CASE STUDY | Office Building Demand Curtailment

The objective of this case study was to determine what our client could do using the building automation system to reduce electrical demand while running on generator power in preparation for a local power outage. Tri-M performed a remote analysis of the current operation of the facility and suggested four Energy Conservation Measures (ECMs) that could help reach the customer's energy goal.

1. Disable Dehumidification Mode
2. Reduce non-essential fan VFDs to minimum speed
3. Set back cooling setpoints to 76°F
4. Lock out Electric Resistive Heating

The above ECMs were implemented during a test period of 3 hours. During testing, it was discovered that the nighttime setback routine was improperly sequenced and causing excess energy use. It was disabled for the entirety of our monitoring period.

To capture energy usage, Tri-M partnered with EnerG Test to install temporary power quality meters.

SNAPSHOT

- Converted Warehouse
- Southern Delaware
- Vertical Market: Office

SCOPE

- Demand Limiting
- Sequence Optimization

RESULTS

- 370.9kW (41.7%) demand reduction during testing
- 347.9kW (64.4%) demand reduction during nighttime setback optimization
- >$20,000 estimated annual excess energy spend

Demand Limiting

Disable Dehumidification Mode

- Disabling Dehumidification mode allowed the chiller to offload capacity and in some instances, shut off completely.

Reduce Non-Essential Fan VFDs to Minimum Speed

- A reduction in fan speed resulted in lower demand.

Set back Cooling Setpoints to 76°F

- Relaxed space temperature setpoints allowed cooling to operate less frequently, aiding in reducing chiller load.

Lock-out Resistive Heating

- With dehumidification disabled, resistive heating was called for less, however certain spaces could potentially need heat so a program was added to lock resistive heat from operating.

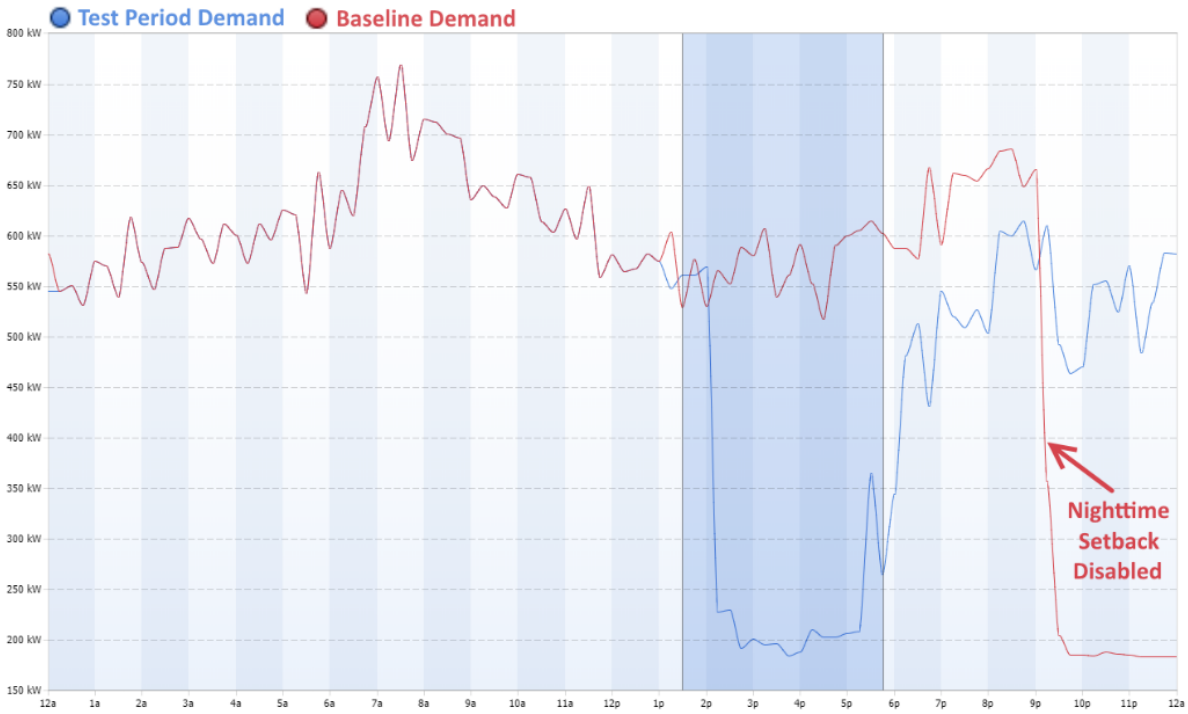
Nighttime Setback Optimization

It was found that during nighttime setback, dehumidification mode was keeping the chiller active with very little or no load in the building. It was also calling for heating to raise the temperature to the setback temperatures. Tri-M's sequence optimization released dehumidification mode and properly allowed the building to coast up to setback temperatures.

Results/Conclusion

Utilizing Tri-M Analytics in conjunction with the Building Automation System allowed this facility to effectively reduce its electrical demand by more than 41%. An additional 64.4% demand reduction was realized by optimizing the nighttime setback routine.

Results of Demand Curtailment



	Demand Reduction Testing	Nighttime Setback Optimization
Baseline Average Demand	889.7kW	540.6kW
Testing Average Demand	518.8kW	192.7kW
Demand Reduction	370.9kW	347.9kW
% Reduction	41.7%	64.4%