

## **OPERATIONAL STRATEGIES FOR ROLLING BLACKOUTS AND BROWNOUTS**

*(Week of July 18, 2022; meetings held virtually and at the Central Receiving Building)*

### **How and when did the discussion of controlled grid outages start?**

- In June, F&S received messages from the Midcontinent Independent System Operator (MISO), which operates the high-voltage grid across the middle of the country.
  - MISO indicated that the organization might have difficulty meeting demand over the summer (not enough power) at peak capacity times due to a lack of available generation in certain sections of their footprint.

### **Why is there a need for an operational response and a curtailment plan?**

- Utilities & Energy Services (UES) is planning to be prepared for the potential variability of grid conditions and ensure support for research and education activities.
  - F&S will strive for the least amount of impact to campus customers if an occurrence happens.
- The starting point for these discussions is identifying loads that can be shed and which loads must be maintained, if possible, due to their critical nature.
  - That is why UES is reaching out to stakeholders to help identify these items.
  - This will be a long-term effort, leveraging the expertise of campus to assist UES.
- Campus has not experienced this before – campus has had Energy Alerts for peak usage periods and capacity charges, but never the need for a comprehensive contingency plan.

### **What is the initial framework for the operational strategies and energy reduction efforts?**

- Thus far, UES has outlined a sample plan that seeks to identify procedures to reduce electrical load on campus.
- This includes protocols for protracted electrical energy shortages in the MISO region that would be implemented in a way that is as fair as possible to everybody on campus.
- The curtailment plan has five steps, which require unit and individual occupant action:
  - (1) Voluntary
  - (2) Voluntary – 5% uniform among all U of I consumers
  - (3) Mandatory – 5 to 15% uniform again;
  - (4) Mandatory – 15%
  - (5) Mandatory – 15% plus possible feeder building isolations

- This plan will combine and synchronize with the additional work that UES will do with academic and administrative units to identify how campus can shed load during a controlled outage.
  - This proactive planning will help UES optimize processes on campus and shed loads as efficiently and safely as possible.
- Units need to start getting departments and teams together to develop action plans.
  - Does it help if you turn out your lights? Yes, any energy we do not use results in a more sustainable campus and will help the university in this effort. For example, if we turned off all the lights on campus, there may be enough load shed to meet some of these requirements.
  - As we have emphasized in our Energy Alert, Freezer Challenge, and Energy Conservation Incentive Program messaging, everyone can make a difference, and small combined efforts can make a significant impact. Every little bit adds up to make a big impact.
- If there is an upcoming grid outage, F&S will use all of the available campus communication methods to make the campus community aware of the need to activate planning efforts (massmail, Eweek, website, social media, and digital signage as applicable).
- It is important to get this message to everyone on campus; this is the time of preparation (we have time now, but unless something significant changes the outlook for these types of events is not going to improve long-term).
  - This is likely to become an even bigger challenge in future years.
  - UES is staying in contact with Ameren and MISO for the latest information.
  - Right now, UES doesn't know how much lead-time the organization would receive as a market participant if a grid outage occurred.
  - It could be a week, or same-day (a couple of hours) based on some of the previous market factors.

**What will be the F&S reduction strategies also utilized during these periods?**

- On the production side, UES will take steps to conserve or shift load.
  - Things can be done to lessen that burden, such as using the Thermal Energy Storage tank to cool water at off-peak periods and then using it when most needed.
- The peak times on the grid have typically been late July and August, although last year it happened in June. There were similar concerns due to severe weather the previous winter.
  - If any generation goes offline in MISO, then controlled outages could also happen unexpectedly at any time.
- As we continue to electrify more items as a society, we will continue to see these challenges emerge as the grid continues to transform.
  - For this reason and other contributing factors, you are seeing periods of the winter become a factor regarding peaks on the grid.
- The focus will be on determining how we can ramp up energy conservation efforts while also increasing on-site production and distribution to stabilize our overall energy load during these periods.

- If the university can demonstrate we are not a load on the grid, then that will be a positive factor should these conditions arise.

### **When are the peak periods likely to happen, and how much advance notification will the university receive?**

- In these situations, Ameren is looking at the large users first. If they get into a grid emergency, addressing the larger issues will stabilize the grid faster.
  - If the university can show that we are not a strain on the grid, then more than likely Ameren will look elsewhere to take action.
- The electrical peak occurs in the summer and is driven by A/C driven by large chillers – the evening is stable 40-45 MW (in general, 1 MW is ~ 1,000 homes).
  - When school is in session, the university peaks between 3-5 p.m. The load goes from 40 to 70 MW and then drops right back down to 40-45 MW (winter curb is similar with 35 MW and then peaking to 50MW).
  - Ameren’s load curve is very similar – slightly later than ours because of industrial operations continuing – more like between 4 p.m. and 7 p.m. when the peak occurs.

### **How do emergency generators factor into these reduction strategies?**

- Most building generators do not back up power to the mechanical systems but rather for lighting and other critical loads.
- F&S requests that units let us know where they have emergency generation in place and how much power would be supplied by that equipment.
  - F&S also has some limited ability to support emergency generation requirements.
  - Again, that is why these ongoing discussions are so important to identify what options exist and what might be possible.
  - Emergency generators are not to be used for load shedding situations as they are designed as a means of last resort during critical times.

### **What precautions are being made to help protect the university’s many animal care facilities?**

- There is a lot of liability and risk when it comes to animal facilities --- testing would be necessary to ensure power reliability during these potential conditions.
- The university is legally bound to report to the federal government when animal welfare is potentially compromised.
  - Fans shutting off at animal facilities would be significant and a critical issue.
  - Animals kept inside need ventilation.

### **What other items are important to note about this initial effort?**

- Campus leadership is aware of the situation, and F&S is keeps the Office of the Chancellor and the Provost’s Office updated regularly.

- Leased space is not on the campus proper; those facilities aren't directly connected to the university's grid (however, all are connected to the Midwest grid).
  - Anything done in these areas can be helpful as well to the overall effort.