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Datasheet for the decision of 22 January 2026

Case Number: T 0002/24 - 3.2.04

Application Number: 19203846.1

Publication Number: 3643914

IPC: F03D7/02, F03D17/00

Language of the proceedings: EN

Title of invention:
SYSTEM AND METHOD FOR PROTECTING WIND TURBINES FROM EXTREME AND FATIGUE LOADS

Patent Proprietor:
General Electric Renovables España, S.L.

Opponent:
ENERCON GmbH

Headword:

Relevant legal provisions:
EPC Art. 54, 56, 83

Keyword:
Novelty - after amendment
Inventive step - non-obvious alternative
Sufficiency of disclosure - enabling disclosure (yes)

Decisions cited:

Catchword:

Europäisches Patentamt
European Patent Office
Office européen des brevets

Beschwerdekammern

Boards of Appeal

Chambres de recours

Boards of Appeal of the
European Patent Office
Richard-Reitzner-Allee 8
85540 Haar
GERMANY
Tel. +49 (0)89 2399-0

Case Number: T 0002/24 - 3.2.04

D E C I S I O N
of Technical Board of Appeal 3.2.04
of 22 January 2026

Appellant: (Opponent)	ENERCON GmbH Dreekamp 5 26605 Aurich (DE)
Representative:	Eisenführ Speiser Patentanwälte Rechtsanwälte PartGmbB Postfach 10 60 78 28060 Bremen (DE)
Respondent: (Patent Proprietor)	General Electric Renovables España, S.L. Calle Roc Boronat 78 08005 Barcelona (ES)
Representative:	Zimmermann & Partner Patentanwälte mbB Postfach 330 920 80069 München (DE)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted on 19 October 2023 rejecting the opposition filed against European patent No. 3643914 pursuant to Article 101(2) EPC.**

Composition of the Board:

Chairman	A. Pieracci
Members:	S. Hillebrand
	M. Millet

Summary of Facts and Submissions

I. The appeal was filed by the opponent against the decision of the Opposition Division to reject the opposition filed against the patent in suit.

In this decision, the Opposition Division held i.a. that
- the patent disclosed the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art,
- the subject-matter of the independent claims was novel and involved an inventive step.

II. In a communication according to Article 15(1) RPBA, the Board pronounced the preliminary opinion that
- the patent disclosed the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art,
- the subject-matter of granted claim 1 might not be novel or involve an inventive step, but that of the independent claims according to auxiliary request 1 seemed to meet the requirements of the EPC.

III. Oral proceedings were held before the Board on 22 January 2026 in the form of a videoconference with all parties attending remotely.

IV. The appellant (opponent) requests that the decision under appeal be set aside and that the patent be revoked.

The respondent (proprietor) requests that the appeal be dismissed or, in the alternative, that the patent be maintained on the basis of one of auxiliary requests 1

- 3 already filed in opposition proceedings and refiled with their reply to the appeal.

V. Claim 1 of the main request reads as follows (numbering of features added by the Board):

M1.1 A method (100) for protecting a wind turbine (10) from extreme and fatigue loads associated with high wind speed events, the method (100) comprising:
M1.2 receiving, via a wind turbine condition estimator (56) programmed in a turbine controller (26) of the wind turbine (10), operating data indicative of current wind turbine operation;
characterised by the following method steps:
M1.3 determining, via the wind turbine condition estimator (56), a plurality of estimated wind turbine conditions at the wind turbine (10)
M1.4 by solving a control algorithm having one or more equations using the operating data,
M1.5 the plurality of estimated wind turbine conditions comprising, at least, an estimated wind speed at the wind turbine (10) and
M1.6 at least one loading proxy of the wind turbine (10); and,
M1.7 implementing, via the turbine controller (26), a corrective action only when each of the plurality of estimated wind turbine conditions indicates that one or more loading conditions of the wind turbine (10) exceeds a predetermined limit.

Subject-matter of claim 10 of the main request is (numbering of features added by the Board):
M10.1 A system for protecting a wind turbine (10) from extreme and fatigue loads associated with high wind speed events, the system comprising:
M10.2 a turbine controller (26) comprising at least one processor (58) having a wind turbine condition

estimator (56) stored therein,
characterised in that:
M10.3 the wind turbine estimator determines a plurality of estimated wind turbine conditions at the wind turbine (10)
M10.4 by solving a control algorithm having one or more equations using operating data indicative of current wind turbine operation,
M10.5 the plurality of estimated wind turbine conditions comprising, at least, an estimated wind speed at the wind turbine (10) and
M10.6 a loading proxy of the wind turbine (10), and
M10.7 wherein the turbine controller (26) implements a corrective action when each of the plurality of estimated wind turbine conditions indicate that one or more loading conditions of the wind turbine (10) exceeds a predetermined limit.

In claims 1 and 10 of auxiliary request 1, the loading proxy of feature M1.6 and M10.6 is additionally specified as
"including an estimated loading of one or more wind turbine components".

VI. In the present decision, reference is made to the following documents:

D3: DE 10 2006 034 106 A1
D5: DE 10 2016 103 254 A1
D6: EP 2 927 486 A1
D14: Erich Hau: "Wind Turbines - Fundamentals, Technologies, Application, Economics", 2nd edition, Springer Verlag Berlin Heidelberg, 2006.

VII. The appellant's arguments can be summarised as follows:
The claimed invention is not sufficiently disclosed to be carried out by a person skilled in the art, in particular with regard to solving an algorithm and estimating a wind speed.
The subject-matter of the independent claims according to the main and the first auxiliary request is not new.

The respondent's arguments can be summarised as follows:
The person skilled in the art can rely on their general background knowledge for carrying out the invention.
D3 discloses to measure the wind speed for the method of figure 4, not to estimate it. Theres is also no clear and unambiguous suggestion in D3 to do this as an alternative.

Reasons for the Decision

1. The appeal is admissible.

2. **The patent and its technical background**

The patent deals with methods and systems for protecting wind turbines from extreme fatigue loads.

2.1 As explained in its paragraph [0003], power output of a wind turbine generator increases with wind speed until a rated power is reached at which the wind turbine can operate with an acceptable level of fatigue and load on components. When wind speed increases further, corrective action is implemented, in particular changing the pitch angle of the rotor blades in order to extract less energy from the wind and keep power at rated power. Eventually, at wind speeds higher than a trip limit, this is not sufficient any more to stay

within acceptable load limits and further control action is implemented, such as shutting down the wind turbine. This is illustrated in figure 14.10 of D14 and in figure 3 of D3 albeit an intermediate control action being implemented here at wind speed limit C before shutting down the wind turbine at wind speed limit J.

2.2 A well known problem in these control methods is that the wind speed, on which they are based, cannot be measured accurately with an anemometer at the top of the wind turbine, usually at the nacelle. Wind speed can vary considerably with height, is influenced by rotor movement creating turbulence and wake from other wind turbines. It is therefore common practise to use an estimated or effective wind speed (EWS) for wind turbine control rather than a measured one, which EWS is basically derived by means of a kind of mathematical wind turbine model "backwards" from the effect of the wind, i.e. generated power, see the IEEE reports referenced [2] and [3] in paragraph [0071] of D5.

2.3 According to the independent claims of the main request, it is not only relied on calculated estimated wind speed for deciding on corrective actions to avoid overload, but on a further calculated estimated condition somehow representing load, the "loading proxy". Only when *each of them* indicates that a loading of the wind turbine goes beyond limit, a corrective action (shut down or other load reducing measure) is implemented.
In this way, the number of unnecessary trips and downtime can be reduced, see paragraph [0007] of the patent.

3. **Main request - claim interpretation and sufficiency**

3.1 In point 1 of its communication according to Article 15(1) RPBA, the Board expressed the following preliminary view with regard to these issues:

"*1.1 According to claim 1, a wind turbine condition estimator receives current operating data ("indicative of current wind turbine operation") and calculates from these operating data a plurality of estimated wind turbine conditions (features M1.2 - M1.4). Since an algorithm as such is not "solved", but obviously a (programmed) routine "having" or rather solving equations (paragraph [0012], end of paragraph [0032] of the patent), this seems to represent the understanding of the skilled person, who is considered to be an engineer with specific knowledge of wind turbine modelling and control.*

1.2 The plurality of estimated wind turbine conditions comprises an estimated wind speed (i.e. not the measured wind speed), which itself represents a loading proxy of the wind turbine according to paragraph [0031] of the patent, as well as a (further) loading proxy, which can be anything else related to loading, e.g. also the measured wind speed, paragraphs [0004], [0011] (feature M1.5). A number of ways for estimating a loading proxy appear to be disclosed, e.g. wake in paragraph [0036].

1.3 The skilled person is aware of the lacking preciseness of nacelle wind speed measurement and of many different model-based algorithms for estimating wind speed based on turbine operational data as stated in section 12 of the impugned decision. This background knowledge is for instance confirmed by the references [2] and [3] cited in paragraph [0071] of D5.
When looking at Equation (1) in paragraph [0035] of the

patent, the skilled person immediately identifies it as a wind turbine power equation, see D14, page 492 for electrical power or torque equation (6) in reference [2] and equation (1) in reference [3] for mechanical power. Accordingly, paragraph [0035] suggests to employ a wind speed estimator, in which the power coefficient C_p can be looked-up and power is "known" as well (see also end of paragraph [0032]). The equation can then be solved for V delivering an estimated wind speed. The Board notes that this seems also to be described for figure 2 in paragraphs [0058] - [0060] of D5, in which the wind speed estimator is named "Windbeobachter".

1.4 Finally, only when each of the estimated wind turbine conditions, i.e. at least estimated wind speed and a further loading proxy, indicates in some way that at least one "loading condition of the wind turbine" different from the estimated conditions exceeds a predetermined limit, a corrective action is implemented (feature M1.7). Although it is thus not required that the estimated conditions themselves exceed a respective limit, this might be an indication that also a loading condition does so. Examples of loading conditions are given in paragraph [0034] according to which the estimated conditions may be "representative" of wind parameters and/or these loading conditions."

3.2 The appellant did not comment on this preliminary view, but referred during oral proceedings to their written submissions. After further consideration, the Board therefore confirms its understanding of the claimed features as expressed above as well as its conclusion that the patent discloses the invention sufficiently to be carried out by a person skilled in the art, Article 100b) EPC.

4. **Main request - novelty**

4.1 Figure 4 of D3 illustrates a method for protecting a wind turbine from extreme fatigue loads associated with high wind speed.
Corrective actions are implemented when the wind speed exceeds predetermined limits C, J indicative for damaging loads as (partly) known from the prior art described in paragraph [0003] of the patent. Avoiding such loads appears to be mean nothing else than to maintain loading conditions within predetermined acceptable *limits*, see paragraph [0003] of the patent and paragraphs [0021], [0022], [0064], [0065] of D3 ("gewisses Maß", "übermäßige Belastung, "akzeptables Maß" or "Niveau"). Further, already at a lower wind speed threshold C_3, different corrective actions following curve 3 are implemented if in addition strong turbulences representing a load proxy are identified as being present, paragraph [0125].
The question is whether turbulence and wind speed are calculated as estimated wind turbine conditions in the sense of the independent claims.

4.2 Preceding paragraph [0123] suggests that wind speed and turbulence are measured values ("Messwerte"). When analysing the meaning of "measured" in D3, it appears, however, that not only "directly measured", e.g. by wind speed and turbulence sensors, is encompassed by "measured", but also indirect measurement such as derivation from other measured parameters and even general determination.
In paragraphs [0029] - [0031] some simple methods for directly measuring wind direction and wind speed by means of a wind vane and an anemometer are presented. Already here, turbulence derived from wind speed measurements is qualified as being "measured".

According to paragraphs [0033] - [0039], wind turbulences are determined from values delivered by sensors in the rotor blades, such as acceleration sensors, depending on the rotor blade position. In this way, wind turbulences are "measured", paragraph [0040]. It follows that "Messwerte" is used in paragraph [0123] as a synonym for "Kenngrößen" or "parameter" as it already has been before in paragraphs [0023], [0025] and is later again in paragraph [0137]: Not only wind speed should be taken into account as "Messwert" but also wind direction, wind turbulences and other parameter having a detrimental effect on structural integrity of the wind turbine.

4.3 Paragraphs [0029] - [0044] disclose alternative methods for measuring/determining wind related parameters which are needed for carrying out various embodiments of D3. Contrary to the opinion of the respondent, the structure of these paragraphs does not correspond to the sequence of embodiments so that only paragraphs [0029] - [0031] would relate to the "first" embodiment according to figure 4. Wind speed plays a role in all embodiments of figures 4, 6, 7 (see paragraphs [0125], [00137] - [0140]) and is mentioned in paragraphs [0030], [0036], [0043], [0044]. Turbulences, which are relevant for the embodiment of figure 4, are subject of paragraph [0030] and again of paragraphs [0040] - [0044]. Wind direction for the second embodiment of figures 6, 7 is dealt with in between in paragraphs [0036], [0038] but also in paragraphs [0040], [0041]. No structural pattern or order of paragraphs relating to measuring methods for specific parameters can thus be recognised in D3.

4.4 When looking for a way to determine "strong turbulences" in order to carry out the method of figure

4, the person skilled in the art is prompted by paragraph [0040] not to rely on the anemometer measurement of wind speed according to paragraph [0030], but to measure turbulences over the whole rotor area in order to get a clearer picture of the loads on the wind turbine. The following paragraphs [0043] and [0044] teach how to obtain a picture of both parameters needed in figure 4, namely wind speed and turbulences, over each rotor sector and in different heights by analysing and evaluating stored data from the pitch control. Such analyses necessarily involve algorithms solving some sort of equations. They are used as basis for deciding on corrective actions with regard to power output, an example of which is illustrated by curve 3 of figure 4.

4.5 The person skilled in the art would not refrain from applying the measuring method of paragraphs [0043], [0044] for the embodiment of figure 4 because it provides "a picture".
First of all, also a "picture", such as a curve or other graphical display of wind speed and turbulence in different regions, is based on a plurality of individual values derived from pitch control and thus "estimated". Moreover, neither claim 1 of the patent nor the method of figure 4, paragraph [0125] according to D3 require the estimated load proxy turbulence to be a "scalar" in contrast to a "picture" as suggested by the respondent. The presence of "strong turbulences" in a specific region could also simply be affirmed in a decision making process with a "yes" when the frequency of pitch control exceeds a certain limit.
The method of figure 4 and the estimation according to paragraphs [0043, 0044] of D3 are therefore compatible with each other and result in estimated wind turbine conditions indicative for loading conditions of the

wind turbine.

4.6 Since D3 discloses thus a method with all steps of claim 1 according to the main request, the subject-matter of claim 1 is not new in the sense of Article 54(1), (2) EPC.

5. **Auxiliary request 1**

5.1 In claims 1 and 10 of auxiliary request 1, the (further) load proxy is specified as including an estimated loading of one or more wind turbine components.
This feature is disclosed in paragraphs [0010] and [0031] of the original specification, Article 123(2) EPC.

5.2 As outlined in point 2.3, above and in point 5.3 of the Board's communication according to Article 15(1) RPBA, already a general "loading proxy" taken into account in addition to estimated wind speed does represent a clear limiting feature of the independent claims.
Moreover, it seems to be common ground that the alternative ("Variante") "loading of wind turbine components" for the loading proxy in auxiliary request 1 is different from the alternative ("Variante") loading proxy "wind turbulence" known from D3 in the context of the remaining features of claims 1 and 10, see page 45 of the appeal brief.
The method of claim 1 and the subject-matter of claim 10 are therefore new with regard to the disclosure of D3.

5.3 Starting from figure 4 of D3 as closest prior art, it has not been argued that it would be obvious to replace wind turbulence by an estimated loading of a wind

turbine component in this embodiment of D3.
Since the Board is also unable to identify any suggestion for the skilled person to take into account an estimated loading of a wind turbine component in this embodiment, the method of claim 1 and the subject-matter of claim 10 involve an inventive step in the light of the cited prior art.

5.4 The description of auxiliary request 1 has been adapted to the amended independent claims 1 and 10, in particular paragraphs [0010], [0011], [0016] and [0032] of the published patent specification, Article 84, Rule 42(1)c) EPC.
The appellant objects to the expression "in one aspect" in paragraph [0010], which would actually deal with the claimed invention, not just an "aspect". The Board does not see any inconsistency with the amended independent claims 1 and 10 since they cover in one aspect a method according to paragraph [0010] and in another aspect a system according to paragraph [0016].

6. **Result**

With their appeal, the opponent successfully challenged the findings of the Opposition Division that the subject-matter of claim 1 was new with regard to the disclosure of D3. This leads to setting aside the corresponding decision of the Opposition Division to reject the opposition.
As the patent, taking into account the amendments made in auxiliary request 1, meets the requirements of the EPC, in particular those of sufficient disclosure, novelty and inventive step, it may be maintained in the amended form of auxiliary request 1, Article 101(3)a) EPC.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the Opposition Division with the order to maintain the patent in amended form on the basis of the following documents:

Claims:
Nr. 1 - 15 of auxiliary request 1 filed with letter of 4 July 2024

Description:
pages 2 - 7 as filed at the oral proceedings before the Board

Drawings:
Figures 1 - 4 of the published patent specification.

The Registrar: The Chairman:

G. Magouliotis A. Pieracci

Decision electronically authenticated