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The Increasingly Worrying State of Defense-related Research in US Universities

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A few months after I started my academic career I spoke about distributed communication architectures at a small conference. My talk managed to pique the interest of a research coordinator of a large company that desperately needed, or so it seemed, an expert on just such architectures. Soon enough I was invited to present my ideas at the company's headquarters and a research proposal was sent, reviewed, revised and accepted. This was my first year as an assistant professor, and I felt very accomplished. My dean sent me an official congratulatory letter.

A telephone call from the university's Research Administration Office managed to cloud matters a bit. There was, I was told, a slight disagreement on language, pertaining to publication rights and intellectual property; "our people are talking to their people to resolve it." Three weeks later there was still no resolution, and at that time I was told that "our lawyers are talking to their lawyers to resolve it." Then lawyers from both sides met. Then they met again.

About two months later I received another phone call; there was finally "a mutually acceptable agreement" and "everybody was happy with it." I was relieved. "When can I start the project?" I asked the lady from Research Administration. There was a long pause on the other side as the woman was choosing her words. "The thing is," she said at long last, a bit embarrassed, "we decided finally that it is in the best interest of all sides not to proceed with your project."

This then was the result that made everybody so "happy." As you can imagine I was not among the celebrating parties that day (or during the next few weeks, as I was trying frantically to get both sides back to the negotiation table).

This old personal anecdote came to mind recently when a colleague reported on a meeting of officials from several US federal agencies and a group of university administrators and professors. The subject was the research and development needs of the agencies, most of which were in law enforcement,

homeland security, and defense. The event progressed much like the one that dealt with my old ill-fated project. Everybody agreed that the needs of the agencies were real, legitimate, and scientifically and technically challenging; they indeed posed intellectual challenges suitable for the sharpest of minds. Everybody also agreed that the universities had the tools, experience, and appropriate personnel to attack these problems, and that a lot of good would come from such effort. However... as soon as details of the conditions under which the work was to be done were discussed, it was only a matter of time until everybody came to another "mutually acceptable agreement" that the proposed collaboration would not work... The agencies would not agree to the universities' "leisurely" timetable and to the need to provide financial support for periods that correspond to the training plans of graduate students. The universities would not agree to restrictions on publications or to background checks of personnel. Each "side" stuck to high "non-debatable" principles; there was much sermonizing and finger wagging; "The Nation's Security" and "Freedom of Thought" were part of the currency that was used liberally on both sides. At the end participants could not agree on anything but that the best way forward is to have no way forward.

One ill-fated meeting does not make a trend. In fact, in my academic institution and in many others there are many ongoing useful collaboration efforts with defense-related agencies that, without a doubt, provide much value for participants on all sides. Yet there appears to be a quiet disengagement of academia and certain federal agencies, as both sides seem unable to come to terms with the new post 9/11 environment. There are quite a few well known (and probably many less known) examples of universities turning down substantial research grants because the universities would not agree to government restrictions (on publications, foreign nationals, and background checks for personnel). There are many reports (and some documented statistics) on lengthy negotiations between

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April 2007 TABLE OF CONTENTS

The Increasingly Worrying State of Defense-related Research in US Universities . . .	1
The U.S. Congress, Higher Education, and College Sports Reform	3
Accreditation Perspectives - A Historical Note . . .	6
ECEDHA Update	8
The Internationalization of Engineering Technology	10
IEEE/ASEE The Interface Column	12
From the IEEE-EAB Committee on Engineering Accreditation Activities	13
FIE 2007	14
From your Editor	16

schools and federal agencies about these restrictions. A much higher fraction of federal funding in some universities is available now for US citizens only. These trends (and the increased complexity of the visa issuing process to non-US students who wish to study in the US) signify a material change in the landscape of technical research and graduate education in US universities. In time the accumulation of the policy changes may result in significant long term effects, especially in seemingly ‘hot’ disciplines that would face serious funding and staffing crises.

It would be only fair to mention that new conditions on grants to universities are not limited to federal contracts. Increasingly, private foundations are adding “anti-terrorism” and other restrictive clauses to their grant requirements in the spirit of the times. Due to alleged vagueness and excessively wide scope of some of these restrictions, they have given pause to university administrators that had to ascertain compliance with them (examples include conditions added by the Ford Foundation and the Rockefeller Foundation, which prompted several universities to declare a moratorium on sending funding proposals to these foundations).

The problem is not that we are not talking about the new research restrictions. There is a long trail of relevant statements, declarations, and testimony in front of legislative bodies and their committees. Several articles document the phenomenon, and repositories were compiled of problematic clauses in university research contracts. More than a few universities announced publicly that they would not agree to the new limitations. Provosts and university presidents wrote to the US Congress, the Department of Defense, and to the heads of private foundations that have imposed new regulations. University Senates everywhere commissioned studies of the phenomenon and made strong policy pronouncements about it.

The problem is that by and large the discussion did not lead to any meaningful change. While local negotiations were able to

remove or modify objectionable language in specific contracts, the overall picture is of prolonged stalemate and entrenchment. Some of the “objecting” universities, including some of the recognized leaders in engineering and computer science, have seen their defense-related research funding vanish or be significantly curtailed. Others have told their faculty to stay away from requests for proposals in areas that used to be the focus of their research if “there are strings attached.” In many other institutions uneasy case-by-case accommodations were sought and often non-US students found themselves with reduced opportunities to participate in research as graduate assistants. At the same time several federal agencies, some more publicly than others, redirected funding to non-university recipients (such as private or for-profit research and development laboratories) that were willing to accept the tighter controls.

With few exceptions, the changes are gradual, unannounced, and not part of a master plan to alter the way defense-related research and development in the US is conducted. . At times re-direction takes place behind the scenes, imperceptibly, piecemeal, and without much analysis or purposeful decision making. The difficulty is that a major change is happening nevertheless – announced or not, planned or not – and it is progressing with little reflection or long term assessment of consequences.

This state of affairs is not good for anybody. The government is losing access to minds and intellects that have shown, in previous trying times, remarkable ability to rise to the occasion and provide ingenious and potent answers to difficult technical and scientific challenges. US academia is losing an important part of its relevance. One is reminded of Richard Hamming’s observation: “if you do not work on an important problem, it’s unlikely you’ll do important work”. If US academia does not work on the most important problems in terrorism countermeasures and homeland security, it is unlikely to contribute to these areas, or to develop the next generation of

sharp minds who would solve them. Where will these problem solvers come from then?

I do not have an easy and quick solution, but know that we cannot wait for one for too long. In academia the applicable research infrastructure is relatively fragile. Prolonged starvation would decimate rather quickly the progress that was made over several decades. On the government side it is hard to measure what is being missed in the short run, but a quick projection of human resources for future defense-related R&D should serve

as an alarm. Clearly all involved entities, which at present seem to talk past each other, need to talk to each other. It may be left to “third parties” (possibly the National Academies, possibly professional associations) to restart the discussion, but letting the matter slide would be a very bad alternative. Literally, it would put our long-term security at risk.

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THE U. S. CONGRESS, HIGHER EDUCATION, AND COLLEGE SPORTS REFORM: Signs of Progress, Truth, and Consequences

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INTRODUCTION – The athletics arms race, with its multi-million-dollar coaches’ salaries, stadium wars, and academic corruption, continues to have a debilitating impact on higher education. Insights into this situation can be found in a 3-year-old commentary¹ by **John W. Prados**, Vice President Emeritus and University Professor, The University of Tennessee, and former president, Accreditation Board for Engineering and Technology:

Frank Splitt’s well-researched brief identifies clearly the distortion of institutional priorities and the threats to academic integrity that result from increasing commercialization and obsession with winning in “big-time” college sports. The situation has developed gradually over the past 100+ years, and now its correction faces major obstacles, both financial and psychological, in particular, the dependence on revenues from football and men’s basketball to fund bonded indebtedness on expensive athletics facilities and to support the non-revenue producing sports, and the over-identification by too many alumni and other supporters of their own value with “their” school’s athletic success. Can the situation be corrected? I believe it can, but with great difficulty. It will demand a long-term, coordinated effort by responsible faculty leaders, presidents, and governing board members who are willing to put aside personal advantage and work together to do what is right for their institutions and the educational enterprise. Frank Splitt has pointed us down the right path. Will we have the courage and perseverance to follow it?

As Prados and others have suggested, the reform effort will have to reach critical mass in order to restore big-time sports to their proper role in higher education. Sad to say, the answer to Prados’ penetrating question – *Can the situation be corrected?* – appears to be “No” insofar as the great majority of college presidents and governing board members are concerned.

WHAT’S THE PROBLEM? – Inadvertently or willingly, far too many college and university presidents, provosts, and governing boards continue to conspire with the NCAA and the

TV media to tap into the ocean of money associated with the big-time college sports entertainment industry.²

Excessive commercialization has given rise to money-focused presidents who often view sports programs as an economic necessity and undergraduate education as an expensive nuisance ... presidents who have little patience with serious reform efforts by their faculty.

As a general rule, big-time university and college presidents cannot advocate true reform without risking termination driven by a storm of protest about economic impact and assorted tradition-based arguments by influential (wealthy) members of their governing boards, boosters and alumni, as well as misguided fans. But there can be exceptions, for example, Birmingham Southern University recently moved from NCAA Div. I to Div. III. This bold move enabled the school to provide more athletic and educational opportunities for its students. The move was made for all the ‘right’ reasons – providing a rare but shining example of educational sanity trumping irrational athletic exuberance.

However, the move by Birmingham Southern’s president **David Pollick** and his board is an anomaly. All too often such moves are blocked by influential board members who use their school’s athletic programs as ego-boosting playthings. Also, the target of major contributions by wealthy alumni is often not academics, but rather their alma mater’s athletics department. Such gifts help fuel the athletics arms race.

Compounding the negative influence of rabid sports fans that serve on governing boards is the fact that most tenured faculty members, intent on doing research, seem too busy to work for reform. Disheartened by a perceived lack of institutional power, faculty members often shun involvement in controversial nonacademic affairs. But here again there are exceptions to this general rule, for example, **Jan Kemp** at the University of Georgia, **Tiffany Mayne** at Louisiana State University, **Linda Bense**-Meyers at the University of Tennessee, **Tom Palaima** at the University of Texas-Austin, and **Jim Gundlach** at Auburn University. Also, **Nathan Tublitz** and **James Earl** recently decried academics’ decline relative to

athletics at the University of Oregon – prompting a swift defense of the status quo by the university president who argued that excellence in athletics does not preclude excellence in academics, but failing to address the expressed concerns of the 90 faculty members who endorsed the Tublitz-Earl complaint.

In addition, almost all untenured faculty members are too busy working to get tenure and are not in a position to challenge administrative policy on intercollegiate athletics. In either case, faculty members who defend academic integrity are often considered subversive—inviting intimidation and position-threatening retaliation by school administrations.

In any case, the life of faculty members that work for academic primacy over athletics is not without pressure, consequent stress, and the fear of being ostracized. For example, the members of the University of Minnesota's Faculty Consultative Committee have just been placed in a difficult, likely untenable, position by the university president.³ Even deans and senior faculty have great difficulty in saying no to demands by presidents and provosts, especially if the demands are in any way related to defending the NCAA and the status quo in intercollegiate athletics.

The bottom line is simply this: The relatively sparse exceptions to the general rule fall far short of the critical mass of responsible faculty leaders, presidents, and governing board members required to correct the situation. However, in this void an alternate critical mass was formed – inspired, in part, by the cogent words of **Margaret Meade**, *Never doubt that a small group of thoughtful, committed citizens can change the world. Indeed it is the only thing that ever has.*

WHAT HAS BEEN DONE? – The key to unraveling the mess in big-time college sports is federal intervention.⁴ There will be no serious reform without such intervention and related oversight. There will only be a veil of secrecy shrouding a continuing national scandal characterized by academic institutions beholden to the out-of-control college sports entertainment business ... institutions that have distorted or abandoned their educational mission.

To help catalyze government intervention, I worked closely with **Jim Duderstadt**, President Emeritus and University Professor of Science and Engineering at the University of Michigan. Duderstadt was the author of *Intercollegiate Athletics and the American University*⁵ and the foreword to my second essay on college sports reform.⁶ as well as an early supporter of my work on systemic engineering education reform. We and others in The Drake Group and beyond, worked with staff members of the Oversight Subcommittee of the House Committee on Ways & Means during the past year to illuminate the true professional nature of big-time college sports, its tight connection to the entertainment business, and its marginal relevance to the educational, tax-exempt mission of its member institutions, as well as its negative impact on America's K-16 education system.⁷

House Committee on Ways & Means Chairman Rep. **Bill Thomas**' Oct. 2, 2006 sharply-worded letter to NCAA President Myles Brand – asking why the NCAA and its member

institutions should maintain the tax-exempt status of their sports programs – was one of the high points of this effort. The Thomas letter triggered a powerful issue-amplifying column⁸ by nationally syndicated columnist **George Will** as well as a host of supporting editorials and columns in *The New York Times*, *The Wall Street Journal*, *USA Today*, *The Boston Herald*, *The Washington Post*, *The Indianapolis Star*, *The Dallas Morning News*, and *The Birmingham News*, among many others.

Another high point was Duderstadt's testimony at the Dec. 5, 2006, Senate Finance Committee Hearing. "Report Card on Tax Exemptions and Incentives for Higher Education: Pass, Fail, or Need Improvement?" chaired by Senator **Charles Grassley**.⁹

Also, just prior to the hearing, **George Dennison**, president of the University of Montana, invited me to contribute an article commenting on the congressional scrutiny of the NCAA for *The Montana Professor* – a journal of Education, Politics and Culture. The article, "The U. S. Congress: New Hope for Constructive Engagement with the NCAA and Intercollegiate Athletics," will appear in the Spring 2007 issue of the journal opposite NCAA President Brand's article, "Faculty Members' Constructive Engagement in Intercollegiate Athletics."¹⁰ Readers will find a sharp contrast between the articles. Brand urges faculty to get with athletic programs by providing direct support for their school's leaders – recommending roles for faculty members that: *will yield both constructive engagement and resolution of the issues facing intercollegiate athletics.* My article focuses on the need for federal intervention based on the truth about big-time college sports ... the brutal truth that is often obfuscated by myths, misrepresentations, and misinformation promulgated by the NCAA and ardent defenders of the status quo. However, telling the truth about college sports has not been without consequences.¹¹

Taken together these are exciting events. While certainly not earth shattering, they nevertheless represent sure signs of progress on a path toward serious reform in intercollegiate athletics as well as a basis for cautious optimism.

WHAT MORE CAN BE DONE? – To help sustain the momentum developed by the House Committee on Ways & Means and by Senator Grassley and Duderstadt at the Dec. 5, 2006 Senate Finance Committee Hearing, we will be asking Congress to follow up on the groundbreaking work of these congressional committees. Specifically, we will be asking Congress to give careful consideration to the following plan of action – taking steps consistent with the recommendations of Secretary of Education *Margaret Spellings' Commission on the Future of Higher Education*:¹²

1. Initiate a focused congressional hearing on intercollegiate athletics. Such a hearing would fully expose the NCAA and its secretive ways to the light of day – as Supreme Court Justice Louis Brandeis said: Sunlight is said to be the best of disinfectants.
2. Realign priorities at America's colleges and universities – addressing the perverse government subsidization of the NCAA and big-time intercollegiate athletics would not only help flip the apparent athletics-over-academics

priority at many schools, but also provide substantial incremental tax revenues.¹³

3. Take steps to hold the NCAA cartel accountable for the substantial financial support it receives from America's taxpayers—with Congress giving serious consideration to conditioning the continuation of the NCAA's tax-exempt status on the NCAA meeting specific requirements aimed at increasing the transparency, accountability and oversight of its operations and those of its member institutions.
4. Take a hard look at tax policies governing seat licenses, luxury skyboxes, corporate sponsorships and other unrelated business income.
5. Add interpretive wording to student privacy legislation to make clear that such legislation does not prohibit release of information on the academic performance of individual athletic teams, so long as the data do not identify individual team members.
6. Require the NCAA and its member institutions to take steps that will permit athletes to function as real students—having the institutions provide tangible evidence that they practice what they preach, i.e., evidence that their athletes attend regular whole-period classes on accredited degree tracks and that the athletes are maintained as an integral part of the institution's student body where academic standards of performance for athletes are the same as for all other students.

CONCLUDING REMARKS – America's higher education enterprise should be focused on academics, not athletics. With this focus in mind, tax code benefits would result in increased emphasis on learning and research, not on the subsidization of commercialized sports entertainment and health-spa-like facilities for athletes.

A question still looms in the minds of reform-minded academics: Will Congress follow up on Chairman Thomas' letter and build consensus to unmask the NCAA's amateur 'student-athlete' charade and put an end to the tax subsidies that help fuel the athletics arms race? If the NCAA is left to operate "foot loose and tax free" at the expense of American taxpayers and the future health of America's system of higher education, it will be because the Congress has yet to appreciate the long-term negative implications of 'what's going on,' or, chooses not to exercise its inherent responsibility to rectify the situation.

What's required is a good measure of political courage and the will to stand up to powerful legal, economic, political, and lobbying forces mustered by the NCAA cartel to protect its financial interests. In addition, those answering the call must be willing to withstand the inevitable pressure to maintain the status quo from school officials, notable alumni and rabid fans.

It has often been said that a democracy has as one of its fundamental strengths the ability to bring great ideas, innovation and individual initiative, into what could otherwise be a failing system. The higher education enterprise, just as a democracy, is only as strong as the people who are willing to keep it vital and ever evolving. Faculty members in all disciplines need to become more aware of the problems besetting

their segment of the enterprise and then, hopefully enabled and supported by government intervention, rise to the challenge of reclaiming academic primacy in higher education.

Frank G. Splitt, a Life Fellow of the IEEE and a Fellow of the International Engineering Consortium, is a former McCormick Faculty Fellow at Northwestern University, a Vice President Emeritus of Nortel Networks, and a member of ASEE and The Drake Group. He was a member of the inaugural ABET Industry Advisory Council and the recipient of the *2006 Robert Maynard Hutchins Award*. His essays and commentaries on college sports reform are available at <http://thedrakegroup.org/splittessays.html>.

NOTES

- 1 Splitt, Frank G., "Reclaiming Academic Primacy in Higher Education: A Brief on Working for Reform in Intercollegiate Athletics and Engineering Education, p. xi, IEC Publications, Chicago, IL, Dec. 31, 2003, http://thedrakegroup.org/Splitt_Reclaiming_Academic_Primary.pdf
- 2 None of these groups would be willing to let go of the status quo unless their future prosperity is assured.
- 3 Splitt, Frank G., "Employing Academically Unqualified College Athletes," *CollegeAthleticsClips.com*, Feb. 5, 2006, http://thedrakegroup.org/Splitt_Unqualified_College_Athletes.pdf
- 4 Schakowsky, Janice D. "Call for attention to the work of Dr. Frank Splitt," Congressional Record, Extension of Remarks, March 17, 2005, - p 9, http://thedrakegroup.org/Splitt_Essays.pdf
- 5 Duderstadt, James J., *Intercollegiate Athletics and the American University: A University President's Perspective*, First paperback edition, University of Michigan Press, 2003.
- 6 Splitt, Frank G., "The Faculty-Driven Movement to Reform Big-Time College Sports," IEC Publications, Chicago, IL, July 13, 2004, http://thedrakegroup.org/Splitt_Sequel.pdf
- 7 Attention was also called to the NCAA's penchant for quoting statistics characterizing all sports programs rather than the far more alarming results of the large revenue sports of football and men's basketball, the perpetuation of the NCAA's contrived amateur 'student-athlete' myth, their deceptive self portrayal as an institution of higher education, and the perverse federal tax-policies governing seat licenses, luxury skyboxes, corporate sponsorships and other unrelated business income, that help fuel the athletics arms race.
- 8 Will, George, "Tax Breaks for Football (Factories)," *The Washington Post*, Oct. 25, 2006.
- 9 *The Dec. 5, 2006 Senate Finance Committee Hearing*, <http://www.senate.gov/~finance/sitepages/hearings.htm>
- 10 In addition to the print edition, an online version of this issue will be posted at URL <http://mtprof.msun.edu>. My article will also be available at http://thedrakegroup.org/Splitt_Montana_Professor.pdf
- 11 My EECS Department hosted website (focused on engineering education and sustainable development) was recently shutdown by Northwestern's senior administration – no doubt a consequence of my article for *The Montana Professor* and work with Congress – calling to mind the earlier retraction of my honorary McCormick Faculty Fellow title and position, http://thedrakegroup.org/Splitt_Statement_on_Academic_Retaliation.pdf
- 12 Editors, "In Focus: The Spellings Commission," *InsideHigherEd.com*, <http://inside-highered.com/news/focus/commission>. Note, this URL provides access to an extensive list of references on the work of the Spellings Commission.
- 13 These incremental tax revenues could help finance a boost in the federal investment in basic research, recruitment of future Science, Technology, Engineering, and Mathematics (STEM) teachers, and scholarships for undergraduate STEM and other students interested in attending college to learn, not just to 'play ball.'



Accreditation Perspectives – A Historical Note

Ron Thomas and Ed Jones

About nine years ago, Roland E. (Ron) Thomas wrote an outstanding history of the activities of CEAA. Ron is an ABET Fellow. He did much to improve the accreditation process during his long involvement. A major contribution was his mentoring of new program evaluators. Another major contribution was working with appropriate agencies in the government to greatly increase the involvement of engineers in such agencies as DOD, NASA, etc. in the ABET process. We believe the ideas expressed in 1998 still hold today, and we are pleased to reprint his article.

I recently passed two milestones. First, I have been on the approved list of IEEE program visitors for a quarter century. Second, I have now participated in thirty campus visits. It occurred to me that perhaps my experiences hold some lessons for those who will implement Engineering Criteria 2000 (EC2000) in the next century. When weighing my opinions it is important to know that only rarely was I directly involved in the decisions that forged the accreditation process we know today. I don't say this with regret or as a criticism. Rather, my point is that my insights were shaped by the prism of thirty campus visits. What I have to offer is not a memoir from headquarters, but a diary from the trenches.

When I broke into the accreditation business in 1972 it was very much an old boys club. From my perspective the club initiation was a model of simplicity. The IEEE's VP for Educational Activities asked if I would be willing to serve. I said yes. Although formal accreditation training sessions were not available at the time, the IEEE did provide some printed guidance for new visitors. It fit neatly on one side of one page and basically admonished us to be flexible about design content but tough on math. At the time the accreditation agency was the Engineers' Council for Professional Development (ECPD). The members of its Engineering Education and Accreditation (EE&A) Committee chaired the visiting teams. The team chairs routinely led visits to four schools per year and picked all of the program visitors (except chemical engineering). Program visitors often made two visits per year. During my first five-year term I made nine visits (a tenth was cancelled at the last minute); three of those visits were with the same team chair. Almost all of the visits took place in the spring—there was no due process loop until 1977. No one in the IEEE reviewed any of my visit reports.

I don't mention these things to impress you with how tough things were in the good old days. Rather, my purpose is to highlight the progress that has been made and perhaps leave you with an appreciation of the time and effort that went into reforming the accreditation process.

To fully appreciate the effort involved requires some awareness of the debate in the 1970's regarding IEEE's participation in ECPD accreditation.¹ At the time there was a very vocal group within IEEE who felt that the ECPD accreditation process did not serve the needs of practicing engineers. If one

looked beyond their demagoguery it developed that they advocated the following changes in the accreditation process:²

- (1) IEEE should be able to choose the visitor for each electrical engineering program to be evaluated by an ECPD visiting team.
- (2) IEEE should review the program reports written to ECPD by its visitors to ensure that they follow the IEEE's policy.
- (3) Proposed accreditation criteria should be reviewed by an IEEE committee composed equally of practicing engineers and engineering educators.
- (4) Visiting team appointments and assignments should be the responsibility of an IEEE committee composed equally of practicing engineers and engineering educators.
- (5) IEEE should ensure 50% representation of engineers from industry at all levels of the accreditation process.

Today's participants may well wonder why these suggestions were matters of contention since they are now standard IEEE practice. In fact, at the time the suggestions themselves were not the root cause of the controversy. What was truly controversial, some times bitterly so, was a vast difference in perception of the pace at which changes could be made. The ECPD critics wanted immediate change under a threat of IEEE's unilateral withdrawal from ECPD. Those directly involved in accreditation cautioned that while progress was being made it would take time to implement these modifications.

How long did it take? Listed below is my reconstruction of the chronology of events. Those in the inner circle of decision making might name other events or attach slightly different dates. These differences in perspective aside, the important point is this: it took more than a decade to move from the "good old boy" days to the mid 1980's when most of the elements of the present system were in place. The reason is that ECPD, like its successor ABET (Accreditation Board for Engineering and Technology), was an umbrella organization run by volunteers representing numerous professional societies. As such, ECPD operated more like a company stock holders meeting than a meeting of the company board of directors. Accreditation agencies, be they ECPD or ABET, are not designed to move swiftly, and appropriately so.

Chronology of Changes in Accreditation Policy and Procedures^{1,3,4,5}

Year	Event
1972	IEEE adopts the policy that 50% of those on the ECPD list of approved electrical engineering program visitors will be from industry.
1975	The IEEE's Educational Activities Board (EAB) publishes guidelines for IEEE members on ECPD accreditation teams. The intent of such guidelines was to amplify and interpret ECPD criteria as they apply to electrical engineering programs.
1976	IEEE begins to provide ECPD Team Chairs with recommended visitors for each program to be visited. The overall balance was 50/50 between academia and industry.
1976	IEEE Review Committee formed to review visit reports written by IEEE members of visiting teams. The goals were to maintain consistency of accreditation recommendations and to identify problem areas in criteria interpretation.
1976	IEEE Committee on Electrical Engineering Visitors (CEEV) formed to evaluate candidates and select individuals to be added to the ECPD list of approved accreditation visitors.
1977	IEEE begins to offer accreditation visitor training seminars.
1977	EAB appointed task force codifies and documents the IEEE accreditation policies and procedures in the form of a Program Visitor's Manual.
1980	ECPD and the EE&A Committee reorganized as ABET and the EAC, respectively. IEEE membership on the EAC expands to six with three from academia and three from industry.
1983	IEEE guidelines for electrical engineering, computer engineering, and bioengineering replaced by program criteria published in the EAC/ABET accreditation criteria document.
1985	IEEE Review Committee and CEEV merged to form the Committee on Engineering Accreditation Activities (CEAA). IEEE Accreditation Policy Committee (APe) Formed.

The time and effort required to reform the accreditation process is further illustrated by reviewing high points in the IEEE's crusade to increase the number of practitioners on visiting teams to a 50% level. In 1972 the IEEE established a goal of having 50% industry representation on the ECPD list of approved electrical engineering program visitors. In that year there were 100 names on the list of IEEE program visitors: 71 from academia and 29 from industry. The actual selection by team chairs leaned even more heavily to the academic side. Remember that in the early 1970's ECPD team chairs made four visits per year, did not benefit from any formal post visit dialogue with the institution, defended the team's recommendations before an often critical EE&A committee, only to have the final accreditation decision kicked upstairs to the ECPD Board of Directors. From the team chair's perspective the campus visit was a one shot event

with a premium on getting it right under intense time pressures. Under these circumstances it is understandable that team chairs tended to pick experienced visitors from academia.

In 1976 the IEEE began to offer team chairs the names of recommended visitors for each program to be reviewed. Overall these recommendations were balanced 50/50 between academia and industry. In that year the final list of IEEE visitor selections included one third from industry. This was a substantial improvement over previous years, but still short of the goal. The advent of the ABET/EAC in 1980 paved the way for further progress. Team chairs normally made only two visits per year, the due process loop allowed for post visit correction of errors of fact or minor deficiencies, and the EAC (Engineering Accreditation Commission) made the final accreditation decision and developed procedures for off-line conflict resolution. As the credibility of the IEEE visitor recommendations grew, an overall 50/50 split on visiting teams was achieved in the 1980's. The fact that a 50/50 split has been maintained in the ensuing years is due in no small part to the dedicated efforts (especially long-term record keeping) of the IEEE's longtime visitor assignment coordinator, **Ed Jones**.

In summary, the IEEE decided to expand industry representation on the program visitor list in 1972, took the first steps to control its visitor assignments in the 1976, achieved de facto control in the 1980's, and finally received officially sanctioned control in 1996. Thus again, implementing and maintaining accreditation reform requires a sustained effort spread over many years. It requires a continuity in our shared values that extends across the leadership changes that inevitably occur in an all-volunteer activity.

In this regard it is perhaps worth remembering that the Wickenden Report that led to the founding of ECPD in 1932 was six years in the making (1923-29) and that the first campus visits did not occur until 1936.⁶

I was recently appointed to the IEEE's Committee on Engineering Accreditation Activities (CEAA). Having served in the 1970's on one of the precursor committees, the experience was somewhat like returning to my hometown after a prolonged absence. While I recognized several older buildings, there was a whole new development out on the interim visit bypass, and some nearby towns (APC, CSAB, RAe) that weren't there before. I was told that one of the purposes of the APC is to protect the CEAA from the ebb and flow of day-to-day politics. As a military veteran I was relieved to learn that APC stands for accreditation policy committee rather than armored personnel carrier. I have come to admire the impressive array of CEAA responsibilities and especially the way a very wide range of accreditation issues are openly debated and decided. I have been pleased to see that the IEEE continues to lead the way in the diversity of its participants at all levels of the accreditation process. What might my experience from the past have to say to the future residents of this marvelously bustling city?

My foremost advice is to be patient and persevering. With EC2000 the accreditation process will undergo yet another historic transition. A lesson of the past is that the transition will not be over in 2001. It will be at least a decade before most of the important

implications and problem areas will be understood. If the accreditation history teaches anything, it is that future participants should resist the temptation to quick-fix these problems by expanding the criteria. If industry's experience with continuous improvement teaches anything, it is that implementation problems are not solved by expanding company policy documents, but by improving employee training. These lessons suggest that the IEEE should place greater emphasis on mentoring and training its accreditation visitors. Specifically, the CEAA should shift the emphasis of its report review effort from evaluating visitors to identifying common problems in criteria interpretation with a view toward improving visitor training. It should shift its emphasis from evaluating programs to helping the program's faculty develop an ongoing continuous improvement process required by EC2000.

Finally, throughout this discourse present day participants have undoubtedly noticed that I have always used the noun visitor rather than evaluator. This is not just because that's what we were called in the good old days, but that somehow the term visitor seems more appropriate to the nonadversarial process envisioned in EC2000.

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Biographical Sketch

Roland E. Thomas received the B.S. degree from New Mexico State University, the M.S. degree from Stanford University, and the Ph.D. from the University of Illinois at Urbana, all in electrical engineering.

In 1985 he founded TCS, an independent engineering consulting company based in Scottsdale, Arizona. Prior to that he worked for the Government Electronics Division of Motorola, the Colorado Springs Division of Mission Research Corporation, and the Kaman Sciences Division of Kaman Aircraft Corporation. He served for 20 years as a member of the faculty of the United States Air Force Academy, including 13 years as the Professor and Head of the Electrical Engineering Department.

Roland Thomas served as an officer in the United States Air Force for more than 26 years, retiring in the grade of Brigadier General. During his military career he was awarded the Legion of Merit, the Air Medal, the Air Force Commendation Medal and the Vietnamese Honor Service Medal.

Dr. Thomas is a senior member of the IEEE and a Fellow of ABET. He served on the Engineering Accreditation Commission of ABET from 1980 to 1985.

In his article, Ron describes the actions in the EAB to change the role of IEEE in the accreditation process, and to implement certain ECPD policies that had been found difficult to follow. EAB appointed an ad hoc study committee to recommend policies and procedures. The committee was co-chaired by Edward Ernst, then of the University of Illinois, and William Sackett, of Honeywell. The committee included Kjell Carlson, General Electric, Edwin C. Jones, Iowa State University, Earle Steele, University of Kentucky, and Harry Venema, Borg Warner. The committee completed its deliberations in much less than a year, and the recommendations were adopted and implemented. Then, EAB appointed the committees, which eventually came together into the CEAA and, for Engineering Technology, CTAA. A principal responsibility of the CEAA has been to maintain, not a 50:50 balance (academic vis-à-vis industrial/government engineers) of names on the approved list, but a 50:50 balance in the actual workload. Achieving this has required careful record keeping and careful selection of evaluators from all parts of the employment spectrum. In practice, the workload distribution has varied from 55:45 to 45:55 over the last twenty years.

**Main Article by Ron Thomas
Prolog and Postlog by Ed Jones**



ECEDHA Update

ECEDHA and HKN

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Developing leadership in our students is critical to the future of our profession. In recognition of this, ECEDHA as an organization and its members individually have been working hard in

recent years to energize the ECE national honor society "HKN." At the national level, under the guidance of Executive Director Roger Plummer and by way of the tremendous leader-



From left to right: Robert Trew, North Carolina State University; Richard Blahut, University of Illinois at Urbana-Champaign; Mark J. T. Smith, Purdue University; David Munson, University of Michigan; Gary May, Georgia Tech; Kelvin Erickson, University of Missouri, Rolla; Ali Sayed, University of California, Los Angeles; Karl Martersteck, HKN Board; and David Irwin, HKN Board.

ship provided by the late Robert Janowiak, HKN has been infused with new energy. HKN is building a new image for itself as seen through its rejuvenated magazine – *The Bridge* – and its exciting and informative new webpage at <http://hkn.org/>, both with the assistance of the International Engineering Consortium (IEC) (<http://www.iec.org>), led so ably for many years by Bob Janowiak. At the student chapter level, ECEDHA members have been working with faculty and students to expand the level of HKN activity. The result of these collective efforts was evident last year with nine schools being recognized at the ECEDHA annual meeting. UIUC, Purdue, Georgia Tech, Michigan, North Carolina State, Missouri-Rolla, UCLA, Florida International and UC Berkeley each received outstanding chapter awards. The department heads/chairs shown below from seven of these schools were present to receive their chapter's plaque during the awards presentation.

One of the most prominent signs of HKN's revitalization is the recent Leadership Conference, which drew students from all over the region. The conference, held November 3-4, began with a reception on Friday evening followed by a full program of activity on Saturday. After opening remarks from Roger Plummer and Professor Thomas Talavage (Purdue University Beta Chapter Advisor), attendees heard an opening keynote speech on HKN and Leadership from Professor Steve Goodnick, Vice President for Research at Arizona State University. (Steve serves on the HKN Board and was on the ECEDHA Board when he was EE Chair at ASU.)

Following a short break, students engaged in a team project design exercise. Attendees were divided into groups of four, each given a bag of assorted odds and ends with the objective of making a ping-pong ball launcher. Teams were allowed to trade with other groups or bid on extra supplies. The goal was to design a launcher to propel the ball



at least one foot, but as far as possible. Extra points were awarded for creativity and novelty of design. Students were able to meet HKN members from other schools and learn how to work together as a group - a valuable skill for these future leaders.



Dr. Michael Birck, co-founder and chairman of Tellabs Inc, gave the keynote address during lunch and shared his perspectives on leadership from an industry viewpoint. Students had an opportunity to interact with Dr. Birck during the lunch and afterward during the group tour of Purdue's state-of-the-art Nanotechnology Center named in honor of the TellLabs co-founder.

In the afternoon, two workshops were held: one on career development, the other on chapter development. For the latter workshop, panelists addressed issues related to recruiting undergraduates and graduates, funding activities and collaborations with other societies.

Rounding off the conference presentations was the dinner keynote speech, given by Professor Leah Jamieson, Dean of Engineering at Purdue University and President-elect of the IEEE. Jamieson shared her thoughts on the future of the engineering profession and the opportunities for the next generation of HKN graduates

The leadership conference was a tremendous success. It is hoped that this will be the first of many, held regionally on different campuses. ECEDHA is grateful to the vision and support of the IEC and the tireless efforts of Executive Director Roger Plummer, the members of the HKN Board, the passion of the late Robert Janowiak, and John Janowiak, current president of IEC for his continuing support to take HKN and ECEDHA to the next level.

ECEDHA and Other ECE Organizations

Starting three years ago, the ECEDHA Board has sent one of its members to one or both of the annual Canadian department heads meetings to help develop a better association with ECE programs at their Universities. ECEDHA president Jon Bredeson gave a presentation to CHECE-DGEIC (Canadian Heads of Electrical and Computer Engineering/Directeurs de génie électrique et informatique du Canada) on October 23, 2006 at the University of Alberta in Edmonton talking about a variety of issues facing ECE and ECEDHA. This included an update on the web site and a preview of the ECEDHA Annual Meeting. Exchanging ideas and discussing common issues between ECEDHA and CHECE-DGEIC has been mutually beneficial outcome these visits.

Bredeson also attended the Commission on Engineering Accreditation Activities (CEAA) in Short Hills, New Jersey, January 27 and reported on ECEDHA activities including an overview of the program at the Annual Meeting. Several former officers of ECEDHA have been serving with CEAA for a

number of years. The session titled "ABET: The Costs and Benefits of Assessment" was discussed at some length since a number of heads and chairs are very concerned about all the work that goes into preparing for accreditation and the actual benefits received. He also gave a report at the Education Activities Board Meeting, February 17, in Universal City, CA on similar issues.

ECEDHA Activities

The 2007 annual ECEDHA meeting was held at the Renaissance Resort at World Golf Village in St. Augustine, Florida, March 16 – 20, 2007 with the Theme: Recapturing the Image. ECEDHA vice president Mark Smith was in charge of the program and a number of very interesting sessions were held. There was an ABET workshop for programs to be visited in 2008 and 2009, an IEEE program evaluator's workshop, and a workshop for new department heads. Panel sessions covered a variety of topics including recruiting and retention strategies, assessment support for ABET criterion III, globalization of ECE from an international perspective, the costs and benefits of ABET assessment, technology enhanced learning, and the future role of energy and power in the ECE curriculum.

ECEDHA provides important services to ECE program heads, such as facilitating discussion on the topics of common interest mentioned above. Another important service is the ECEDHA survey. The survey has been in place for many years and provides useful and relevant information to ECED-

HA member schools. During this next year, the ECEDHA survey underwent a major upgrade both in terms of improving data entry and the reporting of results. It is our hope to make the ECEDHA survey the most comprehensive source of ECE program data currently available in an effort to assist heads and chairs in their reporting and benchmarking.

ECEDHA continues to promote regional department meetings which are valuable since they are smaller groups allowing close interactions with most in attendance. The eight regions (seven in the US plus one in Canada) and their activities are listed on the ECEDHA Activities web page. Most regional meetings take place on campus, which provides the host university an opportunity to highlight its special programs and facilities.

The resources of GradNet, which are maintained by IEC, can be used to address assessment concerns for ABET Criterion 3. Utilizing a portal to GradNet and summary reporting software, it should be possible to provide direct assessment. A session dealing with this subject is part of the annual meeting. Departments are encouraged to use the resource and to continue their involvement in helping to develop GradNet content.

ECEDHA continues its efforts to address the challenges that confront the ECE profession and to provide services to its membership. A detailed review of activities and accomplishments for Spring 2007 will be presented in the next issue of Interface.



The Internationalization of Engineering Technology

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The Technology Accreditation Commission (TAC) of ABET developed and then piloted a new outcomes based criteria in 2001 with full implementation being achieved in 2004. The criteria are called Technology Criteria 2000, or TC2K for short. TC2K is composed of 9 criteria.

Criterion 2 is titled *Program Outcomes* and contains a list of required student outcomes which is commonly referred to as the 'a through k list'. Part j of criterion 2 is stated as follows: *An engineering technology program must demonstrate that graduates have a respect for diversity and knowledge of contemporary professional, societal and global issues.* Prior to the advent of TC2K, it was common for engineering technology programs to give little or no attention to the criterion 2.j topics. Since TC2K came into being, program evaluators have found during accreditation reviews that a variety of strategies are used to respond to the requirements of criterion 2.j.

One popular strategy is to introduce pertinent material into required courses. The alternatives to achieve this are 1) do it

yourself, and 2) let others do it. If a program chooses the second of the two alternatives, it is, in effect, depending on the non-technical courses, which are oftentimes electives, to respond to the criterion 2.j topics. A major disadvantage of this approach is that the engineering technology faculty does not have control of those courses. This being the case, it is difficult to be confident the criterion is being adequately addressed. In addition, the faculty of the non-technical courses may not be (or perhaps are not) inclined to spend time gathering the data/information necessary to demonstrate that the topics are being addressed and that the student learning outcomes are satisfactory.

The first alternative, i.e., 'do it yourself', eliminates the uncertainty of 'letting others do it' by integrating appropriate exercises/assignments into one or more of the technical courses which the engineering technology faculty control. An excellent example of this is described by Purdue University ECET Professor **Tim Skvarenina** in a paper he presented at

the National *ASEE Conference* in 2004.

Professor Skvarenina has integrated material which responds to criterion 2.j into his course which is titled “Electrical Power and Controls”. This is a fourth-semester required course in the Electrical Engineering Technology program at Purdue. Professor Skvarenina used a variety of strategies such as case studies, classroom discussion, discovery, and having the students write a short position paper on a topic of interest to address the criterion 2.j topics.

The following paragraphs describe two of Professor Skvarenina’s successful and innovative strategies to introduce diversity, contemporary professional, societal, and global issues into his course.

To drive home the point of globalization in the manufacturing arena, Professor Skvarenina used the example of a popular automobile, the PT Cruiser. When asked where they thought the car was manufactured, the most popular answer was Detroit. Few students were aware that it was designed by a company called Daimler-Chrysler headquartered in Germany. After discussion, the students were knowledgeable of the scope of international involvement in putting the PT Cruiser on the roads of America – the car was designed primarily for the American market by a company headquartered in Germany and built in Mexico.

Another point relating to internationalization is that a requirement being implemented in one country has the potential to affect the economy of another country. The students read and discussed a Business Week article which indicated that the European Union plans to require lead-free solder in all equipment. The students immediately realized that we would have to do the same in this country if we wanted to sell any products there.

Professor Skvarenina’s complete paper titled “*Incorporating ABET ‘Soft Skills’ into Energy Conversion Courses*” can be found in the Proceedings of the 2004 National ASEE Conference.

Criterion 3 of TC2K requires that “Each program must utilize multiple assessment measures in a process that provides documented results to demonstrate that the program objectives and outcomes are being met.” In addition to assessing the effectiveness of classroom work such as Professor Skvarenina’s, many engineering technology programs survey their students in regard to the topics of criterion 2.j during the senior year. Examples of attitudinal type questions that pertain to the topics of criterion 2.j are:

I expect to have a need to work/communicate with associates from other countries during my career.

I understand that outsourcing is a common practice in today’s industry and that the practice may in some way affect my career.

During my career, it is likely that I will encounter colleagues from different cultures who represent a broader spectrum of gender and diversity than I have been accustomed to.

Attitudinal survey questions such as the examples given above usually offer a range of choices such as ‘Strongly agree’ to ‘Strongly disagree’.

Many engineering technology programs have stepped up their involvement in the international arena by getting involved in international projects. Financial support for initiatives such as this is often obtained by applying for a grant from an outside agency. An example of this is Rochester Institute of Technology being awarded a grant of \$400,000 from the United States Agency for International Development to establish the Center for Energy and Natural Resource Development at American University in Kosovo.

Engineering technology and engineering faculty at RIT will, through the Center, collaborate with colleagues at the American University in Kosovo. It is expected that eventually there will be opportunity for faculty exchanges as well as opportunities for RIT students to earn credits at the American University in Kosovo and vice-versa.

Another example of an engineering technology program being involved in an international initiative is the Purdue University ECET department’s plan to offer a two-week course in Digital Signal Processing in collaboration with the faculty at Fachhochschule (University of Applied Science) Wolfenbüttel, Germany. Professor **Greg Moss** is managing this initiative for the ECET department. His colleague, Professor *Athula Kulatunga*, will travel to Germany to participate as a member of the faculty team for the course.

As many as twelve Purdue ECET students have confirmed their plans to travel to Germany for this experience. The students will, in addition to earning credits toward their degree requirements, get an impression of Germany and the region by attending presentations on history, geography, and culture as well as visiting companies and places of interest.

In summary, engineering technology programs have, since the implementation of TC2K, introduced a ‘step function’ in the level of international considerations in their programs of study.

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IEEE/ASEE The Interface Column



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As we started 2007, ECE Division was collecting papers which were accepted (based on abstract review) in November of 2006. Program Chair, **Dennis Silage**, working with reviewers and session chairs, is putting together an outstanding technical program for the Division in June as part of ASEE Annual Conference in Hawaii. Detailed session information will be available through ASEE website:

<http://www.asee.org/conferences/annual/2007/index.cfm>

Briefly, this year's sessions include: BSECE open forum, curriculum innovations, panel discussion (teaching/learning with technology), digital & wireless communication systems, digital and embedded system design, pedagogy and assessment, research in undergraduate ECE education, new trends, laboratory design, posters. The panel discussion (Tuesday 6-26-07, 8:30 a.m.) has been expanded to include members from government/industry. If you attended this session in Chicago you have noticed the format which in the past only included panelists from academia. We are delighted to report that **Ian Bennett** of NSF and President **Jakubowski** of Rose-Hulman will be joining the panel discussion this June. AdCom meeting of the EdSoc will be on Monday, June 25 at 6:30 p.m. Division Chair, **Victor Nelson**, has been trying to introduce smooth operation/transition of division's normal business by documenting (and forwarding to new officers) a notebook of best practices in the division. In short the ECE Division is in good shape (and good hands) and our business meeting (Monday June 25, 7:00 a.m.) has attracted good attendance in the past. In addition to usual business agenda items, we conduct our annual election of officers during the business meeting. We like to introduce **Jenna Carpenter**, as incoming secretary/treasurer for the division. We will be sending out notice through our listserv for nominations for this position to be elected during the business session in Honolulu.

There is much to report regarding IEEE and the Education Society. **Rob Reilly** is doing a superb job in notifying society members (Notes, Newsletters, Webinars, e-mails, webpages, etc). Just wanted to mention that membership has been growing in the EdSoc, with more than 3000 members as of February, 2007. We like to engage in discussion regarding the ways and means of encouraging more faculty members to join this important society, especially now that there is a national/international debate on the future of engineering education. If we use regions 1-6 as an example, a very rough estimate of the number of faculty in the Electrical and Computer Engineering disciplines will tell us that we should be able to double the number of Education Soci-

ety members! Attending international conferences and forums, we were delighted to see that there are ECE departments where the entire faculty are members of the EdSoc!! In Region 4 (Chicago, January 2007) we were fortunate to have President **Leah Jamieson** join the meeting of the R4 ExComm and regional meeting at the invitation of R4 Director, **Robert Dawson**, and to make an interesting presentation regarding IEEE worldwide activities and importance of "Expanding the Conversation." She talked about the value of membership, China, industry relations, new technologies and core strengths of IEEE (publications, products & services, conferences, standards, networking, career development). After discussing the top 20 greatest engineering achievements in the 20th century (many by IEEE members), she asked the question that what will be the greatest achievements of the 21st century? Among other issues, she mentioned humanity's top 10 problems for the next 50 years: energy, water, food, environment, poverty, terrorism & war, disease, education, democracy and population. She then discussed future jobs, workplace, workforce, engineering in the coming years, role of technology in learning, emerging technology areas, fostering innovation and global issues.

Another continuing activity in the IEEE that we are involved in are the e IT (electro information technology) conferences. After the successful eit2006 conference at Michigan State in May of last year, the seventh conference will be hosted by IIT in Chicago (www.eit-conference.org/eit2007), May 17-20, 2007. 2008 Conference will be hosted by Iowa State University and 2009 by University of Windsor; 2010 is tentatively scheduled for the Twin Cities, Minnesota. We conclude this column by encouraging our readers to engage in a dialog concerning the importance of professional societies such as IEEE and ASEE with their colleagues and greater learning community. It is encouraging for example to hear that student membership within IEEE is growing but to sustain this growth we need to discuss the advantages and values of the membership in these and other professional societies. We have tried, as an example, to provide membership information in conferences such as e IT, there are some attendees who are not members and will join if they hear about the benefits and networking opportunities. One incentive will be to use the extra conference registration fee to provided for first year (or 6 months) free membership in the organization. Please send us your comments, views regarding the items we have discussed in this column.



From the IEEE-EAB Committee on Engineering Accreditation Activities

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A PERSPECTIVE ON THE COST OF A CAMPUS VISIT

After getting back from my campus visit this fall, I took a moment to reflect on my tenth experience as a Program Evaluator. When I did, two things came to mind, as I felt more than a little guilty about the money spent on the two really great team dinners.

The first was that it seems incredible to me that from two to sixteen people come together for a two and a half day campus review and pull it off like they have been working together, as a team for years. It is constantly amazing. In fact, the teams in general, have never met each other before, let alone worked together! It's not like they have a lot in common. They represent academia, industry, or government, as well as varying educational, cultural, and experiential backgrounds. Because of conflict of interest concerns, none of them has a relationship with the university they are visiting.

Almost by definition, no one on the team is in any sort of "comfort zone" relative to any of the other members of the team. Yet almost immediately, in the first meeting Sunday, team members are working together, adding perspective on a troubling issue, helping someone in clarifying Criterion 2, etc.

Lest you think I have no "perspective", I also sit on an all-volunteer Board of Directors, who are constantly arguing and haggling!

The other thought I had was the monetary value of the time program evaluators spend before and during a visit. As a salaried employee for the past 30 years I never really focused on the hourly numbers. However, recently I took on a consulting effort and have to document my time on an hourly basis. It's caused me to think about some things I haven't ever dealt with before. Do I report travel time? How about reporting the time to complete the online time cards?

So, let's look at the time a Program Evaluator spends on this "consulting effort". Although it varies immensely, most

folks will tell you that if you count it all up, most program evaluators spend about forty hours preparing for a visit. If you are not a program evaluator, and think that's excessive, I will tell you that one year I spent over fifteen hours and two conference calls just trying to sort out a university transcript process, and one of the minor issues never did get resolved!

Then, there is the campus visit. You leave home Saturday noon and get back Tuesday night late (if you're lucky). I would guess this consists of a good 30 hours. This is clearly conservative, since most times you can't get home until sometime Wednesday.

In total this nets out to about 70 hours. What does an experienced consultant make an hour? To keep things in round numbers, and to be conservative, lets assume one hundred dollars an hour. That gives a figure of seven thousand dollars for a single program evaluator. Now the teams range from a minimum of two to a maximum of about sixteen people. I've seen no statistics, but including the team chair, I would guess seven people on a team is typical. Seven people times seven thousand dollars and you come up with nearly fifty thousand dollars.

\$50,000 dollars!

Fifty thousand dollars of volunteer time and effort donated to a university with which no one on the team has an affiliation, or direct "interest" in the results of the visit. Not even to mention the indirect impacts to the Program Evaluators, such as losing a weekend that could be spent with one's family.

So, summarizing the above two thoughts, on average, each campus visit is comprised, typically, of seven professionals volunteering about \$50,000 of their effort and they have an extremely professionally rewarding and collegial experience as their only "reward". Only one thought comes to mind: "priceless"!

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Frontiers in Education Conference

Global Engineering: Knowledge Without Borders, Opportunities Without Passports

Hilton Milwaukee City Center • Milwaukee, Wisconsin
Wednesday–Saturday • October 10–13, 2007

The 2007 Frontiers in Education Conference (FIE 2007) continues a long tradition of disseminating innovations that improve computer science, engineering, and technology (CSET) education. FIE is a major annual international conference devoted to improvements in CSET education. It is an ideal forum for sharing your ideas, learning about new developments in CSET education, and interacting with your colleagues.

Globalization has dramatically changed engineering. Global engineering teams design products for global markets. Knowledge has no borders in a world where information flow is digitized and sent worldwide in seconds. A core requirement of engineering globalization is an understanding of how the different cultures of the global marketplace shape product development, multi-national engineering teams, and consumer expectations. Engineering education must address this issue with innovative solutions including new pedagogies; new approaches that improve student learning of technical skills and cultural skills; improved methods of distance education; study-abroad components; curricula reform; and partnerships between academia, industry, government, and K-12 educators.

Recent FIE conferences have addressed the borders between people and the impact that global hiring will have on engineering graduates. This year, in the city of Milwaukee—a city where Old World craftsmanship meets the New World of the information age—the FIE conference planners are especially interested in continuing the dialog about globalization with contributions that address the essential technical skills, cultural skills, learning skills, and curricula that will be required of graduates entering the global workplace.

Papers, Works in Progress, Panels, & Interactive Sessions

Topics will include:

- Accreditation and evaluation
- Active learning
- Assessment
- Capstone and senior design experiences
- Computer and Web-based software
- Community outreach: educating the public
- Creative design experiences
- Degree programs and curricula
- Distance learning: methods, technologies, and assessment
- Diversity: valuing it, achieving it, and teaching it



- EE courses and labs
- Entrepreneurship programs
- Ethics: creative ways to teach and assess it
- Faculty development
- Introductory courses and programs
- Gender issues and CSET education

- Globalization: preparing faculty and students
- Graduate curricula and programs
- K–12 initiatives and partnerships
- Laboratory experiences: on-site and at a distance
- Learning models
- Lifelong learning
- Nontraditional students
- Partnerships (industry, government, university, international)
- Pedagogies
- Service learning
- Skills development: technical writing, presentation, teamwork
- Software engineering
- Student retention and persistence
- Study-abroad programs
- Undergraduate research experiences
- Uses of technology in the classroom
- Other (You may submit abstracts and proposals on other topics that address issues at the frontiers in CSET education.)

Location

Milwaukee is a vibrant metropolitan area on the western shore of Lake Michigan. It is the home of 1.6 million people and many major engineering companies including Astronautics, Briggs & Stratton, Falk, General Electric Medical Systems, Harley Davidson, Johnson Controls, and Rockwell Automation. Milwaukee is a city of many cultures and is known for more than 50 major festivals and public gatherings held throughout the year. In addition, with major and minor league sports teams, miles of stunning parks along the Lake Michigan shoreline, four distinct seasons, museums with international reputations, and a full-range of performing arts groups including opera, symphony, ballet, and theater there is something to do in Milwaukee all-year round!

Hilton Milwaukee City Center

Milwaukee is a vibrant metropolitan area on the western shore of Lake Michigan. It is the home of 1.6 million people and many major engineering companies including Astronautics,



Briggs & Stratton, Falk, General Electric Medical Systems, Harley Davidson, Johnson Controls, and Rockwell Automation. Milwaukee is a city of many cultures and is known for more than 50 major festivals and public gatherings held throughout the year. In addition, with major and minor league sports teams, miles of stunning parks along the Lake Michigan shoreline, four distinct seasons, museums with international reputations, and a full-range of performing arts groups including opera, symphony, ballet, and theater there is something to do in Milwaukee all-year round!

The Hilton Milwaukee City Center sits in the heart of downtown. Originally the Schroeder Hotel, it has been recently renovated to reflect the original 1920s classic grandeur while adding state-of-the-art communications and amenities. It is surrounded by restaurants and shopping and is a short walk from many of Milwaukee's premier attraction

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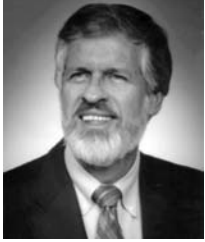
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From your Editor

Bill Sayle
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As the weather warms in the Northern Hemisphere and cools in the Southern Hemisphere, I hope the changing seasons find each of you in good health. In this issue of *The Interface* you will find our usual collection of articles with relevance to engineering education.

Although we might be stretching the link with this issue's article by Frank Splitt, I believe you will agree the points he makes are certainly relevant to higher education in general, which certainly includes engineering education.

A history of the accreditation infrastructure within IEEE is presented in an article by Ron Thomas. This article originally appeared in *The Interface* in 1998 and is repeated in this issue, along with comments from Ed Jones.

In his column, IEEE CEEA Chair Franc Noel puts into perspective the costs and benefits of ABET accreditation. An appropriate column as many institutions are questioning the amount of time and effort required by the accreditation process.

We also feature several other interesting articles on a variety of topics. We have the usual entertaining/controversial

submission from IEEE Vice-President for Educational Activities Moshe Kam. Moshe usually generates significant responses to his articles and told me that's what he wants. This time, Moshe takes a break from curricular and ABET matters and focuses on the relationships between universities and research funding agencies. Many of us have likely encountered some of the "challenges" about which Moshe writes.

Don't forget to clear your calendar for the 2007 Frontiers in Education Conference. This year's conference will occur on 10-13 October in Milwaukee, Wisconsin, USA. FIE is THE conference in engineering education and features opportunities to interact with your colleagues from around the world on a personal level.

As a reminder, you can usually read the latest issue, along with recent back issues, of *The Interface* on the IEEE Education Society web site: <http://www.ewh.ieee.org/soc/es/>

I hope this issue of *The Interface* finds each of you in good health.

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