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WHITE PAPER

11 Things to Know When Owning & Operating a Standby Generator

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INTRODUCTION

Purchasing a standby generator system can be a major undertaking. Unless you are in the critical power domain, this is a transaction that does not occur frequently. Even most electrical engineers turn to generator manufactures to properly select and design the right generator for each unique application. This white paper will outline the top 11 considerations to make for sizing, owning and operating a standby generator application.

1. REASON FOR PURCHASING

At first glance, this may seem like a simple factor to address, especially when it comes to legally required generators. Whether the generator is needed for demand response programs, limited operation or powering an entire building, initially identifying the intent of the generator system is important before making a purchase. Identifying emergency loads what you expect out of your generator system will have a major influence on overall design and product selection.

2. SIZING

Part of the generator sizing process also includes the identification of the application's peak load requirements. For standby applications, the load target range is 60 to 80 percent. Undersizing a generator does not help the life of the generator, and can actually lead to engine damage; this pertains to diesel engines in particular. Temperatures and fuel delivery requirements should also be kept in mind. A properly sized generator will provide an end user optimal product performance. Being able to account for concurrent and non-concurrent loads, as well as natural load sequencing, is imperative during the sizing process. Keeping up with ever-changing load profiles of different manufacturers can be a daunting task. When using sizing and specification tools, use a program that is easily updated to ensure these changes are always taken into account.

3. MANUFACTURER SELECTION

After identifying generator size, specifying parties must choose their desired manufacturer. Aside from product reliability and code compliance, specifying parties must ensure the manufacturer is experienced and supported by a staff of qualified and trained field technicians that can ensure the product's optimal performance at all times.

4. PLACEMENT

Indoor and outdoor installations are both impacted by factors such as weather patterns and ease of access for service. While indoor systems are often considered more reliable, engineering considerations such as airflow, heat rejection, fuel delivery and equipment access can influence a generator's performance. The effects of these factors are greatly reduced when a generator is installed in an outdoor setting.

5. FUEL SELECTION

Over the years, fuel combustion requirements have been influenced by ever-changing emission regulations. These directives have mandated the use of low sulfur fuel for diesel applications, which is a difficult fuel source to maintain as it can go bad quickly if left untreated. Making matters worse, unforeseen factors such as inclement weather and refinery setbacks can significantly impact the availability of fresh fuel when it is needed most. This makes natural gas a more reliable fueling solution when compared to traditional fossil fuels, as it requires minimal maintenance, reduces cost and features an unlimited, continuous supply.

6. COST OF OWNERSHIP

The cost of generator ownership can fluctuate with a variety of factors including fuel reliability, refueling needs, emission requirements and interruptible rate programs. Though natural gas units can cost more to install, paralleling technology, diesel refueling and maintenance costs, as well as the reliable and infinite supply of a natural gas fuel source, make natural gas applications more cost-efficient than diesel fuel applications over time.

7. MAINTENANCE REQUIREMENTS

Yearly inspections and routine servicing are required for standby generators with less than 250 hours of annual run time. While filters and oil should be changed on a yearly basis, cranking batteries commonly need to be replaced every two to three years. Additional items, such as belts, hoses and coolant should be inspected and tested annually; replacements for these items are typically required every four to six years. Until detailed cost assessments can be produced, an initial maintenance estimate of $500 fixed cost and $1.00/kW can be used for gauging the potential cost of a generator's maintenance requirements.

8. TESTING

System testing is a practice commonly required by governing bodies and/or end user business units. This practice is employed to ensure system reliability. For paralleling solutions as well as single genset applications, access to end user loads is essential to the testing process. Identifying connection locations as well as whether end user loads or load banks are required should also be considered during the application design process.

As time goes on, changes such as the addition of load banks or the removal of cables need to be taken into account for each testing window, and re-commissioning should be completed after each change is made.

9. MONITORING

As the digital world continues to grow, the demand for accessible data updates has increased significantly. By developing innovative system monitoring technologies, select manufacturers are helping to ensure end users have up-to-the-minute access to information detailing the state of their industrial power applications, which helps field technicians complete product maintenance and servicing procedures more efficiently than ever before. While it is difficult to gather information on standby generators with limited run time, predictive monitoring is also becoming more popular for UPS applications.

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10. BACK-UP FOR THE BACK-UP

For those that sacrifice product quality over investment and operational costs, having a back-up plan for a standby power system is paramount. When mechanical equipment breaks down, immediate service may not be available, which can lead to detrimental downtime for industrial markets like data centers, business buildings and wastewater treatment facilities.

Given the propensity for less reliable equipment to break down, integrating a modular power system (MPS) may be necessary. MPS applications—which feature paralleled generators for power redundancy – provide a reliable, flexible and scalable solution to ensure power is always readily available to dedicated loads.

11. A MULTI-PURPOSE ASSET

While most projects start only considering using the standby generator for emergency purposes, today there are an increasing number of energy management opportunities to utilize the generator. Options like formal demand response programs with your local utility or a demand response aggregator allow the potential to provide for a regular income stream based on limited run hours or even just the availability of the asset. In this case, there are distinct advantages in operating costs for a natural gas fueled solution versus the limited flexibility and added complexity of an EPA Tier 4 diesel genset. With the current and projected low cost of natural gas itself, many customers are evaluating selective peak shaving based on their particular spark spread, or operating cost differential between buying power from the utility versus self-producing by their natural gas genset.

SUMMARY

Sizing, specifying and installing a standby generator solution should not be taken lightly. By taking the aforementioned factors into consideration, engineers and end users can both ensure they are using the right solution for a variety of industrial power applications. To ensure a seamless ownership experience, be sure to contact your local generator representative for assistance determining the ideal standby power system for your needs.

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