
# Analysis of the Potential Impact of Requiring Additional Education for Engineering Licensure

Prepared by the NCEES Engineering Education Task Force
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# Introduction

At its 2008 Annual Meeting in Minneapolis, NCEES passed a resolution to investigate the potential impact of the requirement for additional education prior to engineering licensure. The Council adopted this requirement in the *Model Law* and *Model Rules* in 2006. The 2008 resolution describes a number of concerns held by some NCEES Member Boards and others in the engineering profession that related to implementation of the requirement. This resolution is known as the Southern Zone Resolution. As a result of this action, President Henn Rebane, P.E., charged the Engineering Education Task Force (formerly known as the Bachelor's Plus 30 Task Force) with providing a written analysis of the following:

- The potential educational, professional, regulatory, and economic impact of the B+30 requirement; and
- Any alternative solutions to the additional education concept that have been or might be identified (including items such as additional experience before licensure in lieu of additional education).

This charge to the task force was to be completed prior to the interim zone meetings in 2009.

The task force conducted a conference call in October 2008 and held two face-to-face meetings (one in December 2008 and the other in February 2009). This written analysis provides the results of the task force deliberations.

## Terms and concepts in the analysis

It is important to note a few key terms and concepts used throughout the analysis. First, the term "master's or equivalent" is used to refer to the additional education requirement for engineering licensure. This is a departure from the terms "bachelor's plus 30" and "B+30" that were used by NCEES after passage of this requirement in 2006. Since then, members of NCEES have wrestled with the specifics of implementing it at the state level. A number of state boards indicated that it would be easier to pass legislation if the requirement were called a master's degree in engineering or equivalent. Therefore, after the 2008 Annual Meeting NCEES began referring to this requirement as simply "master's or equivalent," with one of the primary "equivalents" being B+30.

Second, the concept of a clearinghouse is mentioned throughout the analysis. The purpose of a national clearinghouse would be to perform additional education-related services for Member Boards, organizations and institutions, and individual applicants. The clearinghouse would be designed to make the master's or equivalent requirement easier for Member Boards to implement. In response to a separate charge—one that is outside the scope of this analysis—the Engineering Education Task Force has developed a conceptual model of such a clearinghouse, which will be included in the task force's 2009 Annual Meeting report.

Finally, in all discussion of master's or equivalent, it is important to recognize that a degree earned from a master's program accredited by EAC/ABET (known as an M-ABET degree) should satisfy the future requirement for additional education. ABET has recently lifted its prohibition of dual-level bachelor's and master's accreditation for the same engineering program at a college or university. This could, in the future, increase the number of M-ABET degree programs and add another pathway to satisfying the master's or equivalent.

## Structure of the analysis

The impact analysis in this paper is presented in a question/answer style. The task force felt that this style was most appropriate considering the number of individuals who contributed to writing the content. The information presented is based on the experience and expertise of the individual task force members.

The Engineering Education Task Force membership is made up of the following:

- 11 voting members from NCEES, including the chair
- 3 consultants, including a past president of ABET and the chair of the NCEES Committee on Uniform Procedures and Legislative Guidelines
- 7 society resources, representing ACEC, AIChE, ASCE, ASHRAE, ASME, IEEE–USA, and NSPE
- 1 Board of Directors liaison and 1 NCEES staff liaison

During the course of the task force meetings, the group discussed conducting original research to address the various issues. It was quickly decided that there was not enough time or funding available to conduct any serious research. Therefore, this analysis is the best effort task force members could accomplish in the few months available with the information readily available to them.

The full text of the Southern Zone Resolution is in the Appendix. One of the directives of the resolution is to develop a written analysis of the 10 Whereas statements, as appropriate. After developing the analysis of the various impacts, the task force members felt that most of the Whereas statements were addressed within the context of the analysis of each impact. Therefore, a separate analysis of each individual Whereas is not presented.

The following sections analyze the potential impact of the additional education requirements in educational, professional, regulatory, and economic areas. The paper concludes with a listing of alternatives to the master's or equivalent requirement.

## Educational Impact

The task force studied the potential educational impact by forming answers to the following questions.

- What are the pathways by which a candidate can obtain the required additional education?
- How long will it take for a candidate to obtain the needed education by these pathways?
- What other educational factors should be considered?

The task force considered six pathways by which a candidate could obtain the education needed for licensure in 2020, as shown in the table below.

### Table 1: Pathways to meeting additional education requirements in 2020

| Path | Bachelor's Education | Additional Education | Years for Education (B.S. = 4 years) | Additional Years of Experience | Total Years |
|---|---|---|---|---|---|
| 1 | EAC/ABET | • Engineering master's degree<br>• Full-time student | B.S. + 1–2 years | 3 | 8–9 |
| 2 | EAC/ABET | • Engineering master's degree<br>• Part-time student<br>• Full-time employee | B.S. + 4–6 years | 0* | 8–10 |
| 3 | EAC/ABET | • Engineering master's degree<br>• Executive format or "weekend" format<br>• Full-time employee | B.S. + 2 years | 2* | 8 |
| 4** | EAC/ABET | • Full-time student | B.S. + 1–2 years | 4 | 9–10 |
| 5** | EAC/ABET | • Part-time student<br>• Full-time employee | B.S. + 4–6 years | 0* | 8–10 |
| 6 | Non-EAC/ABET | • EAC/ABET engineering master's degree (M-ABET) | B.S. + 1–3 years | 3 | 8–10 |

*Accrues all or part of the experience requirement while completing the additional education requirement

**B+30 option

In the table, it is assumed that all full-time employment is acceptable for engineering experience and that experience credit for graduate education cannot be counted if it is concurrent with employment experience. The number of years of experience required prior to licensure varies depending on the type and length of education. Candidates with a master's degree are allowed to waive a year of the four years of progressive experience required for licensure. Candidates who earned the additional education as an alternative to a master's degree (the "or equivalent" part of the requirement) are not allowed to waive the year of experience.

In its discussions about the possible educational impact, the task force also addressed the following questions.

### Will there be a problem if it takes a long time to earn a master's degree?

Some universities have a time limit on how old a course can be and still be counted toward a master's degree. Usually, older courses in engineering can be validated by some procedure because the underlying theory has not changed.

### Will engineering classrooms have room for the additional students who will be taking courses because of the master's or equivalent requirement?

It is very likely that there will be room since the majority of engineering programs currently have available capacity at the graduate level.

### Will requiring more education increase the number of courses engineering faculty will have to teach?

An increase in the faculty-teaching load is unlikely at the present time because most programs have excess capacity for students. Many factors influence the number of courses that are assigned to each faculty member to teach. It is the responsibility of the university administration, starting with the chair of the department, to make these assignments. Each institution will make these teaching assignments according to its own needs and requirements.

### Would an engineering dean be concerned about another accreditation visit for a master's program?

Typically, a dean would be concerned about another accreditation visit because that visit would require additional work on the part of faculty and staff. The additional education requirements outlined in Table 1 would not require that any additional programs be accredited. An existing EAC/ABET-accredited bachelor's program is all that is needed. The dean may elect to have a master's program accredited, but M-ABET accreditation is not required to fulfill the additional education requirement for licensure.

### What is the difference between an accredited program and an approved course?

To ABET, a program includes the ability to change courses and create new courses. The concept of a program includes the procedures to evaluate courses and their contribution to overall objectives. An approved course for the additional education requirement is a standalone item. Any changes in the course and all new courses would have to be approved by the same authority that approved the course originally. It is expected that non-university institutions will not set up the procedures needed to establish a program. Thus, there needs to be a way for companies, laboratories, and professional societies to get their courses approved on an individual basis. For these institutions, the expense of setting up a full program may not be justified.

### Will bachelor's-degree recipients with low grade point averages (GPA) have a problem becoming licensed because their GPAs prevent them from being admitted to a master's program?

Applicants to an engineering master's program are generally evaluated on several criteria, including overall undergraduate GPA, GPA over the last 60 hours, Graduate Record Examination (GRE) scores, original essays, etc. Students are routinely admitted on probation if they meet most, but maybe not all, of the entrance requirements. Probation generally means that the student must have a B average after the first 12 hours of graduate work; if the student does not earn that B average, then he or she will no longer be in the program. There is sometimes an ability to waive an entrance requirement because the candidate has an alternative criterion that can be used (such as using a passing score on the FE or PE exam instead of the GRE). It is not necessary that a candidate be admitted into a graduate program in order to take graduate courses as a non-degree-seeking student; such candidates would not be earning a master's degree but would be able to earn credit for coursework that would qualify for the "or equivalent" portion of the master's or equivalent.

### Will graduate-level engineering courses be available by distance education or in an executive or "weekend" format?

Such courses and engineering master's degree programs are already available by distance education and in executive format. Two examples of these courses and programs are North Carolina State University (engineeringonline.ncsu.edu) and Iowa State University (www.ede.iastate.edu/Grad-Pro/). It is expected that the number of engineering master's degrees available by distance education or in executive format will increase with the demand for flexible locations and times.

### Will the increase in educational requirements for engineering licensure result in bachelor's education reform in engineering programs?

While it cannot be stated that undergraduate programs will change as a direct result of the additional educational requirements for licensure, the opportunity to reform undergraduate engineering programs will be available. Currently, many undergraduate engineering programs have eliminated "breadth" courses because of credit-hour limits and university core-curriculum requirements. If a master's degree increasingly becomes viewed as a degree required for practice, it is more likely that programs will shift senior elective courses in very specific subjects to the graduate level. If this were done, it could open up room in the undergraduate programs to put back the breadth courses that have been removed.

## Professional Impact

In its discussions about the potential professional impact, the task force addressed the following questions.

### Will the master's or equivalent requirement affect the number of individuals who will consider engineering as a career in the future? Will the requirement affect the number of licensed engineers who might be available in the future?

The answers to these questions differ for three different groups of individuals:

- **Pre-College Individuals:** For individuals who are considering an engineering career, the effects will probably be minimal. They will be able to understand the requirements well in advance of their decision and properly prepare for them. It is anticipated that their response will depend more on their impression of the profession, their level of interest in the profession, the efforts by the professional societies to promote the profession, and economic factors. For individuals with career plans that include licensed practice, the effect of the change would likely be similar to the effect for college students discussed under the next bullet.
- **College Students:** For individuals who have decided on an engineering career that requires a license and who will continue with their education to satisfy the additional education requirements, the proposal adds a significant amount of additional educational time (a minimum of 1 to 2 years beyond the bachelor's degree) and cost (addressed in this paper's section on Economic Impact). These factors could reduce the number of these individuals who pursue licensure.
- **Post-College Engineers:** Those who decide to pursue licensure after graduation with a bachelor's degree will also be affected by the time (an estimated 4 to 6 years) and cost to complete the additional education requirements. In addition, there may be significant non-economic costs while they fulfill the requirements, such as the impact on an individual's personal and family life. These factors could reduce the number of these individuals who pursue licensure. This is not a completely new situation in licensure. It is fairly common for state boards to address individuals who did not decide on a career in licensed engineering practice until after college. Depending on the individual circumstances, some of them have to make significant additions to their education and experience to qualify.

In the Economic Impact section, the task force considered it likely that the value of lifelong earnings would offset the cost for pursuing the proposed additional education requirements. Some task force members believe that individuals may not value such a long-term return in such a quantitative way. If that is the case, there could be a negative effect on those who choose a career as a licensed engineer. Other members said that the need for licensed engineers will not diminish and that as the demand for licensed engineers exceeds the supply, market forces will adjust and the shortage would be addressed.

### What effect will the master's or equivalent requirement and the potential reduction of numbers of individuals that pursue licensure have on NCEES exam usage?

If the number of individuals pursuing licensure drops, it would result in a corresponding drop in the number of both Group I and Group II PE examinations administered. This would have a financial impact on NCEES that would have to be addressed. Perhaps of more concern would be the effect on the Group II exams. The Group II exams are supported by lower numbers than the Group I exams. Consequently, a drop in numbers for certain Group II exams could result in the exams being placed on probationary status.

### If the additional education requirement results in fewer engineers becoming licensed, would this have a negative effect on the ability of licensed engineers to properly exert responsible charge?

The task force noted that a reduction in the number of licensed engineers could result in licensed engineers having to be in responsible charge of more projects. This may or may not have an effect on their ability to properly exert responsible charge.

### Would the master's or equivalent requirement result in better P.E.'s?

The task force agreed that raising the educational standard should eventually result in a more knowledgeable, capable, and better-educated engineering workforce, which could be reflected in an improved quality of services by licensed engineers.

### Will the new requirement increase the perceived stature of the engineering profession?

The task force decided that although this is not a primary driver of the initiative, the stature of the profession might improve as a result of the master's or equivalent requirement.

### What have other learned professions recently done relative to educational requirements?

Many of the learned professions, including architecture and accounting, have increased their educational requirements. This fact does not necessarily mean that engineering should follow suit, but it is an indication that the concern currently being considered in our learned profession has also occurred in others. Since part of the definition of a learned profession includes "specialized knowledge gained through formal training or education," this fact should not be ignored. In addition, it may be of value to look at the lessons learned by the other professions.

# Regulatory Impact

The task force interprets the regulatory impact of the master's or equivalent requirement to mean the effect it will have on Member Boards as they license professional engineers beginning in 2020 and thereafter.

One of the primary concerns of Member Boards is the perceived difficulty in implementing the *Model Law/Model Rules* additional education language and the associated clearinghouse in their jurisdictions. State legislators may have an easier time passing additional education legislation that looks like a master's degree, or equivalent, than legislation that looks like the B+30 requirement. Under the bachelor's-plus-a-master's-or-equivalent scenario, the B+30 pathway is one of the equivalents (see pathways 4 and 5 in Table 1 in the Educational Impact section); therefore a jurisdiction could bypass the B+30 requirements and enact just the master's requirement if it felt the former was too difficult to implement.

### How will the additional education requirement affect comity?

Like everything else in the NCEES *Model Law* and *Model Rules*, the master's or equivalent concept becomes a national guideline once the effective date is reached. The *Model Law* and *Model Rules*, however, are simply that—a model. They exist for the use of individual jurisdictions to the extent a jurisdiction wishes to use them. It follows that the master's or equivalent requirement will have no regulatory impact if no jurisdictions choose to adopt the *Model Law* and *Model Rules* in their statutes.

The regulatory impact will occur after a jurisdiction adopts the additional education requirement in its statute. The most obvious impact is that individuals will not be able to obtain their first license in that jurisdiction without meeting the requirement. This could initially decrease the number of first-time licensed engineers in that jurisdiction if individuals choose not to fulfill the new education requirement. If individuals desire to practice in that jurisdiction, the impact will be less because they will choose to fulfill the requirement.

Additionally, comity will be affected for non-Model Law Engineers properly licensed in other jurisdictions but only if the jurisdiction with the master's or equivalent requirement will not "grandfather" the engineer for being licensed prior to the effective date.

The number of engineers who meet the Model Law Engineer 2020 designation could increase as a result of a desire to receive national comity through the Council Records program.

It should be noted that comity issues between jurisdictions currently exist. With regard to the additional education requirement, comity will be affected if an individual Member Board has different requirements for the credit split between technical and nontechnical courses or different interpretations relative to what is considered a technical course versus a nontechnical course or if individual Member Boards accept different equivalents. Jurisdictional differences in the definitions of acceptable coursework and providers as well as the percentage of engineering and non-engineering

coursework could also affect comity. In another case, comity could be affected if a Member Board accepts only the master's degree while not accepting the "or equivalent" portion of the master's or equivalent requirement.

Another potential impact of the master's or equivalent requirement could be comity affected by the equivalency of master's degrees. If, in the future, only a small percentage of master's programs are accredited by ABET, some NCEES Member Boards may not deem all master's degrees equivalent, thus affecting comity.

### How will enforcement be affected by implementation of the additional education requirement?

Another regulatory impact could be an increase in unlicensed practice. This could occur if the master's or equivalent requirement results in fewer licensed engineers. There could be instances where more unlicensed engineers are performing the work, which could result in more plan stamping.

In the above case, the regulatory impact is assumed to be the result of fewer individuals becoming licensed because of increased education requirements for licensure. If the number of individuals who become licensed after the master's or equivalent goes into effect does not significantly decrease over time, then the impact will not be more significant than it currently is.

The number of complaints/disciplinary actions resulting from incompetence could decrease if the additional education requirement produces a population of more highly educated, competent professional engineers.

### Will the master's or equivalent requirement increase the workload of Member Boards?

A potential Member Board impact is an increased workload. This could result if a particular Member Board chooses to review applications individually rather than relying on the clearinghouse. In addition, a Member Board administrator and his or her staff could spend more time answering questions from individuals seeking clarification on clearinghouse issues. This impact is expected to occur mainly during the initial stages of a jurisdiction adopting the master's or equivalent requirement and is not expected to be a long-term impact.

### How could the clearinghouse potentially diminish the regulatory impact?

In all the examples cited above, it is critical that a highly functioning clearinghouse be in place to facilitate greater national uniformity in the application of the new requirement. The clearinghouse will also need to create a level of trust so that Member Boards will not feel compelled to exhaustively review the record of every individual applying for licensure. With a clearinghouse in place, the regulatory impact could be minimized.

# Economic Impact

The implementation of the *Model Law* provisions requiring a master's or equivalent will have an economic impact on applicants and their employers due to the cost of the additional education borne by those engineers who otherwise would not obtain a master's degree. Some engineers' salaries will likely increase. There will be an economic impact on the public in that the cost of engineering services may increase to cover the cost of additional education and increased salaries.

### What percentage of current engineers would potentially meet the master's or equivalent requirement for licensure if it were in effect today?

The task force reviewed data from several sources in addressing this question.

- The task force looked at responses from an NCEES survey of 19,100 examinees who sat for the FE, PE, FS, and PS exams in ELSES states in October 2008. There were 8,231 respondents, of whom 3,395 took the PE exam. When asked to indicate the highest engineering degree they had completed, 70 percent said a bachelor's, 26 percent a master's, and 4 percent a Ph.D.
- Data from the American Society for Engineering Education for the United States in 2006–07, the latest year for which statistics were available, indicate that the number of master's degrees awarded in engineering was roughly half (50.4 percent) the number of engineering bachelor's degrees awarded. This percentage has increased in recent decades. Some of those who receive master's degrees are foreign born, and some of them return to their native countries. The percentage of graduates with M.S. degrees varies widely by discipline; it is 40 percent for civil and environmental engineers, most of whom are licensed, and 64 percent for electrical and computer engineers, most of whom are not licensed. The percentage is lower for chemical and mechanical engineers: 23 and 27 percent, respectively.
- Data from several exam administrations in Texas indicate that about 40 percent of PE examinees had an advanced degree at the time of examination. Some of these advanced degrees were in business.

Based on the available information, the estimated portion of current engineers who would have been required to attain additional education for initial licensure if the requirement were already in effect is about 60 percent or somewhat higher.

### Will P.E. salaries be affected?

Salary survey information and an analysis of the survey data was provided by the National Society of Professional Engineers Licensure and Qualifications for Practice Committee. The salary survey data from a sample of about 12,000 professional engineers indicate that the median career-long salary differential between P.E.'s with a master's degree and P.E.'s with only a bachelor's degree is 5.5 percent over the course of a 30-year career. This translates to a 30-year increase in compensation of a present value of $75,000 if the spread between salaries does not increase over time with inflation and of $125,000 if the spread does increase with inflation.

Some engineers receive a compensation increase when they receive a P.E. license. In cases where the additional engineering education requirements delay the time of licensure for one or more years, this additional compensation might be received later. After completing the additional engineering education and becoming licensed, engineers may have improved prospects of advancing to positions of greater responsibility and higher compensation, and they may have increased long-term employment security due to increased skills. Future salary differentials may or may not be consistent with historic data.

### What does it cost to earn a master's degree in engineering?

The cost of obtaining a master's degree in engineering varies widely based on the institution, delivery method, and program. Many conventional master's engineering programs that require a thesis may take an average of 18 months as full-time students in residence at a university. Project and course-only master's degrees, as well as accelerated "executive" M.S. degrees, are becoming more common; full-time students can typically complete them in one year. High-quality graduate engineering distance-learning options are now available in most engineering disciplines, allowing an engineer intern to take one course at a time and obtain a master's degree while working full time. Costs for tuition, fees, and books for 30 credits of graduate engineering education by distance learning are currently in the range of $18,000 and up. Costs for attendance at a university with living expenses included are in the range of $20,000–25,000+ per year.

### Who will bear the cost of the additional education?

The cost of additional engineering education may be borne by engineers early in their careers, when earning power and available assets are limited. The cost may be partially offset by scholarship grants for some engineers or by contributions from some employers.

Engineers' employers will also experience an economic impact, either through higher salaries or through employers' partial contributions to employees' cost of education, or both. Many employers currently share in the cost of tuition for some employees. These contributions may continue at current levels or may be reduced as demand increases, perhaps placing more of the burden on the individual. Engineering employers will have to adopt appropriate policies to deal with the possibility of losing an engineer to a competitor or other employment following the employer's sharing in the investment in additional engineering education costs.

In some engineering disciplines, compensation for engineers with master's degrees is significantly higher in industry than is the case in the "built environment." Some perceive there to be an associated risk that engineers with master's degrees will move away from the built environment to industry.

Accurately estimating the national economic impact of this change in the engineering profession would require far more resources than are available to the Engineering Education Task Force. Taking a simplistic approach with the information and resources currently available, one might estimate based on historical data that salary levels for 60 percent of engineers might increase an average of 5.5 percent

over the course of their careers, resulting in a ballpark estimate of the overall impact on the cost of engineering services in a range of 3 to 4 percent. This is the cost to be weighed against the subjective benefit of a more qualified professional engineering workforce and improved protection of public health, safety, and welfare resulting from engineers' increased knowledge and skills.

## Alternatives to the Master's or Equivalent Requirement

As mentioned in the introduction to this paper, this section addresses the Southern Zone resolution's request for alternatives to the current additional education requirement. Two things to note are that an EAC/ABET engineering bachelor's degree is assumed to be a prerequisite in all of the alternatives and that the amount of hours and years mentioned below are merely suggestions and would need to be analyzed if the Council decides to move in one of these directions.

During the discussions about what alternatives to present in this analysis, the task force deliberated on whether to include rescission of language about the additional education requirement that the Council voted to add in the *Model Law* and *Model Rules* in 2006. A motion was made to accept all of the alternatives listed below, including one about rescinding the current definition. A motion was then made to amend the original motion by removing "rescission" as an alternative. The amendment passed by a 6:5 vote of the task force members; the nonvoting society resources took a straw poll vote and were equally split. The task force then voted on the amended motion to present the following alternatives as shown below. The amended motion passed by a 7:2 vote.

What the task force presents here is a list and not an analysis of the viability or equivalency of the items in the list. Just as the master's or equivalent has been researched and developed over a number of years, these alternatives would need to be further studied and defined in the future.

### A. Continuing education between the FE and PE exams

Similar to the continuing education required in the *Model Law* for a P.E. to maintain a license, individuals who are beginning their engineering career should also be expected to continue their education. During the period in between taking the FE and PE exams, the candidate would be required to take courses totaling 150 contact hours (approximately 10 college credit hours) in areas germane to the applicant's area of practice. As with the present additional education requirement, criteria should be developed that would allow either credit or noncredit courses to be accepted. In its discussions, the task force envisioned that the contact hours were to have more rigor and assessment than most jurisdictions' requirements for a professional development hour. The clearinghouse function in this alternative would be to ensure that the provider and the coursework were of the rigor and assessment appropriate in advancing the applicant's ability to practice as a professional. The hours taken by the applicant should supplement the professional experiences gained during 4 years of professional practice.

### B. Continuing education between the FE and PE exams with mentoring

This alternative includes all of Alternative A described above, plus the implementation of a structured mentoring program that would assure the quality of the professional experience. This could be a program similar to Canadian, Australian, and architecture programs.

For example, the architects have developed an intern development program that requires an architectural intern to have two mentors who are registered architects; one is the intern's supervisor and the other is selected by the intern. Specific professional categories that apply to the work environment are identified. The intern is mentored for 700 hours over 3 years and must submit documentation along the way on what he or she has covered.

### C. Continuing education between the FE and PE exams with 6 years' experience

This alternative includes all of Alternative A described above, except that the hours taken by the applicant should supplement the professional experiences gained during 6 years of professional practice.

### D. Master professional engineer

This alternative is a market-driven approach where an individual's knowledge in a specific discipline would be enhanced by additional education. The idea of a master professional engineer is consistent with what is done in the United Kingdom with the chartered engineer designation. In the United States, the master professional engineer concept is similar to that of the structural engineer in discipline-specific title act states. Most individuals who pursue the discipline of structural engineering will major in civil engineering with an emphasis in structural engineering. They then go on to graduate school to specialize in structural and get a master's degree either in structural or civil engineering. The master professional engineer license would be available only to those choosing the additional education path, but it could be broadened to any engineering discipline offering a master's program.

In this alternative, the P.E. licensing requirements with regard to education would revert to those in effect prior to the 2006 change to the *Model Law*, i.e., an EAC/ABET bachelor's degree and 4 years of experience.

# APPENDIX

## Southern Zone Resolution Passed by NCEES at the 2008 Annual Meeting

Concerning the bachelor of engineering degree plus thirty credit hours (B+30) as a requirement for engineering licensure

WHEREAS, Some have expressed support of the concept of additional engineering education for all engineers (not just those who choose the path to professional licensure); and

WHEREAS, Some believe that the educational community will adapt to teaching students the fundamental body of knowledge needed to be entry-level engineers in the profession; and

WHEREAS, Some believe that technology allows for greater efficiency in analyzing and solving technical problems, using less classroom and study time than at previous times; and

WHEREAS, The B+30 concept, as currently constructed, only impacts the engineers who become licensed; and

WHEREAS, Some contend that the engineering licensure process should not be compared to other professions; and

WHEREAS, Some question the strength of the correlation between credit hours required for the bachelor's degree and the competency of entry-level engineers via items such as lower FE/PE pass rates, the production of less competent practicing engineers, or other measures; and

WHEREAS, Some are concerned that placing additional curriculum requirements would adversely affect meeting a perceived shortage of licensed professional engineers in this country; and

WHEREAS, The B+30 concept has been opposed by some professional engineering organizations; and

WHEREAS, The B+30 concept may not be easily adopted into individual state statutes and, where adopted, some are concerned that comity between states will be put into jeopardy; and

WHEREAS, The 2007 NCEES resolution regarding a greater effort to include ABET in the goal of additional education has led to discussions between these organizations' leadership; therefore, be it

RESOLVED, That the NCEES president charge a committee/task force (and it is recommended that this committee/task force be the current B+30 Task Force) with the development of a written analysis of 1) the above listed points as appropriate; 2) the potential educational, professional, regulatory, and economic impact of B+30; and 3) any alternative solutions to the concept of additional education that have been or might be identified (including items such as additional experience before licensure in lieu of additional education, etc.). The purpose of these reports would be to allow NCEES jurisdictions to make better-informed decisions regarding B+30. It would be expected that this analysis could be completed by the time of the 2009 Interim Zone Meetings.