

# CASE STUDY

Mission Critical/Power Quality

## State of TN North Data Center UPS Battery Plants

Nashville, TN

The battery plants for the State's data center parallel-redundant UPS system were in need of replacement and upgrade. Puckett Engineering provided design, construction admin, and commissioning for replacing and upgrading the battery plants. Puckett Engineering's solutions included the following:

- Assessment of the existing layout and configuration of the two existing battery plants and the DC power distribution and switchgear. Each battery plant supplies a 675 kW UPS module.
- Confirm that ventilation, space temperature control, eye wash, and hydrogen sensors were in-place for the existing battery room.
- Determine ratings for replacement battery plants, including voltage, kW capacity, runtime, and end-cell voltage based on the UPS kW, inverter efficiency, and cut-off voltage ratings, cable losses, and the State's requested runtime.
- Battery room DC cable distribution utilizing single-conductor cables and cable tray, including cable short-circuit bracing and cable tray seismic support.
- Upgrade DC feeders between the battery plants and the UPS modules for handling the battery plants' maximum discharge current.
- Acid spill containment (for VLA batteries).
- Battery monitoring system for monitoring each battery jar.
- Charging system and rack for spare battery jars.
- The battery plants were initially designed and bid utilizing vented lead acid (VLA) batteries and then afterwards at the owner's request the battery plants were re-designed and installed utilizing valve regulated lead-acid (VRLA) batteries.
- Identification of the battery plants' equipment for ready identification of the equipment and other pertinent information.
- Special considerations and coordination were included during design and installation for maintaining daily operations and avoiding any downtime to the data center operations.
- The battery plants were fully tested in conjunction with their UPS systems including functional and capacity testing and thermal imaging of terminations.



### PROBLEM OR NEED

Improve reliability of data center UPS System.

### PUCKETT SOLUTIONS

Replacement & upgrade of UPS battery plants.

Battery monitoring system.

No downtime.

Commissioning.



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Year Completed: 2014

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