



DPC: 20/30424707 DC

**BSI Group Headquarters**

389 Chiswick High Road London W4 4AL

Tel: +44 (0)20 8996 9000

Fax: +44 (0)20 8996 7400

www.bsigroup.com

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Interested committees:

Title: Draft BS EN IEC 61400-15-1 Wind energy generation systems. Part 15-1: Site suitability input conditions for wind power plants.

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- ii) affects other national standard(s)
- iii) requires additional national guidance or information

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## Introduction

This draft standard is based on national and international discussions. Your comments on this draft are invited and will assist in the preparation of the consequent standard.

For international standards, comments will be reviewed by the relevant UK national committee before sending the consensus UK vote and comments to the international committee, which will then decide appropriate action. If the international standard is approved, it is usual for the text to be published as a British Standard.

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## UK Vote

Please indicate whether you consider the UK should submit a negative (with supporting technical reasons) or positive vote on this draft. Please indicate if you are aware of any reason why this draft standard should not be published as a British Standard.

## Submission of Comments

- **Annotated drafts are not acceptable and will be rejected.**
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## Template for comments and secretariat observations

|                  |                        |
|------------------|------------------------|
| Date: xx/xx/20xx | Document: ISO/DIS xxxx |
|------------------|------------------------|

| 1  | 2                                          | (3)                          | 4               | 5                                                                                                                                  | (6)                                                                      | 7                                                  |
|----|--------------------------------------------|------------------------------|-----------------|------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|----------------------------------------------------|
| MB | Clause No./ Subclause No./Annex (e.g. 3.1) | Paragraph/Figure/ Table/Note | Type of comment | Commend (justification for change) by the MB                                                                                       | Proposed change by the MB                                                | Secretariat observations on each comment submitted |
|    | 3.1                                        | Definition 1                 | ed              | Definition is ambiguous and needs clarifying.                                                                                      | Amend to read '...so that the mains connector to which no connection...' |                                                    |
|    | 6.4                                        | Paragraph 2                  | te              | The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK. | Delete reference to UV photometer.                                       |                                                    |

PROJECT NUMBER:

**IEC 61400-15-1 ED1**

DATE OF CIRCULATION:

**2020-07-17**

CLOSING DATE FOR COMMENTS:

**2020-10-09**

SUPERSEDES DOCUMENTS:

**88/451/NP, 88/468/RVN**

|                                                                                                                                                                             |                                                                                                                                                                 |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>IEC TC 88 : WIND ENERGY GENERATION SYSTEMS</b>                                                                                                                           |                                                                                                                                                                 |
| <b>SECRETARIAT:</b><br>Denmark                                                                                                                                              | <b>SECRETARY:</b><br>Mrs Christine Weibøl Bertelsen                                                                                                             |
| <b>OF INTEREST TO THE FOLLOWING COMMITTEES:</b>                                                                                                                             | <b>PROPOSED HORIZONTAL STANDARD:</b><br><input type="checkbox"/><br>Other TC/SCs are requested to indicate their interest, if any, in this CD to the secretary. |
| <b>FUNCTIONS CONCERNED:</b><br><input type="checkbox"/> EMC <input type="checkbox"/> ENVIRONMENT <input type="checkbox"/> QUALITY ASSURANCE <input type="checkbox"/> SAFETY |                                                                                                                                                                 |

This document is still under study and subject to change. It should not be used for reference purposes.

Recipients of this document are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

TITLE:

**Wind energy generation systems – Part 15-1: Site suitability input conditions for wind power plants**

NOTE FROM TC/SC OFFICERS:

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**Wind energy generation systems –  
Part 15-1: Site suitability input conditions for wind power plants**

## FOREWORD

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International Standard IEC 61400-15-1 has been prepared by subcommittee 15: Site Suitability Inputs, of IEC technical committee 88:

The text of this International Standard is based on the following documents:

| FDIS       | Report on voting |
|------------|------------------|
| XX/XX/FDIS | XX/XX/RVD        |

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

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

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

The National Committees are requested to note that for this document the stability date is ....

THIS TEXT IS INCLUDED FOR THE INFORMATION OF THE NATIONAL COMMITTEES AND WILL BE DELETED AT THE PUBLICATION STAGE.

## 1 INTRODUCTION

- 2 This part of the IEC 61400 defines a framework for assessment and reporting of the wind resource  
3 and turbine suitability conditions for both onshore and offshore power plants.

4

## 1 Scope

The scope of this standard is to define a framework for assessment and reporting of the wind resource and turbine suitability input conditions for both onshore and offshore wind power plants. This includes:

- a) Definition, measurement, and prediction of the long-term meteorological and wind flow characteristics at the site
- b) Integration of the long-term meteorological and wind flow characteristics with wind turbine and balance of plant characteristics
- c) Characterizing environmental extremes and other relevant plant design drivers
- d) Addressing documentation and reporting requirements to help ensure the traceability of the assessment processes

The framework will be defined such that applicable national norms are considered and industry best practices are utilized.

The meteorological and wind flow characteristics addressed in this document relate to wind conditions, where parameters such as wind speed, wind direction, air density or air temperature are included to the extent that they affect the operation and structural integrity of a wind turbine and energy production analysis.

According to IEC 61400-1 and IEC 61400-3 site specific conditions are wind conditions, other environmental conditions, soil conditions, ocean/lake conditions and electrical conditions. All of these site specific conditions other than site specific wind conditions and related atmospheric variables addressed herein are out of scope for this standard.

This standard is framed to complement and support the scope of related IEC 61400 series standards by defining environmental input conditions. It is not intended to supersede the design and suitability requirements presented in those standards. Specific analytical and modelling procedures as described in IEC 61400-1, IEC 61400-2, and IEC 61400-3 are excluded from this scope.

## 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 61400-1 Ed. 4, Wind energy generation systems – Part 1: Design Requirements

IEC 61400-3-1: Wind energy generation systems - Part 3-1: Design requirements for fixed offshore wind turbines

IEC TS 61400-3-2:2019: Wind energy generation systems - Part 3-2: Design requirements for floating offshore wind turbines

IEC 61400-12-1: 2017 Ed 2.0, Wind energy generation systems – Part 12-1: Power performance measurements of electricity producing wind turbines

ISO 2533:1975

### 3 Terms and Definitions

For the purposes of this document, the following terms and definitions apply. All the below parameters are expected to represent the climate conditions over the design lifetime of the wind turbine and apply at hub height.

#### 3.1

##### **flow inclination angle**

The flow inclination is defined as the angle between a horizontal plane and the wind velocity vector at hub height. The flow inclination angle is positive if the wind velocity vector is pointing upwards.

#### 3.2

##### **mean turbulence intensity**

The turbulence intensity is defined as the ratio of the wind speed standard deviation to the mean wind speed determined from the same set of measured wind speed data and taken over a period of 10 minutes and a based on at least 1 Hz sampling frequency.

The mean value is the average of a subset of the turbulence intensities. The subset typically represents a bin within a wind speed- and wind direction matrix.

#### 3.3

##### **standard deviation of turbulence intensity**

The standard deviation of a sub set of the turbulence intensities (I). The sub set typically represents a bin within a wind speed- wind direction matrix.

#### 3.4

##### **associated data source**

Primary data source used to derive wind conditions for a given turbine location. This can include, but is not limited to, meteorological towers, remote sensing devices, production data or model data.

#### 3.5

##### **data occurrences**

The number of data points which form the basis of the associated parameter value

#### 3.6

##### **mean wind shear**

Wind shear (or power law) exponent as defined in IEC-61400-1 Ed 4 and estimated across the rotor swept area.

#### 3.7

##### **average turbulence intensity at 15m/s**

Mean turbulence intensity over all wind directions in the 15m/s wind speed bin. Bin width defined as 14.5-15.5 m/s.

#### 3.8

##### **annual mean ambient temperature**

Annual mean ambient temperature at the site.

#### 3.9

##### **annual wind speed frequency distribution**

Annual distribution of wind speeds as a function of wind direction and/or wind speeds.

#### 3.10

##### **Weibull distribution Pw**

The probability distribution function.

#### 3.11

##### **Coefficient Of Variation of the annual maximum extreme wind speed**

Standard deviation divided by the mean value of the annual maximum extreme wind speed