



IEC/TC OR SC:	SECRETARIAT:	DATE:
88	Denmark	2016-09

Please ensure this form is annexed to the Report to the Standardization Management Board if it has been prepared during a meeting, or sent to the Central Office promptly after its contents have been agreed by the committee.

A. STATE TITLE AND SCOPE OF TC

TC 88: Wind energy generation systems

Standardization in the field of wind energy generation systems including wind turbines, wind power plants onshore and offshore and interaction with the electrical system(s) to which energy is supplied.

These standards address site suitability and resource assessment, design requirements, engineering integrity, modelling requirements, measurement techniques, test procedures, operation and maintenance. Their purpose is to provide a basis for design, quality assurance and technical aspects for certification. The standards address site-specific conditions, all systems and subsystems of wind turbines and wind power plants, such as mechanical and electrical systems, support structures, control and protection as well as communication systems for monitoring, centralized and distributed control and evaluation, implementation of grid connection requirements for wind power plants, and environmental aspects of wind power development. The TC 88 standards will be developed based on and in agreement with appropriate IEC/ISO standards.

The TC 88 scope was recently updated to more accurately reflect that TC 88 is not just limited to the wind turbine itself but the wind power plant of which the wind turbine is just a component. A meeting was held with TC 8 SC 8A to more accurately define the boundary between it and TC 88. No near term update of the TC 88 scope is anticipated.

B. MANAGEMENT STRUCTURE OF THE TC

Currently the TC 88 management structure is very flat with leadership consisting of Chair and secretariat. Project leaders report to this leadership team. A CAG consisting of all conveners and secretaries of the working groups is available for quick feedback on issues. A specific CAG would be assembled in case where the Chair needs guidance on a specific larger issue.

A project team (PT 61400-101) was set up to look at creating an overarching document tying the TC 88 standards together and also look at creating a more logical standards structure. If the work of PT 61400-101 results in breaking up the existing standards in multiple smaller documents, this may result in inserting an additional layer of management to assure consistency between the documents by managing the interfaces and to be able to maintain the system level objectives.

TC 88 has a JWG with ISO TC 60 on wind turbine gearboxes and with IEC TC 57 Power systems management and associated information exchange

C. BUSINESS ENVIRONMENT

Wind energy has become the most cost effective new renewable energy source. Many reports show it being the lowest cost of any new installed energy.

After a slowdown in 2013, the wind industry set new records for annual installations in 2014 and 2015. Globally, 51 752 MW of new wind generating capacity was added in 2014 and 63 467 MW in 2015 according to the global wind market statistics by the Global Wind Energy Council (GWEC). The top five countries with new installed capacity China, USA, Germany, Brazil and India.

Offshore wind energy is predominantly installed in Europe where more than 90% of all offshore wind is located. Although an emerging market it currently only represents a few percent of the overall installed capacity worldwide. China, Japan, South Korea have released plans for significant deployment of offshore wind in the near future.

Reliability has increased dramatically but still needs to improve to reduce the cost of onshore and offshore energy.

Many countries are establishing grid interconnection and integration rules to facilitate grid stability as renewable energy increases penetration, especially locally. In general grid operators have been able to manage the new generation as long as the new offerings meet their interconnection requirements and can operate according to newly established integration rules. Denmark often generates more than 100% of their hourly electrical energy from wind, exporting excess and balancing through interties with Norway, Sweden and Germany.

D. MARKET DEMAND

Almost all megawatt scale turbines are now certified. Certification of major components has become common. IEC standards have become the basis for many of the certifications with significant content added from local national standards or private certification body guidelines.

Standards are used by the OEM's (Original Equipment Manufacturers) and consultants for design, testing laboratories for testing, Certification bodies for confirmatory assessment and certification and end user to reduce risk in the performance of the wind plants.

In several countries, compliance with the IEC standards, ideally through certification, are referred to in order to obtain building permit or incentives.

E. TRENDS IN TECHNOLOGY AND IN THE MARKET

Wind turbine suppliers are actively exploring technology updates to their existing product lines. Almost all are offering larger turbines to meet market demands. The average size turbines are greater than 2,5 MW with rotors larger than 100 m in diameter. In the next few years onshore turbines will have rotor diameters exceeding 120 m and ratings of 3 MW. Offshore turbines are trending towards 6 MW ratings with 10 MW turbines under design. R&D is beginning to focus on technologies that will allow larger turbines still.

As a result, transportation and installation has become a significant part of the cost of energy. Thus some R&D is focused on components that can be shipped in smaller loads and field assembled or manufacturing of large components on site. There is a trend towards direct drive and medium speed generators for both onshore and offshore turbines for reliability reasons.

Most OEMs operate internationally with design offices and manufacturing in multiple countries. Local manufacturing enables local content and reduced transportation costs.

A few new companies are exploring airborne wind turbines. If shown feasible this technology would require a specific set of standards to address their unique features.

The most recent trend is to have increased amount of turbine models available with different rotor sizes based on the same "platform", this leads to a better ability to tailor the wind turbine design to the local wind conditions even inside a wind plant.

F. SYSTEMS APPROACH ASPECTS (REFERENCE - AC/33/2013)

There is no additional need for a systems approach. In a sense the wind turbine can already be considered a system, and the wind plant again is a system, TC 88 is able to cover all aspects of those systems. Beyond that wind plants are a part of the electrical energy supply system. To that end TC 8/SC8A and TC 88 have established a liaison.

G. CONFORMITY ASSESSMENT

Now that the responsibility for IEC 61400-22 has been handed off to IECRE WE-OMC (wind energy operational management committee), no standards under TC 88 include requirements for Conformity assessment schemes and systems. IECRE WE-OMC developed a transition plan for IEC 61400-22 which will allow for IEC 61400-22 to be de-solved once IECRE has been able to put the necessary documents in place.

The testing and design standards developed by TC 88 are actively being used by IECRE.

One of the cornerstones of TC 88 has been the development of a series of test standards that produce high quality reproducible test results. These tests are used for verification of the design, characterisation of the performance and verifying warranty claims.

PT 61400-101 is working on a document regarding general requirements for wind plants. This document intend to tie the TC 88 standards together in a logical way by laying out the typical lifecycle of a wind plant, including design of the wind turbine, design of the plant and operation and maintenance of the plant. As there are concerns that his document may approach conformity assessment requirements close collaboration with IECRE and more specifically IECRE WE-OMC has been established to assure PT61400-101 does not overstep its bounds.

H. 3-5 YEAR PROJECTED STRATEGIC OBJECTIVES, ACTIONS, TARGET DATES

Several standards under TC 88 have significantly grown in size with each revision. The teams working on these revisions have also grown in size. It is thus prudent to look at how some of these documents can be split into smaller, easier to maintain documents. However generating more, smaller, documents then results in the need to increase management to manage the interfaces between the different documents. PT 61400-101 has been given the task to come with a proposal to TC 88 on how to structure the standards. This restructuring can then simultaneously be used to generate a more logical numbering of the different documents.

As the industry is maturing, most standards are showing an increased sophistication and refinement of design requirements and testing methods. It is expected that several of TC 88's standards will undergo revision in the next 3-5 years and that new standards will be added as their needs are identified by the national committees.

As IECRE will gain more experience in the use of the TC 88 standards it is expected that needs for further documents will be identified. TC 88 and WE-OMC will work together closely to serve the needs of all industry stakeholders.

STRATEGIC OBJECTIVES 3-5 YEARS	ACTIONS TO SUPPORT THE STRATEGIC OBJECTIVES	TARGET DATE(S) TO COMPLETE THE ACTIONS
Develop proposal for restructuring of TC 88 standards		Dec 2017
Develop general requirements document for wind plants		Dec 2017
Develop formal plan on how TC 88 plans to interact with IECRE WE-OMC	Chair to develop plan on how TC 88 intends to interact with IECRE	Dec 2016

Note: The progress on the actions should be reported in the RSMB.