



A Simple Solution for Power Plant Retrofits

■ ■ White Paper

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■ ■ Introduction

One of the biggest problems for power equipment engineers and planners is what to do with installations where the existing power plants are nearing end of life or are not large enough to handle to growing load demands. Replacing the power plant is often the ideal choice, but hot transitioning the distribution of the plant increases both risk and costs. Even when the risks are mitigated by using a temporary plant, the need to minimize cost remains a key concern. Add to this the problem of space constraint prevalent in so many sites, and the power system retrofit can become a power engineer's biggest headache.

Many outside plant facilities, such as Controlled Environment Vaults (CEV) and huts, and intra-office facilities, such as remote, rural, fiber, and repeater locations, use the original DC power systems that were commissioned with the office. In many of these instances, the distribution is in tact and continues to be serviceable, but the power supplies are in disrepair and replacement parts are difficult to locate or unobtainable. As an economical solution, retaining existing DC distribution and re-feeding it with the newest rectifier technology can reduce first cost replacement in lieu of full power plant replacement. Additionally, this allows the client carrier to make fewer power transitions, thus reducing the risk of service outages, and saving capital dollars in labor costs.

In addition to replacing aging power systems, service providers often need to add DC power in a site where space is at a premium. Older switchmode and ferroresonant rectifiers consume a lot of space for the amount of output power. Growing these power plants is problematic because of their size. However, new switchmode plants offer much greater density, and their modular design makes it much easier to add to an existing rack of equipment. Small, high density power plants are beginning to be equipped with full featured controllers, making them an ideal solution for central office applications when space is limited. The power density of these small to medium size switchmode systems also makes them a candidate for legacy applications where additional DC power is required, or where complete replacement of ferroresonant rectifiers is necessary.

By taking advantage of the latest rectifier technology, the client carrier can also integrate microprocessor technology into a site previously equipped with analog equipment. The feature enhancements found in the new power system controllers allow for greater battery trending analysis and monitoring, expanded capacity management features, and offer full featured alarm reporting characteristics. Furthermore, utilizing remote connectivity, the user can recognize capacity trends as well as diagnose potential problems and failure points. This remote connectivity can also save dispatch time and man hours, providing a way for service personnel to be more efficient.

■ ■ PECO II Solution

PECO II has designed the 129BD Bulk Distribution power system specifically to address retrofit applications. The 129BD is the ideal product for upgrading an existing installation with modern, high capacity DC power while minimizing installation cost and the risk of service interruption. The 129BD can meet the demands of these varying applications:

- ▶ Replacing aging ferroresonant or switchmode power systems with a modern alternative
- ▶ Making efficient use of existing distribution bays and panels by using a bulk output system, versus replacing the entire DC power system
- ▶ Resourcing existing distribution bays, which would eliminate many of the risks involved with hot circuit cutovers, and would also lower installation costs
- ▶ Temporary power

The 129BD power system provides the end user an economical alternative to complete power plant replacement. It can be configured to serve small loads and expanded to serve new or larger requirements as they evolve:

- ▶ Scalable rectifier shelves have a capacity up to 200 Amps and require only 2 rack units of space. Up to 6 shelves can be equipped per 1200 Amp system
- ▶ Rectifier shelves can easily be added to an in-service unit
- ▶ Moderately-sized 50 Amp rectifiers support small loads, however up to 24 can be equipped making the 129BD the perfect solution for medium sized loads as well.
- ▶ Modular, hot swappable, plug-and-play rectifier modules
- ▶ Full featured Phoenix™ controller in a 2 RU package

The features of the state-of-the-art Phoenix™ controller are typically found only in larger power plants. It's equipped with 16 contact closures and 24 LED's for instant identification of plant conditions. The Phoenix can monitor DC loads and manage battery performance, collectively bringing these values to one common microprocessor. Access to the system via an Ethernet connection allows the client carrier to further analyze the plant and associated loads remotely without having to make costly field trips to verify operating conditions.

The following diagrams show how the 129BD can be applied in various equipment replacement situations.

Typical Bulk Output Replacement

Figure 1 represents a typical bulk power replacement where the existing primary distribution power board is left in service. This example shows the existing rectifier bay totally disconnected and removed. This would be typical of a location that has ample available floor space. The power system shown is factory configured and integrated in a 23" relay rack, ready to be installed when it arrives at the site.

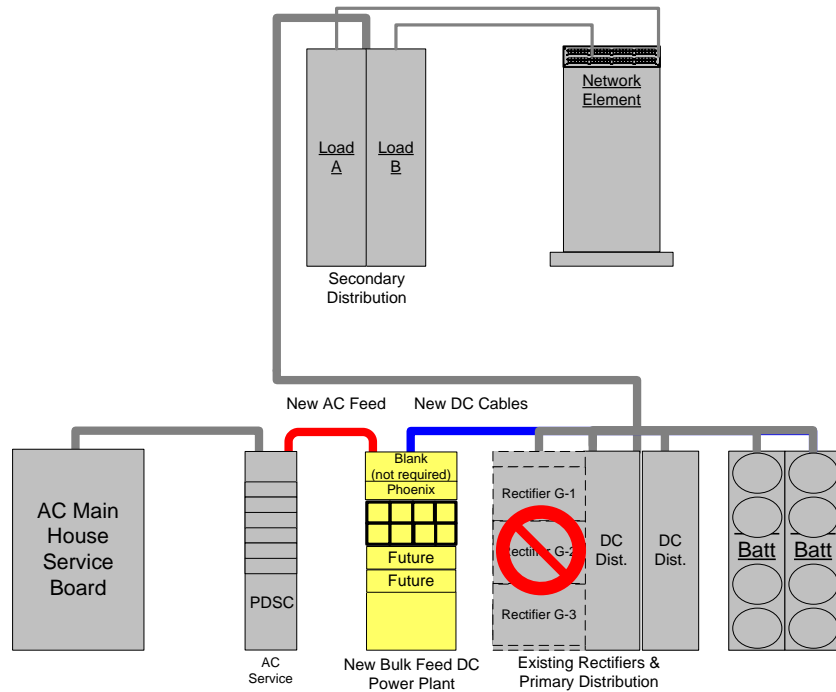


Fig. 1 DC Power Plant as bulk replacement

Legend:

- New AC Cabling
- New DC Cabling
- Equipment in yellow is new
- Equipment in gray is legacy

Bulk Output Replacement Where Space is Critical

If floor space is critical, the 129BD can be ordered on frame rails and installed in an existing rack at the site. As noted in Figure 2, the installer would disconnect and remove existing rectifier(s) and replace them with a 129BD. Once the 129BD is in service, the remaining existing rectifiers may be removed allowing for additional rectifier growth space (if needed) for the 129BD. In either case the 129BD collection bars are sized to accommodate 1,200 Amps of terminations.

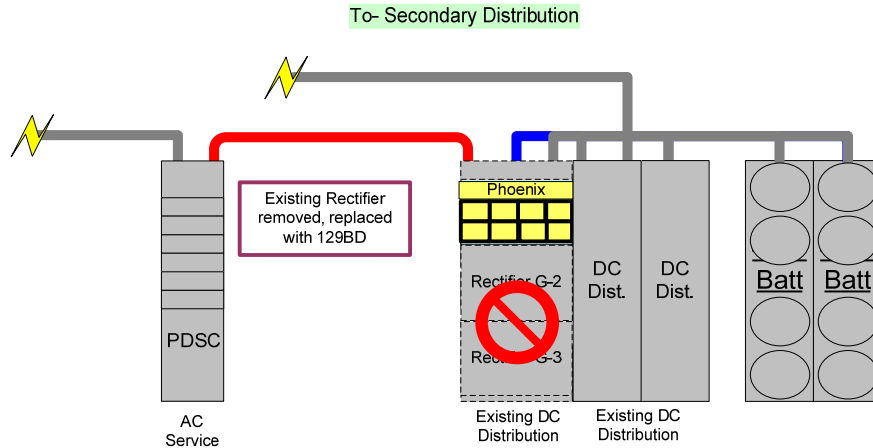


Fig. 2 129BD as in-bay replacement

129BD with Additional Distribution

If the client carrier needs additional distribution, PECO II offers products that can be married to the 129BD to increase its expandability. As found in figure 3, the 5069 BDFB equipped with load shunts and pluggable distribution positions can serve as many as 144 single loads, or it can also be equipped with larger TPL-B fuse blocks to serve up to 250 Amps per position.

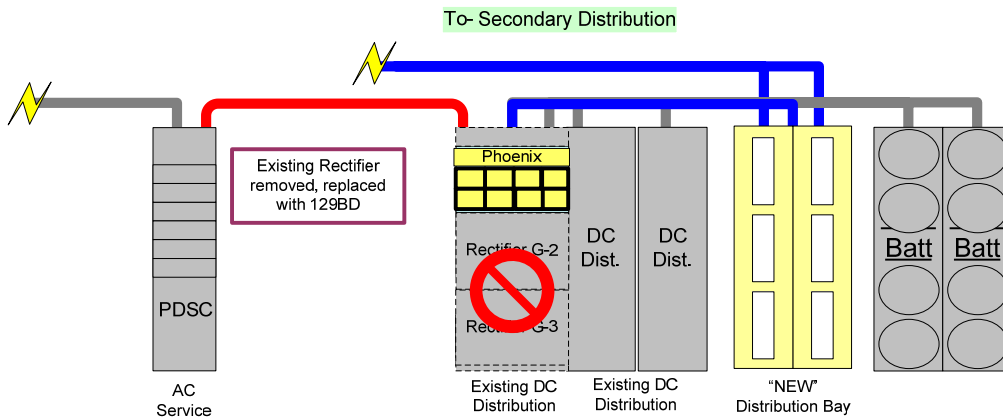


Fig. 3 129BD as in-bay replacement with "NEW" additional distribution bay

■ ■ Links

J-Drawing: 438129BD
 Product Manual: 438129BDPD
 Phoenix™ Controller Manual: 4380400PD

Visit www.peco2.com for additional product details, or to learn more about how PECO II can serve your DC power needs.