

## PROJECT CERTIFICATION OF WIND FARMS ACCORDING TO IEC 61400-22

What to do when applying the IEC 61400-22? The service specification DNVGL-SE-0073 provides guidance and directs you to relevant standards to cover the certification aspects of wind turbines, substations (both including their support structure) and the power cables of a wind farm.

The document has been published in December 2014 and elaborated with the committee of experts, which involves external members to ensure an industry beneficial document.

Why is this DNVGL-SE-0073 service specification for project certification necessary?

- IEC 61400-22 standard leaves room for interpretations
  - DNVGL-SE-0073 provides guidance to the applicant based on best practice
- IEC 61400-22 standard is not covering all topics in sufficient detail
  - DNVGL-SE-0073 offers a proposal how to fill these gaps
- in addition to the wind turbines, this service specification addresses the assets: substations and power cables, which are not specifically addressed by IEC 61400-22
- experiences in application of the IEC 61400-22 since publication in 2010 has been taken into account
- DNV GL scheme allows flexible split into asset related certifications.

DNVGL-SE-0073 is public available and provides a transparent and harmonised description of DNV GL's certification services when applying IEC 61400-22. By applying the DNVGL-SE-0073 for project certification the compliance with IEC 61400-22 is given.

Fig. 1 shows the DNV GL certification scheme with their phases in comparison to the IEC 61400-22. The full wind farm certification (with all assets) or only asset related certifications (see columns "Wind Turbines", "Substations" and "Power Cables") are possible and illustrated. The grey cells show the different deliverables (conformity statements per phase, project certificate at final stage). The phases in dark blue are marked as mandatory in the sense that completion is necessary to receive a Project Certificate according to IEC 61400-22. However, splitting in assets and their certification only is still possible.

		Project Certificate Wind Farm			Deliverables
Modules in IEC 61400-22	Phases in DNV-GL-SE-0073	Wind Turbines	Substations	Power Cables	
Site Conditions Evaluation	I	Design Basis	Design Basis	Design Basis	Conformity Statements
Design Basis Evaluation					
Integrated Load Analysis	II	Design	Design	Design	
Design Evaluation					
Manuf. Surveillance	III	Manufacturing	Manufacturing	Manufacturing	
Transport. & Install. Surveillance	IV	Transport & Installation	Transport & Installation	Transport & Installation	
Commissioning Surveillance	V	Commissioning	Commissioning	Commissioning	
Project Charact. Measurements					
Final Evaluation		Final Evaluation Report	Final Evaluation Report	Final Evaluation Report	Final Evaluation Report
Project Certificate		Project Certificate Wind Turbines ⊕	Project Certificate Substations ⊕	Project Certificate Power Cables ⊕	Project Certificate Wind Farm - Wind turbines - Substations - Power Cables
Operations & Maint. Surveillance	VI	In-Service Ⓞ	In-Service Ⓞ	In-Service Ⓞ	Conformity Statement

Fig. 1: Project certification scheme in accordance with IEC 61400-22, see [DNVGL-SE-0073](#)

In brief, the document [DNVGL-SE-0073](#) is structured as follows:

- Section 1 provides general information on the wind farm assets covered in this service specification and general requirements regarding project certification of wind farms.
- Section 2 provides a service overview for the defined project phases and the deliverables of project certification.
- Section 3 is set up along the certification phases illustrated in Figure 1 and contains the main descriptions and references to relevant standards to cover the mentioned assets of a wind farm. Furthermore wind farm related services such as met mast, site specific and grid code compliance certification services are addressed.

Regarding wind turbines and their support structures reference is not only made to IEC 61400-1 and -3, also to the industry known and acknowledged standards DNV-OS-J101, GL-IV-1 for onshore and GL-IV-2 for offshore, which provide further details.

Regarding the substations including topsides and support structures the main standard is the internationally applied DNV-OS-J201.

Regarding the power cables of an offshore wind farm reference is mainly made to GL-IV-2 (Edition 2012, Section 8.10) in consideration of recommendations given in DNV-RP-J301 and CIGRÉ guidelines.

Several standards such as DNV-OS-J101, DNV-OS-J201 or DNV-RP-J301 has been updated this year by

- *Support structures for wind turbines*, [DNVGL-ST-0126](#)
- *Offshore substations*, [DNVGL-ST-0145](#)
- *Subsea power cables in shallow water*, [DNVGL-RP-0360](#)

To address the latest developments and market needs, DNV GL has recently (in December 2015) issued a fully revised certification scheme for project certification, [DNVGL-SE-0190](#). This service specification is titled *Project certification of wind power plants* and contains references to all relevant and latest standards. It is the most complete set of specifications to date and designed to mitigate risks at each stage of the project certification phases, ensuring that wind power plant operate safely and cost efficiently and all technical, design and construction requirements are met.

The new service specification [DNVGL-SE-0190](#) encompasses more risk-related features for state-of-the-art power plant certification than any other project certification standard available on the market, adding value beyond common certification practices. To provide ultimate flexibility, the new DNV GL scheme addresses more than before individual project needs.

Since issuing its first wind certification standard in 1986, DNV GL continuously worked together with the industry to develop up to date certification schemes tailored to the demands of the advancing renewables market.

If you want to know more about the [DNVGL-SE-0190](#) feel free to contact us or have first a look at "[DNV GL launches world's most comprehensive service specification for wind power plants](#)".

Standards are the basis for the state of the art, but to really solve the challenges it is necessary to have an early and strong collaboration with well experienced actors in the wind industry business.

## FOR FURTHER INFORMATION

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