GENERAC®
INDUSTRIAL POWER

# WHITE PAPER

## Unlocking the Potential of Demand Response

BY MICHAEL HAINZL
Power Solutions Manager at Generac Power Systems

### INTRODUCTION

Demand response is an economic signal to reduce power consumption of an electric utility customer to better match the available supply of electricity. Electric energy cannot be easily stored, so utilities have traditionally matched demand and supply by throttling the output of their power plants, taking generating units on or off line, or importing power from other utilities. There are limits to what can be achieved on the supply side, because some generating units can take a long time to come up to full power, some units may be very expensive to operate, and demand can at times be greater than the capacity of all the available power plants put together. Demand response seeks to reduce electricity demand on the utility when it is uneconomical or technically impossible to increase supply.

Utilities may signal demand response requests to their customers in a variety of ways, including time-of-use rate structures, in which power is cheaper at certain times of the day, and smart metering, in which explicit requests or changes in price can be communicated to customers.

The customer may adjust power demand by postponing some tasks that require large amounts of electric power, or may decide to pay a higher price for their electricity. Some customers may switch part of their consumption to alternate sources, such as on-site generators.

Program structures vary but the overall objective of the utility is to defer capital expense on electrical generation or distribution infrastructure by mitigating peak demand.

*CONTINUED* | 1

## HOW DEMAND RESPONSE WORKS

Demand response reduces demand on the utility supply by curtailing load at the customer's location. In the simplest form, it can be implemented with remote controlled contactors on residential electric water heaters, air conditioning systems and pool pumps. Load reduction may be triggered through commercial and industrial building automation systems that act on lighting, HVAC and other mechanical loads, such as turning off the water fountain pump or reducing the number of elevator cars that can move up at any given time.

## VALUE PROPOSITION OF DEMAND RESPONSE FOR THE END USER

Installation of a standby generator is often driven by building and/or fire code requirements. They represent a significant capital investment by the building owner and often have low utilization over their life cycle. Participation in demand response programs can offset generator capital and operational expenses while providing the owner some return on what would otherwise be just an insurance policy. Use of a natural gas-fueled generator offers the following practical benefits for demand response:

- The capital cost for a natural gas generator set that meets the more stringent exhaust emissions limits for demand response is significantly lower than a comparably equipped diesel engine.
- It has a lower fuel cost with natural gas compared to the same amount of power produced with a diesel engine.
- There are no diesel fuel maintenance costs, i.e. fuel polishing.
- Natural gas is a highly reliable fuel source, even in situations where the transportation of diesel fuel to a location may be at risk.
- There is increasing acceptance of natural gas by authorities having jurisdiction (AHJs), even for emergency systems where an on-site fuel source (diesel) may have traditionally been used.

## WHO TO WORK WITH

The call for demand response action is typically managed by the independent system operator (ISO) or regional electric utility companies. Increasingly, utilities are outsourcing the monitoring and dispatch of assets to a third party, especially for commercial and industrial customers with on-site generation.

An energy service company (ESCo) will deploy an energy management system (EMS) to a client's location for the purpose of recording load, dispatching generation assets and managing load.

Working with an ESCo is often simpler for a commercial or industrial client. Financial incentives for enrolling standby generators into demand response programs vary. Understanding the variable incentives offered by the ISO and local utilities, the ESCo can help the client maximize the economic benefit from their generator assets.

## ADVANTAGES OF WORKING THROUGH AN ESCO

- Little involvement by the generator distributor. The contract for demand response is between the client and the ESCo.
- Partnering with an ESCo can extend savings beyond the generator connected load. For example, an HVAC plant that is not on generator power could also be curtailed for additional savings using the same EMS hardware.
- Helps the client maximize their revenue opportunity.

## EQUIPMENT REQUIREMENTS

- Engines require non-emergency emissions certification.
- Closed transition transfer switch desirable, but not required.
- Ability to remotely dispatch generator and force the automatic transfer switch (ATS) to switch is desirable, but not required. The EMS typically has the capability to facilitate automatic operation.
- Ability to measure the demand reduction so customer can receive financial incentives; frequently installed as part of the EMS.

## SUMMARY

As companies are forced to either halt their business operations or pay the increased price for utility power during periods of peak demand, standby on-site generation systems powered by a dependable fuel source like natural gas are a practical solution that can provide a financial return and minimize operational consequences.

With the help of a local ESCo and an EMS, commercial and industrial end users are able to employ natural gas-powered standby solutions that approach a cost-neutral position over the generator's life cycle and offer cost savings over a diesel fuel alternative.

**Generac Power Systems, Inc.**
S45 W29290 Hwy. 59, Waukesha, WI 53189 | 1-844-ASK-GNRC (1-888-275-4672) | 0204540
**GENERACINDUSTRIALPOWER.COM**