

Nor-Cal Controls Uses PACSystems™ RX3i Control System for Solar Power Storage Site Transformation

RESULTS

- Quick site response to grid's dispatch center's commands for changes in frequency and voltage
- Simplified control architecture speeds system response to grid instability events and curtailment instructions
- Advanced performance of the PACSystems RX3i PLC makes the system ready for future CAISO and NERC regulatory changes
- Quicker fault detection and reduction in underproduction of power result in enhanced billable power output and improved revenue



APPLICATION

Automation upgrade to comply with updated CAISO and NERC performance and reliability requirements.

CUSTOMER

Nor-Cal Controls, the control systems integrator for a solar energy plant in California, USA.

CHALLENGE

The 100MWac solar project in California was developed and constructed in 2016 and the company employed a 75MW/300MWh battery energy storage system (BESS) retrofit to the site.

The existing SCADA system was not capable of adhering to upcoming changes to regulatory standards as defined by NERC (North America Electric Reliability Corporation). Furthermore, the system was causing some of the site's individual inverters to fault and underproduce. Despite an over-built site capacity, the control scheme was unable to identify faulted/underproducing field equipment, leading to a loss of revenue.

Irrespective of the need to comply with the new CAISO (California Independent System Operator) and NERC regulations, the site's existing SCADA system needed an overhaul to eliminate underproduction, and ensure accurate and predictive fault detection for quick redressal or avoidance of faults altogether. Furthermore, the new control system required stringent standards of high availability, cybersecurity, ease of migration and scalability for future expansion.

"The PACSystems RX3i control system is the smart choice for retrofit projects because of its modern compliance, efficiency, and cost effectiveness."

Engineering Team
Nor-Cal Controls

SOLUTION

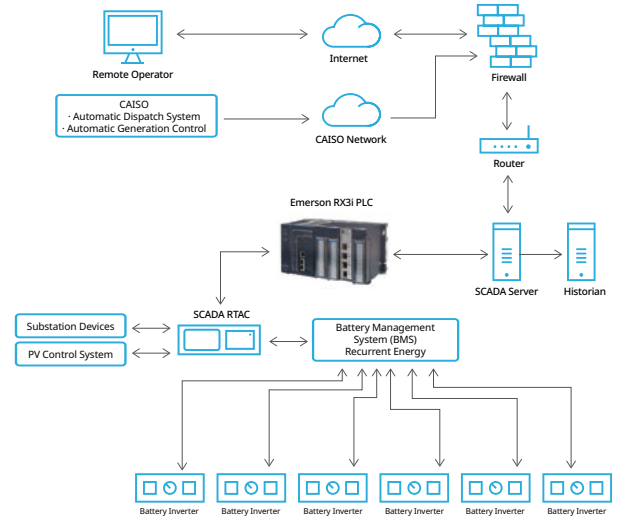
The power company selected Nor-Cal Controls for the site's transformation. Nor-Cal Controls is a renowned solution provider to the renewable power generation industry globally and is based in El Dorado Hills, CA. Nor-Cal is also the preferred solar industry automation solution provider of Emerson, and this relationship is based upon Nor-Cal's strong experience in the solar power industry and its adoption of PACSystems as a preferred controls platform.

Nor-Cal redesigned the controls schema for the site utilizing the advanced features in the PACSystems RX3i solution. The updated control scheme consolidated multiple distributed controller tasks into a single, centralized PACSystems RX3i controller, increasing communications reliability and decreasing site's response time to curtailment instructions or grid instability events. The PACSystems RX3i controller utilizes closed loop controls (PID) to continually compare the plant's actual vs. command production. This enables the new system to leverage functioning field equipment to make up for the deficits of faulted equipment, thereby decreasing the loss of revenue and increasing contributions to grid stability. With these changes in performance and capability, the system is now fully ready for upcoming CAISO and NERC compliance requirements.

Nor-Cal also selected the PACSystems control solution over other options because of the ease of scalability and ability of the PACSystems technology to integrate with older I/O families. For future migration, the customer just needs to migrate the CPU and retain I/Os, resulting in tremendous savings in cost, testing time and rewiring, and ensuring speed and reliability of migration.

RESOURCES

www.Emerson.com/PACSystems



Control systems schema for battery energy storage management system.

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