

POSITION STATEMENT

ELECTRICITY DELIVERY WORKFORCE TRAINING

*Approved by the IEEE-USA
Board of Directors (23 April 2009)*

There is a pressing need to build, enhance, and sustain workforce training programs that are focused on the new education requirements of the future electric power and energy workplace. This need is being driven by:

- retirement eligibility and career changes affecting up to 50 percent of engineers and skilled trades in electric utilities, and 40 percent or more of university power engineering faculty over the next five years,¹ and
- reinvestment in electric power infrastructure to modernize the grid, to insure that the appropriate electric energy supply resources are available and successfully integrated into the electric power grid, and to help customers use energy wisely.

The American Reinvestment and Recovery Act (ARRA) of 2009 (P.L. 111-5) was enacted for:

Making supplemental appropriations for job preservation and creation, infrastructure investment, energy efficiency and science, assistance to the unemployed, and State and local fiscal stabilization, for the fiscal year ending September 30, 2009, and for other purposes.

For Energy Programs of the Department of Energy, the Act states:

For an additional amount for “Electricity Delivery and Energy Reliability,” \$4,500,000,000: Provided, that funds shall be available for expenses necessary for electricity delivery and energy reliability activities to modernize the electric grid, to include demand responsive equipment, enhance security and reliability of the energy infrastructure, energy storage research, development, demonstration and deployment, and facilitate recovery from disruptions to the energy supply, and for implementation of programs authorized under title XIII of the Energy Independence and Security Act of 2007 (42 U.S.C. 17381 et seq.): Provided further, That \$100,000,000 shall be available for worker training activities...

¹ Center for Energy Workforce Development, *Gaps in the Energy Workforce Pipeline: 2008 Survey*. Information for obtaining a copy available at <http://www.cewd.org/>. Also, U.S. Power and Energy Engineering Collaborative, *Preparing the U.S. Foundation for Future Electric Energy Systems: A Strong Power and Energy Engineering Workforce*, April 2009. Available at <http://www.ieee.org/go/pes-collaborative/>.

Based on the requirements of the ARRA, IEEE-USA recommends that the Department of Energy support worker education and training in the electricity delivery field by providing funds:

- to prepare an engineering and skilled trades workforce that has the necessary knowledge and skills to design, plan, construct, operate, and maintain a modern electricity delivery system, including transmission, distribution, and system operations, as well as to manufacture the necessary components of that system,
- to enable retraining that will allow unemployed and under-employed workers in other fields to find new job opportunities in electricity delivery, and
- to enhance, build and sustain the education infrastructure at accredited educational institutions, including community colleges and universities, offering credit and non-credit education in electric power and energy.

Among other possible uses, the IEEE-USA recommends that DOE designate the worker training funds for:

- 1. Student financial support.** Financial support, such as scholarships, fellowships, internships and cooperatives, will help families put their children through post-high school education in electric power and energy, will enable unemployed or under-employed workers to retrain for new jobs, and will provide incentives for people to pursue credit or non-credit continuing education required for electric power and energy jobs today and the future.
- 2. Innovative education approaches.** Accredited institutions must provide the fundamental and advanced education in electric power and energy, and to do so in ways that are effective, economical, and responsive to student needs. For example, some students may need to continue working while pursuing an educational opportunity. Accredited institutions should be encouraged to pilot new educational approaches that are based on sound instructional principles and business plans. These pilots should be critically evaluated so that the results can be assessed and shared with others. The pilots should include associate, bachelors, and graduate degree programs, certificate programs, apprenticeship and journeyman training, and non-credit continuing education.
- 3. Curriculum development.** To build, operate and maintain a modern grid will require redefinition of the key elements of a foundational education in electricity delivery. For example, knowledge of power electronics, and information and communications technologies will be needed. Educators at accredited institutions should be supported in their work to create new curricula in areas identified as the most relevant to the modern grid. For apprenticeship and journeyman training, support should be provided to identify what new knowledge and skills need to be learned, and to integrate those educational outcomes into national and regional training curricula.
- 4. Educational infrastructure.** Educational institutions require high quality educators with access to up-to-date equipment for effective instruction on modern electricity delivery concepts and methods. New university faculty in electric power and energy engineering should be awarded grants to help them during their first years of teaching and research. Instructional labs at accredited institutions should be equipped to expose students to current and advanced technologies for a modern grid.

- 5. A national web-based education portal.** An easily accessible central portal for career and education information on electric power and energy is urgently needed by young people, parents, K-12 teachers, and guidance counselors along with adults looking for education opportunities. Although many websites now provide information related to careers in electric energy supply and delivery, it is challenging for users to find precisely what they need. A central education portal will help users locate existing information sources. New web-based resources created for the portal website can fill any information gaps.

The Nuclear Regulatory Commission's Nuclear Education Grant Program provides a good model for grants to community colleges, universities, faculty, and students.

This statement was developed by a Special IEEE-USA Task Force on Electric Delivery Workforce Training and represents the considered judgment of a group of U.S. IEEE members with expertise in the subject field. IEEE-USA advances the public good and promotes the careers and public policy interests of the more than 215,000 engineers, scientists and allied professionals who are U.S. members of the IEEE. The positions taken by IEEE-USA do not necessarily reflect the views of IEEE or its other organizational units.