CASE STUDY

Combatting Inverter Obsolescence: A Revival Strategy for BMR Energy's Solar Facility

SUMMARY

Faced with increasingly failing original inverters and discontinuation of their model by the OEM, BMR Energy sought a cost-effective replacement strategy for their Bodden Town Solar Plant. They partnered with Clean Energy Associates to devise a repowering strategy, replacing the failing 30 kW inverters in clusters with larger units from the same OEM, and installing a neutral deriving transformer to accommodate the new inverter's wye (4-wire) configuration. This phased approach, set to span approximately 8-10 years, has increased system capacity by approximately 48 kW in its first phase, suggesting improved performance and reliability, while avoiding costly facility reconstruction and SCADA integration. The case underlines the importance of a proactive, well-thought-out repowering strategy to maximize performance and profitability as solar facilities age.

KEY TAKEAWAY

As solar power plants get older, critical equipment that needs to be replaced may become obsolete or difficult to find. This could mean that the entire plant will need modifications or upgrades in order to maximize project performance and profitability. A proactive approach, including the development of a well-thought-out repowering strategy, will likely be required as solar facilities age.

DETAILS

CLIENT OVERVIEW: BMR Energy, LLC, who is a key player in the solar energy sector, acquired the Bodden Town Solar Plant located in Grand Cayman in December of 2018. The original plant was built in 2017.

PROJECT LOCATION: Grand Cayman, Cayman Islands.

PROJECT SIZE: Replacement of all 173 original inverters.

TIMING: Approximately 8-10 years to replace all the inverters

CEA

THE CHALLENGE

With time, the original inverters began to fail increasingly frequently, necessitating regular replacements. Upon the expiration of the inverter warranty, the Original Equipment Manufacturer (OEM) informed BMR that they were discontinuing the inverter model and would no longer service the fleet of inverters in operation. This required BMR to devise a replacement solution to maintain the facility's output.

The primary challenge lay in finding cost-effective replacement inverters that minimized the need for significant reconstruction of the existing system. The requirements of the new inverters were the following:

- Of a similar size or a multiple of the existing units to minimize rewiring efforts.
- Compatible with the existing SCADA communications and controls without extensive control modifications.
- Readily available.
- Compatible with a Delta transformer configuration.

THE SOLUTION

BMR hired Clean Energy Associates to devise a repowering strategy. The chosen solution utilized newer, larger units from the same OEM in two different sizes. The varied sizes (same model) were necessary to best match the capacity of the various clusters of original inverters at the facility. The original 30KW units were grouped in 2, 3, or 4 units per pad. These clusters were replaced with one 62KW unit, two 50KW units, and two 62KW units respectively.

Given that all inverters in this size range operate with a Y transformer configuration and the plant was built with a Delta configuration, a neutral deriving transformer was installed. The project is being implemented in phases; as the obsolete inverters fail, they are replaced, and some spares are generated. The entire project is expected to span approximately 8-10 years to replace all 173 original inverters.

This solution ensured minimal electrical reconstruction and utilized the same OEM communications system, which was easily integrated into the existing SCADA system.

THE RESULTS

- The successful implementation of the first phase resulted in a system capacity increase of approximately 48 kW. Early indications suggest enhanced performance and improved reliability.

- The strategy of replacing with larger inverters from the same OEM proved cost-effective by avoiding extensive facility reconstruction and costly SCADA integration.