

Largest US Electric Grid Organization Addresses COVID-19

Editor's Interview with Manu Asthana, President & CEO of PJM



Manu Asthana oversees the largest power grid in North America and the largest electricity market in the world. He has extensive leadership experience across the electricity industry, including power generation operations, optimization and dispatch, competitive retail electricity, electricity and natural gas trading, and risk management, which he acquired over more than 20 years in the industry. He formerly served as President of Direct Energy Home in North America, where he led a team of over 2,600 to combine the company's retail electricity and home-services businesses, creating a leading energy and home-services provider serving over 3.4 million customers. He previously

led power generation operations at Direct Energy, energy trading at both Direct Energy and at the TXU group of companies, as well as generation optimization and dispatch at TXU. In addition, Mr. Asthana also served as chief risk officer of TXU Corporation, where he helped senior management and the board quantify and manage risk in TXU's businesses. Mr. Asthana earned a Bachelor of Science in economics from The Wharton School at the University of Pennsylvania, where he was a Benjamin Franklin Scholar and a Joseph Wharton Scholar. He was interviewed by *JCIP* Editor Richard Krieg in September 2020.

Krieg You oversee a regional transmission organization (RTO) that coordinates the movement of wholesale electricity in all or part of 13 states and Washington D.C. In the composite, it's the largest power grid in North America—and the largest electricity market in the world. Could you describe PJM's organizational dimension?

Asthana PJM Interconnection is a membership organization, providing services on a revenue-neutral basis to more than 1,000 members. Our membership represents five sectors: generation owners, transmission owners, electric distributors, other suppliers, and end-use customers. PJM members share the benefits of power pooling (access to electricity resources across a broad geographical region) and competitive wholesale electricity markets. PJM members have a vote in the PJM stakeholder process—a thorough governance system designed to work through issues related to operations, markets, planning, and other matters—and recommend proposals to our Board of Managers. PJM and its Board of Managers are fully independent from our members; we are technology- and fuel-neutral, and do not own or maintain any transmission or generating assets.

Krieg PJM Board of Managers Chair Ake Almgren announced last November that you were appointed President and CEO, effective January 6 of this year. The announcement happened a few weeks before the first case of COVID-19 was known. So your first six months at PJM coincided with a worldwide pandemic ... what's that been like?

Asthana It has been fascinating and humbling. When I showed up, I wanted to make a difference, but I have learned from experience that you don't always get to select the way you can make a difference. The script gets written, and each of us has to rise to the occasion. That is what I have aspired to do, and what I believe my people have been doing. To say these are unusual times is an understatement. When I started as PJM's CEO, I never dreamed that inside of two months we would be facing this global health crisis. During the first week of January, which, as you say, was also my first week on the job, I had a discussion with my team about the coronavirus. By mid-January, we had made the call to limit all international travel to and from our campus in Valley Forge, and later to restrict business travel by our staff.

On March 13, we started telecommuting in the face of the worsening pandemic. Only essential workers have been back to campus since that day. Right now, we are focused on ensuring the secure, reliable, continuous operation of the grid while keeping our employees and our members safe. It's been quite an experience, and certainly a privilege to work with this great team, which includes the many member companies who work with us in tandem to generate and deliver the electricity that powers modern life.

Krieg So far, have any generation or transmission resources under your pur-

view experienced a major incapacity directly or indirectly related to the pandemic?

Asthana No, they have not. Through all of this, I am really pleased to share that grid operations remain uninterrupted. Reliability is my number-one priority, and PJM continues to rise to that challenge—so that is one thing our region doesn't have to worry about amid so many other fierce challenges around us.

At the same time, we have kept in close communication with our members, trying to act as a facilitator for best practices during the pandemic—whether it be in managing social distancing in the field, dealing with supply chain challenges or coordinating with health authorities to ensure that members have access to coronavirus testing for critical control room personnel.

And I also want to recognize the often extraordinary efforts of our members—from transmission and generation owners to local utilities and public power entities—to maintain the reliable flow of electricity to hospitals, home offices, and to every county emergency response center that has been called to action in these times.

Krieg Like nothing before it, the pandemic illustrates how much modern society relies on electric power. In fully a quarter of the states and the District of Columbia, PJM enables citizens to stay at home, maintain online communications and powers businesses and new business models. Uninterrupted power supply is critical for modern hospitals, among the heaviest commercial power users. From a CEO perspective, in what ways did the pandemic impact “business as usual.”

Asthana The most important thing to remember about events of this magnitude is that they are bound to impact you in ways you had not previously imagined, so flexibility better be one of the skills your organization has honed over the years. The sudden, disruptive, and now long-lasting shift away from working on campus was a huge change for employees and members. Since March 13, most employees have been working remotely—that's more than 90 percent of our workforce. It's a big change for all of our people, and for the people we serve, and we have been working hard to make sure that everyone has what they need to thrive in a new—and sometimes very challenging—work environment.

For those essential workers remaining on campus, we made a number of changes to our dual control rooms, most notably, creating a third control room and sequestering a team of operators for a period of time.

Each of these presented technical and logistical challenges, such as the availability of COVID-19 testing for our operators. Although we have fewer people on campus, operating on campus presents its own set of logistical challenges to operate safely, following the building and business safety guidelines issued by the PA Secretary of Health and Centers for Disease Control and Prevention (CDCC). PJM's Incident Response Team, which includes members of the Security, Business Continuity and Safety teams, is responsible for managing the day-to-day logistics on campus to meet those challenges and to maintain continuity of business operations, which is paramount through this pandemic.

We also continue to operate with security officers as well as mechanics from the Facilities Department on campus 24/7. Similarly, with those working off campus, communication is key. Specialists from our Human Resources Department conduct wellness calls, and our managers are making extra efforts to make sure that everyone is being included every day. Everybody's situation is different, but they need to feel part of the PJM community. Also, the onboarding of new employees hasn't stopped, and we've needed to find ways to recruit new talent and train new hires—in many cases, people who have never been to our campus—and get to know them in a new way. Onboarding people in a virtual space can be very tricky, but we've been able to do it pretty effortlessly, thanks to the efforts of our HR Team, which has been among the busiest of all our departments during the pandemic.

PJM has extended its current work-from-home posture until January 2021 because of increasing COVID-19 cases. The campus will remain closed to members, stakeholders and other visitors, and PJM will continue to hold stakeholder meetings virtually until at least that time. From the beginning, PJM has been flexible in our return-to-campus plan. Our three-stage (red, yellow, green) approach mirrors Pennsylvania's phased plan. At any time, changing virus conditions may result in a return to actions and precautions implemented during prior phases. When employees and visitors do return to campus, they will be noticing a number of changes, including temperature kiosks, designated entry and exit doors, Plexiglas barriers in public areas and masks being worn and available. We are not doctors or experts in public health, so we hired an epidemiologist to help guide us in our conversations and decision-making. She is reviewing our pandemic measures including our return-to-campus plans, facility set-up and social distancing policies going forward.

Krieg Were specific actions taken in systems operations, control centers, backing up shift operators and the like?

Asthana We have had a pandemic plan in place since 2006. A priority for us, in that plan, is to protect the operators—the people who actually dispatch and monitor the flow of power from our control centers. We have two control rooms at two separate locations, completely redundant. We immediately isolated the two control rooms, from each other, so people were not traveling from one to the other.

While we work really hard at envisioning and preparing for thousands of scenarios that can affect grid reliability and security, COVID-19 has brought challenges that no one expected. We took a number of measures early on to keep our control room operators safe. This included establishing designated entrances and exits and transitioning to longer shifts. We also set up alternate workstations within the control room to maximize social distancing. All access to the control room was suspended except for control room staff.

In addition, we set up staging areas for arriving operators while their workstation is cleaned in order to limit contact between dispatchers between shifts. We are disinfecting control rooms daily and sanitizing operator workstations prior to and after each shift. We've also minimized the use of shared equipment like headsets. Another important step was to encourage operators to self-quarantine when not on shift and to conduct a self-observation checklist including twice daily temperature checks before coming on shift.

Most notably, we constructed a third control room on one of our campuses in a physically separate structure to be populated by a sequestered team of operators. On April 11, PJM began sequestration of that team, who worked and lived on campus in RVs until June 23. These operators were tested before going in and went in together. While sequestration has ended, we have retained the third control room and campuses as sequestration-ready. In addition and going forward, we and others have identified the need for a “deeper bench” of trained operators who may be working in other positions, but maintain their certifications and would be able to work in case of a mass infection of control room workers.

Krieg What about coordination with generation resource managers? How did you obtain information from these owners on how the pandemic was impacting individual company operations? Did this include considering worst case pandemic scenarios, and, if so, what were the findings?

Asthana Coordination of maintenance has been a big focus for us. Early on, PJM Operations led an outreach effort to the transmission and generation owners to better ascertain what to expect and best plan for the upcoming

ing system conditions. At the time, we were in the “shoulder season” when the warmer weather brings lighter demand for power. This is the time of year when companies schedule routine, planned outages of plants, transmission lines and facilities for required maintenance. Those outages restrict, temporarily, grid capacity. In some instances, about one in four, companies selected to shorten the duration of this maintenance or defer activities until the fall shoulder season.

Coordinating these outages and facilitating this communication has been a key function at PJM through the pandemic. It was important for PJM to have this information in order to avoid outages cascading from week to week and running into peak summer season, which could possibly compromise reliable operations. PJM doesn’t allow planned outages for the peak summer months. We have found that transmission impacts as a result of COVID-19 have been minimal.

Generation impacts as a result of COVID-19 also have been minimal. Generation owners showed flexibility early in dealing with maintenance outages. Work that was deferred to later in the spring was completed, and other work was pushed to the fall or 2021. Initially, about 20–30 percent of planned outages were deferred, and 5 percent canceled. Some generators reported some crew shortages due to travel restrictions and also impacts to parts supplies.



Krieg On a related issue, how has your information technology infrastructure worked so far to support employees working remotely?

We have had to re-imagine some of our processes, but we were positioned well from the outset. We have a 24/7 technology operation center—essentially, it’s “the grid that runs the grid.” We don’t usually spread this team into another geographic location, but when the pandemic required social distancing, we needed to move some employees elsewhere. As luck would have it, the back-up space we normally would move them into had been turned into our third control room. So we had to stand up another room, transport all the necessary equipment, and make sure our operators were safe and functioning.

A challenge particular to our technology infrastructure is that while software and updates may be executed remotely, fixes to hardware require a personal touch. So we were very thoughtful and focused regarding our planning—how many visits can we consolidate? This thought process enhanced our efficiency and effectiveness and is a lesson that we will take beyond the pandemic.

These were process-oriented challenges, however. As far as our technology infrastructure itself goes, we were prepared through our business continuity plan to engage employees remotely, and it worked. In fact, the first day the majority of our staff worked from home, March 13, was simply a test of the plan. Over that weekend, however, the CDC revised its guidelines, and we made the decision to continue that stance until it was safe to return to campus.

Krieg Consolidated Edison in New York has reported increases in vendors targeted by ransomware and higher email intrusion attempts during the pandemic. With telecommuting and other factors, did the nature or level of cybersecurity threats change for PJM?

Asthana There is definitely an elevated threat environment for cybersecurity. We are seeing people using this crisis to try and break into systems, which is typical—attacks tend to increase during times of potential vulnerability. All of us have to be really vigilant about all of that. That requires collaboration between industry and government. Our government partners have been fantastic in sharing real-time information as well as best practices. It will continue to be an area of focus.

We were well positioned with our workforce, because everyone uses PJM-issued devices that allow us to manage all security controls. We did not need to rush to put anything out there which we were not able to

secure. So that was good. PJM already deploys a continuous, robust spear-phishing campaign, but we stepped that up as we saw more phishing attempts related to the pandemic.

One ongoing challenge is that a lot of collaboration tools are cloud-based. When we need to start enabling collaboration for market-sensitive tasks, it's critical to be very vigilant in terms of security risks. This has accelerated the work of our security and architecture teams. So, truly from an operations perspective, the transition to a remote workforce was mostly seamless. Cloud-based solutions and technologies will now be a big focus for our security team, so we can use those technologies but maintain a strong cybersecurity posture.

Krieg Did stay-at-home orders or other pandemic factors in the various states where you operate impact daily peaks, energy demand or load patterns?

Asthana All of those things. As industry paused and more people began working from home, power demand moved from commercial to residential customers. Usually that load is about evenly split. That makes a difference in the summer, particularly because residential air conditioning is considerably less efficient. The time of day people were using power changed, because, for example, some of the commute evaporated. And this varied across the footprint, because, as you know, different localities moved with differing degrees to first shut down and then reopen their economies.

In order to try to isolate the effect of pandemic-related behavior, PJM has been analyzing electricity demand by using traditional forecast models to “back-cast” expected loads and plugging in the actual temperatures, so that the models’ forecasts for weather are perfect. Since late March, power demand has dropped about 7 percent from what we would typically expect. On the weekends, the drop is closer to about 3 percent. The most significant peak impacts took place in the first half of May, when power demand was down 11–15 percent. As of August, with increased economic activity and somewhat loosened social restrictions, peaks were coming in generally less than 5 percent under what we would have expected. Weekdays continue to be impacted more than weekends for both peaks and energy usage. In general terms, the COVID-19 virus has smoothed out peaks compared to traditional hourly load patterns of late winter/early spring.

Krieg Finally, from your CEO perspective, what’s been learned so far by the energy industry as the COVID-19 pandemic continues?

Asthana One thing we learned is that the availability of testing for COVID-19 impacted our ability to sequester operators and our timeline to do so. We had to wait until testing was available, and then again until the results had come back. Ideally, we would have tested everyone again once they were sequestered, but the lack of available tests made that impossible.

We also realized the importance of keeping up training for employees who have the ability to work in the control room, but who may currently be in other positions—to have certified operators on the bench, so to speak. Through all of these efforts, we have remained in close communication with industry, government, other RTO/ISOs and member companies to share best practices and learn from our collective experiences. We have kept a Best Practices document that we update regularly, so that our members and industry partners can share in the knowledge we have acquired since this all began.

At PJM, we talk a lot about resilience—the ability to plan for, recover from and work through events that are beyond the scope of our regular emergency preparations—as we strive to ensure reliable grid operation through any and all conditions. Now, we are living it. And we are seeing what we knew from experience—to expect the unexpected. We will come out of this pandemic with many lessons on how to confront a new, never-before-experienced phenomenon that challenged many of our previous assumptions. And we will be better for it.