



**U.S. Department of Energy
Electricity Advisory Committee Meeting
Capital Hilton Hotel
Washington, DC
June 11, 2012**

Minutes

EAC Members in Attendance

Richard Cowart, Chair
Regulatory Assistance Project

Irwin Popowsky, Vice-Chair
Pennsylvania Consumer Advocate

William Ball
Southern Company

Rick Bowen
Alcoa

Merwin Brown
Alcoa

**Clarke Bruno (Representing Edward
Krapels)**
Anbaric Holdings

Ralph Cavanagh
Natural Resources Defense Council

The Honorable Paul Centolella
Public Utilities Commission of Ohio

David Crane
NRG Energy, Inc.

The Honorable Robert Curry
New York Public Service Commission

José Delgado

Clark Gellings
Electric Power Research Institute (EPRI)

Robert Gramlich
American Wind Energy Association

Michael Heyeck
American Electric Power

Val Jensen
Commonwealth Edison

Joseph Kelliher
NextEra Energy, Inc.

Susan Kelly
American Public Power Association

Barry Lawson
National Rural Electric Cooperative
Association

Ralph Masiello

KEMA

Clair Moeller

Midwest Independent Transmission System
Operator, Inc.

David Nevius

North American Electric Reliability
Corporation

Wanda Reder

S&C Electric Company

The Honorable Phyllis Reha

Minnesota Public Utilities Commission

EAC Members Not in Attendance

Guido Bartels

IBM

Dian Grueneich

Dian Grueneich Consulting, LLC

DOE Staff in Attendance

Anjan Bose

Office of Electricity/ Washington State
University

Caitlin Callaghan

Office of Electricity

Imre Gyuk

Office of Electricity

The Honorable Patricia Hoffman

Office of Electricity

Brad Roberts

Electricity Storage Association

The Honorable Tom Sloan

Kansas House of Representatives

David Till

Tennessee Valley Authority

Gordon van Welie

Independent System Operator of New
England

Mike Weedall

Bonneville Energy Administration, Retired

M. Granger Morgan

Carnegie Mellon University

The Honorable Rebecca Wagner

Nevada Public Utilities Commission

David Meyer

Office of Electricity

Bill Parks

Office of Electricity

Matt Rosenbaum

Office of Electricity

Non DOE Staff in Attendance

Venkat Banunarayanan

ICF International

Susan Blaine

ICF International

Paula Klein

ICF International

The Honorable Cheryl LaFleur

Federal Energy Regulatory Commission

Phil Mihlmester

ICF International

Elliot Roseman

ICF International

John Shenot

Regulatory Assistance Project

Welcome, Introductions and Developments

Mr. Richard Cowart, Chairman of the DOE Electricity Advisory Committee (EAC), opened the meeting by thanking everyone for attending. *Mr. Cowart* began by discussing logistical information and announced that the new members had been confirmed. *Mr. Cowart* then asked all members to introduce themselves.

After introductions *The Honorable Cheryl LaFleur*, Federal Energy Regulatory Commission (FERC), noted that she was happy to be at the EAC meeting and updated the group with recent activities and conferences that she had recently attended where she had seen some of their work. *Ms. LaFleur* announced that the FERC was in the process of setting up regional conferences on gas, electric and interdependency issues for summer 2012 and that dates would soon be announced.

Update on the U.S. Department of Energy (DOE), Office of Electricity (OE) Delivery and Energy Reliability's 2012 Current Programs and Initiatives

The Honorable Patricia Hoffman, Assistant Secretary for Electricity Delivery and Energy Reliability, U.S. Department of Energy (DOE), spoke to the EAC to inform them that their discussions should drive conversations and topics that are most relevant to gas, electricity, and value storage. She explained that she would like the committee to continue the trend of last year's discussions. *Assistant Secretary Hoffman* then introduced *Dr. Anjan Bose*, Senior Advisor to the Undersecretary of Energy, U.S. Department of Energy, who would address the country's recent blackouts and give his presentation on the action plan to increase the visibility of the grid.

Dr. Bose introduced himself and his role, which is to coordinate developments across the DOE. One coordination effort is a committee that *Dr. Bose* chairs, which is the "Grid Tech Team." The Grid Tech Team is formed by all program managers in DOE with any project regarding a grid, which totals about 15 to 20 people. *Dr. Bose* is working to understand the managers' current processes and how best to move forward. *Dr. Bose* discussed the grid in its current condition, the five phases of goals that were the result of research conducted after the 2003 and 2011 blackouts, and outlined his proposed schedule for implementation. The phases are:

- Phase 1: Long term planning.
- Phase 2: Operations (day-ahead) planning.
- Phase 3: The model gap between planning and real-time.
- Phase 4: Real-time data exchange for situational awareness.
- Phase 5: Real-time data exchange at sub-second rates.

ACTION ITEM:

At the closing of his presentation, *Dr. Bose* requested the EAC's assistance with the execution of these efforts. During Q&A *Dr. Bose* requested a recommendation from the EAC that could potentially carry some weight for research and development (R&D) funding.

Questions and Answers Regarding Dr. Bose's Presentation

Implementation and Coordination, including Transmission Subcommittee

David Nevius suggested that this is strictly an implementation issue as the industry already understands how to apply these practices and some places have already put these phases into action. *Mr. Nevius* would like to know what DOE can do to assist in the implementation. *Dr. Bose* answered that by bringing these phases to the attention of DOE is what can and should be done.

Merwin Brown requested *Dr. Bose* elaborate on the distinction between phases four and five. *Dr. Bose* explained that phase four focuses on situational awareness without Phase Measurement Units (PMU) data, and phase five brings in the PMU data.

Michael Heyeck stated that the Transmission Subcommittee will look at the next generation Energy Management System (EMS) and will add the shaping of some of the phases to the work plan. The standard format in exchanging data is already in place. *Mr. Heyeck* asked what the plan is to coordinate as there are a lot of stakeholder groups, such as the EAC, the Grid Committee, North American Electric Reliability Corporation (NERC), etc. *Dr. Bose* answered that the coordination must be industry-wide and involves NERC and power companies. *Mr. Heyeck* does not want an overlap, but does want to help and agreed that a real-time operation is needed.

Mr. Cowart asked what if the dates on the phases were set to drive internal DOE conversations. *Dr. Bose* answered that these are dates for the industry to aim towards, but he understands the political and institutional boundaries surrounding the phases.

William Ball stated that a systems perspective is a good route and that grid flexibility is a better long-term goal than integrating the various types of technology. *Dr. Bose* said that this is the R&D aspect of the phases.

Gordon van Welie asked what DOE sees as the draw. Early stages of the plan are about implementation and execution, which will take effort, oversight and time. *Mr. van Welie* did not see a need for DOE for this plan, but did see a need for DOE to deal with the technology deficit. *Mr. van Welie* asked who would pay the R&D dollars to fund the technology deficit. *Dr. Bose* answered that the DOE Grid Tech Team is

underfunded, but it is on the agenda to push for more funding. *Dr. Bose* would like a recommendation from EAC that could potentially carry some weight for this funding.

Wanda Reder commented that a lot of *Dr. Bose's* goals are transmission-focused and the conversation spans both distribution and transmission. *Dr. Bose* agreed and added that renewable integration will likely be moved into the conversation soon. *Assistant Secretary Hoffman* said that flexibility of the distribution system is needed to optimize accessibility.

Robert Gramlich asked for clarification regarding the use of the term "grid flexibility." *Dr. Bose* answered that "flexibility" refers to the balance, effective reliability, renewable integration, and new technologies.

Jose Delgado supports what the EAC has already said, which is that the next step will be a lot of effort. His concern is that the plan needs to affect all stakeholders for it to gain support. There is a lot of data available, but opportunity is being wasted.

The Honorable Robert Curry addressed the regulatory standpoint. He said that ensuring the future generation has the appropriate backup for the grid. When looking at transmission as it gets closer to distribution, enhanced host of achievement of goals need to be rationalized. *Mr. Curry* asked if the Grid Tech Team or Transmission Subcommittee is focusing on this. *Mr. Heyeck* responded that the Transmission Subcommittee would like someone to sponsor the aging grid review, how much it would cost to replace it, and add to the enhancements the EAC has noted. *Mr. Heyeck* again expressed that this is more of an implementation issue that requires software development and R&D, and that this is not costly to the average consumer. *Mr. Heyeck* believes the costs are in the hundreds of millions of dollars rather than billions of dollars.

Mr. Curry would like to know who will pay for this, and once the ultimate reliability is achieved, how it will be packaged and sold. *Mr. Heyeck* answered that all of these issues come from the states, or the federal government, or the markets, but is beyond the scope of the Grid Tech Team. *Dr. Bose* believes that the amount of investment needed to "beef up" the system is an issue on the table.

The Honorable Paul Centolella stated that the most important outcome for improving the reliability of the grid is at the customer level, not the transmission level. *Mr. Centolella* believes that this will not take into account the way the models are developed, which means that the models would be out of date by the time they're implemented. He would like for the industry to think forward about where the grid will be in 10 years. *Bill Parks, Special Assistant, DOE-OE* noted that from the previous two meetings the discussion has leaned towards an integrated systems approach. The goal is to not overburden the consumer by making decisions in a vacuum and that costs should be kept as low as possible.

PMU Data

Mr. Nevius commented that there can never be enough PMU data. Post-blackout analysis was easier to conduct in 2011 than in 2003 because of the PMU data that was already in place, but this is not to suggest that more data isn't needed.

Role of the EAC

Ralph Cavanagh does not believe that the problem is institutional. He would like to know if there is a role for the EAC to respond to the needs identified by *Mr. Nevius*. *Mr. Nevius* stated that there is not a real direct role for the EAC, as the issues presented are known and already being addressed. *Mr. Nevius* believes that DOE needs to provide support to the agencies in the West (who are already effectively addressing these issues) to step up and take the lead.

Strategic Plan for DOE OE – Presentation

Mr. Bill Parks spoke about the presently complex times that the DOE is facing in reference to the grid. He explained that the grid tech team has evolved since they first spoke about it with the EAC, and that this is demonstrative of the building together within the Department and between all the different offices. He went on to say that this building within the Department is influencing the decision making discussions that are happening with Secretary and the Undersecretary. This is a very important opportunity to take advantage of, and the insight of the EAC is critical to determining how to continue to move forward on this.

Mr. Parks spoke about a parallel process that is taking place within OE, where energy efficiency and renewable energy are looking at their strategic missions and planning how to move forward. It is important to consider how best to utilize and align resources, have impact, set priorities, and integrate OE, while simultaneously thinking about an integrated solution set to situations that arise with the grid. He told the EAC members that they are looking for feedback, and introduced Peter Bonner from ICF International.

Peter Bonner, Consultant, ICF International thanked *Mr. Parks*, and explained that his presentation had two purposes: to provide a snapshot of where the DOE OE strategic plan is in the strategy development process, and to engage the EAC in dialogue about the strategic challenges and issues that OE faces. He began by discussing the steps they went through to develop the OE strategic planning process. First, they did an "as is" situation assessment, and adapted Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis. He said that they are in the middle of examining mission, vision, values, and strategic challenges of OE, and then will move on to identify goals and objectives.

Mr. Bonner spoke about the uncertainties and constraints associated with an election year. Significant inflection points exist from a policy standpoint, from a resource standpoint, and from how the organization is aligned to achieve its objectives. He explained that a key part of the process is looking at the uncertainties and stress testing the scenarios.

Next, he spoke about options, choices, performance measures and accountability, and how these are impacted when dealing with a federal organization. OE is subject to the Government Performance Results Act and Modernization Act, which means performance measures are critical. Integrating and

aligning the organization to create change that leads to success is a major piece of this process. A few desirable outcomes have been identified, with the first being adaptive strategies that lead to a sustainable future. *Mr. Bonner* explained that this adaptive concept is important because of the uncertainties that OE faces as it looks towards the future. The plan must align with both the tacit and explicit mission of the entire Department, and promote collaboration across key programs and initiatives. Another key part is building the next level of leadership around strategic thinking, so that as they look towards the future there will be a common focus and language with which they describe the direction, views, and operating principles of the organization. The third piece of this process was organizing the development of the strategic planning process into two primary work streams: one with the OE executive leadership team and another with a group of professionals and managers in the core strategy team. He explained that a major objective of the plan is to build greater sustainability in the organization at the next level of leadership with OE.

The core strategy team is doing the heavy lifting in looking at the trends out into the future in terms of where the strategic inflection points are, what the public policy issues are, what the technology and regulatory issues are, and what the challenges and objectives need to be. Developing this two-pronged effort is what will ultimately lead to sustainability over time. He presented a chart of activities around timeline, and said that they plan on having a working draft of the plan in early July.

Next, *Mr. Bonner* presented various components of the mission statement that is in development for OE. The core strategy team and the executive leadership team agree that the development of the grid is critical to this mission, as well as protecting and securing energy infrastructure and mitigating the impacts of disruptions. Further, ensuring reliable, resilient, efficient, and flexible electrical power for everyone in the United States, and leading and coordinating the national efforts surrounding are central elements.

Questions and Answers Regarding the Strategic Plan for DOE OE Presentation

Mr. Cowart commented that he was drawn to the third bullet, and recognized that bullets one and two are probably necessary to achieve bullet three. *Mr. Bonner* agreed that there was cause and effect between the first two and the third bullets he presented.

Ms. Susan Kelly noted that no information about cost was included in bullet three, and that it was important to factor in. *Mr. Bonner* responded that there had been robust debate among the core strategy team and executive leadership team about cost effectiveness.

Mr. Ralph Cavanagh commented that the fourth bullet suggests that there is a national effort, and that everyone around the table knows this is false. He stressed that DOE should acknowledge this, and try to fit itself effectively into regional and statewide concerns. *Assistant Secretary Hoffman* responded that they had also had that conversation.

Mr. Parks said that this raised the question of should there be some sort of national effort. He said that they agree that there is a lot more ability to move in the regional space currently.

Mr. Cavanagh followed by saying that a few years ago there had been an obsession with a national grid, but that the conclusion had been that there are many big regional grids, which are big enough. He said that this could appear as the Department taking sides. *Mr. Parks* asked if he meant taking sides of states

versus federal. *Mr. Cavanagh* responded no, rather that they would not be acknowledging the multiple stakeholders and equal partnerships, and that they would be implicitly supporting a national grid.

Mr. William Ball agreed with everything *Mr. Cavanagh* said, and said that he was surprised the word research was not included in the list. He said that this is what they value about the DOE, that they are heavily invested in not just tomorrow, but what is going to happen 20 years from now. *Mr. Parks* explained that the mission is designed to reflect the three parts of OE that deal with institutional issues, the policy, R&D, and infrastructure security issues. The question they want to pursue is how best to integrate these three elements, since they cannot work in isolation. *Mr. Bonner* added that they want to avoid having a mission statement that merely lists all the functions of the organization, and rather capture what brings it together as its core purpose.

Mr. Jose Delgado commented that the industry has always been looking at a third bullet when trying to meet the needs of consumers, whether they are generators or users. He was surprised that the mission statement did not attempt to forecast the needs of policy. He argued that the needs of customers are fairly foreseeable, whereas the needs of policy are not and DOE should try to make progress on that. *Mr. Parks* responded that it is embedded within the framework of the mission.

Mr. Heyeck agreed with *Mr. Cavanagh* and *Mr. Ball* that the statement needs to be narrower in focus. He said that the Department needs to own the security of energy infrastructure piece, and that it should be the primary focus. He suggested that they look at the pieces of the statement as three pillars.

Mr. Joseph Kelliher commented that OE's mission should be bounded/guided by the authority and function of their function. He said that the first item mentioned in the presentation, encourage development of the grid, seems like something that is outside of OEs jurisdiction, and that they should be a policymaking body that is divorced from authority. *Mr. Bonner* said that all of the authorities that form the boundaries in which OE works would be included in a strategy document, just not in the mission statement itself.

Mr. Kelliher said that the mission statement should drive certain actions. He asked if number one meant that OE was going to use the citing authority Congress granted them seven years ago, or use R&D authority differently. *Mr. Parks* replied that they are hoping to use the mission statement to capture their role in helping to strengthen the grid. Their office is best suited to facilitate development.

Mr. Gordon van Welie suggested that the mission be restated in terms of what OE is able to do. He asked how they would be able to execute this mission when they do not control the purse strings. OE is an enabler rather than a manager.

Commissioner LaFleur commented that almost all energy issues come down to trying to co-optimize or trade off the core values of reliability and security, cost, and environmental impact, and that the mission seemed to focus exclusively on reliability and security. DOE works on all of those elements, and so they should be included. She said that it is critical to articulate how to address the elements included in the mission. *Mr. Bonner* replied that this was a helpful comment.

Mr. Barry Lawson reiterated that the first three bullet points are things that are taking place through FERC, NERC, and a combination of industry. He explained that he looks to the Department to provide R&D and new and better technologies to help industry and others. The mission should focus on what OE does to assist others to accomplish these bullet points.

Mr. Parks said that it was interesting to see all the different perspectives on what OE does from around the table. R&D cannot be done in a vacuum, and it has to relate to real world conditions and link to policy. He explained that it is important to look at how these boundaries intersect, and what role OE will have.

Mr. Bonner finished the presentation by discussing the key strategic challenges that the core strategy team and executive team came up with. The challenges ranged from the dynamic asymmetric environment that OE lives in, to its broad mandate versus limited budget, to evaluating the impact of ARRA initiatives and OEs role in that. He closed by saying that the complete version of the strategic plan will be presented at the October EAC meeting.

Mr. Parks thanked *Mr. Bonner* for presenting.

Workforce Panel

Wanda Reder introduced the Workforce Panel. Several drivers of workforce were discussed: a growing demand, a digital economy, and aging infrastructure. Also, how are the presentations and studies of aging faculty going to be carried on to the next generation of students? *Ms. Reder* discussed the Institute of Electrical and Electronics Engineers (IEEE) Power and Energy Society Workforce Collaborative goal of a scholarship internship program. Some highlights of the program are:

1. Increased interest of best and brightest in industry.
2. Funded by industry – finding money is difficult process.
3. Used to administer career experience.

Workforce Panel: *Barbara Kenny*, National Science Foundation (NSF)

Ms. Kenny began by stating that she likes the idea of collaboration with DOE and the EAC, and that her goal was to give a snapshot of happenings at the NSF. *Ms. Kenny* discussed NSF's mission and vision of research and education, which has been unchanged since 1950. She then presented the current programs and activities within NSF related to workforce issues.

- Engineering Research Centers Program (1985)
 - Industry partners pay a fee to participate, as well as meet NSF's requirements
 - Example: Center for Ultra-wide-area Resilient electric Energy Transmission networks (CURRENT)
- Industry/University Cooperative Research Centers (I/UCRC) (1973)
 - NSF's funding to this center is minimal
 - Example: GRAPES – Power electronics – University of Arkansas and University of South Carolina
- Human Resources Development Programs
 - Graduate Research Fellowships (GRF)
 - IGERT – Integrative Graduate Education and Research Training - \$3 for 5 years
 - Research experiences for undergrads, teachers and veterans

- Sample grid-related projects
- Program/Curriculum Development
 - Transforming Undergraduate Education in Science, Technology, Engineering, and Mathematics (TUES)
 - Advanced Technological Education (ATE)
 - Sample grid-related projects
 - Faculty workshops
- Engineering Education Research
 - Goal: get more students into the engineering workforce pipeline, at an early age

Ms. Kenny discussed a visit from Boeing in the fall, saying that they are concerned about the same type of workforce issues. She presented a chart that they had used, and postulated that the power and utility company workforce looks similar. Additionally, Boeing and SRI International are researching how best to model the education system and know where money should be directed.

Workforce Panel: *Ann Randazzo*, Executive Director, Center for Energy Workforce Development (CEWD)

Ms. Randazzo said that the center was formed in March of 2006 as a coming together of utilities to focus on the critical issue of the aging workforce. A great deal of their efforts centered on figuring out what works and then packaging it and quickly scaling it across the country. CEWD is a nonprofit that works in four different areas, career awareness, education, workforce planning, and metrics structure and support. Funded entirely by the energy industry, their members are electric and natural gas utilities across the country, trade associations, and energy companies like Arriva. She said that they enable their members to pick things up quickly, mobilize them, and get them to work at the state and regional levels.

For career awareness, they have a nation brand called Get Into Energy, and have developed branding materials for members to distribute. This way not everyone has to reinvent the wheel, but can quickly personalize and distribute materials in schools and universities. For education, CEWD focuses on the entire continuum. She explained that they are interested in determining the best way to train the next generation of workers. For workforce planning and metrics, they do surveys and collect information from other sources. She said that they have found working at the state level makes for the most efficient process.

Next, *Ms. Randazzo* spoke about the numbers, from total industry jobs lost to the specific areas in which they are most impacted. They spend a lot of time looking at retirements and replacements, and total retention of industry jobs will be less than 40 percent by 2020. Looking at just the critical jobs, the forecast is better, but primarily because they do not have the option to just leave and find another job. She explained that in 2008 the industry was hiring to replace, and hiring into training positions. In 2009, after the economy faltered, hiring was drastically reduced and in some cases stopped. Engineers are essentially being replaced one for one and for line workers it is almost one for two. She explained that they must determine how many of each job category they will need to train, when they will to train them, and where they will be. Line workers cannot just be trained en masse and deployed where they are needed, as people are not likely to pack up and move across the country for a technician position. She talked about focusing on grow your own as a response to this trend, so that it can be sustainable. The numbers for nuclear are separate, they focus on a uniform curricular program through the Nuclear Energy Institute (NEI).

Ms. Randazzo talked about how intensive the effort is to train each individual line worker, and said that the overall training effort for line workers between now and 2020 will amount to \$6 billion. Working within the public education system decreases their internal costs, and so there is a particular focus on the community college system. She showed the attrition rates projected for the next five to ten years, and said that for engineers a huge part of the solution comes from focusing on the students who are already in school and convincing them that power engineering is a worthwhile path for them to go down. Additionally, she said that they need to think critically about taking current engineers and turning them into power engineers, nuclear engineers, or electrical engineers with a power focus.

A lot of companies are unwilling to invest in workforce development, because they are not considering the long term strategy. She reiterated that for the jobs that are available currently, it is necessary to get people into them with the right skills from places like the military and community college where they already have the background. Thinking about the next three to five years, you are still utilizing existing programs, but also can initiate some new ones. Students who are currently in high school can move into these programs quickly once they understand what a great field this is to go into. For the jobs that are opening six to ten years from now, she explained that they want to target students in grade school and middle school. Girls make a decision about whether they are good in math while in the fourth grade, and so they must be targeted before this or they will never consider a math based academic track.

She discussed their efforts at the state level. Some states are now represented by energy and workforce consortia, which are collaborations of utilities, educators, and others. When companies join together, including construction or manufacturing within a state that needs similar skills, then those programs can stay alive. She said that the focus here is on common skills and competencies so that programs can sustain and provide the pipeline of students that are needed.

She spoke about the Get Into Energy Career Pathways model that they have developed with U.S. Department of Labor (USDOL). This competency model identified the basic skills that everybody in the industry needs to know, and builds from there to successively more job specific. Tiers one through three are basic academic requirements, whereas industry fundamentals are such as environmental, safety considerations, and the knowledge of the regulatory environment. The nature of this allows individuals to go pretty far in a program before they must make a decision about a specific career. In the career pathways model five demographics are focused upon: youth, military, women, low income young adults, and transitioning adults. They have boot camps in place that can help build the skills to actually pass a pre-employment test and get a job. She explained that the particular type of curriculum depends on the job for line workers, but for the most part it is getting people towards an associate degree. *Ms. Randazzo* closed here and invited everyone to contact her with questions or check out the CEWD website at www.cewd.org.

Workforce Panel: *Gil Bindewald*, Department of Energy, Office of Electricity:

Mr. Bindewald began by stating that he had more questions than he had slides and would focus on the project trends rather than specifics. He is involved in some of the ARRA Smart Grid Workforce training projects within OE.

One project, Smartgrid.gov, is for industry, universities, community colleges, and training institutions. Each association had to submit a gap analysis, but DOE did not tell them what it should be about. The

focus of the project was to hear the needs of the associations and ask for letters of commitment. How have some of these projects changed since 2009? More projects were inward-focus than what was anticipated. Retirement trends and other expectations were used to assign, retain, and refocus the current DOE staff. *Mr. Bindewald* asked, “What does a smart grid mean to the workforce? Does it mean new skills and new positions?” He answered by saying that yes, layers are needed, but as a whole the industry is looking for someone with strong technical, communication, and business skills.

Mr. Bindewald continued with the university perspective: some have struggled, some have succeeded. The successful universities have partnered with multiple businesses. Regional relationships encourage a broader range of skill sets and are not dependent on just one business. Another contributor to successful university programs is their pipeline. The universities who are engaged in the community at the K-12 level and their teachers are more likely to attract the students with the required skill sets. Some universities share curriculum with other engineering degrees, but some made energy a focus that was difficult to obtain (i.e., a 999 level), with only temporary offerings.

Mr. Bindewald discussed DOE’s research mandate and how that relates to reliability and research in this area. DOE is looking to the centers and topics that are relevant to the industry and how DOE can put into place a way for those who are interested to stay informed. *Mr. Bindewald* spoke on the topic of workforce issues are at the state level. He asked if there are opportunities that are inter-agency or inter-relationship between federal and state. Finally *Mr. Bindewald* discussed flexibility in workforce training. He asked how more promotion can be made domestically towards energy. How can DOE create something that meets your needs and brings you back to us?

Questions and Answers for the Workforce Panel

Assistant Secretary Hoffman began by providing the panel with some comments:

1. Make sure DOE knows the centers in excellence and how to stay ahead of the game in building capabilities.
2. Currently the job demand is in cyber-security and that is where DOE is trying to develop and re-train.
3. Hub-solicitation and how DOE can make this of a regional nature. For example, involve universities and provide a funding opportunity for a hub in a regional electric grid focus.

Merwin Brown stated that the future workforce in this industry requires fundamental differences in the type of people being hired: managers, etc. Is that correct? *Ms. Randazzo* responded that it does take a different type of person and rather than looking at people coming out of high school, industry should be looking at people with better base skills that can be added to. Technician skills are the same now, but you need someone that will stick with you as the grid changes. *Ms. Reder* commented that a person who is multi-disciplinary in nature is what will be looked for.

Mike Weedall asked where the jobs are disappearing from. *Ms. Randazzo* answered that the reduction is mostly in hiring. There is not a specific company or place where there is a big change; rather vacancies

are not being filled. *Ms. Randazzo* has seen a reduction in meter readers, but most have been absorbed back into the company and have been retrained and replaced. There is still a growing need for line workers and, due to their extensive apprenticeship; it is becoming a huge issue to fill this void.

Mr. Irwin Popowsky asked *Ms. Randazzo* why she had not brought up unions. In Pennsylvania, training is a big issue for unions, and he asked if CEWD works with the International Brotherhood of Electrical Workers (IBEW) or other unions. *Ms. Randazzo* responded that they absolutely do, and that the President of IBEW, Edwin Hill, is on their board. IBEW and UWA are part of CEWD, and IBEW has regional training centers that they have collaborated to work on. She reiterated that it will take a huge diverse collaborative effort to accomplish this, and that they are looking at all types of models. The boot camps she had mentioned could be delivered at an IBEW regional training center, a technical school, or a community college. *Mr. Popowsky* recommended that the ad hoc workforce working group contact the unions.

Mr. David Nevius talked about the Energy Systems Engineering Institute, and said that he has spoken to their graduate classes at Lehigh University. He is not sure how many other universities have picked up this model as another form of a center of excellence, but that it cross-trains innovative students in not just the power system itself, but in the entire system of reliability and economics and environment. *Ms. Reder* replied that she is not aware of how many systems or systems-type curriculums that are being built. There is a phenomenal amount of good in being able to understand and quantify the situation. On the academic side they do not have that as strongly, and she said that IEEE-PES is making a survey online to get regular feedback on the curriculums, number of programs, professors, etc. She said that the question remains of who should analyze the data, and that there is a gap between understanding the trends of the academics out there.

Ms. Randazzo commented that when they look at the supply side, they often go to their educational partners for information and it is a very manual process of discovery.

Mr. Heyeck said that his company outsources T&D, and their employees were moved to other providers, which probably impacts the data. He spoke about the persistent problem of Universities accepting high numbers of foreign born grad students since they pay full freight, but that they then do not stay in the country and join the workforce because of the difficult visa process. *Ms. Randazzo* responded that they poll their members and ask very specific questions about retirement and attrition and such. The focus is on utility employees, and not on supplemental labor contractors. She spoke of a metrics toolkit, in which they have identified six key metrics for workforce development.

Ms. Reder asked if she had a response to the outsourcing trend. *Ms. Randazzo* replied that uncertainty in the industry makes it difficult to project those numbers.

Mr. Brad Roberts echoed some of *Mr. Heyeck's* comments. He said that many students are just unaware of the opportunities available to them. He said that he looks forward to working towards improved communication.

Dr. Bose added a different perspective for the committee to consider. He spoke about the hiring of permanent faculty members at both the university and community college level. This is happening because of a notion that there will be more R&D funding in those areas, so if this revenue dries up there will be no more power engineering faculty hired. He sees sustainability of these programs as an issue.

The Honorable Paul Centolella commented that they pair utilities, some manufacturing and economic people, and 10 Universities in Ohio and west Pennsylvania into smart grid clusters to look at research and workforce development issues. He asked if there really is a role for the DOE or others at the state level to understand and communicate the best practices regarding the development of academic curriculum, and how that can be fostered. *Ms. Randazzo* replied that there is a role. Actively sharing is difficult, as often the faculty feels like they own a curriculum. This is easier at the community college level. *Mr. Bindewald* added that Energy Efficiency and Renewable Energy (EERE) have put together a web portal that allows the exchange of information, especially on the renewable side, for weatherization, wind, manufacturers, or installers. It is important to create the curriculum and encourage sharing it, but also to create a mechanism that allows the exchange of that.

Mr. Centolella asked about the impact US Universities could have if they allowed for remote learning for their power engineering courses. *Ms. Kenny* commented that the Engineering Research Center Program has best practices that have been developed since 1985. On the curriculum side, they are trying to answer some of these questions in terms of how to pass on a better pedagogy once it is discovered. For the open source questions, there is a trend to putting the courses out there. She did reiterate that there is difficulty in getting courses shared across campuses. *Ms. Randazzo* commented that remote education is definitely part of the answer, saying that it is a great way to distribute education.

Mr. Ralph Masiello said that he had drafted the GridWise Alliance's report on smart grid in 2008, which said a lot of jobs would be created. He asked if there are any statistics about productivity in the technician and the lineman type workforce. He also commented that research and improving productivity in some of these spaces should be investigated.

Mr. Cowart asked all panelists to briefly comment on what the workforce working group should be doing. *Ms. Reder* said that they need improve the outline for the committee. She boiled it down to the extent to which they can make visible the programs and initiatives that are out there and better connect them and increase collaboration so that we can scale and leverage activities both at the state and federal level and across agencies. Connecting research to education needs is important.

Ms. Randazzo wrapped up her comments by saying that they struggle with finding quantifiable answers to the questions the committee raised. Having a planning tool, doing scenario planning to begin to look at the "ifs" is a huge step forward. She said being able to evaluate the situation in a much more specific way is what they are working towards.

Mr. Bindewald closed by saying that the big question is not only what needs to be focused on in terms of the research objectives, but understating who is going to be doing that and whether they have the capabilities at present to achieve those outcomes.

ACTION ITEM

Mr. Popowsky recommended that EAC get in contact with the IBEW or the working group to continue to be engaged on this issue.

Wrap Up

Mr. Cowart closed by talking about the subcommittee sign-up sheet and the dinner the committee members would be attending that night. He adjourned the meeting at 5:10 EDT.

Respectfully Submitted and Certified as Accurate,



Richard Cowart
Regulatory Assistance Project
Chair
DOE Electricity Advisory Committee

8/20/2012

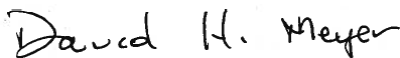
Date



Irwin "Sonny" Popowsky
Pennsylvania Consumer Advocate
Vice-Chair
DOE Electricity Advisory Committee

8/20/2012

Date



David Meyer
Office of Electricity
Designated Federal Official
DOE Electricity Advisory Committee

8/20/2012

Date

Matthew A Rosenbaum

Matthew Rosenbaum
Office of Electricity
DOE Electricity Advisory Committee

8/20/2012

Date