



Pacific Northwest Center of Excellence for Clean Energy

Smart Grid Curriculum Sub-Committee
Thursday, 10 February 2011, 10:00 AM – 2:00 PM

Confirmed attendees:

Yvonne Chase, PNCECE
Jeff Hammarlund, Portland State University
Barbara Hins-Turner, PNCECE
Jamie Krause, PNCECE
Shane Pacini, Avista Utilities
Jay Pickett, Centralia City Light
Kevin Schneider, Pacific Northwest National Laboratory
Dale Singer, Avista Utilities
Bob Topping, Chemeketa Community College

Unable to attend:

Karen DeVenaro, Seattle City Light

Introductions

Barbara Hins-Turner welcomed everyone and said that each person is here because they have curriculum design in their workplan either funded or in the form of match except Chemeketa and Centralia City Light. Barbara asked everyone for introductions and to share their background.

Purpose and Process

Barbara announced that the PNCECE would be attending the Department of Energy NETL meeting in Annapolis, MD this summer. She said PNCECE was selected as one of three DOE Smart Grid projects to participate on the steering committee to plan the event. Portland State University originally applied for Part A of the Smart Grid grant but wasn't funded. Since they are a vital partner in Smart Grid technology, Jeff Hammarlund was asked to come in.

Barbara mentioned the new equipment the COE recently purchased for Centralia College's Energy Program from the DOE Smart Grid funds. She suggested everyone visit the classroom when we break.

Barbara asked everyone to tell the group why they are here and where they see the curriculum design and development phase of the project going. Dale Singer from Avista said that his interest is whether we are developing new training or are we really upgrading what we currently have. Smart Grid is a small part of the total

package. He would like to ensure that whatever this sub-committee comes up with isn't a duplication of something else already in existence.

Jay Pickett said he just came from Centralia City Light's (CCL) AMR system and upgrades planning session. CCL is very interested in supplying what resources they can to help operate this project. CCL deployed an auto meter reading system that communicates over a 12/5 distribution system and relays back to their central location. Their next software upgrade will allow for more outage management and distribution. CCL would like to offer this up to the group and hopefully find a creative way to use it.

Bob Topping from Chemeketa Community College shared how he put together a curriculum around a standard protocol for senior maintenance electricians and substation mechanics to trace one line diagrams. They are now teaching this curriculum at Bonneville Power Administration. The end game is a standardized protocol built on industry skill standards that creates best practices.

Avista is bringing their expertise in a host of areas to advance the baseline of what others are doing. This will help skill-up workers and launch new technology. It is about connecting the new technologies and skills to existing processes while redefining existing technologies. This can be a great catalyst for other utilities that are not as advanced. Jay Pickett said that this is one of the biggest reasons he is here at the table.

Shane Pacini said that Avista has been selling Smart Grid technology for a while and now on a mass level. They have hundreds of devices on the line, at substations, and incorporated into Avista's training. What Avista is looking for with this Smart Grid project is the development of training. They are looking for this meeting to give them immediate direction. Also, Shane advised that the 10 different occupations targeted by the Smart Grid project need to have a point person with subject matter expertise. Barbara introduced the Newsletter that was just printed and pointed out the 10 occupations that we are required to address as part of the Smart Grid project.

Kevin Schneider said that curriculum means different things to different people. There won't be one class to cover all occupations. He would like a more defined framework for what we are targeting in regards to curriculum; it sounds more like we are targeting undergraduate level. Jeff said that he thinks we need one day trainings that Avista and CCL could potentially use as well as graduate students. Kevin said that UW and WSU are putting together a lot of training for graduates. That might be a place we could focus and possibly leverage so work isn't duplicated. Sounds like those being represented are more on the utility side rather than the universities.

Jeff said that Portland has a lot going on in terms of companies; BPA, PacifiCorp, PGE, Corps of Engineers, Public Power Association, companies coming up around

Energy Efficiency, etc. The Northwest has been the leader in this area, not only in the Portland area but all over the Pacific Northwest. On Feb 2nd of this year, Portland State University convened a meeting of top industry executives from the utilities and energy conservation groups. Industry said their workforce desperately needs to upgrade their skill sets around energy efficiency, demand response, Smart Grid, etc. Industry was thinking of creating their own training program, but instead asked Portland State University to take the lead and the companies would contribute their top people to the program. Jeff relayed that there is a huge need for incumbent worker training. PSU is thinking of developing a bachelor's certificate or master's program, primarily to serve this incumbent workforce. Thousands of people need this training. Also, out of the Feb 2nd meeting industry indicated an interest in the development of engineers. They are looking for engineers that are business savvy. There is interest in a series of core courses, regardless of the incumbent worker's profession to be followed by specialized courses. We want to avoid duplication, and we want collaboration. Barbara said that at the Center of Excellence Advisory Board meeting a few years ago, they were looking at a master's degree in sustainability. University of Idaho and Montana are interested in this along with the community colleges. There is an expectation that the Education Taskforce, along with the Curriculum Development Subcommittee develop an endorsement process to ensure all curriculum is skill standards based and meets industry needs.

Barbara asked what Avista is teaching. Dale said that they aren't concerned with higher education until we can identify what Smart Grid really is. Until we can do that as an industry, the higher academia level will struggle. Avista has approval requirements through the JATC. Everything is approved either by the state or the federal government. Dale handed out a document identifying the classes offered to their apprentices for Smart Grid noting some areas may change. Kevin said that anything that comes out of the Committee should be run through the utilities. Dale noted that every company will want to put their own spin on the training. Jeff added that some areas don't have to be reinvented. For example, PSU has a strong IT component but doesn't have strong curriculum in other areas. There are opportunities to collaborate there. Jay noted that we need talent that understands advanced mathematics and logic then we can work with them after that. That should be two separate target audiences. Two years of school isn't very long. There is a need to decide what part of the program is to get the individual the job; and what part helps them remain successful on the job.

Dale asked the committee what should be the primary goal of the group and what the immediate priorities should. Who is going to work on what? Barbara said that our main target is incumbent workers. Dale said that Avista's pre-apprentices don't always have a two year degree. Avista isn't recruiting from colleges; they get most of their workers from "helper" status. They evaluate how they work and proceed from there. The baby boomers are retiring—retirees are the issue. There needs to be a fundamental shift of philosophy around the retirement bubble. Jay said that most of the hires that he has been involved in have come with a two year degree. They

pay enough to expect the two year degree. Kevin said that in the Benton-Franklin area job postings have been open as long as a few years.

Barbara said that Avista's Lineman school is different than the two year degree program at Centralia College. Centralia produces graduates that are going into substation fields. Dale added that what they look for in Avista's Lineman School is whether the student is afraid of heights and whether they have the aptitude to do the job.

Kevin asked if curriculum being developed is only at the community college level or are we looking at four-year universities. Dale said engineers; business majors will need to be trained. Kevin said that in this committee we couldn't possibly cover all areas and must focus on what is most important. We aren't going to come out of this with the curriculum for a "degree" in Smart Grid.

Jeff said that we are trying to figure out what articulation opportunities exist so community college graduates can transition to a 4 year with options to get into different careers that are needed by the energy industry. Dale said that it may be a building block process. If we train for development then you can cut out what you don't need at the community college and shift that to incumbent worker training modules. Jay noted that there are two sides to the community college—pre-apprenticeship and apprenticeship.

Barbara asked Avista to review what they have done with their Smart Grid projects. Shane opened my mentioning that Smart Grid means different things to different people. They are installing devices on the distribution lines and substations. In Pullman they are installing smart meters. They aren't really doing anything on the transmission or generation side. Avista is installing smart meters but they are not fully operational. Training is critical since the meters have been available for a year and a half. Transmission has been Smart for 20 years; we are updating the distribution system to catch up with the rest of the system. Jay said that Smart Grid jobs are a better use of efficiency. A lot of the technology has been out there for some time. Kevin noted that the attraction of new students into the energy industry is huge due to the technology factor. Jay added that the "green" is what we need to market to the students. We need encourage the utilities to hire from the program and "green" is what does this. We need to make sure we aren't getting Smart Grid and Green confused.

Jeff said that we could assume that Smart Grid goes from generation to the consumer's home or business. In Portland it is more looking at the consumer interface. All of these are important. Do we have guidance from DOE whether they care? Barbara said no there isn't any guidance from DOE either way. Kevin said that what we discuss here and put into a workable program will make DOE happy. Kevin said when we talk about curriculum we need to know how many modules. Shane added that a lot of the modules will be interchangeable.

Shane handed out the Avista Smart Grid Device training manual and discussed some of the items included in the manual. Dale said the electric smart grid is from the generator to your receptacle and generally back. Transmission is more equipped and is already smart. What we are talking about is the communication piece. From our substation to the home: what it will allow us to do is voltage control using smart meters for customers. This is what everyone is jumping about. Jay suggested that the goal of smart technology is to make the demand side the supply side. Dale agreed they have to go hand in hand. The CSR is the most important part to consider in regard to smart grid. Jay said that we should focus on the commonalities of the two sides. That is what we should look at in terms of training.

Jay suggested that if this group had an endorsement and an outreach strategy, we could get all the students we want along with incumbent workers from industry. When we endorse curriculum we are saying it meets a specific list of requirements and we offer a certificate either at graduate, undergraduate, associate, or technical level. Education and training organizations could still build their own programs then have the Taskforce/Sub-Committee evaluate it to see if it meets the different levels of education and competencies required by industry. Bob Topping said that this process is used to develop a best practice—by evaluating the demand side and supply side of the industry, education levels required following a standard. Curriculum is developed through a process that is similar across the region resulting in measurable outcomes, valued by industry and approved by this group.

Once we set the standard everyone will have to adhere to it if they are looking for industry endorsement. Possibly codify the curriculum development standard. There may be a problem with sharing information back and forth and setting the standard. Subject matter experts may need to weigh in on how different occupations will be affected. Proprietary information may be an issue too. For example, vendors may have different meanings for two way communication devices. This may affect the curriculum with the community colleges.

We need to establish a precursor to what smart grid is. Another off the shelf option is the energy efficiency training in Oregon structured into one day modules for large commercial industrial partners to get them ready for the smart grid. It is designed to train power managers. Jeff offered to make this available with PGE support. They are meeting in a couple of weeks to evaluate the re-design. It is more of an introduction to smart grid with customers, hospitals, etc.

There are a lot of different definitions of what smart grid is. Using the DOE definition would be best to get started. Every definition is very utility-centric. Dale said that smart meters have different meaning in different states. We have to make sure we are an entity that is recognized by industry so people pull from our programs.

Bob suggested the group focus on training development not necessarily accreditation. Dale noted that for Avista accreditation doesn't guarantee we aren't

duplicating existing work. We need to develop something first and then see if it is worthy of being accredited.

Structure & Next Steps

Barbara stated that we have a good starting point. Another issue is who is going to do the train-the-trainer. What continues to be missing is a working definition of smart grid. Dale said that Avista is already doing training around smart grid and efficiency: what they need is an updated definition of “smart grid technology.”

It was suggested we go through the skill standard process to determine smart grid training. Possibly take an example of curriculum from the utilities, then develop create mission critical, core competencies for smart grid training. Pick what is needed for the training and then create the standard.

Jay asked if the grant money can pay for the needs assessment. Barbara said that they would have to review the workplans. Jay said the needs assessment should be done within the group then compare it to other utilities, prioritize it, and then act on those items the group identifies.

Shane said that he likes what he is hearing so far. Avista will have to work on the outline classes and move ahead right away. Dale said that he doesn't see why he couldn't share this information but will have to ask Avista.

Bob Topping said that if we come up with core competencies, we can create a signature course. Shane said that Avista is in the position to take the lead in some areas. They are unable to design the whole thing on their own or have it be a complete training course. Kevin said PNNL is here to help from the laboratory level. Maybe help more on the academic classes but depends on what the framework will look like.

Barbara said train-the-trainer is an important piece and will need to be addressed. Dale suggested teaching subject matter experts how to become instructors, how to provide the proper training. Bob Topping can help in this area. Barbara said that Bob knows the craft world so he would be good at this. Bob said there is a protocol and has to be implemented by someone who can put it into a process where people understand it. Needs to be someone they trust and believe in to convey the training. Jeff is teaching at the graduate level; teaching faculty how to train. Bob said that at the end of the grant we can say this is how you teach journey level workers to do the job. Dale asked how we say this is the best person to do the training to give credibility to the instructor. Jeff said that most people who take his course are engineers or want to be engineers—incumbent workers. We need people who have real world experience to teach. There must be credibility behind the instructor.

Jay said that he would like to be part of the group that creates the list of priorities so we can start talking action the next time the group gets together.

Jamie said communication is important. SharePoint is a good tool for sharing documents.

Barbara explained the process of how the Curriculum Development Subcommittee came about. The Educational Taskforce formed then this group was chartered as a Curriculum Development Sub-committee by the Taskforce. This is where the work is going to get done.

There was some discussion on who should be the chair. The criteria is to have someone who isn't receiving grant funds or contributing match for curriculum development; and is impartial and independent to the curriculum development process. Also, the criteria is to include subject matter experts across the target occupations, experience on curriculum linking to skill standards, DACUM –like processes with industry, and experience working in secondary and post-secondary with faculty across the education system. Barbara proposed that Bob Topping and Jay Pickett to co-chair. Bob and Jay graciously accepted the position.

The timeline is to have the charter of what they are going to do and have it ready for review by the next meeting to be held at Avista in March. Suggest the meeting to be held at Avista's Jack Stewart Training Center in Spokane. Recommend the information be submitted for the charter for review by March 3, 2011.

Jeff asked who the other utility partners are. Idaho and Montana will be year two. The public powers are Seattle City Light, Tacoma Power, among others. Barbara asked Jeff to pull the Oregon utilities.

Barbara said the other piece to this is the Edmonds Community College NSF grant. They are working on creating skill profiles for a number of demand side occupations. They are addressing the five in the smart grid grant plus a few more. The intent is that they will overlap.

At the next meeting, we will adopt the charter process map, and start assigning tasks. Also, we can input the data into QuikSigma. Bob Topping explained what the QuikSigma program does.

Cascadia Community College was unable to attend today's meeting. Bob Topping will follow-up with them. Bob passed out a process model for curriculum design and development called a Training Outcome Guide (TOG) Process Model. Bob suggested presenting this model to all of the community colleges considering developing curriculum around smart technologies.

Barbara talked about the branded website Centralia College purchased from General Physics. A lot of utilities use this for their training. General Physics is developing a module on smart grid. The initial module will be from the Center of Excellence budget. Dale wondered about security issues Avista may have. He likes

the Smart Grid 101 theme. He will have to check to see if they can put it on their public site or their LMS site.

Adjourn

Meeting adjourned at 2:20 pm.