RTO Insider
Your Eyes and Ears on the Organized Electric Markets
CAISO ■ ERCOT ■ ISO-NE ■ MISO ■ NYISO ■ PJM ■ SPP

ISSN 2377-8016 : Volume 2019/Issue 14 April 2, 2019

Report: 'Naive' PJM Underestimated GreenHat Risks

By Christen Smith

Naive, overconfident staff and underlying market flaws allowed a small trading shop to amass the largest portfolio of financial transmission rights in PJM history without the collateral to back it up, an independent review concluded last week.

The RTO's Board of Managers *commissioned* a special *report* on the GreenHat Energy debacle in October, just four months after the company defaulted on 890 million MWh of FTRs and racked up $100 million (and counting) in losses.

The review concluded PJM staff ignored red flags about the company's assets and exhortations from other members about the portfolio's financial shortcomings — a failure of protocol that CEO Andy Ott said "needs to change."

"PJM needs to get better," Ott told *RTO Insider*. "Quite frankly, we're just not used to this type of behavior from a market participant."

Independent Review

The board hired three consultants to focus on the RTO's role in enabling the default, handing off the task to Robert Anderson, Neal Wolkoff and Arleigh Helfer. Anderson serves as executive director of the Committee of Chief Risk Officers, whereas Wolkoff has consulted with the U.S. Commodity Futures Trading Commission and has held leadership positions at the New York Mercantile Exchange and the American Stock Exchange. Helfer is a litigation attorney based in Philadelphia.

"It is clear what a significant outlier GreenHat was," the report reads. "GreenHat's trading pattern was conspicuous in that its positions were far larger and of longer tenor than those of other financial participants in the FTR market."

Continued on page 28

PJM Files Energy Price Formation Plan (p.30)

TSA Defends Pipeline Security Practices Before FERC

By Michael Brooks

Clockwise from foreground: TSA Administrator David Pekoske; FERC Commissioners Bernard McNamee, Cheryl LaFleur, Chair Neil Chatterjee and Richard Glick; and Bruce Walker, assistant secretary of DOE's Office of Electricity. | © *RTO Insider*

WASHINGTON — Transportation Security Administration officials last week defended their efforts to protect the country's natural gas pipelines, telling FERC they are adding more staff to the effort.

The importance of securing gas infrastructure was a recurring theme at a technical conference organized by FERC and the Department of Energy on security investments for energy infrastructure — an acknowledgement of the fuel's growing importance to the country's electric generation mix.

Continued on page 8

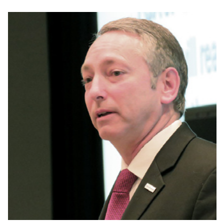
ERO INSIDER

NERC Conference Ponders the Human Element to Reliability

By Rich Heidorn Jr.

More than 400 attendees from 180 organizations attended the eighth annual Human Performance Conference. | © *RTO Insider*

ATLANTA — When NERC considers a new reliability standard, it convenes drafting teams heavy on engineering expertise and system operations. But for its eighth annual Human Performance Conference last week, NERC brought in firefighters, psychologists and speakers from the airline industry to provide lessons.



James Merlo | © *RTO Insider*

"We find that all industries have people, people who actually operate the same way, whether they're moving electrons or moving aircraft," explained

Continued on page 3

Ex-Fire Chief Shares 9/11 Lessons at NERC Conference (p.6)

Expanded MRO Winds Down SPP RE Transition Period (p.7)

Also in this issue:

NEI Sees Glass Half Full for Nuclear Industry (p.11)

PNM's Bid to Join Western EIM Gets Approved in Part (p.13)

Analysis Group Presents NYISO Carbon Pricing Study Plan (p.23)

RTO Insider

CAISO ERCOT ISO-NE MISO NYISO PJM SPP

RTO Insider LLC
10837 Deborah Drive
Potomac, MD 20854
(301) 299-0375

2019 Annual Subscription Rates:

Plan	Price
Newsletter PDF Only	$1,450
Newsletter PDF Plus Web	$1,750

See additional details and our Subscriber Agreement at rtoinsider.com.

In this week's issue

ERO Insider

NERC Conference Ponders the Human Element to Reliability 1
Ex-Fire Chief Shares 9/11 Lessons at NERC Conference 6
Expanded MRO Winds down SPP RE Transition Period 7

FERC/Federal

TSA Defends Pipeline Security Practices Before FERC........................ 1
Reports Show Steady Advance of Gas over Coal..............................10
NEI Sees Glass Half Full for Nuclear Industry.................................11

CAISO/WECC

CAISO Board OKs Market Power Mitigation Remedy........................12
PNM's Bid to Join Western EIM OK'd in Part.................................13

ERCOT

ERCOT Generators Upset over Early March Weather Event 15
ERCOT Technical Advisory Committee Briefs 17

ISO-NE

Former Mass. DPU Chair Reflects on Service.................................19

MISO

MISO Contemplates DER Effect, Possible Rules..............................20
FERC OKs MISO Outage Scheduling Rules, DR Testing......................21

NYISO

Analysis Group Presents NYISO Carbon Pricing Study Plan 23
NYISO Management Committee Briefs......................................25

PJM

Report: 'Naive' PJM Underestimated GreenHat Risks......................... 1
Clock Ticking on Pa. Nuke Subsidy Bill Hearings.............................27
PJM Files Energy Price Formation Plan 30
Rushing Price Formation Filing Unwise, AMP Tells PJM 31

Briefs

Company Briefs...32
Federal Briefs..32
State Briefs 33

ERO INSIDER

This is a preview of ERO Insider, a new publication providing exclusive coverage of NERC and the Regional Entities that form the Electric Reliability Organization. Pricing and other details will be coming later this spring. For now, email any feedback on our coverage to EROInsider@RTOInsider.com.

NERC Conference Ponders the Human Element to Reliability

Continued from page 1

NERC Vice President and Director of Reliability Risk Management James Merlo, who served as master of ceremonies for the three-day event, co-hosted by the Department of Energy and the North American Transmission Forum (*NATF*).

The conference attracted more than 400 attendees from 180 organizations, including linemen, control room operators — and at least one utility billing analyst, who said he attended because his company uses root-cause analysis on billing errors.

NATF HP Assistance Visits

At the beginning of the conference, NERC CEO Jim Robb signed a new memorandum of understanding with NATF, whose 7,400 subject matter experts conduct peer reviews to promote "excellence and continual improvement."

Tom Galloway | © *RTO Insider*

The nearly 90 companies in NATF operate 80% of transmission of 200-kV and higher. "It's an impactful set of members," NATF CEO Tom Galloway said. "If we get the forum oriented on a topic, we can typically move the ball forward pretty well."

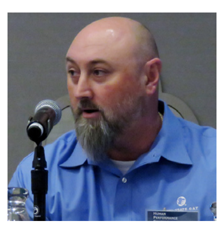
Representatives of MISO, Arizona Public Service and Tri-State Generation and Transmission Association shared their experiences with inviting NATF to visit.

John Rymer | © *RTO Insider*

MISO's John Rymer, who formerly worked in transmission substation operations for Duke Energy, said he asked NATF to help transfer human performance (HP) tools from the field to the RTO's control room. "These assistance visits really help you pinpoint where you need to concentrate your efforts," he said.

Rymer said he is looking for "low-hanging fruit" in spreading the HP message in real-time and control-room operations first. "You can move that upstream or downstream in our organization, because engineering, IT, all these groups, can utilize the same tools," he said.

Rain forced the outdoor welcome reception to the sixth floor of the parking deck at NERC headquarters in Atlanta. Some attendees showed their creativity in the design of their beer taps. | © *RTO Insider*



Sage Williams | © *RTO Insider*

Sage Williams, manager of Tri-State's Eastern maintenance region, agreed. "HP can affect not just field guys. It's your entire organization: engineering, system operations," he said.

Sharing Mistakes, Using Technology

Digger derricks — utility trucks with augers for digging holes for poles and boom-mounted hydraulic lifts for working on wires — played supporting roles in stories by several speakers who shared mistakes they made as linemen.

In a talk titled, "How strong character improves safety and reliability," former lineman

MidAmerican Energy is using 3D animations to share lessons from accidents. | © *RTO Insider*

Jeff White, now an HP consultant with *Applied Learning Science*, recounted how his truck flipped on its side when soft ground gave way underneath its outriggers while he was installing a pole on a new golf course.

After the crew used a second truck to get the

ERO INSIDER

first one back on its tires and wiped off the mud, the lead lineman told White and the other crew members not to report the incident. "'This was a nonevent. What you just witnessed, erase from your memory.'"

Jeff White | © *RTO Insider*

White initially agreed, but after a sleepless night, he told his foreman of the incident the next day, fearful that the truck might have sustained unseen damage that could result in an injury to another worker.

"What if the bolts on that turntable — half of them are broken and we can't see them? What if there's factures in that steel that we can't see? I need to speak up," White said.

In another presentation, MidAmerican Energy displayed 3D recreations of field accidents, crafted by ***3DInternet***.

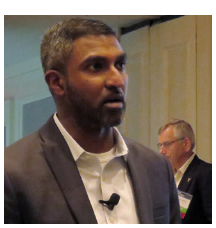
Mike Buntz, a MidAmerican line crew foreman, narrated an animation of a near tragedy that occurred while replacing a rotten utility pole. The truck became fully energized when its boom contacted an overhead wire, setting the grass around it on fire. Luckily, no one was injured.

Mike Buntz | © *RTO Insider*

"It wasn't one of my prouder moments," Buntz said. "But I agreed [to participate in the animation] hoping that I could help somebody down the road."

"One of the things that we learned about using these 3D animations is it helps us to have a better appreciation of what actions made sense at the time ... what happened and why," said Sam Reno, MidAmerican's performance improvement program manager. MidAmerican also is using GoPro cameras mounted on hardhats to produce training videos.

Sam Reno | © *RTO Insider*



Peter Jackson | © *RTO Insider*

Peter Jackson, an HP coordinator for Georgia Power, said utilities often have "brittle systems" that assume 100% error-free performance.

A conference attendee tries 3DInternet's virtual reality demonstration. | © *RTO Insider*

He demonstrated a pilot program using ***visualization technology*** that turns an iPad into a situational awareness tool that shows real-time data on substation equipment's health and other metrics.

Jackson said the tools can help utilities deal with the loss of experience as more of their aging workforce retires.

"We think that this really helps our guys build a deeper knowledge of the tasks and how to do it right," he said. "We also think there's an application potential for everything from troubleshooting to [simulations of] high-risk tasks."

Answers from the Field

Michelle Miller and former colleague Monika Bay recounted their efforts to improve worker safety at Baltimore Gas and Electric after the electrocution of a worker at a substation.

"You can have the best intervention design in the world, but if you cannot convey it in a way that connects with the head and the heart of these front-line employees you will not be successful," said Bay, who left BGE a year ago to start her own company, Safety & Operational Risk Solutions.

Bay said sustaining improvement "is by far the hardest part. This is really about line leaders keeping the language alive — keeping these concepts alive in their own workgroups."

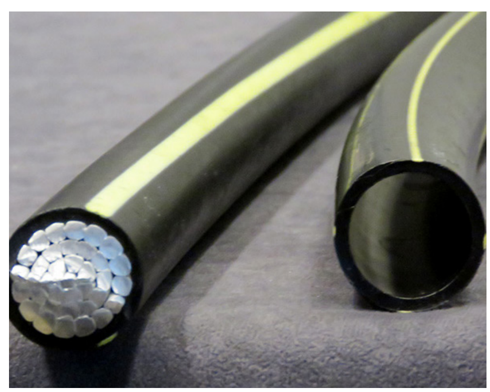
After her and Miller's work, workers in the field started bringing risks to them, Bay said.

One such issue: the potentially fatal consequences of confusing a black, yellow-striped electric line with a nearly identical black, yellow-striped, three-quarters-inch, high-pressure, plastic gas pipe.

At BGE, gas lines are supposed to be buried 2 feet below ground, with electrical lines a foot below them. In practice, however, the lines can get transposed, meaning a worker expecting to cut a gas line could end up getting electrocuted by cutting the electric cable. The only apparent difference between the two: The gas pipe has four stripes; the electric cable only three.

"It's 2 o'clock in the morning, I'm a gas mechanic, I'm 2 feet down in the hole, it's raining and muddy, and I'm going to tell the difference?" Bay said.

"It wasn't just this: We had 16 pairs of assets where the gas and electric looked very similar."



BGE field workers complained of safety dangers from the company's nearly identical gas (right) and electric lines. | © *RTO Insider*

Bay said BGE's Executive Safety Council, which included its chief operating officer, was "horrified" by the disclosures.

"System design often puts risk into the hands of the employees," she said. "Sometimes we don't know some of the risk that front-line guys are dealing with because they're just dealing with it."

ERO INSIDER

Lessons from the Airlines


Christian Vehrs | © *RTO Insider*

Christian Vehrs of Delta Air Lines described how an aircraft maintenance employee confused a fuel heater valve with a nearly identical engine anti-icing valve because of a faulty manual and his own confirmation bias.

"These manuals are 20 years old, and we're still discovering mistakes," he said.


David Marx | © *RTO Insider*

David Marx of *Outcome Engenuity* used dice to illustrate resilient systems. The more dice you roll, he said, the more redundancy — like setting multiple alarm clocks to prevent oversleeping.

The redundancy provided by multiple "dice" is essential in aeronautics, he said, because while Federal Aviation Administration rules require a 1 in 1 billion chance of failure, "nobody can design a part that will never fail."

Marx used the experience of pilot Chesley "Sully" Sullenberger, who famously landed his Airbus A320 on the Hudson River when his engines failed after striking a flock of Canada geese shortly after takeoff from LaGuardia Airport in 2009.

Airline engines are expected to fail only once in every 50,000 hours. Because planes must have two engines, the chances of both failing simultaneously should be $50{,}000^2$, or 1 in 2.5 billion, Marx noted.

In Sullenberger's case, however, LaGuardia was near a landfill that attracted birds, meaning the dice were "stuck together," Marx said. (Airport officials *increased* their bird-killing programs after the incident.)

In another example, Marx cited a woman who died in 2017 after mistakenly being given a paralytic, vecuronium, instead of the mild sedative midazolam — marketed under the brand name Versed — that had been prescribed for her during a PET scan.

Hospital procedures set four "dice," starting with an automated dispensary stocked with the drugs. A nurse mistakenly chose the wrong drug when the autocomplete function gave her options after typing the letters "V-E."

The nurse then failed to check the drug at the dispensary or later when she delivered it to the patient. Finally, the fourth die was the nurse's failure to remain with the patient to monitor her reaction to the drug.

"What should have been four dice became one," he said — the active failure of choosing the wrong drug compounded by the nurse's failure to perform the other three safeguards. The nurse is now *facing* reckless homicide charges.

Marx said the incident illustrated why many of us ignore speed-limit signs but slow down when we see a police car.

"We are not inherently rule followers; we are hazard and threat avoiders," he said. "The police officer represents consequence. The sign just represents the rule."

Lessons from the Football Field


Dave Sowers | © *RTO Insider*

Dave Sowers of *Knowledge Vine* used a *video* of the play known as the "Prayer at Jordan-Hare" — Auburn University quarterback Nick Marshall's unlikely 2013 game-winning touchdown pass over the University of Georgia — in a discussion on the role of luck.

It was 4th and 18 with 36 seconds left in the fourth quarter. Auburn Head Coach Gus Malzahn called for a pass to get the first down, which would have put the team into field goal range. And the intended receiver was wide open as a second receiver went deep, drawing triple coverage. Marshall unwisely threw the ball to the deeper receiver, but two of the Georgia defenders collided, one tipping the ball into the hands of the receiver, who ran into the end zone untouched.

Marshall was lucky in that instance, but his gunslinger judgment ultimately proved his undoing, as too many of his passes ended up intercepted. "That's why he's not playing on Sundays" in the NFL, Sowers said. Instead, he plays for the Canadian Football League's Saskatchewan Roughriders.

HP in the Control Room


Mohammad Alfayyoumi | © *RTO Insider*

Mohammed Alfayyoumi recounted the changes he made since becoming director of Dominion Energy's transmission system operations center. He spread out the workload by scheduling switching orders throughout the week rather than having them all on Mondays. He doubled the operations staff to four per shift after benchmarking Dominion's staffing against similar-sized utilities.

He also increased simulator training, began near-miss reporting and training in root-cause analysis, and eliminated work that didn't add value by automating 6,000 phone calls per week.

Operator hiring was improved by adding testing and screening, including more complex behavioral interviews.

"We invest a lot in steel and copper but not a lot in humans," Alfayyoumi said. "Operator selection is vital to human performance, because you cannot fix poor selection. If you hire the wrong operator, there's nothing you can do to make him better," he said.

Adaptive vs. Procedural Systems


Jake Mazulewicz | © *RTO Insider*

Consultant *Jake Mazulewicz* made the case for "adaptive" over "procedural" systems, recounting a conversation with an employee for an unnamed company who complained it had become excessively dependent on procedures.

"He said when an incident happens, even something small — someone cuts themselves with a knife, no stitches, very small stuff — everybody hears about it. And within two or three weeks you can bet your next paycheck that [the] safety and training [department] is going to say … 'Here's a new and updated procedure to make sure that never happens again.'

"Nobody even bothers reading the new procedures … because it doesn't matter, because it's going to change," Mazulewicz continued.

Under system-based thinking, he said, "when you see an error … you don't think who's wrong, you think that's a signal that my … system could use some improvement. … Almost every incident we're talking about is triggered by human error, but it's caused by a whole lot of other things: latent organizational weaknesses, previous decisions, things like that.

"How do you minimize errors in a system-based thinking? You improve your system. … You make it hard for people to do the wrong thing, and you make it easy for people to do the right thing." ■

ERO INSIDER

Ex-Fire Chief Shares 9/11 Lessons at NERC Conference

By Rich Heidorn Jr.

Joseph W. Pfeifer | *© RTO Insider*

ATLANTA — The ballroom at NERC's Human Performance Conference was pin-drop quiet Wednesday as Joseph W. Pfeifer, former chief of counterterrorism and emergency preparedness for the New York City Fire Department, gave an hourlong speech recounting his experience leading firefighters into the World Trade Center on Sept. 11, 2001.

Pfeifer's experience was captured in brothers Gédéon and Jules Naudet's ***documentary***, "9/11."

One of the filmmakers accompanied Pfeifer, then a battalion chief, as he and his men rushed to the World Trade Center after the North Tower was hit by the first highjacked airliner at 8:46 a.m. The film captured the chaos and confusion when the second plane hit the South Tower at 9:03 a.m., then the collapse of the South Tower at 9:59 a.m., which left the glass-walled lobby of the North Tower pitch black.

It was then that Pfeifer ordered his firefighters to abandon rescue efforts and evacuate the North Tower, he told the conference, which was co-hosted by the Department of Energy and the North American Transmission Forum.

"That sounds like a simple order when you look back in hindsight. I had no idea that the whole [South Tower] had collapsed. I thought the only people in trouble were us. But giving an order where you are pulling the rescuers out and leaving a thousand people behind is not an easy order at all. But it's using that two parts of the brain — the intuitive part and the analytical part."

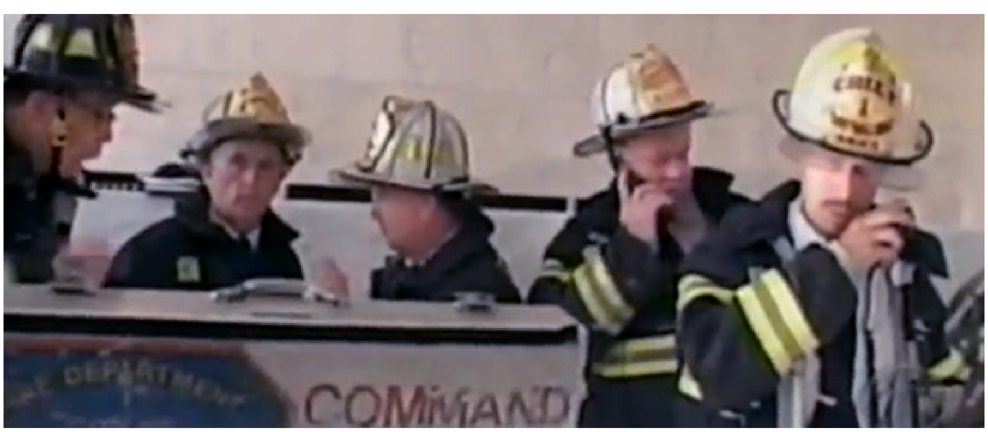
Battalion Chief Joseph W. Pfeifer at the World Trade Center on 9/11 before the collapse of the South Tower | *Jules and Gédéon Naudet*

Pfeifer was back out on the street when the second tower collapsed at 10:28 a.m., sending him and others running away.

Pfeifer said the event illustrated "organizational bias" — how firefighters, EMTs and police tend to stay in their own groups even when working together.

After the first tower collapsed, police in a helicopter circling the North Tower reported that the building's top 15 floors were "turning red" and the corner of the building was starting to buckle. "'Pull everybody back three blocks,'" Pfeifer said the copter warned, fearing the second building's collapse.

"That message never got through to the fire department, and the fire department never asked," Pfeifer said. "Here you have two great organizations — NYPD and FDNY — and they didn't talk to each other at the most critical time."



Battalion Chief Joseph W. Pfeifer (right) and other commanders at the World Trade Center command post on 9/11 | *Jules and Gédéon Naudet*

Some 71 law enforcement officers and 343 firefighters — including Pfeifer's brother — died that day, along with almost 3,000 civilians. Among those killed were the top-ranking firefighter on the scene and other command chiefs.

"We had no command staff. They were all gone. So how do you re-establish command?" Pfeifer asked.

After the second building toppled, Pfeifer recalled, his immediate boss, Deputy Assistant Chief Peter Hayden, got on top of a burned-out fire truck and gathered the surviving firefighters and reinforcements together.

"The chief said, 'I want you to take off your helmets, and we're going to have a moment of silence, because we lost a lot of people today,'" Pfeifer recalled. "And we took off our helmets.

"And then he asked us to put back on our helmets. And in the moment of putting back on the helmets, he re-established command, because there was a lot of stuff to do. There were rescues to be made, and fires to be put out. But what he did, he used what I'm calling now 'crisis empathy.' ... He listened to what we were feeling.

"We knew it was bad, and we knew we lost a lot of people, but by him being able to recognize that and then articulate it, [it] made all the difference in the world and it re-established command. So, sometimes those small gestures mean a lot more than it sounds." ■

ERO INSIDER

Expanded MRO Winds down SPP RE Transition Period

By Amanda Durish Cook

MRO board members in round table format | © *RTO Insider*

ST. PAUL, Minn. — The Midwest Reliability Organization is winding down transition activities after a year of expansion that doubled its territory and regulatory responsibility.

The organization's Board of Directors voted unanimously Thursday to approve the *dissolution* of a special oversight committee on the transition of former SPP Regional Entity members to MRO.

Silvia Parada Mitchell | © *RTO Insider*

Board Chair Silvia Parada Mitchell opened the meeting with an analogy related to weather in Minnesota's Twin Cities, which were experiencing the first warm days of spring. The board last met during the snowiest February on record for St. Paul, when 9 inches of fresh snow prevented some board members from appearing in person. She likened the weather change to MRO's recent transformation.

"For us in 2019, that's what we're seeing in MRO. We are thriving with the opportunities of last year, and we will continue to thrive," Parada Mitchell said. "I think this is a great beginning."

Parada Mitchell pointed to the "expanded and more diverse board," which now consists of 23 members after MRO leadership added both independent and regional stakeholders to represent newly joining entities.

Board members at the Thursday meeting were arranged in a new roundtable seating format to make it "more inclusive," Parada Mitchell said.

MRO's annual *report* noted the expansion "essentially doubled MRO's regional footprint and regulatory responsibilities." The merger "necessitated numerous governance and policy changes" and "provided us the opportunity to rethink MRO's structure," Parada Mitchell said.

SPP dissolved its regional entity in late August after citing a mismatch its footprint and that of the RE. MRO took most of its members, with SERC Reliability signing on the remainder. (See *SPP Closes Book on Regional Entity*.) The move provided MRO with about 100 SPP registered entities and territory in Kansas and Oklahoma, along with parts of Missouri, Arkansas, Louisiana, Texas and New Mexico.

MRO began 2018 with 102 registered entities performing 326 reliability functions and closed the year with 194 registered entities performing 556 reliability functions.

Sara Patrick | © *RTO Insider*

MRO President and CEO Sara Patrick said the organization is currently sharing its lessons learned and transition advice as SERC prepares to absorb the *dissolving* Florida Reliability Coordinating Council in early summer.

"We've been working with SERC to share our experiences," Patrick said.

MRO in 2018 managed two separate budgets: its usual, preapproved annual budget, and about $2.1 million in transition-related costs, which will be covered by a transfer of assessments from SPP RE. To handle the transition, MRO hired 12 additional staff members and remodeled its St. Paul offices. MRO originally budgeted $1.5 million for the transition.

The merger had impacts on MRO's 2018 financial performance and revenues. Last year, the organization recorded $15.6 million in operating revenue and $13.5 million in operating expenses, with about $2.7 million in operating income. Baker Tilly partner Nicki Donlon, who completed a February financial audit of 2018 expenses, called the performance a "healthy balance sheet." Expenses were in excess of MRO's original $11.7 million *budget* for 2018. Taken together, the two budgets exceeded the organization's FERC-approved budget by about 9%.

The organization also recorded about $9 million in assets and $3.7 million in liabilities. By contrast, it had $6 million in assets and roughly $3.5 million in liabilities in 2017, with $10.7 million in operating revenue and $10.8 million in operating expenses, resulting in a small loss in operating income.

MRO said this year it will focus on integrating even more new registered entities. The organization has forecasted spending about $16 million during the year.

Ron Gunderson, chair of the organization's Reliability Advisory Council, said his group this year will also focus on "near misses" in addition to the usual focus on outright reliability violations. He said the group is interested in events that almost — but not quite — rise to reliability issues.

MRO General Counsel Miggie Cramblit said the organization will also work in 2019 to make introductions to state regulators to increase awareness of its reliability role.

"There's some confusion that we are MISO instead of MRO," Cramblit said.

Staff also said they're considering hosting future workshops and conferences in more southern locations in order to accommodate new members. ■

FERC & Federal News

TSA Defends Pipeline Security Practices Before FERC

Continued from page 1

From left to right: William Evanina, director of the Office of the DNI; Charles Kosak, DOD deputy assistant secretary of defense continuity and mission assurance; Sonya Proctor, TSA assistant administrator of surface operations; AEP CEO Nick Akins; WAPA CEO Mark Gabriel; and NERC CEO Jim Robb. | © *RTO Insider*

TSA — established under the newly created Department of Homeland Security after the Sept. 11, 2001, terrorist attacks — has come under increasing scrutiny in the last year over its role in securing pipelines.

Last June, the *Houston Chronicle* published an *op-ed* by FERC Chairman Neil Chatterjee and Commissioner Richard Glick that called on Congress to move responsibility for pipeline security from TSA to "an agency that fully comprehends the nation's energy sector and has sufficient resources to address the growing cybersecurity threat to gas pipelines."

The Government Accountability Office issued a critical report in December that noted TSA's Pipeline Security Branch had only six full-time equivalent employees watching over more than 2.7 million miles of natural gas, oil and hazardous liquid pipelines.

In January, the U.S. Intelligence Community's Worldwide Threat Assessment warned that Russia and China can launch cyberattacks that cause "localized, temporary disruptive effects on critical infrastructure," such as pipelines. (See *GAO Critical of TSA Pipeline Security Efforts*.)

At a Senate Energy and Natural Resources Committee hearing on energy cybersecurity in February, some senators questioned whether Congress should give the pipeline job to a different, energy-focused agency. (See *Senators Call for Urgency on Energy Cybersecurity*.)

David Pekoske | © *RTO Insider*

The GAO report suggested TSA's pipeline role has been neglected by the agency in favor of airport security, a conclusion TSA Administrator David Pekoske did not dispute at Thursday's hearing.

One of the criticisms of the GAO report was that "the agency has a detailed allocation plan for strategically aligning resources to screen passengers at TSA-regulated airports, but not for the entire agency." Pekoske said that currently, all the agency's inspectors, including those designated for surface transportation, are on the staffs of the 440 airports under TSA jurisdiction. "But we're going to make a change to that," he said.

Pipeline is one of the six modes of transportation under TSA's jurisdiction, along with Aviation, Freight Rail, Highway & Motor Carrier, Postal & Shipping, and Mass Transit, according to the agency's *Cybersecurity Roadmap*.

Pekoske also said he was consolidating the agency's multiple "policy shops" into one, "I think there is a lot to be learned from security in other sectors that apply across the board, so all of our policy is going into one place." He said he is also establishing regional offices co-located with the Federal Emergency Management Agency in New York City, Atlanta, Chicago, Dallas and Seattle.

"We already have a [regional presence] in place right now; it's primarily purposed to support our aviation security mission," he said. "I'm repurposing that ... to advance the surface transportation security mission and also advance our contingency and planning response capability."

Another criticism of the GAO report was that TSA lacked a strategic workforce plan to identify the skills required of its employees, such as cybersecurity expertise. Pekoske said the agency was "working very hard on" investing in staff with cybersecurity expertise. It currently relies on DHS' Cybersecurity and Infrastructure Security Agency, "but it's my desire to have specific, industry-related cybersecurity expertise within TSA," he said.

"We believe TSA has both the tools and the authority to address any threats within the pipeline industry," said Sonya Proctor, the agency's assistant administrator of surface operations. "As a result of the realignment of resources that the administrator has undertaken, we're going to be able to increase the number of personnel focused on pipeline security, which means we will have a presence in the pipeline community on a very regular basis."

Though TSA has the authority to issue mandatory standards, its voluntary *Pipeline Security Guidelines* "provide us the flexibility to address threats outside of the time-consuming regulatory process, which could conceivably take months or even years to go through," Proctor said. She also noted that as administrator, Pekoske has the authority to issue mandatory directives to pipeline companies in the event of an emergency or serious threat.

Pekoske urged those listening to visit the agency's website and view its *2018-2026 Strategy* and *Administrator's Intent*. Neither of these documents, however, specifically mentions pipelines.

Neither Pekoske nor Proctor mentioned current staffing levels, or how many people would be added.

Questions of Standards

TSA published the documents Pekoske mentioned shortly before the Chatterjee-Glick op-ed. Chatterjee has backed off somewhat on the recommendation that pipeline security be

FERC & Federal News

reassigned, telling senators and the National Association of Regulatory Utility Commissioners that he had been impressed by Pekoske's and the industry's efforts since the article's publication.

"TSA and industry should have an opportunity to better address cybersecurity concerns on a voluntary basis before anyone imposes mandatory cybersecurity standards for gas pipelines," he said Thursday.

Glick pressed Proctor about how the agency prioritizes its pipeline oversight. According to the GAO report, TSA takes the top 100 critical pipeline systems, ranked by the volume of fuel transported a year, and re-ranks them through a risk assessment that calculates threat, vulnerability and consequences to determine their priority in getting reviewed.

"Putting aside the 100, what do you do with regard to the rest of the pipeline system around the country, including the distribution pipelines?" Glick asked.

Proctor said that the agency isn't limited to the top 100 when it conducts its reviews, "but clearly we're looking at risk, and we're looking at the resources we have to apply to that risk so that is where our focus is first." She said the agency will have the capability to review more than the top 100 with Pekoske's resource realignment.

The GAO report said that operators of at least 34 of the top 100 had identified no critical facilities, speculating that this was because TSA's guidelines lack a clear definition of the criteria to determine facilities' criticality. Glick asked Proctor if the agency only did reviews of pipelines that had identified critical facilities.

"That is the language in the Pipeline Security Guidelines, and that's something we continue to discuss with the pipeline systems, so that's an area we continue to work with," Proctor responded.

Glick also asked Don Santa, CEO of the Interstate Natural Gas Association of America (INGAA), why the industry doesn't support mandatory standards.

"INGAA thinks the current collaborative model with the Transportation Security Administration works well, and in fact it is improving," Santa replied. "We think that, as Assistant Administrator Proctor described, it enables us to be more agile and reacting quickly to things than if we were in a mandatory situation. ...

"Let's focus on improving [TSA's work], making it better [and] getting it to be what it can be, rather than on changing the model," he concluded.

NERC CEO Jim Robb was noncommittal over whether there should be mandatory pipeline standards.

"The gas system and the electric system are so intertwined right now from a reliability perspective that the gas system has to have at least equivalent secure reliability to serve its needs as the electric system that's built on top of it," he said in response to a question from Glick. "So, whether it's through a mandatory standards regime or some other regime than what TSA is doing today or just through the work that TSA is doing, I don't really care so much about that. What I do care about is making sure that the gas is there when we need it." ■

FERC & Federal News

Reports Show Steady Advance of Gas over Coal

By Robert Mullin

Gas-fired generation continues to rapidly gain market share at the expense of coal, a trend likely to accelerate this year and into the near future, according to two reports released last week.

A U.S. Energy Information Administration *report* released March 25 showed the power sector pushed U.S. natural gas consumption to record levels last year as gas-fired generators continued to steadily displace coal plants.

Gas consumption surged by 10% in 2018, rising across all economic sectors but boosted largely by a 3.8-Bcfd increase in uptake by power generators, EIA found. Gas-fired capacity additions of 14.5 GW and weather-related factors drove the increase.

The power sector consumed 29 Bcf of gas per day last year, 35% of domestic consumption. The sector set an all-time consumption record of 39.9 Bcfd in July, hitting its second-highest level of 38.6 Bcfd in August.

Gas-fired plants accounted for 35% of all generator output during the year, followed by coal (27%), nuclear (19%) and hydro (7%). Renewables accounted for 6.5%, according to another EIA report issued the previous week. (See *Report: U.S. Renewable Generation Doubled Since 2008*.) Nearly 13 GW of coal generation were retired in 2018, EIA said. Gas first supplanted coal as the sector's leading fuel source in 2016.

While EIA forecasts that coal's share of power output will slip below 25% this year, a *report* released March 26 by the Institute for Energy Economics and Financial Analysis (IEEFA) contends that outlook "could even be understating the decline."

"We expect the erosion of the utility market for coal to accelerate through 2019 and into the coming decade due to a combination of factors that have fundamentally changed the domestic electricity generation sector, the prime market for the U.S. coal industry," said IEEFA, which describes its mission as accelerating "the transition to a diverse, sustainable and profitable energy economy."

Chief among those factors: price drops for natural gas and renewables; the aging of the utility coal fleet and a growing utility sector interest in retiring the plants; increased corporate interest in greener resources; and growing concerns about CO2 emissions and climate risk.

IEEFA noted that total U.S. coal consumption dropped 4% last year to 688 million tons (MT), falling below the 700-MT level for the first time in 40 years. The report showed that, based on EIA statistics, the electricity sector accounted for 93% of the country's demand for coal from 2007 to 2018.

While EIA projects that utility-sector coal consumption could drop to 563.9 MT this year, IEEFA thinks the level "could even fall more given the amount of coal-fired capacity retired last year, coupled with expectations of more closures going forward."

IEEFA says 2019 "is already shaping up to be another important year for coal plant retirements, with almost 10 GW of planned closures announced through the end of February." The group acknowledges that a year ago, it sharply underestimated this year's closures, projecting just 4 GW in retirements.

"That figure has shot upward over the past year and now is nearing 10 GW, which would put it on pace to be the third-highest total for coal plant retirements ever," IEEFA wrote. "And more announcements could be on the way, as the sector's worsening economics continue to force utility decision-makers to move ahead with closures."

The institute noted that Georgia Power has recently asked state regulators to approve immediate closure of a combined 982.5 MW of coal-fired capacity at its Hammond and McIntosh plants, while Alabama Power plans to shutter its 1,062-MW Gorgas plant in this month.

The IEEFA report also points to the decline in performance for coal plants relative to natural gas. Coal plant capacity factors, about 70% in 2009, has held at about 54% over the past four years.

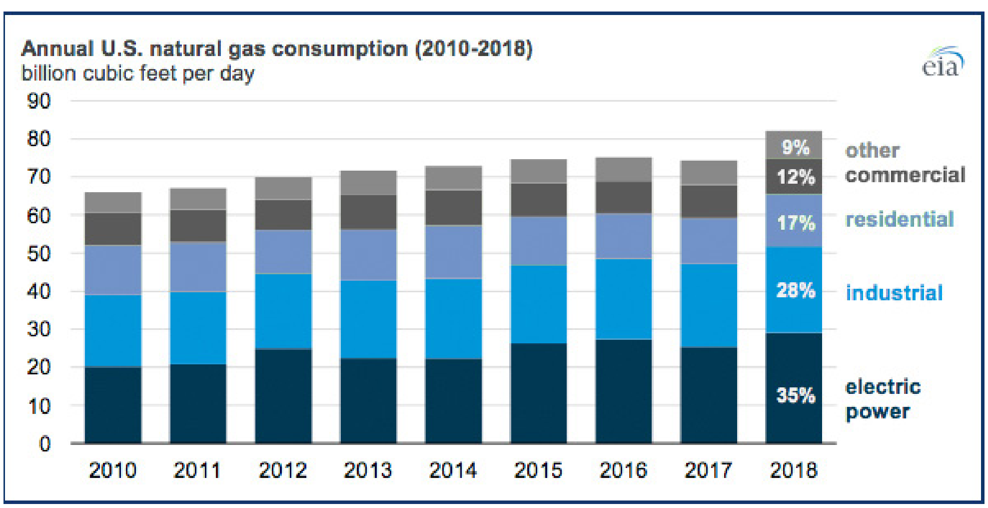
"It is important to point out here that this decline has occurred even as 75 GW of coal-fired capacity were closed from 2011 to 2018, much of it older and operated only occasionally. All else being equal, those retirements should have improved the average coal-fleet capacity factor, but that proved not to be the case," the report said.

In contrast, average capacity factors for combined cycle generators have risen from 39.8% in 2009 to 57.6% last year.

The group's report also points out that, for the first time last year, the capacity of natural gas combined cycle plants exceeded that of coal, 263 GW to 243 GW, "with the two sectors trending in opposite directions."

That trend in buildouts "has fundamentally changed market operations in the utility sector to coal's lasting detriment," IEEFA said.

The industry has made it clear, with the support of President Trump and Energy Secretary Rick Perry, that it will not go down without a fight. On Wednesday, coal trade group ACCCE (which no longer spells out the unrealized potential of its original name, American Coalition for Clean Coal Electricity) released its latest *white paper* making the case for coal's "fuel security" and "fuel diversity" value. ■



The power sector led the boost in U.S. natural gas consumption to record levels in 2018. | *U.S. Energy Information Administration*

FERC & Federal News

NEI Sees Glass Half Full for Nuclear Industry

By Rich Heidorn Jr.

Maria Korsnick | *NEI*

Despite record-high capacity factors and reduced operating costs, the U.S. nuclear power industry is threatened by federal and state policies and an "increasingly distorted" energy market, Nuclear Energy Institute CEO Maria Korsnick said last week in her annual state of the industry *address*.

Vogtle nuclear plant construction | *Georgia Power*

"Our capacity factor and generation has never been higher, and our operation costs have not been this low since 2004," said Korsnick, citing the 2018 capacity factor of 92% and a 25% drop in "average total generating costs" since 2012. Nuclear power produced 20% of the nation's electricity in 2018 and more than 55% of emissions-free power, she added.

But Korsnick said nuclear's role in limiting carbon emissions is at risk from both RTO energy markets that fail to compensate them fairly and renewable portfolio standards in more than half of the states that limit their carbon-free technologies to wind and solar. "They ignore nuclear, and that's shortsighted," she said.

'Not a Bailout'

She noted that the Nature Conservancy and the Union of Concerned Scientists have become *more supportive* of nuclear power, calling it a recognition of nuclear's role as the "workhorse" of emission-free generation.

"I think it's a realization that this idea of 100% renewables is not gonna happen," she said in a Q&A session with NEI's senior director of external communications, Monica Trauzzi. (Although Trauzzi asked some questions from viewers, Korsnick did not take questions from the media.)

Korsnick praised state officials in Illinois, New York, New Jersey and Connecticut, who have authorized new revenue streams to keep their nuclear plants operating, while noting that 12 plants nationwide are planning early retirements. (See related story, *Clock Ticking on Pa. Nuke Subsidy Bill Hearings*.)

"Saving nuclear plants is not a bailout. It is not a subsidy. It's helping to right wrongs in an increasingly distorted energy market," she said.

Korsnick said the industry also is at risk of losing its competitiveness internationally, saying two-thirds of the reactors being built around the world are from China or Russia. She called on Congress to reauthorize the Export-Import Bank and restore its *quorum* to ensure the financing needed to compete internationally.

Bright Times Ahead?

Korsnick was nevertheless optimistic about the future, saying 2020 could see the Nuclear Regulatory Commission approve its first application to renew a plant license for a second time; it would add a second 20-year extension, for a total of 80 years. Next year also could see NRC certification of NuScale's *design* for a small modular reactor.

NEI has high hopes for bipartisan legislation *introduced* last week to create public-private partnerships to develop, test and deploy new nuclear technologies. It follows President Trump's signing in January of the *Nuclear Energy Innovation and Modernization Act*, which seeks to accelerate the development of new reactor designs.

Korsnick said she was hopeful NRC's *Transformation Initiative* would result in "off ramps" that allow the commission to terminate proceedings involving issues of "low-safety significance."

The Electric Power Research Institute "came out with a *report* recently and mentioned that the current designs … are over 100 times safer than the original safety goals that the NRC set many years ago. … The industry is mature," she said. "Let's come up with ways — we're calling it off ramps — so that we're not spending an inordinate amount of time … churning on an issue that quite frankly just has low safety significance."

Korsnick's speech came the day before the 40th anniversary of the partial meltdown at Three Mile Island, which ended the expansion of nuclear power in the U.S. for decades.

Vogtle Milestone

Korsnick celebrated progress on Georgia Power's Vogtle plant, which reached a milestone March 22 with the installation of the containment cap on Unit 3. Vogtle will be the first new U.S. nuclear plant built in three decades.

She did not mention the delays and massive cost overruns that have plagued Vogtle, and which led to the cancellation of a nuclear project in South Carolina. She said only that "massive infrastructure projects are always messy. They don't always go as planned."

In 2008, Georgia Power estimated that Vogtle Units 3 and 4 would cost $14.3 billion and begin commercial operations in 2016 and 2017, respectively. The most recent estimates put the total cost at about $28 billion and the completion dates in November 2021 and November 2022, *according* to Taxpayers for Common Sense.

The Department of Energy last month approved an additional $3.7 billion in loan guarantees for the project, bringing total taxpayer liabilities to more than $12 billion, the taxpayers group said. ■

CAISO/WECC News

CAISO Board OKs Market Power Mitigation Remedy

Governors also Approve Transmission Plan, RMR/CPM Changes

By Hudson Sangree

FOLSOM, Calif. — CAISO's Board of Governors on Wednesday unanimously approved a proposal meant to address concerns that the ISO's market power mitigation rules disincentivize Pacific Northwest hydroelectric resources from participating in the Western Energy Imbalance Market.

The concerns arose shortly after Canada-based Powerex joined the EIM last April as the market's first non-U.S. member. The company, responsible for marketing the ample surplus generation produced by BC Hydro, quickly determined that transmission constraints at the U.S.-Canada border were frequently triggering CAISO's local market power mitigation (LMPM) processes in the EIM, which requires use of default energy bids (DEBs) to settle transactions. (See *Troubled Waters for Powerex in EIM*.)

Powerex found that the inflexibility of the formulas underpinning the DEBs left its market operations out of the money by forcing it to sell power into low-priced, oversupplied markets, when in fact it was attempting to buy on the cheap for later arbitrage. Other operators of the region's fast-ramping hydroelectric resources noted the rules posed a similar risk for them.

"This issue is particularly acute in the Western Energy Imbalance Market because of the Northwest's numerous hydro resources that have opportunity costs for energy sales because of their water limitations. Suppliers operating these resources may have disincentives to offer these needed flexible hydro resources to the EIM if they cannot reflect their costs," CAISO Vice President Keith Casey wrote in his *memo* to the board regarding the proposal.

In response, the ISO proposed a set of market changes designed to prevent the LMPM process from resulting in the dispatch of resources at prices below their costs.

The plan, which still must be approved FERC, would create a standard DEB for hydropower resources. The measure is needed, Casey wrote, because CAISO's "market power mitigation process reduces a market participant's submitted energy bid to a resource's default energy bid, calculated by the ISO, in the event it detects market power. Default energy bids are intended to reflect a resource's actual marginal costs of energy."

From left to right: CAISO governors David Olsen, Ashutosh Bhagwat and Severin Borenstein; CEO Steve Berberich; and other staff members. | © *RTO Insider*

The new option for DEBs is "specifically designed for hydro resources that better estimates these resources' actual costs, which typically consist of opportunity costs reflecting their limited water availability," Casey said in the memo.

Severin Borenstein, the newest board member appointed by California Gov. Gavin Newsom in January, indicated he wasn't entirely comfortable with the proposal, but he voted for it nonetheless.

"I'm still trying to wrap my head around the economics of this," said Borenstein, an MIT-trained economist and faculty director of the Energy Institute at the University of California, Berkeley's Haas School of Business. "Cleary the hydro producers in the Northwest care about this" because they are getting value from the market and want it to operate in a way that's more favorable to them, he said.

In other matters:

- The board unanimously elected David Olsen to another one-year term as its chair and named Angelina Galiteva as vice chair.
- Over objections from Pacific Gas and Electric and Southern California Edison, the board approved *a plan* to expand the EIM's scope of authority on changes to real-time market rules when the primary driver of the changes is the EIM.
- The board approved CAISO's 2018/19 *transmission plan*, with several major changes over last year's plan. The plan, intended to ensure grid reliability, identified 13 new transmission projects at a projected cost of $644 million, all within PG&E's service territory. It also recommended canceling six transmission projects in PG&E's territory that planners concluded were no longer needed, eliminating $440 million to $550 million in future costs.

RMR/CPM Updates

The board approved a plan to improve CAISO's *reliability-must-run* (RMR) and Capacity Procurement Mechanism (CPM) programs, which let the ISO procure energy and keep generators online that might otherwise be retired. Of particular concern are the state's gas-fired plants that are essential for meeting peak demand but are under financial strain from the falling costs of solar and wind power.

The newly approved plan is intended to simplify and clarify the RMR process in accord with current market conditions and to compensate generators for keeping plants online.

Some stakeholders and board members expressed concerns that generators might propose retiring or mothballing plants to game the market. CAISO planners said they believed a new provision, requiring generators to submit an affidavit explaining their reasoning and intentions for retiring resources, would help mitigate those risks. ■

CAISO/WECC News

PNM's Bid to Join Western EIM OK'd in Part

Regulators Deny Utility's Request to Find Costs Reasonable in Advance

By Hudson Sangree

In a case that's grown increasingly convoluted, state regulators last week granted two of the approvals Public Service Company of New Mexico (PNM) had requested to join CAISO's Western Energy Imbalance Market, but they denied one concession the utility deemed key (18-00261-UT).

The New Mexico Public Regulation Commission found that PNM had complied with state filing requirements and authorized the utility to create a regulatory asset that would allow it to seek cost recovery in a future rate case.

The commission had *approved* the same two requests for joining the EIM in December, but it *vacated* the order in February and reconsidered the matter, to the surprise of PNM and environmental groups that supported the move.

In its *latest order*, issued Wednesday, the PRC balked at a third request by New Mexico's largest utility to "find that it is reasonable to join the EIM and expend necessary funds to do so." The commission decided PNM was asking it to approve the costs to join the market in advance, without proof of a net public benefit.

PNM estimated it would incur about $29 million in capital costs and expenses, including for 19 new staff positions and computer systems.

"No party objects to the most obvious interpretation [of the reasonableness request], i.e. that PNM seeks approval to join the EIM. But PNM states that it is not seeking commission approval to join the EIM," Hearing Examiner Ashley Schannauer wrote in her *recommended decision*, which the PRC's five commissioners unanimously adopted.

PNM contended it didn't need the PRC's approval to join the EIM because it wasn't necessary for the provision of adequate service, nor was it required by any commission rule or regulatory mandate.

What the utility wanted, Schannauer wrote, amounted to a guarantee that it would get reimbursement of its expenses plus a return on its investment in the form of profits. The hearing examiner concluded PNM was trying to shift the financial risk of joining the EIM from its shareholders to ratepayers.

Public Service Company of New Mexico has sought to join the Western EIM partly because it facilitates trade in renewable power across the West. | *PNM*

"PNM asks that it be allowed to recover its costs as long as they are consistent with the estimates provided in this case and as long as the specific costs it incurs are reasonable," Schannauer wrote. "Ratepayers would be required to pay all of those costs whether the EIM actually produces savings or not."

The commission agreed with Schannauer that it lacked legal authority to approve "ratemaking treatment in advance of a rate case." Regulators in other states hadn't granted their utilities such preferential treatment for joining the EIM, the PRC noted. In a 2014 *filing* with Oregon regulators, PacifiCorp, the EIM's first member, asked to defer until a future general rate case the recovery of $20 million in start-up costs required to bring its six-state system into the market.

PNM issued a statement saying it was "profoundly disappointed" that the PRC hadn't clearly acknowledged the prudency of joining the EIM.

"Membership in the EIM has resulted in cost savings exceeding a half billion dollars for utility companies' customers since 2014," PNM said. "In New Mexico, that would produce savings conservatively projected at $10 million annually for PNM customers, increasing to over $20 million annually in the next decade."

Convoluted Case

The case has taken a series of unexpected turns since PNM *declared* its intent to join the EIM last August. (See *PNM Seeks to Join Energy Imbalance Market*.) Initially it seemed as if the utility were merely looking for a nod of approval from regulators, along with a mechanism for eventually recovering its upfront costs.

The EIM is entirely voluntary and largely noncontroversial. Proponents have credited the intra-hour, interstate market with increasing the exchange of electricity among Western states, especially power generated from wind and solar resources, and with *saving its participants* nearly $565 million in the past five years.

On Dec. 19, the commission approved PNM's application to join the EIM and said the utility's next general rate case would bear the burden of showing its costs were reasonable and consistent with the estimates presented to the

CAISO/WECC News

PRC. (See *New Mexico Regulators Say PNM Can Join EIM*.)

In that decision, the PRC acknowledged staff's recommendation "that the commission make clear that approval to create the regulatory asset is not a guarantee that the actual costs will be found to be reasonable or prudent. Staff notes that PNM will have the opportunity to support the reasonableness of those costs during its next general rate case and further notes that PNM has acknowledged that the commission will retain final ratemaking review and authority over costs in PNM's next rate case."

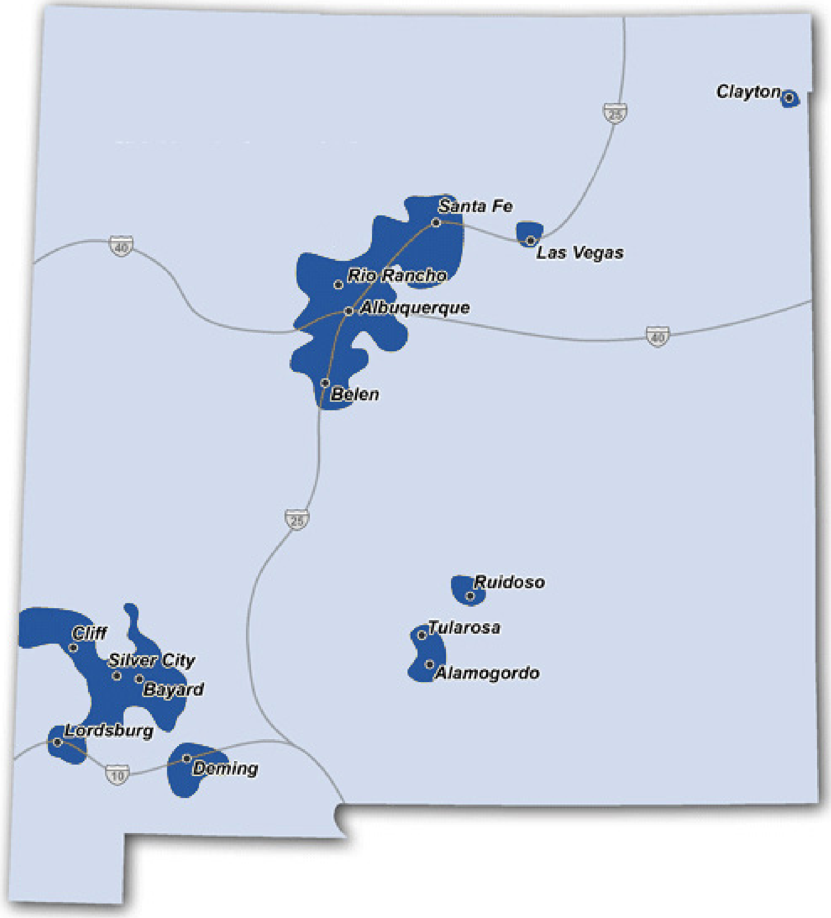
Then, in mid-January, the Albuquerque Bernalillo County Water Utility Authority, which had opposed the creation of a regulatory asset all along, asked the PRC to reconsider its December order. The commission granted that request Feb. 6 after two new commissioners were sworn in. The news had worried EIM backers that it could delay PNM's membership in the market for another year and cost ratepayers $10 million in projected annual benefits. (See *State Regulators to Re-examine PNM's EIM Membership*.)

Latest Order

The PRC dealt with the matter on an expedited schedule to meet the April 1 deadline.

In its Wednesday order, the PRC said it "does not oppose" PNM joining the EIM, and it gave PNM authority, in the form of an accounting order, to create a regulatory asset to record its expenses and to seek compensation.

However, the commission said the utility's EIM-related costs and the reasonableness of its expenditures should be decided in the future rate case.



PNM serves more than 500,000 customers across New Mexico. | *PNM*

"Preapproval of reasonableness at this juncture in the case would be premature, given that a future determination ultimately must be made that such costs are proven to be reasonable or unreasonable," the commission said.

It ordered PNM to file annual reports of its EIM costs and savings and CAISO's quarterly reports on EIM benefits.

PNM did not say if still intended to move forward with joining the EIM in 2021. (See *New Mexico Moves Toward Clean Energy, EIM Participation*.) "We will not have any further comment until we have time to fully review and evaluate the final order," the utility said in an email. ■

ERCOT News

ERCOT Generators Upset over Early March Weather Event

By Tom Kleckner

ERCOT market participants last week grilled staff over the grid operator's requests to delay generation outages in advance of an early March cold-weather event that led to a new monthly peak but ultimately did not require emergency actions.

Members rained their concerns on Dan Woodfin, ERCOT's senior director of system operations, for more than two hours at the Technical Advisory Committee's March 27 meeting. They contended the grid operator didn't give the market a chance to work and that it had an insight into the market not shared with its participants.

When it was over, TAC Chair Bob Helton teased Woodfin to be careful drinking water "because of all the holes punched in you."

Cold Weather, High Loads

In late February, weather forecasters projected an arctic cold front to cover much of Texas during the first week of March. ERCOT's earliest assessments indicated peak loads of more than 58 GW, "substantially higher" than is typical for early March.

Complicating matters was the more than 7.7 GW of capacity scheduled to begin maintenance outages on March 1 and 2, in addition to more than 12 GW of outages already underway. Meanwhile wind forecasts from ERCOT vendors indicated the grid operator could face low wind output during peak times through March 5.

ERCOT issued an operating condition notice (OCN) just after noon on Feb. 27, warning of a "potential cold weather system" affecting its footprint March 3-7. Staff said they followed up by asking the generators' qualified scheduling entities to review their fuel supplies and urging them to delay maintenance or return from outages early. ERCOT said it asked about 6 GW of outages to be delayed, but by the following afternoon, only one unit had delayed its outage.

"Normally, when we issue an OCN of this type, we see a lot of response from the pertinent units," Woodfin said. "It's not a matter of OCNs causing us to do things; it's a matter of OCNs causing the market to respond. The idea is to look at your outages … it should cause people to sit up and look closer, and delay the outage because things look tight."

On Feb. 28, ERCOT projected it had 58 GW of capacity available, which included 2 GW of wind and load resources. However, expected gas curtailments and forced outages led to what ERCOT called a "more reasonable scenario" of a 5.5-GW shortage and a "potential for more extreme conditions" — considering a projected 60-GW peak and a need for 3.5 GW of reserves.

But when ERCOT posted market information at 8 a.m. on Feb. 28, it indicated a surplus of 3.4 GW, boosted by 7 GW of wind energy. Later that day, ERCOT switched to a second vendor's more conservative forecast of wind production.

	MW	
	Posted at 2/28 08:00	ERCOT Assessment 2/28 8:00
Load Forecast	58600	60000
Regulation Up + RRS	3190	3500
Non-Spin	1831	0
Total Needs	63621	63500
Conventional Generation Available	59000	59000
Wind Forecast	7000	1000
Load Resources	1000	1000
DC Tie Imports	0	0
Gas Curtailments		-1000
Other Forced Outages		-2000
Total Available	67000	58000
Surplus/Shortage	3379	-5500

ERCOT assessments on Feb. 28 for a March 5 peak | *ERCOT*

'Voluntary' or not?

Generator representatives objected to ERCOT's descriptions of the event. Calpine's Brandon Whittle noted ERCOT used the terms "ask" and "voluntary" in reviewing the event, but said it was "not the case for my shop."

Calpine's Brandon Whittle (left) and Luminant's Ian Haley

The OCN "was just a notice. We get many of those during the year," he said. "[ERCOT said,] 'We issued an OCN, no one did this, now you have to respond.' Ultimately, this is an issue for operators and generators to determine when it is to their economic advantage to start a plant or do whatever they need to do."

"When we issued the OCN, our expectation was people on their own would respond to it," Woodfin replied.

"The language I heard over and over that afternoon and the next morning, in discussions with ERCOT staff and management, was that because no one responded to the OCN, you have to do this," said Whittle, using "strong

ERCOT News

arm" to describe the underlying message he received from staff. "Part of the instruction to generators was if you don't move your outage, we'll cancel it, or you will have it forced."

When Woodfin explained ERCOT was requesting outage delays so generators could maintain their place in the schedule, Whittle responded, "Is that not a threat in some way?"

"We were trying to help them," said Woodfin, who observed communications between ERCOT operators and market participants. "All those communications were very cordial. There was no animosity."

Eventually, more than 6.5 GW of generation originally scheduled to begin planned outages was available through the cold spell.

Potomac Economics' Beth Garza, director of ERCOT's Independent Market Monitor, said that while she was supportive of the grid operator's description of events, it also reminded her of the "*offer he couldn't refuse*" line from "The Godfather."

"'Either your brains or your signature will be on the contract.' Either your outage will be moved, or it will be withdrawn," she said. "That's what it sounds like right now. That's not a good situation."

Reliant Energy Retail Services' Bill Barnes

"No doubt ERCOT was doing what they think they needed to do to maintain the reliability of the system," Reliant Energy Retail Services' Bill Barnes said. "We would certainly have a different view when ERCOT declares an OCN and there would be some expectation to take action. The OCN, to us, is information that is interesting, but the No. 1 thing that will drive our behavior is what the prices are doing.

"If the prices are high enough, that would encourage us to change our outage schedule around. I don't think ERCOT should have that expectation that people are going to start taking all this action unless the market sends the price signal to do so," he said.

ERCOT "complained of a lack of voluntary outage deferrals after it issued the OCN, but based on the forecasts … there was no reason for the market to expect an extreme situation," Whittle told *RTO Insider* on Monday. "Without an expectation of scarcity, the forward prices for the cold snap were not high enough to incent generators to defer outages on their own."

The generators also complained about a lack of transparency in ERCOT's development of planning scenarios for March 3-7 and what they saw as a delay in issuing the OCN.

"We want to wait as long as possible to let the market respond on its own," Woodfin said. "On the 27th, we realized no one was adjusting and we see this [cold weather] coming. Hello? That was what the OCN was for."

"Issuing the OCN earlier would have prompted more response," South Texas Electric Cooperative's Clif Lange said.

Lack of Transparency?

"Why didn't market prices reflect what was going on?" Barnes asked. "[There was] a lack of transparency in some of the information [provided]. There were also likely expectations that ERCOT would intervene with reliability actions. That should be the focus of what we try to address. There should be confidence in the market."

"We try to let the market respond, and hopefully, it will, so we don't have to take command-and-control actions," Woodfin said.

ERCOT set a new monthly record for demand on March 5 at 60.7 GW, breaking a mark set in 2014. The grid operator wound up with 66.5 GW of capacity to work with, and it canceled the OCN at noon on March 6.

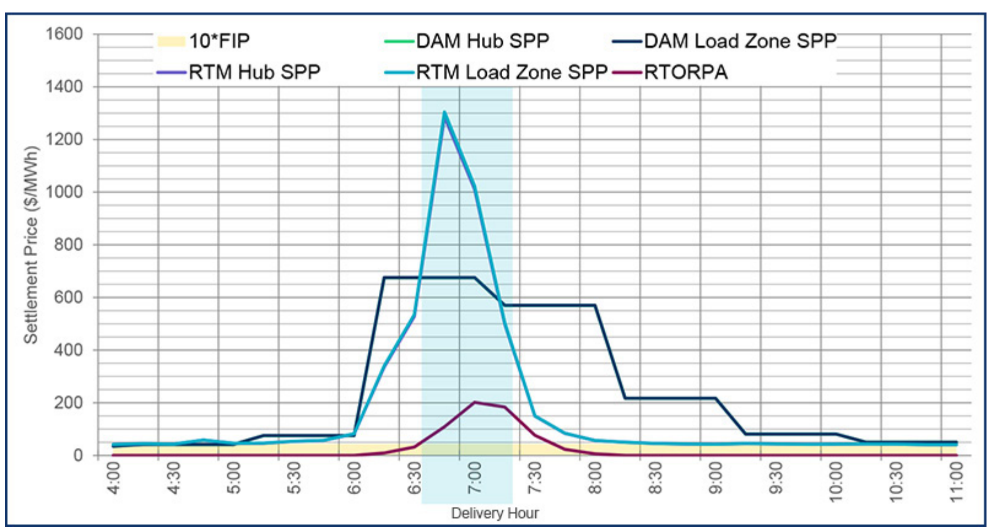
Prices briefly eclipsed $1,300/MWh in the real-time market and approached $800/MWh in the day-ahead market during the morning hours. There were also periods of lower operating reserve demand curve (ORDC) reserves and higher ORDC price adders during the same period.

Asked whether ERCOT believed it had completed all reasonable options before issuing the initial OCN, COO Cheryl Mele responded, "We've heard that message."

"We're already talking about the ways we can ensure we're portraying to the market all the things we are looking at," she said. "The root of the problem is we didn't do a good job of selecting the forecast early enough that would be what we thought was going to be the most likely outcome."

ERCOT staff will review its existing Protocols governing the use of OCNs and other market notifications, and it has already begun discussing improvements to its communications processes. Separately, Helton said he would work with TAC Vice Chair Diana Coleman to assemble a group to review how ERCOT distributes planning information data, its definitions or levels of emergencies in the planning horizon, and the timing of market notifications.

Texas Public Utility Commission Chair DeAnn Walker was among the interested observers during the two-hour discussion. Walker did not join in the discussions, but the PUC has opened a docket (Project *49378*) to review ERCOT's "outage scheduling processes" and has placed it on the agenda for its April 4 open meeting. ■



Pricing outcomes for March 5 | *ERCOT*

ERCOT News

ERCOT Technical Advisory Committee Briefs

Reduction in Peaker Net Margin Threshold Tabled

The ERCOT Technical Advisory Committee last week tabled a request to lower the grid operator's peaker net margin (PNM) threshold pending further direction from the Public Utility Commission of Texas, which is debating the threshold's continued existence.

The PNM threshold is used to determine the point at which ERCOT's systemwide offer cap is reset from the high limit of $9,000/MWh to the low cap (the greater of $2,000/MWh or 50 times the daily effective fuel index price).

The ERCOT Protocols require the PNM threshold be set at three times the cost of new entry (CONE) for a power plant, historically a combustion turbine. The threshold has been $315,000/MW-year in recent years, but a Brattle Group report in December identified the latest CONE for a CT to be at $88,500/MW-year.

ERCOT has proposed the PNM threshold be reduced to $265,500/MW-year, which is three times the recently determined CONE.

"We're taking something that came out of an academic exercise. This needs more vetting," Reliant Energy Retail Services' Bill Barnes said.

"Several of us have commented at the commission," said Direct Energy's Sandy Morris, representing the Independent Retail Electric Providers segment. "You might have a resolution from the commission. If we don't hear from the commission, then we can proceed with what we hear here. That's fine with me. … I want to see a lower CONE."

ERCOT's Dan Woodfin addresses the TAC at its March 27 meeting.

RTC Task Force to Begin Work April 4

The TAC endorsed the creation of a task force to establish market rules for implementing real-time co-optimization (RTC), which PUCT Chair DeAnn Walker hopes will bring "economic benefits that exceed its costs" and "operational benefits for ERCOT as well." The PUC has directed ERCOT to proceed with RTC's implementation (Project *48540*).

The Real-Time Co-optimization Task Force (RTCTF) will be led by ERCOT Compliance Director Matt Mereness and Bryan Sams, director of regulatory affairs for Lone Star Transmission. Mereness will serve as either chair or co-chair alongside Sams, depending on the task force's determination.

"It's an honor to do this. It's a big deal," said Mereness, who promised up to three meetings a month. ERCOT has said it will take four or five years and about $40 million to implement RTC.

The RTCTF will report directly to the TAC and comprise stakeholders and staff from ERCOT, the PUC, the Independent Market Monitor and Office of Public Utility Counsel. It will hold its first *meeting* April 4.

ERCOT staff have said RTC will efficiently coordinate the provision of energy and ancillary services (AS) in the real-time market and price AS shortages according to their defined demand curves.

ERCOT Gathering Input for Storage Workshop

ERCOT staff briefly reviewed a *list of issues* to be discussed during an April 23 *workshop* on energy storage. Staff are still gathering input on the workshop, which will also include a brief overview of an April 25 *workshop* on inverter-based resources.

The PUC opened a rulemaking on energy storage ownership (Project *48023*) following last year's rejection of AEP Texas' request to connect two West Texas battery storage facilities to the ERCOT grid. Transmission and

ERCOT News

distribution providers have squared off against generators over the devices' ownership. (See "Commission Welcomes Legislative Input on Energy Storage," *Texas PUC Briefs: Jan. 17, 2019*.)

TAC Approves RMS Leadership, 15 Revision Requests

The TAC approved American Electric Power's Jim Lee as chair and Just Energy's Eric Blakey as vice chair of the Retail Market Subcommittee, which serves as a forum for resolving retail market issues directly affecting ERCOT and its Protocols. Lee and Blakey are exchanging the positions they held through much of 2018, maintaining the RMS' unofficial practice of having a utility representative and a retail electric provider representative share the leadership positions.

The committee also endorsed 11 Nodal Protocol revision requests (NPRRs), two changes to the Retail Market Guide (RMGRRs), one to the Resource Registration Glossary (RRGRR) and one system change request (SCR):

- *NPRR891*: Removes the 50-kW threshold for non-opt-in entities to report unregistered distributed generation to ERCOT for its unregistered DG report.
- *NPRR900*: Addresses inconsistencies in the current Nodal Protocol language that don't align with current processes, PUC rules and system design.
- *NPRR906*: Streamlines the Protocol language and removes ambiguity over how ERCOT systems handle the decision-making entity during security-constrained economic dispatch's (SCED) mitigation processes.
- *NPRR908*: Aligns RMG references and updates mass transition notification requirements for emergency qualified scheduling entities to match with RMGRR159's revisions.
- *NPRR909*: Resolves a gap in the Protocols by addressing the unplanned unavailability of emergency response service (ERS) loads and generators.
- *NPRR912*: Addresses the settlement of switchable generation resources (SWGRs) that receive a reliability unit commitment instruction to switch from a non-ERCOT control area to the ERCOT control area. The change provides a make-whole payment for an SWGR when its real-time ERCOT revenues are not sufficient to cover certain specified costs the resource may have incurred in complying with the RUC instruction.
- *NPRR914*: Adds data points unique to a controllable load resource available for dispatch service or dispatch with a real-time market bid to the existing 60-day SCED disclosure report.
- *NPRR916*: Sets the mitigated offer floor to $0/MWh for "combined cycle" and "gas/oil steam and combustion turbine" resource categories, replacing the fuel index price-based calculation. The change also eliminates the grey-boxed language from *NPRR664*.
- *NPRR920*: Modifies the resource ramp rate logic in the Protocols (Section 6.5.7.2, Resource Limit Calculator) to dynamically adjust the amount of ramp rate reserved for regulation service in real time based on the percentage of regulation service being deployed in the opposite direction.
- *NPRR922*: Aligns the DC tie import forecast with forecasts of other resources in ERCOT's Capacity, Demand and Reserves (CDR) report that are deployed during ERS and other energy emergency alert events. The revision also addresses a reporting gap in the CDR by specifying an approach for forecasting expected capacity imports for planned DC tie projects.
- *NPRR925*: Increases the minimum quantity that can be submitted for point-to-point (PTP) obligation bids from 0.1 MW to 1 MW, matching the minimum quantity for energy-only offers and energy bids.
- *RMGRR158*: Codifies competitive retailer responsibilities during an extended unplanned system outage.
- *RMGRR159*: Clarifies the mass transition processes and communications by: shortening required minimum timelines for initial notification to affected parties from two hours to one hour; allowing preliminary notification of mass transition to affected transmission and distribution service providers, providers of last resort and PUC staff, as long as protected information is not disclosed; and clarifies that ERCOT may coordinate periodic testing of mass transition systems and processes with market participants.
- *RRGRR020*: Corrects certain submittal requirement fields inadvertently left blank during *RRGRR007*'s implementation by replicating requirements from the full interconnect study column to the planning model column for the affected rows. The request does not add any new data requirements to the glossary.
- *SCR798*: Introduces a limit on the total number of PTP obligation bids that can be submitted into the day-ahead market per qualified scheduling entity and per counterparty. The limit will apply to the number of bid IDs per operating day. ■

— Tom Kleckner

ISO-NE News

Former Mass. DPU Chair Reflects on Service

Angela O'Connor Says Energy Experience is 'Transferable'

By Michael Kuser

Then Massachusetts DPU Chair Angela O'Connor speaks at the New England Restructuring Roundtable in Boston in October 2018. | © *RTO Insider*

After serving a four-year term as chair of the Massachusetts Department of Public Utilities, Angela O'Connor became a free agent in February — just like some of the basketball players she knew during her decade helping to market the Boston Celtics.

That job had her wearing a headset behind sportscaster Marv Albert and Los Angeles Lakers star Earvin "Magic" Johnson while she coordinated timeouts with referees.

Asked about the Lakers' conspiracy theories regarding their "heated" locker room in Game 5 of the 1984 NBA Finals at the Boston Garden, when temperatures in the arena neared 100 degrees Fahrenheit, O'Connor said, "Whatever you heard, it was probably true."

O'Connor, known as Angie to her friends, is more circumspect when it comes to her time at the DPU, crediting "incredible staff expertise" with helping her to run the agency "at the busiest time in its history."

She is most proud of the work DPU did helping Gov. Charlie Baker position the state to procure Quebec hydropower and getting ISO-NE to become the first grid operator in the country to change its market rules to accommodate state procurement of clean energy contracts through Competitive Auctions with Sponsored Policy Resources (CASPR).

The RTO in February concluded Forward Capacity Auction 13, the first run under the new CASPR rules, at the lowest clearing price in six years. (See *ISO-NE Completes FCA 13 Despite Controversy*.)

"That was a lot of work to try to convince folks, 'you got to do this,'" O'Connor said. "And Massachusetts wasn't doing it to crush a price because there's a recognition that you can't run the system on wind, solar, storage, fairy dust and unicorns. You need power plants to be able to back up those intermittent resources, tremendously flexible plants, and they are gas plants, largely."

Private and Public

In all her regulatory work, O'Connor said she "wanted to make sure that whatever we did would not be a barrier to innovation. Massachusetts is a small state but a thought leader."

Though she had no state government experience prior to her role at DPU, O'Connor was conscious of the need to work with public officials, having come to the job from being Northeast region executive director at TechNet, a trade association representing the technology industry to state and federal policymakers.

And she went to TechNet from the New England Power Generators Association, which she founded and where she served as president.

"It's very different coming from the private sector into government," she said. "We were the first state to regulate Uber and Lyft, known as transportation network companies or TNCs, which we started in 2015. People just didn't associate that with DPU ... but then we also oversee the [Massachusetts Bay Transportation Authority] for public safety.

"It's all about how you handle things, and all those skills are transferrable to other industries, but I do love energy," O'Connor said.

She refuses to speak on the record about her toughest experience at DPU, overseeing the agency's response to the Columbia Gas pipeline explosions around Lawrence last September, in which one person was killed and about two dozen others were injured. Her reticence around the incident — the largest such disaster in U.S. history that forced the evacuation of three towns — is because it is still under investigation by the National Transportation Safety Board and the DPU.

"I would like to add how proud I am of the work the team did to support the governor and [Energy Secretary Matthew Beaton's] work on the ground, especially Pipeline [Safety] Division Director Richard Wallace," O'Connor said.

'A Privilege'

"Regulation is like a black hole to some people in other industries," O'Connor said. "They think, 'We're saving the planet, you don't have to regulate us,' which is not true. However, I came to appreciate that perspective because from the private sector, you want to get things done, but making good policy takes time."

O'Connor once headed up energy policy at Associated Industries of Massachusetts (AIM), the commonwealth's main statewide employer organization, a job she came to from managing operations for the Massachusetts Health and Educational Facilities Authority (MHEFA) PowerOptions program in the 1990s, which today is the largest energy-buying consortium in New England.

MHEFA was a bonding authority for colleges, universities and nonprofits, and after the move into energy aggregation, "we had under contract [more than] 500 MW of load, which was MIT, Harvard, Boston College, Northeastern, Mass. General Hospital ... the Museum of Science [and] the Museum of Fine Arts," she said.

"That was my first energy job, and I remember we also had Sister Mary Ruth and Little Sisters of the Poor," O'Connor said. "We had a two-year contract with a one-year extension, or a five-year contract, and Little Sisters of the Poor was the same cost as Boston College or MIT. One little facility, but that was one price."

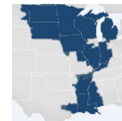
Massachusetts went all-in on restructuring the electricity industry, she said.

"I really liked this energy thing, and [as] scary as it sounds, I liked the process of [the New England Power Pool]. I liked all the people around a table. I liked how do you figure things out, how do you bring consensus," O'Connor said.

[NEPOOL last month voted to admit this *RTO Insider* correspondent as an End User member under strict rules that prevent the publication from reporting publicly on what he hears in meetings. O'Connor said she hopes FERC does the "right thing" in its ongoing proceeding over the matter and directs the organization to allow press to report on the meetings. (See *RTO Insider Reporter Admitted to NEPOOL*.)]

"Even though there were challenges, public service really is a privilege," O'Connor concluded. "I remember when I was sworn in, [Baker] said that — over my four years I learned he was right — it truly is a privilege to serve the people of the Commonwealth and to give back. I have been blessed with a number of amazing jobs, and working for this administration was by far the best of all." ■

MISO News



MISO Contemplates DER Effect, Possible Rules

By Amanda Durish Cook

Solar panels in Indianapolis | © *RTO Insider*

CARMEL, Ind. — MISO may have to contend with security concerns, communication constraints and even the eventual phaseout of the vertically integrated utility model as it strives to manage a grid with growing amounts of distributed energy resources.

Those possible scenarios were laid out March 26 at the latest in a series of educational workshops hosted by the RTO and the Organization of MISO States. The events are a precursor to MISO bringing discussion of DER market rules to its stakeholder process.

The first workshop on DERs in late January was cut short by a dangerous cold snap that knocked out power to MISO's Carmel headquarters. (See *Cold Snap Halts DER Talk as MISO Calls Max Gen Event*.) The RTO has planned two additional workshops more technical in nature for April 9-10 and April 17-18.

Located far from the coasts, the Midwest and South are typically slow to take up new energy trends. MISO has a relatively low level of DERs on its system, with a 2018 OMS survey finding about 2.6 GW (compared with about 6 GW in the geographically smaller CAISO footprint). But Bob Shively, president of training firm Enerdynamics, said MISO's volume is "significant" and predicted that DER will grow — albeit lopsidedly — based on state politics and regulation.

MISO DER Program Manager Kristin Swenson said it's appropriate for discussions to happen now, even if adoption is currently relatively low.

"The rate of change seems very slow until it happens all at once. … Political, regulatory changes happen quickly, and it takes a long time to prepare," Swenson said. "Now is the time to be looking at what's going to be five years, 10 years away."

Shively said DERs are fast becoming economic: "There's this distinct possibility that DER penetration is happening very quickly out there, and it will have impacts on the bulk electric system."

T&D Communication

Shively said MISO and its members must now figure out how to improve communication at the transmission and distribution interface to increase visibility and determine what wholesale market changes are needed to include aggregated DER.

"There's going to be a coordination and discussion that never took place in the past," Shively said, adding that metering DERs will one day become a "necessity." He said the distribution grid will likely become a data monitor and automated system in addition to a power delivery system. Distribution operators may soon be scheduling generation, Shively said, or form distribution-level system operators to optimize the use of DERs. He also said MISO may need to devise a special interconnection agreement for DER aggregations.

"This is not going to happen overnight, but there are some models being talked about out there," Shively told stakeholders.

Currently, MISO has neither visibility nor situational awareness about the location or output of DERs in its footprint, and management thinks it possible that FERC will issue rules on the treatment of DERs this year. The grid operator also predicts that DERs will require "new gird management protocols" as the transmission grid, distribution grid and end users begin flowing energy between one another, deviating from the traditional pattern of one-way flows.

But Shively said changes to incorporate DERs must be made thoughtfully, with special attention on system frequency, voltage and resource adequacy.

"When we're planning the system, the No. 1 thing is we don't want to break the system," he said. "So if we're bringing DERs on … we want to make sure that we're not doing things to damage our equipment."

He said to maintain frequency, utilities can control generation and might someday control even load courtesy of smart devices.

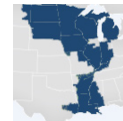
Shively also pointed out that there's no dollar value placed on reactive power to control voltage and no incentive to provide it. "Unless you want to be a good corporate citizen," he chuckled. He added that voltage instability will likely be localized and managed on the distribution circuit and said frequency issues are the bigger threat to the grid.

'Points of Entry'

Stakeholders pointed out that DERs open the question of what generation falls under NERC Critical Infrastructure Protection standards. Shively said DERs open new "points of entry"

Continued on page 21

MISO News



FERC OKs MISO Outage Scheduling Rules, DR Testing

By Amanda Durish Cook

CARMEL, Ind. — FERC on Friday granted MISO permission to implement the remaining two proposals in its three-part short-term resource availability and need project.

Facing baseload generation retirements, more frequent emergencies and diminishing capacity margins, MISO had proposed stricter outage scheduling rules and annual real power testing for demand response. FERC said MISO could implement both provisions, though it wants the RTO's Maintenance Margin tool chronicled in its Tariff.

In February, FERC approved a MISO proposal requiring owners of load-modifying resources to provide firmer and more clearly documented commitments regarding their availability. (See *MISO LMR Capacity Rules Get FERC Approval*.)

Taken together, the three filings are geared toward freeing up an additional 10 GW of supply as MISO navigates its spring maintenance outage season and the arrival of warm weather.

Stricter Outage Planning

MISO can now impose new generator accreditation penalties for planned outages taken during what it deems "low margin, high risk periods" (*ER19-915*). RTO staff have said the rules will incent the forward scheduling of planned generation outages.

FERC approved the proposal effective Monday and said it expected the rules will promote advanced scheduling, improve outage coordination and help MISO address its recent spate of shoulder period emergencies.

DTE Energy's St. Clair Power Plant is among coal plants that could close earlier than expected, exacerbating baseload generation retirements in MISO.

"MISO's proposed Tariff revisions add specificity and incentives to the Tariff's existing provisions governing the scheduling of generator planned outages," FERC said.

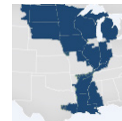
MISO generation resources now must provide 120 days' notice for planned outages. However, outages scheduled between 14 and 119 days in advance will be exempt from the RTO's accreditation penalties, provided the outages are scheduled during predefined periods with adequate margins. Generator planned outages and derates scheduled fewer than 14 days in advance and occurring during a declared maximum generation emergency would be subject to accreditation penalties. The proposal also provides safe harbor provisions for resources that adjust a planned outage at MISO's request.

The RTO also has instituted a transition period to the new set of outage rules. Outages scheduled prior to April 1 will not be subject to the accreditation penalty, while requests and revisions submitted April 1 and beyond for outages starting April 15 through July 29 would be exempt from the penalty if the request is submitted no later than 14 days in advance and MISO foresees "adequate projected margin at the time of the request." The full set of outage requirements will go into effect for outages scheduled to start July 30 or later.

MISO said that although it has so far managed generation outages through voluntary rescheduling, "there has been a significant increase in the number of maximum generation emergencies that are at least in part driven by highly correlated generator planned outages." The RTO said only 30% of planned outages are scheduled 120 days or more in advance, with most being scheduled just weeks in advance.

A group of state regulators and Prairie Power argued that MISO wasn't providing enough detail into what load forecasts it uses in its Maintenance Margin tool, the nonpublic webpage the RTO maintains to help members schedule outages during adequate supply conditions.

The two also contended that MISO mischaracterized the accreditation penalty as an "incentive"; violated its stakeholder process by allowing just 11 days for stakeholders to review the final proposal; and that the proposal "ignores the real world of utility operations" in which previously unknown problems can be uncovered as equipment is disassembled. Indiana Municipal Power Agency and Southern Minnesota Municipal Power Agency also



derided the 14-day deadline as "arbitrary."

But FERC said the tiered approach "provides MISO with the forward transparency it seeks, reduces the risks associated with correlated [outages] and maintains sufficient flexibility for generator owners to schedule their [outages] without risk of an accreditation penalty." FERC also pointed out that outages scheduled fewer than two weeks in advance aren't automatically subject to an accreditation penalty unless the outage occurs during an emergency.

However, FERC agreed with WEC Utilities and American Municipal Power that MISO needs to define the Maintenance Margin in its Tariff. The tool "is the sole factor in determining whether there is an 'adequate projected margin' under the proposed Tariff revisions," FERC said, and as such, should be recorded in the MISO Tariff.

"We find that the Maintenance Margin can have a significant impact on rates, terms and conditions of service," the commission said, directing MISO to make a compliance filing by the end of April.

Real Power Testing for DR

FERC on Friday also approved MISO's proposal to require annual actual power tests from its DR resources (*ER19-651*).

The RTO had asked for permission to conduct the tests to get more certainty about resources' ability to perform when needed during tight operating conditions.

At MISO's recent Board of Directors week in New Orleans, RTO executives said the move will put DR on a more level playing field with other resources, which are already beholden to the annual power tests.

DR resources that complete the annual testing will receive credit for one of the five deployments required of them in a planning year. MISO has said that resources that are deployed and follow all scheduling instructions in a planning year will not be subject to the testing in the following year.

MISO has also said it will waive the testing requirements for DR resources "that are subject to regulatory restrictions that preclude testing." Additionally, a DR resource that simply wants to opt out of testing can do so, provided it agrees to pay MISO three times the cost of demand reduction for non- or under-performance.

Some MISO member companies protested the filing, arguing that the RTO failed to justify the need for annual testing; the testing would cause DR to exit the market; the proposed penalty cost was arbitrarily punitive; and an annual testing requirement would result in increased production costs and risk to equipment.

But FERC disagreed on all fronts.

"To the extent that MISO's proposal increases costs on demand resource owners, they can reflect those costs in their submitted offers into the auction," FERC said. ■

MISO Contemplates DER Effect, Possible Rules

Continued from page 19

to the grid. He said it's possible that hackers could access controllable home systems.

But he also pointed out benefits, saying DERs could potentially provide black start services to restore the grid from blackout.

Stakeholders asked about the difference between a DER and a more energy efficient refrigerator, when both serve to reduce load.

"It starts to get really fuzzy: What is a DER and what isn't a DER. … So the answer is, it's a fuzzy line, not a fine line," Shively said. "Is a Nest thermostat that changes your temperature a DER, or is it just customer behavior?"

Shively said MISO will have to keep in mind that its DER supply mix will directly result from state processes, but it's up to the RTO to plan the system and model load. That will prove difficult for grid operators that lack visibility of DER behavior, he said. Shively said MISO should also consider that line maintenance can take multiple DERs out of service.

Minnesota Public Utilities Commission staff member Hwikwom Ham recommended MISO differentiate its future operational concerns from its planning reserve concerns regarding DER integration. The RTO has said it may have to rethink its planning reserve margin as resource availability shifts. (See *MISO, Stakeholders Debate Merits of Seasonal Auction*.)

Others' Load

WPPI Energy economist Valy Goepfrich observed that the MISO system only seems to encounter complexities when a DER owner goes from serving its own load to serving others. She asked if MISO might only have to make changes when groups of DERs enter the wholesale market *en masse*.

But Shively said even when customers choose to serve their own load with DERs, load modeling becomes a problem. He said under that scenario, data exchanges will still be needed between distribution and transmission.

"I think you're right; it's probably a spectrum" of grid preparation based on DER use, Shively said.

Shively also said that once new guidelines for visibility and control are in place, MISO members can't assume that existing communications systems will be adequate. He pointed to rural areas that lack high-speed internet.

But he said the DER discussion is reminiscent of the fears he heard when utility-scale wind and solar were being integrated into the system. However, he allowed that the question of generation on the distribution level muddies the regulatory waters.

Vertical Integration

Stakeholders asked how increasing use of DERs would interact with the largely vertically integrated utility model in the MISO footprint.

Shively paused. "That's a great question." But, after a beat, he said, "I think that there's going to be more pressure for customers to have retail choice. … I would contend you can go down the road for a while without retail choice, but the more you crack open the door…"

He trailed off, later adding that companies like Google and Amazon might lead the way on pushing for supplier choice.

At the end of day, Shively said, the difficulties of absorbing DERs into the market should prove worth the effort.

"We can come up with lots of problems with implementing DERs, but we also have to remember there's a lot of potential," he said. "I think, long-term, DERs can provide low-cost reliable service to customers. That's the goal of what all this should be." ■

NYISO News

Analysis Group Presents NYISO Carbon Pricing Study Plan

By Michael Kuser

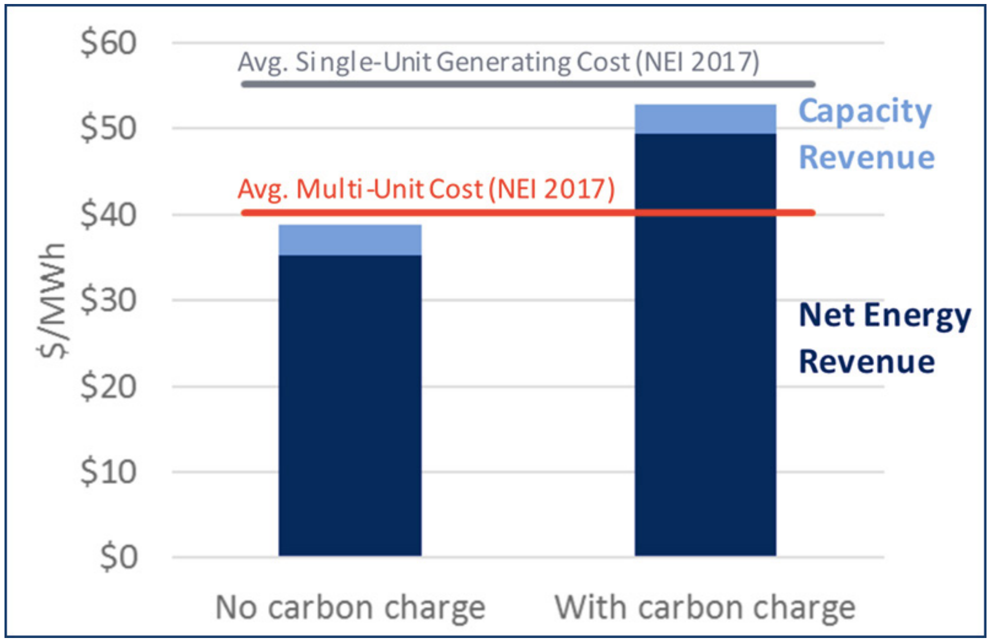
RENSSELAER, N.Y. — Stakeholders expressed some skepticism last week as the Analysis Group revealed the *outline* of a new study underway to provide insights into pricing carbon in NYISO's markets.

The ISO surprised stakeholders in February when it announced it had commissioned Analysis Group to supplement the Brattle Group's foundational study in order to finalize a pricing scheme. (See *NYISO Commissions New Social Cost of Carbon Study*.)

Susan Tierney, a senior adviser with Analysis Group, allayed their concerns with poise and humor as she told the Installed Capacity/Market Issues Working Group on Thursday that she and colleague Paul Hibbard "had some ideas for additional things that we didn't think were captured in the Brattle *report*, starting with macroeconomic or co-benefits, known as extra-market activities," and second, discussing "some reasonable but less conservative assumptions."

The firm plans to present preliminary findings and discuss with stakeholders the study approaches by the end of the month, present initial analysis results in mid-May, and prepare a white paper and companion technical report by the end of May, Tierney said.

A task force created in October 2017 by NYISO and the New York Public Service Commission worked for more than a year developing a carbon pricing proposal. In December it turned the *proposal* and final details over to the ISO's stakeholder process. (See *IPPTF Hands off Carbon Pricing Proposal to NYISO*.)



The effect of a carbon charge on nuclear revenue under 2030 reference assumptions | *Brattle Group*

Stakeholders Question

Stakeholders were quick to tell Tierney that it's not easy to put together a carbon pricing report in a couple months and contribute to a policymaking process that's been going on for nearly two years.

"Is this going to be something unbiased that looks at both sides of the issue, or just looks for benefits that Brattle might have missed?" said Couch White attorney Michael Mager, who represents Multiple Intervenors, a coalition of large industrial, commercial and institutional energy customers. "Will you not look for costs and co-damages; effects on jobs; manufacturing; emissions in other states?"

"We want to do credible analysis, so of course we look at pluses and minuses, positive and negative impacts," Tierney said.

Couch White attorney Kevin Lang, representing New York City, reacted to a presentation slide with a photo of the city skyline in haze, and captions that said most emissions reductions will be "downstate" and that the greater metropolitan area has the 10th worst ozone air quality in the U.S.

"Your assumption that New York City will benefit from improvements in air quality is flawed, as Brattle acknowledged that carbon pricing would not reduce fossil fuel-based generation in the city, and that what Brattle termed 'downstate' included Zone F [the capital region and upper Hudson River Valley]," Lang said.

Tierney said she probably conflated the terms, but she insisted that they were not redoing or critiquing the Brattle report, and that they would indeed be looking at statewide co-benefits — and negative impacts.

"Co-benefits is a term used in Washington for things that are not the intended effects of a policy," Tierney said. "When looking at employment impacts, for example, we know we can't just count up the new jobs without considering the jobs that might be lost."

Erin Hogan, representing the New York Department of State's Utility Intervention Unit, said the study should allow stakeholders to understand the net employment impacts, not gross impacts.

Mark Reeder, representing the Alliance for Clean Energy New York, said the final Brattle report noted that a carbon charge would induce steam unit repowering downstate, which could benefit public health by improving the air quality in New York City.

Brattle cited analysis by the ISO's Market Monitoring Unit, Potomac Economics, that said steam unit repowering might already be economically feasible, and Tierney said they will base their assumptions on the issue on further analysis expected from the Monitor.

Renewables and Tx

The new study also will examine employment and other macro impacts of a carbon charge on New York's economy, including reduced imports of fossil fuels.

"It is not going to be a general equilibrium model," Tierney said. "We want to see if we can come up with a credible list of things that would be retired, or added to the system, or would otherwise have a meaningful impact on it.

"The Brattle study examined whether there would be more or fewer zero-carbon resources as a result of carbon pricing, mostly focused on nuclear," she said, "including the enormous cost implications of" replacing the capacity and

NYISO News

energy of those existing zero-emissions and nuclear resources, were they to retire.

"One key assumption in the Brattle analysis was that the state would simply be able to execute on its goals of putting in thousands and thousands of renewable resources," she said. (See *IPPTF Updates Carbon Charge Analysis, Treatment of RECs*.) "We want to explore the role of carbon pricing in enabling the accomplishment of those important goals."

Reeder said it would be beneficial to measure the effect of carbon pricing on the retention of existing renewable resources, such as a wind turbine with a contract that expires in 2025, and that analysis so far has not put any dollar value on the impact of carbon pricing on the deployment of energy storage, so it also "would be great to fill that gap."

Mark Younger of Hudson Energy Economics said that "pricing carbon would signal incentive to build new transmission, which is important if you don't have benefits downstate without added transmission."

Lang said he had been talking about the need for transmission for two years, and "to understand the effect of carbon pricing on building transmission would be great."

David Clarke, director of wholesale market policy for the Long Island Power Authority, asked about the cost-effectiveness of the Regional Greenhouse Gas Initiative as an alternative model against which to assess the cost-effectiveness of carbon pricing, which he said would be a good way to measure its impact on carbon abatement.

"We did look at the revenues question, but layering on top of that the incredibly complex question of cost-effectiveness would be ... somewhat outside the scope of pricing carbon

Brattle found that a carbon charge would induce steam unit repowering downstate, which could benefit public health by improving the air quality in New York City. | *NYC Department of Environmental Protection*

dispatch," Hibbard said.

Analysis Group will use data from the modeling runs performed for the Brattle study to assess the impact of a carbon price on demand for natural gas, Tierney said, adding that it had no plans to pursue additional Multi Area Production Simulation (MAPS) runs.

One stakeholder suggested that one or two new MAPS runs might be reasonable and cost-effective now that some base assumptions from the Brattle study are possibly out of date, including the expected in-service date of the delayed AC Public Policy Transmission projects. (See *NYISO Public Policy Tx Revisions Approved*.)

"I have no objections to additional data or information," Hibbard said.

Fuel Security Study

Analysis Group also presented the preliminary *outline* of a study commissioned by NYISO to assess winter fuel and energy security for the New York Control Area.

Hibbard reviewed the proposed input assumptions and sources of data that would feed into the fuel security model, along with alternative assumptions and system stress scenarios. Data used are a mix of those publicly available and internal to the ISO, with preference given, where possible, to assumptions previously vetted with stakeholders.

The purpose of the analysis is not to predict the future but instead examine different scenarios, he said.

The plan is to follow up on the assumptions, data and scenarios by mid-April and present the initial findings by late April. Analysis Group will present final findings and initial recommendations in June ahead of a presentation of final recommendations in July. ■

NYISO News

NYISO Management Committee Briefs

Winter 2018/19 Operations Mostly Uneventful

RENSSELAER, N.Y. — NYISO on Wednesday *reported* that it confronted minimal operating challenges this past winter as New York enjoyed relatively mild weather for most of the season.

Emilie Nelson, ISO vice president of operations, told the Management Committee that there were two noteworthy periods of cold conditions this winter.

The first cold wave produced the winter peak of 24,728 MW on Jan. 21 — Martin Luther King Jr. Day — topping the 24,330-MW 90/10 day-ahead forecast. In advance of the holiday weekend, NYISO coordinated with transmission owners and neighboring RTOs, and participated in calls with the Northeast Power Coordinating Council. The ISO also recalled some New York transmission facilities back into service, she said.

The second cold period began when an arctic front arrived Jan. 30 and stretched into Feb. 2.

"The ISO's fuel survey inventories indicated sufficient alternate fuels, so again we appreciate that process," Nelson said. She noted there was no need for statewide supplemental capacity commitments, demand response, emergency actions such as voltage reduction or public appeals, or emergency energy purchases from neighboring regions.

The New York Control Area's transmission infrastructure provided excellent performance, she said.

Interstate and local natural gas pipelines all remained in service, though they issued many gas alerts, daily and hourly operational flow orders (OFOs), and notices signaling that interruptible gas customers may not be able to get gas.

"Even with relatively few cold days, New York experienced a high number of OFO conditions this season, which may become more prevalent and constraining at higher temperatures than compared to the past," Nelson said.

She pointed out the record amounts of LNG shipped this winter, with the Northeast Gateway Deepwater terminal hitting a record sendout flow rate of more than 800,000 MMBtu/day on Feb. 1, while Canaport and Everett LNG also saw high levels of imports this season.

Fuel assurance will continue to be important, highlighting the significance of NYISO's ongoing fuel and energy security project, Nelson said.

Increasing Board Compensation

Interim CEO Rob Fernandez said NYISO is proposing to raise compensation for its Board of Directors in order to remain competitive in recruiting members.

Under the proposal, the annual retainer for each board member would increase to $65,000 from $55,000, while compensation for attending meetings would rise to $3,500 from $3,000 per meeting. Directors would also earn a flat fee of $5,000 per committee meeting day, which typically entails three or four meetings, compared with the current compensation of $2,000 per committee meeting.

Fernandez asked stakeholders to provide comments by Friday.

ISO Customer Satisfaction Improves

NYISO last year scored an "extraordinarily high" 90% in overall satisfaction among its customers and market participants, *said* Don Levy, director of the Siena Research Institute, which conducted the member surveys.

"We're sort of on the outside end of a satisfaction bell curve, so it is challenging to keep moving it up, but this year we did see it move up a point," Levy said.

The survey comprised three platforms: customer inquiry, market participants and CEO strategic outreach.

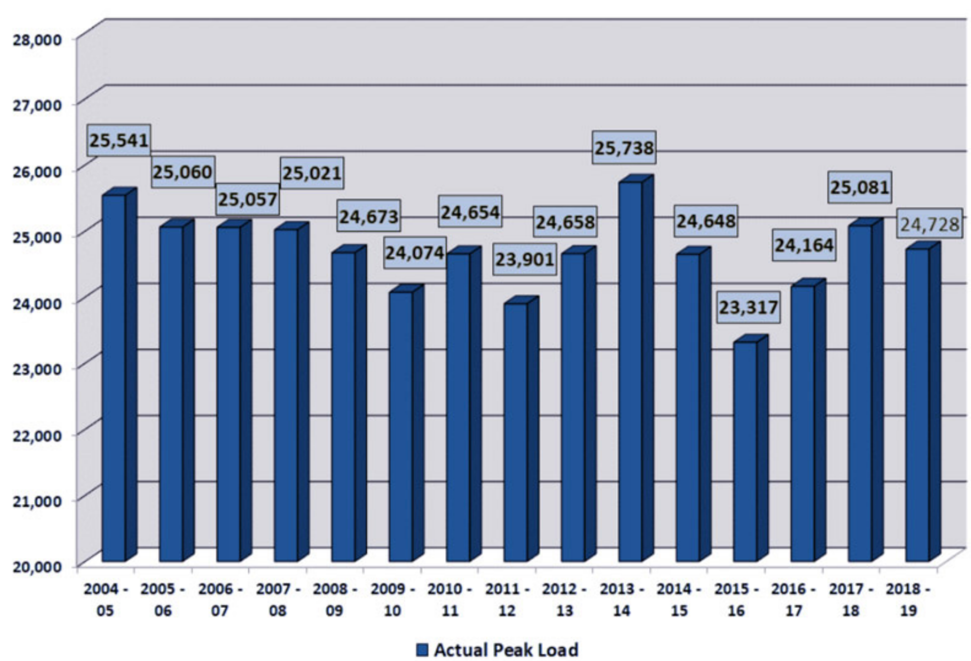
Levy said areas for improvement identified in the surveys included how the ISO explains policies and procedures; transparent operations; considerations of individuals' input; conducting comprehensive long-term grid planning; advancing technological infrastructure; and providing information to policymakers, stakeholders and investors.

"We will note that, in terms of transparency, we have seen significant improvements over the year," Levy said.

New Zone J Operating Reserves Go to Board

The MC approved establishing operating reserve demand curves that assign a $25/MWh value to the proposed reserve requirements for Zone J (New York City), following a recommendation by the Business Issues Committee. (See *NYISO Business Issues Committee Briefs: March 13, 2019*.)

Ashley Ferrer, NYISO energy market design specialist, *reiterated* her presentation to the BIC



Winter peak loads (MW) | *NYISO*

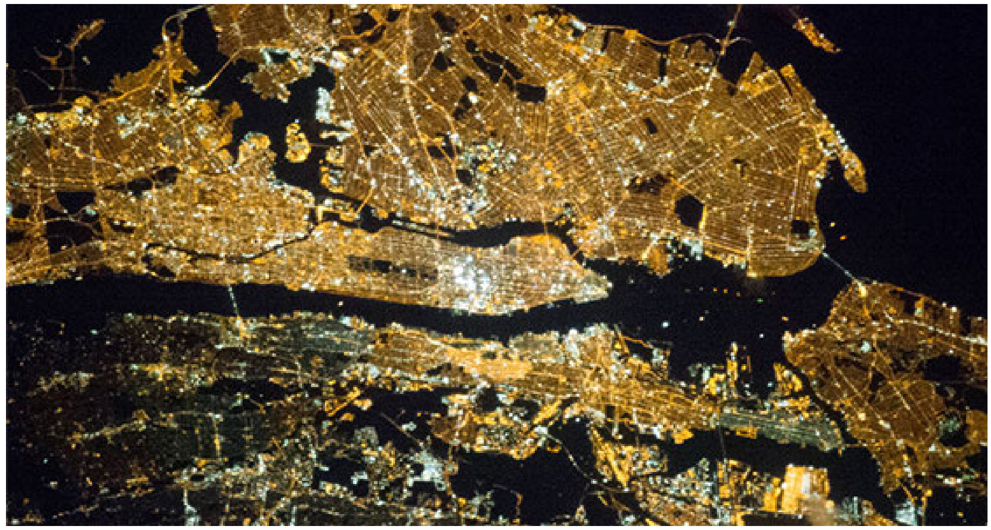
NYISO News

showing that the requirements would necessitate procuring 500 MW of 10-minute reserves and 1,000 MW of 30-minute reserves.

NYISO is not proposing to revise the Zone J requirement during Thunderstorm Alert (TSA) events in order to ensure implementation for June. However, Ferrer said that, absent further evaluation of the appropriate reserve requirements during TSA events, use of a $500/MWh demand curve price could result in unnecessarily high pricing outcomes during those events.

TSAs are called when actual or anticipated severe weather conditions lead the ISO to reduce transmission limits into Southeast New York.

The ISO will submit the proposal to the board this month and file Tariff revisions with FERC seeking approval to implement them in June.



The greater New York City area (Zone J), as seen from the International Space Station in 2013 | *NASA*

Tariff Revisions Clarify TCC Credit Calculation

The MC approved Tariff revisions to clarify how to calculate the holding requirement for historic fixed-price transmission congestion contracts (HFPTCCs) that do not align with the beginning of a capability period by using proposed enhancements previously approved by stakeholders.

Sheri Prevratil, NYISO's manager of corporate credit, *said* three HFPTCCs have start dates that do not match the first day of a capability period. The ISO identified the issue while developing software to use the market clearing price to calculate the credit requirement for fixed-price TCCs.

"The [proposed] methodology is consistent with the current methodology," Prevratil said. ■

— Michael Kuser

PJM News

Clock Ticking on Pa. Nuke Subsidy Bill Hearings

By Christen Smith

It's been nearly three weeks since Pennsylvania lawmakers proposed a $500 million plan to subsidize the state's nuclear fleet, and hearings on the issue still appear to be weeks away.

The clock is ticking if lawmakers want to save Three Mile Island from shutting down in September. Exelon promised to begin the four-month deactivation process June 1, leaving legislators a small window of opportunity to intervene.

Rep. Thomas Mehaffie (R), whose district includes TMI, introduced *House Bill 11* last month as a way to "properly" value the zero-carbon energy nuclear plants provide. (See *Pa. Lawmakers Unveil $500M Nuke Subsidy Bill*.)

The plan places nuclear power in a newly created third tier in the state's Alternative Energy Portfolio Standard (AEPS) Program, from which suppliers must buy 50% of their electricity. Should the state lose all five nuclear reactors, Mehaffie said taxpayers will foot an estimated $4.6 billion in costs, including: $788 million in higher electric prices; $2 billion in lost state GDP; and $1.86 billion in costs associated with carbon emissions and harmful criteria air pollutants, including SO2, NOX and particulate matter.

Mehaffie told *RTO Insider* on Wednesday that no amendments have been made to his bill, though he believes a hearing is scheduled in the House Consumer Affairs Committee sometime during the first half of this month.

Committee Chairman Brad Roae (R) said in an email that an official schedule will be released soon. "This is a very complex and technical issue, and we are conducting hearings on the legislation to educate legislators so that we can make good decisions," he said.

Exelon's Three Mile Island nuclear power plant

Asked if there's any sense of urgency among lawmakers to move the bill, Roae did not respond.

The Associated Press has *reported* that opposing lawmakers could throw their support behind a modified plan that includes environmental policies aimed at reducing carbon emissions or subsidizing renewable resources.

"The crisis is here and we need … to deal with it," Rep. Carolyn Comitta (D) told the AP on March 22. "Even things we thought were problems in the past need to be part of the solution."

Critics of the legislation argue the "bailout" prioritizes aging, expensive nuclear facilities at the expense of cheaper sources like natural gas and coal. Others insist the concept defies the purpose of PJM.

"By the end of this, the bill is going to be chock-full of handouts to grease the skids," *tweeted* former Montana Public Service Commission Vice Chairman — and National Association of Regulatory Utility Commissioners President — Travis Kavulla, now director of energy and environmental policy at R Street Institute. "Begging the question: Why the hell should Pennsylvania pass a law because a single power plant is out of the money?"

PJM's Independent Market Monitor said last month that three of the RTO's 18 nuclear facilities face revenue shortfalls through 2021, a natural reaction to competition. The three plants — Davis-Besse, Perry and TMI — each operate just one reactor, which is the source of their financial strain, the Monitor said. The remaining multiunit facilities, including the subsidized Quad Cities in Illinois, will remain profitable. Even without zero-emission credits, Quad Cities would cover its costs for the next three years, according to the Monitor. (See *Monitor Says PJM's Capacity Market not Competitive*.)

Meanwhile, State Sen. Ryan Aument (R) has yet to introduce his version of the bill. Chief of Staff Ryan Boop told *RTO Insider* on Wednesday the final language of the proposal is close to resolution, though he declined to say whether Aument's version included the same elements of HB 11 or any concessions to sway critics. ■

PJM News

Report: 'Naive' PJM Underestimated GreenHat Risks

Continued from page 1

The report tracked a four-year timeline of events, beginning with GreenHat's 2014 entry into PJM despite "a questionable history," followed by unchecked growth in FTRs that more than doubled each year between 2016 and 2018, as well as warnings from at least four other market participants who estimated the portfolio was short by as much as $40 million. It ended with the company defaulting on a $624,000 collateral payment last June.

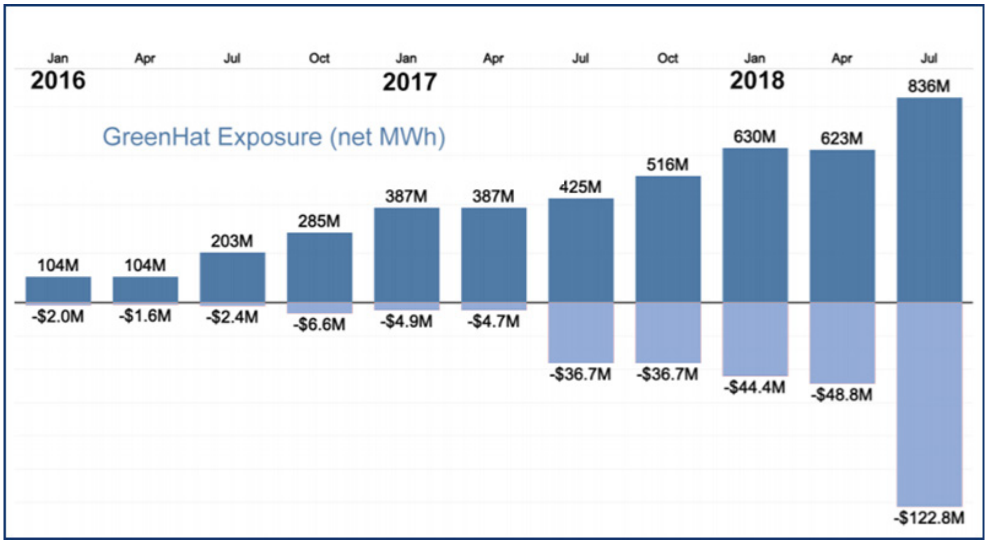
"Long tenor of a financial position is riskier than a near-term duration because less is known about the distant future than the near future, and more events can intervene to affect the value of a position over time," the report said. "GreenHat's portfolio was very risky because of its size and the length of time the positions would be open and subject to market forces before settlement."

GreenHat, which listed its address as a UPS store in Coronado, Calif., was owned by two traders who previously gained notoriety as participants in J.P. Morgan Ventures Energy Corp.'s scheme to manipulate the *CAISO* and *MISO* markets between 2010 and 2012. (See *Doubling Down — With Other People's Money*.)

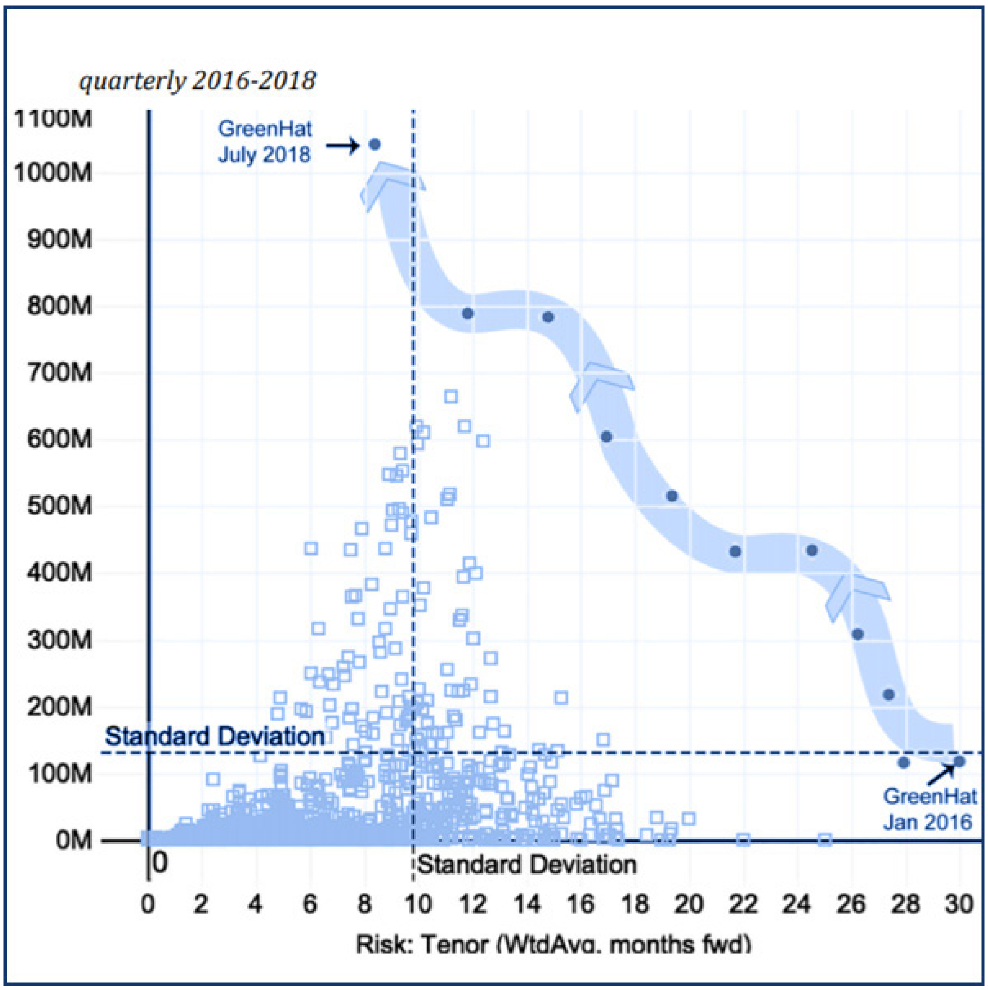
FERC Commissioner Richard Glick *said* in January the commission must investigate participants who willfully manipulate the market through fraud and escape any sort of punishment, thereby perpetrating their schemes on other RTOs. "That investigation should consider the full extent of our existing authority under the Federal Power Act and whether any legislative action is needed to ensure the commission has the authority to preclude these individuals from continued participation in wholesale electricity markets," Glick said. "I hope this is an issue we can address in the months ahead."

The consultants also determined a flaw in PJM's methodology for calculating collateral adjustments created "counter-intuitive" and "sometimes directionally incorrect" collateral requirements. The faulty approach meant even as GreenHat's portfolio became increasingly risky, its collateral requirements actually shrank, leaving healthier portfolios to essentially subsidize the entire FTR market, the report found.

The report's authors noted that "best practices incorporate forward information to determine collateral requirements for market partici-



GreenHat's significant growth in exposure and MTA loss | *PJM*



Size and tenor of GreenHat's portfolio versus others | *PJM*

PJM News

pants. In contrast, PJM's assessment of risk was based entirely on historical, or backwards looking, information." They recommended PJM require use of mark-to-auction values from more frequent auctions, include long-term FTRs in monthly or bimonthly auctions, and base collateral on forward-looking metrics to better capture risk.

PJM Response

Ott said the RTO takes the report's deep criticisms "very seriously," announcing on March 26 a list of reforms it will implement immediately, starting with the hiring of a chief risk officer — someone with the knowledge and experience to prevent such calamities from befalling the market again.

"We realize we need to get better at credit risk management," he said.

PJM will also review and revamp its credit risk assessment and monitoring procedures, as well as facilitate stronger coordination between PJM's markets, credit/finance and legal groups, and the Independent Market Monitor.

"We expect this report will provide the momentum to move these issues forward," Ott said in a *press release* March 26. "PJM will work with our members and federal regulators to examine changes recommended by the report designed to strengthen the regulation of our FTR market. It is our job to make sure this never happens again."

Ott said federal regulators identified issues with PJM's credit risk management practices in 2010, but stakeholders expressed reluctance over the potential costs of implementing a more sophisticated system.

Independent reviewers confirmed a 2007 FTR default by Tower Research Capital spawned recommendations on how to improve risk management policies and market surveillance, including increasing the frequency of auctions, limiting positions based on participant's capital, basing collateral on forward-looking metrics and shortening the time period of settlement for outstanding charges.

After lengthy discussions, stakeholders agreed only to the latter recommendation. The review blames PJM staff for not effectively communicating the critical necessity of the other suggested changes.

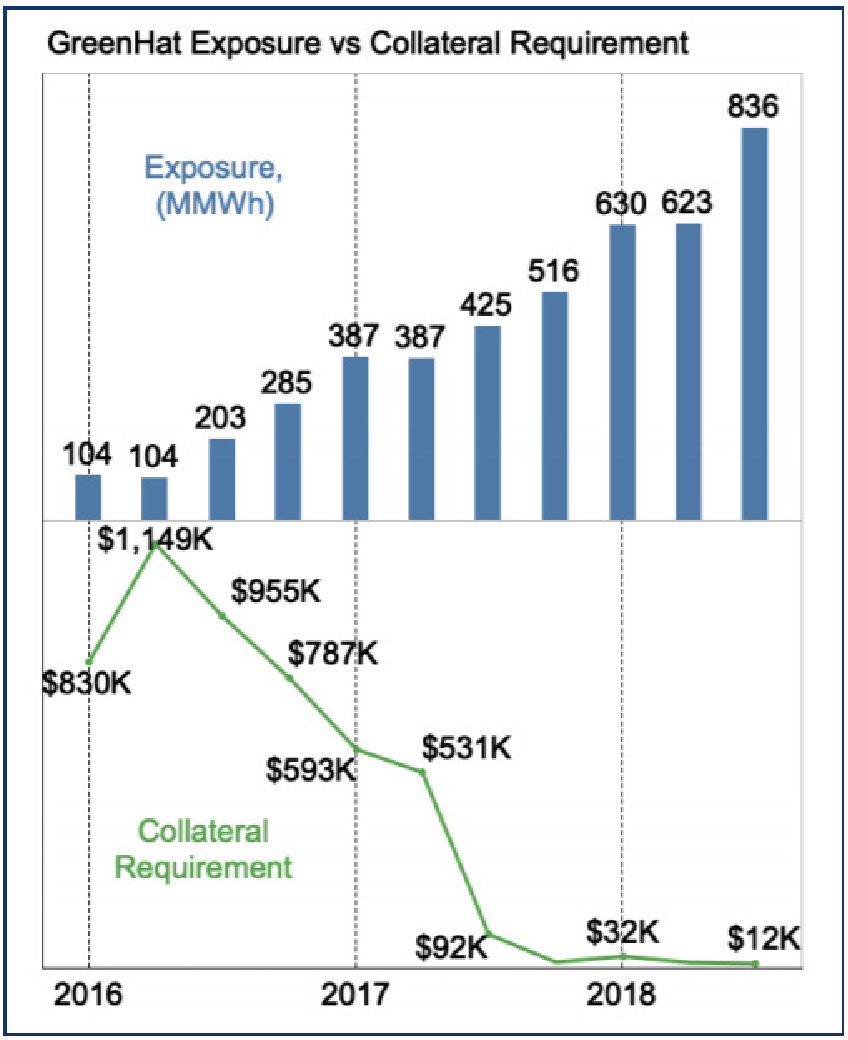
"This is something where we have to look at ourselves and what we could we have done better and there's plenty there," Ott said.

Ongoing Fallout

At the Market Implementation Committee meeting on Feb. 6, PJM CFO Suzanne Daugherty told members that a FERC order to rerun the July 2018 FTR auction to liquidate GreenHat's positions could add $250 million to $300 million to the $186 million the RTO had earlier projected the default would cost members. (See *PJM: FERC Order Could Boost GreenHat Default by $300M*.) On March 26, the commission issued a tolling order giving it more time to rule on PJM's rehearing request on the issue (*ER18-2068*).

"We recognize the shortcomings identified in this review," Ott said. "PJM takes the cost of this default very seriously, and we are committed to reforms that better protect market participants in the future."

The review faults "dismissive" attitudes from the PJM executive team and flawed legal advice regarding the RTO's ability to revoke GreenHat's trading rights after concerns grew over its projected losses. Daugherty acted on her own authority in 2017 when she halted the company's ability to participate in future FTR auctions — held in June and December each year — before reversing her decision three weeks later, fearing possible Tariff violations and legal repercussions.



Growth with declining collateral requirement | *PJM*

Daugherty, who retired as CFO last month, had declined to say whether her departure was related to the GreenHat fallout. (See *PJM CFO Retiring in Wake of GreenHat Default*.) The March 26 report better illuminated her role in the debacle, noting she and other PJM staff put too much faith in verbal and written agreements with GreenHat guaranteeing the company held $100 million in assets and would receive a $62.2 million payout from two bilateral contracts.

"If PJM knew its customer better, PJM may have recognized these instances as red flags indicating the GreenHat pledge agreement may have actually been a sham before signing," the report said. "These red flags may have helped PJM to conclude that GreenHat did not have an asset worth $62 million to pledge and assign."

Ott said other organizational changes lie ahead for the RTO but declined to comment on the status of specific staff members, noting there "is certainly a need to strengthen different departments." ■

PJM News

PJM Files Energy Price Formation Plan

By Christen Smith

PJM filed its energy price formation proposal with FERC on Friday, after a yearlong discussion with stakeholders produced no consensus.

The RTO said its plan — submitted unilaterally under Section 206 of the Federal Power Act — appropriately values energy reserves during times of stress. It said the proposal relies on concepts that have been used successfully by other RTOs to capture the real-time actions of grid operators, including a revised operating reserve demand curve (ORDC); improved utilization of existing capability for locational reserve needs; alignment of the day-ahead and real-time markets; and increased penalty factors (*EL19-58*).

"Proper price formation is critical to ensuring that prices reflect the value of the reserves required to operate the system. PJM's proposal represents a major step forward in the design of the market," said Stu Bresler, senior vice president of operations and markets, in a *press release* Friday. "These resources are not just critical to reliability today and in the future, they will provide the backup flexibility needed so that the grid is prepared for the continued integration of alternative sources of energy."

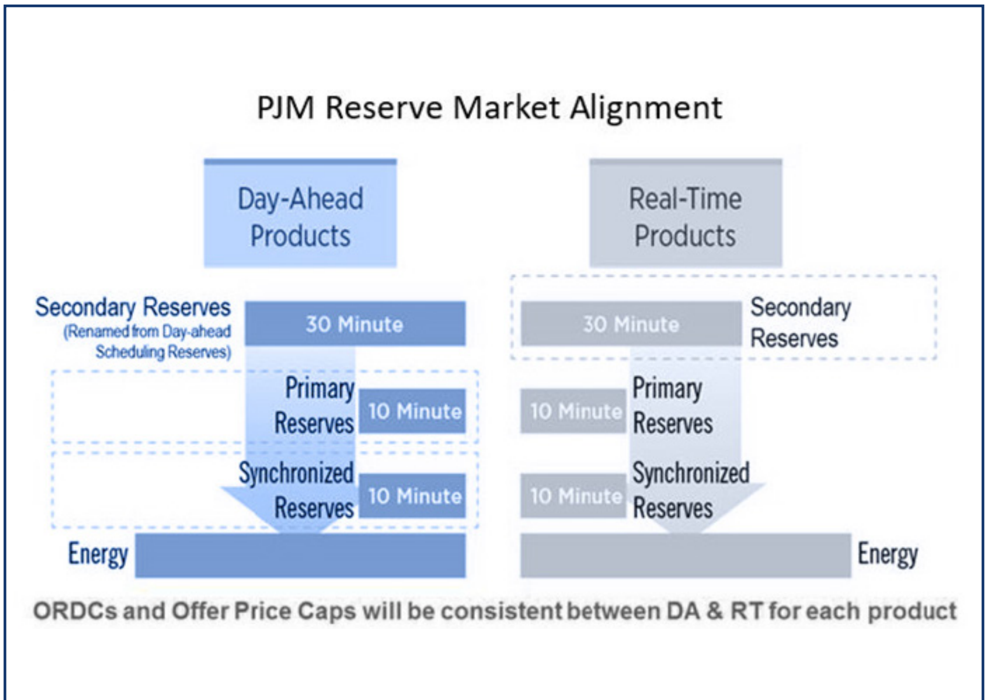
Bresler said renewable portfolio standards for D.C. and the RTO's 13 states call for adding 25,000 MW of wind and 12,000 MW of solar by 2034, adding a level of complexity to reserves that existing rules don't address. Ensuring reliability — and ultimately more competition and lower prices — depends on the reserve market reflecting the value of operator actions, Bresler said.

"There's ample evidence that our reserve pricing needs to be reformed," he told *RTO Insider* on Friday. In "41 out of the 48 hours of the polar vortex in January [2019], the price for synchronous reserve was at or near zero. To have the reserve price so close to zero, it doesn't really make sense."

Synchronized reserves are those able to provide power or remove demand within 10 minutes.

A Contentious Process

Despite meeting 23 times over 13 months beginning in January 2018, the Energy Price Formation Senior Task Force was unable to reach consensus. Tired of the stalemate, the PJM Board of Managers in December demanded staff move forward without member support if no consensus was reached by Jan. 31.



PJM's realignment of its reserve market under the proposal it filed with FERC | *PJM*

The Markets and Reliability Committee voted on five proposals in January, none of which cleared the two-thirds threshold required for a Section 205 filing under the FPA. Members protested the board's deadline as "arbitrary," but a last-ditch effort at compromise fell short on Feb. 6. (See *Last Gasp Bid on Energy Price Formation Falls Short*.)

The board agreed to submit staff's proposal in mid-February. (See *PJM Moves Forward with Own Energy Price Formation Plan*.)

Staff, however, did grant the unusual step of seeking feedback from stakeholders on the filing before submitting it to FERC. The March 14 meeting produced "helpful" input, said Bresler, who noted that staff asked the commission for an extended 45-day comment period to give members ample time to weigh in.

"Frankly, I hope we never have to use this [Section 206] process again," he said. "But we do think that it is beneficial to get stakeholder feedback, because they usually do point out things that are a benefit to clarify in the language."

American Municipal Power CEO Marc Gerken said on Wednesday he believed the board's deadline pressured staff into filing prematurely, leaving the door open for market flaws. (See related story, *Rushing Price Formation Filing Unwise, AMP Tells PJM*.)

He also criticized the RTO for tweaking the language in its proposal after the Jan. 24 MRC meeting. PJM posted slides detailing these revisions just 24 hours before the March 14 meeting, he said, which wasn't enough time to review and respond to such "significant" alterations.

Bresler disagreed with Gerken's characterizations of the process. "I think it's reasonable to expect that with a proposal like this there are many details that fall under the major components, if you will, that are in constant flux. You saw that with the voting process during stakeholder meetings," he said. "It's reasonable to expect that that's going to be the case. I think we were getting down to a level of detail that we needed to ensure that we had a complete proposal."

Section 206 filings come with no statutory deadlines, though PJM requested the commission rule by Dec. 15 in order for the RTO to implement changes by June 1, 2020. ■

PJM News

Rushing Price Formation Filing Unwise, AMP Tells PJM

By Christen Smith

American Municipal Power said Wednesday that PJM's rush to file its energy price formation proposal with FERC leaves the door open for design flaws.

AMP CEO Marc Gerken sent a *letter* to the PJM Board of Managers criticizing the RTO's "arbitrary" and "self-inflicted" deadline to implement a revised set of rules that a majority of stakeholders doesn't support. PJM filed its proposal Friday. (See related story, *PJM Files Energy Price Formation Plan*.)

"Broad review of all aspects of market changes is one of the primary benefits of the stakeholder process; a benefit PJM staff seems disinterested in availing itself of," Gerken wrote. "While PJM and stakeholders are often under tight timelines, that is not the case here. There is simply no need for PJM to rush ahead with this [Federal Power Act Section] 206 process."

AMP CEO Marc Gerken (left) and Larry Stalica, then of Linde Energy Services, at the 2017 PJM Annual Meeting | © *RTO Insider*

Section 206

The letter comes two weeks after PJM staff hosted a meeting with stakeholders reviewing the evolving *language* of its proposal, which they said would be filed by March 31. Nine sections to be added to the Operating Agreement had not yet been finalized, Gerken said, while manual revisions memorializing the changes had yet to be drafted.

Filing under FPA Section 206 allows PJM to submit a proposal that doesn't have stakeholder consensus. Stu Bresler, senior vice president of operations and markets, told stakeholders in February that staff would recommend the board submit the RTO's proposal to FERC after multiple compromise packages failed to garner enough support. (See *Last Gasp Bid on PJM Price Formation Falls Short*.)

Gerken argued that PJM's lack of preparedness suggests the stakeholder process could have carried on despite the Jan. 31 deadline for a compromise set by the board in December. (See *PJM Board Demands Action on Energy Price Formation*.)

"That this level of detail is still being developed should be a clear sign to the board that PJM was no more prepared than the rest of the stakeholders to act within the board's arbitrary deadline," he said. "Forcing a solution and an unrealistic deadline has resulted in PJM being forced to make an FPA Section 206 filing rather than a [Section] 205 that could have resulted from a reasonably managed process."

He also criticized staff's decision to let manuals determine key aspects of its proposal, saying "it does not strike the appropriate level of granularity that should be included in the Operating Agreement."

"Not addressing these components of PJM's proposal fails to give stakeholders the opportunity to understand and provide feedback on PJM's proposed changes," he said.

Undisclosed Changes

Gerken's letter further chastised PJM for making changes to its *proposal* after the Jan. 24 meeting of the Markets and Reliability Committee. He said staff posted PowerPoint slides detailing the changes online 24 hours before the March 14 meeting, some of which he described as "significant" alterations.

PJM presented the following changes to stakeholders during the meeting, including:

- Capping demand response procurement at 50% instead of the previously recommended 33%;
- Changing how equivalent demand forced outage rates are reflected in the operating reserve demand curve (ORDC);
- Recalculating lost opportunity costs for offline resources;
- Revoking market participants' ability to self-schedule resources as secondary or non-synchronized reserves;
- Changing real-time treatment of inflexible resources with a day-ahead reserve commitment; and
- Using the ORDC to calculate a secondary reserve nonperformance penalty.

"PJM had an obligation to inform stakeholders of such fundamental changes prior to voting at either the January MRC or the special [Members Committee meeting] that was called to vote on the consensus proposal," Gerken said.

An Unusual Step

PJM took an unprecedented step earlier this month when it convened a meeting to discuss the Section 206 filing with stakeholders. Typically, feedback isn't sought on 206 filings.

Dave Anders, director of stakeholder affairs, said staff decided to organize the meeting after members requested to view the proposed tariff revisions. Engaging stakeholders prior to filing with FERC is a lesson the RTO learned when implementing Capacity Performance rules, he said. ■

Company Briefs

Enmax Buying Emera Maine for $959M

Emera last week announced it had agreed to sell its Maine utility to Enmax for $959 million.

Enmax, which is headquartered in Calgary, Alberta, generates and sells power through its subsidiaries. Emera Maine is centered in Bangor, while its parent company is based in Halifax, Nova Scotia.

The sale is subject to regulatory approvals at the state and federal levels, but both parties said they expect the deal to close later this year.

More: *The Associated Press*

Dominion Closes 10 Power Plants, Sets Emissions Targets

Dominion Energy last week permanently closed 10 coal and natural gas plants in Virginia and pledged to cuts its carbon and methane emissions by 55% and 50%, respectively, by 2030.

The plants had been placed on reserve last year with the possibility of coming back online, according to a company spokesperson. Dominion CEO Thomas Farrell II made the announcement at the company's 2019 investor day in New York City.

Dominion will supplement the more than 2,000 MW of retired capacity with $6 billion to $7 billion to add more than 5,000 MW of solar in Virginia, the company said.

More: *S&P Global Market Intelligence*; *Richmond Times-Dispatch*

Report: Global 'Collapse' in Number of New Coal-fired Plants

The number of coal-fired power plants being developed around the world has collapsed in the last three years, according to a *report* released last week by nongovernmental organization Global Energy Monitor.

The number of plants on which construction has begun each year has fallen by 84% since 2015, and 39% in 2018 alone, while the number of completed plants has dropped by more than half since 2015.

The report also warns, however, of a possible coal plant resurgence in China, where satellite photos show developers have restarted work on dozens of suspended projects. Data from the International Energy Agency published last week show that global carbon emissions rose in 2018, with a young fleet of coal plants in Asia accounting for a third of the increase.

More: *The Guardian*

Large Corporations Form Renewable Energy Buyers Alliance

Walmart, General Motors, Alphabet, Johnson & Johnson, Facebook, Disney and Salesforce are among the corporations that last week formed the Renewable Energy Buyers Alliance (REBA), a trade organization to represent firms that purchase renewable energy.

REBA membership allows access to the Rocky Mountain Institute's Business Renewables Center and other tools to aid in purchasing renewable power. The group's CEO, Miranda Ballentine, is a former managing director of the BRC; the chair of its board of directors, Emily Cichy, is Disney's director of global public policy.

The group will hold its Spring Member Summit at Disney's Coronado Springs Resort in Orlando, Fla., May 7-9.

More: *CNBC*; *NPR*

Energy Transfer, Shell Agree to Further Develop Lake Charles LNG

Royal Dutch Shell and Energy Transfer Partners signed an agreement that "provides the framework to further develop a large-scale LNG export facility in Lake Charles," La., the companies announced last week.

The companies have started engaging LNG engineering, procurement and contracting firms on the project, but a final investment decision on the project has still not been made.

The Lake Charles LNG project was given final authorization to export gas in 2016, but the project has not moved forward. Shell acquired BG Group, the developer of the project, that same year, according to the project website. The project would convert an existing LNG import facility into an export site.

More: *The Advocate*

Federal Briefs

DOE Halts Use of ZTE, Huawei Tech

The Energy Department has stopped using products from Chinese telecommunications companies Huawei and ZTE because of cybersecurity concerns, Bruce Walker, assistant secretary of the department's Office of Electricity, said at joint FERC-DOE technical conference on security investments in energy infrastructure Thursday.

NERC CEO Jim Robb also said the organization had sent a nonpublic, all-points bulletin to more than 1,000 companies the day before via the Electricity Information Sharing and Analysis Center, warning them of the Chinese companies' technology "creating real risks for their systems."

Robb's disclosure came after Sens. Joe Manchin (D-W.Va.) and Angus King (I-Maine) *wrote* to him requesting information about NERC's efforts to protect the grid from supply chain vulnerabilities, particularly those posed by vendors from Russia and China.

More: *Politico*; *Politico*

Feds, Fishing Groups Sign MOU on Offshore Wind

The National Oceanic and Atmospheric Administration and Bureau of Ocean Energy Management last week announced they had signed a memorandum of understanding concerning offshore wind energy with the Responsible Offshore Development Alliance, a broad coalition of fishing industry groups and companies.

NOAA said the agreement hopes to bring fishing interests together with regulators "to collaborate on the science and process of offshore wind energy development on the Atlantic Outer Continental Shelf." Meanwhile, BOEM said wind energy developments must take into consideration how the projects could affect the marine environment and other industries.

More: *The Associated Press*

Democrats to Move on from Green New Deal

The Senate last week voted 0-57 to reject the Green New Deal, the nonbinding resolution introduced by Sen. Ed Markey (D-Mass.) that would have called for the U.S. to get 100% of its electricity from renewable resources by 2030. Most Democrats, including Markey, voted "present," with three joining Republicans in voting against it.

Democratic supporters of the resolution, including Rep. **Alexandria Ocasio-Cortez** (N.Y.), are said to be shifting their sights away from passing it and instead looking at multiple bills to advance the broader initiative. Corbin Trent, communications director for Ocasio-Cortez, said she will likely roll out individual climate bills instead of a comprehensive measure like the Green New Deal. The hope is that shifting to smaller bills will gain more support from moderate Democrats.

"We're now in the process where the hearings have started on the House side," Markey said. "Committee after committee have had the first hearings that haven't been held for eight years. And ideas and legislation will start emanating from committee after committee looking specifically at what has to happen."

More: *The Hill*

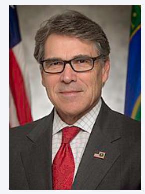
DOE Announces Solar R&D Funding

The Energy Department has selected up to $36 million in research projects aimed at advancing solar energy's role in strengthening the resilience of the electricity grid. Additionally, the department has announced up to $130 million for new research to advance early-stage solar technologies.

The hope is the projects will enable grid operators to quickly detect physical and cyber-based abnormalities in the power system and use solar generation to recover from outages without human control.

More: *Solar Industry*

Perry Defends Proposed Budget Cuts Before Congress



Energy Secretary **Rick Perry** last week appeared before both the House and Senate appropriations committees to defend President Trump's proposed budget cuts to his department.

The $37.1 billion budget request is a step up from last year's proposal, but it shows an 11% decrease in funding from fiscal 2019 enacted numbers. It includes $116 million to restart the licensing hearings on the department's application to build a permanent storage facility for high-level nuclear waste at Yucca Mountain.

Perry also appeared before Senate Armed Services Committee last week and confirmed media reports that the department has approved seven civil nuclear trade authorizations with Saudi Arabia over the past two years (though Perry misspoke and said it had approved six, according to a department spokesperson). The department has approved 37 nuclear applications since January 2017, including two for Jordan.

More: *WFED*; *Las Vegas Review-Journal*; *The Associated Press*

State Briefs

ARIZONA

Report: Rural Renewable Projects Contribute $9B to State Economy

A new economic impact *report* found that renewable energy development activity in rural areas of the state contributed more than $9 billion to the state's economy since 2000.

The Western Way, a conservative environmental group, examined the construction of 34 solar and wind energy facilities across the state between 2001 and 2017. In addition to a $9.4 billion boost to the economy, the projects created nearly 18,000 jobs and resulted in $16.7 million in state and local tax revenues, according to the report.

In 2018 alone, the plants contributed roughly $63 million to the state economy and supported more than 700 jobs, the report said.

More: *KTAR*

CALIFORNIA

PG&E Creditors Pitch $35B Plan

Pacific Investment Management Co., Elliott Management and Davidson Kempner Capital Management have been meeting with state lawmakers and stakeholders to discuss a proposal that would establish a $14 billion cash trust to pay for claims tied to Pacific Gas and Electric's role in starting deadly wildfires that forced the utility to declare bankruptcy, people familiar with the matter told Bloomberg last week.

The utility is facing liabilities that could exceed $30 billion from fires its equipment may have caused. Under the plan, PG&E would be recapitalized through contributions of $8 billion, allowing the company to refinance its debtor-in-possession loan and other maturities. In the end, $18.5 billion in funds would be provided by the creditor group with another $2 billion from insurance proceeds.

The plan would also establish a statewide wildfire fund of at least $13 billion that would be financed by PG&E, other state utilities, bonds and other funding sources.

More: *Bloomberg*

ILLINOIS

Ameren Eager to Add Electric School Buses to Territory

Ameren Illinois is hoping schools in the central and southern part of the state will follow the lead of Chicago, whose schools were awarded roughly $750,000 last year from the state's settlement with Volkswagen to pay for electric buses.

The utility has been co-hosting a series of webinars and in-person meetings aimed at educating district officials downstate on the benefits of electric buses, as well as state funding opportunities.

Experts say electric buses offer health and environmental benefits for riders and are especially appealing because they have the potential to serve as grid resources when they are not in use. Electric buses cost about $300,000, while diesel ones are usually closer to $100,000. The state Environmental Protection Agency has also dedicated $10.8 million to help purchase electric buses.

More: *Energy News Network*

MAINE

Mills' Hometown Votes to Oppose Tx Project

Gov. **Janet Mills**' hometown of Farmington last week voted 262-102 to rescind a letter

of support for the New England Clean Energy Connect transmission project that would run through the town.

Residents rescinded a July 25, 2017, letter in which the board of selectmen supported the project. In addition to rescinding the letter, the town also chose to straight up oppose the project instead of remaining neutral. The vote was held after 50 minutes of heated discussion, with Mills in attendance and appealing to the town for support of the project.

Farmington has a population of about 7,500 people and is the largest town along the corridor to reverse support for the project.

More: *Bangor Daily News*

MASSACHUSETTS

DOER Sets Specifics for 2nd Offshore Wind Procurement

The Department of Energy Resources, along with Eversource Energy, National Grid and Until, have filed documents with the Department of Public Utilities to initiate a procurement of up to 800 MW of offshore wind power.

A 2016 law authorized up to 1,600 MW of offshore wind power, with Vineyard Wind securing the first 800-MW contract earlier this year. The renewable energy law requires bidders come with lower prices in the second procurement, but officials said are going to be flexible because they view Vineyard's winning bid as a competitive price.

The time frame for the second procurement calls for bids to be submitted in August, project selection in November and the signing of a contract by the end of the year.

More: *State House News Service*

MICHIGAN

DTE Preparing to Close Multiple Plants Ahead of Schedule

DTE Energy last week filed an integrated resource plan with the Public Service Commission that details its plans to close the St. Clair Power Plant and the Trenton Channel Power Plant in 2022, one year ahead of schedule. The River Rouge Power Plant also will be retired in 2022.

The utility also announced it will reduce carbon emissions by at least 50% by 2030, surpassing its previous carbon reduction commitment of 45% by that year.

DTE will more than double its renewable energy production over the next five years, according to the company. By the time DTE removes all coal from its generation fleet in 2040, its renewable energy portfolio will have quadrupled, it said.

More: *DTE Energy*

NEVADA

NV Energy Aims to Lure back, Keep Customers amid Exodus

NV Energy hopes to roll out a new rate option for government entities and large commercial customers that is cheaper and solar-based, according to documents filed with the Public Utilities Commission late last month.

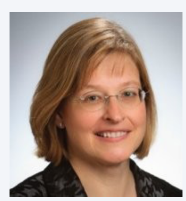
The proposed program, NV Energy Optional Pricing Program Rate, is "intended to stem the tide of departures" and would charge a fixed rate (replacing the current variable energy rate) that's based on costs from renewable resources. The PUC will hold a hearing on the proposal June 4.

Six companies have officially exited NV Energy since 2005. In 2018, 10 companies began making moves to leave the utility, while three entities have formally submitted documents to begin the process of departing already this year.

More: *Las Vegas Review-Journal*

NEW YORK

NYISO Names Teresa Marrinan to Board of Directors



NYISO last week announced the selection of **Teresa Marrinan** to its Board of Directors, effective April 15.

Marrinan has 35 years of energy experience, most recently serving as founding partner of Hanover Strategy Advisors, where she advises a variety of clients on energy strategy, financial, regulatory and market issues.

"Teresa brings a diversity of experience and knowledge essential to the board and the future of the competitive wholesale electric markets," Chair Ave Bie said. "We welcome her perspective and look forward to the expertise she brings."

More: *NYISO*

TEXAS

TRE to Fill Generation Vacancy

The Texas Reliability Entity's Board of Directors last week approved an election to fill a vacancy on its Member Representatives Committee, which advises the board on developing regional reliability standards, administrative matters, funding mechanisms and other issues.

The board's approval during a Wednesday conference call will allow the MRC to fill a vacancy among the two generation representatives after a recent departure. The committee hopes to have its full complement of 11 members seated for TRE's May board meeting.

The board also approved terminating TRE's 457(b) retirement plan before adjourning into executive session. The plan was made available in January 2017 but had yet to attract a single participant.

WISCONSIN

We Energies Proposes 5.9% Rate Increase

We Energies is seeking approval from the Public Service Commission to increase its electric rates by a total of 5.9%, or about $72/year for the typical residential customer, by 2021 after having kept rates the same for four years. The company has also asked for a 1% increase in natural gas rates.

WE asked that it be allowed to earn a 10.35% return on equity, up from 10.2%. Ted Eidukas, vice president of regulatory affairs for parent company WEC Energy Group, said the higher return was justified by the increase in interest rates.

The PSC has allowed WE to defer including certain costs in its electric rates, instead allowing the shortfall to build up in escrow accounts. The company has proposed now including those costs — which involve transmission expenses and a coal-fired power plant in Michigan's Upper Peninsula — in its rates.

More: *Milwaukee Journal Sentinel*