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UNITED STATES DISTRICT COURT

CENTRAL DISTRICT OF CALIFORNIA

General Electric Co.,

Plaintiff,

vs.

Vestas Wind Systems A/S, and Vestas-American Wind Technology, Inc.,

Defendants.

Case No. 2:17-cv-05653-AB-PLA

SECOND AMENDED COMPLAINT FOR PATENT INFRINGEMENT

DEMAND FOR JURY TRIAL

Plaintiff General Electric Co. ("GE" or "Plaintiff"), by and through its undersigned counsel, complains and alleges against Vestas Wind Systems A/S ("Vestas A/S") and Vestas-American Wind Technology, Inc. ("Vestas-American") (collectively "Vestas" or "Defendants") as follows:

NATURE OF THE ACTION

1. This is a civil action for patent infringement arising under the patent laws of the United States, 35 U.S.C. §§ 1 *et seq*.

2. GE brings this suit to halt Defendants' infringement of one or more claims of U.S. Patent Nos. 6,921,985 ("the '985 patent") and 7,629,705 ("the '705 patent"). The '985 patent and '705 patent address problems with power grid connected wind turbines. Power grids naturally experience short-term voltage dips due to, for example, large electrical loads, lightning strikes, or short circuits. To avoid damage resulting from this voltage drop, wind turbines traditionally were designed to disconnect from the grid and attempt to reconnect after a certain period of time. The '985 patent is directed to Low Voltage Ride Through (LVRT) and provides, *inter alia*, techniques to allow a wind turbine generator to remain connected to the power grid during low voltage events and to maintain functioning of the blade pitch system in spite of lack of voltage at the generator terminals during such events. The '705 patent is directed to Zero Voltage Ride Through (ZVRT) and provides that a wind turbine generator coupled to an electric power system is configured such that the wind turbine generator remains connected to the electric power system during and subsequent to the electric power system voltage decreasing to approximately zero volts.

3. As legal owner by assignment of the '985 and '705 patents, GE seeks damages for Defendants' infringement and a permanent injunction restraining Defendants from further infringement.

THE PARTIES

4. Plaintiff GE is a corporation that is organized and existing under the laws of the State of New York, with its principal place of business at 41 Farnsworth Street,

Boston, Massachusetts 02210. GE engages in the development, manufacture, and distribution of variable speed wind turbines and components.

5. Defendant Vestas A/S is a corporation organized under the laws of Denmark, having its headquarters and a principal place of business at Hedeager 42, 8200 Aarhus N, Denmark. Vestas A/S is the ultimate parent of a number of subsidiaries here in the United States. Vestas A/S engages in the sale, development, manufacture, distribution, installation, use and service of variable speed wind turbines and components of variable speed wind turbines in the United States, including California and this judicial District.

6. Defendant Vestas-American is a wholly-owned subsidiary of Vestas A/S, is organized under the laws of California, and has its headquarters and a principal place of business at 1417 NW Everett St., Portland, OR 97209. Vestas-American engages in the sale, development, manufacture, distribution, installation, use and service of variable speed wind turbines and components of variable speed wind turbines in the United States, including in California and in this judicial District.

7. Upon information and belief, Vestas-American is ultimately under the direction and control of Vestas A/S and acts on behalf of, for the benefit of, and as an agent of Vestas A/S. There is furthermore unity of interest and ownership between Vestas A/S and Vestas-American such that the separate personalities of the two entities no longer exist. The Vestas A/S website states that the company has offices in 24 countries and five regional "business units" in Northern Europe, Central Europe, Americas, Mediterranean, and Asia Pacific & China, all of which fall under a nine-member Executive Committee. The 2016 Annual Report of Vestas A/S also collectively refers to Vestas A/S and its subsidiaries as "Vestas" or "The Vestas Group." The 2016 Annual Report further identifies the Portland office of Vestas-American as a "sales and service office" of "Vestas." In addition, the 2016 Annual Report reports total revenues from the U.S. and does not distinguish between the revenues of Vestas A/S and the revenues of Vestas-American. Vestas A/S has also

issued press releases regarding agreements to supply and commission wind turbines in the U.S., and has identified individuals at both Vestas A/S and Vestas-American as points of contact regarding those supply and commissioning agreements. Thus, Vestas-American holds the power to alter legal relationships between Vestas A/S and third party customers purchasing wind turbines for the United States and acts as a fiduciary with respect to those matters.

JURISDICTION AND VENUE

8. This Court has federal question jurisdiction over the subject matter of this action under 28 U.S.C. §§ 1331 and 1338(a), because this is a civil action arising under the patent laws of the United States, 35 U.S.C. §§ 1 *et seq*.

9. Vestas-American is subject to this Court's personal jurisdiction. Vestas-American is incorporated in the State of California. Vestas-American is involved in the design, manufacture, importation, and testing of variable speed wind turbines and components thereof. Further, Vestas-American regularly conducts business in the State of California and in this District, and has committed acts of patent infringement in this District, including, but not limited to, offering for sale, selling, distributing, installing, making, using, and/or commissioning variable speed wind turbines at the following wind farms in California: San Gorgonio Wind Farm, Brookfield Wind Farm, Alta II-IX Wind Farm, and Solano III Wind Farm. As such, Vestas-American has purposefully availed itself of the privilege of conducting business within this District; has established sufficient minimum contacts with this District such that it should reasonably and fairly anticipate being haled into court in this District; has purposefully directed activities at residents of this District; and at least a portion of the patent infringement claims alleged herein arise out of or are related to one or more of the foregoing activities.

10. Vestas A/S is subject to this Court's personal jurisdiction. Vestas A/S is involved in the design, manufacture, sale, importation, installation, service, and testing of variable speed wind turbines and components thereof. Further, Vestas A/S conducts

business in the State of California and in this District, and has committed acts of patent infringement in this District, including, but not limited to, offering for sale, selling, distributing, installing, making, using, and/or commissioning variable speed wind turbines at the following wind farms in California: San Gorgonio Wind Farm, Brookfield Wind Farm, Alta II-IX Wind Farm, and Solano III Wind Farm. For example, Vestas A/S stated in a press release dated January 16, 2016 that it had entered into a 15-year service contract to service wind turbines at the Alta II, III, IV and V wind farms in Mojave, California. Vestas A/S intends for the variable speed wind turbines and components thereof that it designs, manufactures, tests, distributes, and markets to be sold and installed in California. Vestas A/S has thus purposefully availed itself of the privilege of conducting business within this District; has established sufficient minimum contacts with this District such that it should reasonably and fairly anticipate being haled into court in this District; has purposefully directed activities at residents of this District; and at least a portion of the patent infringement claims alleged herein arise out of or are related to one or more of the foregoing activities.

11. Venue is proper in this District pursuant to 28 U.S.C. §§ 1391 and 1400(b). Vestas-American is incorporated in, and thus resides in, the State of California and this District. Vestas A/S does not reside in the United States, and thus, may be sued in any judicial district.

GE'S ASSERTED PATENTS

12. On December 8, 2009, the United States Patent Office duly and legally issued the '705 patent titled "Method and Apparatus for Operating Electrical Machines." A true and correct copy of the '705 patent is attached hereto as Exhibit A.

13. The '705 patent identifies Sidney A. Barker, Anthony Klodowski, John D'Atre, Einar Larsen, and Goran Drobnjak as the inventors.

14. GE is the owner of all right, title, and interest in the '705 patent with the full and exclusive right to bring suit to enforce the '705 patent, including the right to

recover for past damages and/or royalties.

15. On February 11, 2010, GE filed a complaint against Mitsubishi Heavy Industries, Ltd. and Mitsubishi Power Systems Americas, Inc. (collectively, "Mitsubishi") in the United States District Court for the Northern District of Texas (Case No. 3:10-cv-00276) asserting that Mitsubishi's wind turbines configured for zero voltage ride through infringed claim 1 of the '705 patent. Following a jury trial in February-March 2012 and a bench trial in October 2012, the Court entered final judgment that claim 1 of the '705 patent was infringed, not invalid and not unenforceable; awarded GE $166,750,000 in lost profits and $3,445,000 in reasonably royalty damages; and entered a permanent injunction against Mitsubishi. Mitsubishi and GE reached a settlement regarding all legal actions between the parties in December 2013.

16. The validity of claim 1 of the '705 Patent has also been confirmed after multiple reexaminations by the United States Patent Office. On March 24, 2011, Mitsubishi filed a request for *inter partes* reexamination of claims 1-9, 13 and 14 of the '705 patent (Control No. 95/000,603). The reexamination with respect to claims 1-6 of the '705 patent was dismissed on September 19, 2014 pursuant to the estoppel provision of pre-AIA 35 U.S.C. § 317(b). An *inter partes* reexamination certificate, attached hereto as Exhibit B, issued on August 17, 2016 confirming the patentability of claims 7 and 8. On September 14, 2012, Mitsubishi filed a request for *ex parte* reexamination of claim 1 of the '705 patent (Control No. 90/012,587). An *ex parte* reexamination certificate, attached hereto as Exhibit C, issued on July 12, 2013 confirming the patentability of claim 1. On March 24, 2013, Mitsubishi filed another request for *ex parte* reexamination of claim 1 of the '705 patent (No. 90/012,880). A second *ex parte* reexamination certificate, attached hereto as Exhibit D, issued on April 24, 2014 confirming the patentability of claim 1.

17. The '705 patent is valid and enforceable.

18. On July 26, 2005, the United States Patent Office duly and legally issued

the '985 patent titled "Low Voltage Ride Through for Wind Turbine Generators." A true and correct copy of the '985 patent is attached hereto as Exhibit E.

19. The '985 patent identifies Wilhem Janssen, Henning Luetze, Andreas Buecker, Till Hoffmann, and Ralf Hagedorn as the inventors.

20. GE is the owner of all right, title, and interest in the '985 patent with the full and exclusive right to bring suit to enforce the '985 patent, including the right to recover for past damages and/or royalties.

21. On February 27, 2008, GE filed a complaint against Mitsubishi Heavy Industries, Ltd. and Mitsubishi Power Systems Americas, Inc. (collectively, "Mitsubishi") in the United States International Trade Commission (Inv. No. 337-TA-641) asserting a violation Section 337 based on the importation of Mitsubishi wind turbines configured for low voltage ride through that infringed certain claims of the '985 patent. On August 7, 2009, following a bench trial, the Administrative Law Judge entered an Initial Determination finding that (i) Mitsubishi infringed claim 15 of the '985 patent; (ii) Mitsubishi failed to show that claim 15 of the '985 patent was invalid; and (iii) GE satisfied the domestic industry requirement of Section 337. On January 19, 2010, the Commission reversed the ALJ's determination that GE satisfied the domestic industry requirement, and took no position on the remaining issues. On July 6, 2012, the Federal Circuit reversed the Commission's decision that GE failed to satisfy the domestic industry requirement and remanded for further proceedings. Mitsubishi and GE reached a settlement regarding all legal actions between the parties in December 2013.

22. The validity of the '985 patent has been confirmed following an extensive reexamination by the United States Patent Office. On October 22, 2010, Mitsubishi filed a request for *inter partes* reexamination of claims 1-45 of the '985 patent (Control No. 95/000,580). An *inter partes* reexamination certificate, attached hereto as Exhibit F, issued on August 17, 2016.

23. The '985 patent is valid and enforceable.

COUNT I

INFRINGEMENT OF U.S. PATENT NO. 7,629,705

24. GE re-alleges and incorporates by reference the allegations of the preceding paragraphs of this Complaint as if fully set forth herein.

25. Upon information and belief, Vestas-American directly infringes, literally or under the doctrine of equivalents, at least claim 1 of the '705 patent by making, selling, and using variable speed wind turbines with ZVRT capabilities, within this judicial District and elsewhere in the United States, including, but not limited to, the V90-3.0, V100-2.0, V110-2.0, V112-3.0, and V117-3.3 wind turbines ("Accused ZVRT Products"). By way of example, Vestas-American issued an announcement on March 26, 2015 that it had received a firm and unconditional order to supply and commission 13 V112-3.0 MW wind turbines in the United States. Upon information and belief, the 13 V112-3.0 MW wind turbines were installed and commissioned in 2016.

26. Upon information and belief, Vestas A/S directly infringes, literally or under the doctrine of equivalents, at least claim 1 of the '705 patent by making, selling, and using the Accused ZVRT Products within this judicial District and elsewhere in the United States. Vestas A/S is liable for direct infringement based also on the acts of its wholly-owned subsidiary Vestas-American. The 2016 Annual Report of Vestas A/S states that "Vestas can provide everything from simply supplying the individual wind turbines to all-inclusive package, including supply, installation, and calibration of the wind power plant as well as civil and electrical works." By way of example, Vestas A/S issued announcements on January 21, 2015, December 24, 2015, and March 31, 2016, that it had received firm and unconditional orders to supply and commission V100-2.0MW, V110-2.0MW and V117-3.3MW wind turbines in the United States. The announcements by Vestas A/S identify as points of contacts individuals at both Vestas A/S and Vestas-American.

27. These models of Accused ZVRT Products are non-limiting examples that

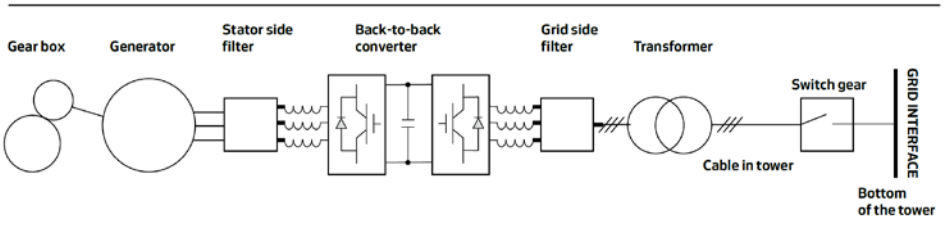
were identified based on publicly available information, and GE reserves the right to identify additional infringing products and activities, including, for example, on the basis of information obtained during discovery. Set forth below is a non-limiting description of Defendants' infringement of claim 1 of the '705 patent in connection with the Accused ZVRT Products. This description is based on publicly available information. GE reserves the right to modify this description, including, for example, on the basis of information about the Accused ZVRT Products that it obtains during discovery.

[1.P] A method for operating an electrical machine, said method comprising:

28. In the period since the '705 patent issued on December 8, 2009, Defendants installed and commissioned the Accused ZVRT Products at least at the following wind farms in the United States: Spinning Spur (Texas); Longhorn (Texas); Mile (New Mexico); Kingfisher (Oklahoma); Origin (Oklahoma); Headwaters (Indiana); South Plains (Texas); Keechi (Texas); Hoopeston (Illinois); Alta II-IX (California); Brookfield (California); Granite Reliable (New Hamsphire); Kibby Mountain (Maine); Central Plains (Kansas); Solano (California); Kingdom Community (Vermont); Elkhorn Ridge (Nebraska); Passadumkeag (Maine); and San Gorgonio (California).

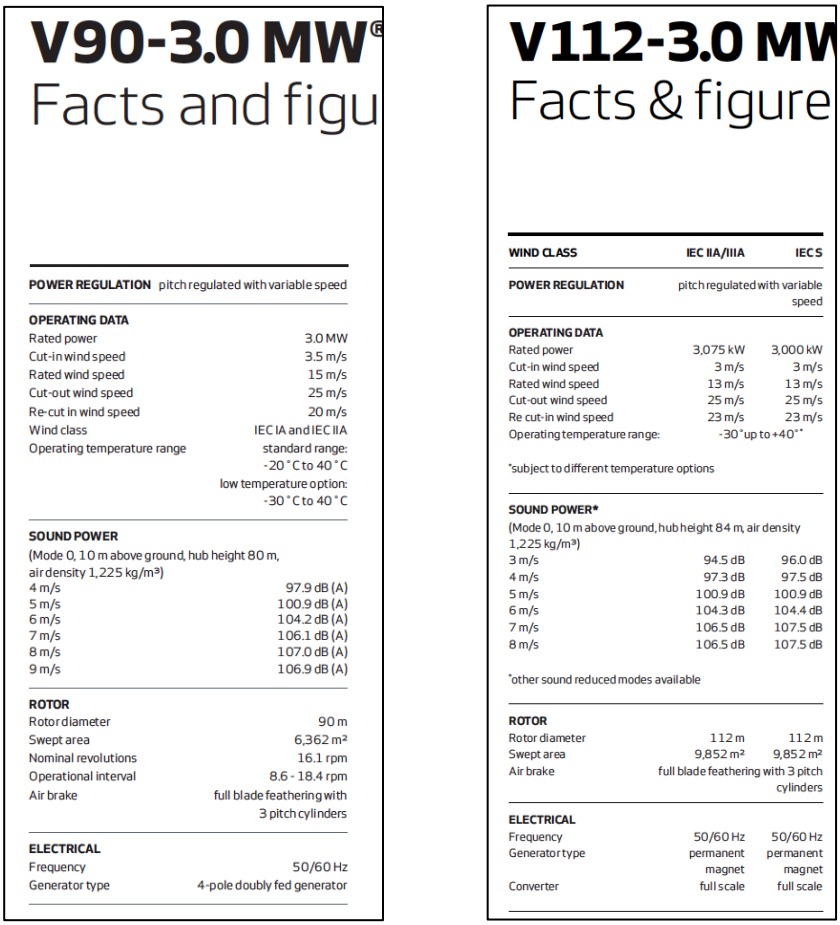
29. The method of claim 1 is practiced when the Accused ZVRT Products are installed and commissioned.

[1.a] coupling the electrical machine to an electric power system such that the electric power system is configured to transmit at least one phase of electric power to the electrical machine; and



Excerpt from Vestas brochure for 3.0MW onshore turbines

30. The Accused ZVRT Products include either (1) a doubly-fed induction generator (DFIG) that is coupled to a three-phase electric power system via a stator and through a power conversion assembly via a rotor; or (2) a full conversion generator that is coupled to the electric power system through a power conversion assembly via a stator.



V90-3.0 MW®
Facts and figu

POWER REGULATION	pitch regulated with variable speed
OPERATING DATA	
Rated power	3.0 MW
Cut-in wind speed	3.5 m/s
Rated wind speed	15 m/s
Cut-out wind speed	25 m/s
Re-cut in wind speed	20 m/s
Wind class	IEC IA and IEC IIA
Operating temperature range	standard range: -20 °C to 40 °C low temperature option: -30 °C to 40 °C
SOUND POWER	
(Mode 0, 10 m above ground, hub height 80 m, air density 1,225 kg/m³)	
4 m/s	97.9 dB (A)
5 m/s	100.9 dB (A)
6 m/s	104.2 dB (A)
7 m/s	106.1 dB (A)
8 m/s	107.0 dB (A)
9 m/s	106.9 dB (A)
ROTOR	
Rotor diameter	90 m
Swept area	6,362 m²
Nominal revolutions	16.1 rpm
Operational interval	8.6 - 18.4 rpm
Air brake	full blade feathering with 3 pitch cylinders
ELECTRICAL	
Frequency	50/60 Hz
Generator type	4-pole doubly fed generator

V112-3.0 MW
Facts & figure

WIND CLASS	**IEC IIA/IIIA**	**IEC S**
POWER REGULATION	pitch regulated with variable speed	
OPERATING DATA		
Rated power	3,075 kW	3,000 kW
Cut-in wind speed	3 m/s	3 m/s
Rated wind speed	13 m/s	13 m/s
Cut-out wind speed	25 m/s	25 m/s
Re cut-in wind speed	23 m/s	23 m/s
Operating temperature range:	-30°up to +40°*	
*subject to different temperature options		
SOUND POWER*		
(Mode 0, 10 m above ground, hub height 84 m, air density 1,225 kg/m³)		
3 m/s	94.5 dB	96.0 dB
4 m/s	97.3 dB	97.5 dB
5 m/s	100.9 dB	100.9 dB
6 m/s	104.3 dB	104.4 dB
7 m/s	106.5 dB	107.5 dB
8 m/s	106.5 dB	107.5 dB
*other sound reduced modes available		
ROTOR		
Rotor diameter	112 m	112 m
Swept area	9,852 m²	9,852 m²
Air brake	full blade feathering with 3 pitch cylinders	
ELECTRICAL		
Frequency	50/60 Hz	50/60 Hz
Generator type	permanent magnet	permanent magnet
Converter	full scale	full scale

Excerpts from Vestas brochures for V90 and V112 turbines

[1.b] configuring the electrical machine such that the electrical machine remains electrically connected to the electric power system during and subsequent to a voltage amplitude of the electric power system operating outside of a predetermined range for an undetermined period of time, said configuring the electrical machine comprising:

31. Defendants configure the Accused ZVRT Products with ride-through capabilities such that the Accused ZVRT Products remain electrically connected to the

electric power system during and subsequent to the voltage amplitude of the electric power system operating outside of a predetermined range for an undetermined period of time. For example, Vestas has stated that "Vestas products, such as the V100-1.8 MW, are designed so that your wind park will be fully compliant with applicable grid codes at the point of common coupling. How this is achieved may differ from country to country, but generally, the Vestas advanced grid compliance system provides active and reactive power regulation, frequency regulation and fault ride-through capabilities to support grid levels and stability in the event of grid disturbances." *Vestas V100 Brochure*. In addition, Vestas has graphically illustrated the ride-through capabilities of the Accused ZVRT Products in its product brochures, manuals, and presentations:

9.5 Performance – Fault Ride Through

The turbine is equipped with a full-scale converter to gain better control of the wind turbine during grid faults. The turbine control system continues to run during grid faults.

The turbine is designed to stay connected during grid disturbances within the voltage tolerance curve as illustrated:

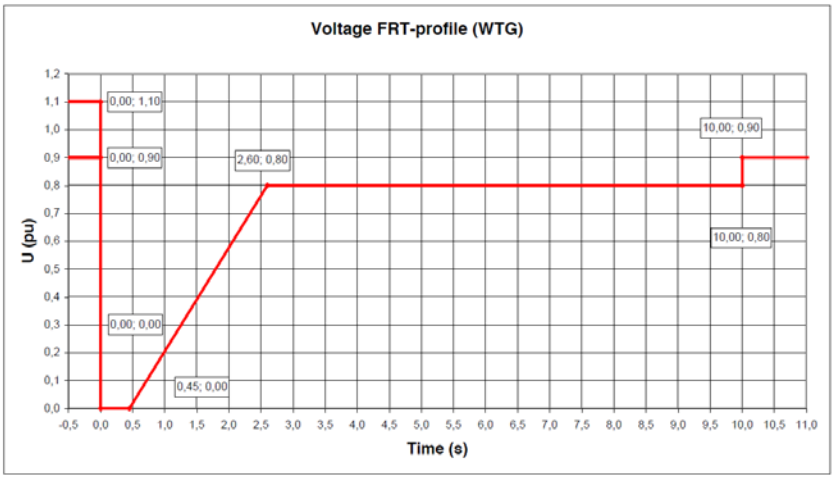
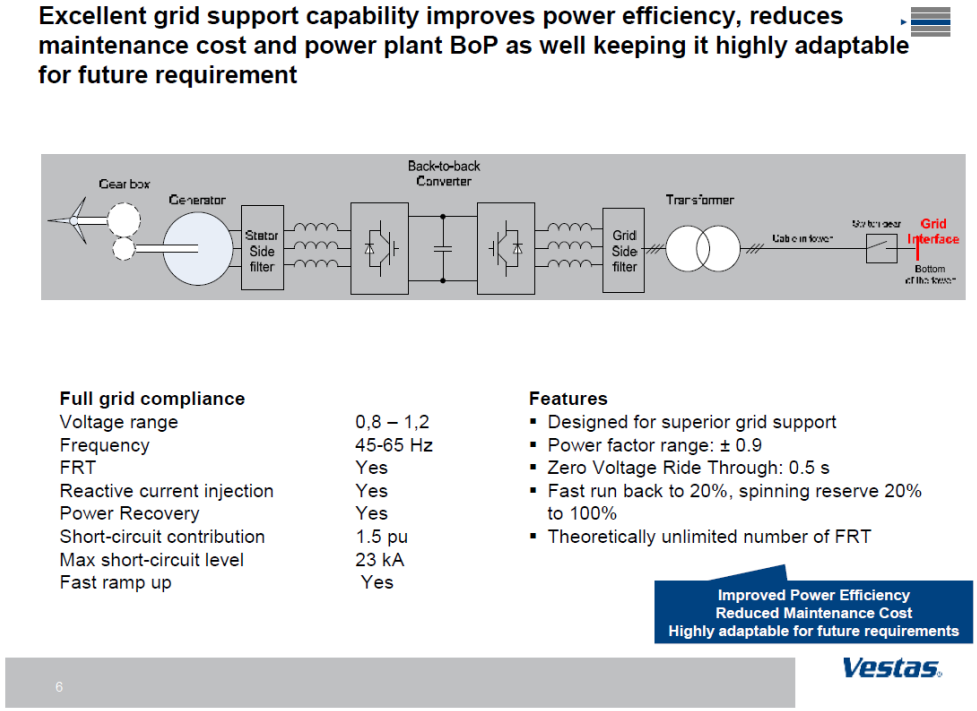


Figure 9-3: Low voltage tolerance curve for symmetrical and asymmetrical faults, where U represents voltage as measured on the grid

For grid disturbances outside the protection curve in Figure 9-, p. 29 the turbine will be disconnected from the grid.

Excerpt from Vestas Specification for V117 turbine



Excerpt from Vestas Presentation for V112 turbine

[1.c] electrically coupling at least a portion of a control system to at least a portion of the electric power system;

32. Defendants couple at least a portion of a control system in the Accused ZVRT Products to at least a portion of the three-phase electric power system. For example, as shown in the figure below, the Accused ZVRT Products are controlled by a Vestas Multi Processor (VMP) Controller, which provides the function of the synchronizing the generator to the three-phase electric power of the electric power system, monitoring the electric power system, and operating the wind turbine during voltage disturbances.

3.8 Vestas Multi Processor (VMP) Controller

The turbine is controlled and monitored by the VMP6000 control system.

VMP6000 is a multiprocessor control system comprised of four main processors (ground, nacelle, hub and converter) interconnected by an optically based 2.5 Mbit ArcNet network.

In addition to the four main processors, the VMP6000 consists of a number of distributed I/O modules interconnected by a 500 kbit CAN network.

I/O modules are connected to CAN interface modules by a serial digital bus, CTBus.

The VMP6000 controller serves the following main functions:

- Monitoring and supervision of overall operation.
- Synchronizing of the generator to the grid during connection sequence.
- Operating the wind turbine during various fault situations.
- Automatic yawing of the nacelle.
- OptiTip® - blade pitch control.
- Reactive power control and variable speed operation.
- Noise emission control.
- Monitoring of ambient conditions.
- Monitoring of the grid.
- Monitoring of the smoke detection system.

Excerpt from Vestas Specification for V117 turbine

[1.d] coupling the control system in electronic data communication with at least a portion of the electrical machine; and

33. Defendants couple the control system of the Accused ZVRT Products in electronic data communication with at least a portion of the electrical machine. For example, the Vestas VMP Controller includes a processor for the converter of the electrical machine. The processor is in electronic data communication with at least the converter in order to provide the functions of monitoring and supervision of overall operation, synchronizing the generator to the grid during connection sequence, and operating the wind turbine during various fault situations.

3.8 Vestas Multi Processor (VMP) Controller

The turbine is controlled and monitored by the VMP6000 control system.

VMP6000 is a multiprocessor control system comprised of four main processors (ground, nacelle, hub and converter) interconnected by an optically based 2.5 Mbit ArcNet network.

In addition to the four main processors, the VMP6000 consists of a number of distributed I/O modules interconnected by a 500 kbit CAN network.

I/O modules are connected to CAN interface modules by a serial digital bus, CTBus.

The VMP6000 controller serves the following main functions:

- Monitoring and supervision of overall operation.
- Synchronizing of the generator to the grid during connection sequence.
- Operating the wind turbine during various fault situations.
- Automatic yawing of the nacelle.
- OptiTip® - blade pitch control.
- Reactive power control and variable speed operation.
- Noise emission control.
- Monitoring of ambient conditions.
- Monitoring of the grid.
- Monitoring of the smoke detection system.

Excerpt from Vestas Specification for V117 turbine

[1.e] configuring the electrical machine and the control system such that the electrical machine remains electrically connected to the electric power system during and subsequent to the voltage amplitude of the electric power system decreasing below the predetermined range including approximately zero volts for the undetermined period of time, thereby facilitating zero–voltage ride–through (ZVRT).

34. Defendants configure the Accused ZVRT Products with ride-through capabilities such that the Accused ZVRT Products remain electrically connected to the electric power system during and subsequent to the voltage amplitude of the electric power system operating outside of a predetermined range for an undetermined period of time, including approximately zero volts, thereby facilitating zero-voltage ride through. For example, Vestas has stated that "Vestas products, such as the V100-1.8 MW, are designed so that your wind park will be fully compliant with applicable grid codes at the point of common coupling. How this is achieved may differ from country to country, but generally, the Vestas advanced grid compliance system provides active and reactive power regulation, frequency regulation and fault ride-through capabilities

to support grid levels and stability in the event of grid disturbances." *Vestas V100 Brochure*. In addition, Vestas has graphically illustrated the zero voltage ride-through capabilities of the Accused ZVRT Products during grid faults occurring for undetermined periods of time in its product brochures, manuals, and presentations:

9.5 Performance – Fault Ride Through

The turbine is equipped with a full-scale converter to gain better control of the wind turbine during grid faults. The turbine control system continues to run during grid faults.

The turbine is designed to stay connected during grid disturbances within the voltage tolerance curve as illustrated:

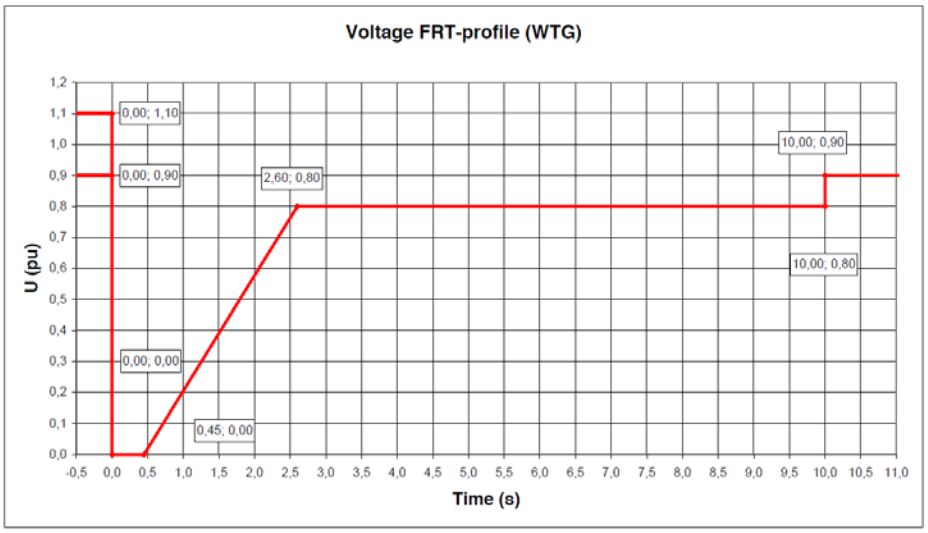
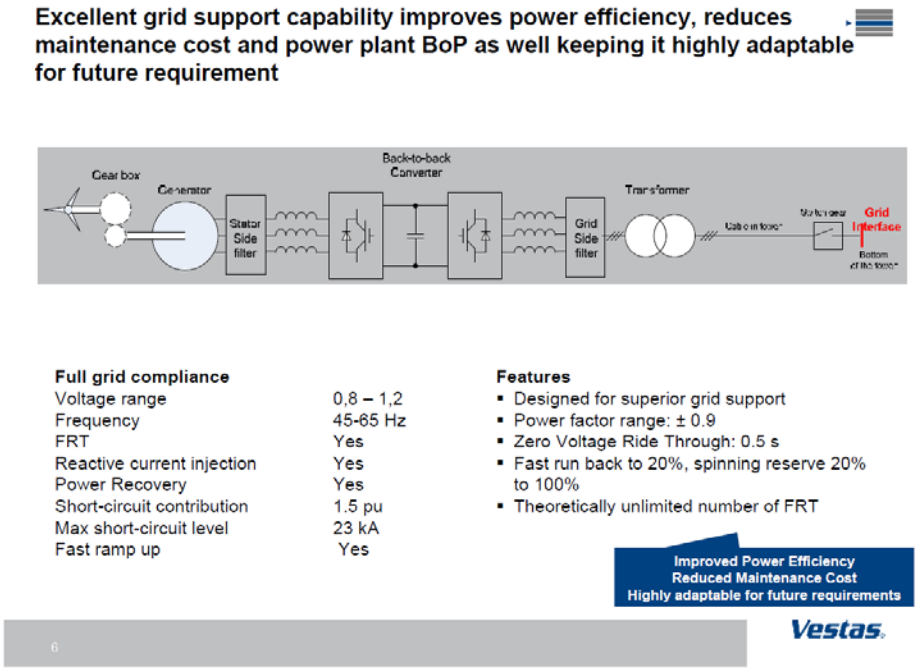


Figure 9-3: Low voltage tolerance curve for symmetrical and asymmetrical faults, where U represents voltage as measured on the grid

For grid disturbances outside the protection curve in Figure 9-, p. 29 the turbine will be disconnected from the grid.

Excerpt from Vestas Specification for V117 turbine



Excerpt from Vestas Presentation for V112 turbine

35. Defendant Vestas A/S has also indirectly and is indirectly infringing at least claim 1 of the '705 patent.

36. Upon information and belief, Defendants had actual knowledge of the '705 patent since September 14, 2011, when Vestas-American and Steven Saylors, an electrical engineer employed by Vestas-American, were served with subpoenas to provide documents and testimony in *General Electric Co. v. Mitsubishi Heavy Industries, Ltd. and Mitsubishi Power Systems Americas, Inc.*, C.A. No. 3:10-cv-276-F (N.D. Tx. Sep. 14, 2011) ("the Mitsubishi case"). In the Mitsubishi case, GE asserted infringement of claim 1 of the '705 patent against two Mitsubishi entities. As Vestas-American and its employee were both served with subpoenas for evidence and testimony in the Mitsubishi case, Vestas-American obtained notice of the '705 patent and became aware that it covered a method of providing zero-voltage ride through capability for wind turbines. In particular, Vestas-American was notified in the subpoena that it would be questioned about the "[m]ethods and apparatuses of Vestas for configuring and operating electrical machines that remain connected to the electrical power system during low voltage or zero voltage events, prior to October

20, 2006."

37. Defendant Vestas A/S has contributed and contributes to the infringement of at least claim 1 of the '705 patent in violation of 35 U.S.C. § 271 by making, offering to sell, selling, and importing the Accused ZVRT Products and components thereof that Vestas A/S has known and knows are especially made or especially adapted for use in practicing at least claim 1 of the '705 patent. These Accused ZVRT Products and components thereof are not staple articles or commodities of commerce suitable for substantial non-infringing use, and the Accused ZVRT Products and components thereof are a material part of the invention of the '705 patent. As described in paragraphs 25 through 34, the Accused ZVRT Products constitute or contain components, including, for example, a generator designed to be coupled to a power grid for receiving at least one phase of electric power, configured to remain electrically connected to the power grid during voltage drops, and coupled to a control system, as well as a control system coupled to the generator and configured so that the generator remains electrically connected to the power grid during voltage drops to facilitate zero voltage ride through. The generators and control systems of the Accused ZVRT Products as designed and configured are material to practicing the '705 patent's invention, and have no substantial non-infringing use. By way of example, Vestas A/S announced on January 21, 2015, December 24, 2015, and March 31, 2016, that it had received firm and unconditional orders to supply V100-2.0MW, V110-2.0MW and V117-3.3MW wind turbines to be commissioned in the United States. The 2016 Annual Report of Vestas A/S further states that "Vestas can provide everything from simply supplying the individual wind turbines to all-inclusive package, including supply, installation, and calibration of the wind power plant as well as civil and electrical works." Accordingly, Vestas A/S is contributing to the direct infringement of at least claim 1 of the '705 patent when the Accused ZVRT Products are installed and commissioned.

38. Defendants' infringement of at least claim 1 of the '705 patent is willful

and egregious. As described in paragraph 36, Defendants have had actual knowledge of the '705 patent since September 14, 2011, including the knowledge that the '705 patent covered a method of providing zero-voltage ride through capability for wind turbines. Despite Defendants' actual knowledge of the '705 patent and further knowledge that the Accused ZVRT Products practice at least claim 1 of the '705 patent, Defendants knowingly and intentionally continued to manufacture, make, sell, offer for sale, use, install and/or commission Accused ZVRT Products throughout the United States from September 14, 2011 to the present date.

39. Defendants are not licensed or otherwise authorized to practice the claims of the '705 patent.

40. By reason of Defendants' infringement of the '705 patent, GE has suffered, and will continue to suffer, substantial damages.

41. GE is entitled to recover from Defendants the damages sustained as a result of Defendants' wrongful acts in an amount subject to proof at trial, but in no event less than a reasonable royalty for the infringement of at least claim 1 of the '705 patent by Defendants, together with interest and costs as fixed by the Court.

42. Defendants' continuing acts of infringement are irreparably harming and causing damage to GE, for which GE has no adequate remedy at law, and GE will continue to suffer such irreparable injury unless Defendants' continuing acts of infringement are enjoined by the Court. The hardships that an injunction would impose are less than those faced by GE should an injunction not issue. The public interest would be served by issuance of an injunction. Thus, GE is entitled to an injunction against further infringement of the '705 patent.

COUNT II

INFRINGEMENT OF U.S. PATENT NO. 6,921,985

43. GE re-alleges and incorporates by reference the allegations of the preceding paragraphs of this Complaint as if fully set forth herein.

44. Upon information and belief, Vestas-American directly infringes,

literally or under the doctrine of equivalents, at least claims 1, 3, 6, 7 and 12 of the '985 patent by making, selling, offering to sell, importing, and using variable speed wind turbines with LVRT capabilities, within this judicial District and elsewhere in the United States, including, but not limited to, the V90-3.0, V100-2.0, V110-2.2, V112-3.0 and V117-3.3 wind turbines ("Accused LVRT Products"). By way of example, Vestas-American issued an announcement on March 26, 2015 that it had received a firm and unconditional order to supply and commission 13 V112-3.0 MW wind turbines in the United States.

45. Upon information and belief, Vestas A/S directly infringes, literally or under the doctrine of equivalents, at least claims 1, 3, 6, 7, and 12 of the '985 patent by making, selling, offering to sell, importing, and using the Accused LVRT Products within this judicial District and elsewhere in the United States. The 2016 Annual Report of Vestas A/S states that "Vestas can provide everything from simply supplying the individual wind turbines to all-inclusive package, including supply, installation, and calibration of the wind power plant as well as civil and electrical works." In addition to its own acts, Vestas A/S is liable for direct infringement based also on the acts of its agent Vestas-American. By way of example, Vestas A/S issued announcements on January 21, 2015, December 24, 2015, and March 31, 2016, that it had received firm and unconditional orders to supply and commission V100-2.0MW, V110-2.0MW and V117-3.3MW wind turbines in the United States. The announcements by Vestas A/S identify as points of contacts individuals at both Vestas A/S and Vestas-American.

46. These models of Accused LVRT Products are non-limiting examples that were identified based on publicly available information, and GE reserves the right to identify additional infringing products and activities, including, for example, on the basis of information obtained during discovery. Set forth below is a non-limiting description of Defendants' infringement of claims 1, 3, 6, 7 and 12 of the '985 patent in connection with the Accused LVRT Products. This description is based on publicly

available information. GE reserves the right to modify this description, including, for example, on the basis of information about the Accused LVRT Products that it obtains during discovery.

1. A wind turbine generator comprising:

[1.a] a generator;

47. The Accused LVRT Products are wind turbine generators. *See, e.g.*, General Specification 2.0/2.2MW V100/110 50/60Hz ("The Vestas 2.0 MW series wind turbine is a pitch regulated upwind turbine with active yaw, gearbox, and three-blade rotor. The turbine is available in two rotor diameters 100 or 110m with a generator rate at 2.0 or 2.2MW"); General Specification V117-3.3 MW 50/60 Hz ("The Vestas V117-3.3 MW wind turbine is pitch regulated upwind turbine with active yaw and a three-blade rotor."), at p. 11 ("The generator is a three-phase synchronous generator…").

[1.b] a blade pitch control system to vary a pitch of one or more blades; a turbine controller coupled with the blade pitch control system;

48. The Accused LVRT Products comprise a blade pitch control system to vary a pitch of one or more blades and a turbine controller coupled with the blade pitch control system. *See, e.g.*, General Specification 2.0/2.2MW V100/110 50/60Hz ("The turbine utilizes a microprocessor pitch control system called OptiTip®…"), ("The pitch system is optimized keep the turbine within normal speed conditions"), ("The generator rpm and the main shaft rpm are registered by inductive sensors and calculated by the wind turbine controller to protect against overspeed and rotating errors.").

3.8 Vestas Multi Processor (VMP) Controller

The turbine is controlled and monitored by the VMP6000 control system.

VMP6000 is a multiprocessor control system comprised of four main processors (ground, nacelle, hub and converter) interconnected by an optically based 2.5 Mbit ArcNet network.

In addition to the four main processors, the VMP6000 consists of a number of distributed I/O modules interconnected by a 500 kbit CAN network.

I/O modules are connected to CAN interface modules by a serial digital bus, CTBus.

The VMP6000 controller serves the following main functions:

- Monitoring and supervision of overall operation.
- Synchronizing of the generator to the grid during connection sequence.
- Operating the wind turbine during various fault situations.
- Automatic yawing of the nacelle.
- OptiTip® - blade pitch control.
- Reactive power control and variable speed operation.
- Noise emission control.
- Monitoring of ambient conditions.
- Monitoring of the grid.
- Monitoring of the smoke detection system.

General Specification V117-3.3 MW 50/60 Hz

[1.c] a first power source coupled with the turbine controller and with the blade pitch control system to provide power during a first mode of operation

49. The Accused LVRT Products comprise a power source coupled with the turbine controller and the blade pitch control system to provide power to those systems during normal operation, which is a first mode of operation. *See, e.g.*, General Specification V90-3.0 ("When the grid supply is present the power will flow t[h]rough the UPS and it will use the grid supply to charge the batteries. When the grid supply is not present the UPS will take the power from the batteries and supply all the components connected to the UPS."); General Specification V117-3.3 MW 50/60 Hz ("The UPS is equipped with an AC/DC, DC/AC converter (double conversions) and battery cells placed in the same cabinet as the converter. During grid outage, the UPS will supply specific components with 230 V AC.").

[1.d] an uninterruptible power supply coupled to the turbine controller and with the blade pitch control system to provide power during a low voltage event in which the generator remains connected to a grid when the voltage at the output terminals of

the generator is less than 50% of a rated voltage of the generator; wherein in response to detection of a transition from the first mode of operation to a second mode of operation comprising the low voltage event the turbine controller causes the blade pitch control system to vary the pitch of the one or more blades in response to the transition.

50. The Accused LVRT Products comprise an uninterruptible power supply (UPS) coupled to the turbine controller and with the blade pitch control system to provide power during a low voltage event in which the generator remains connected to a grid when the voltage at the output terminals of the generator is less than 50% of a rated voltage of the generator. *See, e.g.,* General Specification V90-3.0 ("When the grid supply is present the power will flow t[h]rough the UPS and it will use the grid supply to charge the batteries. When the grid supply is not present the UPS will take the power from the batteries and supply all the components connected to the UPS."), ("The controllers and contactors have a UPS backup system to keep the turbine control system running during grid faults."); General Specification V117-3.3 MW 50/60 Hz ("The UPS is equipped with an AC/DC, DC/AC converter (double conversions) and battery cells placed in the same cabinet as the converter. During grid outage, the UPS will supply specific components with 230 V AC.").

9.5 Performance – Fault Ride Through

The turbine is equipped with a full-scale converter to gain better control of the wind turbine during grid faults. The turbine control system continues to run during grid faults.

The turbine is designed to stay connected during grid disturbances within the voltage tolerance curve as illustrated:

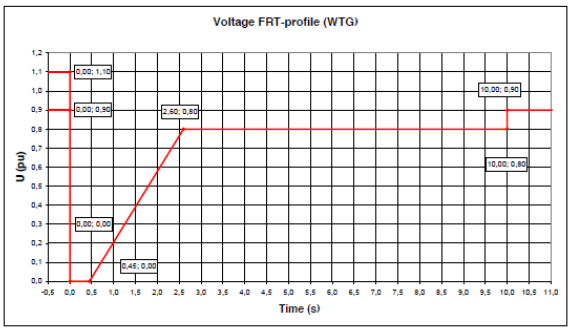


Figure 9-3: Low voltage tolerance curve for symmetrical and asymmetrical faults, where U represents voltage as measured on the grid

For grid disturbances outside the protection curve in Figure 9-, p. 29 the turbine will be disconnected from the grid.

5.5 Fault ride through

5.5.1 UVRT

The turbine is equipped with a reinforced converter system in order to gain better control of the generator during grid faults. The turbine control system continues to run during grid faults.

The pitch system is optimised to keep the turbine within normal speed conditions, and the generator speed is accelerated in order to store rotational energy and be able to resume normal power production faster after a fault and keep mechanical stress on the turbine at a minimum.

The turbine is designed to stay connected during grid disturbances within the UVRT curve in Figure 5-5, p. 13.

Power recovery time	
Power recovery to 90% of pre-fault level	Maximum 2 seconds

Table 5-6: Power recovery time

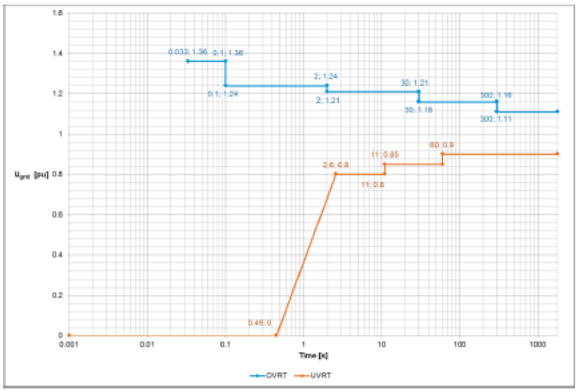


Figure 5-5: OVRT, UVRT curves for symmetrical and asymmetrical faults where U_{grid} represents grid voltage values

General Specification V117-3.3 MW 50/60 Hz; General Specification 2.0/2.2MW V100/110 50/60Hz

51. The Accused LVRT Products are further configured such that in response to detection of a transition from the first mode of operation to a second mode operation comprising the low voltage event the turbine controller causes the blade pitch control system to vary the pitch of the one or more blades in response to the transition. *See, e.g.*, General Specification V90-3.0 ("The Turbine is controlled by the System 3500 controller hardware and Vestas controller software…The turbine control system serves the following main functions…Operating the wind turbine during various fault situations…Monitoring of the grid…"), ("The controllers and contactors have a UPS backup system to keep the turbine control system running during grid faults. The pitch system is optimized to keep the turbine within normal speed conditions..."); General Specification 2.0/2.2MW V100/110 50/60Hz ("The turbine is equipped with a reinforced converter system in order to gain better control of the generator during grid faults. The turbine control system continues to run during grid

faults. The pitch system is optimized to keep the turbine within normal speed conditions…").

3.8 Vestas Multi Processor (VMP) Controller

The turbine is controlled and monitored by the VMP6000 control system.

VMP6000 is a multiprocessor control system comprised of four main processors (ground, nacelle, hub and converter) interconnected by an optically based 2.5 Mbit ArcNet network.

In addition to the four main processors, the VMP6000 consists of a number of distributed I/O modules interconnected by a 500 kbit CAN network.

I/O modules are connected to CAN interface modules by a serial digital bus, CTBus.

The VMP6000 controller serves the following main functions:

- Monitoring and supervision of overall operation.
- Synchronizing of the generator to the grid during connection sequence.
- Operating the wind turbine during various fault situations.
- Automatic yawing of the nacelle.
- OptiTip® - blade pitch control.
- Reactive power control and variable speed operation.
- Noise emission control.
- Monitoring of ambient conditions.
- Monitoring of the grid.
- Monitoring of the smoke detection system.

General Specification V117-3.3 MW 50/60 Hz

3. The wind turbine generator of claim 1 wherein the low voltage event occurs for up to 3 seconds.

52. The Accused LVRT Products are designed to stay connected during grid disturbances including low voltage events for up to 3 seconds. *See, e.g.:*

9.5 Performance – Fault Ride Through

The turbine is equipped with a full-scale converter to gain better control of the wind turbine during grid faults. The turbine control system continues to run during grid faults.

The turbine is designed to stay connected during grid disturbances within the voltage tolerance curve as illustrated:

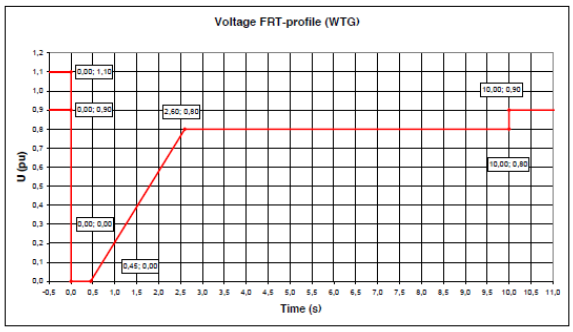


Figure 9-3: Low voltage tolerance curve for symmetrical and asymmetrical faults, where U represents voltage as measured on the grid

For grid disturbances outside the protection curve in Figure 9-, p. 29 the turbine will be disconnected from the grid.

5.5 Fault ride through

5.5.1 UVRT

The turbine is equipped with a reinforced converter system in order to gain better control of the generator during grid faults. The turbine control system continues to run during grid faults.

The pitch system is optimised to keep the turbine within normal speed conditions, and the generator speed is accelerated in order to store rotational energy and be able to resume normal power production faster after a fault and keep mechanical stress on the turbine at a minimum.

The turbine is designed to stay connected during grid disturbances within the UVRT curve in Figure 5-5, p. 13.

Power recovery time	
Power recovery to 90% of pre-fault level	Maximum 2 seconds

Table 5-6: Power recovery time

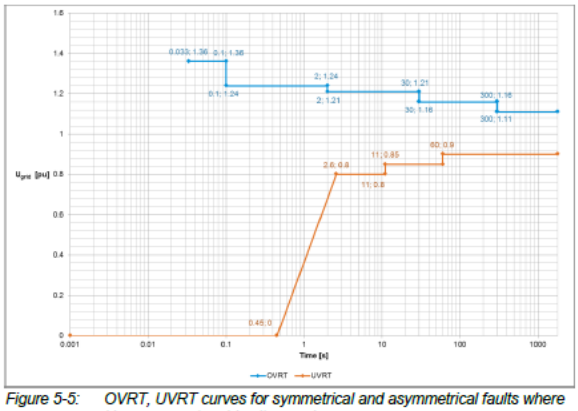


Figure 5-5: OVRT, UVRT curves for symmetrical and asymmetrical faults where U_{grid} represents grid voltage values

General Specification V117-3.3 MW 50/60 Hz; General Specification 2.0/2.2MW V100/110 50/60Hz

6.1 Advanced Grid Option 2

Wind turbines with the advanced grid option are specially designed to tolerate short time voltage reductions due to grid faults. With the grid option the turbines will generate a capacitive short circuit current, improve the grid stability and resume power production almost instantly after a grid fault.

The turbine is equipped with a reinforced Vestas Converter System in order to gain better control of the generator during grid faults. The controllers and contactors have an UPS back-up system in order to keep the turbine control system running during grid faults.

The pitch system is optimized to keep the turbine within normal speed conditions and the generator is accelerated in order to store rotational energy and be able to resume normal power production after a fault.

General Specification V90-3.0 MW

12. The wind turbine generator of claim 1 wherein the uninterruptible power supply comprises a battery power supply.

53. The Accused LVRT Products include an uninterruptible power supply that comprises a batter power supply. *See, e.g.:*

6.2 Extended UPS

The UPS-system consists of one UPS from where the power is distributed to a number of strings. On these strings some of them will have a timer controlled relay function, which will disconnect the power to the devises on this string. The control for the timer will be managed by the turbine control system and some preset timers. The reason for disconnecting some strings is that there are different demands on how long backup time is needed for the different devises. By disconnecting some strings it will allow the remaining stings to run for longer time without draining the battery too fast, which results in the UPS is closing down and no power will be available.

When the grid supply is present the power will flow trough the UPS and it will use the grid supply to charge the batteries. When the grid supply is not present the UPS will take the power from the batteries and supply all the components connected to the UPS.

General Specification V90-3.0 MW

3.9 UnInterruptible Power Supply (UPS)

The UPS is equipped with an AC/DC, DC/AC converter (double conversions) and battery cells placed in the same cabinet as the converter. During grid outage, the UPS will supply specific components with 230 V AC.

The backup time for the UPS system is proportional to the power consumption. Actual backup time may vary.

UPS	
Battery Type	Valve-Regulated Lead Acid (VRLA)
Rated Battery Voltage	2 x 8 x 12 V (192 V)
Converter Type	Double conversion
Converter Input	230 V +/-20%
Rated Output	230 Vac

General Specification V117-3.3 MW 50/60 Hz

54. Claim 6 of the '985 patent differs from claim 1 in that the "low voltage event comprises a voltage at the output of terminals of the generator between 15% and 50% of rated voltage of the generator." As set forth above in paragraphs 52 through 54, the Accused LVRT Products are designed to stay connected during grid disturbances including low voltage events between 15% and 50% of rated voltage of the generator.

55. Claim 7 of the '985 patent includes the same limitation as claim 3 that "the low voltage event occurs for up to 3 seconds." As set forth above in paragraphs 52 through 54, the Accused LVRT Products are designed to stay connected during

grid disturbances including low voltage events for up to 3 seconds.

56. Defendant Vestas A/S has also indirectly and is indirectly infringing at least claims 1, 3, 6, 7 and 12 of the '985 patent.

57. Upon information and belief, Vestas A/S had actual knowledge of the '985 patent prior to the filing of this lawsuit. On March 16, 2009, Vestas A/S filed U.S. Patent Application No. 12/404,939. In that application, Vestas A/S stated that "U.S. Pat. No. 6,921,985 discloses a LVRT system for a wind turbine connected to a utility grid." Thus, prior to the filing of this lawsuit Vestas A/S had knowledge of the subject matter described and claimed in the '985 patent. The '985 patent is also described in the specification of at least four other patent applications filed by Vestas A/S: U.S. Patent Application No. 12/404,974 (filed on March 16, 2009); WO 2011/019321 (filed on August 10, 2010); WO 2011/095169 (filed on February 2, 2011); and U.S. Patent Application No. 13/919,371 (filed on June 17, 2013).

58. Defendant Vestas A/S has contributed and contributes to the infringement of at least claims 1, 3, 6, 7, and 12 of the '985 patent in violation of 35 U.S.C. § 271 by making, selling, offering to sell, and importing the Accused LVRT Products or components thereof that Vestas A/S knows are especially made or especially adapted for use in the infringement of at least claims 1, 3, 6, 7 and 12 of the '985 patent. These Accused LVRT Products or components are not staple articles or commodities of commerce suitable for substantial non-infringing use, and the Accused LVRT Products or components are a material part of the invention of the '985 patent. As described in paragraphs 44 through 55, the Accused LVRT Products constitute or contain components, including, for example, a generator designed to remain connected to the power grid when the voltage at the output terminals of the generator is less than 50% of a rated voltage of the generator, and an uninterruptible power supply coupled to a turbine controller and a blade pitch control system to provide power during a low voltage event. The generator, uninterruptible power supply, turbine controller, and blade pitch control system of the Accused LVRT

Products as designed and configured are material to practicing the '985 patent's invention, and have no substantial non-infringing use. By way of example, Vestas A/S announced on January 21, 2015, December 24, 2015, and March 31, 2016, that it had received firm and unconditional orders to supply V100-2.0MW, V110-2.0MW and V117-3.3MW wind turbines to be commissioned in the United States. The 2016 Annual Report of Vestas A/S further states that "Vestas can provide everything from simply supplying the individual wind turbines to all-inclusive package, including supply, installation, and calibration of the wind power plant as well as civil and electrical works." Accordingly, Vestas A/S is contributing to the direct infringement of at least claim 1 of the '985 patent when the Accused LVRT Products are made, offered for sale, sold imported, or installed and commissioned.

59. Defendants' infringement of at least claims 1, 3, 6, 7 and 12 of the '985 patent is willful and egregious. As described in paragraph 57, Defendants have had actual knowledge of the subject matter described and claimed in the '985 patent since at least March 16, 2009, including the knowledge that the '985 patent covers a low voltage ride through solution for a wind turbine generator. Despite Defendants' actual knowledge of the '985 patent and further knowledge that the Accused LVRT Products practice at least claims 1, 3, 6, 7 and 12 of the '985 patent, Defendants knowingly and intentionally continued to manufacture, make, sell, offer for sale, use, install and/or commission Accused LVRT Products throughout the United States from March 16, 2009 to the present date.

60. Defendants are not licensed or otherwise authorized to practice the claims of the '985 patent.

61. By reason of Defendants' infringement of the '985 patent, GE has suffered, and will continue to suffer, substantial damages.

62. GE is entitled to recover from Defendants the damages sustained as a result of Defendants' wrongful acts in an amount subject to proof at trial, but in no event less than a reasonable royalty for the infringement of at least claims 1, 3, 6, 7

and 12 of the '985 patent by Defendants, together with interest and costs as fixed by the Court.

63. Defendants' continuing acts of infringement are irreparably harming and causing damage to GE, for which GE has no adequate remedy at law, and GE will continue to suffer such irreparable injury unless Defendants' continuing acts of infringement are enjoined by the Court. The hardships that an injunction would impose are less than those faced by GE should an injunction not issue. The public interest would be served by issuance of an injunction. Thus, GE is entitled to an injunction against further infringement of the '985 patent.

PRAYER FOR RELIEF

WHEREFORE, Plaintiff respectfully prays for the following relief:

(a) A judgment that Defendants have infringed the '705 patent;

(b) A judgment that Defendants' infringement of the '705 patent has been willful;

(c) A judgment that Defendants have infringed the '985 patent;

(d) A judgment that Defendants' infringement of the '985 patent has been willful;

(e) An injunction against Defendants, their respective officers, agents, servants, employees, attorneys, parent and subsidiary corporations, assigns and successors in interest, and those persons in active concert or participation with them, enjoining them from infringement of the '705 patent and '985 patent, including but not limited to an injunction against making, using, selling, and/or offering for sale within the United States, and/or importing into the United States, any products, methods, equipment and/or services that infringe the '705 patent and/or the '985 patent;

(f) Damages adequate to compensate GE for Defendants' infringement of the '705 patent and the '985 patent under 35 U.S.C. § 284, together with prejudgment and post-judgment interest and costs;

(g) Treble damages under 35 U.S.C. § 284 as a result of Defendants' willful and deliberate infringement of the '705 patent and '985 patent;

(h) A declaration that this Action is exceptional pursuant to 35 U.S.C. § 285, and an award to GE of its attorneys' fees, costs, and expenses incurred in connection with this action; and

(i) Such other relief as the Court deems just and equitable.

DEMAND FOR JURY TRIAL

Pursuant to Rule 38(b) of the Federal Rules of Civil Procedure, Plaintiffs demand a trial by jury on all issues on which trial by jury is available under applicable law.

Dated: November 6, 2017

RAINES FELDMAN LLP

By: _____
MILES J. FELDMAN
LAITH D. MOSELY

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