



## How to ensure your generator is ready for unexpected weather conditions

Whether it's extreme heat or cold, weather can change at any time and create havoc on your backup power system. That's why you need to be prepared before the weather changes. Here are just a few simple things you can do to be prepared for anything nature throws at your backup power system.

- 1. Make sure your antifreeze/coolant is at the right mixture.** Antifreeze, also called coolant, is usually a glycol-based concentrated liquid that is mixed with distilled water and many other additives (such as, bitter substance, silicate, antioxidant agents, foam inhibitors) to prevent several things from happening. As the name suggests, antifreeze prevents your engine's cooling system from freezing when temperatures drop below 34 °F. Additionally, it prevents overheating in extremely hot temperatures. This very important liquid also helps prevent scale build up and corrosion in the engine while improving heat transfer. **A 60/40 to 50/50 mixture of antifreeze and distilled water will protect your engine in temperatures ranging from -13 °F to -40 °F and up to 220°F to 225°F** (the higher the pressure of radiator cap will increase those figures). Never go above a 70/30 mixture, as this will cause overheating. It will also decrease the freeze point, as undiluted glycol freezes at about 8 °F. So, as you can see if you want a reliable backup power system, it's very important to have the right mixture of antifreeze in your engine. To get an accurate reading of your mixture, you'll need a refractometer. However, **a simple antifreeze strip tester bought from any local auto parts store will provide you with a good idea of the mixture ratio in your generator's engine.**
- 2. Keep your antifreeze warm.** Remember, **your engine has an optimal operating temperature that it needs to maintain, to not only be efficient, but also reliable.** This can be achieved with a simple engine block heater. Most industrial generators already have these block heaters installed on them. They are usually set anywhere from 80°F to 140°F, depending on the type of engine. Whether it's summer or winter, these heaters should always be on. Block heaters regulate the engine's cooling/heating system with a thermostat, so there's no chance of them overheating if properly maintained. **Maintaining the engine's temperature to as close to operating temperature as possible, ensures your backup generator will start easily, reducing the amount of battery power needed, and ensures its reliability.**
- 3. Batteries! Batteries are one of the most important parts of an emergency backup power's system, and one of the most overlooked items in that system.** Batteries on your backup power system are not the same as batteries in your car. Unlike your car, **your generator is ALWAYS on** and must always be ready to run. To do this, requires it to always be in a standby state. That means, the controller and engine's electronic systems must always be powered on. This would drain the batteries in just a few days if not maintained by a battery charger. **Battery charges are very useful and needed; however, they are also very destructive to the life of batteries.** Because of this, generator batteries require a more frequent replacement interval than car batteries, usually every two years. **Check the date on when your batteries were installed and replace them if they are over two years old.** Remember, batteries don't perform as well in extreme heat or cold. So, it's always good practice to **check your batteries with a battery analyzer every quarter to ensure your backup power system will be reliable in extreme temperatures.** These can be found online or from your local auto parts store.
- 4. Fuel** is the final item in this discussion that needs attention, if you want your equipment reliable. **Diesel fuel needs to be winterized for any temperatures below 34°F.** It should **also be tested annually for water and other containments**, or your backup power system may not function properly, or even at all. **For gaseous fuel systems, it's critically important to ensure there's no condensation in the pipes. Condensation could freeze fuel diaphragms and other vital parts needed to allow the right amount of fuel into the engine's intake system.** When temperatures drop below freezing these components may freeze, causing failed starts from not enough fuel or overspeeds from too much fuel. To reduce the risk of this happening, make sure the fuel piping has a condensation trap. **Consider installing fuel heaters for both diesel fuel systems and gas fuel systems and introducing anti-gelling additives to diesel to prevent freezing.**

These are just a few actions you can take now to ensure your backup power is reliable. For more information on this, and to learn what we can do for you, contact your local Powersmith sales rep. We're always working harder for you to have a safer, better, more reliable tomorrow.

*ERCOT estimates: Texas grid still vulnerable to blackouts in severe winter weather, despite preparations*



The Farmer's Almanac is Predicting Below-Average Temperatures This Winter in Texas

Generator Sales at all time high. High demand for backup generators along with supply chain shortages has made it nearly impossible to buy a new generator.

With ERCOT still being vulnerable to power outages, possibility of another bad winter storm coming, and supply chain shortages, it's more important than ever to properly maintain your current backup power system.

Powersmith has the resources to ensure you have reliable backup power. Give us a call to learn how we can help you to be prepared this winter.

# Powersmith revives a 100 year old design and turns it into a modern, reliable emergency backup power system

We received a call from a client wanting us to fix his very old Delaval Enterprise 3.5MW generator. He said that a former employee put acid in the air control system and no one he called was able to fix the Air-O-Matic control system. It's a very complex control system that uses air relays and timers to control the more than 80 functions of the control unit, including the starting air vain system which is also very complex for something so old.

We got to work right away bypassing the Air-O-Matic controller, starting and test running the engine on the first day. We wanted to be sure the engine and generator operated without any big issues that could slow us down from completing our mission on time. We then provided our client with a solution that would bring his unit into the 21<sup>st</sup> century.

What we gave him was a totally automated system with ComAp's 17" touch screen controller and BaseBox. Our engineering team got to work right away on the design while our service team started retrofitting the new controls into the existing control box and installing the new switchgear for a seamless transition from normal utility to generator power and vice versa. It was a monumental task, but we were all in, working several weeks to complete the project. Our first test run was an instant success. The system worked flawlessly. The old system took two technicians two hours to get it started and transferred, not an ideal solution for today's demanding power needs. Our solution had this unit up in 5 minutes, with the option to bring that time down to an incredible 5 seconds. Contact us to learn what we can do for you.

## Delaval Enterprise Generator



# Harmonics and their effects on your backup power

Did you know?

Harmonics are in every electrical system, everywhere. They're even in your backup power's electrical system, and they can cause unexpected problems during critical operation of your backup generator, such as:

- Nuisance tripping of circuit breakers
- Reduced system capacity / interruptions
- Excessive heating of entire electrical system
- Transformer overheating and failure
- Generator/Motor winding burns & hunting causing total system failure
- Neutral overloading failure
- EMI (electromagnetic interference) to sensitive electronic signals [very common in some UPS' (uninterruptible power supply) which may result in UPS failure]

**Powersmith can help mitigate these problems and even eliminate failures resulting from excessive harmonics! We have the resources and knowledge to provide you with a detailed analysis of your backup power system. We even provide you with important recommendations to ensure you don't experience failures from excessive harmonics.**

Contact Us for a Consultation

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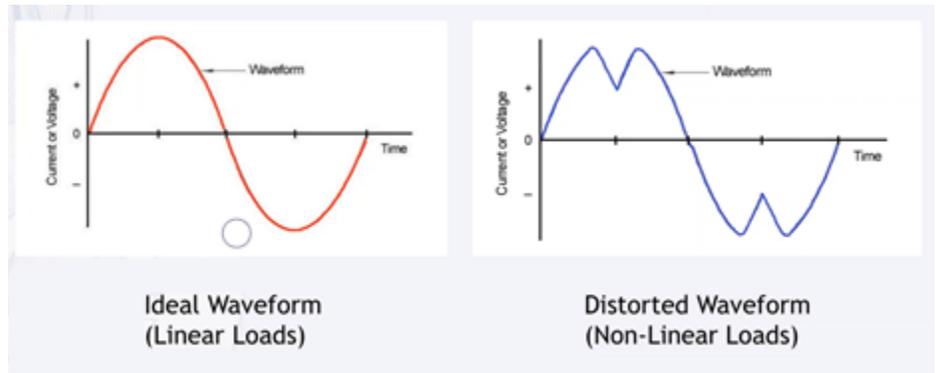
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## What Causes Harmonics?

- Harmonics are created by electronic equipment with nonlinear loads drawing in current in abrupt short pulses.
- The short pulses cause distorted current waveforms, which in turn cause harmonic currents to flow back into other parts of the power system.
- Harmonics are especially prevalent when there are many personal computers, laser printers, fax machines, copiers, or medical test equipment, fluorescent lighting, uninterruptible power supplies (UPSs), and variable speed drives all on the same electrical system.

As you can see from the graph below, harmonics can cause all kinds of issues with electrical waveforms. If this happens to your backup power system, it is much harder to overcome, because, unlike utility power, your generator has a limited potential of what it can handle. You may be at risk right now without even knowing it.



## Don't wait until it's too late!

Be proactive and call us today for a consultation. We can perform a power quality study on your emergency electrical system. And you'll know for sure if your backup power system will be ready when it's needed in the most critical time. Powersmith will provide a detailed analysis with any needed recommendations to keep you reliable and in the light.

## Ask us about our renowned Reliability Forecast

With Reliability Forecasting from Powersmith, you won't be guessing whether your equipment is ready for the next ice storm or how long it will operate during the next heatwave or severe thunderstorm. We give you the knowledge you need to take predetermined actions that will ensure your equipment will work in any kind of weather condition. Call, email, or click to book your consultation.

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