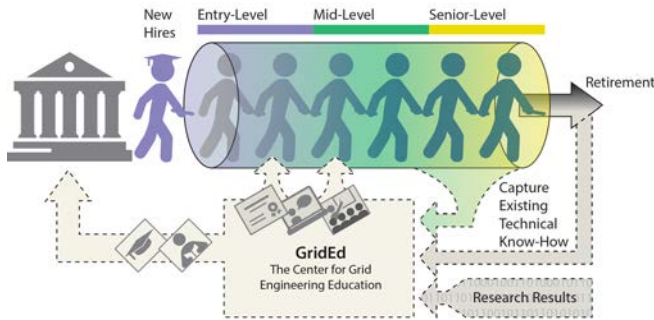


Educating Power Engineers for a Future Distribution Grid



Background, Objectives, and New Learnings

As the electric grid continues to evolve, there will be increasing presence and reliance on renewable and other distributed energy resources, as well as more price-sensitive and responsive loads. This will change old operating norms and present new requirements and challenges in the quest to achieve efficient and reliable delivery of electricity. Educating power engineers in new practices, devices and paradigms is needed.

Today, the penetration of renewable energy resources on the grid—such as wind, solar and energy storage often combined with these resources—is rapidly growing, and the technologies associated with these devices are both intelligent and complex. The electric utility industry requires a reliable engineering workforce to envision design and manage these grid-connected variable renewable resources. However, a knowledge gap exists for professional engineers entering the workforce today regarding their ability to master current and future renewable technology trends.

One way to answer the need of the industry and close the gap is to increase power systems research, development and analytical capacity with electric utilities while enhancing the knowledge of current and incoming industry professionals. Training a cadre of professional engineers will poise the industry for continued success. A robust training program would include two main channels of specialist knowledge:

- Spearhead the development of an educational process for future power engineers.
- Retrain and expand the knowledge base of the existing engineering workforce through participation in focused short courses.
- Utilize grid integration knowledge and research outputs stemming from a unique relationship among EPRI, its university partners, and the electric utility industry.

- Research results on integrating distributed and renewable energy sources into the grid.
- Expert knowledge that would be lost by attrition (such as through retirement) could be captured through a process to collect valuable experience before it is lost.

The result will be training material in many forms suited to specifically educate new college students and retrain and update existing engineering personnel.

Benefits

The growing need to produce a workforce that is trained in these new technologies can be achieved through a collaborative program where costs are shared with multiple entities. This proposed collaborative allows for leveraging of electric utility, government and private sector investment.

- Joining this collaborative will provide a seat on an Advisory Board to guide and shape the content of the curriculum that is developed in the educational programs.
- Each participant in the program will qualify for three seats per each year, which may be allocated to attend selected courses from the educational programs. (This does not include college credit courses.)
- Each utility that joins the collaborative can invite two universities to join special technology transfer training activities in the new curriculum under development in this program. (This does not include any funding to those universities.)

- Participating utilities will get priority to host selected short courses, seminars, and workshops in their facility (or at the facilities of their chosen university).

Project Approach and Summary

EPRI formed a consortium, known as GridEd – The Center for Grid Engineering Education, with four universities – Georgia Institute of Technology, University North Carolina Charlotte, Clarkson University and University Mayaguez (Puerto Rico) - to utilize electric utility industry R&D results with power engineering educational expertise to meet the objectives of the DOE's Grid Engineering for Accelerated Renewable Energy Deployment (GEARED).

In order to develop training materials, EPRI intends to draw from partners' research results, including participating electric utilities, universities and training activities in EPRI's research programs—a \$450M asset over the past five years. The team will utilize R&D results in areas such as distributed renewable integration, energy storage, electric vehicles, demand response, customer behavior and rates, energy efficiency, power quality and distribution engineering. Our university partners will bring their power engineering expertise as well as teaching experience. Participating utilities will act as advisors/reviewers to help define technical issues, direction and evaluate quality/impact.

In order to identify training needs and options, GridEd will engage the utility participants, industry researchers and the university partners. For example, educational programs are planned to address workforce needs at various career stages spanning from new industry entrants through to retraining of existing industry participants. This includes classic degree programs, professional development courses, basic seminar courses and outreach to communities (K through 12 students) to heighten interest in power engineering careers. Knowledge sources will also include government and industry roadmaps that define research gaps and needs.

While DOE funding will be utilized for an initial five-year period, it is a goal of both this project and the DOE project that these educational efforts become sustainable beyond the initial five-year period.

Deliverables

Educational Curriculum: Use information from EPRI's R&D results and associated materials from our university partners to define and develop power engineering educational curriculum and offerings.

Teaching Materials: Provide teaching materials that can be incorporated into regular undergraduate and graduate programs, as well as in a variety of short courses, and tutorials.

Project Status and Schedule

This collaborative will begin in November 2013. It is intended to operate at least five-years, in tandem with the EPRI-led U.S. Department of Energy GEARED project.

Who Should Join

Participants interested in advancing the education of their current staff, preparing future power engineers for their company and responsible industry leaders who want to assure leadership in the electric industry.

Contact Information

For more information, contact the EPRI Customer Assistance Center at 800.313.3774 (askepri@epri.com).

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