McHale & ASSOCIATES, INC.

*Inarajan, Guam*

## Facility Summary

Photovoltaic Solar Facility

25 MWe

## Dandan Solar Facility

*NE Corner of Facility*

# DANDAN SOLAR PROJECT

Dandan solar facility is located on the south side of the Guam island. There is a total of 25MWe generation from 42 acres of photovoltaic panels.

### Project Issues

The project was completed and testing scheduled during the rainy season in Guam. The site terrain was rolling and covered with vegetation which would overgrow the panels and deteriorate the facility capacity.

### McHale Contracted Tasks

We were contracted to develop and execute a performance testing plan that allowed the project to demonstrate contractual obligations given the expected weather and terrain. Our scope included the creation of a performance test procedure, supplying and installing precision instrumentation for measurement of ambient solar insolation, ambient temperature, and wind speed, detailed data filtering using statistical algorithms and performance evaluation determination using PVSyst software.

### Problem Resolution

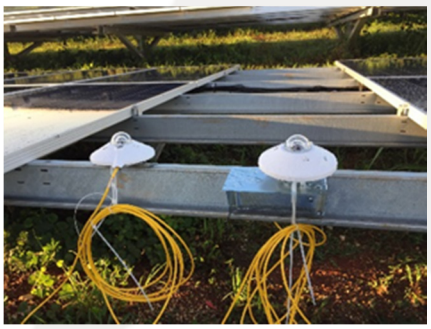
Typically photovoltaic testing takes 4 to 5 days; however at Dandan it took six (6) weeks to obtain sufficient data due to ambient conditions. The sky was cloudy in the morning and the sun was too intense in the middle of the day which led to the inverters clipping. Each day, the data set was carefully analyzed until sufficient time periods could be assembled to provide a result that was repeatable and reliable in accordance with the construction contract and the applicable test codes. Data filtering and correction methods accounted for vegetative growth that negatively influenced the facility performance characteristics.

### Work Outcome

Thermal performance was demonstrated to meet the contractual goals during suboptimal ambient conditions. Detailed granular analysis on a daily basis minimized schedule impacts to quickly identify times of acceptable clear sky conditions. Typically testing would not be achievable during the rainy season, but the McHale engineering and custom software developed during the project sufficiently proved the capacity of the facility at design conditions which allowed the plant to achieve commercial operation.

*View from South Side of Facility*

*Vegetation Growing Through PV Panels*



*Pyranometers at GHI and Plane of Reference*