Technical Focus, Energy & Environmental Committee Meetings

December 2019
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M I N U T E S

TUES-WED, December 10-11, 2019

TECHNICAL FOCUS GROUP SESSION

Mike Zebell, Environmental Resources Management, *Technical Committee Chairman*

Mike noted that the subject of sustainability and resilience was brought up at the Annual Meeting , in particular resilience, and was suggested as the topic for today's focus group. The integration of renewables and other new energy devices puts new requirements on the grid system.

Vince Visconti and **Feridun Bozkurt** of CleanSpark Inc. presented on opportunities for a cleaner, more efficient, and resilient grid of grids. CleanSpark Inc. is a supplier of micro grids and a manufacturer of substation type equipment. Micro grids have been around for a while, but the economics limited the applications to specialty situations.

Technology improvements and cost reductions have improved the situation, as well as experience with the systems. Energy markets have become accessible in certain parts of the country. The distributed energy resources that can be used by a micro grid are many and varied, including engines, PV, batteries, gas turbines, CHP, etc. Each application is site specific. Thus, equipment selection can be somewhat complicated. Further, with the additional equipment, operations become more complex.

Adaptation is a further concern as regulations and site demand change. The three key entities are the energy consumer, the utility provider, and the distributed energy resource (DER) provider. Energy consumers can be anybody. Utility entities also vary, although not as much as consumers. DER providers can be any equipment supplier. One thing all stakeholders agree on is the need for cost savings (and revenue generation). Energy security and resiliency are the second most important reason for looking at micro grids. Sustainability and GHG reductions come in third.

Industrial customers and government facilities are particularly interested in the security and resiliency aspects, as are hospitals, grocery stores, etc. In order to address these issues, two key products have been developed. The first is a software package that optimizes the system design through modeling. The site specific details of the client, utility, and potential equipment are modeled to provide the selection of DER equipment for the micro grid. The second software solution is an operations package that provides operating instructions for a given set of constraints and objectives (model based control). The design package provides cost information, payback analysis, pre-tax and after tax IRR, peak demand (and demand charges), and energy use statistics. The model can show

current information as well as predicted information. Further, each piece of equipment in the micro grid can be analyzed for performance and applicability.

For the control package, both controls and parametric modeling are used to provide operating information. The system is a hybrid cloud based program. The controller can operate whether or not the cloud connection is available. The cloud provides access to additional data that can help to optimize the operation. CleanSpark Inc. keeps the cloud updated with tariff data, fuel pricing, and equipment performance.

Integration with the existing facility starts with the equipment that already exists. The company makes its own switch gear. The switch gear can handle low voltage (4,160 V and less) and medium voltage (about 5 kV) applications. Parallel power delivery lines can switch from one to the other.

Distributed generation with CHP has seen increased activity of late. Switching can occur as a result of a failure or as a result of peak shaving. The peak shaving aspect saves the high rates associated with peak demand charges. By keeping the facility below the targeted demand rate, the excess demand charges (which persist for 12 months) can be avoided.

Feridun Bozkurt provided an on line example of such a system. The system simulation showed two power lines coming into a system of consumers. There is a main breaker between the two which isolates the two lines. If one line fails, the breaker can be closed to allow the other line to provide power to the failed line. There are 4 distributed generators along with a battery and a solar PV system. For battery and PV systems, inverters are used to supply AC power from DC generation. For the most part, the suppliers provide the inverters with their equipment. With the integration of renewables, it is possible to export power from the micro grid. Depending upon the various factors, the different resources are started and controlled. If both utility lines fail, the 4 distributed generators are started to provide backup power. The software can handle waste heat as well as CHP. There is a higher level controller that can decide between selling power and buying power.

Jim Feese of Detroit Stoker Company reported on coal to gas conversions for sustainability and resilience. The University of Missouri has a CHP facility that includes renewables, boilers and gas turbines. There are 4 existing coal fired boilers of which one is still operating. This unit is a 1971 vintage Riley Stoker unit at 200 kpph.

The client wanted to maintain the option of burning coal. The unit did originally have gas burners, but the price of oil and gas went up substantially in the 70s and not much gas was ever fired. The client wanted to be able to burn coal or gas at full load on either fuel as well as being able to co-fire gas and coal. The unit was able to run at 229,000 lb/hr on coal, but was restricted to 184,000 lb/hr on gas with problems related to high steam temperatures near MCR. The client wanted to get similar performance with the retrofit.

New low NOx burners were required. Pressure regulation on the gas was needed. Gas piping and air ducting was needed. The existing FD fan was utilized. A total of 4 burners at 68 MMBTU/hr each with 10:1 turndown were installed. Thermocouples were added to the burner throat so that temperatures could be monitored during periods when the unit was on coal and cooling air was needed. CFD modeling was done to evaluate the air flow going to the burners. Balanced flow at

+/- 3% variation in air flow to the burners was required. New under grate air dampers were needed to control air flow to the grate under all conditions. Double block and bleed valves were installed for each burner. Two flame scanners per burner were utilized. Cooling air for the scanners was needed. Vent piping, gas piping, and air lines were brought up to NFPA requirements. A new PLC control system was installed. The use of two scanners allowed the system to determine whether there was a coal flame or a gas flame. Coal ash was used as an insulating blanket on the grate when gas was being fired. For extended periods of gas operation, a full blanket was installed to cover the grate and the feeders to avoid overheating. The steam flow rate on gas was 187,000 lb/hr. Some over fire air and spray attemperation was used to control steam temperatures.

At the University of Wisconsin, the coal fired boilers are being converted to gas. These units are small, saturated steam units (40 – 60 kpph). These older units (1963) had no economizers. Delivered coal costs were increasing and gas prices were declining. ($5.60/MMBTU for coal and $3.40/MMBTU for gas delivered). Due to the small dimensions of the existing units a dual register burner system was selected. No. 2 oil was specified as the backup fuel. Pressure part modifications were needed to install the burners. A new BMS and control system will be supplied.

Ann McIver of Citizens Thermal gave the presentation prepared by **Kristin Maguire** of Kinetrex, who was unable to make it to the meeting. Kinetrex provides gas delivery via liquefied natural gas (LNG). LNG is 1/600th of the volume of natural gas, so that storage and transportation is somewhat easier. Skid mounted storage systems can be provided at remote locations. LNG provides some price stability compared to propane. The skid mounted systems can be delivered when there is a fuel shortage (propane, diesel, etc.). The portable storage and supply provides a virtual pipeline system.

Ann McIver also reviewed the 2020 Survey Results. A total of 48 responses were received. Half of the responders had not been to a meeting in the last year. Information was the main reason to attend meetings. Email was the primary means of sharing the information. Environmental issues were still the major policy issue of importance. Energy policy, technical, and sustainability concerns were next.

On the legislative side, climate change and GHGs were ranked first. For boilers, GHGs, burners, boiler fundamentals, and efficiency were all deemed important. Combustion control systems were the lead for emissions control systems. Integration of renewables was of interest for the renewable issues.

On the permitting side, new source review and Title V permitting ranked high. MACT rules were a priority. On reporting, the reporting of GHG emissions was top ranked. For water, the WOTUS rule came in first.

In solid waste, the definition of solid waste topped the list. Energy efficiency topped the list for DOE information. On fuels and diversity, energy storage and batteries came out top ranked, followed by alternative fuels.

I. Government Affairs Session
TBD, *Government Affairs Committee Chairman*

The two speakers from Congress were tied up and could not break free for our session.

II. Energy Committee

Frederick (Fred) P. Fendt, The Dow Chemical Company, *Energy Committee Chairman*
Robins Mills Ridgway, Purdue University, *Energy Committee Vice-Chairman*

Carl Bozzuto, CIBO Consultant**,** reported on the situation with Pacific Gas & Electric and their bankruptcy due to the wild fires in California. As a result of the bankruptcy, PG&E has been curtailing power to areas that are prone to wild fires. PG&E was hit with a $13.5 billion fine as a result of a finding that one of their transmission wires was instrumental in causing one of the fires last season. This year, PG&E has been shutting off power in areas with fires. While PG&E had an obligation to serve under any conditions. They can no longer risk being sued over these fires as a result of the fine and bankruptcy they just received. The concern here is that now any utility supplier can shut off the power with no recourse.

Angela Kallhauge of the World Bank provided a presentation on trends of carbon pricing. **Tom Erb** of the Carbon Pricing Leadership Coalition started off with a summary of world activity. Carbon price options include cap and trade programs and taxes. Pricing has certain benefits compared to other approaches such as standards and requirements (i.e. CAFÉ standards, renewable credits, subsidies, ethanol requirements, etc.). Carbon pricing is being used in 46 national and 31 regional locations. Over 50% of these locations have a carbon price below $10/ton of CO2. Some studies show that the price level needs to be much higher ($50 - $100/ton) to achieve the goals of the Paris Agreement.

At the business level, carbon pricing can link a company's financial performance to its climate impact, help companies manage their climate risk, and help quantify the cost of project emissions in comparing various alternatives. Some companies are using a fairly high carbon price ($50/ton) in order to prepare their operations for potential regulations on carbon prices. Some 1,400 companies are planning to use a carbon price of $20/ton.

The financial community is pushing on industry and government to take a more active role in carbon pricing. International aviation has set up a coalition (CORSIA) that has set a goal of carbon neutral growth from 2020. Looking ahead, expanding the coverage, deepening the impact, aligning the pricing, progression on the guidelines, and engaging all relevant stakeholder groups. The World Bank has a group that specializes in carbon pricing. The Carbon Pricing Leadership Coalition looks to provide stakeholder engagement and business engagement with carbon pricing. Communications is a key effort. The World Bank can be a source of information for industry.

George Frampton of the Partnership for Responsible Growth reported on what is going on in carbon tax activities. Of our trading partners, Canada has the most comprehensive carbon pricing program in the world. In Canada, the carbon price is now $20/ton and will rise to $30/ton next year. The price will rise in $10/ton increments.

The EU has had a cap and trade system for 10 years that covers about half of the overall emissions. They had originally issued too many emission allowances and the price level dropped. They have tightened up the number of allowances and the price is now $25 euro/ton.

For the transportation sectors, there will be a tax starting at around $20/ton but increasing over time. There will be no trading during the first 5 years and then trading will start. For whatever is left, a third trading system will be initiated to try to cover all of the emissions. China is talking about a cap and trade system. Mexico started a carbon tax. In the US, California has a cap and trade system along

with a low carbon fuel system. California has other standards that impact the potential pricing in the trading system.

The Democratic Party candidates have all pretty much supported a carbon tax. The objections to the tax are that it will reduce GDP growth and that it will be regressive. Model studies tend to indicate that the impact on GDP is small (either way). It is true that such a tax would be regressive (i.e. disproportionately impacting the poor). The response to that is that the money can be returned to families in the form of tax rebates and subsidies. The level of such a return is debatable.

The IMF estimates that the world subsidizes fossil fuels to the level of $15/ton. This comes in the form of job subsidies or price subsidies in many countries. Assuming a potential cost of carbon at a level of $25/ton, this means that decisions are being made today that do not account for some $40/ton in terms of subsidies and potential costs.

Jordan McGillis of the Institute for Energy Research reported on natural gas fuel choice flexibility. US gas production has been increasing substantially in the last 10 years (+50%). The price has subsequently dropped ($2.30/MMBTU today). Forecasts indicate another 33% increase in the next 10 – 20 years. The increased use of natural gas has helped to reduce overall emissions as well as GHG emissions. Never-the-less natural gas is still a fossil fuel and some eNGOs are engaged in the vilification of natural gas.

Regardless of the results of the next election, state and local policy threats continue to exist. New York State has declared a moratorium on new gas pipelines. California has municipalities that are banning new natural gas. The various current proposals are not likely to really solve the problem. Adaptation is the most likely way to adjust. The "so called" tax dividend is really just another welfare program. Some government policies are counterproductive.

III. Environmental Committee Session
Tom Webster, DuPont, *Environmental Committee Chairman*
TBD, *Environmental Committee Vice-Chairman*

Jake Tyner of the US Chamber of Commerce reported on the PFAS Action Act. These polyfluoride compounds have been in the news over the last year and a half. Some of these compounds have been in use since the 1940s. One concern is that they can persist in the environment for a long time. The most recent toxic substances inventory indicates something like 600 such compounds, of which 3 – 5 have been extensively studied and perhaps 20 – 30 that are in active use. The two oldest, long chain products are no longer produced in the US.

Under the toxic substances control act, EPA has issued some guidance, but have primarily done more research on the potential impacts. (some 70 parts per trillion suggested) EPA has started looking at the general class more closely and held a summit last year. From the summit, an action plan has been developed. Draft interim ground water recommendations have been issued for comment. Additional PFAS substances have been proposed to be added to the Toxics Release Inventory.

The Chamber comments were that ground water levels should not be the same as drinking water levels. Regulatory determinations for PFOA and PFOS were sent to OMB recently. There is concern that some substances might be classified under CERCLA. PFAS is used in firefighting foam. Fire

fighters need to train in the use of foam. If they are prevented from using the foam, they can't train and meet those requirements.

The House has started to hold oversight hearings on the subject. There have been 35 legislative proposals. There are also military aspects for the use of PFAS. Congress looked at this through the military appropriations. The House and Senate have passed bills and they are in conference on a final bill. It is likely that the final bill will come out by the end of the year. PFAS is used in MREs to preserve the quality of the food for the military. It looks like that will have to be phased out. Right now there is no realistic alternative, but one will have to be developed. The same will apply to fire foam.

EPA will be directed to develop appropriate measures for the safe destruction of PFAS.
Bob Bessette of CIBO noted that there is nothing on the CIBO web site that says anything about PFAS or a carbon tax or price. Bob solicited our input for a position, if necessary, on our site.

Scott Darling of Alcoa Corp. reported on Ozone of CSAPR. The Midwest Ozone Group (MOG) had a meeting since the CIBO Annual Meeting. The first item was the status of the CSAPR rule. This replaced the CAIR rule. EPA issued an update rule. There has been litigation from downwind states on upwind states. The rule allows upwind States to continue their significant contributions to downwind air quality problems beyond statutory deadlines by which downwind States must demonstrate their attainment of air quality standards. The Court sided with the States.

The Court did allow that EPA possess a measure of latitude in defining which upwind contribution "amounts" are significant. The Court also denied industry claims for international emissions. They reasoned that upwind states can still contribute to downwind states.

EPA did some additional work in the last year to "close out" the CSAPR rule. With the decision on the update rule, the close out rule was vacated. EPA needs to work on the update rule. As the utilities have significantly reduced their emissions, the next target would likely be the industrials.

There were a number of Section 126 petitions against units in the mid-West (PA and WV). EPA has denied most of these petitions. However, part of the EPA justification cited the CSAPR update rule. Maryland and Delaware have appealed. New York cited many units (348 total). EPA denied the New York petition. EPA cited that New York did not do any modeling to show which of these units actually had an impact. In this case, the CSAPR update rule was not cited. However, the definition of the significant level is not fixed at the moment.

Some petitioning states, asked for a "1% of the standard" level (0.7 ppb). Other suggestions have been 1 or 2 ppb. The higher numbers make it easier for a state to claim it is not having an impact on a downwind state.

Gary Merritt of Northern Star Generation Services Company LLC reported on the Clean Water Act issues. EPA issued the final rule on the definition of Waters of the US (WOTUS). They went back to the original definition. However, there is another rule at OMB that would remove ground water from WOTUS. The 316(b) rule on water intake impacts those taking more than 2 MM gal/day**.**

Ann McIver of Citizens Thermal pointed out that their "de minimis" approach to compliance was denied by Region 5. The reasoning was that their fine mesh, traveling screens were considered to be

only "trash racks" by the Region, as opposed to fish protection. The Region wants a fish return for such devices. Further, all of the "must" and "may" factors must be addressed in the evaluation of impingement and entrainment. There was another provision for exemption for those plants that get their water from a public water system.

Public versus private water supplies, The Cambria Somerset Authority had been designated as a public water supply system. However, the PA DEP suddenly designated the Authority as a private water supply. That put the onus for all of the studies, testing, and reports on the plant drawing the water (as opposed to the Authority).

Regarding ground water, The Maui case involving ground water went to the Supreme Court on Nov. 6. This case was about Maui using an injection well for disposal. The material could get into the ground water, which eventually could get to the Pacific Ocean. The eNGOs want a discharge permit for this system.

On coal refuse units, EPA has a new proposal that would set August 2020 as the new date for facilities to stop placing coal ash into affected impoundments. There is also a provision for extension to 2023 or 2028 depending upon size.

The new effluent limitation guidelines have more rules for scrubber sludge. There are separate requirements for high flow facilities, low utilization boilers, and boilers retiring by 2028. For indirect discharges, pretreatment of the water is being proposed similar to BAT.

For PFAS, there could be a potential problem. Military bases may be the primary target. This is a hot topic right now. There will be a lot more work and more regulations coming on this subject. There are 8 states with numerical limits. A recommended national limit is 70 parts per trillion.

Lisa Jaeger of Bracewell, LLC gave the Regulation and litigation update. Dan Brouillette was confirmed as Secretary of Energy. There are 3 nominees for positions that have to be confirmed. Regulatory reform is still in process. Significant items include NEPA, transparency in science, and EPA appeals board reform.

The ozone NAAQS review is ongoing. The administration has committed to getting the ozone and PM NAAQS back on schedule with the CAA timeframe. CIBO is part of a coalition proposing a review of the NAAQS process. CASAC held a public hearing with written comments and testimony by scientists.

The policy assessment on the PM standard did not establish the need to call into question the protection offered by the 2012 standard. A similar conclusion was reached on the ozone standard. New Source Review is still at EPA. On once in always in, there are still some outstanding issues. On the work practice standard for startup and shutdown, the issue came up in the MATS case. The eNGOs argued that it was arbitrary to treat startup emissions differently under MATS (work practice) and the Acid Rain Program (continuous).

The eNGOs also claimed that they did not have the opportunity to comment on the EPA procedure to identify the startup period as the proper period to then begin to apply numerical standards. On the pulp mill MACT RTR, oral argument was held Dec. 4th. The issue is whether or not the agency must set limits for HAP not regulated by the MACT for the source category.

Formaldehyde emissions are at the center of eNGO attempts on these rules. They feel that this gives them a "back door" way to regulate gas fired equipment. New York filed a 126 petition and pulled in New Jersey. There are 3 environmental groups supporting New York and a host of industrial groups against. New York filed a motion to expedite the hearing. EPA and the industrials opposed and set a schedule for oral argument in May and hearings in the fall. The Delaware and Maryland case will go to argument in January.

There are a number of cases where the public is pursuing the oil companies. Again, the approach is to rile up the public about the climate issue. The Maui case is going to the US Supreme Court. In another case, EPA has a Superfund judgement against ARCO and remedies are being applied. However, additional petitioners at the state level have filed for additional remedies to nearby property owners.

Yearend environmental closeout concerns were given by **Tom Webster** of DuPont. Training at DuPont includes reminders to review the permit, identify the equipment, and know the emissions. For boilers, there are work practice standards and required reporting. Most sites have engines. An inventory of the engines on site is useful, as some units might be rentals, some have been replaced, or some might have been rebuilt. Maintenance records are needed to maintain certification. Some need to be available for EPA inspection.

Annual fuel usage records, opacity documentation, fuel certification, and emissions control requirements are required for most permits. If testing is required, a calendar for such requirements is a good idea. There are refrigeration regulations as well. A site inventory is worthwhile, especially in those areas that require Global Warming Potential reporting. Leak rate calculations have changed. Documentation is now required for units that leaked above 125% for the year. It is a good idea to get all of this information documented electronically. For permits, submittal dates, expiration dates, changes, test requirements, and record keeping requirements should all be documented.

The EPA ECHO database should be checked for accuracy. This database reflects what the outside agencies think your emissions are. Changes always occur. Everything from the business name to the name of the contact at the agency can change during the course of a year. Regulations also change. All of these changes should be updated. Reporting and submittals are key. A calendar with reminders is helpful. Deviation reporting should be checked to make sure that all events have been included for the entire year.

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