

# ABB performs remote E-HAZOP assessments on US solar plants



During 2021, ABB Consulting was commissioned to undertake remote Electrical System Hazard and Operability (E-HAZOP) studies on solar electric generation facilities for customer Atlantica Sustainable Infrastructure plc.

## Background

Atlantica is a sustainable infrastructure company that owns a diversified portfolio of contracted renewable energy, storage, efficient natural gas, transmission lines, and water assets in North America, South America, and certain markets in EMEA. Headquartered in London, the company is included in the prestigious “A” list compiled by global non-profit CDP, which runs the world’s environmental disclosure system for companies, cities, states and regions.

## Customer issue

Atlantica’s flagship assets in the US are the Mojave and Solana concentrated solar power (CSP) plants in California and Arizona, respectively. Being solar, these plants are in a constant state of start-up and shutdown, putting more strain on equipment and systems versus traditional base-load gas and coal power plants. As a contracted supplier of renewable energy, it is key that Atlantica provides assurance of availability and plant resilience. The Solana site went into operation in 2013 and the Mojave site in 2014. Given they are approaching 10 years old, and having conducted its own Process Hazard Analysis (PHA), the company also wanted to ensure the facilities follow the latest electrical safety requirements and best practice. Knowing the potential hazards and level of risk of any site is also key for insurance providers.

## Why ABB?

ABB are a trusted provider of engineering support and electrical infrastructure. ABB E-HAZOP studies are a unique approach, identifying potential hazards present in electrical system installations and assessing their risk, to provide a more complete risk profile of a facility. They identify design and operational deficiencies and recommend potential improvements that will lead to safer and more controlled operations. The studies also identify and record the good design features and procedures that are in place to manage the hazards. Key focus areas include switchgear systems, fire detection / protection in electrical switch rooms as well as lifecycle management of key electrical equipment such as generators, transformers and UPS systems.

ABB is one of the world’s premier suppliers of automation, telecoms, and electrical equipment and systems for a huge range of industries. Atlantica’s Mojave plant uses the ABB Industry Standard 26kV generator circuit breaker which is a key component of the plant’s unique operating model for a solar plant as it has to synchronize onto the grid on a daily basis.

### **ABB's approach**

Based in the UK, ABB Consulting Services provides professional services globally to improve performance in the areas of process safety, functional safety, and engineering. Our highly experienced specialists have excellent knowledge of best practices across industry sectors. We have a long heritage of developing structured HAZOP methodology to identify industrial process safety hazards that have the potential for explosion, fire or toxic consequences. ABB E-HAZOP studies add to, and complement our suite of HAZOP studies.

A key new development is evaluating electrical issues in the same way as HAZOP for process safety by describing the design intent of each section, then using specific ABB E-HAZOP guide words to identify potential deviations. This gives the study a similar degree of rigor as HAZOP for process safety, ensuring all key issues are discussed for each part of the electrical distribution system, and a clear record produced as a robust demonstration. Our focused methodology identifies causes, potential consequences and level of harm to personnel, the environment, operating costs (downtime and equipment) and reputational damage for each hazard. We look to see what safeguards are in place to both prevent and limit each hazardous event, identifying any gaps and making recommendations to meet good practice as defined by regulations and published guidance. Our expertise and familiarity with operating companies throughout industry allows us to take this a step further by highlighting opportunities to implement best practice measures for the facility. Each hazardous event is risk-ranked to provide a more complete risk profile of the facility, and allow recommendations associated with higher risk hazards to be prioritized.

We can conduct studies on site or remotely according to customer requirements and availability. ABB E-HAZOP studies utilize the knowledge of the entire team, so it is critical that both engineers who understand the design and operators and maintenance personnel who are familiar with the operation are involved throughout. We use ABB HAZOP leaders and electrical specialists to support the study step by step.

During the study the team are guided through a discussion on the physical electrical set-up and how it is operated, whilst examining key documentation and diagrams. Over the past 2 years ABB HAZOP leaders have developed expertise in conducting study meetings on-line, leading discussions and maintaining full team involvement.

### **Customer benefits**

The E-HAZOP studies resulted in a prioritized list of recommendations for each site. Each study involved six days of remote Teams meetings spread across a three week period to fit around availability of site personnel. Prior to the pandemic the ABB team would normally conduct the process on site following an initial orientation walk-around during which areas such as housekeeping could be observed. In this case, we asked Atlantica site personnel to talk through aerial site photos, plot plans and to take photos of specific areas and equipment under consideration. Conducting the E-HAZOPs remotely removed the need to travel resulting in a significant cost reduction.

The interactive E-HAZOP sessions resulted in all team members gaining a more complete understanding of the design and operation of the facility along with a deeper insight into potential electrical hazards. Greater workforce involvement is good for internal communications and reinforcing corporate responsibility values as well as being a key component of a robust process safety management framework.

### **Customer feedback**

Electrical engineers Scott Leonard and Zachary Sleppy, ABB's primary contacts at the Mojave and Solana plants, respectively, were both very happy with the E-HAZOP studies and the support provided by the ABB team, concluding that the studies met all Atlantica's requirements.

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