Industrial Communication

A rugged data network in Saudi Arabia stands up to the challenge

RUGGEDCOM RSG2100 from Siemens enables efficient, reliable network communications for oil and gas operations in Saudi Arabia

Major players in today's oil and gas industry in Middle Eastern countries such as Saudi Arabia have very sophisticated needs for data communications to span their expansive upstream, midstream and downstream operations. To monitor and manage all the equipment and locations, it's essential to have a powerful and reliable network.

As a leading distributor of communications equipment for oil and gas operations across the region, Xceltra – founded in the United Arab Emirates and with a sales team based in Saudi Arabia, UAE and Egypt – works with system integrators to meet the needs of oil and gas companies. In offering everything from small wireless devices to large routers and switches, Xceltra also meets the communications equipment needs of companies in other industries such as mining and electrical power.

Xceltra has had a long-standing relationship with Siemens. Most recently, the two organizations have worked together to provide a system integrator working with a major Saudi Arabia's oil company with key products for a major enhancement to its network.

The challenge

Requirements to handle old and new interfaces, meet IEC substation standards, and overcome extreme heat.

With newly added substations, Xceltra's customer in Saudi Arabia was looking for industrial Ethernet connectivity into the company's existing Supervisory Control and Data Acquisition (SCADA) network. Using a microwave link, there would be fast and effective communications between the new substations and remote terminal units (RTUs) in the field, as well as intelligent electronic devices (IEDs) feeding into the RTUs.

The RTUs had older legacy interfaces (BaseFL), while the IEDs had newer interfaces (BaseFX). Any switch brought into the network had to be able to handle both types while meeting IEC 61850 substation standards, plus have back-up redundancy, and do it all with full reliability, despite temperatures that can exceed 50°C, which is typical in the Saudi Arabian desert.

Nourhan Wally, Engineering and Support Team Leader at Xceltra, was provided with a description of the exact requirements of the new substations being integrated with customer's existing control systems and immediately got to work with her technical team to find a solution.

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The solution

The versatile and dependable RUGGEDCOM RSG2100.

Ms. Wally explains that every switch for the network required 13 or 14 ports per substation – and that brought the RUGGEDCOM RSG2100 into the picture.

"The network needed to be built with as many IEDs as possible for every substation," she says. "The system integrator wanted to use converters and switches for the design. But we convinced them not to do that. We sent them a demo unit to test the RUGGEDCOM RSG2100 switch and it worked really well. We were convinced that the switch would work well and it should be used for all four new substations."

She felt strongly the RSG2100 would be ideal for the task at hand for a number of reasons. "First of all, it's very rugged. We need a wide temperature range," she says, referring to how the device can operate from anywhere between −40° C and +85° C, with the ability to handle the extreme heat obviously being critical in this deployment. "We also need electromagnetic immunity and it gives us that. Plus it meets the IEC 61850 substation standards, which is essential."

She added that the switch's versatility was another major advantage. "They are modular and very flexible when it comes to design," she describes. "I don't need to use different switches. I can use the same switch and add the modules as per my requirements. And they are really easy to configure and manage."
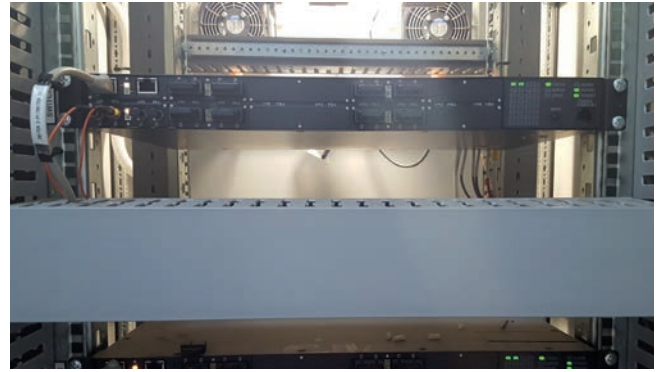
RUGGEDCOM RSG2100 switches in RTU cabinet

The results

The right switches for the job delivered quickly, backed by excellent support.

With quickness and responsiveness – and in a cost effective manner – Siemens delivered forty RUGGEDCOM RSG2100 switches that were needed for the four substations, with configuration and integration being handled by the company responsible for Engineering, Procurement and Construction (EPC).

Once fully installed and integrated, the devices will be critical linchpins in the overall network architecture, enabling mission-critical data communications that are cost-effective, reliable and efficient.

Ms. Wally explains that in this project – similar to all the other projects where Siemens has worked with Xceltra – the team from Siemens has ensured that everything is handled with the utmost excellence.

"We have constant support from Siemens, from the beginning of the project until the very end," she says. "We've attended partner training with Siemens so we have more insight into how RUGGEDCOM products work in the network design, and how they stand up compared to other brands in terms of design and configuration. The training helps us a lot to design the right solutions in our projects. The technical support people at Siemens are really helpful. When we say we need advice on this or that design, they respond quickly and they always help us with many alternatives."

RUGGEDCOM RSG2100 switches in RTU cabinet

The future

More projects with more customers in more countries.

Describing Siemens as a strong strategic partner, Ms. Wally explains how their collaboration has enhanced Xceltra's customer relationships, paving the way to a great future of RUGGEDCOM products helping Xceltra succeed.

"When you have a solid partner you can depend on, the customer will trust you on more new projects. They trust that you will be able to deliver the support they need and meet all the expectations they have," she notes.

Siemens has already helped Xceltra with other oil and gas operations, in Dubai and Qatar, for example, as well as companies in the mining and power industries. Ms. Wally adds that Xceltra expects to use Siemens in the future as a formally approved vendor for any oil and gas, or other industrial application, or for any substation.

"We have many consultants where we have already established contacts. Now we will start getting involved with as many projects as we can," she says.

RUGGEDCOM RSG2100

A utility-grade, fully managed, modular Layer 2 19" rack Ethernet switch, the RUGGEDCOM RSG2100 is specifically designed to operate reliably in electrically harsh and climatically demanding utility substation and industrial environments. Its superior rugged hardware design, coupled with its embedded RUGGEDCOM Operating System (ROS®), provides improved system reliability and advanced cybersecurity and networking features, making it ideally suited for creating secure Ethernet networks for mission-critical, real-time control applications.

- Up to 3 Gigabit Ethernet and 16 fast Ethernet ports (copper and/or fiber)

- Two-port module granularity for port configuration flexibility

- Supports many types of fiber (multimode, single mode, bidirectional single strand)

- Immunity to electromagnetic interference and heavy electrical surges

- Exceeds IEC 61850-3 (electric utility substation) and other key IEC standards

- Operating temperature of −40°C to +85°C, without fans

- 18 AWG galvanized steel enclosure

- Hazardous location certification: Class 1 Division 2

- Comprehensive cybersecurity features

Case study at-a-glance

Customer: Xceltra is a unique distributor of robust communications equipment in the Middle East and North Africa, with extensive experience offering industrial-grade networking products for harsh environments

Challenge: sophisticated communications infrastructure was needed to monitor and manage a Saudi Arabian's oil company widespread, unmanned, remote oil and gas sites, most notably an ultra-rugged switch to handle extremely high temperatures, and with port flexibility to handle various network elements feeding into it, some of which are new and some legacy.

Solution: RUGGEDCOM RSG2100 from Siemens, a utility-grade, fully managed Ethernet switch specifically designed for harsh conditions in utility substations and industrial environments.

Results: forty RUGGEDCOM RSG2100 Layer 2 19" rack switches were provided and are being integrated into customer's network to enable mission-critical data communications that is efficient, reliable and cost-effective.

Future: with Siemens and Xceltra as strong partners, there are many possibilities for future projects in the oil and gas sector and also beyond it.