IN THE UNITED STATES DISTRICT COURT

FOR THE WESTERN DISTRICT OF WISCONSIN

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GAMESA EOLICA, S.A.,

Plaintiff,

v.

GENERAL ELECTRIC COMPANY,
d/b/a GE WIND ENERGY,

Defendant.

OPINION AND ORDER

04-C-43-C

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Plaintiff Gamesa Eolica, S.A. and defendant General Electric Company d/b/a GE Wind Energy are in the business of designing, manufacturing and selling wind turbines. Plaintiff has brought a claim of patent infringement against defendant, alleging that defendant is selling a 1.5MW wind turbine that infringes independent claim 1 and dependent claim 2 of plaintiff's U.S. Patent No. 4,695,736. Plaintiff's patent discloses a variable speed wind turbine having a "control strategy based on electrical adjustment of generator torque to maneuver speed to obtain peak performance." '736 Pat., col. l, lns 64-66. ("Torque" is a force that produces rotation or torsion.) According to the patent, torque is controlled by a "variable speed wind turbine controller" that is "responsive to a sensed

generator speed signal and a sensed generator power output signal." Id. at col. 2, lns 4-9. The controller uses the speed and power signals to "determine what the generator air gap torque should be according to a function defining sensed power versus generator speed to achieve maximum efficiency," id. at col. 5, lns. 5-10, and sends a "generator torque command signal" to a frequency converter that regulates current to the generator.

The case is before the court on (1) plaintiff's motion for summary judgment on defendant's affirmative defenses; (2) the parties' cross motions for summary judgment on the issue of infringement; and (3) plaintiff's motion to supplement its briefs in support of its motion for summary judgment and in opposition to defendant's motion. Jurisdiction is present. 28 U.S.C. § 1331.

I start with plaintiff's motion to supplement, which will be denied. Plaintiff filed this motion on February 14, 2005; briefing would have been completed on January 21, 2005, had plaintiff not been granted leave to file a sur-reply brief. Having had this additional briefing opportunity, plaintiff is in no position to ask for yet another chance to argue its case. It does not advance the resolution of litigation to allow parties to supplement their briefing in bits and pieces as they continue to undertake discovery. The preliminary pretrial conference order speaks to this point at p. 4: "parties are to undertake discovery in a manner that allows them to make or respond to dispositive motions within the scheduled

deadlines."

In its motion to supplement, plaintiff seeks an opportunity to add to the record evidence obtained from the deposition of Einar Larson, one of defendant's engineers. Plaintiff has a reasonable sounding explanation for its failure to depose Larson in a timely manner, although it does not suggest that defendant failed to identify Larson as an individual likely to have discoverable information, as required by Fed. R. Civ. P. 26(a)(1). However, under this court's rules governing summary judgment motions, the court takes into account only those factual matters that have been made the subject of proposed factual findings. Taking account of other factual matters would deprive the opposing party of an opportunity to respond to the new factual matters and identify evidence that would create a dispute of fact. Procedure to Be Followed on Motions for Summary Judgment (attached to Preliminary Pretrial Conference Order, dkt. #11), I.B.1 ("Each fact should be proposed in a separate, numbered paragraph"); I.B.4 ("The court will not consider facts contained only in a brief"). Plaintiff has not made the Larson information the subject of any proposed fact. Moreover, it has not authenticated two of the three exhibits, A and C, attached to the brief. Without authentication, the exhibits are inadmissible, Fed. R. Evid. 901, and would not support a proposed finding of fact. Procedure, I.C.1.

With respect to the cross motions on the issue of infringement, plaintiff's motion will be denied and defendant's will be granted. The only independent claim of the '736 patent

requires that the turbine have a variable speed turbine controller that calculates a torque command signal using a function that defines generator speed "versus" generator electrical power output, that is, as two distinct pieces of information. Defendant's 1.5MW turbine uses generator speed to calculate torque command signals but it does not use generator electrical power output for this purpose. Although defendant's turbine operates substantially on the optimum performance curve, it does so without using sensed signals of both speed and power to calculate the torque commands. Thus, defendant's 1.5MW turbine does not infringe claim 1 of the patent. Without a finding that independent claim 1 has been infringed, no infringement of dependent claim 2 is possible. Finally, I will deny as moot plaintiff's motion for summary judgment on defendant's affirmative defenses.

From the parties' proposed findings of fact, I find the following facts to be material and undisputed.

UNDISPUTED FACTS

A. Parties

Plaintiff Gamesa Eolica, S.A. is a corporation organized under the laws of Spain, with its principal place of business in Huarte-Nevarra, Spain. Plaintiff is in the business of manufacturing wind turbines, including variable speed wind turbines. It is the assignee of U.S. Patent No. 4,695,736. Defendant General Electric Company, d/b/a/ GE Wind Energy

LLC, is a New York corporation with its principal place of business in Fairfield, Connecticut. It was formed in 2002; in May of that year, it acquired substantially all of the wind turbine assets of Enron Wind, including all of the goodwill and technology assets relating to Enron Wind's 1.5MW variable speed wind turbine.

B. The '736 Patent

The '736 patent discloses a variable speed wind turbine that converts variable frequency alternating current electricity (AC) to fixed frequency AC and includes mechanisms for maneuvering turbine speed to increase efficiency. The '736 patent has eight claims; claim 1 is independent and claims 2-8 are dependent. Claim 1 reads as follows:

> 1. A variable speed wind turbine system having an optimum power coefficient versus velocity ratio performance curve, comprising:
>
> a turbine rotor shaft with a hub at one end with at least one blade attached to the hub;
>
> a gearbox, having a low speed side thereof attached to the other end of the turbine rotor shaft;
>
> an AC generator, having a generator rotor shaft attached to a high speed side of the gearbox, the generator providing variable frequency AC at a power output line thereof;
>
> sensing means, for sensing generator speed and generator electrical power output and for providing sensed signals indicative thereof;
>
> a variable speed wind turbine controller, responsive to the sensed signals

indicative of generator speed and generator electrical power output, for providing a generator torque command signal for commanding maneuvers of the generator speed according to a function defining generator speed versus generator electrical power output which maneuvers tend to cause the wind turbine to operate substantially on the wind turbine power coefficient versus velocity ratio optimum performance curve substantially at the peak thereof; and

a frequency converter, electrically connected to the generator power output line and responsive to the generator output AC for converting the variable frequency AC to constant frequency AC, the frequency converter responsive to the generator torque command signal for controlling the magnitude of power flow through the converter, thereby effecting control of the generator torque.

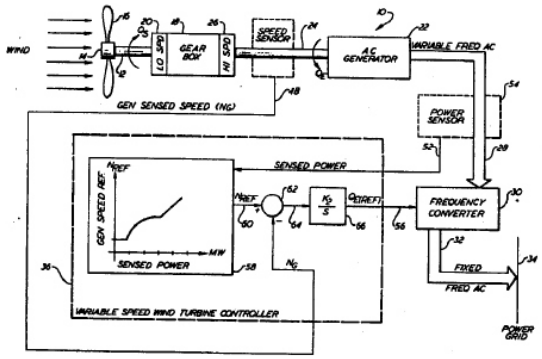
The only other claim at issue, dependent claim 2, reads as follows:

2. The wind turbine of claim 1, wherein the variable speed wind turbine controller includes

a high pass filter, responsive to the sensed generator speed signal for providing a damping signal; and

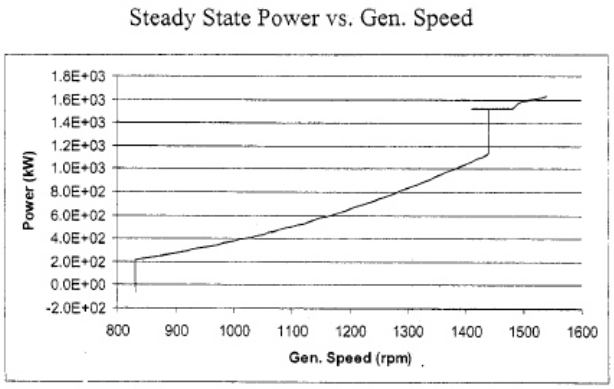
a summing junction responsive to the generator torque command signal and the damping signal for providing an augmented generator torque command signal to the frequency converter for damping a selected torsional mode of vibration.

The '736 patent includes the following illustration, Fig. 2, showing "the variable speed wind turbine controller in a system level format," '736 Pat., col. 5, lines 39-40:



B. Defendant's 1.5 MegaWatt Series Wind Turbine

Defendant's 1.5MW variable wind turbine operates to achieve maximum efficiency and near optimum energy capture over a range of wind speeds. The GE control system is designed to stay on the curve depicted by the following graph:



Defendant's turbine has a turbine rotor shaft with a hub at one end to which at least one blade is attached. The other end of the turbine rotor shaft is attached to the low speed side of the gearbox. The high speed side of the gearbox is attached to a generator rotor shaft, which is part of the turbine's AC generator.

The AC generator has two power output lines, one of which provides power to the frequency converter in the form of variable frequency AC. This current flows through the frequency converter and leaves the converter as nominally fixed frequency AC. The amount of power that flows through the frequency converter is determined by the speed of the generator and by the torque command.

After leaving the frequency converter, power is delivered to a power grid. The amount of power delivered to the grid is not the same as the power put out by the turbine's generator; some is used to operate ancillary devices within the turbine. A digital protective relay power sensor calculates measured power delivered to the power grid from sensed values of current and voltage. (The primary function of the power sensor is to shut off the turbine if there is a fault condition, which it does by sending signals to the Bachman Controller over an electronic communication system. Power is monitored and made available to the Bachman Controller continuously.)

The Bachman Controller is a programmable logic controller that generates a torque command signal that is used to control the speed of the generator by regulating the air gap

torque within the generator. (Air gap torque is a counter-rotational force found in the generator between the spinning rotor and the stationary stator.) When the air gap torque in the generator increases, the speed of the generator will decrease. The Bachman controller uses signals indicative of generator speed to develop the torque command signal. Generator speed is determined by a speed sensor, by means of six tachometer signals. The Bachman Controller does not use a measurement of power in generating the torque command signal.

After the Bachman Controller creates the torque command signal, it sends the signal to the Converter Control Unit (CCU) within the frequency converter. The CCU contains a CPU, Input/Output devices, RAM, and flash memory modules. A Can-bus link allows the Bachman Controller to send the torque command signal to the CCU and also allows the CCU to transmit data back to the Bachman Controller. The CCU is responsible for receiving and implementing the torque command signal generated by the wind turbine controller. In addition, the CCU determines the extent to which the actual torque tracks the desired torque. Any difference between the actual torque and the desired torque is used to control the power electronic switching elements in the frequency converter. The actual torque is calculated by software in the frequency converter from values of flux and current.

OPINION

Infringement analysis is a two-step process in which the court must first construe the

claims at issue and then compare the properly construed claims to the accused device. Cybor Corp. v. FAAS Technologies, Inc., 138 F.3d 1448, 1454 (Fed. Cir. 1998) (en banc); Vitronics Corp. v. Conceptronic, Inc., 90 F.3d 1576, 1582 (Fed. Cir. 1996); Markman v. Westview Instruments, Inc., 52 F.3d 967, 979 (Fed. Cir. 1995) (en banc), aff'd, 517 U.S. 370 (1996). Claim construction is a legal determination to be made by the court while infringement is a question of fact. Vitronics, 90 F.3d at 1582; Instituform Techs., Inc. v. Cat Contracting, Inc., 161 F.3d 688, 692 (Fed. Cir. 1998).

A. Rules Governing Claim Construction

"It is well-settled that, in interpreting an asserted claim, the court should look first to the intrinsic evidence of record, i.e., the patent itself, including the claims, the specification and, if in evidence, the prosecution history." Vitronics, 90 F.3d at 1582. Construction of the disputed terms begins with the language of the claims. "There is a 'heavy presumption' that the terms used in claims 'mean what they say and have the ordinary meaning that would be attributed to those words by persons skilled in the relevant art.'" SuperGuide Corp. v. DirecTV Enterprises, Inc., 358 F.3d 870, 874-75 (Fed. Cir. 2004) (quoting Texas Digital Systems, Inc. v. Telegenix, Inc., 308 F.3d 1193, 1202 (Fed. Cir. 2002)). Dictionaries, encyclopedias and treatises may be used in determining the ordinary and customary meaning of claim term language. Home Diagnostics, Inc. v.

Lifescan, Inc., 381 F.3d 1352, 1356 (Fed. Cir. 2004). "[U]nless compelled to do otherwise, a court will give a claim term the full range of its ordinary meaning." Rexnord Corp. v. Laitram Corp., 274 F.3d 1336, 1342 (Fed. Cir. 2001).

"If the disputed claim term 'is a term with no previous meaning to those of ordinary skill in the prior art, its meaning, then, must be found elsewhere in the patent.'" Novartis Pharmaceuticals Corp. v. Abbott Laboratories, 375 F.3d 1328, 1334 (Fed. Cir. 2004) (quoting J.T. Eaton & Co. v. Atlantic Paste & Glue Co., 1006 F.3d 1563, 1568 (Fed. Cir. 1997)). In most instances, the specification "is the single best guide to the meaning of a disputed term." Vitronics, 90 F.3d at 1582. "[P]atent law permits the patentee to choose to be his or her own lexicographer by clearly setting forth an explicit definition for a claim term that could differ in scope from that which would be afforded by its ordinary meaning." Rexnord, 274 F.3d at 1342; see also Vitronics, 90 F.3d at 1582. In addition, "the specification may define claim terms 'by implication' such that the meaning may be 'found in or ascertained by a reading of the patent documents.'" Bell Atlantic Network Services, Inc. v. Covad, 262 F.3d 1258, 1268 (Fed. Cir. 2001) (quoting Vitronics, 90 F.3d at 1582). Although the patent specification may not be used to rewrite the claim language, SuperGuide, 358 F.3d at 875, the specification may be used to interpret what the patent holder meant by a word or phrase in the claim, E.I. Du Pont de Nemours & Co. v. Phillips Petroleum Co., 849 F.2d 1430, 1433 (Fed. Cir. 1988).

After considering the claim language and the specification, a court may consider the final piece of intrinsic evidence, the patent's prosecution history. Vitronics, 90 F.3d at 1582. "[S]tatements made during the prosecution of a patent may affect the scope of the invention." Rexnord, 274 F.3d at 1343. This is especially true if a particular interpretation of the claim was considered and specifically disclaimed during the prosecution of the patent. Warner-Jenkinson Co., Inc. v. Hilton Davis Chemical Co., 520 U.S. 17, 30 (1997); Vitronics, 90 F.3d at 1582-83. Generally, analysis of the intrinsic evidence will eliminate any ambiguity in the claim terms, rendering unnecessary any reference to extrinsic evidence. Vitronics, 90 F.3d at 1583.

B. Claim Construction

Neither party disputes the meaning of the first four and the sixth limitations of claim 1 or denies that defendant's turbine satisfies those limitations. Instead, the interpretive disputes are based on the claim language in the fifth element of the claim, which discloses

> a variable speed wind turbine controller, responsive to the sensed signals indicative of generator speed and generator electrical power output, for providing a generator torque command signal for commanding maneuvers of the generator speed according to a function defining generator speed versus generator electrical power output which maneuvers tend to cause the wind turbine to operate substantially on the wind turbine power coefficient versus velocity ratio optimum performance curve substantially at the peak thereof.

Although the parties' claim construction and infringement arguments are heavily intermingled, it is possible to identify four disputes about the meaning of the claim: (1) whether the phrase, "a variable speed wind turbine controller," means the hardware and software that is used to control the wind turbine or the hardware and software that provides torque command signals; (2) whether the phrase "signals indicative of . . . generator electrical power output" covers signals from which generator power can be calculated; (3) whether the torque command signals produced by the controller must be *derived from* a function that defines generator speed versus generator electrical power output or whether the torque command signals need only direct the turbine to operate in a manner that *results in* a "function" between generator speed and electrical power output; and (4) whether the phrase, "for providing a generator torque command signal for commanding maneuvers," defines the purpose of the turbine controller or the purpose for its responsiveness to sensed signals indicative of generator speed and power output. (A function is a mathematical rule defining the relationship between two variables.) To the extent that the parties had any other disputes, they did not develop them sufficiently to make it necessary to address them.

1."Variable speed wind turbine controller"

Plaintiff suggests that this term be interpreted to mean "the hardware and software that is used to control the wind turbine"; defendant contends that it should be defined as

"the hardware and software that provides torque command signals to the frequency converter." If defendant's reading is appropriate, it is preferable, because it is more precise and therefore gives greater guidance to persons wishing to avoid infringement. In re Warmerdam, 33 F.3d 1354, 1359 (Fed. Cir. 1994) ("Claims should be evaluated by their limitations, not by what they incidentally cover."). The claim discloses a turbine controller that "provid[es] a generator torque command signal"; a set of hardware and software that does not provide a torque command signal would not satisfy this limitation. Plaintiff's proposed construction is unacceptable because it could encompass sets of hardware and software that do not provide torque command signals and therefore, would not constitute a variable speed wind turbine controller. Correct claim construction "stays true to the claim language and [] naturally aligns with the patent's description of the invention." Renishaw PLC v. Marposs Societa per Azioni, 158 F.3d 1243, 1250 (Fed. Cir. 1998).

Plaintiff finds defendant's proposal too narrow because it would exclude the high pass filter and summing junction that generate an "augmented torque command signal,"as disclosed in dependent claim 2. In fact, defendant's proposed construction does not exclude "augmented" torque command signals. Defendant's construction (hardware and software providing torque command signals) would encompass the high pass filter and summing junction because they generate torque command signals, albeit augmented signals.

However, plaintiff has a second challenge to defendant's construction: it would not

reflect the fact that claim 7of the '736 patent discloses a wind turbine controller with means for providing a turbine rotor speed reference signal in addition to providing torque command signals. Plaintiff overlooks the nature of claim 7, which is a dependent claim. Although courts are to interpret dependent and independent claims of a patent consistently when it is reasonable to do so, Rambus, Inc. v. Infineon Technologies Ag, 318 F.3d 1081, 1093 (Fed. Cir. 2003) (interpretations of independent claims that render terms in dependent claim meaningless are disfavored), plaintiff's challenge does not implicate this rule.

Defendant's construction is not *inconsistent* with dependent claim 7 simply because the construction does not describe an additional limitation described in that claim. To the contrary, the general rule is that courts are not to read limitations stated in dependent claims into independent claims. Innova/Pure Water, Inc. v. Safari Water Filtration Systems, Inc., 381 F.3d 1111, 1123 (Fed. Cir. 2004). A construction incorporating a dependent claim limitation would be improper. To the extent that there might be some confusion whether defendant's proposal implies a limitation on the functions performed by the turbine controller, I will add the phrase "among other things" to make it clear that the variable speed controller performs functions other than generating a torque command signal.

Last, plaintiff contends that defendant's proposed construction is confusing because it includes two claim terms that are not defined: "torque command signal" and "frequency converter." However, as plaintiff goes on to note, the meaning of these terms is not

disputed. A frequency converter is a device that converts variable frequency AC to fixed frequency AC while a torque command signal dictates the amount of rotational force (torque) used inside the generator, regulating the speed at which the rotor spins. I see no basis for plaintiff's suggestion that these terms render defendant's construction too confusing.

I will make two minor modifications to defendant's proposal. The first is to eliminate the clause "to the frequency converter" because no such restriction exists in the fifth paragraph of claim 1. Although the sixth paragraph discloses a frequency converter that is "responsive to the generator torque command signal," defendant's proposal suggests a need for direct transmittal that is not mandated by the claim language. The second modification simply makes it clear that a controller is an integrated set of hardware and software. I conclude, therefore, that the phrase "variable speed wind turbine controller" means "an integrated set of hardware and software that provides torque command signals, among other things."

2. "Sensed signals indicative of . . . generator electrical power output"

It is helpful to see the disputed phrase in context, along with the preceding paragraph of the claim:

sensing means, for sensing generator speed and generator electrical power output and

for providing sensed signals indicative thereof;

a variable speed wind turbine controller, responsive to *the sensed signals indicative of* generator speed and *generator electrical power output*, for providing a generator torque command signal for commanding maneuvers of the generator speed according to a function defining generator speed versus generator electrical power output which maneuvers tend to cause the wind turbine to operate substantially on the wind turbine power coefficient versus velocity ratio optimum performance curve substantially at the peak thereof;

In construing the phrase, "signals indicative of . . . generator electrical power output," the question is whether it include signals from which generator power can be calculated or whether signals "indicative" of speed and power are signals of actual, measured speed and actual, measured power.

The fourth limitation of claim 1 discloses a "sensing means, for sensing generator speed and generator electrical power output and for providing sensed signals indicative thereof." I understand this "sensing means" to be the sensed signals to which the phrase in element five refers when it discloses a controller responsive to "*the* sensed signals indicative of generator speed and generator electrical power output." (Emphasis added). The word "indicative" in preceding element four makes it clear that the signals would convey the amount of power sensed. Contrary to plaintiff's suggestion, this reading does not render the phrase "indicative of" superfluous; instead, the phrase is used to signify the content of the sensed signals.

This construction is consistent with the meaning of "indicative" as it is used in other

portions of claims. In each instance, indicative is used to signify what information a particular signal relays. E.g., '736 Pat., col. 10, lines 21-24 ("a difference signal having a magnitude indicative of the difference in magnitudes between the generator speed reference signal and the generator sensed speed signal"); lines 44-46 ("an additional sensor for sensing turbine rotor speed for providing a sensed signal indicative thereof"); col. 11, lines 14-16 ("a calculated wind speed signal indicative of effective full-disc wind speed"); col. 12 lines 2-5 ("a velocity ratio signal having a magnitude indicative of the ratio of the magnitudes of the rotor tip speed and wind speed signal"). In addition, the construction is consistent with the use of the word "indicative" in the claim specification. E.g., '737 Pat., col. 2, lines 15-18 ("[a] difference signal indicative of the difference between the speed reference signal and the sensed generator speed signal"); col. 3, lines 60-63 ("a calculated wind speed signal indicative of effective full-disk speed"); lines 64-66 ("a velocity ratio signal having a magnitude indicative of the ratio of the magnitudes of the rotor speed and calculated wind speed signals"). It is presumed that "the same terms appearing in different portions of the claims should be given the same meaning," Fin Control Systems Pty, Ltd. v. OAM, Inc., 265 F.3d 1311, 1318 (Fed. Cir. 2001) and that words are used consistently in the claim language and the specification, Autogiro, 384 F.2d at 397 ("words must be used in the same way in both the claims and the specification").

3. "According to a function defining generator speed versus generator electrical power output"

As suggested in the preceding discussion, this is a critical aspect of the parties' dispute. In context, the phrase reads as follows:

> a variable speed wind turbine controller, responsive to the sensed signals indicative of generator speed and generator electrical power output, for providing a generator torque command signal for commanding maneuvers of the generator speed *according to a function defining generator speed versus generator electrical power output* which maneuvers tend to cause the wind turbine to operate substantially on the wind turbine power coefficient versus velocity ratio optimum performance curve substantially at the peak thereof;

Both parties agree that the term "function" means a mathematical rule defining the relationship between an independent variable and a dependent variable in which each independent variable value corresponds with exactly one dependent variable value. The question is whether the words "according to" mean "dependent on" or "derived from" or whether they mean simply "consistent with." In its ordinary use, the phrase is susceptible to either interpretation. Merriam-Webster Dictionary online at http://www.m-w.com/cgi.bin/dictionary (definition of "according to" includes both "in conformity with" and "depending on").

The claim specification explains that "[t]he variable speed wind turbine controller, by means of the signal processor, determines what the generator air gap torque should be *according to* a function defining sensed power versus generator speed to obtain maximum

efficiency." '736 Pat. at col. 5, lns. 5-10 (italics added). This language supports a "dependent on" or "derived from" construction. In plaintiff's view, however, the clause "according to a function defining generator speed versus generator electrical power output" modifies "commanding maneuvers of the generator speed" rather than "providing a generator torque command signal." Even if plaintiff is correct, "according to" would necessarily refer indirectly to the provision of generator torque command signals because generator speed maneuvers are commanded by generator torque command signals.

Moreover, it is not clear that "according to" refers to command maneuvers. It would apply if one used the last antecedent rule, a doctrine of interpretation that presumes that qualifying phrases refer to the terms immediately preceding them. Shelby County State Bank v. Van Diest Supply Co., 303 F.3d 832, 836 (7th Cir. 2002) (noting that Supreme Court recognized "last antecedent" rule as early as 1799). Although rules likes these may be useful in construing patent claim language, Chisum on Patents § 18.03[2][a] (2003), the last antecedent rule is "not an absolute and can assuredly be overcome by other indicia of meaning," Barnhart v. Thomas, 540 U.S. 20, 26 (2003); see also Miniat v. Ed Miniat, Inc., 315 F.3d 712, 715 (7th Cir. 2002); Shelby County, 303 F.3d at 836 (rule is "helpful in determining the existence of the ambiguity, but not in solving the puzzle when [two] readings are plausible").

In this instance, the claim specification is an indication of meaning. It establishes

that the function of defining generator speed in contrast to generator power output is to be used in determining what the generator air gap torque should be. In addition, the preferred embodiments demonstrate that a function that defines generator speed versus generator electrical output is used in producing torque command signals. For example, Fig. 2 depicts a system in which sensed power signals are transmitted to the turbine controller where the function that defines sensed power as distinct from generator speed is used to produce a generator speed reference signal that is transmitted to the summing junction, where it is compared to a signal of actual generator speed. The summing junction generates a difference signal representing the difference between the speed reference signal and the generator speed signal, which is used to determine the generator torque command signal.

Finally, the phrase immediately following the one in dispute reads "*which maneuvers* tend to cause the wind turbine to operate substantially on the wind turbine power coefficient versus velocity ratio optimum performance curve substantially at the peak thereof." If these maneuvers had been the noun that the "according to" phrase modified, it would have been unnecessary to re-identify it, rendering the second "maneuvers" superfluous.

In this case, the claim language, the claim specification and the preferred embodiment all point towards defendant's construction of the phrase "according to." Therefore, I conclude that "for providing a generator torque command signal for commanding maneuvers of generator speed according to a function defining generator speed versus generator

electrical power output," the generator torque command signals issued by the controller must be determined by a mathematical rule defining the relationship between generator speed and generator electrical power output.

4. "For providing a generator torque command signal for commanding maneuvers"

To understand the parties' arguments about the construction of this phrase, the phrase must be read in context:

> a variable speed wind turbine controller, responsive to the sensed signals indicative of generator speed and generator electrical power output, *for providing a generator torque command signal for commanding maneuvers* of the generator speed according to a function defining generator speed versus generator electrical power output which maneuvers tend to cause the wind turbine to operate substantially on the wind turbine power coefficient versus velocity ratio optimum performance curve substantially at the peak thereof;

The dispute is whether the phrase "for providing a generator torque command signal for commanding maneuvers" defines the purpose for which the turbine controller is responsive to signals indicative of generator speed and power output, as defendant suggests, or whether plaintiff is correct in asserting that the phrase defines the purpose of the controller. Under plaintiff's construction, the controller need only be responsive to these sensed signals in some fashion, not necessarily for producing torque command signals. Plaintiff contends that "responsive to the sensed signals indicative of generator speed and generator electrical power output" is a non-restrictive clause because it is set off with commas.

As a general rule, plaintiff is correct that non-restrictive clauses are parenthetic and should be enclosed between commas. William Strunk Jr. and E. B. White, The Elements of Style 3 (3d ed. 1979)).

However, for the reasons just explained, the variable speed controller must calculate torque command signals using a mathematical rule defining the relationship between generator speed and generator electrical power output. It would be inconsistent with this limitation to adopt plaintiff's construction, under which a controller need not be responsive to sensed signals of generator electrical power output and generator speed in any particular manner or for any particular purpose. As defendant notes, the claim specification makes clear that the figures of generator speed and power the controller uses in defining the torque command signals are provided by the sensed signals:

> The variable speed wind turbine controller, by means of a signal processor, determines what the generator air gap torque should be according to a function defining *sensed* power versus generator speed to obtain maximum efficiency.

'736 Pat., col. 5, lns. 5-10. In addition, the preferred embodiments depict a system in which the sensed signals of generator speed and power are used to calculate torque command signals. E.g., Id., Figs. 2 and 5. Plaintiff has not identified any portion of the claim specification suggesting any other purpose that the patentee may have intended or even anticipated.

Furthermore, defendant's construction is consistent with the numerous pairings of "responsive to [something]" followed by "for [doing something]" found throughout the other

claims of the '736 patent. In each instance, the "for [doing something]" defines the purpose for which the relevant device is "responsive [to something]." E.g., '736 Pat., col. 9, line 68 -col. 10, lines 1-2 ("frequency converter *responsive to* the generator torque command signal *for controlling* the magnitude of power flow . . ."); col.10, lines 6-7 ("a high pass filter, *responsive to* the sensed generator speed signal *for providing* a damping signal"); col. 10, lines 8-9 ("summing junction, *responsive to* the generator torque command signal and the damping signal *for providing* an augmented generator torque command signal"); col. 10, lines 16-18 (generator speed reference schedule, *responsive to* the sensed generator electrical power signal *for providing* a generator speed reference signal"); col. 10, lines 21-25 ("integral control, *responsive to* a difference signal having a magnitude indicative of the difference in magnitudes between the generator speed reference signal and the generator sensed speed signal *for providing* the generator torque command signal"); col. 10, lines 47-49 ("integral control, *responsive to* a difference signal having a magnitude indicative of the difference in magnitudes between the generator speed reference signal and the generator sensed speed signal *for providing* the generator torque command signal"); col. 10, lines 57-59 ("electro-hydraulic aerodynamic torque control, *responsive to* the aerodynamic torque command signal *for changing* the aerodynamic torque of the turbine rotor"); col. 11, lines 3-9 ("integral control, *responsive to* a difference signal . . . *for providing* the aerodynamic torque command signal").

As noted above, it is presumed that language is to be given consistent meaning

throughout different portions of the claim. Fin Control Systems, 265 F.3d at 1318. The claim specification provides no reason to deviate from this principle here. In fact, both the specification language and drawings suggest that providing torque command signals is the only purpose for which the controller uses sensed signals of generator speed and electrical power output. Accordingly, I conclude that the variable speed controller must be responsive to sensed signals of generator velocity and electrical power output for the purpose of providing torque command signals.

C. Infringement

Infringement analysis requires a comparison of the properly construed claims with the allegedly infringing device or method to determine "whether all of the claim limitations are present, either literally or by a substantial equivalent, in the accused device." Johnson Worldwide Associates, Inc. v. Zebco Corp., 175 F.3d 985, 988 (Fed. Cir. 1999). "Literal infringement of a claim exists when each of the claim limitations 'reads on,' or in other words is found in, the accused device." Allen Engineering Corp. v. Bartell Industries, Inc., 299 F.3d 1336, 1345 (Fed Cir. 2002). Under the doctrine of equivalents, "a product or process that does not literally infringe upon the express terms of a patent claim may nonetheless be found to infringe if there is 'equivalence' between the elements of the accused product or process and the claimed elements of the patented invention." Warner-Jenkinson Co. v. Hilton Davis

Chemicals Co., 520 U.S. 17, 21 (1997).

Whether infringement of an accused product occurs either literally or under the doctrine of equivalents is a question of fact. IMS Technology, Inc. v. Haas Automation, Inc., 206 F.3d 1422, 1429 (Fed. Cir. 2000). Nonetheless, summary judgment is appropriate where there are no material facts in dispute. Johnson Worldwide, 175 F.3d at 988. There are two principal debates regarding infringement: (1) whether defendant's 1.5MW turbine's variable speed turbine controller is "responsive to the sensed signals indicative of generator speed and generator electrical power output" and (2) whether the controller provides generator torque command signals "according to a function defining generator speed versus generator electrical power output." I conclude for the reasons stated below that defendant's 1.5MW turbine does not meet either limitation.

1. Literal infringement

With respect to the first debate, plaintiff has shown that defendant's 1.5MW turbine uses sensed power signals to shut off the turbine if there is a fault condition but not that it uses sensed signals of power in generating torque command signals. Furthermore, the claim specifies a controller that is responsive to "the sensed signals of generator electrical power output." Defendant's turbine is responsive to grid power but the power sent to the grid is less than the total electrical power output of the generator because of the operation of some

ancillary devices within the turbine.

As to the second debate, it is undisputed that the Bachman Controller does not use a measurement of power in generating the torque command signal. Nonetheless, plaintiff asserts that it can show that defendant's turbine meets the limitation at issue through two charts, both of which depict a function between speed and power. Plt.'s Br., dkt. #80, at 6 n. 10. The only information plaintiff provided in its proposed findings of fact regarding the chart numbered GE011045 is that it was prepared by defendant. Plaintiff does little in its briefs to explain what the chart purports to represent. In the absence of any contextual information, this graph does not even meet the minimal standards of relevancy, much less prove infringement.

With respect to the second chart, which has been reproduced in the Fact Section above, it is undisputed that the control system was designed to stay on the line depicted in the chart. However, this is immaterial because the claim requires that the generator torque command signal be generated using a function that defines generator speed versus generator electrical power output. Plaintiff proposes no facts showing that the function depicted in this graph is utilized by defendant's turbine in calculating torque command signals. In its response brief, plaintiff asserts that its expert, Dr. David Torrey, averred in an unidentified paragraph of his declaration that the graph depicts a turbine in which "speed is controlled according to a function defining generator speed versus generator electrical power output."

Plt.'s Br., dkt. #78, at 5. Even if I were to overlook plaintiff's failure to make this information the subject of a proposed fact, the only statement Torrey actually made regarding this graph is that it "shows a function defining speed versus power" and that the axis could be reversed so that power would be on the horizontal and speed could be on the vertical axis. Torrey Dec., dkt. #74, at 5-6, ¶ 9. It is obvious that the graph represents a function of speed and power, but this does not help plaintiff show that torque command signals are generated according to this function.

The testimony that plaintiff cited in conjunction with its proposed fact related to this chart suggests that the power referred to on this graph is the power delivered to the grid and not the total power produced by the generator. See Plt.'s PFOF, dkt. #49, at 9, ¶ 71; Miller Dep., at 38, attached to O'Connor Aff., dkt. #50, ex. J. Because there is a total lack of evidence suggesting that the turbine controller utilizes the function depicted in this graph in producing generator torque signals or that the graph even represents a function of generator speed versus generator electrical power output, it could not substantiate a conclusion that defendant's turbine produces generator torque command signals according to "a function defining generator speed versus generator electrical power output" as that phrase has been construed herein.

Also telling is plaintiff's apparent inability to cite adequate evidence in support of its responses to defendant's proposed findings of fact. Plaintiff contends that the optimized

relationship between optimum rotor speed and torque is *"almost certainly* based on measured generator power." Plt.'s Responses to Defendant's PFOF, dkt. #70, at 10, ¶ 39. Plaintiff fails to cite any factual evidence from the record to support this response, making it unclear whether this is the conclusion of Dr. Torrey or plaintiff's counsel. Plaintiff's failure to cite record evidence is not surprising. The statement appears to be mere speculation about the way that defendant's turbine derives the optimum relationship between optimum rotor speed and torque, rather than fact supported by evidence in the record. Plaintiff seems to speculate again when it asserts that "GE *would necessarily* have made measurements of power of the 1.5MW wind turbine that was initially characterized." Id. at 7-8, ¶ 26. The cited evidence does not support this conclusion. Instead, it describes a "pragmatic approach" to determining the functional relationship between torque and speed for optimal generator output, Torrey Aff., dkt. #74, at 7-8, ¶ 11, and says nothing about whether such an approach is actually followed by defendant. I conclude that plaintiff has not supported its assertion that defendant's 1.5 MW turbines produce generator torque command signals according to a function defining generator speed versus generator electrical output.

2. Doctrine of equivalents

Plaintiff has not articulated an argument to support its contention that the limitation at issue has been satisfied under the doctrine of equivalents. Plaintiff included a footnote in

the introductory section of its brief in support of its motion for summary judgment, contending that defendant's turbine infringes claims 1 and 2 of the '736 patent under the doctrine of equivalents. Plt.'s Br., dkt. #48, at 2 n.3. In its response brief, defendant noted that plaintiff had not "explain[ed] the basis for this contention, such as [by] identifying the missing claim limitations, identifying the features of [defendant's turbine] that [plaintiff] contends are the equivalent of any missing limitation, and presenting expert tesimony that the missing limitations and identified features have the same 'function, way and result.'" Dft.'s Br., dkt. #55, at 19. Defendant also stated summarily that plaintiff should be barred from relying on the doctrine under either the all elements rule or prosecution history estoppel. In its response, plaintiff argued that it should not be barred from relying on the doctrine of equivalents but gave no hint as to what its doctrine of equivalents theory might be. Plt.'s Br., dkt. #78, at 7-8. In fact, plaintiff disavowed any reliance on an argument that measured speed is the equivalent of measured speed and power.

As the party alleging infringement, plaintiff bears the burden of proving infringement by a preponderance of the evidence. Nutrinova Nutrition Specialties and Food Ingredients GmbH v. International Trade Commission, 224 F.3d 1356, 1359 (Fed. Cir. 2000). "This burden extends to infringement under the doctrine of equivalents as well as literal infringement." Lemelson v. United States, 752 F.2d 1538, 1547 (Fed. Cir. 1985). "[A] patentee who fails to provide probative evidence of infringement runs the risk of being

peremptorily nonsuited." Novartis Corp. v. Ben Venue Laboratories, Inc., 271 F.3d 1043, 1050-51 (Fed. Cir. 2001). General or conclusory assertions are insufficient. TechSearch, L.L.C. v. Intel Corp., 286 F.3d 1360, 1372 (Fed. Cir. 2002). Because plaintiff has not developed a legal or factual argument to the effect that defendant's turbine satisfies the "according to" limitation under the doctrine of equivalents, defendant is entitled to summary judgment on this issue. Celotex Corp. v. Catrett, 477 U.S. 317, 322-23 (1986) (courts are to enter summary judgment against party who fails to make showing sufficient to establish the existence of element essential to that party's case and on which party will bear burden of proof at trial, after party has had adequate time for discovery).

D. Moot Issues

Claim 1 is the only independent claim in the '736 patent. Claim 2 depends on claim 1 and cannot be infringed unless the independent clause on which it depends has been infringed. Minnesota Min. & Mfg. Co. v. Chemque, Inc., 303 F.3d 1294, 1300 (Fed. Cir. 2002). Because defendant is entitled to summary judgment as to claim 1, it is entitled to summary judgment as to claim 2 as well. In addition, the finding of no infringement renders moot plaintiff's motion for summary judgment as to defendant's affirmative defenses. Accordingly, this motion will be denied.

ORDER

IT IS ORDERED that

1. The motion for summary judgment filed by plaintiff Gamesa Eolica, S.A. is DENIED;

2. The motion for summary judgment filed by defendant General Electric Company d/b/a Wind Energy LLC is GRANTED;

3. Plaintiff's motion for summary judgment on defendant's affirmative defenses is DENIED as moot;

4. Plaintiff's motion to supplement is DENIED as untimely and procedurally improper;

5. The clerk of court is directed to enter judgment in favor of defendant and close this case.

Entered this 7th day of March, 2005.

BY THE COURT:

BARBARA B. CRABB
District Judge
