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AMENDMENT 1
AMENDEMENT 1

Wind energy generation systems - Part 1: Design requirements

Systèmes de génération d'énergie éolienne - Partie 1: Exigences de conception

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Wind energy generation systems - Part 1: Design requirements

AMENDMENT 1

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Amendment 1 to IEC 61400-1:2019 has been prepared by IEC technical committee 88: Wind energy generation systems.

The text of this Amendment is based on the following documents:

Draft	Report on voting
88/1109/FDIS	88/1133/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this Amendment is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications/.

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– reconfirmed,
– withdrawn, or
– revised.

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2 Normative references

Delete:

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

Add the following new references:

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

IEC 61400-6, *Wind energy generation systems - Part 6: Tower and foundation design requirements*

3 Terms and definitions

Add, after 3.77, the following new definitions:

3.78
damage equivalent load
constant amplitude cyclic load, S_{eq} derived from the load spectrum and a given S-N curve exponent that results in an equivalent fatigue damage for a given reference number of load cycles, N_{ref}, as the real load spectrum under the assumption that the damage can be determined on basis of the load cycles from a linear S-N curve with a given negative inverse slope, m

Note 1 to entry: Let the discrete load spectrum be specified by the number of cycles n_i for the load S_i, i = 1,2, …, n_s. Then the equivalent load can be calculated from the equation

$$S_{eq} = \left(\frac{\sum_{i=1}^{n_s} n_i S_i^m}{N_{ref}} \right)^{1/m} \quad (40)$$

3.79
reference loads, pl.
loads that had been utilised for detailed structural verification of the wind turbine components

3.80
serviceability
ability of a structure or structural element to perform adequately for normal use under all expected actions

3.81
serviceability limit state
state which corresponds to conditions beyond which specified service requirements for a structure or structural element are no longer met

3.82
S1
serviceability limit state load level for design lifetime actions, which relate to continued correct operation of the wind turbine

3.83
S2
serviceability limit state load level for frequent actions, which are exceeded for 10^{-4} of the lifetime

3.84
S3
serviceability limit state load level for the equivalent to frequent actions, which are exceeded for 10^{-2} of the lifetime

4 Symbols and abbreviated terms

4.1 Symbols

Add the following symbol to the list:

φ 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.

4.2 Abbreviated terms

Add the following abbreviated terms to the list:

EM	electromagnetic
EMC	electromagnetic compatibility
LDD	load duration distribution
LRD	load revolution distribution
NTM90	normal turbulence model, 90 % percentile value of distribution

6.2 Wind turbine class

Replace the second paragraph with the following new text:

Class T assumes all wind model parameters to be the same and allows the combination of $V_{\text{ref,T}}$ with all turbulence categories. It does not cover all the areas prone to tropical cyclones. The evaluation of the 1-year return period extreme wind speed should be done independently of the 50-year return period extreme wind speed. A site assessment based on Clause 11 is needed, as a minimum assessing that V_{50} is below V_{ref} of class T ($V_{\text{ref,T}}$), and that V_1 is below the value of the chosen class I, II or III.