



# **SURVIVING THE STORM:**

**THE PERILS OF PRIVATE GENERATOR  
BACKFEED**

**SAFEGUARD SAFETY PAPERS: BACKFEED**

**Backfeed is one of the leading causes of electrical fatalities in the workforce.<sup>1</sup> Sadly, there is no feasible approach to entirely eradicate the totality of the risk. With the proper tools and training, workers can, however, mitigate the hazard. This document aims to apprise on the causes, risks, and prevention methods associated with back feed.**

Utility companies and line workers are aware of the dangers of electricity backfeeding onto a power grid. Yet despite the implementation of safety protocols, incidents of job-related **injuries and fatalities** during power-outage restoration work continue to occur **nearly every year.**

Worse, these tragedies may grow in frequency as they are tied to the private sector's increasing adoption of permanent and portable power generators — one of the leading cause of backfeed onto the grid. The rise in supplemental power generation correlates to consumers having observed or experienced major power outages in recent years, mostly due to extreme weather events such as:

- **Texas Winter Storm (2021):** A winter storm that caused widespread power outages and water shortages across Texas.
- **Hurricane Ida (2021):** A category 4 hurricane that hit Louisiana, causing widespread flooding.
- **Hurricane Ian (2022):** A category 4 hurricane that hit Florida, causing extensive damage and leaving residents without power or running water for days.

Outages caused by extreme weather are just one factor in why consumers are choosing to invest in generators. The cultural narrative in western countries has also shifted toward a desire for “clean and renewable energy” which does not require fossil fuels.

Consequently, many consumers are installing energy systems such as rooftop solar which can operate independently or in unity with the main grid. Unfortunately, these, too, can sometimes cause backfeed.<sup>2</sup>

This increase in private generation raises a red flag for lineman safety, especially during the disarray of extreme weather events. Keep reading to discover how Safeguard Equipment technology provides a **long-awaited solution** for the risk of backfeed.

## **The Hidden Risks of Backfeed onto The Grid**

For those who are not familiar, backfeed is the flow of electricity in the opposite direction from its intended path. Normally, electricity flows from a source, like a power plant, to an endpoint, such as a home or business. Backfeed occurs when permanent or portable power sources, like back-up generators and solar panels, are connected to the grid without an automatic shut off switch, which in the event of an outage – can unknowingly cause electricity to flow back onto the grid. Essentially, these generators act like miniature power plants, energizing the power line from multiple sources.

Backfeed dangers to line workers happen when there are problems with the grid, such as downed lines caused by adverse weather or utility equipment failure due to a vehicle accident. **Normally, a downed line segment should be de-energized** once disconnected from the grid. However, improperly connected **portable and permanent generators can cause backfeed and keep the line energized.**

An energized line threatens the safety of line workers and everyone else in the vicinity. The downed line can cause fires or electrify anything it touches, including power equipment, a chain-link fence, a puddle or a vehicle.

Line workers are trained to treat every line as energized when repairing them, but without proper testing tools, **it is extremely difficult to know whether the line is energized.** Not only that, but line repairs are also frequently completed under difficult conditions, such as during heavy storms. Line workers must deal with poor visibility and exposure to the elements while navigating electrical hazards and working at great heights in bucket trucks or atop poles.

Despite having personal protective equipment (PPE), utility line workers can **be injured and even killed** when private parties unknowingly energize the grid with backfeed during an outage – if the alternative energy does not have an automatic shut-off switch. According to survey data from utility companies and linemen, **42 out of every 100,000 linemen are killed** on the job each year, while **2400 out of every 100,000 are injured each year.**<sup>3</sup>

**Even one injury or death is unacceptable.**

## **The Growth in Private Power Generation**

Given the ever-growing dependency on electrical devices in modern life, home and business consumers want to ensure they will always have access to electricity. This in turn leads users to turn to private power generation to supplement electricity during outages.

According to Fortune Business Insights, the U.S. sales market for generator technologies was valued at **\$6.10 billion in 2023.** The market is expected to see significant growth to \$8.96 billion by 2030.<sup>4</sup> When broken down to units, roughly **12% of energy using households worldwide own a backup portable generator.**<sup>5</sup>

*Generator use will only continue to grow, along with the risk to line workers.*

The types of generators being used by consumers fall into the categories: portable and permanent. Portable generators, the type fueled by gasoline or propane, are popular for supplemental power

because they are:

- **Affordable**
- **Easy to use**
- **Foster greater energy independence**
- **Potentially generate passive income**

Other homes and businesses prefer to install permanent power generator solutions like solar power panels, or in some cases, private wind turbines. Permanent power generation allows these users to:

- **Reduce their carbon footprint with clean energy**
- **Control utility costs**
- **Foster greater energy independence**
- **Potentially generate passive income**

Permanent power generator systems are usually connected to the grid for the sake of reliability, as the wind does not always blow, and the sun does not always shine. Should a property owner's power generation fall short of their needs, it allows them to use power from the grid. At the same time, if they generate more power than required, the surplus can be sold to the utility and added to the grid.

## Challenges With Generator Installations

Private power generators should not pose backfeed risks if properly connected to the grid. Unfortunately, this isn't always the case.

It is fine for portable generators to be connected to a home's electrical system, **if all safety precautions are followed**. Regulations, however, require the purchase and installation of an automatic transfer switch. This switch isolates the generator from the grid to prevent backfeed during operation. Unfortunately, DIY homeowners all too often connect generators to their houses incorrectly, which leads to backfeed risks for line workers.

This is less the case with permanent power generator systems, as they require professional installation to essentially make them part of the grid. Backfeeding is an intentional feature of these systems so homeowners or businesses can use them to feed surplus power to the grid. For that reason, an automatic transfer switch is already integrated into the system to isolate the generator from the grid when an outage occurs.

In theory, permanent power generators are not inherently problematic when it comes to a downed line. Nonetheless, backfeed problems can still arise from incorrect installation or a defective transfer switch that jams or fails.

The CDC repeatedly warns owners of private generators about the danger of backfeed, and power companies regularly issue alerts. **Backfeed negligence is illegal in many jurisdictions.**

All generators also come with instructions for connecting the unit to prevent backfeed. Nonetheless, problems still occur because of human ignorance, negligence and error.

## Challenges With Generator Installations

Line work is inherently dangerous. Utility companies work hard to protect their linemen, implementing safety protocols such as:

- Requiring the use protective gear and tools
- Engaging in intensive safety education and training
- Enforcing safety standards
- Developing new safety technologies

**But there can never be “too much” electrical safety.** Just ask Josh Sears with Northern Lights Electric Cooperative in Sagle, Idaho. He reports:

*“I was struck with 7620 volts. Customers just hard-wired their generator lead into their electrical panel and did not turn off their main breaker. I thought I was grabbing a part of our set-up of devices on the pole that wasn’t energized. when I touched that, I touched it exactly together at the same time and I was able to let go.*

*“That doesn’t happen. You don’t walk away from that. When it comes to things that could have been prevented, there was a step that should have been taken. Somethings need to be changed. If we’re only doing it halfway, we’re putting people at danger.”<sup>6</sup>*

### Josh is not alone.

According to a 2022 CNN report, two linemen were horribly injured while working to restore power after Hurricane Ian, a category-4 storm, caused extensive damage across Florida.

“One male patient, in his 20s, had critical injuries [burns to his face, back, arms, and hands] and was transported to Halifax Hospital as a trauma alert.

“Another patient—a woman in her 40s—had minor injuries and refused transport to the hospital.”<sup>7</sup>

***Injuries like this occur every time a storm hits.***

## PVCDs CAN PROTECT WORKERS FROM BACKFEED RISKS

The presence of voltage and current cannot be seen, felt or heard. Other than hearing or seeing a generator run, it is extremely difficult to know for sure whether a line is energized by backfeed. It's why a **personal voltage and current detector (PVCD)** should be an essential article of PPE for every line worker.

PVCDs can provide line workers with a clear warning when backfeed is present. When a downed line is supposed to be de-energized, the PVCD alerts them about the presence of voltage and current. It also informs them to investigate the source of the backfeed and to shut down the private generators.

This heads up not only prevents injury to line workers but can keep homeowners from causing harm, fatalities, fire or damage that affects their lives, their families, their homes and their neighborhoods.

Safeguard Equipment designs and manufactures state-of-the-art PVCDs to protect workers who operate near energized lines and equipment. Safeguard's newest product, the **COMPASS Pro**, not only alerts workers to the presence of voltage and current but also has features that facilitate an **immediate emergency response** should an injury occur. It enables line workers and their teammates to quickly get medical help to the right location when seconds count, **so lives are saved**.

### COMPASS PVCDs have a proven record of saving lives.

COMPASS personal voltage and current detectors are a critical element of PPE that can protect line workers from backfeed and other electrical risks. Contact Safeguard today to find out how you can protect your linemen with the COMPASS PVCDs.

Contact Safeguard today to find out how you can protect your linemen with the COMPASS Pro today.



**COMPASSPRO**  
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