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Mariesa Crow

Missouri University of Science and Technology, crow@mst.edu

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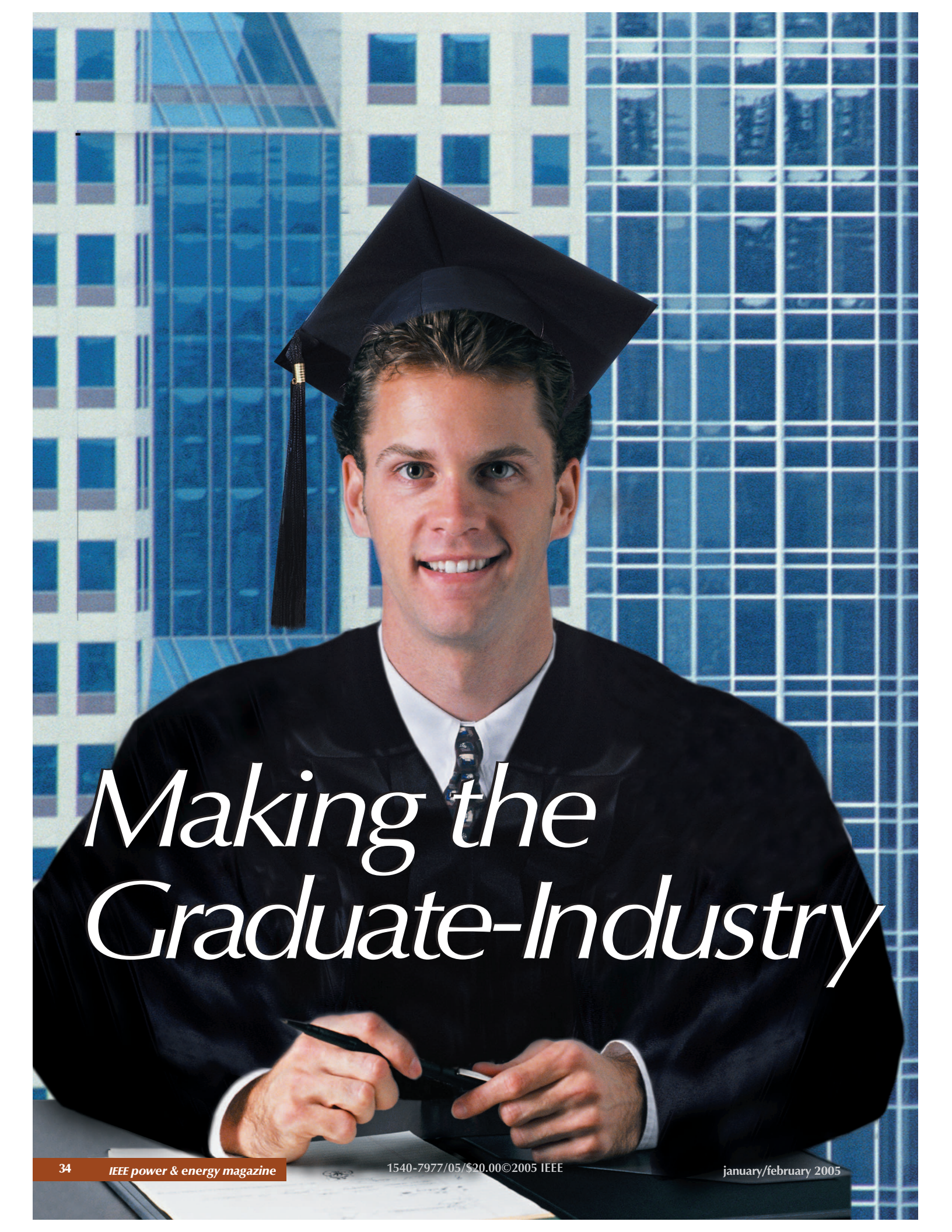
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Making the Graduate-Industry

Supportive University Relationships Help Companies Find Bright Engineering Graduates

by Mariesa Crow

Connection

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THE POWER ENGINEERING INDUSTRY HAS seen many changes over the last decade. Many countries have introduced deregulation legislation that has significantly impacted the operation and planning of the bulk power system. Technological advances have occurred at the fastest pace ever since the advent of ac transmission. Recent blackouts and price swings have focused the public's attention on the plight of the aging power industry infrastructure. This is truly an exciting time to be a part of the electric power industry.

Many utilities are beginning to ramp up their recruiting and hiring efforts to attract bright young engineering graduates into the industry to replace the large numbers of engineers that have recently retired or will retire in the next few years. Unfortunately, the long drought in hiring brought on by the uncertainty of deregulation and the perspective that the industry is "old and conservative" has caused a mismatch in the interests of young engineers and the companies that want to hire them. In addition, the number of young people pursuing engineering degrees is decreasing as they become attracted to other lucrative occupations that aren't burdened by the introverted, nerdy stereotypes typical of engineering careers.

Faced with these challenges, how do companies identify and court bright, enthusiastic engineering graduates? Typically this is accomplished through a supportive relationship with a university. There are numerous ways a company can build a relationship with one or more universities to create an environment that fosters student interest in power engineering; some of these are formal recruiting activities, and others are more informal activities. The question is: what strategies are the most effective to establish a fruitful match between graduate, university, and future employer?

The needs of the power engineering industry have changed and so must the power engineering curriculum. The electric power industry is a large dynamic industry in need of talented people who have an appreciation of the new technologies and operating paradigms. In addition to engineering skills, successful graduates must also be able to write and speak effectively, have basic business skills, and have the maturity to carry a project from beginning through to completion. This is a tall order for students coming out of engineering programs that are being pressured to reduce the number of credit hours in their B.S. curriculum. Basic engineering

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courses are being squeezed out by the desire to include more “soft skills” and humanities. Two decades ago, new power engineering graduates would enter the workforce with upwards of 20 credit hours in power engineering. Now a specialization is frequently considered to be only three courses in a particular area such as power.

While this deemphasis on undergraduate specialization leads to more well-rounded and flexible graduates, the companies that hire these graduates must put in more effort to attract them to a particular field and then train them once they join the company. While it is more difficult for graduates to be confident in their early career choices, there are numerous things that companies can do to pique student interest while still in school.

Industry-University Collaboration

To produce and maintain a good-sized pool of qualified students from which to recruit, a company should establish a positive presence on campus and provide support to the schools that have retained their power engineering programs and faculty dedicated to this specialization. There are numerous ways industry can foster good relationships with faculty and students.

One of the easiest forms of establishing a positive presence on campus is to have power engineers talk to student groups about their company and job. Most universities have student IEEE chapters, and a few even have a student IEEE Power Engineering Society branch chapter. These Society meetings are an excellent forum to meet bright, enthusiastic students. This also provides the company the opportunity for some free publicity. If the talk is accompanied by a company-sponsored pizza or ice cream social, this provides the opportunity to meet with students individually and identify potential candidates for future interviews. The more frequently that these talks are held, the easier it is to dispel the notion that the power engineering field is “old” and “boring.” A similar effort is to sponsor field trips to manufactur-

ing plants or utility control centers. As shown in Figure 1, most power engineering graduates will work for manufacturers or utilities. Even a visit to a substation can be exciting when accompanied by a practicing engineer who can articulate the challenges and technologies of the next decade.

An additional effective way to promote power engineering internal to the educational process is to become involved in the senior design course. As part of the ABET accreditation criteria, each program must provide a capstone design course in which student teams synthesize and apply their education to a produce an original design. Students become much more excited and engaged in their project when it is perceived as a “real world” problem. By offering project ideas, engineering mentorship, and in some cases project funding, companies can promote the power engineering field and help students learn about some of the challenges in the industry. Industry volunteers that assist in evaluating senior design projects provide considerable validity and significance to this component of the senior year experience without a large time commitment on the part of the industry.

Another type of industry-university interaction is to serve on departmental advisory boards. Most departments have one or more industry advisory groups to provide feedback and leadership on curriculum issues. Advisory groups can also be advocates to the university administration that power engineering is a vital field. Advisory group participation provides the university with

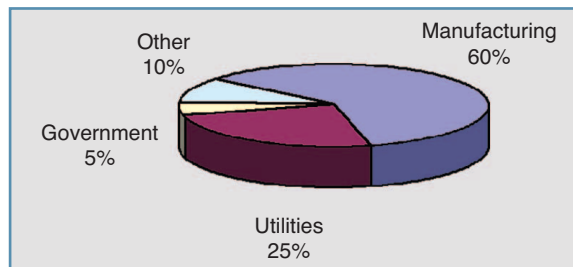


figure 1. Where power engineering graduates work.

much needed feedback about how well their curriculum is preparing their graduates for the workforce. Faculty rely heavily on advisory groups to provide guidance in laboratory requirements, topics in required and elective courses, amount and breadth of business and communication courses, team versus individual student efforts, design versus analytical content of courses, and design project work. A good working relationship between companies and faculty can produce numerous benefits for both industry and academia.

There are many ways companies can build relationships with universities to create an environment that fosters student interest in power engineering.

Research support is also vital to the well being of power engineering programs. Both the industry and university participants can gain immensely from a healthy and meaningful collaborative research partnership. Industry-supported research projects provide practical knowledge to both faculty and students. This practical knowledge can then be incorporated into the curriculum. The research can produce new technologies of immense value to the industrial partner. Typically, the industrial partner will define the research problem and provide the basic tools, data, and information about the state-of-the art technology. Universities are in a good position to form a research team of faculty with expertise in a variety of areas to better formulate an approach and solution to the research challenge posed by the industrial partner. The best industry-university research partnerships will balance fundamental and applied research. Ideally, part of every graduate student research project should be carried out in partnership with industry, enabling the student to be exposed current industry practices. This provides the student the opportunity to develop practical knowledge as well as an appreciation for the business implications of the problem.

Effective Recruiting Strategies

Thriving power engineering programs graduate well-rounded students with an interest in the power industry as well as the expertise to be productive employees. There are numerous strategies that companies can adopt to identify and recruit good students. The three primary strategies are:

- ✓ on campus recruiting
- ✓ co-op and internship programs
- ✓ career fairs.

On-campus recruiting is the mainstay of most companies' recruitment effort. By itself, however, this effort is not as effective as an approach combining several aspects. Career fair attendance is a cost-effective way of meeting a large number of students. Employers can ensure a successful career fair experience if the following guidelines are utilized:

- ✓ Develop a display that is informative about the company, the degreed disciplines hired, and types of positions available. An effective visual display will encourage students to stop and gather more information about the company.
- ✓ Schedule an information session the night prior to the career fair. Utilize enthusiastic junior engineers to talk about their on-the-job experiences.

- ✓ Be knowledgeable about the number, type, and location of positions available.
- ✓ Advertise before the event. Contact faculty to announce that you are going to be on campus, and ask them to encourage students to stop by the information session and/or display booth.
- ✓ Send personal invitations to students to come and meet the recruiting team.

Follow up the career fair with personal contact. If there are students who have attractive credentials, follow up with an invitation to submit a resume or interview. It is far more effective to have a phone call than an e-mail or form letter acknowledgment. Remember that the recruiting process is about matching people to jobs and careers, not about purchasing a commodity.

One method for both students and employers to "trial run" a position is the co-op or internship. A co-op (short for cooperative) employment is typically an eight-month (summer plus one academic semester) appointment in a group where the student is mentored as part of an engineering project team. This provides the company the opportunity to get to know the abilities and personality of a prospective permanent employee. This is also the opportunity to entice the student with interesting and challenging projects. If the student is then hired at a future time, the company has the advantage of bringing in a new engineer with company experience and the knowledge that it is a good fit for both sides. An internship is similar to the co-op but encompasses only the three-month summer period.

On-campus recruiting can be very successful if it is approached as the pinnacle of an on-going partnership with the student and faculty and not as one-stop shopping. Campus partnerships yield considerable benefits for both the industry and the university, and the benefits far outweigh the time and financial commitments required.

Biography

Marisa Crow is a professor of electrical and computer engineering at the University of Missouri-Rolla. She served as the vice president for education/industry relations of the IEEE Power Engineering Society from 2002–2004. She is a registered professional engineer in the State of Missouri.

