

NSF Workshop Nov. 29-30, 2007

WORKFORCE ISSUES

Anjan Bose

How did we (power programs) get here?

The decreasing emphasis of power engineering within the electrical engineering departments started in the 50s with the spreading impression that innovation is no longer needed in this field. This impression was reinforced, with small ups and downs, by the de-emphasis of research funding both by private industry and federal government. The final blow came to the power programs after 'deregulation' when the power industry de-emphasized engineering by downsizing their engineering staff.

What have power programs contributed to industry challenges?

The examples are too numerous to list, so here are a few technologies that are close to my interest area:

- State Estimator (MIT)
- Fast Decoupled Power Flow (UMIST)
- Phasor Measurement Units (Virginia Tech)
- On-line Dynamic Security Analysis (Iowa State)
- Operator Training Simulator (Arizona State)

In addition here are a couple of very successful companies started from universities with pioneering technologies:

- Schweitzer Engineering Labs (Washington State – Microprocessor based relays)
- PowerWorld (Univ. of Illinois – Visualization)

How do we sustain power programs?

Short answer (quoting Bob Thomas):

- The students need jobs;
- The faculty and university administration need research funding.

These are however, necessary conditions but not sufficient. Here are some ground realities:

- The number of engineering graduates in the US is not sufficient to meet demand. Having job openings in power engineering is not enough; the industry needs recruitment strategies to successfully compete for engineers.
- The industry has broad requirements and needs more than EEs, so engagement on the recruiting side should be across departments at the college level and across different types of universities.
- The industry itself is diverse – gencos, transcos, discos, ISOs, vendors/manufacturers, A&E service providers, etc. – requiring different levels of background and expertise. The industry-university relationships should reflect this diversity.

- The image of the industry must portray excitement and innovation to attract the better engineers.
- Innovation must be backed up by real R&D at both utilities and vendors.
- Long term fundamental R&D support from the federal government (which is where university research funding comes from) will require the existence of short-term industry R&D infrastructure.
- The message about workforce and innovation (and their impact on the US economy) must come from the highest levels of industry.

Some short-term action items:

- Engage all levels of the university hierarchy with the power industry.
- Set up long-term hiring strategies at universities.
- Set up endowed professorships in power engineering.
- Lobby for federal government R&D in power engineering.