Best practices for the construction of an offshore substation

Siemens offshore substation, Lillgrund, Sweden

Offshore wind farms require offshore substations to gather the electricity generated and connect these remote power systems to the grid. In order to minimise costs, maximise efficiency and ensure the required high system availability, it is important to optimise the design of offshore AC substations, and ensure their suitability for offshore deployment.

Background

A workshop of eleven industry delegates was led by Narec which brought together specialists in the field of transmission and distribution with experts in the construction of offshore platforms. This two-day workshop was co-funded by Regional Development Agency One North East.

Objectives

The purpose of the workshop was to share knowledge and experiences and discuss best practice for the construction of an offshore 33/132kV substation for connection to a 250MW wind farm.

Presentations were given by:

- Consafe, regarding the Barrow Wind Farm's 33/132kV offshore platform;
- Siemens, regarding the Nysted 33kV Wind Farm in Denmark.

Results

Narec convened the workshop. The resulting comments from the workshop were then formulated into a pre-design intent document. Many areas were covered, including outline specifications for the power transformer, gas insulated switchgear, substation control and monitoring, lightning protection and cables. Following this project, detailed design criteria were developed through subsequent work by the partners.

Successes

This workshop moved the design of offshore substations forward by engaging a group of key experts in their respective fields. The workshop was followed by the development of detailed design criteria which were used and taken forward by the members of the consortium to inform future designs of offshore substations.

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