



White Paper

Battery Damage Caused by Unqualified Installers

White Paper: Battery Damage Caused by Unqualified Installers

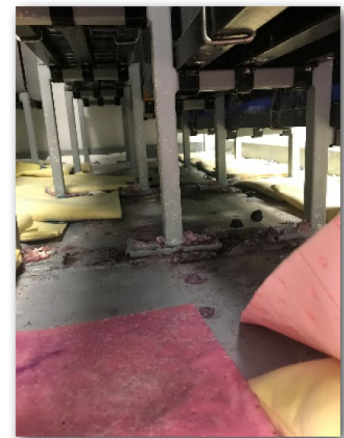
Introduction

An electrical contractor damaged jars during installation resulting in delayed leaks surfacing after new battery and battery building was turned over to plant operations.

In 2017 we received a call from a utility customer who reported leaking cells in a new battery recently installed in their plant by a contractor working for a major engineering firm. In addition to the loss of electrolyte in the jars, the customer noticed electrolyte underneath the elevated building, apparently leaking through the floor. We were asked to send a technician out to identify, jumper out, and remove the leaking cells.

Once on site, we discovered that the problems were much worse than the customer realized.

- The leaking cells were being filled with distilled water as the electrolyte leaked out. Over time all electrolyte in the leaking cells had been replaced with distilled water. The measured specific gravity of those cells was 1.001. As a result, the battery would provide little to no usable energy if called upon to support the load.
- The leaking electrolyte had caused corrosion of the battery rack and the metal floor beneath it.
- In addition, the electrolyte was leaking through the floor of the battery room onto the concrete below the battery building. This created a safety issue for personnel walking beneath the building.



Actions We Performed

A full assessment of the damage was made, and the following recommendations were offered:

- Barricade the area under the battery room due to leaking electrolyte
- Jumper out and remove leaking cells
- Neutralize, repair, and repaint the floor damaged by electrolyte
- The leaking electrolyte had caused corrosion of the battery rack feet and the metal floor
- Replace the spill containment system
- Replaced damaged rack
- Replace leaking cells
- Perform a capacity test after all the corrective actions have been completed

The customer followed our recommendations and had us remove all jars and the rack. This allowed access to the damaged floor which was repaired. A functional spill containment pan was added, and the rack and leaking cells were replaced.



White Paper: Battery Damage Caused by Unqualified Installers

What the Contractors Did Wrong

The battery installers were careless in handling the jars during installation. As shown in the photos below, the rack has a front lip. During installation, the installers rested the heavy jar on this lip, then pushed it into place. Once the front of the jar cleared the lip it dropped approximately $\frac{3}{4}$ " to rest between the front and back rails.



Conclusion

While the jars are designed to support the distributed weight of the cell, 330 lbs. in this case, they are not designed to support that load across the thin width of the rack lip, which occurred when the contractor pushed the jars onto the rack. Compounding the problem, additional stress was added when the battery dropped the $\frac{3}{4}$ " on to the rack rails. These actions resulted in cracks in the case allowing electrolyte to leak from the cells.

If the contractor had followed proper installation procedures, they would have placed the jars directly on the rack rail from the end of the rack, avoiding the lip, and then sliding each jar into place. This would have eliminated the stress caused by the rail lip and the drop of the jar into place. The root cause was the contractor's lack of battery knowledge and how to properly handle heavy batteries during installation.