Operational Strategies for Rolling Blackouts and Brownouts

Planning, Academic, and Administrative Unit Efforts and Communications

Introductions

F&S Utilities and Energy Services

- Robert Roman, Director of Utilities and Energy Services
- Mike Larson, Associate Director of Utilities Production
- Sushanth Girini, Utilities Distribution Management Engineer
- David Hardin, Associate Director of Energy Management Systems (EMS) Controls
- Paul Foote, Energy Efficiency & Conservation Specialist

Rolling Blackouts and Brownouts

- What are they?

  A brownout is a reduction in or restriction on the availability of electrical power in a particular area. A blackout is a failure of electrical power supply.

- Why are we talking about them?

  In April, the Midcontinent Independent System Operator (MISO) announced that projected electric capacity shortfalls in the organization's north and central regions this summer might leave those areas at increased risk of temporary, controlled outages.

- How are we mitigating our risk?

  Facilities & Services is updating operational strategies designed to meet the university's energy needs should those situations arise. Methods will include performing urgent contingency planning as necessary.

Curtailment Plan

- Identifies procedures to reduce electrical energy load on campus
- Includes protocol for protracted electrical energy shortages in the MISO region
- Procedures are initiated and implemented by F&S in a nondiscriminatory manner with consideration of essential service requirements from U of I Stakeholders
- Goal is to effectively administer and achieve curtailment while providing fair and equitable treatment to U of I stakeholders, minimizing adverse impacts to faculty, staff, and students, and complying with State laws and regulations

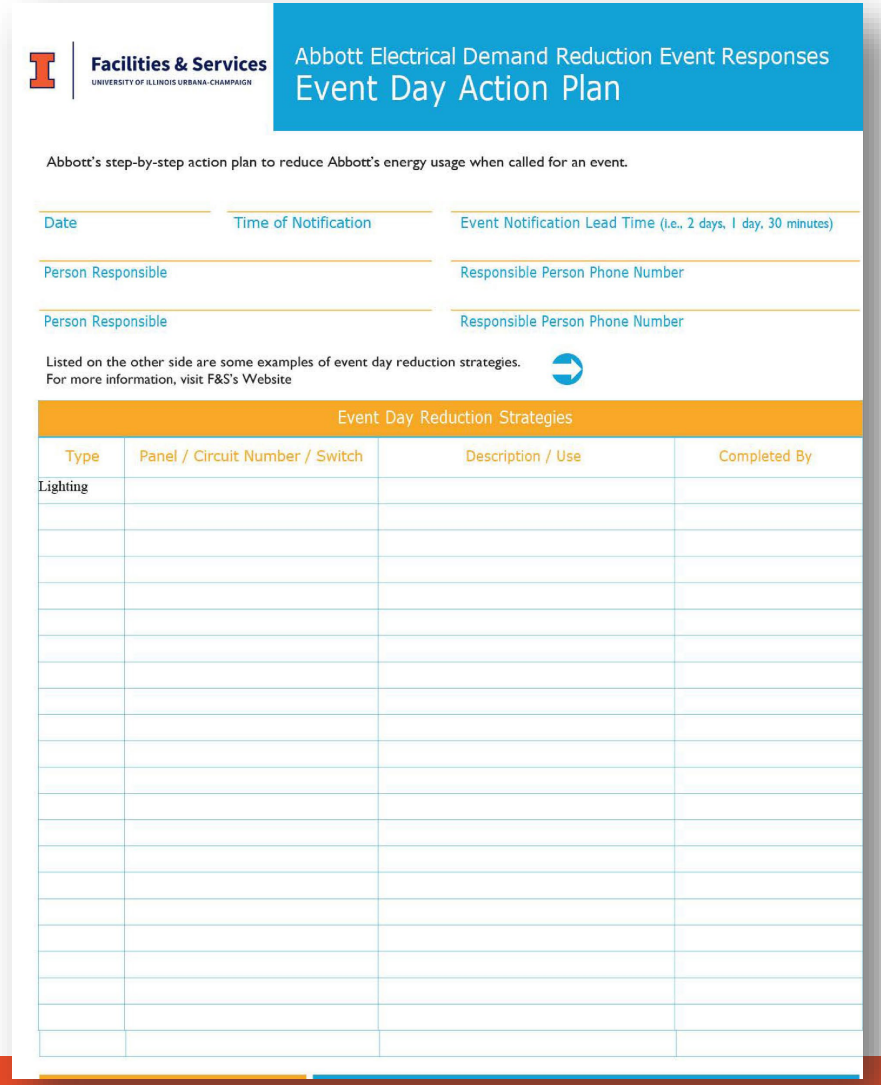
OPERATIONAL STRATEGIES (*Sample Plan*)

STAGE	ACTION TYPE	PERCENTAGE LEVEL	CURTAILMENT
1	Voluntary	None specified	Uniform among all U of I Consumers
2	Voluntary	5% +	Uniform among all U of I Consumers
3	Mandatory	5% to 15%	Uniform among all U of I Consumers
4	Mandatory	15%	Uniform among all U of I Consumers
5	Mandatory	15% plus possible feeder and building isolations	Uniform among all U of I Consumers plus F&S actions including forced feeder and building isolations and possible blackout outs.

Stage 1:	F&S will commence or continue communication of curtailment info to U of I Consumers. As appropriate, F&S will assist in briefing the media about the shortage.
Stage 2:	F&S will (a) notify Consumers of the percentage level of voluntary curtailment; (b) provide curtailment information to Consumers; (c) answer Consumer questions about curtailment; (d) provide curtailment reports; and (e) provide more detailed information to the media than provided in Stage 1.
Stage 3:	F&S will (a) notify Consumers of the percentage level of mandatory curtailment; (b) calculate weather-normalized Base Billing Period data and Curtailment Targets for all Consumers; (c) provide Curtailment Targets to all Consumers who request such data; (d) provide Consumers with information about how to notify F&S of essential service requirements.
Stage 4:	F&S will notify Consumers of any applicable changes in mandatory curtailment.
Stage 5:	F&S will collaborate with U of I stakeholders to develop and implement the most effective methods for securing the required load curtailment and to minimize the economic and human hardships of the last stage of load curtailment, which is feeder and building isolations.

Event Day Action Plans

- Each U of I college, department, and/or building has been asked to develop an Event Day Action Plan to identify strategies that will be implemented when called upon to shed load
- F&S will notify the campus community of possible grid outages through various media types
  - Specific to college, department, or building groups
  - Massmail system
  - E-week and other departmental media
  - Social media as necessary



Facilities & Services
UNIVERSITY OF ILLINOIS URBANA-CHAMPAIGN

Abbott Electrical Demand Reduction Event Responses
Event Day Action Plan

Abbott's step-by-step action plan to reduce Abbott's energy usage when called for an event.

Date | Time of Notification | Event Notification Lead Time (i.e., 2 days, 1 day, 30 minutes)

Person Responsible | Responsible Person Phone Number

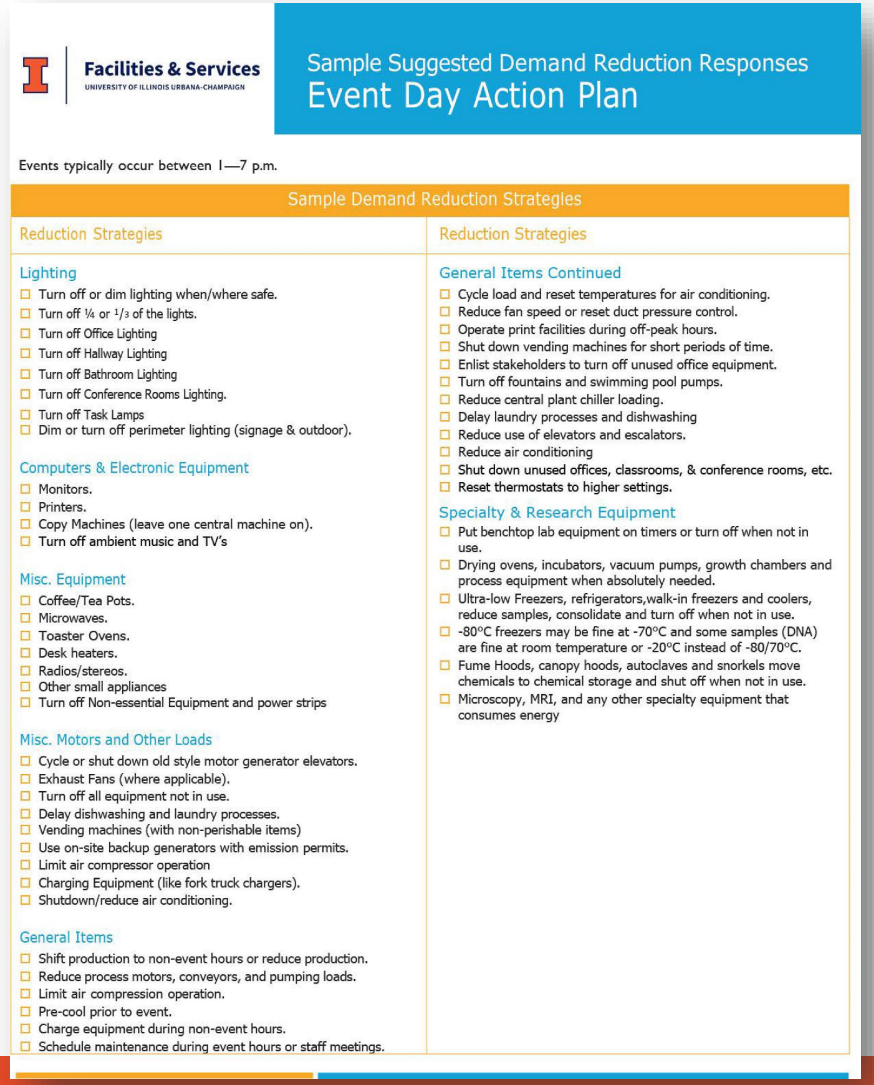
Person Responsible | Responsible Person Phone Number

Listed on the other side are some examples of event day reduction strategies.
For more information, visit F&S's Website

Event Day Reduction Strategies

Type	Panel / Circuit Number / Switch	Description / Use	Completed By
Lighting			

- Identification of critical equipment that must remain in operation is as important as identification of non-essential equipment that can be shut down to shed load
- Examples of load shedding include:
  - Turning off or dimming lights
  - Turning off non-essential equipment and power strips
  - Shutting down unused offices, classrooms, conference rooms, etc.
  - Shifting schedules (flattening the curve)



Facilities & Services
UNIVERSITY OF ILLINOIS URBANA-CHAMPAIGN

Sample Suggested Demand Reduction Responses
Event Day Action Plan

Events typically occur between 1—7 p.m.

Sample Demand Reduction Strategies

Reduction Strategies

Lighting
- ☐ Turn off or dim lighting when/where safe.
- ☐ Turn off ¼ or 1/3 of the lights.
- ☐ Turn off Office Lighting
- ☐ Turn off Hallway Lighting
- ☐ Turn off Bathroom Lighting
- ☐ Turn off Conference Rooms Lighting.
- ☐ Turn off Task Lamps
- ☐ Dim or turn off perimeter lighting (signage & outdoor).

Computers & Electronic Equipment
- ☐ Monitors.
- ☐ Printers.
- ☐ Copy Machines (leave one central machine on).
- ☐ Turn off ambient music and TV's

Misc. Equipment
- ☐ Coffee/Tea Pots.
- ☐ Microwaves.
- ☐ Toaster Ovens.
- ☐ Desk heaters.
- ☐ Radios/stereos.
- ☐ Other small appliances
- ☐ Turn off Non-essential Equipment and power strips

Misc. Motors and Other Loads
- ☐ Cycle or shut down old style motor generator elevators.
- ☐ Exhaust Fans (where applicable).
- ☐ Turn off all equipment not in use.
- ☐ Delay dishwashing and laundry processes.
- ☐ Vending machines (with non-perishable items)
- ☐ Use on-site backup generators with emission permits.
- ☐ Limit air compressor operation
- ☐ Charging Equipment (like fork truck chargers).
- ☐ Shutdown/reduce air conditioning.

General Items
- ☐ Shift production to non-event hours or reduce production.
- ☐ Reduce process motors, conveyors, and pumping loads.
- ☐ Limit air compression operation.
- ☐ Pre-cool prior to event.
- ☐ Charge equipment during non-event hours.
- ☐ Schedule maintenance during event hours or staff meetings.

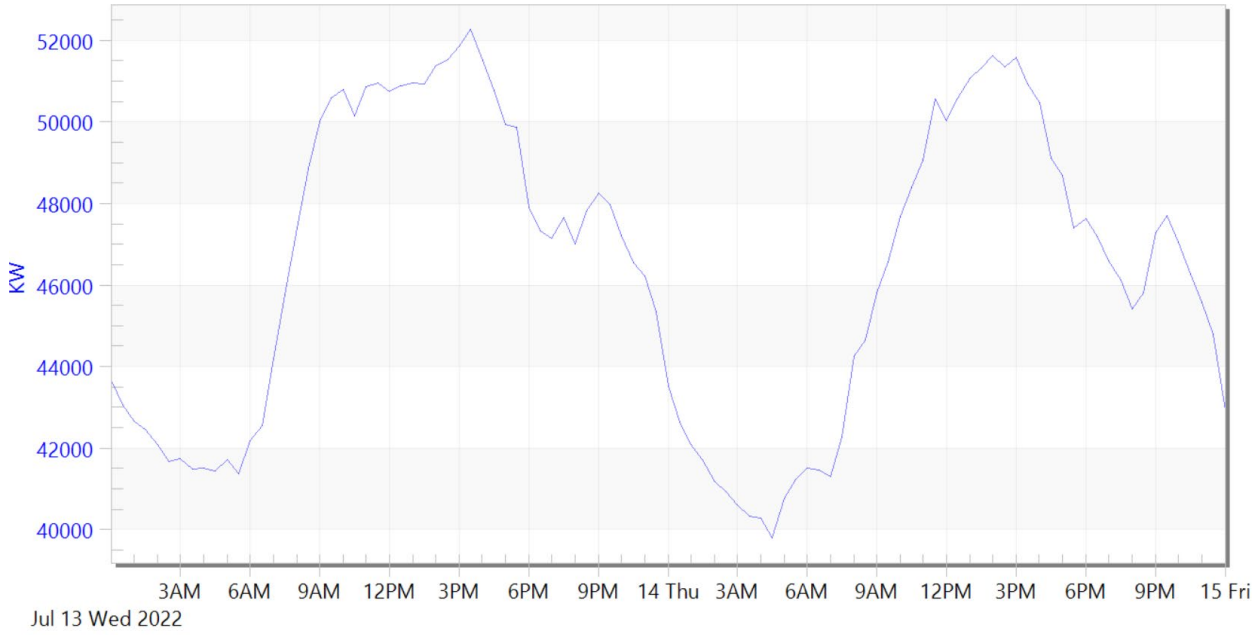
Reduction Strategies

General Items Continued
- ☐ Cycle load and reset temperatures for air conditioning.
- ☐ Reduce fan speed or reset duct pressure control.
- ☐ Operate print facilities during off-peak hours.
- ☐ Shut down vending machines for short periods of time.
- ☐ Enlist stakeholders to turn off unused office equipment.
- ☐ Turn off fountains and swimming pool pumps.
- ☐ Reduce central plant chiller loading.
- ☐ Delay laundry processes and dishwashing
- ☐ Reduce use of elevators and escalators.
- ☐ Reduce air conditioning
- ☐ Shut down unused offices, classrooms, & conference rooms, etc.
- ☐ Reset thermostats to higher settings.

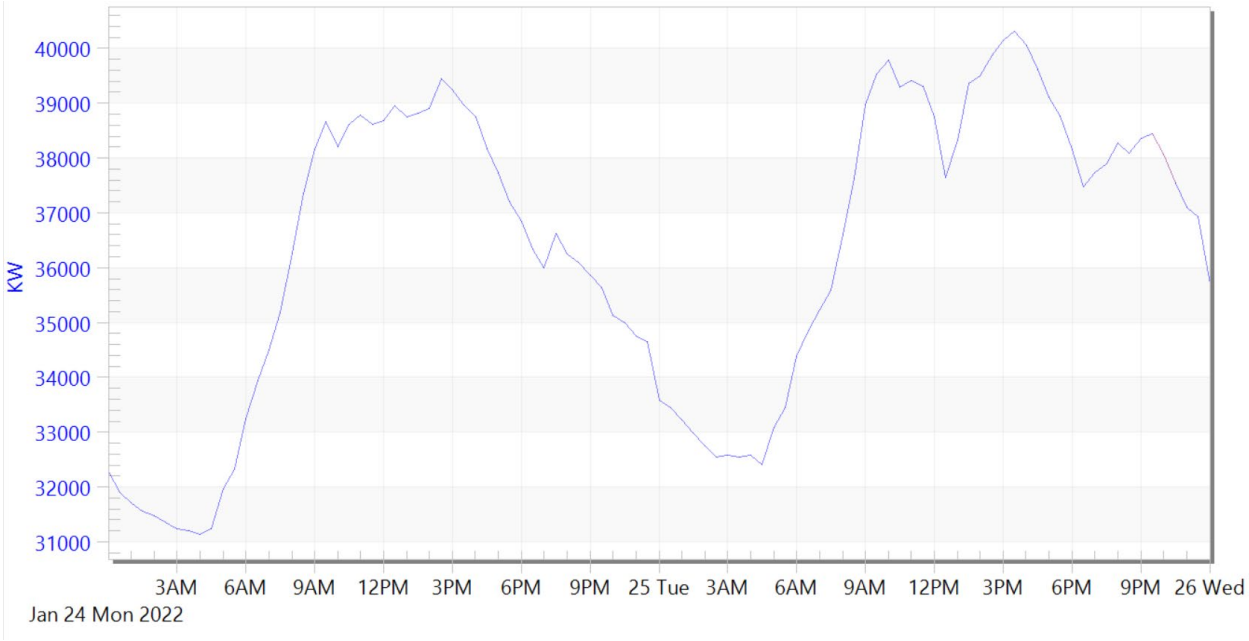
Specialty & Research Equipment
- ☐ Put benchtop lab equipment on timers or turn off when not in use.
- ☐ Drying ovens, incubators, vacuum pumps, growth chambers and process equipment when absolutely needed.
- ☐ Ultra-low Freezers, refrigerators,walk-in freezers and coolers, reduce samples, consolidate and turn off when not in use.
- ☐ -80°C freezers may be fine at -70°C and some samples (DNA) are fine at room temperature or -20°C instead of -80/70°C.
- ☐ Fume Hoods, canopy hoods, autoclaves and snorkels move chemicals to chemical storage and shut off when not in use.
- ☐ Microscopy, MRI, and any other specialty equipment that consumes energy

Campus Electric Load Curves

Summer (July 13 - July 14)



Winter (Dec 24 - Dec 25)



- **Recap**
- **Questions?**

Paul Foote gfoote2@illinois.edu

- **Thank you for your time and efforts!!**