



PROJECT CERTIFICATION



TODAY LARGE SCALE WIND FARMS ARE MOVING OFFSHORE WHICH INVOLVES NEW RISKS AND CHALLENGES

In light of the current trend of large-scale wind farm development offshore, focus must be placed not only on analysing the local wind regime and climate but also on the location's water depth, soil, wave, current, ice and corrosion conditions. Given the increased number of environmental parameters to be considered, opportunities for using generic designs are substantially reduced and a site-specific approval is imperative to ensure the wind farm is designed in the most suitable manner.

Stakeholders are increasingly seeking an independent verification of their wind farms to provide confidence that their project will perform successfully for the duration of its service life. To reduce the risk of energy losses resulting from turbine down-time or repair, a third-party verification of the turbines and associated infrastructure is essential to ensure high availability of the wind farm throughout its lifetime.

The purpose of Project Certification is essentially to verify that the wind farm is capable of withstanding the site-specific conditions it will face during operations.

PROJECT CERTIFICATION BY SGS

I. MINIMISING TOTAL PROJECT RISK DESIGN PHASE AND SITE ASSESSMENT

The preliminary design verification will comprise a comprehensive assessment of environmental conditions – e.g. wind, oceanographic (wave) and geotechnical parameters – which will be used to ascertain the consequential load and design assumptions and,

ultimately, help define the design basis for the project.

II. SITE-SPECIFIC DESIGN OF WIND TURBINE AND FOUNDATIONS

The objective of this phase is to ensure that all relevant factors have been taken into account during the design process. The exercise consists of reviews of (i) the site assessment, (ii) the combined load calculations for the complete wind farm, including a site-specific design verification of the wind turbines, support structures, substation, cable layout and export cable, (iii) the logistical concepts for transportation and installation and (iv) the de-commissioning concepts.

III. MANUFACTURING

To ensure the highest quality during production of components, regular inspection visits of the manufacturers' premises will be performed. This quality control measure begins with a pre-production meeting to establish the scope of inspection and test plan for the relevant components. If requested, quality management and/or ability audits can also be performed.

IV. TRANSPORTATION AND INSTALLATION

To minimise risks during the offshore transportation and installation phase, a number of factors must be taken into account, namely the quality of components delivered, the safety and suitability of the transportation and the building standard. The project certification process includes a detailed quality control management and inspection system, which will minimise the risks

incurred during transportation.

Construction supervision should be carried out throughout the construction phase to ensure that the project is delivered in accordance with previously agreed to specifications.

V. COMMISSIONING

Project commissioning is a critical stage in the life cycle of a wind farm. Errors committed during construction or other quality issues, if not identified at the time of start-up, will increase in severity during the In-Service phase. To prevent such a scenario, the entire project will be surveyed by SGS experts to confirm that all work has been completed in line with approved procedures and specifications. A final acceptance inspection and a functional and safety test will be performed to ensure that the wind farm can safely and efficiently begin operations.

VI. IN-SERVICE

In addition to the Project Certificate attained at the conclusion of Phases I through V described above, SGS performs periodic In-Service Inspections to maintain the condition of the wind farm and the validity of the Project Certificate.

The SGS In-Service Inspections of wind farms during its design lifetime include

- Periodic In-Service Inspections
- Pre-/End-of-Warranty Inspections
- A variety of specialised inspection techniques

The above range of services will be tailored to suit the actual verification needs of the project.



SGS PROJECT CERTIFICATION LIFECYCLE



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