

Energy Management Best Practices Peak Shaving Generators

Problem: Energy prices have risen to an all time high and are expected to rise substantially in the next 12 months. As a result companies are spending millions of dollars more in electricity costs for the same product output.

Best Practices Solutions:

1. Peak Shaving

Peak shaving is a technique that is used to reduce electrical power consumption during periods of maximum demand on the power utility. Thus saving substantial amounts of money due to peaking charges.

Peak shaving also helps the utility provide maximum base load power without starting an expensive to operate peaking generator. In the long-term peak shaving lets the utility reduce its investment in costly new power plants. Their customers who install on-site generating equipment share in those savings, by receiving reduced power rates year round.

Peak demand typically occurs between 3:00 PM and 8:00 PM during the months of July and August, which is the same time non-industrial consumers typically demand the maximum power for family activities and air conditioning.

Typically power companies have a tiered rate structure which involves not only the amount of electricity consumed, but also takes into account when the electricity is consumed. It is common for a facility participating in peak shaving to experience a net energy savings of between 10% and 30% of their electricity bill.

Peak shaving systems use generators and paralleling equipment which allows the generator to monitor the electric grid, startup as necessary and synchronize frequencies with the grid. An added benefit of this equipment would be backup power in case of rolling backups and grid outages.

2. Two other savings programs are available.

- The first is a commitment between the utility and the facility not to exceed a fixed kWh demand. The facility can do this using a technique called “load shedding” which means turning off non critical loads during peak periods, running a generator to power the loads or only operating the loads during off peak hours.
- The second program type is called “peak sharing”. This program is designed in such a way that the utility asks the facility when to start running its generator and take over a portion of the facilities electrical load.

Utility customers install generator sets and operate them at times of peak utility power demand, when directed by the utility. In return, the utility pays monthly credits, or grants special interruptible pricing. Payback on the generating equipment is often three years or less.

3. Generator Sizing Considerations

Generators need to be properly sized. A major factor is how to handle surge loads. Surge loads occur when large electric motors are started. These large motors can draw five times normal operating current for a short period of time. It is usually necessary to use some type of load starting device such as a soft starter or to start the motors sequentially.

Don't forget that critical loads must also be accounted for. One advantage of the modern paralleling control system is electronic monitoring and control which can even shed non-critical loads if necessary to keep the facilities power usage below the agreed to levels.

It is also essential to remember that the generator will obtain the highest fuel efficiency and least engine wear when operating within a 70% to 80% load range.

Case Studies:

Here are just three examples of the benefits of incorporating a peak shaving plan:

- Baldor's Westville Oklahoma motor plant saves over \$100,000 annually from peak shaving. The facility only had to add three 140kW peak shaving generators and the appropriate paralleling switchgear and monitoring equipment.
- Children's Hospital in Philadelphia began using their emergency generators as peak shaving generators during the air conditioning season. This resulted in an annual saving of \$240,000 and a reduced kWh rate on their electric bill. The experiment was so successful that the hospital has added several more peak shaving generators.
- Atlanta installed eight 4,160V, 1,100 kW generators in Concourse E at Hartsfield Airport. The generators provide emergency power and peak savings, which has saved the city \$1 million annually.

For additional information, please contact your local Baldor district office.