



Sealing solutions for offshore wind farms

REPORT FROM WIND FARM PROJECT IN BREMERHAVEN, GERMANY

How to seal the large cables in the newly developed platform? This question suddenly became a major issue for the project partners in the EnBW Baltic 1 offshore substation project.

Roxtec used its long experience from offshore challenges and designed a special solution in co-operation with the classification society GL, Germanischer Lloyd. The Roxtec sealing system is actually specified for use all

over the platform to ensure fire protection and water-tightness. The flexible sealing solutions even provide spare capacity for future needs and expansions.

Partnership for peace of mind

The EnBW Baltic 1 is the first official commercial wind farm in Germany. In the first step, it will transform energy produced by 21 Siemens wind turbines to approximately 50,000 households.

During the construction process, the need for sealing high voltage submarine cable penetrations on the substation was highlighted. The three single lines of the sea cables with large connectors must be routed together, but sealed separately. The new cables were developed especially for the EnBW Baltic 1, so there was not yet any valid certificate. The companies involved had to look for a partner to help them develop a unique solution.

Roxtec to the rescue

As a committed supplier with expertise within offshore cable sealing, Roxtec was invited by the owner EnBW, the design firm TKB and the contractor WeserWind to find a solution.

"We wanted to work with Roxtec since they are the market leader and

” Roxtec is a beautiful solution

BENEFITS

- Certified safety
- Easy to design
- Quick to adapt
- Easy to install
- Built-in spare capacity



have many GL certificates. They were willing to further develop their existing products exclusively for this project," says Sven Kastrau, Project Leader of EnBW.

GL, which is familiar with Roxtec seals for marine applications, was involved in the work. The solution was rapidly agreed and approved after installation.

Convincing service

The result was tailored combinations of stainless steel plates with round seals. The frames were made openable in order to allow installation after the cable routing process.

Another solution was required for the 4.5 m wide bulkhead penetrations for the low voltage and instrumentation cables. Roxtec made tailored combinations of Roxtec S frames and large stainless steel flange plates with easily adaptable modules and compression units.

"We got excellent support with both engineering and materials.

Functionality is what really matters", says Wolfgang Knauff, Electrical Engineering Manager at WeserWind.

Efficient standard solution

A range of Roxtec seals are used in various structures onboard for everything from 4 mm signal cables for sensors in the fire protection system up to the 99 mm single lines of the 450 mm sea cables. It is wise to standardize, given the estimated life time of up to 30 years for the wind farm. There will be many upgrades of cables, software and control equipment.

Useful flexibility

With the same sealing system all over, retrofit can be carried out during the briefest of weather windows, without bringing any spare parts or extra tools. The installer knows exactly what to expect when arriving on site. Since the system can handle cables of different sizes, there is no risk for bad surprises.

"Roxtec Multidiameter™ is wonderful. You just peel off layers until it fits", says Ferry Börner, project manager at ABB, when inspecting the platform just days before deadline.

Beneficial for all parties

Roxtec seals can be used from within the turbines through to the onshore grid. Investing owners appreciate the operational reliability that comes with certified solutions. Designers can draw openings instead of cable configurations, just leaving space for future needs. And contractors and installers are trained by Roxtec to become true specialists.

Ready for expansion

With Roxtec, the project partners reduce risk, save time and eliminate future costs. There is only one cable passing through a transit intended for four cables. The spare modules are reserved for expected additional cables. That is true cost-efficiency.



"Roxtec is a good long-term solution. It is both gas-tight and watertight," says Heiko Koop, Site Manager, WeserWind, meeting Nils Raab, Sales Manager, Roxtec.



Roxtec round seals in openable steel plates.



Roxtec seals are used in shelter structures, raised floors and control equipment.

Facts

Project type	New-build of offshore substation transformer platform for wind farms
Involved companies	EnBW – owner and builder TKB, Technologiekontor Bremerhaven – design and engineering WeserWind – contractor JHK – electrical installations Siemens – control cabinets and wind turbines supplier Germanischer Lloyd – classification society
Applications	Sealing of a range of signal and power cables in shelters, stairways, decks and bulkheads
Sealing requirements	Fire-proof according to A0/A60 (marine) respectively S90 (close to land) Watertight Gas-tight
Roxtec products	Roxtec RS seals Roxtec S, SF and GE extension frames Roxtec openable frames Roxtec wedges Roxtec adaptable sealing modules
Reasons for choosing Roxtec	High safety demands Offshore competence Capacity for future needs Efficient engineering support Support on site Multidiameter™ by Roxtec – adapts to cables of different sizes through sealing modules with removable layers



References

ABB, Areva, Bard Engineering, Clipper Wind, Enercon, Fuhrländer, Gamesa Eolica, Gaz de France, GE Wind Energy, MHI, M-Torres, Multibrid, Iberdrola, REpower Systems, Siemens, Siemens Wind Power, Suzlon Energy, Terna, UESA, Vattenfall, Vestas Wind Systems, WinWinD.



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