CASE STUDY

Mission Critical/Power Quality

Puckett Engineering, PLLC
THE CRITICAL DIFFERENCE BETWEEN OFF AND ON

State of TN North Data Center Generator

Nashville, TN

In order to improve the reliability of the State's data center operations, a redundant backup generator was needed. Puckett Engineering provided design, construction admin, and commissioning for adding a redundant generator. Puckett Engineering's solutions began with an assessment of the loads and the existing emergency power system to determine the best way to incorporate a redundant generator into the distribution system. The resultant solutions included the following:

- 2000 kW emergency generator system.
- Due to the existing emergency switchgear being under-rated for the fault-current from parallel generators and the extensive cost to replace it, a Generator-to-Generator Bypass-Isolation Transfer Switch system was required to be utilized in-lieu of a paralleling system. The Bypass-Isolation feature allows for uninterrupted emergency power operation during maintenance and testing of the system.
- Incorporated a load-bank connection point into the transfer switch system utilizing quick connect/disconnect Camlocks.
- Reconfigured emergency power system grounding for proper ground-fault operation.
- Fault current and coordination studies to determine equipment short-circuit ratings and circuit breaker coordination settings.
- Surge protection for power and low-voltage systems.
- Monitoring of the generator utilizing Modbus data protocol with the building management system and remote annunciator.
- Identification of new and existing electrical distribution equipment in order to readily identify equipment and know where they feed from. In addition, color coding of nameplates was utilized to quickly identify whether a circuit is supplied from emergency, UPS, or normal power.
- Special considerations and coordination during design and installation were included for maintaining daily operations and avoiding any downtime to the data center operations.
- In order to quickly expedite the project, the design was implemented in phases while working with a contractor.
- The emergency power system was fully tested in order to confirm proper operation and monitoring of both generators and the transfer switch system, including testing various scenarios for both normal and fault conditions.

PROBLEM OR NEED

Improve reliability for the data center.

PUCKETT SOLUTIONS

Added redundant generator.

Generator-to-Generator Bypass-Isolation Switch.

Fast-Tracked Project

No downtime.

Commissioning

Year Completed: 2015

Contact:
Rick Abriola
State Data Center
615.253.4838