

Relevance of Power Engineers to Society

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Abstract—From small to large power applications, power plays an important role. There are many uses of power in today's society and it can hardly be imagined to not have. But, how does power exist? How is it generated? The answers to these questions would not be possible if it were not due to power engineers. Power engineers plan, design, and implement solutions to meet energy demands across the world. Their relevance to society is vital for future needs and must be continued to provide comfort and life as known. Increasing power engineers' visibility, promoting power engineering education, and providing community outreach is necessary for the profession's survival.

I. INTRODUCTION

Pertinent to the matter at hand, applicable, and appropriate are all descriptions used to explain relevance. How much of a demand something has normally dictates its relevance in today's society. From drinking water, fast food restaurants, and clothing stores to grocery stores and schools, these subjects bring forth legitimacy to their own relevance. But what about how these topics actually function? How would a water treatment facility produce clean drinking water? How would a school provide a reasonably cool classroom without an air conditioner on a rather hot day? The answer would be "power".

Power plays a vital role in societies across the planet. Rather than being just a formula of Power, $P = \text{Volts, } V * \text{Current, } I$, to the average person not engaged in science or engineering, it is something more valuable. Although some may take power for granted some do not and they work very hard to make power available to communities every day. These individuals are called power engineers. Power engineers play a vital role in generating power and the transmission of power. Power is used in almost every facet of modern life and it is evident in virtually every item we use from cell phones to housing units. Since these things are a part of routine life in developed and developing countries, the source in which they operate are often overlooked. The job of a power engineer is not only to assist in the generation of power but also its sustainability. Without sustainability of power, many lives would be disrupted and the way business is conducted would be delayed.

With sustainability of power in mind, the goal of this paper would be to explain the applicable reasons for the existence of power engineers and their importance. Three main areas will be the center of focus and they are the increase of visibility to the public, promotion of power education, and community outreach.

II. INCREASE VISIBILITY

The need for the profession of power engineering to be made visible is one of a difficult task. This is a task that should not be ignored if the future of power and energy is to be taken into consideration. With the growing concern of decaying energy grid infrastructures and the need for more innovative ways of power generation, one may ask, what is a power engineer? What does a power engineer do and why is it important to me? The answer to these questions will give insight to the importance of this profession and the benefits that society receives because of it.

As previously mentioned power engineers should be encouraged to increase their visibility. The need for increasing visibility means to expand the public's awareness of the many faces of power engineering and how they affect our everyday lives. Simply put, the public needs to know who they are and what do they do. To discuss in further detail, power engineers provide the United States as well as other nations with the energy needed to harness the electricity in our houses, business, and universities. The power engineering field encompasses a wide range of professions. These professions provide energy by an array of different methods. Solar, wind, clean coal, hydro, and tidal, are all various ways that power engineers generate energy around the globe.

The argument for increasing visibility can take many approaches, however, the suggestions made in this paper are those of marketing campaigns, billboard ads, magazine ads, and social networking web sites. In order to create awareness the power engineering community must utilize the technological tools that are at their disposal. For example, there was a popular slogan in the 90s that stated "Got Milk?" This slogan was ingrained into the minds of the generation of that time and also focused attention on milk itself and milk production. How about a slogan called "Got Power?"? With catchy phrases and an aggressive ad campaign whether on the world wide web or by billboards, this could propel attention to the power industry therefore emphasizing the relevance of power engineers. By the use of billboards and social networking sites such as Facebook, Twitter, and Myspace, the advertisement banners created could cause public awareness and increase the presence of power engineers.

III. PROMOTION OF POWER EDUCATION

The second area of focus is that of education. No one could possibly become a power engineer over night therefore

classroom instruction is a must. Although it is important to start promotion of this educational endeavor in grades K-12, there must be a viable offering of power engineering related courses at the university level. In the field of engineering, an individual could expect to spend at least 4-5 years in undergraduate level university training as a minimum, unless graduate goals are desired. With this in mind, and given the size of America, power programs at many universities are somewhat scarce. According to the U.S. Power and Energy and Workforce Collaborative, there are less than five very strong university power engineering programs in the U.S. A very strong program has (1) four or more full-time power engineering faculty; (2) research funding per faculty member that supports a large but workable number of graduate students; (3) a broad set of undergraduate and graduate course offerings in electric power systems, power electronics, and electric machines; and (4) sizable class enrollments of undergraduates and graduate students in those courses. The general lack of research funding opportunities has made it difficult for faculty in existing programs and new emerging programs to meet university research expectations and for engineering deans to justify adding new faculty [1].

The above mentioned perspectives should not be taken lightly. With more and more baby boomers retiring from the workforce in energy related jobs, the need to replace these positions prove to be critical. This again gives relevance to power engineers. How can we move forward innovatively if we neither have the trained personnel nor the interest because of lack of awareness and educational support? A consensus needs to be built around curriculum building between academia and industry. There must be a sense of urgency on the account of the power industry as a whole, as well as the federal government due to national security concerns.

IV. COMMUNITY OUTREACH

In addition to increasing visibility and promoting power education, community outreach can play an important role in assisting with showing the necessity of the power engineering profession. The question is, however, who should perform community outreach. Community outreach should be performed by engineering companies with power related projects or engineering research firms with power engineers engaged in community service. Encouragement to participate in a local IEEE chapter or school science fair is greatly sought after. Many middle and high schools solicit the help of engineers to come for science fairs, science days, as well as math or science help for students. Community outreach programs can deeply impact a community and society in the long run because it will bring notice to a profession of engineering that impacts most lives. This allows the power engineer to meet the grassroots who benefit from his or her labor and expertise.

Another idea of community outreach would be to have science and engineering tours outlining the repeated effects of the power industry to drive the point home in the minds of the general public. These companies could team up with

organizations such as Engineers Without Borders or IEEE's Power and Energy Society to host a community event on a regular basis to educate about implementation of power in their neighborhoods. The goal would be to make the event personal and on the level of the simplest person.

Companies can also challenge universities with projects that will fuel interests into power problems and the issues the industry face. For instance, a company in the United Kingdom called RWE nPower launched the RWE nPower Energy Challenge in 2007. This challenge was a national competition which posed a question of, keeping the lights on – how should the UK plug the impending gap? The event was designed to find practical solutions to the real problems facing the engineering sector and discover new and sustainable ways to ensure the UK's energy needs are met. The competition provided the company with an excellent opportunity to encourage recruitment into the engineering sector and find the finest minds in engineering, science and business. It also provided students with the chance to put theory into practice, while competing on a national level [2]. Strategies such as these are taking place across America as well but there needs to be consistency and a more unified front to display to the public community the serious implications due to lack of action.

V. CONCLUSION

The future of the energy and power sector remains uncertain. Sure there are many theories explaining causes and effects due to energy capacity and enough of a skilled workforce to be able to confront the problem but is there enough being done to combat this problem? Is the relevancy of those who work in the field being portrayed accurately and constantly? With growing concern over meeting energy demands in the near future, all must be done and considered in order to enact a set of initiatives to meet energy goals. The suggestions stressed in this paper were increasing visibility of power engineers, promotion of power engineering education, and community outreach.

The increase of visibility of power engineers lets us know they exist and what they do. It also allows us to learn from these individuals to plan for the future. Power engineering education allows us to effectively educate future engineers and prepare them for tough problems that will be faced due to energy shortages predicted in the near future. Community outreach enables us to give encouragement to the public about the generation and use of power as well as those who are the designers of it.

VI. REFERENCES

- [1] U.S. Power and Energy Engineering Workforce Collaborative Management Steering Committee, "Preparing the U.S. Foundation for Future Electric Energy Systems: A Strong Power and Energy Workforce", IEEE PES, April 2009, pp. 5.
- [2] Power Engineer, "Facing the Challenge", IET, June/July 2007, pp. 28

VII. Biography



David J. Rougely was born on Galveston Island in Texas and has lived in LaMarque and Houston, Texas. He currently resides in Hempstead, Texas. He has attended Houston Community College where he was awarded a National Science Foundation scholarship and became an NSF student scholar. He graduated from Houston Community College with an Associate's Degree in Science. David is a senior electrical engineering student at Prairie View A&M University where he has been the IEEE student branch president for two consecutive terms. His student branch has participated in robot and circuit design competitions. David also performs research in the area of nuclear material sensors while attending Prairie View A&M University for the Department of Energy's Sam Massie Chair of Excellence professor Dr. John Fuller. David is married, has no children, and his hobbies include golfing, reading, camping, and home-made projects.