

CASE STUDY

Mission Critical/Power Quality

State of TN North Data Center Reliability Improvements

Nashville, TN

The State needed to improve the reliability of their data center's power distribution to avoid single-point failures. Puckett Engineering was retained to design Phase 2 of this process, which included upgrading the power distribution between the UPS system and the loads for 2N redundancy. The project also included other facility upgrades as noted below. Puckett Engineering's solutions included the following:

- Assessment of the existing UPS system and power distribution. The UPS system included a 750 kVA parallel-redundant system with provisions to double the capacity to 1500 kVA. The existing UPS power distribution included distribution panels supplying numerous PDUs and RPPs.
- Worked closely with the data center personnel to segregate PDUs, RPPs, and branch circuits into an A/B (2N) configuration.
- Power distribution design for reconfiguring the system for 2N redundancy from the UPS system down to and including the branch circuits to the computer loads with provisions to extend the 2N redundancy upstream to the UPS system itself, including the addition of distribution panel, PDUs, and branch circuits.
- Replacement of old PDUs.
- Surge protection for power distribution system.
- Fault current and coordination studies to determine equipment short-circuit ratings and circuit breaker coordination settings.
- Connection of the existing monitoring system to the new PDUs.
- Complete re-design and replacement of the data center's Emergency Power Off (EPO) system for code compliance, including features to avoid accidental activation, proof-testing without shutdown of loads, status indications, and monitoring for fault conditions.
- In conjunction with this project, complete renovation of the 46,000 SF facility's office space was included as noted in the State North Data Center Offices Case Study.
- In conjunction with this project, Fire Alarm, Video surveillance, Access Control, and PA systems were included for the entire 77,500 SF facility as noted in the State North Data Center Offices Case Study.
- 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 the equipment or circuits are on the A or B side.
- The EPO system was fully tested in order to confirm proper operation of all functions and monitoring.
- A temporary power solution utilizing temporary generators along with work phasing was developed to avoid downtime to the data center operations during construction.
- Construction administration for the project. Before construction began, the distribution upgrades to the data center were put on hold.

PROBLEM OR NEED

Improve reliability of Data Center's Power Distribution.

PUCKETT SOLUTIONS

2N Redundant Power Distribution System.

No downtime.

Commissioning.



Year Completed: 2014

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