CASE STUDY

1 | Challenge: Operation of low-maintenance and extremely robust batteries in lighthouses

A partner's customer from Denmark approached HOPPECKE with a challenging task. The customer wanted to replace the batteries in its lighthouses while minimising maintenance as most of the sited are difficult to reach.

The most important thing about lighthouses is the light. It guides the sailors through the water and warns them of dangers like shoals or helps them to determine their position. To ensure that the light can be seen far out at sea it was installed in tall towers, which usually stand on a cliff, to increase the range of radiation.

In the past a fire burned in the lighthouses, which is why they are also called sea lights. Today they are partly connected to the power grid. In the event of a power failure a back-up battery in the lighthouses ensures an uninterrupted power supply and thus protects the sailors. In remote locations navigation signs must be powered independently of the grid by wind or solar energy.

The generated electricity is fed into a battery and delivered to the consumer if needed. These batteries sometimes have to withstand harsh environmental conditions such as temperatures of up to -45°C. Due to this reason the customer of our long-standing partner, who is responsible for maritime safety in certain areas of Denmark, decided already 16 years ago to use HOPPECKE's FNC technology and equipped the lighthouses with grid | FNC batteries.

The FNC technology has also the advantage that it requires very little maintenance, which is a requirement for the remote areas. The existing batteries are now to be replaced for safety reasons due to their advanced age.

Low maintenance due to remote locations

Temperature resistant due to extreme environmental conditions

Permanently reliable operation of the systems on site

Insensitive against external influences

Volker Nawroth
HOPPECKE Batterien

"We are proud of our longstanding relationship with our customer and look forward to impressing with our product quality and technical support."

Excellent cycle stability due to high elasticity of the conductive material

High investment protection due to permanently safe and long operating life

Savings in maintenance costs due to extremely long water refill intervals

Flexible application options due to temperature-resistant components

2 | Solution: Reduction of maintenance intervals through a valve-regulated battery system

As the existing battery systems were already equipped with FNC 307 L cells in 2004, the customer's first idea was to replace the existing systems 1:1. After extensive coordination between HOPPECKE and our Danish distributor FNC 259 L VR cells were offered for this project.

The FNC battery technology is based on a nickel fiber structure electrode, which is mechanically very robust and has excellent electrical conductivity. It is therefore insensitive to external influences and does not suffer irreparable damage even in the event of a theoretical failure of the charging system. Long storage periods of several years therefore also have no negative effects on the battery. Due to the corrosion-free materials operating times of up to 25 years can also be achieved.

The used VR (valve regulated) technology recombines oxygen and hydrogen gases within the cell with an efficiency of up to 90 %, which extends the water refill intervals to up to 20 years and thus considerably reduces the maintenance effort.

This is essential, especially for lighthouses in hard-to-reach locations and offers high-cost savings. The offered sealing plugs not only make it easier to refill the cells, but also provide additional protection for the battery against backfiring. Furthermore, the cells have been filled with a special electrolyte that allows to operate the FNC cells down to -45°C, thus ensuring safe and long operation.

Key Benefits

- Flexible use at extreme temperatures between -45°C to +60°C due to temperature-resistant materials
- Corrosion-free and mechanically robust fiber structure technology with high-quality battery components ensures long operating life
- Savings in maintenance costs due to extremely long water refill intervals of up to 20 years
- Uncomplicated and long storage in case of unexpected project delays

3 | Products:

▶ **Batteries: grid | power FNC-VR**

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