

ENGINEERING CAREERS and PROFESSIONAL SOCIETIES

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Introduction

Background First, I would like you to know that I, and others, have taken a positive approach to enhancing the engineering profession through the traditional channels of the Institute of Electrical and Electronics Engineers (IEEE). During this period I have served IEEE at the Section, Council, Region and National level. This participation has given me the opportunity to work with the finest people in IEEE and the engineering profession.

Goals My goals have always been the same: To strengthen the bond between the members of the engineering profession; To improve the economic and technical health of the engineering profession; To enhance the career of the members of the engineering profession. Although, working through IEEE has been a warm, friendly and rewarding experience, I must conclude that it has been as productive as shoveling sand against the tide with a pitch fork.

Engineers have contributed to placing astronauts and equipment in space and deserve some credit for a decisive victory in Desert Storm, yet we have difficulty in catching the attention of a single congressman or senator sympathetic to our concerns. Why can't we reach our representatives? Is there a reason?

Engineering Careers

Function An engineering career is rather unique. Engineers are problem solvers. Engineers turn words into components, sentences into functions and paragraphs into systems. Engineering is the work of professionals who answer to the laws of mathematics, physics and nature and apply them to the solution of technical problems. When the problem is solved, the synthesis complete, our task is finished; we must move on to new problems.

An engineer is one who does engineering and not a person that only holds a degree in engineering. The function of the engineer is to design him or herself out of a job. In the 1960's, when you finished a job, there was another good job behind it. We had engineering support people, the country was productive and engineers had an opportunity to practice.¹ In today's low engineering demand economy, covering most of the past 30 year period, the theme has been; first one finished - first one fired.

These conditions deprive engineers of an opportunity to practice their profession and thus, deprives them of a profession. Many of our young engineering graduates are not able to enter the engineering profession for which they studied so hard.²

Needs Engineers must practice engineering and keep involved in the solution of engineering problems to enhance their skill level and their engineering capabilities.³ If engineers want a lifetime profession in engineering they must have an opportunity to practice their profession. Good engineering practice and judgment are derived from in-depth experience and are paramount to the solution of technological challenges. In order to satisfy these needs our engineering skills must be fully utilized and this requires a manpower balance, ie., a balance between the supply of engineers and the demand for engineers.

We need productive engineering jobs and development programs to stay sharp and competent. Our industries need incentives to fund these programs and we must also have the support of the government. In order to achieve this we require

qualified, dignified and credible representation. We have not been getting this representation from the old line engineering or technical societies. This applies to all engineers in all engineering disciplines.

Engineering Societies

Goals The original goals or directives of IEEE were in the technical and educational areas; very similar to other 'engineering' societies. During the U.S. engineering or High Tech recession of the 70's, IEEE added a professional agenda to its technical and educational efforts. We moved into the professional arena to solve our career problems. We thought these new goals and directives were to improve the engineering profession. Obviously, we must have been mistaken. Nothing improved.

Efforts With the hope of improvement, many of us became involved in professional activities thru IEEE's Professional Activities Committees for Engineers (PACE) and a new entity known as the United States Activities Board (USAB). We started a PACE Conference that occurred each Labor Day weekend. We were to meet every year at this 3 day conference to address professional problems and attempt to enhance our profession. During the year we would work to solve the problems. Some of the primary subjects were: age discrimination, pensions, unemployment, underutilization of engineers, communications, patent incentives, importation of engineers, career enhancement and more. We even had a Committee for Professional Opportunities for Women (COMPOW). Are things any better today?

We grew and lost. We grew some more and lost some more. We expanded into five (5) councils, some 30 committees and hundreds of volunteers (some were paid). Our new found solution to professional problems was funded by U.S. IEEE member assessments. At a current \$22 assessment per U.S. member, USAB runs on better than 4 mega-bucks per year. Almost 20 years later, 60 million dollars spent and IEEE has not improved the profession one little bit.

Today I believe USAB produces more problems than it solves. USAB or IEEE-USA, as the operation is now called, is dominated by members that are not really concerned about the engineering profession or our professional needs. More money is spent on keeping the "pipe line" full and recruiting students to the engineering schools than is spent on promoting opportunities for engineers. Obviously, the engineering community and IEEE's members are no better off today than they were in 1973. So, how and where did we fail?

Communications Frank Lord developed a publication called "IMPACT" to serve as a communique for IEEE's PACE volunteers. It was intended to address the concerns of the engineering members and be dedicated to professional issues. "IMPACT" is now used to promote college recruiting by supporting the Pre-college Education Committee and other academic backed programs. However, we lost "IMPACT" and I quote Professor Pete Rodrigue, IMPACT's Editor-in-Chief, from GA. Institute of Technology. He explains how IMPACT, a publication developed to address our needs, has been lost to others. Pete wrote,

"While IMPACT is the PACE newsletter, it is not PACE's exclusive property. PACE leaders make up

only about 20 percent of the circulation. IMPACT has a total circulation of approximately 3500, a little more than one percent of IEEE's members. Of that number, only about 300, less than 10 percent, currently serve as PACE volunteer leaders. Another 400 or so are former PACE workers or others who request IMPACT.

The largest identifiable group, about 25 percent of the whole (or 900) are in education--student branch chairmen, counselors, EE deans and department heads. The second largest group is composed of Technical Activities Board--including Society and Chapter--leaders. They constitute about 750 names (or 22 percent of the circulation)."

"That's the audience IMPACT attempts to address."

This is Pete's rationale and weak justification, not mine. I don't buy it or believe it, but the loss of the publication is very real. I believe we lost IEEE's responsiveness to the engineering profession in the same manner. Engineers do not have a means of communication within their society. Naturally, engineers can not reach engineers in other societies or anyone outside the engineering societies. Each engineer is conveniently isolated.

For other avenues of communication I refer to IEEE's SPECTRUM and THE INSTITUTE. Some IEEE members seek to keep the "Pipe line" full to the engineering colleges without concern for the space available to these graduates in industry. They lend credence to the "SHORTAGE SHOUTERS" such as the National Science Foundation (NSF) by giving them free space in these publications, promoting Engineer Shortage Propaganda (ESP) and smothering any dissension. Some, further compound the engineering unemployment crisis by diverting funds for engineering development programs and stress funding to support the NSF and increase engineering degree production.⁵ This activity increases the manpower unbalance and deprives more engineers of an opportunity to practice.

A further detrimental influence to U.S. engineering capabilities and derived from an engineering manpower surplus is under-utilization. Under-utilization of engineers deprives engineers of the opportunity to enhance their skills, knowledge, efficiency and ability. When an engineer performs engineering work only 20% of the time they will, in a 10 year period, gain only 2 years of engineering experience.

Let's consider IEEE's past election. Of the 14 major offices, all positions on IEEE's Board of Directors, 8 positions or 60 percent were won by academics. Who or what professional society will take on the future "SHORTAGE SHOUTERS" and strive for the ENGINEERING MANPOWER BALANCE required for a productive lifetime profession? Any academic who moves in this direction will soon fall from grace with the college empire.

Conclusions

Addressing the questions posed earlier in this paper: We can not reach our government representatives because some one else is reaching them for us. Others, implying they represent the professional concerns of the engineering community, present their views or agenda in place of ours. Engineers can't reach their representatives because we have always let some one else do this for us.

Conditions are worse today for the engineering professional than ever before. Engineering unemployment is at its highest and recent graduates are not getting the engineering jobs for which they studied so hard. Immigration laws, changed by NSF's propaganda, place U.S. engineers at a disadvantage by giving preferential treatment to immigrants with engineering skills. This further compounds the engineering un-employment crisis.

How and where did we fail? WE failed because we never had the opportunity to express our views. We exhausted our efforts fighting within our engineering society just to get our concerns on the agenda. We failed because we didn't know where to direct our efforts. While we were pre-occupied with internal arguments for problem recognition and methods of communication our opponents, in IEEE, were supporting NSF and their fabrications to get funds for the colleges and degree production instead of engineering jobs.

IF YOU ALWAYS DO WHAT YOU ALWAYS DID YOU WILL ALWAYS GET WHAT YOU ALWAYS GOT

It is time for change. Engineering careers and a professional society are synonymous. We can't have one without the other. Engineers require an association similar to the American Medical Association (AMA), dedicated to the enhancement of the engineering profession and U.S. engineering capabilities.

Engineers require a publication that will address their professional concerns; a publication with a mission that cannot be altered.

Your association should be strong enough to face the challenges and take on the "Shortage Shouters" and the self gratifying bureaucracies such as NSF. We can not afford to expend our efforts fighting for a voice within our present typical engineering societies. The place to present our case is in Washington, in the House and Senate, and there we will confront our opposition.

And finally, we shall continue by representing ourselves. We have the ability to challenge conventional wisdom and shape the future. The battle for our profession continues, but this time we are in it.

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