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# Datasheet for the decision of 22 July 2021

**Case Number:** T 2640/17 - 3.5.02

**Application Number:** 12174100.3

**Publication Number:** 2679812

**IPC:** F03D7/04, F03D7/02

**Language of the proceedings:** EN

**Title of invention:**
Wind park control system

**Patent Proprietor:**
Siemens Gamesa Renewable Energy A/S

**Opponent:**
Vestas Wind Systems A/S

**Relevant legal provisions:**
EPC Art. 100(a), 54, 56

**Keyword:**
Main request - Novelty and Inventive step (yes)

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**Case Number: T 2640/17 - 3.5.02**

# D E C I S I O N
# of Technical Board of Appeal 3.5.02
# of 22 July 2021

| | |
|---|---|
| **Appellant:** (Patent Proprietor) | Siemens Gamesa Renewable Energy A/S<br>Borupvej 16<br>7330 Brande (DK) |
| **Representative:** | Aspacher, Karl-Georg<br>Siemens Gamesa Renewable Energy GmbH & Co. KG<br>Otto-Hahn-Ring 6<br>81739 München (DE) |
| **Respondent:** (Opponent) | Vestas Wind Systems A/S<br>Hedeager 44<br>8200 Aarhus N (DK) |
| **Representative:** | Grünecker Patent- und Rechtsanwälte<br>PartG mbB<br>Leopoldstraße 4<br>80802 München (DE) |
| **Decision under appeal:** | **Decision of the Opposition Division of the European Patent Office posted on 24 November 2017 revoking European patent No. 2679812 pursuant to Article 101(3)(b) EPC.** |

**Composition of the Board:**

| | |
|---|---|
| **Chairman** | R. Lord |
| **Members:** | C.D. Vassoille |
| | A. Bacchin |

## Summary of Facts and Submissions

I. This is an appeal of the patent proprietor against the decision of the opposition division revoking European patent no. 2 679 812 B1.

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

D1: US 2010/0025994 A1
D2: US 2012/0010756 A1
D4: US 2012/0101643 A1
D5: US 2011/0166717 A1

III. In the decision under appeal, the opposition division came to the conclusion that the subject-matter of claim 1 of the main request (patent as granted), was new but in view of D1 in combination with D5 did not involve an inventive step (Articles 100(a) and 56 EPC).

IV. The parties were summoned to oral proceedings. In a communication under Article 15(1) RPBA 2020 annexed to the summons, the board set out their preliminary observations on the appeal, concluding *inter alia* that the maintenance of the patent as granted did not seem to be prejudiced by the grounds for opposition under Article 100(a) EPC in combination with Articles 54 and 56 EPC.

V. Oral proceedings were held on 22 July 2021 in the presence of both parties.

The patent proprietor (appellant) requested that the decision under appeal be set aside and the patent be maintained as granted (main request), or as an

auxiliary measure, that the patent be maintained in amended form according to the first or the second auxiliary request filed with the statement setting out the grounds of appeal on 21 March 2018.

The opponent (respondent) requested that the appeal be dismissed.

VI. Claim 1 of the appellant's main request has the following wording (feature numbering added in squared brackets):

**[1.0]** A wind park control system (100) for controlling a set point of an individual power output of each of a plurality of wind turbines (121, 122, 123, 131, 132, 133) of a wind park, wherein the wind turbines (121, 122, 123, 131, 132, 133) are grouped into at least two groups of wind turbines, the wind park control system (100) comprising,
**[1.1]** a main control unit (110), and
**[1.2]** at least two sub control units (120, 130), wherein each sub control unit (120, 130) is assigned to one of the at least two groups of wind turbines (121, 122, 123, 131, 132, 133),
**[1.3]** wherein the main control unit (110) is adapted to determine a set point for a total power output of each group of wind turbines based on a reference set point for an overall power output of the wind park and on data being indicative for current characteristics of the wind park,
**[1.4]** wherein the main control unit (110) is further adapted to distribute the determined set points between the sub control units (120, 130) via main control signals being provided to the sub control units (120, 130), wherein each main control signal is indicative for the set point for the total power output of the

assigned group of wind turbines (121, 122, 123, 131, 132, 133),
**[1.5]** wherein each sub control unit (120, 130) is adapted to determine a set point for an individual power output of each wind turbine (121, 122, 123, 131, 132, 133) of the assigned group of wind turbines,
**[1.6]** wherein each sub control unit (120, 130) is further adapted to distribute the determined set points between the wind turbines of the assigned group of wind turbines (121, 122, 123, 131, 132, 133) via sub control signals being provided to each wind turbine of the assigned group of wind turbines, wherein each sub control signal is indicative for a set point for the individual power output of a wind turbine (121, 122, 123, 131, 132, 133),

the system being **characterised in that**

**[1.7a]** the main control unit (110) comprises a main control element (311) being adapted to receive results of measurements (302) of the individual power output of the wind turbines (121, 122, 123, 131, 132, 133) and **[1.7b]** is adapted to perform a closed loop control based on the received results and the reference set point for adjusting the set point for each group of wind turbines (121, 122, 123, 131, 132, 133).

Claims 2 to 8 are dependent on claim 1.

VII. Independent method claim 9 of the appellant's main request has the following wording:

"A method for controlling a set point of an individual power output of each of a plurality of wind turbines (121, 122, 123, 131, 132, 133) of a wind park, wherein the wind turbines (121, 122, 123, 131, 132, 133) are

grouped into at least two groups of wind turbines (121, 122, 123, 131, 132, 133), the wind park control system (100) comprising a main control unit (110), and at least two sub control units (120, 130), wherein each sub control unit (120, 130) is assigned to one the at least two groups of wind turbines (121, 122, 123, 131, 132, 133), wherein the main control unit (110) comprises a main control element (311),

the method comprising

by the main control unit (110), determining a set point for a total power output of each group of wind turbines (121, 122, 123, 131, 132, 133) based on a reference set point for an overall power output of the wind park and on data being indicative for current characteristics of the wind park,

by the main control unit (110), distributing the determined set points between the sub control units (120, 130) via main control signals being provided to the sub control units (120, 130), wherein each main control signal is indicative for the set point for the total power output of the assigned group of wind turbines (121, 122, 123, 131, 132, 133),

by the main control element (311), receiving results of measurements (302) of the individual power output of the wind turbines (121, 122, 123, 131, 132, 133) and performing a closed loop control based on the received results and the reference set point for adjusting the set point for each group of wind turbines (121, 122, 123, 131, 132, 133),

by each sub control unit (120, 130), determining a set point for an individual power output of each wind

turbine of the assigned group of wind turbines (121, 122, 123, 131, 132, 133), and

by each sub control unit (120, 130), distributing the determined set points between the wind turbines (121, 122, 123, 131, 132, 133) of the assigned group of wind turbines via sub control signals being provided to each wind turbine (121, 122, 123, 131, 132, 133) of the assigned group of wind turbines, wherein each sub control signal is indicative for a set point for the individual power output of a wind turbine (121, 122, 123, 131, 132, 133)."

VIII. Claim 10 has the following wording:

"A computer program for controlling a set point of an individual power output of each of a plurality of wind turbines of a wind park, the computer program, when being executed by a data processor, is adapted for controlling the method as set forth in claim 9."

IX. Claim 11 has the following wording:

"A computer-readable medium, in which a computer program for controlling a set point of an individual power output of each of a plurality of wind turbines of a wind park is stored, which computer program, when being executed by a processor, is adapted to carry out or control a method as set forth in claim 9."

X. The arguments of the appellant, in so far as they are relevant for the present decision, may be summarised as follows:

*Articles 100(a) and 54 EPC*

An interpretation of feature 1.7a, in particular of the wording "receive results of measurements of the individual power output of the wind turbines", in a broad manner such as to include a summation of these measurements, was not justified. In document D1, the master reactive control device (75) received measurements performed at the Point of Common Coupling (26 or 25) or alternatively, the sum of values of the electric quantities (see in particular D1 in paragraphs [0026] to [0028]). In particular, the master reactive control device (75) received the sum of the power outputs of the individual wind turbines, which was illustrated in figure 3 of D1 (see reference numeral 110). The input signals in this figure were labelled "Inputs from Measurement Point" and the skilled person would understand the measurement point to correspond to the Point of Common Coupling (reference numerals 25, 26, see also paragraph [0024]). Since document D1 did not disclose that a main control element receives results of measurements of the individual power output of the wind turbine, it also did not disclose feature 1.7b of claim 1 according to which the main control element performs a closed loop control based on the received results and the reference set point. In this respect, it was clear that the "received results" of feature 1.7b referred to the results of measurements of the individual power output of the wind turbines according to feature 1.7a.

Similar arguments applied to document D2, see in particular figures 3 and 4 in connection with paragraphs [0032], [0035] and [0037].

Furthermore, D2 did not disclose feature 1.3 of claim 1, because only the reference voltage but not a reference set point for an overall power output of the wind park was used in D2 as an input to the voltage regulation illustrated in figure 4 (see reference numeral 105 in figure 4).

*Articles 100(a) and 56 EPC*

The subject-matter of claim 1 involved an inventive step in view of a combination of documents D1 and D5.

Advantages of the invention were described in the patent in paragraphs [0020], [0030] and [0060].

When starting from D1 as the closest prior art document, the objective technical problem in view of the distinguishing features 1.7a and 1.7b was to be considered as that of how to provide to the main control unit input values which enable the main control unit to appropriately adjust the set point for each group of wind turbines.

Document D5 did not disclose an exchange of measured values of the real powers of individual wind turbines between a SCADA wind farm controller and wind turbine generator control units (24). Rather, D5 in paragraph [0040] disclosed that data including measured values of real powers actually output from the wind turbine generator were received from the WTG controlling units ($24_1$ to $24_N$). Thus, it was not disclosed or suggested to have the main control unit receive results of measurements of an individual power output of the wind turbines.

Consequently, a combination of D1 with D5 would not lead the skilled person to a wind park control system as defined in claim 1, but to a system in which the wind farm controllers (60) illustrated in figure 2 of D1 would receive measured values of the real powers output from the wind turbine generators.

A combination of document D4 with either D1 or D2 also did not result in the subject-matter of claim 1. Document D4 did not disclose features 1.7a and 1.7b of claim 1. Given that also documents D1 and D2 did not disclose these features, a combination of document D4 with either D1 or D2 could not result in a wind power control system as defined in claim 1.

For similar reasons, the subject-matter of claim 1 involved an inventive step when starting from document D5 as the closest prior art document, which does not disclose features 1.7a and 1.7b, in combination with documents D1 or D2.

XI. The arguments of the respondent, in so far as they are relevant for the present decision, may be summarised as follows:

*Articles 100(a) and 54 EPC*

The subject-matter of claim 1 was not new in view of document D1. From paragraph [0020] of the patent under appeal it was clear that each group of turbine could be treated as a single turbine. Feature 1.2 of claim 1 was to be interpreted accordingly and thus, in connection with features 1.7a and 1.7b, the "results of measurements" cited in these features had to be considered to be a sum of the individual power output of the wind turbines. Furthermore, paragraphs [0024],

[0061] and [0067] of the patent under appeal provided a definition of the wording "results of measurements" referred to in feature 1.7a of claim 1, according to which it had to be interpreted so as to include measurements that may be calculated from measurements performed by the sub control units. It was also evident that the measurements had to be performed by the sub control units, because measuring the individual power output in the wind turbines themselves was not possible.

It was also evident that the "received results" in the sense of feature 1.7b corresponded to a combined value of the power outputs of the individual wind turbines, because the main controller could not use a single value. The use of a set point for each group of wind turbines according to feature 1.7b was otherwise not possible. Consequently, also in the context of feature 1.7a the "received results" were to be interpreted as a combined value. While the patent under appeal did not explicitly disclose a summation, it also did not exclude it.

Therefore, the person skilled in the art would understand from the patent as a whole the wording "results of measurements", in the sense of features 1.7a and 1.7b, to include quantities calculated from measurements performed by the sub control units, such as "a summation of respective real power measurement, reactive power measurement, and current measurements, for each individual local windfarm" as recited in paragraph [0028] of D1. No difference could therefore be recognised between the subject-matter of claim 1 and the wind park control system document D1.

As regards feature 1.3 of claim 1, this feature was necessarily provided in every wind turbine and consequently implicitly disclosed by document D1.

These arguments also applied with respect to document D2, such that the subject-matter of claim 1 was not new in view of this document.

*Articles 100(a) and 56 EPC*

The alleged technical effect as presented by the appellant was not derivable from the patent under appeal, in particular not from paragraphs [0020], [0030] and [0060] of the patent. Given that the main controller could not use the individual measurement results, a summation of the results would in any case be necessary to control the groups of wind turbines. Consequently, the objective technical problem in view of document D1 could at best be considered to be that of how to find an alternative way to determine the total power output of the wind park.

The subject-matter of claim 1 did not involve an inventive step in view of a combination of documents D1 or D2 with D5. The local windfarm controller 60 of D1 must receive the individual measurement results. Furthermore, according to document D1, the summation signal of the sub controllers/local controllers could be used, which was passed to the main controller. Otherwise control was not possible (see in particular paragraph [0024] of D1). Document D5 in paragraph [0040] disclosed that the local parameters of the wind turbines were communicated to a SCADA system, whereby SCADA corresponded to a sub control unit in the sense of claim 1). Necessarily, there had to be provided a summation of the individual results of measurements and

it was obvious to the person skilled in the art to do it in the main control unit. Receiving the results of measurements of the individual power output by the main control unit and then summing these measurements was thus an obvious alternative. In conclusion, there were only two possibilities of how to obtain the results of measurements of the individual power output and where the required summation of these values was done was of no concern and it was particularly not advantageous to do it in the main control unit. For similar reasons, the subject-matter of claim 1 did not involve an inventive step in view of a combination of document D2 with D5.

The subject-matter of claim 1 also did not involve an inventive step when starting from document D5 as the closest prior art. Document D5 disclosed an optional measurement of the output power of one of the wind parks (see wind farms A and B in figure 2 of document D5 and paragraph [0040]) on the basis of the data DATAn provided from individual wind turbine generators to the SCADA system, while SCADA corresponded to the sub control unit in the sense of claim 1. Herein, the data including measured values of the real power were actually output from the wind turbine generators. Therefore, document D5 disclosed an alternative to a measurement of the output power, such as the output power measured at points (65) in figure 2 of document D1, representing the output power of an entire wind farm or group of wind turbines. Upon forwarding the accordingly measured output power to the master control device (75) in figure 2 of document D1, particularly outputting the local active output power P, as was indicated by inputs shown by reference numeral (160) in figure 3 of document D1, representing input from the wind farm controllers to the master controller (75),

results of measurements of the individual power output of the wind turbines were provided to the master controller, as defined in feature 1.7a of claim 1.

For similar reasons, the subject-matter of claim 1 did not involve and inventive step in view of document D5 in combination with D2.

The subject-matter of claim 1 further did not involve an inventive step in view of a combination of document D4 with either D1 or D2. Document D4 differed from the subject-matter of claim 1 in that it did not disclose features 1.7a and 1.7b. As regards the technical effect and the objective technical problem resulting from the distinguishing features, reference was made to the arguments presented with respect to the combination of document D1 with D5. Each of the documents D1 and D2 disclosed a main control unit that received the results of measurements of the individual power output of the wind turbines and calculated the total momentary power output of the wind turbines from the individual power outputs in accordance with feature 1.7a. The person skilled in the art being well aware of documents D1, D2 and D4 relating to the control of wind farms would therefore have implemented the master controller as known from one of documents D1 and D2 in the main control unit (800) of document D4 without any inventive activity. As regards a closed loop control as defined in feature 1.7b, arguments similar to those presented with regard to a combination of Document D5 with D1 or D2 applied.

## Reasons for the Decision

1. The appeal is admissible.

*2. Main request - Articles 100(a) and 54 EPC*

*2.1 Novelty in view of documents D1 and D2*

2.1.1 The subject-matter of claim 1 is new in view of documents D1 and D2. Documents D1 and D2 do not disclose at least features 1.7a and 1.7b of claim 1, which have the following wording:

(1.7a) the main control unit comprises a main control element being adapted to receive results of measurements of the individual power output of the wind turbines and

(1.7b) is adapted to perform a closed loop control based on the received results and the reference set point for adjusting the set point for each group of wind turbines.

2.1.2 The respondent's novelty objection based on documents D1 and D2 substantially relies on an unjustifiably broad interpretation of features 1.7a and 1.7b of claim 1.

In particular, the board does not agree with the respondent that claim 1 gives rise to an interpretation other than what the skilled person would normally understand by the expression "results of measurements" recited in features 1.7a and 1.7b, in particular to a broader meaning in the sense of the sum of individual measurements. Rather, the wording of feature 1.7a is

unambiguous and clear in itself, in particular with regard to the meaning of "results of measurements of the individual power output of the wind turbines", so that there is no need for interpretation by reference to the description (see also Case Law of the Boards of Appeal of the European Patent Office, 9th edition 2019, II.A.6.3.1).

In this context, the board further notes that neither feature 1.2 nor any other passage of claim 1 provides any indication that a group of wind turbines was to be understood to form an aggregate turbine as defined in paragraph [0020] of the patent and that the received results of measurements were to be understood as the sum of the individual power outputs.

As far as feature 1.7b is concerned, the board does not agree with the respondent that this feature or any other passage of claim 1 contains anything that could lead the skilled person to believe that the "received results" had to be interpreted contrary to its literal meaning so as to refer to a summation of the results of measurements of the individual power outputs. The only argument in this respect, namely that a summation of the measurements is necessarily used by the main control unit, is in any case not sufficient to convince the board.

An interpretation of feature 1.7a in the light of the description of the patent under appeal that goes beyond what the skilled person would normally understand on a reasonable reading of the claim, is therefore not justified. In the present case, it is consequently necessary to examine what the person skilled in the art would understand when reading the claim in a reasonable manner using the common general knowledge. The board

concurs with the appellant that this understanding in the present case corresponds to the literal meaning of claim 1, and thus that the measurements of power output are performed at each individual wind turbine, which the board considers to be undoubtedly possible, and these results of measurements of the individual power outputs of the wind turbines are transmitted to the main control unit.

2.1.3 Based on a corresponding reasonable interpretation of claim 1, the board has come to the conclusion that document Dl discloses a main control unit comprising a main control element adapted to receive sums of measurements of the individual power outputs of the wind turbines (see D1 in particular in paragraph [0028]), and not as specified in feature 1.7a of claim 1, to receive results of measurements of the individual power outputs of the wind turbines of a group of wind turbines.

Since document D1 does not disclose feature 1.7a, also feature 1.7b, referring to the "received results" in the sense of feature 1.7a, is not disclosed in document D1.

2.1.4 The subject-matter of claim 1 of the main request is therefore new in view of document Dl. This applies also with respect to document D2, which, as regards the disclosure of feature 1.7a and 1.7b, does not go beyond that of document D1.

2.1.5 The above conclusions also apply to the independent method claim 9, which comprises method features corresponding to those of claim 1, as well as to claims 10 and 11 referring to this claim.

2.1.6 The ground for opposition under Articles 100(a) and 54 EPC therefore does not prejudice the maintenance of the patent as granted.

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

*3.1 Inventive step in view of a combination of D1/D2 with D5*

3.1.1 The subject-matter of claim 1 of the patent as granted involves an inventive step in view of a combination of documents D1 or D2 with D5.

3.1.2 In view of the distinguishing features 1.7a and 1.7b (see the board's conclusions under point 2 above), the board for the purposes of applying the "problem and solution approach" can accept the respondent's assessment that the objective technical problem has to be considered to be that of how to find an alternative way to determine the total power output of the wind park.

3.1.3 The board agrees with the appellant that document D5 in paragraph [0040] and figures 1 or 2 explicitly discloses that data including measured values of real powers actually output from the wind turbine generators are received by the SCADA system ("wind farm controller 25"). Furthermore, it was not contested by the respondent that the SCADA system (see for example figure 1) corresponds to a sub control unit in the sense of claim 1.

Therefore, document D5 does not disclose a main control unit receiving results of measurements of the individual power outputs of the wind turbines, but discloses instead a sub control unit receiving these

values. The board is convinced that the implementation of the control mechanism as described in paragraph [0040] of document D5 in a wind power control system according to documents D1 or D2, would result in a sub control unit (wind farm controller 60, see figure 2 of D1) receiving measured values of the actual active powers delivered by the individual wind turbine generators, and not the main control unit ("master reactive control device 75" in D1) receiving these results of measurements.

In particular, it is not apparent to the board what would have motivated the skilled person to choose a different solution when combining these documents, namely a solution which provides for the reception of the measured values of the individual wind turbines by the main control unit instead of the sub control unit. The sole assertion by the respondent, that it was merely an obvious alternative, is in any case not sufficient to convince the board that the skilled person would have implemented this alternative in the wind park control system of D1.

3.1.4 Therefore, the board has come to the conclusion that the subject-matter of claim 1 is not rendered obvious by a combination of documents D1 or D2 with D5 and consequently involves an inventive step.

*3.2 Inventive step in view of a combination of D4 or D5 with D1/D2*

3.2.1 The respondent has not disputed that document D4 does not disclose features 1.7a and 1.7b. Since none of the documents D1, D2, D4 and D5 discloses features 1.7a and 1.7b of claim 1, the board's findings under point 3.1

above also apply to a combination of document D1/D2 with document D4 or D5.

3.2.2 Therefore, the board has come to the conclusion that the subject-matter of claim 1 is not rendered obvious by a combination of documents D4 or D5 with D1/D2 and consequently involves an inventive step.

*4. Conclusion*

Given that the grounds for opposition under Article 100(a) EPC in connection with Articles 54 and 56 EPC do not prejudice the maintenance of the patent as granted and further considering that the respondent did not raise any further objections against the patent as granted, the board had to accede to the appellant's main request.

**Order**

**For these reasons it is decided that:**

1. The decision under appeal is set aside.

2. The patent is maintained as granted.

The Registrar: The Chairman:

U. Bultmann R. Lord

Decision electronically authenticated