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CONTINGENCY PLANNING FOR DISRUPTED ELECTRIC POWER:

The Case for Partnering with a Strong Rental Power Supplier

By: George Schalk

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CONTINGENCY PLANNING FOR DISRUPTED ELECTRIC POWER: *The Case for Partnering with a Strong Rental Power Supplier*

Wisdom is like electricity. There is no permanently wise man, but men capable of wisdom, who, being put into certain company, or other favorable conditions, become wise for a short time, as glasses rubbed acquire electric power for a while.

- Ralph Waldo Emerson

Introduction

In today's global economy, every hour of business time is crucial and can represent thousands or even millions of dollars in revenue. A company's ability to avoid or recover quickly from unexpected electric power disruption can be vital to financial success and competitiveness. Power disruption comes in all forms and durations and is not always predictable or preventable.

By planning ahead for potential power failure, and by developing a contingency plan that includes a rental power option, a company can reduce future business risks from power disruption. An effective contingency plan requires simply understanding a facility's needs, and knowing how to react quickly and whom to call when the power goes out. Rental power generation suppliers are in business to alleviate downtime losses by minimizing a company's risk of being stuck without power. Rental power is designed to keep a business of any size functioning and on schedule for as long as necessary when utility power is unavailable or inadequate.

Whether for a scheduled shutdown or an emergency outage, facility managers and plant engineers can save time and money by planning ahead to secure portable rental generator sets to meet their temporary electric power needs. Most businesses have standby generators that start automatically when power is interrupted, but these may serve only the most basic loads – computer systems, office and emergency lighting, and emergency equipment. Rental power, on the other hand, can keep an entire facility of virtually any size operating at full capacity until power is restored. The ability to maintain operations and continue serving customers when the local power goes down can protect the bottom line and provide a competitive advantage. There are three keys to planning effectively for power interruption:

1. Understanding the company's power needs before a disruption occurs.
2. Tapping into the expertise of a quality rental power supplier.
3. Knowing how to evaluate rental power companies and select the best-qualified supplier.

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Before Power Disruption: How to Plan Ahead

Only when the power fails does a company appreciate the extent to which it depends on reliable electricity. Every company is vulnerable to a power disruption that can interrupt business. Without power, operations are paralyzed, business stops, customers are kept waiting, and the company can incur huge losses in production time, revenue, and customer goodwill.

Power disruption can result from natural causes such as weather; from technological failures involving equipment or wiring malfunctions; and from human error. These issues create myriad problems, including:

- Loss of critical data
- Dropped sales or service calls
- Damage to manufacturing equipment
- Loss of product or a batch of materials
- Environmental safety risks
- Legal liabilities resulting from service lapses

A company unprepared for power failure is exposed to potentially crippling losses that could have been easily avoided by planning ahead. With a crisis plan in place, a company establishes a quick-response strategy to call upon in a power emergency.

Time Is Everything in an Emergency

When a company is unprepared for power disruption, valuable time can be wasted determining the cause of the problem and finding a solution. Common causes of delay in response to a loss in power include:

- No knowledge of how a system responds to power disruption.
- No knowledge of a system's load requirements.
- No knowledge of the size of generator and the type of ancillary equipment needed to fix the problem.
- Contact information for vendors and suppliers not readily available.

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- No established credit with power suppliers, fuel vendors, or trucking companies – or credit established with only one company that turns out not to have the necessary equipment or supplies on hand.
- Rental suppliers or fuel vendors who do not respond immediately or do not deliver during the night or on holidays.
- No knowledge of how to properly place generators set and ancillary equipment to serve the facility efficiently and meet health, safety and environmental codes.
- No knowledge of how to install or operate power generation equipment.

To be well prepared, a company must resolve all these issues before being faced with a power disruption. Money and time will be saved by planning ahead and knowing where to turn when power goes out. Even a company that has invested in a standby power system needs a contingency plan that includes rental power.

Determining Your Power Needs

Complete knowledge of the facility’s power needs is essential to setting up a fast-response and cost-effective system and to identifying the rental supplier best qualified to help restore power during an outage. The following steps are essential:

Define the Facility Power Needs

Sizing and Equipment

What needs power? The first step is to know how much power is required. To do this, it is important to determine the maximum downtime that is acceptable. This can be quantified by calculating the impact from the loss of production per second, per minute, per hour or per day. It is essential to decide whether the entire facility needs power, or only certain critical loads.

Full power. If the whole facility must continue operating during the outage, it is necessary to determine the total aggregate load. The quickest and most accurate way to do determine load is to take ammeter readings from the electrical distribution boxes while the facility is operating normally at peak demand. Peak demand readings also can be taken from electric bills.

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Priority power. It may be more advantageous to power only electrical loads that serve critical functions. If so, it is necessary to prioritize loads. A good way to start is to determine the lost profit or other problems that result if given pieces of equipment are off-line. Other than life-safety loads powered by standby generator sets as required by law, critical loads include lights; heating, ventilation and air conditioning (HVAC); computers; process equipment; and pumps. Prioritizing helps determine which loads require power immediately in an emergency. This is important, since it may take several hours or longer to secure all of the rental equipment needed in a large-scale emergency, such as a natural disaster.

What size rental generator is needed to power the load? Most rental generator sets fit virtually any application and can function continuously. An amperage chart like the one included on page 11 will help in selecting an appropriately sized generator unit to meet any amperage requirement and utility configuration.

What other equipment and services are needed? Is the unit adequately equipped with plug-ins for running accessory equipment? A generator may require certain ancillary equipment and features to meet a facility's needs effectively. Such items can include cables, cable ramps, transformers, distribution panels, and spider boxes. Generator sets are also available that can simultaneously provide a combination of 120/208 volt and 480/277 volt power for accessory equipment plug-ins. To determine the right ancillary equipment and services, it is important to understand the mechanical and logistical requirements of setting up rental power at the facility.

How will response be initiated in an emergency? It makes sense to map out the area where the emergency generator unit and equipment will be placed. Contact phone numbers (including after-hours contacts) and a list of all equipment, cable, transformers and other items needed should be located in a visible spot, so that personnel on duty know immediately whom to call and what is required.

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Define the Basic Rental Needs

Mechanical Requirements

Is the generator portable? For maximum mobility, most rental generators are skid-mounted on fuel tank bases or trailer/van-mounted, depending on their size. Capacities commonly range from 10kW to 2MW. [See the Amperage Chart on page 11.]

Where should the generator be placed? Units are placed outside and cannot be located too close to building air intakes, loading docks, or areas with poor access or ventilation. A sound, level surface is generally required. Attention must also be paid to providing easy access for delivering the equipment, and for fuel trucks that will service the unit.

Is a sound-attenuated generator needed? It is important to be aware of neighboring businesses or residential areas and to determine whether there is a need for low-noise operation. If so, the rental generator should have a sound-attenuated enclosure and a full-load sound rating of 92db(A) or better.

How will cable be routed? Attention must be paid to where and how power cables will connect the generator to the electrical distribution boxes (or equipment) to avoid security, fire safety, or environmental problems. Cable ramps allow multiple cables to be safely and compactly routed around a work site. Spider boxes serve as a base for multiple plug-ins for power distribution.

Will an auto-start/stop connection be needed? This is a critical feature if the rental generator will be backing up a permanent standby unit. This feature automatically starts the rental generator if the standby unit fails.

What other equipment attributes are desirable? A variety of features on today's generator sets can enable safer and more efficient installation and operation. Possibilities include:

Distribution panel labeling. This helps inexperienced operators safely identify output voltages.

Radiator, exhaust discharge. Some generator sets feature vertical radiator and exhaust systems to direct heat and exhaust gases up and away from people and buildings. This can be important in populated or high-traffic areas.

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Electronic governors. These are recommended for critical loads that cannot tolerate fluctuations in electrical frequency. Examples include computers, motor-driven equipment and other machines backed up by uninterruptible power supplies (UPS).

Output bus bars. Bus bars should be spaced to allow for multiple output cable hookups. This lets users run several pieces of equipment off one generator set.

Fuel priming pump. This ensures easier start after transport.

Charging alternator. This ensures that batteries are charging when units are operating.

Sight gauges. Properly positioned sight gauges for fuel and other critical fluids speed up spot-checking, letting staff spend more time on other matters.

Logistical Requirements

What does the rental supplier have available and how quickly can it be supplied? A good power rental supplier will offer a full range of power generators that come with everything necessary to make the installation turnkey. The ability to provide, install and support a complete power system is a critical attribute for a rental equipment supplier.

Will the rental supplier deliver the generator and related equipment? If yes, it is important to know if the supplier offers deliveries around the clock or on holidays. Companies that prefer to pick up the equipment from the supplier must have trucks able to handle the weight of the equipment and must be prepared to offload it safely.

Who will set up and maintain the equipment? What technical service/support does the unit require during operation? Hooking up and maintaining the generator is a critical responsibility that must be handled by a qualified technician. Certain services, such as fuel and oil filter changes, must be performed regularly, depending on the rate of operation and length of time the unit is required to be onsite. Maintenance is an important reason why even a company that owns a standby generator needs a rental backup plan. Standby

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generators stand idle most of the time and require thorough maintenance, upkeep and exercising – tasks often neglected by many generator owners and companies. If a standby unit does not receive regular maintenance, it will not reliably protect the facility in an outage.

Is enough fuel available on site? If not, who will handle fueling? It is important to know how much fuel the rental generator can hold, so that the necessary fuel schedule can be established. Company personnel should check the fuel capacity and consumption rate to determine how many tanks of fuel will be needed during rental period and how frequent fuel deliveries will need to be scheduled. Generator sets should run for at least eight hours between refuelings. If the unit is expected to run for an extended time, an auxiliary fuel tank will help decrease fuel delivery costs and provide extended operation during emergencies.

What security is required? The rental generator unit should be designed with lockable doors. Oil and water drains should be located inside the unit, and exterior fuel drains should be hidden. The rental supplier should offer remote monitoring capabilities that provide 24-hour basic monitoring and control of the unit. This helps detect impending trouble so that a repair technician can be dispatched to the site before a failure occurs.

What happens if the rental generator goes down? A rental generator is only as reliable as the supplier who backs it. Power rental suppliers should provide quality rental-grade generators and be prepared to deliver a backup unit in the event of failure. Maintenance records and load bank tests should be available upon request to ensure equipment is being properly maintained, operated and tested.

What happens in a major emergency covering a large area? A sweeping disaster, such as a flood, hurricane or tornado, can create demand for rental power that quickly overwhelms the local supply. To prepare for such events, some rental companies offer “contingency power rental agreements,” which specify that they will deliver adequate rental power to the customer’s site within a certain window of time. An agreement like this ensures that a business stands among the first in line for service after an emergency strikes.

What to Look for in a Power Rental Supplier

Knowing the facility’s power requirements will help in finding the power rental company that can supply the best equipment to meet the needs of your facility. It is also crucial for the rental company to have

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reliable, qualified staff to assist with all questions and concerns pertaining to all services being offered to the public. Here are the key attributes to look for when researching power rental suppliers:

Network. The more extensive a supplier's network and parts distribution, the more it can be relied on to provide a complete power solution. An extensive inventory allows a rental company to meet power needs exactly as they arise, whether temporary or emergency. A large fleet means availability; multiple branches mean power support for various locations for companies have multiple facilities. A reliable supplier is affiliated with a manufacturer, industrial company, financial institution, and other resources.

State-of-the-Art Equipment. A rental supplier should provide modern equipment built exclusively for rental (for example, sound-attenuated and packaged as both trailer- and skid-mounted units for maximum mobility) and designed to deliver low operation cost, serviceability, reliability, and minimum installation time. These attributes mean the user does not need to worry about the cost and time associated with the upkeep of owned equipment or keeping up with advancements in equipment technology, or changes in environmental regulations.

Flexibility. Power solutions should have the capability to be customized with a wide range of attachments, components, and performance options to fit specific needs and applications. A good power rental supplier will offer equipment and capabilities, like uninterruptible power supplies (UPS), distribution switchgear, redundant generator sets, resistive and reactive load banks, and fuel tanks.

Industry Expertise. A good supplier should have a reputation for durability, reliability and economy, and should be able to supply references to support its claims. Most important, the best supplier will be a consistent performer in the industry of interest – whether healthcare, manufacturing, pharmaceutical, commercial, construction, mining, residential, telecommunication or any other sector – and have knowledgeable service technicians trained to service every aspect of electric power generation (setup, connection, maintenance, refueling, etc...).

Established Partnership with Key Suppliers of Ancillary Equipment. It is critical for the rental company to have connections with reliable suppliers of distribution equipment, clean diesel fuel, and other equipment and supplies to ensure the continuity and quality of power.

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Turnkey Service 24 hours a day, 7 days a week. Because power interruptions obey neither the clock nor the calendar, around-the-clock expert consultation for all needs, questions, and concerns is essential.

Freight. The rental power supplier should offer quick, efficient delivery and pick up of generators and ancillary equipment.

Testing. The rental company should regularly take time to check systems' functionality, safety features, batteries, warning lights, alarms and other components, making it less likely that a user will experience failure.

Conclusion

By tapping into the experience and expertise of power generation rental suppliers, a business gains the flexibility of options in the event of a power failure. These suppliers know the ins and outs of generation equipment and logistics and are committed to helping a business stay online.

Rental power helps to minimize the financial loss and downtime of power failure. Businesses will benefit by preparing for an unscheduled outage before it occurs and by establishing a support network to rely upon in the event of an emergency. Planning of this kind provides inexpensive and necessary insurance against the economic losses that can go with power failure. At the minimum, contingency planning provides peace of mind and enables quick, decisive response in case of an emergency. In the worst case, planning ahead can mean the difference between business failure and success.

Whether facing an emergency, or planning for downtime a year in advance, rental power ensures quick response and uninterrupted power. Planning ahead is simple; dealing with the disastrous effects of power disruption is not.

kVA / kW Amperage Chart – 80% Power Factor

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kV-A	kW	208V	220V	380V	440V	460V	480V	600V	2400V	4160V
13	10	35	33	19	16	16	15	12	-	-
19	15	52	49	28	25	24	23	18	-	-
25	20	69	66	38	33	31	30	24	-	-
31	25	87	82	47	41	39	38	30	8	4
38	30	104	98	57	49	47	45	36	9	5
50	40	139	131	76	66	63	60	48	12	7
63	50	173	164	95	82	78	75	60	15	9
75	60	208	197	114	98	94	90	72	18	10
94	75	260	246	142	123	118	113	90	23	13
100	80	278	262	152	131	126	120	96	24	14
125	100	347	328	190	164	157	150	120	30	17
156	125	434	410	237	205	196	188	150	38	22
188	150	520	492	285	246	235	226	180	45	26
219	175	607	574	332	287	275	263	210	53	30
250	200	694	656	380	328	314	301	241	60	35
313	250	867	820	475	410	392	376	301	75	43
375	300	1041	984	570	492	471	451	361	90	52
438	350	1214	1148	665	574	549	526	421	105	61
500	400	1388	1312	760	656	628	601	481	120	69
625	500	1735	1640	950	820	784	752	601	150	87
750	600	2082	1968	1140	984	941	902	722	180	104
875	700	2429	2296	1329	1148	1098	1052	842	210	121
1000	800	2776	2624	1519	1312	1255	1203	962	241	139
1125	900	3123	2952	1709	1476	1412	1353	1083	271	156
1250	1000	3470	3280	1899	1640	1569	1504	1203	301	173
2188	1750	-	-	3324	2870	2746	2631	2105	526	304
2500	2000	-	-	3798	3280	3138	3007	2406	601	347
2813	2250	-	-	4273	3691	3530	3383	2706	677	390
3125	2500	-	-	4748	4101	3922	3759	3007	752	434
3750	3000	-	-	5698	4921	4707	4511	3609	902	520
4375	3500	-	-	6647	5741	5491	5262	4210	1052	607
5000	4000	-	-	7597	6561	6276	6014	4811	1203	694
5625	4500	-	-	8547	7381	7060	6766	5413	1353	781
6250	5000	-	-	9496	8201	7845	7518	6014	1504	867

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RENTAL POWER CHECKLIST:

Equipment Needs:

Critical load requirement (voltage/amperage):

Priority loads:

Designated loads to be isolated from main breaker:

Size of generator unit(s):

Power cable(s), # and lengths:

Fuel capacity need at full load:

Fuel consumption rate at full load:

Ancillary equipment needed (auto-start/stop connect, ramps, transformers, panels, etc.):

Additional service needed (installation, start up, operation, maintenance checks, etc.):

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Equipment Considerations:

Does the unit meet local requirements for engine emissions?

Do I need a sound-attenuated generator?

Do I need a portable unit?

Does the generator support dual-voltage?

Does the unit have adequate fuel capacity for the intended use?

If the unit is trailer-mounted, what are the overall dimensions? Weight?

Logistics:

Physical location to place generator(s): [Attaching schematic drawings and electrical diagrams is useful.]

In-house operation/Maintenance staff contacts:

Turnkey Service contact:

Power Rental Supplier contacts:

Fuel Vendor contacts:

Trucking service contacts:

Delivery time estimated from initial call:

Does the power rental supplier offer a contingency rental agreement? If yes, do we have one and what does it ensure?

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