

TECHNICAL SPECIFICATION



Wind energy generation systems –
Part 26-3: Availability for wind power stations



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**Wind energy generation systems –
Part 26-3: Availability for wind power stations**

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CONTENTS

FOREWORD.....	8
INTRODUCTION.....	10
1 Scope.....	12
2 Normative references.....	12
3 Terms, definitions and abbreviations	13
3.1 Terms and definitions	13
3.2 Abbreviations for 'Information available'.....	14
3.3 Abbreviations for 'Information unavailable'	16
4 Information model for WPS	17
4.1 General.....	17
4.2 Services.....	18
4.3 Information category priority	20
4.4 Information model for BOP	20
5 INFORMATION AVAILABLE (WPS).....	21
5.1 General.....	21
5.2 OPERATIVE	22
5.3 IN SERVICE.....	23
5.3.1 General	23
5.3.2 FULL PERFORMANCE	24
5.3.3 PARTIAL PERFORMANCE.....	25
5.3.4 READY STANDBY	25
5.4 OUT OF SERVICE	26
5.4.1 General	26
5.4.2 TECHNICAL STANDBY.....	27
5.4.3 OUT OF ENVIRONMENTAL SPECIFICATION	28
5.4.4 REQUESTED SHUTDOWN	29
5.4.5 OUT OF ELECTRICAL SPECIFICATION	29
5.5 NON-OPERATIVE	30
5.5.1 General	30
5.5.2 SCHEDULED MAINTENANCE.....	31
5.5.3 PLANNED CORRECTIVE ACTION	32
5.5.4 FORCED OUTAGE	32
5.5.5 SUSPENDED.....	33
5.6 FORCE MAJEURE	34
6 INFORMATION UNAVAILABLE (WPS).....	35
Annex A (informative) Entry and Exit condition overview	37
Annex B (informative) Application scenarios – examples.....	38
B.1 Overview.....	38
B.2 Application scenarios	38
B.2.1 Example 1: Normal operation – all WPS	38
B.2.2 Example 2: Normal operation – part of WPS	39
B.2.3 Example 3: Dirty WTGSs blades – all WPS.....	40
B.2.4 Example 4: Dirty WTGSs blades – part of WPS.....	41
B.2.5 Example 5: BOP limitations – all WPS	42
B.2.6 Example 6: BOP limitations – part of WPS	43

B.2.7	Example 7: ‘Spinning reserve’ – all WPS	44
B.2.8	Example 8: ‘Spinning reserve’ – part of WPS	46
B.2.9	Example 9: Noise restrictions – Warranty related	47
B.2.10	Example 10: Noise restrictions – environmentally related	48
B.2.11	Example 11: Ice storm on Grid – all WPS	49
Annex C (informative)	Balance of plant integration	51
C.1	WPS functions and services	51
C.2	Externally required functions and services	51
C.3	Internally required functions and services	51
C.4	Expansion of the Information Model for BOP functions and services	51
Annex D (informative)	Determination of potential production for a WPS – examples	53
D.1	Overview	53
D.2	Primary service	53
D.3	Secondary services	53
Annex E (informative)	Service availability indicators – examples	55
E.1	Overview	55
E.2	Time based WPS availability	55
E.2.1	General	55
E.2.2	Operational service availability (“TSO’s view”)	55
E.2.3	Operational service availability (“WPS operator’s view”)	56
E.2.4	Technical service availability (“WPS maintenance provider’s view”)	57
E.3	Production-based service availability indicators – examples	58
E.3.1	Overview	58
E.3.2	System operational production-based availability (“WPS operator’s view”)	58
E.3.3	System operational production-based availability (“TSO’s view”)	59
E.3.4	System operational production-based availability (“WPS maintenance provider’s view”)	60
Annex F (informative)	Examples of optional level 5 categories	62
F.1	Overview	62
F.2	Example of level 5 definitions	62
F.2.1	General	62
F.2.2	NOT CURTAILED	64
F.2.3	NOT CURTAILED – WARNING	65
F.2.4	UP-RATED	66
F.2.5	DERATED – OTHER	66
F.2.6	DERATED – GRID WPS OPERATOR	67
F.2.7	DERATED – GRID TSO	68
F.2.8	DERATED – GRID CONTROL	69
F.2.9	DERATED – NOISE	70
F.2.10	DERATED – TEMPERATURE	71
F.2.11	DERATED – STRUCTURAL LOAD	72
F.2.12	DERATED – WIND	73
F.2.13	DEGRADED – OTHER	74
F.2.14	DEGRADED – DIAGNOSTIC	75
F.2.15	DEGRADED – NOISE	76
F.2.16	DEGRADED – COMPONENT	77
F.2.17	DEGRADED – TEMPERATURE	78
F.2.18	DEGRADED – STRUCTURAL LOAD	79

F.2.19	OTHER READY STANDBY	80
F.2.20	OTHER TECHNICAL STANDBY	81
F.2.21	LUBRICATION	81
F.2.22	DE-ICING	82
F.2.23	DRY OUT	82
F.2.24	CABLE UNTWIST	83
F.2.25	OTHER ENVIRONMENTAL	84
F.2.26	CALM WINDS	84
F.2.27	HIGH WIND	85
F.2.28	TEMPERATURE	85
F.2.29	OTHER REQUESTED SHUTDOWN	86
F.2.30	ENVIRONMENTAL	86
F.2.31	GRID – WPS OPERATOR	87
F.2.32	GRID – TSO	88
F.2.33	NOISE	88
F.2.34	FLICKER	89
F.2.35	WILDLIFE	90
F.2.36	STRUCTURAL LOAD	90
F.2.37	OTHER OUT OF ELECTRICAL SPECIFICATION	91
F.2.38	FREQUENCY	92
F.2.39	VOLTAGE LEVEL LOW	92
F.2.40	VOLTAGE LEVEL HIGH	93
F.2.41	ASYMMETRY	93
F.2.42	SCHEDULED MAINTENANCE	94
F.2.43	OTHER CORRECTIVE ACTION	94
F.2.44	UPGRADE	95
F.2.45	INSPECTIONS	95
F.2.46	RETROFIT	96
F.2.47	REPAIR WORK	96
F.2.48	OTHER FORCED OUTAGE	97
F.2.49	FAILURE REPAIR	97
F.2.50	DIAGNOSTIC	98
F.2.51	LOGISTIC WPS MAINTENANCE PROVIDER	99
F.2.52	LOGISTIC WPS OPERATOR	99
F.2.53	RESPONSE WPS MAINTENANCE PROVIDER	100
F.2.54	RESPONSE WPS OPERATOR	101
F.2.55	OTHER SUSPENDED – SCHEDULED MAINTENANCE	101
F.2.56	PERSONNEL SAFETY – SCHEDULED MAINTENANCE	102
F.2.57	ENVIRONMENT – SCHEDULED MAINTENANCE	103
F.2.58	IT ACCESS – SCHEDULED MAINTENANCE	104
F.2.59	OTHER SUSPENDED – PLANNED CORRECTIVE ACTION	105
F.2.60	PERSONNEL SAFETY – PLANNED CORRECTIVE ACTION	106
F.2.61	ENVIRONMENT – PLANNED CORRECTIVE ACTION	107
F.2.62	IT ACCESS – PLANNED CORRECTIVE ACTION	108
F.2.63	OTHER SUSPENDED – FORCED OUTAGE	109
F.2.64	PERSONNEL SAFETY – FORCED OUTAGE	110
F.2.65	ENVIRONMENT – FORCED OUTAGE	111
F.2.66	IT ACCESS – FORCED OUTAGE	112
F.2.67	INACTIVE RESERVE	113

F.2.68	MOTHBALLED	114
F.2.69	RETIRED	115
F.2.70	FORCE MAJEURE	116
F.2.71	INFORMATION UNAVAILABLE	117
Bibliography		118
Figure 1	Data stakeholders for a wind power station	10
Figure 2	Information category overview for a WPS	17
Figure 3	Example of a model split-up in active power, reactive power high and low frequency compensation services	19
Figure 4	Information category priority for WPS	20
Figure 5	Mandatory INFORMATION AVAILABLE categories for WPS	22
Figure 6	OPERATIVE category	23
Figure 7	IN SERVICE category	24
Figure 8	FULL PERFORMANCE category	24
Figure 9	PARTIAL PERFORMANCE category	25
Figure 10	READY STANDBY category	26
Figure 11	OUT OF SERVICE category	27
Figure 12	TECHNICAL STANDBY category	28
Figure 13	OUT OF ENVIRONMENTAL SPECIFICATION category	28
Figure 14	REQUESTED SHUTDOWN category	29
Figure 15	OUT OF ELECTRICAL SPECIFICATION category	30
Figure 16	NON-OPERATIVE category	31
Figure 17	SCHEDULED MAINTENANCE category	31
Figure 18	PLANNED CORRECTIVE ACTION category	32
Figure 19	FORCED OUTAGE category	33
Figure 20	SUSPENDED category	34
Figure 21	FORCE MAJEURE category	35
Figure 22	INFORMATION UNAVAILABLE category	36
Figure A.1	Overview of the entry and exit conditions of all mandatory information categories described in this document	37
Table B.1	Scenario, Example 1: Normal operation – all WPS	38
Table B.2	Scenario, Example 2: Normal operation – part of WPS	39
Table B.3	Scenario, Example 3: Dirty WTGSs blades – all WPS	41
Table B.4	Scenario, Example 4: Dirty WTGSs blades – part of WPS	42
Table B.5	Scenario, Example 5: BOP limitations – all WPS	43
Table B.6	Scenario, Example 6: BOP limitations – part of WPS	44
Table B.7	Scenario, Example 7: ‘Spinning reserve’ – all WPS	45
Table B.8	Scenario, Example 8: ‘Spinning reserve’ – part of WPS	46
Table B.9	Scenario, Example 9: Noise restrictions – all WPS	47
Table B.10	Scenario, Example 10: Noise restrictions – all WPS	48
Table B.11	Scenario, Example 11: Ice storm on Grid – all WPS	49
Table D.1	Examples on how to determine Potential production	54

Table F.1 – Example of level 5 definitions	62
Table F.2 – NOT CURTAILED category	65
Table F.3 – NOT CURTAILED – WARNING category	65
Table F.4 – UP-RATED category	66
Table F.5 – DERATED – OTHER category	67
Table F.6 – DERATED – GRID WPS OPERATOR category	68
Table F.7 – DERATED – GRID TSO category	69
Table F.8 – DERATED – GRID CONTROL category	70
Table F.9 – DERATED – NOISE category	71
Table F.10 – DERATED – TEMPERATURE category	72
Table F.11 – DERATED – STRUCTURAL LOAD category	73
Table F.12 – DERATED – WIND category	74
Table F.13 – DEGRADED – OTHER category	75
Table F.14 – DEGRADED – DIAGNOSTIC category	76
Table F.15 – DEGRADED – NOISE category	77
Table F.16 – DEGRADED – COMPONENT category	78
Table F.17 – DEGRADED – TEMPERATURE category	79
Table F.18 – DEGRADED – STRUCTURAL LOAD category	80
Table F.19 – OTHER READY STANDBY category	81
Table F.20 – OTHER TECHNICAL STANDBY category	81
Table F.21 – LUBRICATION category	82
Table F.22 – DE-ICING category	82
Table F.23 – DRY OUT category	83
Table F.24 – CABLE UNTWIST category	83
Table F.25 – OTHER ENVIRONMENTAL category	84
Table F.26 – CALM WINDS category	84
Table F.27 – HIGH WIND category	85
Table F.28 – TEMPERATURE category	85
Table F.29 – OTHER REQUESTED SHUTDOWN category	86
Table F.30 – ENVIRONMENTAL category	87
Table F.31 – GRID – WPS OPERATOR category	87
Table F.32 – GRID – TSO category	88
Table F.33 – NOISE category	89
Table F.34 – FLICKER category	89
Table F.35 – WILDLIFE category	90
Table F.36 – STRUCTURAL LOAD category	91
Table F.37 – OTHER OUT OF ELECTRICAL SPECIFICATION category	91
Table F.38 – FREQUENCY category	92
Table F.39 – VOLTAGE LEVEL LOW category	92
Table F.40 – VOLTAGE LEVEL HIGH category	93
Table F.41 – ASYMMETRY category	93
Table F.42 – SCHEDULED MAINTENANCE category	94
Table F.43 – OTHER CORRECTIVE ACTION category	94

Table F.44 – UPGRADE category.....	95
Table F.45 – INSPECTIONS category	95
Table F.46 – RETROFIT category	96
Table F.47 – REPAIR WORK category	96
Table F.48 – OTHER FORCED OUTAGE category	97
Table F.49 – FAILURE REPAIR category	98
Table F.50 – DIAGNOSTIC category	98
Table F.51 – LOGISTIC WPS MAINTENANCE PROVIDER category	99
Table F.52 – LOGISTIC WPS OPERATOR category	100
Table F.53 – RESPONSE WPS MAINTENANCE PROVIDER category	100
Table F.54 – RESPONSE WPS OPERATOR category	101
Table F.55 – OTHER SUSPENDED – SCHEDULED MAINTENANCE category	102
Table F.56 – PERSONNEL SAFETY – SCHEDULED MAINTENANCE category	103
Table F.57 – ENVIRONMENT – SCHEDULED MAINTENANCE category	104
Table F.58 – IT ACCESS – SCHEDULED MAINTENANCE category.....	105
Table F.59 – OTHER SUSPENDED – PLANNED CORRECTIVE ACTION category.....	106
Table F.60 – PERSONNEL SAFETY – PLANNED CORRECTIVE ACTION category	107
Table F.61 – ENVIRONMENT – PLANNED CORRECTIVE ACTION category	108
Table F.62 – IT ACCESS – PLANNED CORRECTIVE ACTION category	109
Table F.63 – OTHER SUSPENDED – FORCED OUTAGE category.....	110
Table F.64 – PERSONNEL SAFETY – FORCED OUTAGE category.....	111
Table F.65 – ENVIRONMENT – FORCED OUTAGE category	112
Table F.66 – IT ACCESS – FORCED OUTAGE category	113
Table F.67 – INACTIVE RESERVE category.....	114
Table F.68 – MOTHBALLED category	115
Table F.69 – RETIRED category	116
Table F.70 – FORCE MAJEURE category	117
Table F.71 – INFORMATION UNAVAILABLE category.....	117

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WIND ENERGY GENERATION SYSTEMS –**Part 26-3: Availability for wind power stations****FOREWORD**

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IEC TS 61400-26-3, which is a technical specification, has been prepared by IEC technical committee 88: Wind energy generation systems.

The text of this technical specification is based on the following documents:

Enquiry draft	Report on voting
88/571/DTS	88/588/RVC

Full information on the voting for the approval of this technical specification can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts of the IEC 61400 series, under the general title *Wind turbines* (previous title), and *Wind energy generation systems* (new title), can be found on the IEC website.

Future standards in this series will carry the new general title as cited above. Titles of existing standards in this series will be updated at the time of the next edition.

Mandatory information categories defined in this Technical Specification are written in capital letters; optional information categories defined are written in capital letters and bold letters.

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INTRODUCTION

The intention of this Technical Specification is to define a common basis for exchange of information on availability indicators between owners, utilities, lenders, operators, manufacturers, consultants, regulatory bodies, certification bodies, insurance companies and other stakeholders in the wind power generation business. From this diverse group of stakeholders a number of external and internal interfaces arise in the operation and delivery of power. Some of these are energy related and many are informational. Since the intention is for a common basis of informational exchange, many of these interfaces are illustrated in Figure 1, which identifies external and internal elements related to energy production and asset management and which also benefit from a defined set of terms. This is achieved by providing an information model specifying how time designations shall be split into information categories. The information model forms the basis for how to allocate time for reporting availability indicators.

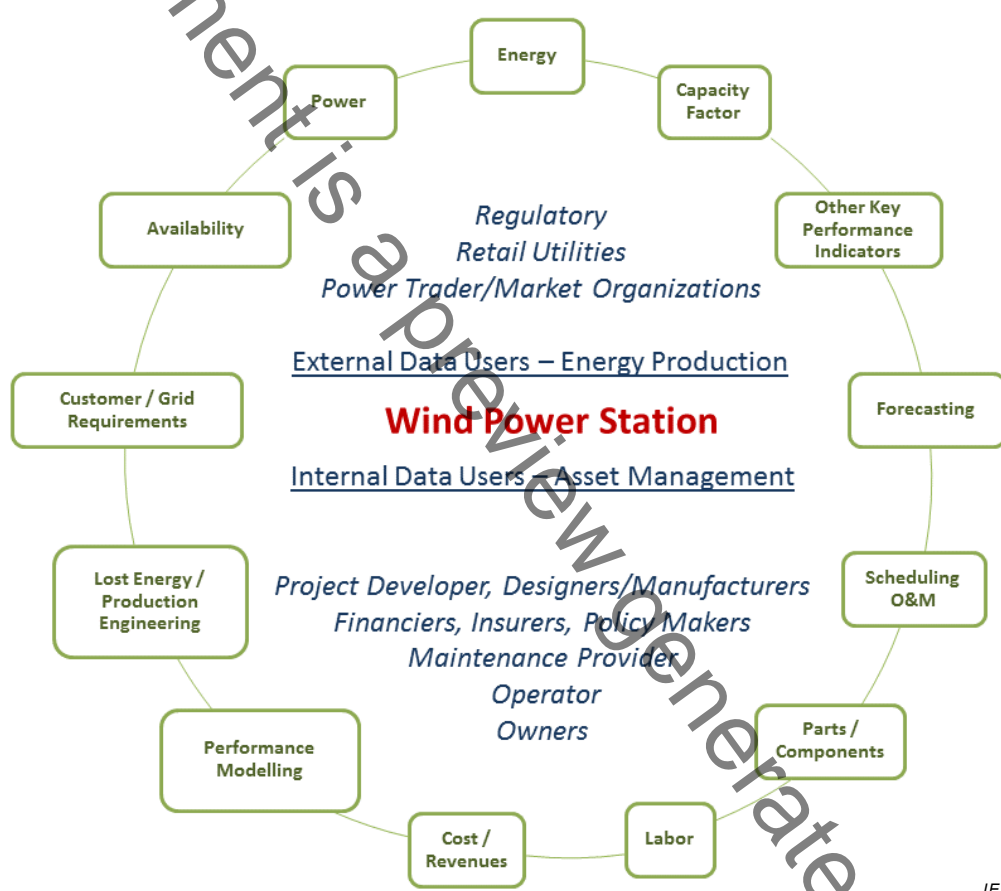


Figure 1 – Data stakeholders for a wind power station

This Technical Specification defines generic terms of wind turbine systems and environmental constraints in describing system and component availability, lifetime expectancy, repairs and criteria for determining overhaul intervals. The specification defines terminology and generic terms for reporting energy based generating unit availability measurement. A generating unit includes all equipment up to the point of interconnection¹. Availability measurements are concerned with fractions of time and/or energy a unit is capable of providing service, taking environmental aspects into account. Environmental aspects will be wind and other weather conditions, as well as grid and substation conditions. The specification furthermore defines terminology and terms for reporting availability indicators based on energy production.

¹ Defined in IEC 60050-415:1999, 415-04-01.

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

- 1) IEC TS 61400-26-1, which specifies terms for time based availability of a wind turbine generating system;
- 2) IEC TS 61400-26-2, which specifies terms for production based availability of a wind turbine generating system;
- 3) IEC TS 61400-26-3, which specifies terms for time based and production based availability and services of a wind power station.

IEC TS 61400-26-3 is based on the models developed in IEC TS 61400-26-1 and IEC TS 61400-26-2.

WIND ENERGY GENERATION SYSTEMS –

Part 26-3: Availability for wind power stations

1 Scope

This part of IEC 61400, which is a technical specification, provides a framework from which time-based and production-based availability indicators of a wind power station can be derived. It unambiguously describes how data is categorised and provides examples of how the data can be used to derive availability indicators.

The approach is to apply the terms and definitions for the applied information models introduced in IEC TS 61400-26-1 and IEC TS 61400-26-2 to a wind power station.

The basic approach is based on the assumption that a wind power station may be modelled as one 'WTGS' representing a complete wind power station. The wind power station is made up of all WTGSs, functional services and balance of plant elements as seen from the point of common coupling.

It is not the intention of this specification to define how time-based and production-based availability shall be calculated. Nor is it the intention to form the basis for power curve performance measurements – which is the objective of IEC 61400-12. However, the annexes should be regarded as examples and guidelines for developing methods for calculation of availability indicators.

This document also includes informative annexes with:

- examples of how to expand the model to more services,
- examples of how to determine the information category for the wind power station,
- examples of how to expand the model to balance of plant elements,
- examples of determination of lost production,
- examples of availability algorithms for production based indicators,
- examples of other availability indicators,
- examples of application scenarios.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60050 (all parts), *International Electrotechnical Vocabulary* (available at <<http://www.electropedia.org/>>)

IEC 60050-415, *International Electrotechnical Vocabulary – Part 415 : Wind turbine generator systems* (available at <<http://www.electropedia.org/>>)

IEC TS 61400-26-1:2011, *Wind turbines – Part 26-1: Time-based availability for wind turbine generating systems*

IEC TS 61400-26-2:2014, *Wind turbines – Part 26-2: Production-based availability for wind turbines*

3 Terms, definitions and abbreviations

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC TS 61400-26-1, IEC TS 61400-26-2 and IEC 60050-415 and the following apply.

3.1.1

actual service

actual level of a Service provided by the WPS as measured at the network connection point

Note 1 to entry: Actual service can only be assigned to measureable Services.

3.1.2

balance of plant

BOP

infrastructural components of the WPS with the exception of the WTGS(s) and its internal components and subsystems

Note 1 to entry: The infrastructure normally consists of site electrical facilities, monitoring and control (often called SCADA) as well as civil plant (such as foundations and roads) which support the operation and maintenance of the WTGS(s).

3.1.3

constrained potential service

calculated level of a Service provided by the WPS as measured at the network connection point based on design criteria, technical and operating specifications, and site conditions

Note 1 to entry: Operating specifications shall include externally caused set-points such as Grid or contractually imposed constraints.

3.1.4

grid

electrical network to which the WPS is electrically connected

Note 1 to entry: The WPS delivers its services into the Grid. The interface between the Grid and the WPS internal electrical system is the network connection point often referred to as the Point of Common Coupling (PCC).

3.1.5

intended function

ability of an apparatus, machine or system to consistently perform its required function within its design specification

3.1.6

lost service

service not supplied

Note 1 to entry: See 3.1.10.

3.1.7

physical potential service

calculated level of a Service provided by the WPS as measured at the network connection point based on design criteria, technical specifications and site conditions

Note 1 to entry: The potential service is the physically possible level of service.