

SUCCESS STORY

# Medium-voltage solution to Erongo RED's Paratus substation

## Walvis Bay, Namibia



Secure and efficient power supply and reliable interoperability of the communication system in a multi-vendor environment.

### Project at a glance

**Customer:** Erongo RED

**Segment:** Utility

**ABB products:** Air-insulated switchgear UniGear ZS1, Is-limiters, Relion® 620 protection and control relays, REA arc protection system, Protection and control IED manager PCM600

### Customer challenge

An upgrade of the existing electrical infrastructure was needed to meet the increase in power demand. To ensure system reliability, the customer also identified the need for a highly integrated system.

The question arose of reliable interoperability between the different protection relays and the control system, as a multivendor environment was created with the introduction of ABB's products into Erongo RED's environment. The existing control system was supplied from another vendor and ABB's Relion protection relays were to be introduced in addition to the existing third party relays.

### ABB solution

The solution is based on a double busbar switchgear capable of distributing 120 MW at 11 kV. The protection and control scheme is based on Relion 620 series protection relays to form a reliable and highly integrated system for maximum redundancy.

Using this solution, with UniGear ZS1 and Relion protection relays, the customer achieves uninterrupted power supply while transferring loads between the busbars. For a medium-voltage power system of this size, this is one of the largest uninterrupted load transfer systems in the world.

An independent reliable arc protection system was requested by the customer and the REA system offers a fully selective arc protection scheme. The scheme isolates the fault by removing only a minimum part of the network.

To ensure power system reliability and performance, the solution utilizes the benefits of horizontal GOOSE-based communication technology between the protection and control devices. GOOSE (Generic Object Oriented Substation Events) is part of the IEC 61850 standard for power system automation. ABB carried out the GOOSE engineering in this multi-vendor environment and also the integration into the existing control system.



To secure the continuity of communication between the protection relays, the Parallel Redundancy Protocol (PRP) was used to ensure zero-time recovery. The protocol detects and alerts for network faults and also checks the redundancy condition.

$I_s$ -limiters were used in the solution to reduce the fault current level and keep it below the supported level of the existing downstream equipment. This is to avoid the additional costs of upgrading the existing equipment.

#### Customer benefits

- Exceptionally high reliability with redundancy on critical components
- Increased reliability using IEC 61850 communication standard and parallel redundancy protocol (PRP) for communication redundancy
- Ensured interoperability of the devices in a multi-vendor environment
- Superior protection performance with the Relion 620 protection relays

#### About the project

The substation is the doorway for all the power to the town of Walvis Bay and it will supply 14,000 residential and 1,300 businesses. There are also 140 industrial customers of which many in the

fishing industry – an industry in which continuous power supply is crucial, as seafood must be stored at uninterrupted refrigeration temperatures to keep fresh.

The port of Walvis Bay is directly supplied from the new substation, with an estimated power requirement of more than 20 MW.

This large substation has 50 switchgear panels housing 43 Relion 620 series relays and a REA arc fault protection system, as well as a multitude of other measuring and protection equipment.

For more information, please contact

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