

**EWEA Technology Workshop,
Analysis of Operating Wind Farms:
Learning the Lessons from Operational sites**

July 02-03, 2012

Lyon, France

Wind Turbine Availability
Technical Specifications
Being Developed by the IEC
Technical Committee 88

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EAPC
WIND ENERGY

IEC 61400-26 Technical Specification For:

61400-26 Availability for Wind Turbines and Windfarms

- **Convenor** – Robert W. Sherwin, EAPC Wind, Norwich, Vermont, USA
- **Secretary** – Niels Raben, Dong Energy, Copenhagen, Denmark

Meetings:

- **Last Meeting:** 15th meeting held March in Yokohama, Japan (MHI)
- **Next Meeting:** 16th meeting to be held in Feldkirch, Austria (Bachmann)

PT-26 Committee is Diverse

35 members from 11 countries

(SE, DE, ES, NO, GB, US, DK, AT, JP, ZA, RU)

Representing 11 WTG manufacturers

(MHI, GAMESA, ENERCON, REPOWER, GE, VESTAS, ALSTOM-ECOTECHNICA, NORDEX, SIEMENS, ACCIONA, and AMPAIR)

And 1 major controller & condition monitoring manufacturer (Bachmann)

Representing 8 major owner operators

(EON, IBERDROLA, STATKRAFT, ENBW, RWE, ESKOM, DONG ENERGY and TERRA GEN)

And 6 IE firms and institutions

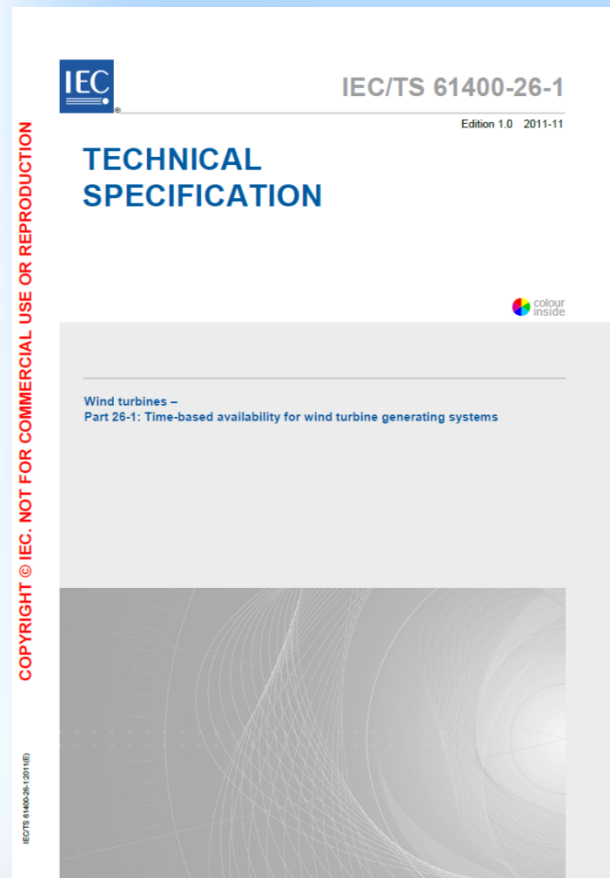
(SMTEKNIK, EAPCWIND, GLGH, WINDCONSULT, SANDIA and JEMA)

The project scope is accomplished by separating the technical specification into three parts:

TS 61400-26-1

Specify terms for time based availability of a wind turbine generation system

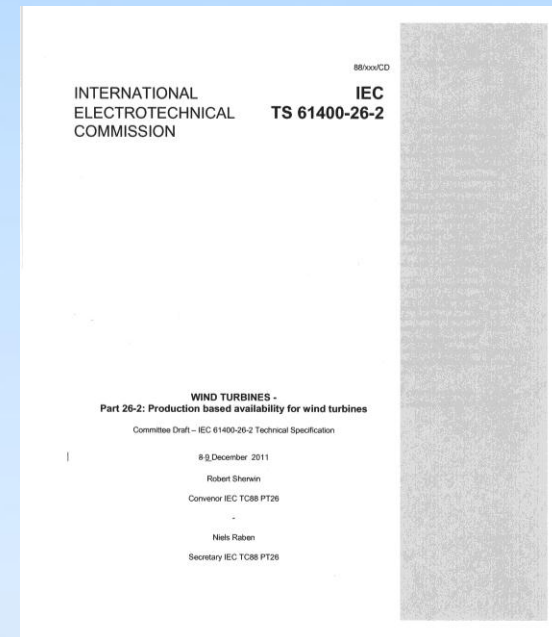
Part 1 is complete and published Nov. 2011



TS61400-26-2

Specify terms for production based availability of a wind generating system

Part 2 has been circulated to participating countries for vote and comments. The vote has been completed and approved. Comments to be resolved at the next meeting. Publication expected later this year.



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The project scope is accomplished by separating the technical specification into three parts:

TS61400-26-3 (Planned new work)
Specify terms for time and production
based availability of a wind farm

Began work on Part 3 in December 2011.
Expected to be completed by 2013.

Part 26-1: Time-based availability for wind turbines

Introduction & Scope

The scope of this technical specification is to define generic information categories to which fractions of time can be assigned for a wind turbine generating system (WTGS) considering internal and external conditions based on fraction of time and specifying the following:

- Generic information categories of a WTGS considering availability and other performance indicators
- Information category priority in order to discriminate between concurrent categories
- Entry and exit point for each information category in order to allocate designation of time
- Informative annexes including:
 - examples of optional information categories
 - examples of algorithms for reporting availability and performance indicators
 - examples of application scenarios

Information Model Utilized in Parts 1 & 2

Information categories					
Mandatory Level 1	Mandatory Level 2	Mandatory Level 3	Mandatory Level 4	Optional - description see Annex A Level 5	
INFORMATION AVAILABLE (IA)	OPERATIVE (IAO)	GENERATING (IAOG)	FULL PERFORMANCE (IAOGFP)		
			PARTIAL PERFORMANCE (IAOGPP)	Derated Degraded	
		NON-GENERATING (IAONG)	TECHNICAL STANDBY (IAONGTS)		
			OUT OF ENVIRONMENTAL SPECIFICATION (IAONGEN)	Calm winds Other environmental	
			REQUESTED SHUTDOWN (IAONGRS)		
			OUT OF ELECTRICAL SPECIFICATION (IAONGEL)		
		NON-OPERATIVE (IANO)	SCHEDULED MAINTENANCE (IANOSM)		
			PLANNED CORRECTIVE ACTION (IANOPCA)		Retrofit Upgrade Other corrective action
	FORCED OUTAGE (IANOFO)		Response Diagnostic Logistic Failure repair		
	SUSPENDED (IANOS)		Scheduled maintenance Planned corrective action Forced outage		
	FORCE MAJEURE (IAFM)				
	INFORMATION UNAVAILABLE (IU)				

Part 26-2: Production-based availability for WTGS

Introduction & Scope

Part 2 is an extension of Part 1 that deals with use of production elements based on the information model defined in Part 1.

The scope of Part 2 provides a framework from which production and capacity based performance indicators of a WTGS can be derived.

The document shall unambiguously describe how data is categorized and provide examples of how the data can be used to derive performance indicators.

The approach of this part of the specification is to expand the time allocation model, with two additional layers for recording of the actual production and potential production associated with the concurrent time allocation.

The document also includes informative annexes with examples determining lost production, algorithms for production based indicators, other performance indicators, and application scenarios.

It is not the intention of this specification to define how production based availability shall be calculated or to form the basis for power curve performance measurements.

Part 26-3: Time and production based availability of a wind farm

Introduction & Scope

Part 3 is an extension of Parts 1 and 2 that deals with use of production and time based elements of wind turbines based on the information model defined in Part 1 and the generic categories for wind power stations. The specifications define terminology, generic terms and propose algorithms for reporting performance indicators based on time and production or capacity terms.

Each category is described in terms of how it can be detected, organized and related to other categories by defining transitions, in order to facilitate exchange of information on performance indicators.

The specification shall include all equipment up to the electrical termination point defined in the distribution code agreed between the generating party and the distribution/transmission party

The specifications provide:

- Common standard definitions for communication among the industry stakeholders
- An information model comprised of different information categories requiring all calendar time and production based performance indicators to be distributed into one of the categories with priorities – Some mandatory, some optional.
- Information categories that are counters for accumulation of time periods with specified attributes.
- Informative annexes providing examples and verification scenarios.

The specification does not provide:

- Technical specifications to determine the method of information acquisition.
- Prescriptive requirements for criteria to establish levels of performance for availability.

Definitions and methodology expected to be used...

- For common basis of reference in turbine supply and warranty contracts.
- For “legal” basis for insurance benefits and claims resolution.
- For interested parties to have a common basis to compare
- WTG and project performance and compatibility attributes.

Definitions and methodology expected to be used...

- For operations and O&M forecasting, management and improvement of outcomes.
- For clarity of definitions for 3rd party engineers and financial institutions for lending and equity placement.
- Improved WTG designs and component selection
- Common definitions and information categories for WTG SCADA and operations reporting