

Corporate Recruiting of Graduating Engineers:

Many Factors Influence Hiring, Consortiums Offer Companies An Edge

By David G. Morrison, Editor, How2Power.com

In last month's Power Supply Jobs and Technology column, I discussed trends in corporate recruiting of graduates from power electronics (PE) programs, focusing mainly on the types of companies that are recruiting these engineers and the level of demand for these engineers. In this issue, I'll explore the technical requirements that may influence recruiting. I'll also touch on the impact of industry consortiums, and how their support of PE programs gives them an advantage in the recruiting process.

Digital Design Is One of Several Requirements

When asked about corporate requirements for graduating engineers and how they might be changing, educators brought up a number of factors. These range from an ongoing need for engineers with a thorough understanding of power electronics theory to growing requirements for digital design skills as well as the need for people skills.

Thomas A. Lipo, director of the Wisconsin Power Electronics Research Center at the University of Wisconsin-Madison, believes that companies continue to seek graduates who have a strong grounding in theory and hire these engineers knowing they will provide them with training in the practical aspects of power electronics.

"I think they're willing to take somebody who has been well educated in the theory and [expose that person to] the practical end themselves," says Lipo. "Most of these companies have a break-in period where these [engineers] are given some of the more practical aspects. I don't think they insist on anything different than they have in the past. We do emphasize our labs and the students do have a lot of practical training. I think the companies are pleased with that. That's why they come here to try to hire."

Despite this continuity of requirements, Lipo notes that there have been some changes in companies' expectations over the long term. "The knowledge of digital signal processors and control using digital techniques is very important these days. And that is expected," says Lipo who notes that these areas are included in the training that students receive in the PE program at the University of Wisconsin-Madison.

Philip Krein, director of the Granger Center for Electric Machinery and Electromechanics at the University of Illinois at Urbana-Champaign, also notes the importance of digital design in describing the skills recruiting companies seek from graduates.

"Most seem to want candidates who are comfortable and adept at hardware design and implementation, but also more and more need embedded systems designers who have a deep understanding of power electronics and control," says Krein.

Others such as Issa Batarseh, the director of the Florida Power Electronics Center, describe how emerging applications will increase demands for digital design skills in the future.

"Power electronics is becoming more digital with more communications, more sensing, more platform, and more software too. Many of the smart grid companies, and solar power and inverter companies, are going to get more power electronics [content] than ever, so there will be a tremendous need for power electronics engineers who know not only the power side—the topologies and controls—but also sensing and communications, and are able to develop digital circuits."

Batarseh also notes how start ups in smart grid and renewable energy businesses are driving the need for more well-rounded PE engineers.

"Many of the new companies ... just came out in the last two to three years. Those start ups can only survive if they have good designers who know multiple functions. They are not huge companies that can handle hundreds and hundreds of engineers," says Batarseh. "So the new generation of companies that are coming out for renewables, for environmental issues, need to have really broad power electronics engineers and researchers that can cover more than one topic. That's a challenge for us [the educators] because we still have traditional courses on the traditional topics."

Some note how companies require technical knowledge in combination with people skills.

"My sense is that firms are looking for technical maturity, combined with strong innovation skills, excellent team skills, and excellent customer interaction skills," says Krein.

Teresa Shaw, the industrial liaison for CPES, also points to the importance of the team concept in discussing why graduates of Virginia Tech's PE program are in demand.

"I believe industry finds CPES students to be desirable because not only do they have strong academic and technical background, CPES students are also well trained to work in a team environment and accustomed to working alongside industry," says Shaw.

The Impact of Industry Alliances

Some of the larger power electronics programs have established industry consortiums, which help to fund research, but also to introduce the graduate students to the member companies. Naturally, this makes it much easier for these companies to recruit the engineers when they receive their diplomas.

A case in point is the CPES Industry Consortium. When asked about which companies have hired graduates of Virginia Tech's PE program, Shaw named 11 well known companies which currently employ four or more of her school's graduates. Most of these companies belong to the consortium.

"Nine out of the 11 companies...are CPES members. Most of them approached our students with employment offers prior to their graduation," says Shaw. "These companies are able to get a head start on student recruitment because they have the opportunity to work closely with our students via the CPES Industry Consortium. For example, Delta, Linear, International Rectifier, Monolithic Power Systems, National Semiconductor, Texas Instruments all participate in the CPES Power Management mini-consortium. As such, they attend the quarterly review meetings and meet and interact with the students on the team."

In addition, most of the recruitment inquiries come from CPES members, and when these are received they are forwarded to CPES students. The program does however, also receive and forward inquiries from non-members of the consortium and from recruitment agencies.

Meanwhile, the power electronics program at the University of Wisconsin-Madison is supported by another well known industry alliance—the Wisconsin Electric Machines and Power Electronics Consortium (WEMPEC). Over 50 companies are members of this consortium.

Lipo, who is a co-founder of WEMPEC, says that most of his school's graduate students in power electronics work at least one summer at a WEMPEC member company. "A high percentage of those students wind up going back to the companies when they graduate," says Lipo who describes these summer internships as a very successful recruiting tool for the companies.

The edge in recruiting provided by industry consortiums is particularly important now when the demand for graduating power electronics engineers outstrips the supply. And even membership in a consortium doesn't overcome the shortage of engineers. As Lipo observes, "We can't produce enough students to satisfy everybody."