that can self-certify that its standards have followed American National Standards Institute's (ANSI) standards development procedures.

RESEARCH: ASHRAE's research program, established in 1912, supports 81 research projects with a combined value of more than $8 million. Research focus includes energy and resource efficiency, indoor environmental quality, design and operation and management tools, alternative technologies and materials and equipment. Through scholarships and grants, the Society supports engineering education and research projects for graduate engineering students.

PUBLIC POLICY: ASHRAE's government affairs program provides a critical link between ASHRAE members and government through contributing technical expertise and policy guidance to Congress and the Executive branch. Current priorities include energy efficiency; building codes; science, technology, engineering and mathematics education; indoor environmental quality; and building security.

TECHNICAL OVERSIGHT: ASHRAE has some 100 technical committees that drive the ASHRAE research program, develop standards, sponsor the technical program at ASHRAE meetings, develop technical articles, special publications and educational courses and write the *ASHRAE Handbook*.

PUBLICATIONS: ASHRAE produces more than 300 publications, including the *ASHRAE Handbook,* the bible of the HVAC&R industry. The Society also publishes the peer-reviewed *ASHRAE Journal*, and *HVAC&R Research*, the most prestigious reporting of archival research in the fields of environmental control for the built environment.

CONTINUING EDUCATION: Through the ASHRAE Learning Institute, ASHRAE offers courses in a variety of formats, including eLearning, professional development seminars (in locations around North America or online), short courses (three-hour seminars offered during ASHRAE meetings) and self-directed learning courses (home study courses).

MEETINGS: The 2009 Winter Meeting is held in Chicago Jan. 24-29 in conjunction with the International Air-Conditioning, Heating, Refrigerating Exposition (AHR Expo). The 2009 Annual Meeting will be June 20-24 in Louisville, KY.

LOCAL CHAPTER LETTERHEAD

NOTE: Letters must be sent in compliance with the procedures laid out in the CTTC Primer on Government Affairs. These include securing permission from chapter leadership. If you have questions, please contact the ASHRAE Washington Office (washdc@ashrae.org or 202-833-1830).

[Date]

[Address]

Re: Opposition to onerous licensure requirements

Dear [Contact Name],

As engineers and building related professionals, we are extremely cognizant of the training and technical competence necessary to protect the public health, safety and welfare. Therefore, the [chapter name] of ASHRAE respectfully requests that you resist efforts to unnecessarily increase the educational requirements to become a licensed engineer in this state.

Within some engineering disciplines there is an effort to unilaterally require significant additional coursework for engineering graduates to obtain licensure. The additional coursework would increase the cost and time commitment associated with licensure and could result in a decrease in licensed engineers while providing no additional benefit to protecting public health, safety and welfare.

Existing mechanisms already are in place to assure the presence of highly competent professional engineers. ABET accredited bachelor's degree programs demonstrate the technical breadth and flexibility and intellectual skills necessary for engineering graduates to pass the Fundamentals of Engineering Exam, complete an internship under a licensed engineer, and pass the Principles and Practices Exam. Further, states have oversight mechanisms that can take action against individual engineers or parts of the system that have fallen short of professional expectations. Continuing education programs assure engineers remain up-to-date on new technologies and best-practices throughout their careers.

Before implementing new licensure requirements, we hope you will consider the following information:

- As concern grows about the nation's capabilities in science, engineering and technology, it is imperative that we expand our technological workforce. However, of the total degrees awarded annually, the percentage of engineering degrees has declined from a high of 7.7 percent in 1984 to only 5 percent today. Additional requirements will make it even more difficult to attract the highly capable students necessary to ensure technological growth.
- Adding 30 additional hours of upper-level undergraduate coursework or graduate-level coursework will require students to commit to an additional academic year with the resulting tuition and room and board costs. Such expense and time is likely to be a significant deterrent to capable students (especially those from underrepresented groups) who may otherwise pursue an engineering degree.
- Further restricting the requirements for licensure may reduce the supply of licensed engineers who are able to practice in the state thus reducing the state's technological competitiveness and potentially raising the cost for engineering services.

The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), founded in 1894, is an international organization of 52,000 members. ASHRAE fulfills its mission of advancing heating, ventilation, air conditioning and refrigeration to serve humanity and promote a sustainable world through research, standards writing, publishing and continuing education. ASHRAE will continue

to develop educational programs that assure its members remain at the forefront of engineering practice and technologies.

We have [number of chapter] chapters in the state consisting of [number of members] that can offer assistance. Additionally, members of our headquarters staff in Atlanta and government affairs staff in Washington, DC are willing and able to provide technical support. If you, or your staff, have any questions or would desire more information, please contact me or [name of chapter government affairs/CTTC chair or other suitable chapter member], at [contact info].

Sincerely,

[Name of chapter president]
ASHRAE [name of chapter] President

Attachment: ASHRAE Resolution on Additional Licensure Requirements

cc: Douglas Read, ASHRAE Director of Government Affairs