Is it Time for ASCE to Withdraw from ABET?


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Purpose and Scope

Over the past few years, faced with persistent budget pressures, members of the American Society of Civil Engineers (ASCE) Board of Direction have raised serious concerns about the substantial costs associated with the Society’s membership in ABET. These concerns have been exacerbated by longstanding issues with some of ABET’s policies, priorities, and processes, and with ASCE’s declining influence in ABET governance. Given these concerns, Board members have inquired about the feasibility of ASCE withdrawing from ABET.

The purpose of this paper is to respond to the ASCE Board’s inquiry by investigating the feasibility of ASCE withdrawing from ABET. Our purpose is not to advocate for or against withdrawal, but rather to inform future Board decisions by identifying the potential benefits, costs, and implications of withdrawal.

We begin by providing background information on ABET, its Member Societies, and its accreditation criteria. We then address the following research questions:

- From ASCE’s perspective, what are the benefits and costs associated with membership in ABET?
- To what extent has ASCE’s membership in ABET enabled or hindered the Society’s pursuit of its strategic interests?

Based on the answers to these questions, we propose a strategy by which ASCE could withdraw from ABET without significantly compromising most of the key benefits the Society currently obtains from ABET membership. We examine the risks associated with this strategy; and we conclude by summarizing the implications—positive and negative—of ASCE terminating its membership in the ABET federation.

Background: ABET and its Member Societies

ABET is a nonprofit organization that accredits university-level programs in applied and natural science, computing, engineering, and engineering technology [1]. ABET is also a federation of 35 Member Societies, most of which represent the technical disciplines that ABET accredits [2].

The current ABET governance structure is illustrated in Figure 1. This organization—which has been in effect since a major ABET governance restructuring in 2015—consists of a Board of Directors, a Board of Delegates, and four Area Delegations. The Area Delegations oversee four associated ABET Commissions—the operating entities that implement ABET accreditation [3]. Within this governance structure, only the Board of Delegates and Area Delegations are representative bodies, with each Member Society allocated between one and three seats in each relevant body, based on the society’s current number of accredited programs. ASCE’s current representation in these governing bodies is indicated by the numbers in parentheses in Figure 1.
Membership in ABET is voluntary. According to the ABET Constitution, the eligibility criteria for Member Society status include [4]:

1. active engagement in the dissemination of technical knowledge;
2. demonstrated interest and capability in the accreditation process;
3. substantial membership of employed graduates in the discipline;
4. an organizational structure that has an educational component; and
5. evidence the society speaks for the technical community it represents.

Under the provisions of the ABET By-Laws, a professional society may apply for membership in ABET with a letter from the society’s governing body to the ABET Executive Director. This letter must provide the society’s rationale and qualifications for membership. A particularly important requirement is that the application “must identify the curricular areas and educational programs the society seeks to represent, and for which it would play a lead role in criteria development [6].” The underlying principle is that each Member Society must serve as a representative for at least one specific curricular area, within the fields of engineering, engineering technology, natural and applied science, and computing.” In this capacity, a Member Society is expected to serve as a Lead Society (or Co-Lead Society) for the development of Program Criteria (discussed below).

Applicants for ABET Member Society status must be approved by a majority vote of the ABET Board of Directors, with the recommendation of the Board of Delegates and subsequent ratification by at least two-thirds of the governing bodies of the current Member Societies [4]. It should be noted, however, that ASCE has never been subjected to this approval process, because ASCE was a founding member of ABET’s predecessor organization—the Engineers’ Council for Professional Development, established in 1932 [7].

“Two ABET Member Societies—the National Council of Examiners for Engineering and Surveying (NCEES) and the National Society of Professional Engineers (NSPE)—are exempt from this requirement because of their unique roles in ABET.
To maintain their membership in the ABET federation, all Member Societies pay annual dues, which are established by the ABET Board and are based upon two factors: (1) the society’s allocated number of seats in the Board of Delegates and (2) the number of accredited programs for which the society serves as Lead Society. For Fiscal Year 2019-2020, ASCE’s annual fees totaled $139,932. The component costs associated with Board of Delegates seats and accredited programs are itemized in Table 1 below.

<table>
<thead>
<tr>
<th>Fee Factor</th>
<th>Rate</th>
<th>Quantity</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Board of Delegates seats</td>
<td>$17,619.00 per seat</td>
<td>3</td>
<td>$52,857</td>
</tr>
<tr>
<td>Accredited programs</td>
<td>$225 per program</td>
<td>387</td>
<td>$87,075</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$139,932</strong></td>
<td></td>
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Table 1. ABET Member Society Dues paid by ASCE for Fiscal Year 2019-2020

The procedure for a Member Society to withdraw from ABET is specified in Section Three of the ABET By-Laws as follows:

A Society may withdraw from ABET by providing written notice to the Executive Director at least six months prior to the end of an ABET fiscal year. The Board of Directors is empowered to accept the withdrawal, and the Board of Delegates shall be notified of the Board of Director’s decision at the next regularly scheduled meeting [6].

In the 88-year history of the organization, eight Member Societies have withdrawn from ABET or its predecessor, ECPD [8].

**Background: ABET Criteria**

Each ABET Commission develops, publishes, and implements accreditation criteria in two broad categories—General Criteria, which are applicable to all programs accredited by the associated Commission, and Program Criteria, which are applicable only to programs with a specified program name [9].

Each set of Program Criteria must include two elements:

- an *applicability clause*, which specifies the specific program name(s) to which the criteria apply; and
- a Lead Society or multiple Co-Lead Societies, which are responsible for developing the criteria.

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* This expenditure represents approximately 0.6% of ASCE’s $23.1 million annual budget for Program Activities [5].
† ABET Member Society Dues paid by ASCE during Fiscal Year 2018-2019 were $150,107.00. ABET implemented a significant dues reduction in 2019, in response to concerns expressed by several Member Societies.
Program Criteria may also specify curriculum topics and faculty qualifications, though these elements are optional. Several current sets of Program Criteria (e.g., Systems and Similarly Named Engineering Programs) specify only that “there are no program-specific criteria beyond the General Criteria. [10]”

According to the ABET Policies and Procedures Manual (APPM), paragraph I.C.4.c.(2), “If a program name implies specialization(s) for which Program Criteria have been developed, the program must satisfy all applicable Program Criteria [9].” Conversely, if a program name implies specialization for which Program Criteria have not been developed, then the program may use that name but is not required to satisfy any Program Criteria. As of November 2019, there were 199 such ABET-accredited programs—with program names implying specialization in fields such as Robotics Engineering, Plastics Engineering, and Structural Engineering, but accredited only under General Criteria. These “General Criteria only” programs should not be confused with programs named “Engineering” or “General Engineering,” which do have Program Criteria and a Lead Society—the American Society for Engineering Education (ASEE).

Accredited programs can also have curricular concentrations without having to comply with Program Criteria in their areas of concentration. For example, an EAC-accredited program named “Engineering” could have a curricular concentration in Civil Engineering but would not be required to comply with the Civil Engineering Program Criteria.

All of these cases are governed by a simple underlying principle: Program Criteria are invoked only by the program name.

Benefits and Costs of ABET Membership

Based on the authors’ collective 40 years of experience serving in ABET governance and ASCE accreditation-related committee and staff roles, we suggest that ASCE gains five principal benefits from its membership in the ABET federation. These benefits are listed in Table 2 below, along with the accreditation-related activities through which these benefits are attained. Benefits are numbered 1-5 for subsequent reference in this paper.

The use of ABET accreditation to establish and enforce educational standards (Benefits 1-3 below) is particularly important for engineering licensure, which is strongly supported by ASCE as a matter of official society policy [11]. Although the educational requirements for the Professional Engineer (P.E.) license vary considerably from state to state, a degree accredited by the Engineering Accreditation Commission (EAC) of ABET is widely considered the “gold standard” for satisfying these requirements [12].

Moreover, the use of ABET EAC accreditation as the principal educational standard for licensure greatly increases the efficiency and consistency of the process by which state licensing boards vet the applications of licensure candidates. Because ABET accredits degree-granting programs, state boards can reasonably assume that all graduates of ABET EAC-accredited programs meet the minimum standards specified in the EAC accreditation criteria. Without ABET accreditation, these boards would need to evaluate the academic transcripts of each individual applicant for licensure.
Table 2. Principal benefits gained from ABET membership

<table>
<thead>
<tr>
<th>Benefit</th>
<th>Accreditation-Related Activity</th>
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<tbody>
<tr>
<td>Ability to establish <em>discipline-specific standards</em> for curriculum</td>
<td>Development and promulgation of Program Criteria for civil, construction, and architectural</td>
</tr>
<tr>
<td>content and faculty qualifications, which guide the educational</td>
<td>engineering and engineering technology</td>
</tr>
<tr>
<td>preparation of future engineering professionals and technologists in</td>
<td></td>
</tr>
<tr>
<td>curricular areas of interest to ASCE</td>
<td></td>
</tr>
<tr>
<td>Ability to participate with other ABET Member Societies in establishing</td>
<td>Development and promulgation of General Criteria at both the baccalaureate and master’s levels</td>
</tr>
<tr>
<td><em>general standards</em> for the educational preparation of future</td>
<td></td>
</tr>
<tr>
<td>engineering professionals and technologists</td>
<td></td>
</tr>
<tr>
<td>Enforcement of these standards through the objective, systematic</td>
<td>Implementation of the ABET accreditation process</td>
</tr>
<tr>
<td>evaluation of degree-granting programs throughout the U.S.</td>
<td></td>
</tr>
<tr>
<td>Ability to participate with other ABET Member Societies in establishing</td>
<td>Participation in ABET governance</td>
</tr>
<tr>
<td>the policies and procedures that govern ABET accreditation</td>
<td></td>
</tr>
<tr>
<td>Ability to engage more broadly in a community of professional societies</td>
<td>Participation in ABET governance and in the ABET accreditation process</td>
</tr>
<tr>
<td>with a shared interest in the quality of engineering education</td>
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</tbody>
</table>

Table 3. ASCE’s approximate annual costs associated with ABET membership, based on Fiscal Year 2020 expenditures, but not including staff costs

<table>
<thead>
<tr>
<th>Accreditation-Related Function</th>
<th>Annual Cost</th>
</tr>
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<tbody>
<tr>
<td>ABET annual dues</td>
<td>$139,900</td>
</tr>
<tr>
<td>Travel costs for participation in ABET governance</td>
<td>$5,000</td>
</tr>
<tr>
<td>Management of ASCE Committee on Accreditation</td>
<td>$11,200</td>
</tr>
<tr>
<td>Management of ASCE Committee on Accreditation Operations</td>
<td>$7,400</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$163,500</strong></td>
</tr>
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</table>
ABET Accreditation and ASCE’s Pursuit of its Strategic Goals

To a large extent, ASCE’s ability to establish, promulgate, and enforce educational standards through ABET accreditation represents a powerful tool for advancing the Society’s strategic interests.

One of ASCE’s most important strategic initiatives of the past two decades has been the ongoing effort to raise the educational standards for entry into the professional practice of civil engineering. In conjunction with this “Engineer Tomorrow” (formerly “Raise the Bar”) initiative, ASCE has defined and published the Civil Engineering Body of Knowledge (CEBOK), defined as “the knowledge, skills, and attitudes necessary to exercise responsible charge in the practice of civil engineering [13],[14].” The CEBOK is attained through undergraduate and post-graduate engineering education, mentored experience, and self-development. Furthermore, as specified in ASCE Policy Statement 465, a principal tool for promoting attainment of the CEBOK is “establishing accreditation criteria for the formal education process [13].”

Consistent with this policy:

- ASCE published the first edition of the CEBOK in 2004 [15] and then developed and implemented CEBOK-based EAC Civil Engineering Program Criteria, effective for accreditation visits starting in the fall of 2008 [16].
- ASCE published the second edition of the CEBOK in 2008 [17] and then developed and implemented revised CEBOK-based EAC Civil Engineering Program Criteria, effective for accreditation visits starting in the fall of 2016 [18].
- ASCE published the third edition of the CEBOK in 2019 [19] and has initiated the process of developing revised CEBOK-based EAC Civil Engineering Program Criteria, which will be effective for accreditation visits starting in the fall of 2024 [20].

These successes notwithstanding, ASCE’s efforts to advance its strategic interests through accreditation have also been hindered—in varying degrees—by a series of issues with ABET policies, processes, and criteria over the past decade. A comprehensive discussion of these issues is beyond the scope of this paper. Rather, below, we briefly describe seven representative examples of these issues, along with references that provide additional details.

- **Attainment of outcomes** – In 2008, a newly proposed revision to the EAC Criteria for Accrediting Engineering Programs eliminated a longstanding explicit requirement for students to attain the outcomes specified in Criterion 3. Previous editions of these criteria had specified that “engineering programs must demonstrate that their students attain the following outcomes…..” The revised criteria specified only that “the program must have documented student outcomes…” and that “the program must regularly use appropriate, documented processes for assessing and evaluating the extent to which the student outcomes are being attained.” In April 2010, ASCE raised this issue in a letter to ABET; however, these concerns were ignored. At the subsequent (October 2010) meeting of the ABET Board, ASCE made a motion that the EAC take action to clarify the issue of outcomes attainment, but this motion was defeated [21].
• **Lower bound on technical curriculum content** – During this same period, ASCE identified a concern about the definition of “one year of study,” as it was specified in the EAC Criteria at that time. The wording of the definition (“one year is the lesser of 32 semester hours…or one-fourth of the total credits required for graduation.”) was problematic, because it placed no definitive lower bound on a program’s math, basic science, and engineering content [21]. It also unfairly penalized programs that require relatively more total credit hours for graduation. In April 2010, ASCE sent a letter to ABET expressing these concerns and recommending that one year of study be definitively specified as 32 semester hours. ASCE received no response to this letter. In June 2011, NCEES sent a letter to ABET expressing similar concerns and also recommending that one year be defined as 32 semester hours. After one full year, the ABET EAC Chair denied the NCEES request. This issue remained a major concern until October 2017, when the ABET Engineering Area Delegation passed an EAC Criteria change that eliminated the concept of “one year of study” entirely and, instead, specified definitive minimum credit hour requirements for mathematics, basic sciences, and engineering topics [22]. Although this change was acceptable to ASCE, it was not ideal, because the specified “floor” for technical content was significantly lower than the level ASCE and NCEES had previously requested.

• **Program naming** – As noted above, APPM paragraph I.C.4.c.(2) is generally interpreted to mean that a program is not required to satisfy any Program Criteria if its program name implies specialization for which Program Criteria have not been developed. ASCE maintains that this policy is inappropriate, because the use of a program name by an accredited program implies the fulfillment of minimum standards in the associated curricular area—and implicitly communicates this message to the public. Because of this policy, large and increasing numbers of programs have been accredited under highly specialized program names (e.g., railroad transportation engineering), even though there are no discipline-specific standards to serve as the basis for these accreditation evaluations. In the 2011-2012 timeframe, ASCE developed a simple but comprehensive proposal to address this issue; however, the proposal was disapproved by the ABET Board of Directors in March 2012 [21]. Although some ABET leaders have acknowledged that continuing growth in the number of “General Criteria only” programs is a concern, no further action has been taken on the issue since 2012.

• **Assignment of program names to Commissions** – The program naming issue described above has been exacerbated by substantial ambiguities in ABET’s procedures for determining which Commission is responsible for accrediting a given program. APPM paragraph I.C.4.c specifies that “The program name determines the commission…applicable to its review,” and APPM I.C.3 provides a series of rules by which program names are to be associated with Commissions (e.g., “All engineering program names must include the word ‘engineering,’”) However, these rules are ambiguous and are not logically all-inclusive. For example, the current APPM provisions are not sufficiently specific to determine whether a program named “Infrastructure Engineering Technology” would be accredited under EAC, ETAC, or ANSAC. ASCE raised this issue at the March 2018 meeting of the ABET Board of Delegates and then followed up with a written analysis demonstrating the feasibility of a logically consistent, all-inclusive set of rules for unambiguous assignment of program names.
to Commissions. Even after revisiting this issue at every subsequent meeting of the Board of Delegates, ASCE has not received a satisfactory response from ABET.

- **ABET governance restructuring** – In October 2013, ABET established a task force to develop a new governance structure for the organization. At the time, ABET’s sole governing body was its 55-member Board of Directors, composed of five officers plus Directors representing all of the ABET Member Societies. The Board organization also included a 14-person Executive Committee that was authorized to act on the Board’s behalf, between its two annual face-to-face meetings. In 2014, the governance task force proposed a substantial downsizing of the Board of Directors—from 55 to 13 members—and elimination of both its representative character and its Executive Committee. To compensate for the loss of Member Society representation on the Board of Directors, the task committee recommended the creation of five new representative governing bodies—the Board of Delegates and the four Area Delegations [23]. ASCE opposed this change, primarily because: (1) the proposed new structure would result in the loss of Member Society representation at the highest level of ABET governance; (2) the proposed structure would create two new layers of bureaucracy that would greatly complicate ABET governance processes; (3) transition to the new structure would cause great disruption to governance processes and accreditation operations; and (4) the desired goals of the restructuring initiative could have been achieved with far less cost and disruption through improvements in Board processes. In 2015, the new governance structure was approved over ASCE’s objections.

- **Expansion of ABET scope** – In 2015, ABET began accrediting programs in mathematics and the natural sciences (e.g., chemistry, geology, biology), although no ABET governing body had authorized this initiative [24]. ASCE opposed this expansion in ABET’s scope of responsibility primarily because of the manner in which it was promulgated. The ABET leadership had advanced the initiative in response to individual natural science programs requesting accreditation, even though no professional societies in the natural sciences had made a commitment to join ABET as new Member Societies [25]. ASCE contends that, as a federation of Member Societies, ABET should begin accrediting programs in new curricular areas only in response to commitments by new or existing Member Societies to provide the leadership, expertise, and resources necessary to perform accreditation evaluations in these new curricular areas. Accreditating new curricular areas solely in response to requests from individual programs is inconsistent with the nature of the ABET organization—a federation of professional societies—and its resourcing model. In April 2017, despite ASCE’s opposition, the Board of Delegates approved the natural sciences initiative and formally changed the names of the Applied Science Commission and the Applied Science Area Delegation to reflect their expanded scope of responsibilities.

- **Major criteria revisions** – In 2009, the ABET EAC initiated a major revision to Criteria 3 and 5 of the EAC Criteria for Accrediting Engineering Programs—the first such change since the Engineering Criteria 2000 initiative of the late 1990s. The EAC disseminated the first draft of this revision to Member Societies as a “pre-proposal” in July 2014. Revised draft criteria were formally submitted to the EAC and the Engineering Area Delegation (EAD) for approval on first reading in 2015, and the public review and approval process was completed in October 2017. During this period, ASCE provided comprehensive written feedback to the
EAC on three occasions (March 2015, June 2016, and June 2017). In all three cases, ASCE opposed the proposed criteria changes, primarily because they were backward-looking and too narrowly focused: they attempted only to address perceived problems with the old criteria, rather than considering how the new criteria should address the future needs of the engineering profession. Other educational leaders and scholars voiced similar concerns [26],[27],[28],[29], [30]. Despite this opposition, the proposed criteria changes received final approval from the EAD in October 2017 and were implemented for accreditation visits starting in the fall of 2019 [31].

As these issues illustrate, for over a decade, ASCE’s efforts to pursue its strategic interests by influencing ABET policies, processes, and criteria have often been stymied. In all of these cases, ASCE’s interests and perspectives differed significantly from those of the ABET leadership and a majority of the ABET Member Societies; thus, ASCE’s positions were consistently defeated by majority votes of the various governing bodies. As a result, the benefits that ASCE should be gaining from ABET membership (as described in Table 2 above) have been diminished, to some extent. Specifically:

- The program naming issue diminishes Benefit 1 (the ability to establish discipline-specific standards for curriculum content and faculty qualifications) by allowing programs to avoid compliance with Program Criteria through the use of program names for which no Program Criteria exist. It also compromises ASCE’s ability to promote attainment of the CEBOK by allowing for baccalaureate-level accreditation of narrow, highly specialized programs, thus avoiding the CEBOK’s requirement for curricular breadth.
- ASCE’s concerns with the recently implemented changes to EAC Criteria 3 and 5—including a less-than-optimal lower bound on technical curriculum content—suggest that Benefit 2 (the ability to establish general standards for the educational preparation of future engineering professionals) is not being realized in a way that meets ASCE’s needs.
- To some extent, the weak criteria provisions governing the attainment of outcomes diminish Benefit 3 (enforcement of standards).
- Both the ABET governance restructuring and the expansion of ABET scope have reduced ASCE’s influence in ABET governance, thus diminishing Benefit 4.

In summary—the potential benefits of ASCE’s membership in ABET are quite substantial; however, these benefits are not being fully realized, because ASCE’s perspectives and interests so often diverge from those of ABET and many of its Member Societies.

Do these diminished benefits still justify the annual cost of ABET membership? We defer this question to the ASCE Board of Direction. We note, however, that—even if the costs of ABET membership exceed the benefits—a decision to withdraw from ABET would be irresponsible without a clear, comprehensive strategy for ensuring that the critically important functions currently performed by ABET would still be fulfilled.

**A Strategy for Withdrawal from ABET**

In the authors’ view, any strategy for ASCE’s withdrawal from ABET must be guided by the need to achieve two essential ends, both of which are grounded in ASCE policy:
• Consistent with Policy Statement 130, ASCE must ensure that civil engineers are able to meet the educational standards for professional licensure [11].
• In accordance with Policy Statement 465, ASCE must have a mechanism for ensuring that civil engineers attain the CEBOK, as a prerequisite for the exercise of responsible charge in civil engineering practice [13].

ASCE can achieve these ends by pursuing a strategy consisting of the following five elements:

• **Withdrawal** - ASCE would withdraw from ABET according to the procedure specified in Section Three of the ABET By-Laws [6].

• **Elimination of Program Criteria** - In conjunction with ASCE’s withdrawal, all six sets of ABET Program Criteria for which ASCE is currently responsible would need to be eliminated. Although the process by which these Program Criteria would be eliminated is unclear, the current ABET governing documents provide no basis for Program Criteria to exist without a Lead Society.

• **Accreditation** - Civil, construction, and architectural engineering programs would continue to seek EAC accreditation, with no need to change either their program names or their curricula. Similarly, civil, construction, and architectural engineering technology programs continue to seek accreditation by the Engineering Technology Accreditation Commission (ETAC). ASCE’s withdrawal from ABET would have no adverse effect on programs’ eligibility for ABET accreditation. Once the Program Criteria have been eliminated, these programs would be accredited as “General Criteria only.” According to APPM paragraph I.C.4.c.(2), they would no longer be required to comply with any Program Criteria [21]. Moreover, under the provisions of APPM paragraph I.A.5, these programs could still be publicly advertised as, for example, “ABET EAC-accredited in Civil Engineering [9].”

• **Licensure** - Graduates of these EAC-accredited programs would experience no change in their eligibility for professional licensure. Most state licensure laws do not require an applicant’s EAC-accredited degree to be in any specific discipline. And the exceptions—states with discipline-specific licensure—do not require compliance with any specific Program Criteria.†

• **Validation of CEBOK attainment** - ASCE would use specialty certification as the mechanism for ensuring that individual civil engineers have attained the CEBOK, as a prerequisite for the exercise of responsible charge in civil engineering practice [33].

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* The six sets of Program Criteria for which ASCE currently serves as Lead Society are Civil Engineering, Construction Engineering, Architectural Engineering, Civil Engineering Technology, Construction Engineering Technology, and Architectural Engineering Technology.
† For example, the state of Alaska, which licenses professional engineers in specific disciplines (e.g., civil, mechanical, electrical), requires as its primary educational prerequisite an “ABET accredited B.S. degree in engineering in the branch of engineering applied for… [32].” An ABET EAC-accredited degree in Civil Engineering would meet this standard, even if the accreditation were not based on Civil Engineering Program Criteria.
Of these five elements, the first four require no changes to ABET policies, state licensure laws, or the licensing exam. The fifth element—a certification process for validation of CEBOK attainment—is not currently in place but is being developed [34].

Development of this specialty certification process began in 2018, when the ASCE Board of Direction initiated a major change to the direction of the “Engineer Tomorrow” initiative. For over a decade prior to 2018, the initiative had been focused on changing state licensure laws, such that a master’s degree or equivalent would become the academic prerequisite for licensure as a professional engineer in the U.S. But in March 2018, having achieved no legislative successes, the ASCE Board created a task committee to examine the feasibility of using an internal credentialing system, rather than licensure, as the principal means of validating fulfillment of the CEBOK [35]. In response, the task committee developed a concept for awarding specialty certification as a post-licensure credential to individual civil engineering professionals who attain the undergraduate and post-graduate engineering education, mentored experience, and self-development outcomes specified in the CEBOK. Details of the task committee’s proposal are provided in [34]. In July 2019, the ASCE Board responded favorably to the task committee’s interim report and authorized them to finalize the proposal, including the development of business and implementation plans for the proposed credentialing system [36].

Although ASCE’s specialty certification system is still a work in progress, it is clear that the system requirements would need to change only slightly to accommodate ASCE’s withdrawal from ABET. Consider the following two cases:

- **ASCE remains a member of ABET** – In this case, the board certification process will be most straightforward for the candidate who has followed a primary pathway consisting of:
  1. an ABET EAC-accredited undergraduate civil engineering degree,
  2. a master’s degree (or equivalent) in a civil engineering specialty area,
  3. licensure as a Professional Engineer, and
  4. fulfillment of all experiential outcomes of the CEBOK [33].

For this primary pathway, the candidate’s undergraduate- and master’s-level education will constitute adequate evidence that the educational outcomes of the CEBOK have been substantially fulfilled; thus, the board certification process will need to validate only the experiential outcomes.

To provide flexibility, however, the certification system must also provide two alternative pathways for undergraduate education:

1A. an EAC-accredited degree in a discipline other than civil engineering

1B. a non-EAC-accredited degree

To validate CEBOK attainment for alternative pathway 1A, the certification board will need to ensure that the candidate’s transcripts include curricular coverage of the civil engineering discipline-specific topics specified in the CEBOK—i.e., the topics currently addressed in the EAC Civil Engineering Program Criteria. For alternative pathway 1B, the certification board will need to ensure that the transcripts include coverage of all CEBOK topics specified for attainment through formal education.
• **ASCE withdraws from ABET** – In this case, alternative pathway 1A will simply become the *primary pathway* for undergraduate education. The certification board will need to ensure that a candidate with *any* EAC-accredited degree has documented curricular coverage of the civil engineering discipline-specific topics specified in the CEBOK. Pathway 1B would remain an alternative pathway.

**Risk Assessment**

In assessing the feasibility of our proposed strategy for withdrawal from ABET, five possible risks must be considered:

*Risk #1 – Upon ASCE’s withdrawal from ABET, another ABET Member Society could claim responsibility for the civil engineering curricular area and establish new Civil Engineering Program Criteria.* This risk does not adversely affect the feasibility of our proposed withdrawal strategy, for the following four reasons:

• As noted above, a condition of ABET membership is that the Member Society “speaks for the technical community it represents [4].” It is doubtful that any current ABET Member Society would be able to demonstrate that it speaks for the civil engineering community.

• It is unlikely that another Member Society would be willing to pay the substantial annual cost—currently $87,075 for 387 programs—of assuming responsibility for the civil engineering curricular area.

• Even if another Member Society were willing and able to assume responsibility for the civil engineering curricular area, there is no reason to expect that the resulting new Civil Engineering Program Criteria would be objectionable to ASCE.

• As a last resort, in the extremely unlikely event that another Member Society instituted new Civil Engineering Program Criteria that were objectionable to ASCE, existing civil engineering programs could avoid compliance with these criteria by using the program name “Engineering,” complying with the associated Program Criteria (which specify “no program-specific criteria beyond the General Criteria) [10], and maintaining a curricular concentration in civil engineering.

*Risk #2 – Upon ASCE’s withdrawal from ABET, a non-U.S. civil engineering professional society could apply for ABET membership, then claim responsibility for the civil engineering curricular area and establish new Civil Engineering Program Criteria.* This risk does not adversely affect the feasibility of our proposed withdrawal strategy. There are currently no non-U.S. Member Societies in ABET, and this situation is unlikely to change in the near future. In 2019, the ABET Board of Directors formally affirmed that “ABET is a United States organization operating globally,” rather than a global organization [37]. Nonetheless, even if the Board’s position were to change in the future, our proposed withdrawal strategy would still be unaffected, for the same reasons cited for Risk #1 above. It is also worth noting that the annual cost of assuming responsibility for civil engineering would be significantly higher for a new ABET Member Society than for an existing Member Society, because a new member would be required to pay the $52,857 dues associated with three seats in the ABET Board of Delegates, in addition to the $87,075 annual cost per program.
**Risk #3 – ABET could institute a new policy requiring that each accredited program must comply with at least one set of Program Criteria.** The likelihood of ABET instituting this policy change is extremely low. In 2012, in an attempt to address the program naming issue described above, ASCE strongly advocated this policy change in a formal proposal to the ABET Board of Directors; however, this proposal was overwhelmingly defeated. Nonetheless, even if ABET did reverse its position and institute a policy requiring all programs to comply with at least one set of Program Criteria, existing civil engineering programs could meet this requirement by using the program name “Engineering,” complying with the associated Program Criteria (which specify “no program-specific criteria beyond the General Criteria) [10], and maintaining a curricular concentration in civil engineering.

**Risk #4 – With the Civil Engineering Program Criteria eliminated, civil engineering programs could reduce or eliminate their coverage of the civil engineering discipline-specific topics specified in the CEBOK.** We expect that, even after the elimination of the Civil Engineering Program Criteria, many civil engineering programs would conscientiously support the professional development needs of their graduates by maintaining appropriate curricular coverage of all CEBOK outcomes; however, others would not. To mitigate the adverse consequences for the graduates of these latter programs, ASCE could offer continuing education courses addressing the relevant subjects. ASCE’s specialty certification process would need to validate the acceptability of these courses.

**Risk #5 – Other ABET Member Societies could follow ASCE’s example and withdraw from ABET.** The likelihood of additional Member Societies withdrawing from ABET is impossible to predict; however, if a sufficient number of such withdrawals did occur, ABET’s capacity to operate its accreditation system could be seriously impaired. And because our proposed strategy relies on the continued availability of ABET accreditation, large-scale withdrawals from ABET could cause the strategy to fail.

**Resource Implications**

Implementation of our proposed strategy for withdrawing from ABET would have the following resource implications:

- ASCE would gain approximately $160,000 per year in funds not spent on ABET dues, participation in ABET governance, and ABET-related committee expenses.
- ASCE could save an additional 1.0 FTE in staff costs.
- In order to maintain accreditation, each civil, construction, and architectural engineering and engineering technology program would be required to pay the annual $225 “per accredited program” cost previously paid by ASCE. ABET charges this fee to all “General Criteria only” programs (i.e., programs for which there is no Lead Society) [38]. This increased cost to programs would be offset, to some extent, by the reduction in effort (i.e., in faculty and administrative time) required to prepare for accreditation without having to demonstrate Program Criteria compliance.

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* This payment would be in addition to the existing institutional fees for ABET accreditation. For U.S. programs, these include a fee for each on-site review (currently a $3,285 base fee plus an additional $3,285 for each Program Evaluator) plus an Annual Maintenance Fee (currently $700 plus an additional $700 for each accredited program) [37].
• ASCE’s specialty certification system will be implemented whether or not ASCE decides to withdraw from ABET. Thus, the baseline cost of the certification system should not be attributed to withdrawal.

• If ASCE does withdraw from ABET, however, implementation of the specialty certification system might incur a small increase in cost, because of the higher level of scrutiny required in vetting applicants for certification. This cost could be borne either by applicants for certification (through an increase in their application fee) or by ASCE, using funds saved by the elimination of ABET dues.

• As an ABET Member Society, ASCE currently provides approximately 65 volunteers per year to serve as ABET Program Evaluators (PEVs). Even after ASCE’s withdrawal from ABET, these PEVs would still be needed, because ASCE’s engineering and engineering technology programs would continue to seek accreditation. It would fall to other ABET Member Societies to provide this resource. ASCE could reduce the adverse impact of this issue by encouraging its members to volunteer for service as PEVs through the American Society for Engineering Education (ASEE) or other ABET Member Societies.

Other Implications

In addition to ASCE’s cost savings, noted above, the two most important positive implications of our proposed strategy for withdrawing from ABET are (1) that civil, construction, and architectural engineering and engineering technology programs can continue to be ABET-accredited (under the General Criteria only); and (2) that their graduates’ eligibility for professional licensure will not be adversely affected.

ASCE’s withdrawal from ABET would also have two significant negative impacts: (1) ASCE would lose its ability to influence the establishment and enforcement of general standards for the educational preparation of future engineering professionals and technologists; and (2) ASCE would lose its association with a professional community that has been working collaboratively to advance the quality of engineering and technology education in the U.S. since 1932. Given that our proposed withdrawal strategy depends on the continuation of ABET accreditation, this disengagement could be perceived as an act of bad faith and thus could generate considerable ill will among ASCE’s peer societies.

Conclusions

Our analysis of the feasibility of ASCE withdrawing from ABET has yielded the following principal conclusions:

• ASCE gains many important benefits from its membership in the ABET federation; over the past decade, however, these benefits have not been fully realized, due to a succession of unresolved issues with ABET policies, processes, and criteria.

• Given these diminished benefits and the high cost of ABET membership, the ASCE Board of Direction would have adequate justification for withdrawing from ABET.
It would be feasible for ASCE to withdraw from ABET by employing the strategy we have outlined above. Under this strategy, civil, construction, and architectural engineering and engineering technology programs would continue to be ABET-accredited, and their graduates’ eligibility for professional licensure would not be adversely affected.

Our proposed strategy for withdrawal from ABET is only feasible because ASCE’s planned specialty certification system will provide a mechanism for validating attainment of the CEBOK. In effect, this certification process can fully compensate for the elimination of the ABET Program Criteria for which ASCE is currently responsible.

By withdrawing from ABET, ASCE would save approximately $160,000 annually in ABET dues and associated costs, plus 1.0 FTE in staff costs. Accredited civil, construction, and architectural engineering and engineering technology programs would incur an additional cost of $225 per program per year. Other ABET Member Societies would be called upon to provide approximately 65 PEVs per year to perform accreditation evaluations formerly done by ASCE volunteers (though ASCE volunteers could still serve as PEVs through other societies).

The two major negative impacts of withdrawal from ABET would be: (1) loss of ASCE’s ability to influence the establishment and enforcement of general standards for the educational preparation of future engineering professionals and technologists; and (2) disengagement from a professional community focused on collaboratively advancing the quality of engineering and technology education in the U.S.

Although our strategy for withdrawal from ABET entails several risks, only one is significant. If a “critical mass” of other ABET Member Societies were to follow ASCE’s lead and withdraw from ABET, the ABET accreditation system could be seriously impaired. And because our proposed withdrawal strategy relies on the continued availability of ABET accreditation, impairment of the ABET system could cause the strategy to fail.

In making a decision about withdrawal, the ASCE Board must weight this risk against the potential benefits of leaving ABET.

References


[37] ABET, Minutes of the ABET Board of Directors Meeting,” August 12, 2019.