# ASEE & ABET Interactions and Collaboration

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## ABSTRACT/INTRODUCTION

ASEE and ABET have enjoyed cordial, cooperative interaction for seven decades. This paper describes ASEE's historic interactions with the ABET Board of Directors, the Engineering Accreditation Commission (EAC), and the Technology Accreditation Commission (TAC), as well as the more recently established Applied Science Accreditation Commission (ASAC). Recent developments have brought to light new, mutually beneficial opportunities for collaboration between ASEE and ABET through more active ASEE involvement in the training and assigning of visitors to engineering and engineering technology programs that do not have traditional lead society sponsors. This paper describes the on-going developments as well as the opportunities these evolving new relationships may offer to ASEE members to provide valuable professional service to engineering and engineering technology education as program evaluators.

## ASEE & ABET Interactions and Involvement

ASEE was almost 40 years old when it and six other professional societies established ABET's predecessor, the Engineers Council for Professional Development (ECPD) in 1932 [1]. ASEE has actively interacted with ABET ever since. ABET and ASEE are vitally interested in the quality of educational programs in engineering, engineering technology, computing, and applied science. The close degree of their interaction is exemplified by the fact that in the past decade two former presidents of ASEE, Win Phillips and Eleanor Baum, have also served as presidents of ABET. Training sessions for ABET evaluators are held regularly by other societies in connection with ASEE regional and national meetings, particularly since 1997 with the introduction of ABET's EAC outcomes-assessment based Criteria EC2000. This relationship has expanded with ABET's TAC introduction of the outcomes-assessment based Criteria 2K. ABET has been recognized by the Council on Higher Education Accreditation (CHEA) since 1997 [1, 2].

There is an annual meeting of ABET and ASEE presidents and executive directors to discuss inter-society relationships and to explore new interactions beneficial to the professions served by the two organizations. These meetings have endorsed developing joint proposals to government agencies to fund in-depth faculty workshops focused on disseminating information about and practicing the application of the revised criteria.

## Nature of ABET and Its Recent Developments

While ABET and ASEE focus on the same educational programs, they are very different. ASEE has 12,000 individual members, 350 educational institution members, and a strong base of over 50 corporate memberships [3]. Financially, ASEE depends on member dues, and competitively won contracts to administer summer faculty programs and grants for special studies about educational programs. ASEE publishes the monthly magazine ***Prism,*** the archival ***Journal of Engineering Education,*** and the data-rich directory ***Profiles of Engineering and Engineering Technology Colleges***. ASEE has an executive director and the headquarters staff in Washington, DC, numbers about fifty persons. ASEE has over 40 divisions, councils and constituent

committees, each with elected officers, some serving on the ASEE Board of Directors. ASEE's national officers are elected by the ASEE members.

ABET consists of 24 Participating Societies[1], 5 Affiliate Bodies, and 2 Cognizant Bodies [4]. These societies relate to educational programs relevant to their disciplines, and financially support ABET in proportion to the number of educational programs for which each society has jurisdiction. The societies train their program evaluators, assign them to visiting teams, and assess their effectiveness. For programs having no participating society representation, ABET headquarters staff select the visitors, often in cooperation with other societies such as IEEE, ASCE, or ASME. Accredited institutions support ABET through fees for accreditation visits and annual maintenance of accreditation listings. The ABET Board of Directors has representatives from the societies in proportion to the number of programs under the society's jurisdiction. ABET's officers are elected from the ABET Board membership. ABET Board members are chosen by Participating Societies.

To accredit the 2500 educational programs at 550 institutions, approximately 1500 volunteers are trained as ABET program evaluators [5]. The volunteers serve through the four ABET commissions: the EAC for engineering programs, the TAC for engineering technology programs, the CAC (Computing Accreditation Commission) for computer science and related programs, and the ASAC (Applied Science Accreditation Commission) for programs in applied science. Volunteers are compensated only for expenses incurred during visits. They normally serve six-year terms. The nature of ASAC programs was presented in [6] at the 2004 ASEE Annual Conference and Exposition.

ABET publishes the list of accredited programs, arranges meetings of the ABET Board and the four commissions, informs institutions of accreditation actions, produces an annual meeting, and provides many services to facilitate accreditation and foster effective training. ABET has an executive director and maintains its headquarters in Baltimore, MD. The ABET staff consists of about 35, including those involved in Engineering Credentials Evaluation International (ECEI). The ABET staff also support the International Activities Committee (INTAC), which develops policies and procedures for substantial equivalency visits.

ECPD accredited the first engineering programs in 1936, and in 1946 it undertook the accreditation of engineering technology programs. In 1980, ECPD reorganized and became the Accreditation Board for Engineering and Technology with two commissions, the EAC and the TAC. Subsequently, a Related Accreditation Commission (RAC) was created to accredit programs with roots in engineering but different from either engineering or engineering technology. The growth of computer science programs led to formation of the Computer Science Accreditation Board (CSAB) by the IEEE Computer Society (IEEE CS) and the Association for Computing Machinery (ACM). The emergence of computer engineering programs generated so much interaction between CSAB and ABET's EAC that merger discussions involving CSAB and ABET naturally arose. This merger occurred in 2002 and the combined organization's official name has become ABET, Inc. A new Computing Accreditation Commission (CAC) encompassed the accreditation activities of CSAB. Concurrently, but for

[1] The seven Founder Societies, by their present names, are: American Institute of Mining, Metallurgical & Petroleum Engineers; AIChE; ASCE; ASME; IEEE; NCEES; and ASEE.

unrelated reasons, the RAC was renamed the Applied Science Accreditation Commission (ASAC) to more accurately reflect the nature of its programs.

**Assessment of ASEE Capabilities for Increased Accreditation Involvement**

The EAC's general criteria for EC2000 and the TAC's general Criteria 2K broadly define the fields of engineering and of engineering technology. The participating societies have developed appropriate program criteria for EC2000 and Criteria 2K, which cover most programs in engineering and in engineering technology. Participating societies having cognizance for program criteria are designated as *lead societies* [4]. There is a significant number of programs, however, for which there is not a logical lead society, e.g., general engineering, engineering science, engineering technology, engineering (with no modifier) and engineering physics programs. Some undesignated programs arise from farsighted, multidisciplinary curricula designed to prepare graduates for emerging areas. These pose challenging evaluations for visitors steeped in discipline-specific participating society training programs.

ASEE is unique in being composed of all engineering and engineering technology disciplines plus many of the support areas. Faculty who teach in such programs are active in ASEE. While most ASEE members are faculty, they run the gamut from research I doctoral institutions to two-year community colleges. There is also a significant number of ASEE members in industry, and ASEE has a very strong, active Corporate Member Council, which has the leverage to reach large numbers of engineers in industry.

The interdisciplinary character of engineering and engineering technology has long been evident in ASEE. While ASEE has classical engineering/engineering technology disciplinary divisions, it also has established interdisciplinary divisions such as Experimental and Laboratory-Oriented Studies, Instrumentation, and Design in Engineering Education. ASEE members can join up to six divisions, so many members are active in the interdisciplinary divisions. The increasingly multidisciplinary nature of programs has also received considerable attention at many ABET meetings and is part of ABET's Strategic Goals, Objectives and Initiatives.

ASEE's diverse involvement goes even deeper. The Multidisciplinary Engineering Constituent Committee (MECC) seeks to promote and develop multidisciplinary engineering education. It does so by assisting in the development of sound curricula and by representing the interests of multidisciplinary engineering on a national level with regard to accreditation, student placement, etc. The group's goal is to have membership representation from all non-traditional multidisciplinary programs. This relatively young Constituent committee is making great strides under the leadership of its officers: Chairperson, Dr. Joan Gosink of the Colorado School of Mines; Program Chair and Vice Chair, Dr. James B. Farison of Baylor University; and Secretary/Treasurer, Dr. Phillip W. Young of the University of Wisconsin at Platteville.

The MECC's contribution manifests itself in its focus on the general criteria. A program evaluator trained from the outset to examine multidisciplinary programs is properly oriented to look at the quality of the program, make certain that it meets the ABET general criteria, has effective programs for assessing how well it meets its outcomes and objectives, and makes

adjustments to improve its effectiveness. The evaluator is not fettered by having to set aside long-standing aspects of program criteria.

Through its regional and national meetings, ASEE can readily accommodate training sessions for ABET evaluators. ASEE also has the infrastructure for disseminating training materials to workshop coordinators and participants.

ABET strives to achieve a balance of program evaluators from industry and government, as well as academe. ASEE is prepared to mount a vigorous effort to recruit engineers and technologists from industry for training as ABET evaluators. The Corporate Member Council and the CMC members will certainly prove to be very effective. However, the Engineering Deans Council is a potent source for ABET visitors, including engineers from industry. Colleges with ABET-accredited programs have industry advisory councils. These council representatives understand accreditation and are valuable allies for recruiting industry engineers to become trained ABET evaluators. The ASEE Engineering Research Council has close ties with U.S. government agencies employing significant numbers of highly qualified engineers, who are another source for training as ABET program evaluators.

**ASEE's Proposal to the October 2004 ABET Board & Reactions**

Plans to submit a proposal to the ABET Board of Directors, requesting that ASEE be awarded lead society status for undesignated engineering and engineering technology programs and for engineering physics, were discussed and approved at the June 2004 ASEE Board of Directors meeting. The proposal was sent to ABET's president. The proposal ultimately submitted to the ABET Board appears in the appendix. For continuity, the Recommended Motion and the Rationale related to programs are reproduced here.

**Recommended Motion:**

The ABET Board of Directors approves the American Society for Engineering Education (ASEE) as the Lead Society for EAC Programs leading to degrees designated as Engineering (without modifiers), Engineering Physics, and Engineering Science(s), and for TAC Programs leading to degrees in Engineering Technology (without modifiers) for which ASEE will provide the fiscal program support, the training and assigning of program evaluators, and the infrastructure for efficient, timely interaction with ABET staff, EAC Team Chairs, and TAC Team Chairs. As do other lead societies, ASEE will strive to establish a constructive balance of program evaluators from academe and industry/government, as well as from under-represented groups in the engineering/engineering technology professional spectrum. These procedures will be in place for the 2006-2007 accreditation cycle.

**Rationale:**

**Programs**

There are estimated to be 32 Engineering, 19 Engineering Physics, and 12 Engineering Science(s) programs within the purview of the EAC. Under the TAC, there are an estimated six Engineering Technology programs. In the past, these have sometimes been called "non-traditional programs." The program evaluators have been assigned by the appropriate lead societies chosen by ABET, in coordination with the program coordinator and the team chair as most closely related to the programs under evaluation. There are no separate program criteria for these programs nor are there interests in developing them.

ABET's Executive Committee viewed the ASEE proposal as not yet ready for presentation to the Board, so it was not originally on the agenda for the October 30, 2004 ABET Board of Directors meeting. ASEE's President Dr. Kerns, Executive Director Dr. Huband, and Dr. Weese, ASEE's representative to the ABET Board, quickly prepared a re-formatted proposal for the ABET Board

so that the ASEE item was added to the October 30th Agenda. Since the deadline had passed for incorporating the supporting materials into Board members' notebooks, the three ASEE collaborators converged in Nashville preceding the ABET Board meeting, duplicated the supporting material, and had it in the mailboxes of ABET Board members, officers and staff. The ASEE trio discussed the proposal with many ABET Board representatives before the meeting.

The ASEE proposal was the last business item on the crowded agenda. The Board meeting was long with extended debate on some items. The meeting room had to be vacated at 4:00 PM for a different group meeting that evening. When the ASEE item came up, time was running out, and the new Board members and officers had yet to be installed. The ASEE proposal encountered opposition from Board members believing they needed to discuss it with their societies. Despite efforts to avert it, the Board approved a motion to table the ASEE proposal.

**Plans for an ASEE Proposal to the March 2005 ABET Board**

The ASEE proposal is good from many perspectives. ASEE is ready, willing, and fiscally able to assume a larger role in accreditation. By assuming lead society responsibilities for these programs, ASEE will provide better trained, more appropriately focused visitors for the programs. It will give faculty in these programs greater opportunity to serve ASEE and engineering education by participating in ABET activity. By taking responsibility for the assigning of visitors, it will provide more timely service to team chairs and reduce the load on the ABET staff. ASEE will also provide somewhat greater financial support for ABET.

Efforts are already underway to recruit supporters for the ASEE proposal from representatives to the ABET Board from other participating societies. Sound rebuttals are being prepared to answer objections that were voiced at the October 30th Board meeting.

Documentation was submitted to ABET for discussion at the February 18th ABET Executive Committee meeting. It is anticipated that this will have been favorably received so that full and complete documentation will be incorporated into the ABET Board members' notebooks for the March 19, 2005 meeting. If the ASEE proposal is approved at that meeting, it will be possible to adhere to the original plan to have the procedures in place for the 2006-2007 accreditation cycle.

**Progress Update**

The deadline for uploading this paper for publication in the Proceedings of the 2005 ASEE Annual Conference and Exposition was March 2nd, almost three weeks preceding the March 19th meeting of the ABET Board of Directors. Consequently, the report presented at the ASEE meeting will contain information that was unavailable when the paper was submitted for publication. This progress update explains the situation as of late February.

Immediately following the October 30th meeting of the ABET Board of Directors, ASEE President, Dr. Sherra E. Kerns, together with the chair of the ASEE Accreditation Action Committee, Dr. Edwin C. Jones, actively solicited letters of support for the ASEE proposal from undesignated engineering and engineering technology programs and from programs in engineering physics. The responses were very gratifying, supportive and timely.

The ASEE request was updated and a revised proposal package that included support letters from EAC-related programs and TAC-related programs. It also included a specific clarification of the intent not to develop new program criteria, as well as a letter supporting this aspect of ASEE's proposal. The implementation procedures, ASEE's statement about PEV qualifications, and ASEE's procedures for PEB selection were also explained more fully. The new proposal package was delivered to ABET for the February 18th meeting of the ABET Executive Committee.

As a result of the ABET Executive Committee meeting, the ASEE proposal is on the agenda for the March 19th meeting of the ABET Board of Directors in Baltimore. Informal feedback indicates that the revised proposal was found to be stronger and that the letters of support were viewed as a very positive factor. Additional letters continue to be received, so supplementary packages of them will be available at the meeting for examination by interested members of the ABET Board. A total of approximately 30 support letters, written by a wide range of types of institutions, was received.

The agenda for the March 19th ABET Board meeting was quite full. The ASEE revised proposal appeared under "old business," almost at the end of the meeting. It behooved ASEE to be precisely prepared, concise, and ready to handle questions expeditiously.

**Closure**

Although it was disappointing that the good ideas presented in the October 30th proposal were not approved, the benefits to be derived certainly merited the further attempt on March 19th. The proposal had been strengthened, evidence of sound support had been added, and there were better preparations to address questions and to deal constructively with objections that may be raised. The outcome of the March 19th ABET Board meeting will be reported when this paper is delivered at the 2005 ASEE Conference and Exposition.

**References**

1. ABET Web site, ***http://www.ABET.org***
2. Council on Higher Education Accreditation (CHEA) Web site, ***http://www.CHEA.org***
3. ASEE Web site, ***http://www.ASEE.org***
4. ABET, Inc., ***2003 Accreditation Yearbook for the Accreditation Cycle Ended Sept. 30, 2003.***
5. ABET, Inc., ***2003 Annual Report for the ABET Fiscal Year 2002-2003.***
6. Weese, John A. and Steven D. Johnson, *ABET and the Accreditation of Applied Science Programs*, Event 2171, Proceedings of the 2004 ASEE Annual Conference & Exposition, Salt Lake City, UT, June 22, 2004.

**Appendix**

**Memorandum**

**Date:** October 22, 2004
**To:** ABET Board of Directors
**From:** American Society for Engineering Education (ASEE)
**Through:** John A. Weese, ASEE Representative to the ABET Board of Directors

**Subject:** Motion to Grant ASEE Lead Society Status for General EAC and TAC Programs

## RECOMMENDED MOTION:

The ABET Board of Directors approves the American Society for Engineering Education (ASEE) as the Lead Society for EAC Programs leading to degrees designated as Engineering (without modifiers), Engineering Physics, and Engineering Science(s), and for TAC Programs leading to degrees in Engineering Technology (without modifiers) for which ASEE will provide the fiscal program support, the training and assigning of program evaluators, and the infrastructure for efficient, timely interaction with ABET staff, EAC Team Chairs, and TAC Team Chairs. As do other lead societies, ASEE will strive to establish a constructive balance of program evaluators from academe and industry/government, as well as from under-represented groups in the engineering/engineering technology professional spectrum. These procedures will be in place for the 2006-2007 accreditation cycle.

## RATIONALE:

**Programs**

There are estimated to be 32 Engineering, 19 Engineering Physics, and 12 Engineering Science(s) programs within the purview of the EAC. Under the TAC, there are an estimated six Engineering Technology programs. In the past, these have sometimes been called "non-traditional programs." The program evaluators have been assigned by the appropriate lead societies chosen by ABET, in coordination with the program coordinator and the team chair as most closely related to the programs under evaluation. There are no separate program criteria for these programs nor are there interests in developing them.

**Selection, Training, Mentoring and Evaluation of Evaluators**

ASEE will select and train new program evaluators from the outset to focus on the ways general engineering and engineering technology programs should meet EAC or TAC General Criteria. This process will develop program evaluators having broad views and well equipped to rigorously review these characteristically cross-disciplinary programs which may use educational approaches that are distinct from those of other traditional disciplines. There will be some use of program evaluators, previously trained by lead societies, who have completed their terms for their lead societies and are no longer on the lead society program evaluator rosters, but are interested in continued service in accreditation. These veterans will be re-trained to inculcate in them the broad view that is so important for program evaluators of cross-disciplinary programs. Previous service as an ABET evaluator will neither assure nor prevent eligibility for service as an ASEE evaluator. Any ASEE training will use ABET-developed training materials, and ASEE will continue to cooperate with and support both ABET and established lead societies in the training of lead society program evaluators. ASEE will mentor and evaluate the efforts of its evaluator pool.

ASEE has partnered with ABET and major lead societies to train EAC/EC2000 visitors and it is presently participating in training evaluators for TAC/TK2000. ASEE's recognition of the significance of interdisciplinary practice is evidenced by the formation of the active, rapidly growing Multidisciplinary Engineering Constituent Committee.

**Solicitation of New Program Evaluators**

ASEE's membership is highly receptive to ABET accreditation service for both EAC and TAC programs. ASEE has more than 40 active divisions and councils, including the Engineering Deans Council (EDC) and the Engineering Technology Council (ETC). Respectively, these two councils include most of the nation's engineering deans and most of the deans of engineering technology. These two groups have substantial leverage with faculty at their institutions which will help recruit candidates to be new program evaluators.

**Recruitment of Industry/Government and Under-Represented Group Program Evaluators**

While ASEE's members are predominantly academics, there is a very active ASEE Corporate Member Council (CMC) with long-standing, close ties with the EDC as well as the ETC. For the past several years, one day of the ASEE Annual Conference and Exposition has featured industry interaction and involvement. ABET's Corporate Member Council (CMC) is strongly supportive of this activity and will help communicate opportunities for service to ABET to the corporate organizations its members represent. The CMC members have access to practicing engineers within their home organizations from whom they can encourage service as program evaluators. Virtually every engineering dean and every engineering technology dean has an active industry advisory council which can

actively assist in the recruitment of new program evaluators from industry. Consequently, ASEE has effective mechanisms for recruiting good program evaluators from industry and government.

Two ASEE divisions, the Minorities in Engineering Division and the Women in Engineering Division, stand ready to directly address the recruitment of representatives from under-represented groups as program evaluators in engineering and engineering technology. In addition, ASEE has the Two-Year College Division, which was specifically created to attract faculty from junior and community colleges. While there is presently only one undesignated engineering technology associate-degree program, the potential for additional programs exists.

**Assigning Visitors and Interacting with ABET**
Having provided a member of the EAC, a member of the TAC, and a representative director for the ABET Board of Directors for many years, ASEE is well attuned to the ways ABET operates and the importance of close, timely interactions with ABET staff, EAC team chairs and TAC team chairs. ASEE has had a standing Accreditation Committee for more than a decade. Its members have extensive ABET experience as well as being or having been ASEE officers. ASEE is committed to dedicate a significant fraction of an established full-time staff member to serve the ASEE Accreditation Committee and to interact with ABET staff to assure high quality, timely communication.

The ASEE Accreditation Committee includes members who have served on the accreditation committees of ABET participating societies and they have first-hand experience in the processes of selecting program evaluators. As such, they are intimately familiar with ABET requirements for confidentiality and the care necessary to guard against conflicts of interest.

**Number of ASEE Representatives to the EAC and the TAC**
While it is understood that there is need for an algorithm to establish the number of EAC and TAC members to which a lead society is entitled, ASEE respectfully points out that its one member on each of these commissions is viewed as quite adequate at this time. Consequently, it respectfully requests that it be permitted to function with one representative to each of these commissions until there are five years of operating experience, at which time the need for ASEE commission members will be re-evaluated.

**Fiscal Implications**
The fiscal implications of becoming the lead society for these programs have been discussed and approved by vote at meetings of the ASEE Board of Directors. ASEE is fiscally sound and quite capable of accommodating the expenses associated with the responsibility of being the lead for these programs.

**Implementation Plan**
Upon approval of this motion, ASEE will immediately begin to set up and field the planned processes to solicit and train new program evaluators. The ASEE president and two co-authors have submitted a paper to be presented this summer to a session of the Multidisciplinary Engineering Constituency Committee at the 2005 ASEE Conference and Exposition. It describes the interactions between ASEE initiatives in this area and our plan to work with ABET to better serve these programs. In parallel, the selection recruitment of prospective program evaluators, the scheduling of training sessions at regional and national ASEE meetings, and all other actions necessary to launch this program for the 2006-2007 accreditation cycle will begin.

**Assessment**
ASEE will implement on-going assessment programs to gage its effectiveness in training and providing ABET program evaluators. It will also develop a parallel program to conduct an assessment program to determine the degree to which its programs are meeting its objectives and make adjustments to improve them.

**Summary**
ASEE has the multi-dimensional breadth of membership with respect to a wide range of disciplines and sizeable numbers of members from under-represented groups, that will enable ASEE to provide excellent evaluator service to a group of programs previously not under the aegis of a lead society. It also has effective mechanisms for recruiting program evaluators from industry and government, as well as established divisions that are important to under-represented groups. It can focus program evaluator training curricula to cultivate a broad view and produce well-

rounded program evaluators who are highly suited to review multi cross-disciplinary programs in engineering and engineering technology. ASEE will strengthen its communication links with the EAC, the TAC, and the ABET staff to ensure the processes function well.

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