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# Power Transfer & Paralleling

## Case History Cox Enterprises

### Where:

Phoenix, Arizona, USA  
New 110,000 sq. ft. data center

### What:

- Paralleling system with two PowerCommand® DMC 300's
- Three DQKAB diesel generator sets rated at 2 MW
- System design, integration, manufacturing & service

### Application:

Standby power

### Primary Choice Factors:

- System integration expertise
- Product reliability
- Smaller footprint

### Distributor:

- Cummins Rocky Mountain

## Reliable video, internet, telephone and wireless service 24/7

Customers with digital video, Internet, telephone and wireless expect their provider to give them uninterrupted service 24/7. For companies that provide these services, it is critical to have a dependable power source not affected by local utility output or weather conditions. They turn to companies like Cummins Power Generation for dependable on-site power solutions that provide energy within seconds to meet their power needs.

Cox Enterprises, a service provider for 6 million residences and businesses in the United States, needed a standby power system to ensure an uninterrupted signal for customers. They installed a system from Cummins Power Generation that could be relied upon 365 days per year. A solution from a manufacturer known for dependability and pre-integrated systems designed to work together in perfect harmony.



When the second phase is completed, the system will include six 2 MW DQKAB Cummins Power Generation generator sets.

## A solution for short and long-term power needs

A solution was developed by a joint team from Cummins Power Generation, distributor Cummins Rocky Mountain and the engineering consultant CCG Facilities Integration. Their mission was to design, manufacture and deliver a standby power system in Cox Enterprises' new 114,000 square-foot data center. The project would be completed in two phases to meet both short and long-term power needs.

“Cox required 4.8 MW of critical power for their data center computer rooms, delivered with a safe, double-redundant and cost effective power system,” according to Mike Mosman, vice president, CCG Facilities Integration. “The immediate need was for 2.4 MW of critical no-break power and 1.6 MW of short-break power for chillers, pumps, air conditioners and lights.” In the long-term, as business continues to grow, three 2 MW generator sets will be added to the initial three units by Cummins Power Generation. The system installed has two PowerCommand® DMC 300 digital master controls and three DQKAB diesel generator sets rated at 2 MW.

## The design required load shifting capability

Both the initial and later expanded power system needed a design that provided the capability of load shifting between the A and B switchgear. “The electrical system is configured N+N redundant—the total building load can be supported with either of the two switchgear while the other is under maintenance,” Mosman said. Design benefits include the capability of shutting down a generator set for maintenance as well as easier access for maintenance.

Mosman also explained that Cox Enterprises wanted the generator sets to automatically follow the load if it shifted from one switchgear line up to the other. If more power is needed in one switchgear line up than the connected engine generators can support, the controls will assign one or more generators to “swing”.



The line of switchgear will provide power transfer between the utility and generator sets.

## Swing system provides double-redundant emergency power

Swing generator set technology provides the equivalent of double-redundant emergency generator sets. "Once both systems are in place, they will have the capability of swinging between the two systems," according to John Kilinskis, regional sales engineering manager, Cummins Power Generation.

Benefits of this configuration include the capability of running the facility loads divided between system A and system B, and then swing all loads to one system while maintenance is being completed on the other system. As facility loading needs vary between systems A or B, the generator paralleling system provides automatic detection to swing the generator power to the appropriate system. "The system also includes soft load/unload closed transition transfers between the utility and generator sources which increases the lifespan of the electrical switching equipment," Kilinskis added.

Cummins Power Generation was also challenged by Cox Enterprises to provide an arc-containing, front-accessible switchgear lineup using linear-actuated breakers. This type of system is commonly used in Europe but had never before been UL-tested in the United States. Cummins engineers directed, coordinated and managed the project, working with two different companies to create one combined



System operation is orchestrated by two PowerCommand® DMC 300 digital master controls and front-accessible switchgear units.

paralleling system. The design included system control and monitoring of ABB solenoid-actuated medium voltage VM-1 breakers with the front accessible switchgear.

"Cummins Power Generation designed and built the EG control cabinet," according to Mosman. "The control cabinets control engine generator starting, paralleling and load control through the MV switchgear, and power transfer between the utility and generator." The switchgear has heavy duty construction able to contain the energy of an internal arcing fault and divert the resultant hot gasses safely outside the building through an integral venting duct.

The PowerCommand® system controls engine-generator starting, paralleling and load add/shed through the switchgear, as well as power transfer between the utility and generator sets. Cummins also installed and tested the system

Mosman stated the main benefit for an arc-containing, front-accessible switchgear lineup was a higher level of safety. The choice of medium voltage switchgear over low voltage switchboards reduces arc flash. The solution also uses the most reliable MV breaker available, is lower in cost (compared to low voltage systems), has high efficiency and a compact size.

