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**Datasheet for the decision
of 30 July 2021**

Case Number: T 0445/18 - 3.5.02

Application Number: 06021973.0

Publication Number: 1914420

IPC: F03D9/00, H02J3/38

Language of the proceedings: EN

Title of invention:

Wind energy installation and method of controlling the output power from a wind energy installation

Patent Proprietor:

Siemens Gamesa Renewable Energy A/S

Opponent:

ENERCON GmbH

Relevant legal provisions:

EPC Art. 100(a), 56, 100(b), 100(c)

Keyword:

Grounds for opposition - insufficiency of disclosure (no) -
extension of subject-matter (no) - lack of patentability (no)



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Case Number: T 0445/18 - 3.5.02

D E C I S I O N
of Technical Board of Appeal 3.5.02
of 30 July 2021

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Decision under appeal: **Decision of the Opposition Division of the
European Patent Office posted on 5 December 2017
rejecting the opposition filed against European
patent No. 1914420 pursuant to Article 101(2)
EPC.**

Composition of the Board:

Chairman R. Lord
Members: C.D. Vassoille
W. Ungler

Summary of Facts and Submissions

I. The appeal of the opponent lies against the decision of the opposition division rejecting the opposition against European patent no. 1 914 420.

II. The following documents are relevant for the present decision:

E3: WO 01/86143 A1

A1: Erlich I. et al.: "Grid Code Requirements Concerning Connection and Operation of Wind Turbines in Germany", Power Engineering Society General Meeting, IEEE, June 12-16, 2005, pages 2230-2234, ISBN: 978-0-7803-9157-4.

A4: SKM: "New Generation Technologies and GB Grid Codes, Report on Change Proposals to the Grid Codes in England & Wales and in Scotland", Final report, December 2004, retrieved from the Internet, URL: <https://www.ofgem.gov.uk/ofgem-publications/62336/9346-gridcodechanges.pdf>, [retrieved on 2016-06-28].

III. In a communication under Article 15(1) RPBA 2020, annexed to the summons to hold oral proceedings, the board informed the parties of their preliminary opinion, according to which the maintenance of the patent did not seem to be prejudiced by the grounds for opposition under Articles 100(b) and (a) EPC.

IV. Oral proceedings before the board took place on 30 July 2021.

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

The respondent (patent proprietor) requested that the appeal be dismissed (main request), auxiliarily that the decision under appeal be set aside and the patent be maintained in amended form on the basis of auxiliary request 1 filed with the reply to the statement of grounds of appeal, or on the basis of auxiliary request 1A filed with letter of 10 May 2021, or on the basis of auxiliary request 2 filed with the reply to the statement of grounds of appeal.

V. Claim 1 of the respondent's main request (patent as granted) reads as follows (feature numbering added in squared brackets):

"**[1.1]** A method of controlling the output power from a wind energy installation to a utility grid (7) having a specified nominal frequency (f_N), in which

[1.2] the output power (P) is controlled depending on the actual grid frequency (f) in the utility grid (7) such that the output power (P) is reduced when the grid frequency (f) exceeds the nominal frequency (f_N), and in that

[1.3] the output power (P) is reduced as soon any increase of the grid frequency (f) above the nominal frequency (f_N) is detected,

characterised [sic!] **in** that

[1.4] the rate of reducing the output power (P) is increased when the magnitude of the deviation (Δf) of

the grid frequency (f) from the nominal frequency (f_N) increases."

Claims 2 to 4 are dependent on claim 1.

VI. Independent claim 5 of the respondent's main request (patent as granted) reads as follows (feature numbering added in squared brackets):

"**[5.1]** A wind energy installation being adapted to be connected to a utility grid (7) for delivering output power (P) to the utility grid (7) comprising:

[5.2] - at least one wind-driven [sic!] generator (17, 19);

[5.3] - a generator electronics (21, 23);

[5.4] - a frequency sensor (37, 39) which is designed and arranged such as to be able to measure the grid frequency (f) present in the utility grid (7) and to output a frequency signal representing the grid frequency (f); and

[5.5] - a control unit (33, 35) which is connected to the generator electronics (21, 23) for delivering a control signal and to the frequency sensor (37, 39) for receiving the frequency signal, and which is adapted to calculate the control signal depending on the grid frequency (f) such that the output power (P) is reduced as soon any increase of the grid frequency (f) above the nominal frequency (f_N) is detected,

characterised in that

[5.6] the control unit (33, 35) is adapted to calculate the control signal depending on the grid frequency (f) such that the rate of reduction in the output power (P) is increased when the magnitude of the deviation (Δf) of the grid frequency (f) from the nominal frequency (f_N) increases."

Claims 6 to 8 are dependent on claim 5.

VII. The arguments of the appellant which are relevant for the present decision are as follows:

Article 100(c) EPC

Introducing feature 1.4 in claim 1 in the course of the examination proceedings constituted an inadmissible intermediate generalisation. The original claim 3, which was cited as a basis for the feature in question, merely stated that the rate of reducing the output power "varies" with the magnitude of the deviation of the grid frequency from the nominal frequency. It was admitted that the original description on page 5, lines 2 to 3 literally disclosed the wording of feature 1.4 of claim 1. However, this paragraph of the description, starting from page 4, line 28, referred to a very specific embodiment of the invention, namely a polynomial like a quadratic function, which was not introduced in claim 1. In particular, the description on page 5 seemed to refer to "curve C" illustrated in figure 2 of the original application documents. Feature 1.4 of claim 1 therefore constituted an inadmissible intermediate generalisation, because the general wording of feature 1.4 was exclusively disclosed in the context of a very specific embodiment, the features of which were not present in claim 1. Similar arguments applied to further passages in the original description, in particular on page 8, line 35 to page 9, line 5 and page 10, lines 1 to 7 as well as page 9, lines 18 to 23 and figure 2. It was particularly pointed out that only "curve C", illustrated in figure 2 and described on page 10, lines 11 to 28, could form the basis of granted claim 1, which however referred to

a particular non-linear curve not forming part of claim 1.

Article 100(b) EPC

According to feature 1.3 of claim 1, the output power was reduced as soon as any increase of the grid frequency above the nominal frequency is detected. A corresponding feature 5.5 was present in the independent claim 5. This feature could not be put into practice, because with a narrow interpretation such that no or a very small threshold increase exists, it was not disclosed how this small deviation could be detected in practice. Furthermore, it should be noted in this context that the only described embodiment which could be considered to fall within the meaning of claim 1 could be "curve C" illustrated in figure 2 of the patent. However, the patent did not give any values for the required control parameters. The claimed subject-matter also contradicted the description in paragraph [0010] of the patent, according to which only a reduction of the dead band was intended. Further problems arose from the contradictive description of the patent in paragraph [0011], stating that the output power should only be reduced "slightly". It was questionable how the described effect of the invention could be achieved by a corresponding minimal output power reduction.

Articles 100(a) and 56 EPC

Document A4 differed from the subject-matter of claim 1 in that it disclosed the provision of a dead band (see the figure on page 39 of A4) in contrast to feature 1.3, which recited that the output power is reduced as soon as any increase of the grid frequency above the

nominal frequency is detected. The objective technical problem was that of how to reduce the control power while providing an effective frequency reduction. The table on page 40 of document A4 included a frequency range F_B and F_C of 49.5 to 51.0 Hz as well as active power ranges P_B and P_C of 50 to 100 MW. It was evident, in particular in view of the description below the figure on page 39 ("... combination of power (P) and frequency (F) values, may be different for each wind farm ..."), that these values could be combined such as to arrive at the claimed invention. In particular, the skilled person concluded from A4 that the frequency F_C could be decreased to 49.5 or 50.0 Hz or the active power P_C be reduced to be lower than P_B and would thus arrive at the claimed invention. As the skilled person always aimed at reducing the control power, while at the same time effectively reducing an increased frequency, it would have been obvious to select either the frequency F_C or the active power value of P_C such as to eliminate the dead band and thus arrive at the claimed invention. This was particularly true when combining document A4 with document A1, the latter of which motivated the skilled person to control the active power as soon as any frequency above the nominal frequency is detected.

The result of a corresponding control was predictable and was in particular comparable to a car driver who brakes less hard in a less risky situation than in a riskier situation. In other words, it corresponded to the natural approach of the skilled person. Furthermore, parameterisation of the control strategy was a common task of the skilled person and, if the common general knowledge was applied in the course of normal technical development, would inevitably lead to the subject-matter of claims 1 and 5.

Document A1 in figure 6a on page 3 allowed for a power reduction in the whole hatched area starting from the nominal frequency. It would have been obvious for the person skilled in the art to only slightly reduce the output power when the deviation from the nominal frequency is small and to increase the rate of reduction of the output power when the deviation becomes bigger.

Document E3 referred to the application of a dead band only in the dependent claim 3, while claim 1 generally referred to a control of the active power of the generator as a function of the grid frequency and thus included a situation where control was carried out without a dead band. The objective technical problem was that of how to reduce the control power while providing an effective frequency reduction. Again, the result of implementing a corresponding control strategy as defined in feature 1.3 was not in any way surprising and would directly result in the implementation of feature 1.4. Reference was further made to the general disclosure of E3 on page 2, fourth paragraph.

VIII. The arguments of the respondent which are relevant for the present decision are as follows:

Article 100(c) EPC

The original description on page 5, lines 2 to 3 in connection with the original claim 3 directly and unambiguously disclosed feature 1.4 and corresponding feature 5.6 of independent claim 5. There were only two possibilities to interpret the wording "varies with" in the original claim 3 and the person skilled in the art would immediately understand that the only sensible

meaning in the overall context of the described invention was a meaning of "is increased" in accordance with feature 1.4. This interpretation was also in line with the original claim 4. It was further to be noted that the paragraph of the original description starting on page 4, line 28 recited "... the non-linear function was, e.g., a polynomial like a quadratic or cubic function..." (emphasis added) and it was thus clear that it merely referred to an example and would not be interpreted by the skilled person as restricting the meaning of the wording "the higher the deviation from the nominal frequency, the higher the reduction rate of the output power" (page 5, lines 2 to 3 of the original description).

Article 100(b) EPC

An infinitely small deviation from the nominal frequency could not be measured by a frequency sensor and was therefore not subject to the method of claim 1 and the apparatus according to claim 5. It was evident that the subject-matter of claim 1 started with the detection of a potentially very small, but in any case detectable frequency deviation. As soon as such a detection had occurred, the output power reduction started. Furthermore, claim 1 provided a clear teaching to the skilled person, which was not contradicted by the description or the drawings. As regards control curve parameters not described in the patent, the appropriate control curve parameter values depended on the specific application, and in particular on the "electric strength" of the respective wind energy installation and on the desired support for the utility grid in case of frequency deviations. The person skilled in the art would be able to find appropriate

parameter values and would thus not have any problems in implementing the invention.

Article 100(a) and 56 EPC

A surprising technical effect was not a prerequisite for inventive step. Each of the appellant's assessments of inventive step was based on hindsight.

Document A4 in the drawing on page 39 explicitly disclosed the presence of a dead band. The table on page 40 included an infinite number of possible combinations of frequencies and active powers. Document A4 did not provide any hint to the skilled person to select a specific combination resulting in the claimed invention, in particular not to feature 1.3.

Document A1 merely disclosed an undefined area of control curves, without however disclosing any specific control strategy. While the invention may well be included in the hatched area, A1 did not provide any hint to reduce the output power as soon as any increase of the grid frequency above the nominal frequency is detected.

Claim 1 of document E3 may be formulated so broadly as to include the subject-matter of claim 1 of the patent. However, it was an acknowledged principle that a general teaching does not anticipate a special teaching. E3 did not provide any hint to the skilled person to implement feature 1.3, i.e. to reduce the output power as soon as any increase of the grid frequency above the nominal frequency is detected.

Reasons for the Decision

1. The appeal is admissible.
2. *Main request - Article 100(c) EPC*
 - 2.1 The board has come to the conclusion that the subject-matter of claim 1 of the main request is directly and unambiguously derivable from the original application documents.
 - 2.2 The following feature 1.4 was introduced in claim 1 during the examination proceedings:

"the rate of reducing the output power (P) is increased when the magnitude of the deviation (Δf) of the grid frequency (f) from the nominal frequency (f_N) increases."

A corresponding feature 5.6 is present in the independent claim 5.

- 2.3 Original claim 3 recited "the rate of reducing the output power (P) varies with the magnitude of the deviation (Δf) of the grid frequency (f) from the nominal frequency (f_N)".

Furthermore, the appellant acknowledged that a literal disclosure of the feature in question was present on page 5, lines 2 and 3 of the original description.

- 2.4 The board agrees with the respondent that the skilled person would not understand the wording on page 5, lines 2 to 3 as being exclusively related to the context of a specific type of non-linear function and in particular not exclusively in the context of "curve

C", illustrated in figure 2 and further described on page 10.

As has been correctly pointed out by the respondent, the corresponding paragraph explicitly refers to a "polynomial like a quadratic or cubic function" only by way of example ("e.g."). The wording "the higher the deviation from the nominal frequency, the higher the reduction rate of the output power" present on page 5, lines 2 to 3 of the original disclosure therefore would not be understood by a person skilled in the art to exclusively refer to a specific function.

Furthermore, the board is convinced that the person skilled in the art, on a reasonable reading of the original application documents, would immediately have understood, in view of the original claim 3 in conjunction with the overall teaching of the application, that the only meaningful connotation of "varies with" (see original claim 3) is an increase in the rate of reduction of the output power according to the disclosure on page 5, lines 2 to 3 of the original description.

Even if the original description on page 4, line 28 to page 5, line 6 referred to a particular type of function, the board is convinced that the skilled person would understand that the wording on page 5, lines 2 to 3 in connection with the original claim 3 applies generally to all possible functions, namely to linear and non-linear functions within the meaning of the original disclosure. It follows that even if feature 1.4 were considered to be an intermediate generalisation with respect to the disclosure in a specific part of the original description, it would in any case be an admissible intermediate generalisation,

since the skilled person, on a reasonable reading of the original application documents, would immediately understand that the teaching of original claim 3 can only refer to an increase in power reduction rate when the magnitude of the deviation of the grid frequency from the nominal frequency increases, in accordance with the disclosure on page 5, lines 2 to 3 of the original description, and is further generally applicable to all kinds of functions, in accordance with the general wording of original claim 3.

2.4.1 Finally, the board observes that the decision in appeal case T 0983/12, cited by the appellant in the statement setting out the grounds of appeal, is not applicable to the present case, as feature 1.4 is not based on a disclosure in the figures, as was the case in that decision.

2.5 The board has therefore come to the conclusion that the opposition division was right to conclude that the ground for opposition under Article 100(c) EPC does not prejudice the maintenance of the patent as granted.

3. *Main request - Article 100(b) EPC*

3.1 The patent discloses the invention as defined in claims 1 and 5 in a manner sufficiently clear and complete for it to be carried out by the skilled person.

3.2 The board agrees with the respondent that the skilled person on a reasonable reading of claims 1 and 5 would undoubtedly understand that the nominal frequency first has to be detected by means of a suitable frequency detector, which implies a certain detection tolerance below which frequency changes cannot be detected.

3.3 Furthermore, the board is convinced that, as was argued by the respondent, the selection of the appropriate control curve parameters depend on the specific application, in particular the type of wind turbine and the required support for the utility grid connected to the wind turbine. In view of the clear teaching of claims 1 and 5, the board has no doubt that the person skilled in the art, applying the common general knowledge, would be able to select the appropriate control parameters without any difficulty.

3.4 The board has therefore come to the conclusion that the opposition division was right to conclude that the ground for opposition under Article 100(b) EPC does not prejudice the maintenance of the patent as granted.

4. *Main request - Articles 100(a) and 56 EPC*

The subject-matter of claims 1 and 5 is not rendered obvious by documents A4, A1 or E3.

4.1 *Document A4*

4.1.1 It was not in dispute between the parties that document A4 did not disclose feature 1.3 of claim 1, i.e. reducing the output power as soon as any increase of the grid frequency above the nominal frequency is detected.

4.1.2 The appellant considered the objective technical problem to be that of how to reduce the control power while providing an effective frequency reduction. For the purpose of applying the "problem-and-solution approach", the board can accept the appellant's formulation of the objective technical problem.

- 4.1.3 The board does not consider the subject-matter of claim 1 to be rendered obvious to the skilled person when starting from A4 and in view of the objective technical problem formulated by the appellant.
- 4.1.4 As regards document A4, the appellant's argument concentrated on the fact that the table on page 40 of document A4 provided a basis for a combination that results in the subject-matter of claim 1, in particular features 1.3 and 1.4. Furthermore, the appellant argued that the skilled person would exhaust the entire range provided by the table. Furthermore, setting the points in A4 accordingly would not bring any surprising effect. The corresponding resulting effects when shifting the points in the indicated ranges were rather known to the skilled person.
- 4.1.5 First, the board observes that the figure on page 39 explicitly discloses the presence of a dead band between points B and C, as was argued by the respondent and which was not contested by the appellant. The board further agrees with the respondent that the person skilled in the art, in view of the infinite number of possible combinations of frequencies and active powers included in the table on page 40, would not have been motivated to select the specific combination needed to arrive at the claimed invention. This is particularly true for a specific reduction in the frequency F_C to 50.0 Hz or below, or alternatively, a reduction of the active power P_C to be lower than P_B . In particular, the board does not consider the general description of the figure on page 39 to be a motivation to select the specific combinations of frequencies or active powers that would result in the present invention.

In this respect, it is further to be noted that the alleged absence of a "surprising technical effect" or the "predictability" of the effects of feature 1.3 are, without the submission of further evidence, in any case not a sufficient argument. The same applies to corresponding arguments presented with respect to feature 1.4.

Thus, the appellant's argument that the skilled person would naturally choose a combination that would foresee the omission of the dead band or, in other words, a reduction of the output power as soon as any increase of the grid frequency above the nominal frequency is detected, in accordance with the distinguishing feature 1.3, does not convince the board.

At the filing date of the patent, controlling the active power of the generator as a function of the grid frequency was indisputably known to the skilled person. However, the board is convinced that the provision of a dead band was the standard practice at that time, to thereby limit a loss of output power to areas outside the dead band (see the patent in paragraph [0010]).

From document A4 it is not apparent to the board what would have motivated the skilled person, when aiming at reducing the control power, to omit the dead band. The appellant's main argument that this would have corresponded to the natural approach of the skilled person (corresponding to a car driver breaking in a critical situation), is in any case not sufficient to convince the board.

Rather, the board considers the method steps according to features 1.3 and 1.4 of claim 1 to be a non-obvious specific further development of the output power

control methods using a dead band. The same applies to features 5.5 and 5.6 of independent claim 5.

4.1.6 Given that document A1 does not provide any hint to the skilled person to omit the dead band and to reduce the output power as soon as any increase of the grid frequency above the nominal frequency is detected, the board does not consider a combination of documents A4 and A1 to result in the subject-matter of claim 1 (see point 4.2 below).

4.1.7 Consequently, the board has arrived at the conclusion that the subject-matter of claims 1 and 5 of the main request involves an inventive step in view of document A4, either in combination with the common general knowledge or with document A1.

4.2 *Document A1*

4.2.1 As regards document A1 as the closest prior art, it was not in dispute between the parties that this document at least does not disclose feature 1.3 of claim 1, i.e. reducing the output power as soon as any increase of the grid frequency above the nominal frequency is detected.

4.2.2 The objective technical problem can be considered to be that of how to reduce the control power while providing an effective frequency reduction.

4.2.3 As submitted by the respondent, document A1 provides for an undefined range of possible control curves on page 3 in Figure 6a.

Similarly to the conclusion reached with regard to document A4 as the closest prior art document, the

board does not see what would have motivated the skilled person, in view of the objective technical problem, to implement the specific teaching of claims 1 and 5, in particular a combination of features 1.3 and 1.4, in a control method as disclosed by document A1. Given that the appellant's main arguments regarding an inventive step in view of document A1 substantially correspond to those provided with respect to document A4, the board refers to the reasons set out under point 4.1 above.

In particular, the mere fact that in A1, figure 6 on page 3, the hatched area already starts at 50 Hz, cannot be considered as sufficient evidence for the obviousness of features 1.3 and 1.4. To the contrary, the board agrees with the respondent that document A1 does not contain any indication of a specific control curve of the output power in the sense of features 1.3 and 1.4. As already stated with regard to document A4, the alleged absence of a surprising effect or the predictability of the effect in the present case is not sufficient to convince the board of the obviousness of the subject-matter of claim 1.

4.2.4 Consequently, the board has arrived at the conclusion that the subject-matter of claims 1 and 5 of the main request involves an inventive step in view of document A1 in combination with the common general knowledge of the skilled person.

4.3 *Document E3*

4.3.1 The appellant has further cited document E3 as a possible closest prior art document. It was not in dispute between the parties that this document does not disclose features 1.3 and 1.4 of claim 1.

- 4.3.2 The objective technical problem can be considered to be that of how to reduce the control power while providing an effective frequency reduction.
- 4.3.3 As submitted by the respondent, the overall teaching of document E3 includes the provision of a dead band, contrary to the definition in feature 1.3 of claim 1. Consequently, in this respect the disclosure of document E3 does not go beyond that of documents A1 and A4.

The opponent considered feature 1.3 to be a partial function which was inherently comprised in the overall function disclosed in document E3, i.e. a frequency dependent output power reduction. However, the board does not consider the obviousness of exactly this special "partial function" within the known frequency dependent power reduction to be sufficiently proven. In particular, the alleged absence of a surprising technical effect and the predictability of the effects of feature 1.3 are, without the submission of further evidence, in any case not a sufficient argument in this regard. The same applies here to the corresponding arguments presented with respect to feature 1.4.

In accordance with the conclusion reached with regard to document A4 as the closest prior art document, the board does not see what, in view of the objective technical problem, would have motivated the skilled person to implement the specific teaching of claims 1 and 5, in particular to provide the particular combination of features 1.3 and 1.4, in a control method of E3. Given that the appellant's main argument regarding an inventive step in view of document E3 substantially corresponds to that raised with respect

to document A4, the board refers to the reasons set out under point 4.1 above.

4.3.4 Given that neither document A1 nor A4 provides any hint to the skilled person to omit the dead band and to reduce the output power as soon as any increase of the grid frequency above the nominal frequency is detected (see the reasons under point 4.1 and 4.2 above), the board does not consider a combination of document E3 with A4 or A1 to render the subject-matter of claim 1 obvious either.

4.3.5 Consequently, the board has arrived at the conclusion that the subject-matter of claims 1 and 5 of the main request involves an inventive step in view of document E3 in combination with the common general knowledge of the skilled person or in combination with A4 or A1.

4.4 The board has therefore come to the overall conclusion that the ground for opposition under Articles 100(a) and 56 EPC does not prejudice the maintenance of the patent as granted.

5. *Result*

Given that the grounds for opposition under Articles 100(a) and 56, 100(b) and 100(c) EPC did not prejudice the maintenance of the patent as granted, and further considering that the appellant did not raise any further objection with regard to the main request, the board had to accede to the respondent's main request.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:



U. Bultmann

R. Lord

Decision electronically authenticated