FOWPI (https://www.fowpi.in/)
FIRST OFFSHORE WIND PROJECT OF INDIA

Project Funded by
European Union (http://eeas.europa.eu/delegations/india/index_en.htm)

Standards and Certification

Today's energy market has become extremely competitive and low carbon energy sources such as wind turbines have become a de-facto resource in the planning of future energy strategies all over the world. This has led to explosive growth and development of the wind turbine industry. Within a short period of time all stakeholders in the wind energy sector have rapidly professionalized and wind turbine manufactures are confronted with high demands, specifically on Cost of Energy (CoE) and reliability.

One of the ways in which industry has matured is through the rapid embrace of certification, specifically wind turbine type certification and offshore project certification. Type certification and Project certification provide a verification of the wind turbine and wind project designs according to international standards. Achieving type certification provides a demonstration of the turbine design capabilities and signals product market readiness to stakeholders.

NIWE [3] has for several years been certifying wind turbines and wind turbine projects in India in accordance with international standards published by the International Electrotechnical Commission (IEC). In addition, The Ministry of New and Renewable Energy, Government of India (MNRE) published a guideline, TAPS 2000, which is a mandatory part of the certification scheme in order to obtain NIWE Type certificate valid for India. TAPS 2000 clarifies the certification requirements including national requirements related to grid conditions, cyclones etc. The standards and certification unit of NIWE has been technically and financially supported by both Danida, and Risø National Laboratories (DTU Wind Energy) in Denmark.

Type Certification

NIWE operates with three different certification categories:

Category – I: Provisional Type Certificate (PTC) for wind turbine (WT) already possessing type certificate or approval

Category – II: PTC for WT already possessing type certificate or approval, with minor modifications/changes including provisional type testing/measurements at the site of NIWE (legacy C-WET)

Category – III: PTC for new or significantly modified WT including provisional type testing/measurements at the test site of NIWE (legacy C-WET)

The IEC Type certification process divides into four main categories:

- **Design basis evaluation**
- **Design evaluation**
- **Manufacturing evaluation**
- **Type testing**

When evaluation conformity has been obtained for each category, a final evaluation process confirms that the design, manufacturing and tests are consistent with the approved design basis and a type certificate is issued.

There are a number of IEC standards that relate to certification, with those more relevant to Type Certification listed below:

- IEC 61400-1:2005+AMD1:2010 Design requirements
- IEC 61400-3:2009 Design requirements for offshore wind turbines
- IEC 61400-12-1:2005 Power performance measurements of electricity producing wind turbines
- IEC 61400-13:2015 Measurement of mechanical loads
- IEC 61400-22:2010 Conformity testing and certification

Please be informed that the above list of standards do not necessarily represent valid revisions.

IEC 61400-22:2010 Conformity testing and certification provides an overview on the Type certification process and includes a more detailed list of relevant IEC standards.

Project Certification

As the design and construction of offshore wind farms are complex and interdisciplinary, project certification aims to help de-risk the process by ensuring compliance with approved codes, standards and procedures at all phases of the project.

Building of offshore wind farms is complex mainly due to challenging marine conditions. Turbine availability is challenged not only by failures and malfunctions, but also from the complex repair and service logistics and limited turbine accessibility. Furthermore the complete offshore wind farm involve many engineering disciplines and interfaces in the design process.

Offshore project certification is integrated into project development, with a third party (certification body) verifying that the design, manufacture, and installation conform to specific criteria, that appropriate methodologies are used, and that rigorous documentation is produced. The certification body must be independent in order to be effective, and should not be otherwise involved in the design or execution of the project. This independence helps project certification de-risk the project by ensuring compliance with the IEC 61400-22 standard. The certification body conducts document review, independent calculations, auditing, and inspection surveillance at various phases of the project in support of this goal.

The DNVGL service specification "Project certification of wind farms according to IEC 61400-22", DNVGL-SE-0073 [1] provides an interpretation of the IEC 61400-22 project certification requirements. Similar guidance is found on TUV homepage [2] and other international certification bodies.

The Project certification divides into five main categories:

- **Design basis evaluation**
- **Design evaluation**
- **Manufacturing evaluation**
- **Transportation & Installation**
- **Commissioning**

It is important to understand that the complexity in offshore projects might dictate scope beyond the standard IEC project certification scheme. Hence, DNVGL has also developed the DNVGL service specification "Project certification of wind power plants" DNVGL-SE-0190 which addresses additional options for managing specific project risks.

IEC 61400-22 – Other Certification Modules

IEC 61400-22 also provide overview on requirements for other certification modules like Prototype certification, Provisional certification and components certification.

Prototype certification takes a safety approach and exclude issues related to serial production and fatigue in general. Prototype certification allows manufacturers to install test turbines that are used to cover the IEC Type test requirements.

Provisional type certificates are relevant to manufacturers who want to initiate serial production before non-safety issues has been closed. Outstanding issues often relates to finalization of manuals or lack of validation data. Provisional certification is also useful in a bidding process because larger projects normally involve turbine designs that is fit for purpose.

Component certification has a scope that is similar to type certification. Component certification is relevant for manufacturers of main components like blades and gearboxes and will make is easier to incorporates components into Wind turbine type certificates.

For more information, refer the following informative links/material:

1. DNVGL, Renewables Certifications (http://www.dnvgl.com/energy/renewables-certification)

2. Offshore Wind Farm Certification, TUV Rheinland (https://www.tuv.com/india/en/offshore-wind-farm-certification.html)

3. NIWE Website (http://www.niwe.com)

Updated on: **October 2018**

Disclaimer:

The content on this website is provided for information purposes only. No legal liability or other responsibility is accepted by or on behalf of FOWPI team for any errors, omissions, or statements on this site, or any site to which these pages connect.

Have any Questions? Send a Message.

(https://www.fowpi.in/)

(https://www.facebook.com/FOWPI/) (https://www.linkedin.com/company/first-offshore-wind-project-of-india-fowpi-/)

For more details on FOWPI project, please email:
info@fowpi.in (mailto:info@fowpi.in) or fowpi.india@gmail.com (mailto:fowpi.india@gmail.com)
Phone +91.124.4319500,
Telefax +91.124.4319501,
Direct +91.9687800983/8849012213

Nodal Ministry for Offshore Wind Energy

Ministry of New and Renewable Energy | MNRE (http://www.mnre.gov.in/)

Nodal Agency for Offshore Wind Energy

National Institute of Wind Energy | NIWE (http://niwe.res.in/)