A skyline dominated by skyscrapers marks the border between the sandy desert and the waters of the Arabian Gulf: Dubai. Since the United Arab Emirates gained independence in 1971, Dubai has developed into a globally significant financial, trade and transport hub:

ZENON SUCCESS STORY

DEWA PROTOCOL CONVERTER GATEWAY

Creating a more sustainable electricity supply in Dubai

The Dubai Electricity and Water Authority (DEWA) has provided the Emirate of Dubai with an uninterrupted water and energy supply since it was established in 1992. To continue meeting its objectives, the authority required a flexible and configurable control solution that provides the necessary visibility and compliance.

In 2015, DEWA launched the Dubai Clean Energy Strategy with the goal of generating 75 % of its electricity from clean, renewable sources by 2050.

In line with this goal, the public power company is pursuing the ambitious DEWA 2021 strategy towards sustainability. It currently supplies 2 billion liters of desalinated water and 10,000 MW of electricity generated and distributed using highly automated equipment.

COST SAVINGS AND IMPROVED DATA ACQUISITION

DEWA began by modernizing one of its older Substation Control and Monitoring Systems (SCMs). Installing a PC-based system using the zenon Software Platform from COPA-DATA as an SCMs Gateway to its main control center led to more flexible and reliable operations while providing DEWA with full vendor independence and cost savings.

A RETROFIT FOR SUBSTATIONS

Forward-thinking projects such as a combined desalination and generation plant and the world's largest single-site solar project at the Rashid Al Maktoum Solar Park reflect this shift towards a cleaner energy system. At the same time, much of the existing equipment requires modernization to bring it up to standard.

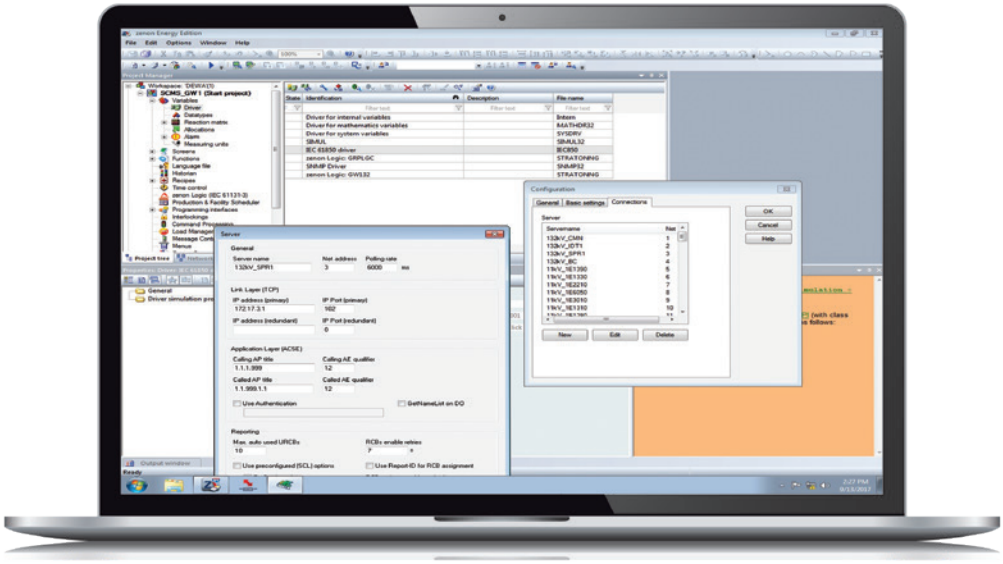
Some DEWA installations date back to 1959 and require significant upgrading. For example, the data interfaces between the substation bay controller units and the company's main control center needed to be upgraded to comply with IEC 60870-101/104 standards. Legacy equipment supplied as part of the original substation structure was no longer in production. Furthermore, any changes to these proprietary systems had to be completed by the equipment vendor and, therefore, came with high engineering costs.

THE NEED TO REPLACE AN AGING PROPRIETARY SYSTEM

The DEWA engineers responsible for Operation Technology-Telecontrol systems in company's Transmission Power division needed to find a solution that could deliver the performance and compliance required while also offering greater engineering flexibility.

The operational engineers began to scour the market for vendor-independent protocol converter gateway software that would be compatible with the existing IEC-61850 bay controller units (BCUs) in the substations.

Because of zenon Energy Edition's track record in substation control, the DEWA team decided to install and test zenon's process gateway functionality in its laboratory. zenon is used in substation control around the world in a variety of ways, including as an on-site control system, as a control room process visualization and as a gateway to high-level control systems. This proven



The engineering environment of the zenon Software Platform is used to create, maintain and expand projects.

pedigree of the zenon Software Platform is convincing. Furthermore, zenon's hardware independence and its ease and efficiency of engineering made zenon a highly attractive option for DEWA.

BETTER ENGINEERING FOR AN IMPROVED COST OF OWNERSHIP

The ability to connect with a wide variety of BCUs, equipment and third-party devices from numerous manufacturers via IEC 61850 is what impressed the DEWA team the most about zenon. This native gateway functionality is bidirectional, allowing it to relay and receive commands as well as forward substation equipment data to the company's control systems.

It can be used for all levels of automation from unmanned, fully automatic operation to on-site operations using ergonomic user interfaces. The software platform also provides seamless redundancy in several different ways, making it easy to guarantee an uninterrupted electricity supply.

All engineering work in zenon can be completed purely by setting parameters. Consistently object-oriented with a wealth of predefined libraries, zenon makes configuring projects a quick and efficient process. Furthermore, zenon addressed two key requirements for DEWA: the need to be hardware independent and the ability to engineer solutions easily in-house.

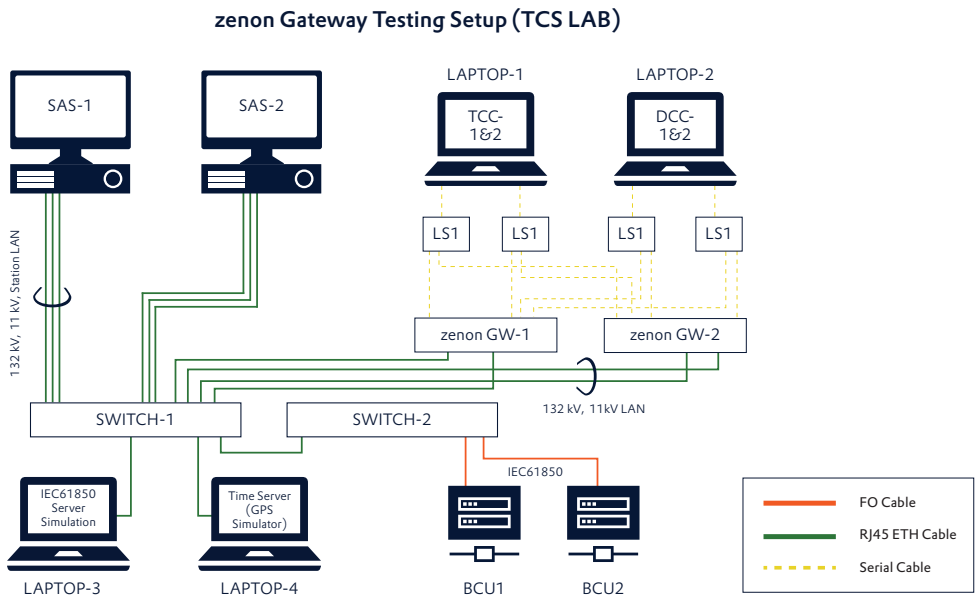
While the ease of engineering was the preeminent reason for DEWA choosing zenon for the DEWA SCMS Gateway, the software also offers an additional functionality that is highly valued by the DEWA team. In particular, the built-in checks and security functionality helped to prevent errors and enabled the team to produce comprehensive, version-controlled documentation with minimal effort.

The zenon software platform also provides seamless redundancy, making it easy to guarantee an uninterrupted electricity supply. DEWA gained more flexible and reliable operations while benefiting from full vendor independence and massive cost savings.

A SUCCESSFUL FIELD TEST

Even before DEWA's first engineer received zenon training, the DEWA Transmission Power Division's Operation Technology Department installed the software on a PC running Windows 7 Professional. They tested zenon's process gateway functionality in a laboratory and encountered challenges like integration of proprietary add-ons in IEC 61850 complied BCUs from a well-known OEM, which was overcome by a work-around implemented by the DEWA team. DEWA worked closely with the engineers at COPA-DATA headquarters to ensure the necessary compliance with international safety standards. The new solution converts IEC 61850 data to IEC 60870-101 as well as IEC 60870-104 and forwards it to four different DEWA control centers.

Following successful in-house laboratory testing, the DEWA SCMS gateway system built using zenon was implemented at one of DEWA's 132/11kV transmission substations for a one-year field test.



DEWA tested zenon in a laboratory and found its performance was suitable to fulfill all of its requirements.

During the laboratory tests, DEWA engineers discovered that the standard zenon version had no native support for the balanced mode in the IEC 60870-5-101 slave required to correctly handle data from some of their legacy central grid applications. COPA-DATA swiftly added this capability with the help of DEWA. In line with the Austrian automation specialist's quest to ensure the software remains free from custom code so that future version changes remain simple, this addition was incorporated in the following version of zenon. Moreover, a solution was added to DEWA Gateway to prevent detrimental circuit breaker reactions to short-pulse double commands from the controlling station.

CREATING A MORE SUSTAINABLE FUTURE

zenon provides DEWA with the opportunity to modernize the existing communication and control system in the future, which will help to assure the necessary compliance.

It is the highly sought-after engineering independence and flexibility and associated cost savings that zenon delivers that the DEWA engineers appreciate most of all.

Following a full year of faultless operation in the original substation, DEWA SCMS Gateway powered by zenon will now replace the legacy SCMS gateways in many DEWA substations. By installing a PC-based system using the zenon software platform rather than a proprietary protocol converter gateway, DEWA has gained full control over all required engineering, making it independent of hardware vendors. DEWA has saved 87 % of investment costs.

HIGHLIGHTS:

- Open integration of hardware from various sources
- In-house, vendor-independent adaptability
- Enhanced, bidirectional communication with grid control center
- Improved data quality
- Multi-language functionality so Arabic can be used on the HMI displays
- Support for necessary IEC protocols and standards
- Seamless redundancy
- Cost savings of 85 %
- A more flexible and reliable system with a lower cost of ownership

DEWA

Dubai Electricity and Water Authority (DEWA) is the exclusive provider of electricity and water services in Dubai. DEWA was formed in 1992 following the merger of the Dubai Electricity Company and the Dubai Water Department which had been operating as an independent entity since 1959. DEWA's 9,700 employees successfully manage the generation, transmission and distribution of electricity and water across the emirate. DEWA serves a large customer base across the emirate and provides over 600 thousand customers with electricity and water.