

Emerson PACSystems™ Controllers Enable Reliable Performance in One of the World's Largest Solar Plants

RESULTS

- Control system helped reduce 14 million tons of CO2 annually and meet sustainability goals.
- Increased productivity per panel through optimal panel management and precise control.
- The scalability and ruggedness of the control system allowed the solar farm to be implemented across 14 sq km of harsh environment.



APPLICATION

Automation of a solar power plant

CUSTOMER

One of the world's largest solar power plants

CHALLENGE

The power generation company sought to build a first of its kind mega solar power plant in a remote, harsh geographical location. To meet the demand, the company needed to spread the solar farm across 14 sq. km in an environment that frequently registered ambient temperatures from -2°C to 52°C. The control system required to manage this would need to be rugged enough to function in the harsh conditions and also scalable enough to enable the solar farm to grow without losing functionality. There were also concerns about cybersecurity as the plant would supply power to two million people. Furthermore, the power company was looking for an OEM partner to engineer and also implement the solution including integration to numerous third-party devices. The challenge was to develop a truly scalable and efficient system that could provide control and monitoring on a mega scale.

Emerson enabled the interconnecting of disparate devices via the cybersecure PACSystems control system to ensure true high availability and seamless integration.

SOLUTION

After evaluation of various automation solutions, Emerson was selected for the project. The solar power plant includes ~80,000 solar panels, 800 inverters, 7,100 string combiner boxes, 5 weather monitoring stations and proportional auxiliary equipment. Emerson's solution connects these devices and consolidates 350,000+ tags in a single SCADA instance. Additionally, 200+ PACSystems controllers perform high speed data acquisition and control. The solution is a complex architecture with multiple fiber optic rings using eight different industrial protocols to connect to 8,000+ external devices. All the tag data is historized with a five-year storage capacity. This enables data analysis to achieve higher equipment productivity like panel positioning and cleaning, failure prediction and proactive redressal leading to better capital utilization, reduced operating expenses and faster return on investment.

The Emerson PACSystems solution is capable of withstanding temperature ranges of -40°C to 70°C right from startup. In addition, it delivers strong cybersecurity with Achilles 2 certification that prevents any denial-of-service (DoS) or man-in-the-middle cyberattacks, as well as any unauthorized firmware changes. Emerson continues to provide timely service to the installation providing electricity to two million people.

RESOURCES

PACSystems

<https://www.Emerson.com/PACSystems>

Emerson's solid project execution and deployment capabilities, in collaboration with the power generation company, enabled the development of a control and monitoring solution on a complex mega scale.

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