Exhibit 21 Siemens Turbine Specifications



DET NORSKE VERITAS

TYPE CERTIFICATE

SWT-2.3-101

IEC TC-218901-0

Type Certificate number

2009-11-04

Date of issue

Manufacturer: Siemens Wind Power A/S Borupvej 16 DK - 7330 Brande

Valid until: 2014-10-30

This certificate attests compliance with IEC 61400-1 ed. 3: 2005 concerning the design and manufacture. The conformity evaluation was carried out according to IEC WT 01: 2001 "IEC system for conformity testing and certification of wind turbines - Rules and procedures."

Reference documents:

Design Evaluation Conformity Statement: Type Test Conformity Statement: Manufacturing Conformity Statement: IEC DE-218901-0 IEC TT-218901-0 IEC MC-218901-0

Type Characteristics Measurement Conformity Statement(s): IEC TM-218901-0 Final Evaluation Report: PD-642189-1240749-22

Wind Turbine specification:

IEC WT class: 2 B. For further information see Appendix 1 of this Certificate.

Date: 2009-11-04

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Management Representative Det Norske Veritas, Danmark A/S



Date: 2009-11-04

600 **Bente Vestergaard**

Project Manager Det Norske Veritas, Danmark A/S

DET NORSKE VERITAS, DANMARK A/S



APPENDIX 1 - WIND TURBINE TYPE SPECIFICATION

General:

| IEC WT class acc. to IEC 61400-1 ed. 3: 2005: | II B |
|--|--|
| Rotor diameter: | 100.6 m |
| Rated power: | 2300 kW |
| Rated wind speed V _r : | 12 m/s |
| Hub height(s): | 80 m |
| Operating wind speed range V _{in} -V _{out} : | 4 m/s - 25 m/s |
| Design life time: | 20 years |
| Low noise option/modified power curve: | May be used which gives lower energy |
| | production |
| | |
| Wind conditions: | |
| V _{ref} (hub height): | 42.5 m/s |
| V _{ave} (hub height): | 8.5 m/s |
| $I_{ref} (V_{hub}=15 \text{ m/s}) \text{ acc. to IEC 61400-1 ed. 3:}$ 2005: | 14 % |
| Mean flow inclination: | 8° |
| Electrical network conditions: | |
| Normal supply voltage and range: | 690 V ±10% |
| Normal supply frequency and range: | 50/60 Hz ±1% |
| Voltage imbalance: | 1% |
| Maximum duration of electrical power network | No limits when requirements in manuals are |
| outages: | followed |
| Number of annual electrical network outages: | Maximum 1000 per year |
| | 1 5 |
| | |
| Other environmental conditions (where taken into ac | count): |

| Air density: | 1.225 kg/m^3 |
|---|---|
| Normal and extreme temperature ranges: | Normal: -10°C to +40°C |
| | Extreme: -20°C to +50°C |
| Relative humidity: | 100% |
| Solar radiation: | 1000 W/m^2 |
| Salinity: | Present |
| Description of lightning protection system: | Designed according to IEC 61024-1 and IEC |
| | 61312-1 |

DET NORSKE VERITAS DANMARK A/S IEC TC-218901-0 Type Certificate



Main components:

Blade type: Gear box type:

Generator type: Tower type: Service lift: Crane: Siemens Wind Power, B49-00 Winergy PEAB 4456.2 or Winergy PEAB 4456.5 or Hansen EH851AQ21 ABB AMA 500L4A Tubular/Conical steel tower Not present HMF 262 T2



The new standard for moderate wind conditions

Siemens Wind Turbine SWT-2.3-101

Answers for energy.









Your trusted partner

Siemens has been a major driver of innovation in the wind power industry since the early 1980s when wind turbine technology was still in its infancy.

Technology has changed with the times, but Siemens' commitment to providing its customers with proven wind turbine solutions remains the same.

The combination of robust and reliable turbines, highly efficient solutions for power transmission and distribution and a deep understanding of the entire energy market ensures that Siemens will continue to be a leading supplier. Siemens' record, when it comes to on-time delivery, is impeccable. Long-lasting customer relationships, based on the successful installation of wind turbines, provide for a sound, sustainable and profitable investment.

Drawing on 140 years of experience in the energy sector, a strong focus on renewables and a global network of highly skilled and trained employees, Siemens has proven itself to be a trustworthy and reliable business partner. And will continue to be in the future.

Harvest more energy from sites with moderate wind conditions

The Siemens SWT-2.3-101 turbine is designed to deliver unparalleled performance and reliability, making it especially suited to areas with moderate wind conditions.

The SWT-2.3-101 turbine offers low energy production costs and joins Siemens' 2.3-MW product family, which has proven availabilitity that is among the highest in the industry. The 101-meter rotor is specifically designed to optimize the energy output in areas with moderate wind conditions. The turbine is also ideal for all types of grid connections in most major markets. The SWT-2.3-101 is designed to last. The robust and reliable design offers a high yield with low maintenance costs. The turbine is backed by advanced condition monitoring and diagnostics, which constantly examine the turbine. Any change in a turbine's performance is promptly addressed by an experienced after-sales service team either remotely or in the field.

If you desire a better return on investment and superior availability, take a closer look at the SWT-2.3-101 turbine.



Superior performance gives higher yields

Optimum energy at moderate wind conditions

Harvesting more energy

The SWT-2.3-101 wind turbine is designed to increase the energy returns from sites with moderate wind conditions. Advanced blade technology also allows for quieter operation. The B49 blade with a rotor diameter of 101 meters and pitch regulation optimizes power output and increases control over the energy output.

High availability

Currently, the Siemens fleet of 2.3-MW wind turbines sets the industry standard for availability. The SWT-2.3-101 will build on the reputation for reliability that the market has come to expect from a Siemens Wind turbine.

High yield with minimal maintenance

Siemens optimizes the return on investment in its wind turbines through intelligent maintenance that ensures the turbine to deliver high yield with low operational costs.

The rugged structural design, combined with an automatic lubrication system, internal climate control and a generator system without slip rings contributes to exceptional reliability. The innovative design of the SWT-2.3-101 allows for longer service intervals.

Superior grid compliance

The Siemens NetConverter[®] system is designed for maximum flexibility in the turbine's response to voltage and frequency variations, fault ride-through capability and output adjustment. The advanced wind farm control system provides state-of-the-art fleet management.

Proven track record

Siemens has a proven track record of providing reliable turbines that last. The world's first offshore wind farm in Vindeby, Denmark, was installed in 1991 and is still fully operational. In California, Siemens installed over 1,100 turbines between 1983 and 1990, with 97% still in operation today. Siemens takes its commitment to reliability seriously and prides itself on the long lifespan that its turbines have demonstrated.



No compromise on reliability

SWT-2.3-101: Newest member of the extremely reliable product family

Designed for life

Siemens turbines are designed to last. The robust design of the SWT-2.3-101 allows for trouble-free output throughout the complete lifecycle of the turbine.

The blades are made of fiberglass-reinforced epoxy in Siemens' proprietary IntegralBlade[®] manufacturing process. The blades are cast in one piece in a closed process, which eliminates the traditional weaknesses found at glue joints in other manufacturers' blades. Like the turbine itself, the blades are designed to last.

Climate control within the turbine protects vital equipment from the outside environment. The turbine also offers controlled-wear strategies for critical components, which results in a further reduction of maintenance costs.

Safety first

Safety is at the heart of all Siemens operations. From production to installation, operation and service, Siemens strives to set the standard in safety.

The fail-to-safe capabilities within a turbine, combined with Siemens' superior lightning protection system, are designed to enhance security for the turbine.

Advanced operations support

Given the logistical challenges associated with servicing wind farms, Siemens has equipped its turbines with a Turbine Condition Monitoring (TCM) system that reduces the need for on-site servicing.

Continuous monitoring of turbines allows for the discovery of small faults before they become major problems.

The TCM system continuously checks the external and internal condition of the wind turbine. Twenty-four hours a day, seven days a week precise measurements are taken of vibrations in the gearbox, the generator and the main shaft bearings. The system instantly detects deviations from normal operating conditions.

Using the knowledge gained from monitoring thousands of turbines over the years, Siemens' experts are exceptionally skilled at analyzing and predicting faults within a turbine. This allows Siemens to proactively plan the service and maintenance of the turbines as each fault can be categorized and prioritized based on the severity of the fault. Siemens can then determine the most appropriate course of action to keep the turbine running at its best.

Technical specifications



| Rotor | | Yaw system | |
|--|--|--------------------------------|--|
| Diameter | 101 m | Туре | |
| Swept area | 8,000 m2 | Monitoring system | |
| Rotor speed Power regulation | 6-16 rpm Pitch regulation with variable speed | SCADA system Remote control | |
| Blades | | Tower | |
| Type Length | B49 49 m | Type Hub height | |
| | | Operational data | |
| Type Activation | Full-span pitching Active, hydraulic | Cut-in wind speed | |
| Transmission system | | Cut-out wind speed | |
| Gearbox type Gearbox ratio | 3-stage planetary/helical 1:91 | Maximum 3 s gust | |
| Gearbox oil filtering | Inline and offline | Weights | |
| Oil volume | Approximately 400 l | Rotor Nacelle | |
| Mechanical brake | | Tower for 80-m hub hei | |
| Туре | Hydraulic disc brake | | |
| Generator | | | |
| Type Nominal power Voltage Cooling system | Asynchronous 2,300 kW 690 V Integrated heat exchanger | | |

| Yaw system | |
|---|---|
| Гуре | Active |
| Monitoring system | |
| SCADA system Remote control | WebWPS Full turbine control |
| Tower | |
| Гуре Hub height | Cylindrical and/or tapered tubular 80 m or site-specific |
| Operational data | |
| Cut-in wind speed Rated power at Cut-out wind speed Maximum 3 s gust | 3-4 m/s 12-13 m/s 25 m/s 55 m/s (standard version) 60 m/s (IEC version) |
| Weights | |
| Rotor Nacelle Fower for 80-m hub height | 62 tons 82 tons 162 tons |



Sales power curve

The calculated power curve data are valid for standard conditions of 15 degrees Celsius air temperature, 1013 hPa air pressure and 1.225 kg/m³ air density, clean rotor blades and horizontal, undisturbed air flow. The calculated curve data are preliminary.



Nacelle arrangement

- 1. Spinner
- 2. Spinner bracket
- 3. Blade
- 4. Pitch bearing
- 5. Rotor hub
- 6. Main bearing
- 7. Main shaft
- 8. Gearbox
- 9. Brake disc

11. Generator

10. Coupling

- 12. Service crane
- 13. Meteorological sensors
- 14. Tower
- 15. Yaw ring
- 16. Yaw gear
- 17. Nacelle bedplate
- 18. Oil filter
- 19. Canopy
- 20. Generator fan

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Your ref:

Our ref: OC-642222-12EVTT1-7 BEVE/CERI

Date: 2010-11-11

Dear Gildas Courtet

SWT-3.0-101 DD, Type Certification Plan for Certification

We hereby confirm that the type certification of SWT-3.0-101 DD is ongoing.

We have received a plan from Siemens Wind Power specifying the remaining documentation to be submitted for certification as well as the delivery schedule.

Assuming that delivery of documentation will be according to the submitted plan, we believe that the targets for finalizing B Type Certification with power curve measurements as the only outstanding issue, and final IEC Type Certification are realistic. Acoustic noise measurement is also included in the plan submitted by Siemens Wind Power. However, this is an optional element for IEC Type Certification.

The targets given in the plan are as follows:

- March 2011 B Type Certification (power curve measurements outstanding)
- September 2011 IEC Type Certification

Yours sincerely for Det Norske Veritas, Danmark A/S

Bente Vestergaard Project Manager

Bright outlook for improved profitability

Direct drive wind turbine SWT-3.0-101

Answers for energy.

SIEMENS



How can you gain maximum performance with 50 percent fewer parts?



As wind power plants develop capacities similar to conventional power plants, power generation companies throughout the world are striving for greater efficiency and cost-effectiveness.

Siemens' solution: increase availability and profitability through innovative technology. The SWT-3.0-101 wind turbine from Siemens offers innovation through a completely new generator. With half the parts of a conventional geared turbine, and much less than half the number of moving parts, the new wind turbine is easy to maintain and extremely reliable. The compact design allows for costeffective transportation on standard vehicles within most markets.



Fewer components, increased profitability! What once was only a dream is now ready for serial production. Comprehensive testing has shown that the new direct drive wind turbine is a reliable investment in the future of power generation.

Henrik Stiesdal, CTO, Siemens Wind Power

Performance and profitability go hand in hand

In designing a wind turbine, a holistic view of the design and construction, materials, processes, manufacture, and installation is critical. With the SWT-3.0-101, Siemens started with the ambitious aim of reducing the number of components by half, while increasing performance. Thanks to innovative engineering, that vision is now a reality.

The gearless SWT-3.0-101 carefully balances all these factors in a compact system that has the potential to significantly lower maintenance costs and service time.

Reduced complexity

Regardless of how reliable Siemens' wind turbine gearboxes have been in the past, the gearbox is always the most complex component of a wind turbine. Eliminating the gearbox reduces complexity and increases reliability.

Siemens has opted for a permanent magnet generator for improved efficiency. Unlike an electrically excited machine with a gearbox, a permanent magnet excited machine does not expend any energy on the excitation itself. The SWT-3.0-101 also has an outer rotor, where the rotor spins on the outside of the stator. This design feature allows the rotor to operate within narrower tolerances, which aids in keeping the dimensions of the nacelle compact.



Simplified design

Despite the compact design, Siemens has actually given service technicians more space in which to operate. The drastic reduction of parts has created a relatively spacious environment within the nacelle, where key components are readily accessible. The "plug and play" nature of components allows most components to be interchanged without impacting other components.

The top-mounted, passive cooling system improves energy efficiency. The SWT-3.0-101 has a dual cooling system that provides an even cooling of the generator. The coolant life expectancy is also increased, aiding both reliability and performance. Of the five key components in a wind turbine – the blade, rotor hub, nacelle, tower, and controller – all but the nacelle are adopted from the existing Siemens' portfolio. By utilizing proven components, Siemens has endeavored to eliminate many of the variables traditionally associated with the introduction of such an innovative product.

Ease of transportation and erection

The nacelle has a length of 6.8 meters and a diameter of 4.2 meters. Weighing 73 tons, the SWT-3.0-101 machine is "light" enough to be carried on trucks commonly available in most major markets. The dimensions of the new wind turbine allow for greater flexibility in road transportation. Key bridge and tunnel clearance specifications have been carefully considered when engineering the machine, and as a result, the 3.0 MW wind turbine can navigate many of the most demanding transport routes.

One clear advantage of the new nacelle's size is that the nacelle is transported in one piece to minimize expensive and risky on-site assembly of critical components. The compact system design, with a reduced number of rotating wear parts, is an ideal basis for profitable deployment onshore, offshore, and in coastal areas.



A new definition of competence: fully developed technology, advanced design

Grid performance with NetConverter®

Grid stability requirements grow as more wind power is fed into the grid, and Siemens sets the standard in the field of grid compliance.

Power conversion is implemented by the Siemens' NetConverter[®] system. This system is characterized by full conversion of the power generated, efficiently decoupling generator and turbine dynamics from the grid. The NetConverter[®] system can offer maximum flexibility in the turbine response to voltage and frequency control, fault ride-through, and output adjustment. As a result, Siemens wind turbines can be configured to comply with a variety of relevant grid codes in major markets and can be readily connected to the grid.

Siemens IntegralBlade®

The rotors of the SWT-3.0-101 are manufactured using patented IntegralBlade[®] technology. The blades are made in one piece from fiberglassreinforced epoxy resin in a single production step. As a result, there are no glue joints, which helps minimize the risk of environmental effects on the blade.

Efficient lightning protection

The SWT-3.0-101 has efficient lightning protection. Its overall basic construction is based on the international standard IEC 61400-24 Lightning Protection Level I.



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|-----|------|-------|-------|-----|-----|
| Nev | пеа | ures | ald | UIG | псе |

- New drive train design with permanent magnet generator is a technological leap forward
- Simple design with less moving parts reduces complexity and need for maintenance
- The compact and lightweight design is a major advantage for transportation and installation

Technical data

| IEC Class | IA |
|------------------------|----------------------|
| Rotor diameter | 101 m |
| Blade length | 49 m |
| Swept area | 8,000 m ² |
| Hub height | 80 m |
| Power regulation | pitch regulated |
| Annual output at 8 m/s | 11,600 MWh |
| Blade weight | 10.3 t |
| Nacelle weight | 73 t |
| 80–100 m tower weight | 162 t |

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