

### Containerized Battery Energy Storage Systems

CBESS

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GEM 360 was contracted to investigate, report, and then deliver & install a custom, design & build cooling solution for a Containerized Battery Energy Storage System or CBESS which is being used for frequency regulation duties at a substation owned & managed by a Midwest USA independent power producer (IPP).

The OEM CBESS package was delivered with a hard ducted, open supply, open return, flood-type HVAC system and contained a very high count of racked battery modules. The cooling system was able to maintain a constant, controlled temperature only until a discharge /charge signal was received which resulted in the battery modules reaching a temperature well above the recommend level needed for the optimum performance & overall best lifespan under documented warranty conditions. These over-temp conditions also caused the system to regularly go offline and not be able to provide power to the grid causing notable economic losses to the owner.

The existing duct system was strategically modified into a closed supply, closed return duct system and the open racks were changed to be fully enclosed. The flood-type airflow streams were modified into direct spot-cooling using a proprietary control method which allowed the cooling air to effectively penetrate the small, interior spaces within the racks without the need for additional & very costly auxiliary electrical cooling fans. Upon final testing, the system performed as expected and the CBESS is now back online & producing revenue.



#### CBESS Specifications Included:

- Lithium Ion-based 3MW/1.4MWh DC to AC Power Delivery
- Custom Modified 40' High Cube ISO Container
- Electric, Forced Air Heating / Cooling Units

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