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Executive Order on the Technical Certification Scheme for the Design, Manufacture, Installation, Maintenance and Service of Wind Turbines

Executive Order no. 651 of 26 June 2008

The following shall be laid down pursuant to section 16(2), section 68(2) and (3), and sections 88, 90 and 92 of the Danish Electricity Supply Act, cf. Consolidated Act no. 1115 of 8 November 2006, as amended by section 1 of Act no. 549 of 6 June 2007, and section 1 in Act no. 503 of 17 June 2008:

Scope

1.-(1) The purpose of the technical certification scheme for the design, manufacture, installation, maintenance, and service of wind turbines (the technical certification scheme) is to ensure that wind turbines and associated foundations are designed, manufactured, installed, serviced and maintained in compliance with established safety, energy and quality requirements. The certification scheme is based on requirements and procedures for the design, manufacture and installation of wind turbines established by the international code IEC WT01, cf. Annex 1. The IEC WT01 incorporates the following main elements: type certification, component certification and project certification.

(2) The technical certification scheme shall cover the individual wind turbine, including electrotechnical installations, transformers and foundations, up to and including turbine connection terminals to the electricity supply grid, including components for leading cables away from wind turbines and permanent technical equipment such as cranes, crane fittings, lift fittings and service lifts.

(3) Wind turbines installed onshore and offshore (in territorial waters and the exclusive economic zone), and which are used for electricity production shall be certified in accordance with sections 2-17.

(4) Wind turbines installed for testing and demonstration purposes may be certified pursuant to sections 8-9.

(5) Wind turbines which have been modified, installed at new sites (relocated) or used after the expiry of a certificate for testing and demonstration shall be re-certified pursuant to sections 10-11.

(6) Wind turbines with a rotor area of 5 sq. m. or less may be type certified in accordance with the provisions laid down in sections 12-13.

(7) The Danish Energy Agency may decide that certain wind turbines covered by this Executive Order be wholly or partially exempt from the provisions of this Executive Order.

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Type certification

- 2.** Wind turbines shall be type certified by a certifying body, cf. section 16, on the basis of the technical requirements and procedures laid down in Annex 2. Type certification of main wind turbine components may be carried out separately.
- 3.- (1)** Certificates for type certification of wind turbines shall be issued to manufacturers or suppliers of wind turbines within two classes of certification (A or B). Type certification shall be a prerequisite for issue of a certificate for project certification, cf. section 6.
- (2)** Certificates for type A certification shall be issued for a maximum of five years.
- (3)** Certificates for type B certification shall be issued for a maximum of one year. Type B certification allows for issues without significant importance to primary safety to be evaluated and verified after the certificate has been issued within a time limit specified by the certifying body.
- (4)** Wind turbines with type A or B certification shall have a certified quality management system in connection with the type certification.
- (5)** Manufacturers and suppliers shall ensure that a valid type certificate has been issued before a wind turbine is installed and put into operation.
- (6)** The certification scheme shall not exempt manufacturers or suppliers from their normal product liability.
- 4.** The technical requirements specified in Annex 2 may in special cases be deviated from, if compliance with safety and energy requirements can be satisfactorily documented, and if the quality conditions for manufacture and installation are not compromised. In the event of deviations of fundamental importance, a certifying body shall submit such deviations for consultation with the Danish Energy Agency's Secretariat for the Danish Wind Turbine Certification Scheme, cf. section 18(1).
- 5.- (1)** Application for type certification shall be sent to a certifying body with the relevant documentation required for evaluation and verification of the wind turbine type in accordance with the requirements laid down in Annex 2.
- (2)** Applicants for type certification shall be responsible for handing over information about technical requirements for the type certification required by the body certifying the applied quality management system, cf. section 3(4).
- (3)** Once a year, holders of a type A certificate shall submit a report to the type certifying body which has issued the certificate about matters significant to safety, energy and quality in relation to the specific type of wind turbine or type of wind turbine component as well as matters of importance to the certified quality management system, for as long as the type certificate is valid.
- (4)** Holders of a type B certificate shall inform the certifying body that issues project certification, cf. section 6, for wind turbines installed based on a type B certificate, about the results of the type certifying body's evaluation and verification of unresolved issues.

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Project certification

6.- (1) Wind turbines shall, at the time of installation, be project certified by a certifying body, cf. section 16, on the basis of the requirements and procedures laid down in Annex 3 to demonstrate whether the prerequisites for types A and B certification are also applicable to current installation conditions.

(2) If a wind turbine obtains project certification on the basis of type B certification with unresolved issues, the need for necessary changes shall subsequently be evaluated by the project certifying body based on the type certifying body's results of evaluation and verification of unresolved issues, cf. section 5(4). The project certifying body shall inform the wind turbine owner about any necessary changes.

(3) The certificate for project certification shall be issued to the wind turbine owner.

(4) Wind turbine owners shall be responsible for ensuring that a valid project certificate has been granted before a wind turbine is put into operation. The use of a wind turbine shall be conditional upon maintenance and service being carried out, cf. section 15, and no changes being made to the wind turbine without a renewed certification, cf. section 10.

(5) Wind turbine owners shall be responsible for ensuring that changes required pursuant to subsection (2) be implemented and documented within one year after having received demands for such changes, and shall ensure that a revised project certification be made available on the basis hereof.

7.- (1) An application for project certification, cf. section 6, shall be submitted to a certifying body together with a valid type certification and relevant documentation required for evaluation and verification of the wind turbine project in accordance with the requirements laid down in Annex 3, items 1-5.

(2) Applicants for project certification shall be responsible for handing over information about technical requirements for the type certification required by the body certifying the quality management system applied.

Certification for testing and demonstration

8.- (1) Wind turbines installed for testing and demonstration purposes in connection with the designing of new types of wind turbines may be approved by a certifying body, cf. section 16, based on an evaluation of requirements and procedures related to safety, cf. Annex 3, item 6.

(2) Certificates for wind turbines for testing and demonstration purposes shall be issued for wind turbines at specific locations to the wind turbine owners concerned for a limited period of up to three years.

(3) Wind turbine owners shall be responsible for ensuring that a valid certificate for testing and demonstration has been issued before a wind turbine is installed and put into operation. The use of a wind turbine during the test period is conditional to maintenance and service being carried out, cf. section 15, and on no changes being made to the wind turbine without renewed certification, cf. Annex 3, item 6.

(4) Wind turbines which have been certified for testing and demonstration purposes pursuant to subsection (1) or pursuant to previous executive orders shall not be used after the expiry of

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the certificate. Continued use of the wind turbine is conditional to a new certificate being issued, cf. section 10(1).

9. Applications for certification for testing and demonstration, cf. section 8, shall be submitted to a certifying body together with documentation relevant for the evaluation and verification of wind turbines in relation to the safety requirements, cf. Annex 3, item 6. Such documentation shall also include a test plan for the period for which application is being made.

Certification of modifications, relocation and use after the expiry of a certificate for testing and demonstration

10.- (1) Wind turbines which have previously been certified pursuant to sections 2-9 or approved pursuant to previous executive orders shall, upon modification, relocation and use after the expiry of a certificate for testing and demonstration, be recertified by a certifying body on the basis of technical reports and safety and function tests, cf. Annex 3, item 7.

(2) Certificates for modification, relocation and use after the expiry of a certificate for testing and demonstration shall be issued to the owner of the wind turbine concerned.

(3) Wind turbine owners shall be responsible for ensuring that a valid certificate for the modification, relocation and use after the expiry of a certificate for testing and demonstration has been issued before a wind turbine is installed and put into operation. The use of a wind turbine are conditional to maintenance and service being carried out, cf. section 15, and no changes being made to the wind turbine without a renewed certificate, cf. subsection (1).

(4) Dismantled wind turbines which have been issued with scrapping certificates shall not be connected to the electricity supply grid in Denmark.

11. Applications for certification for modification, relocation and use after the expiry of a certificate for testing and demonstration, cf. section 10, shall be submitted to a certifying body with documentation relevant for evaluation and verification of the wind turbine project in relation to the safety requirements, cf. Annex 3, item 7.

Type certification of wind turbines with a rotor area of 5 sq. m. or less

12.- (1) Wind turbines with a rotor area of 5 sq. m. or less may be type certified by a certifying body, cf. section 16, on the basis of the requirements and procedures laid down in Annex 4.

(2) Certificates for type certification of wind turbines with a rotor area of 5 sq. m. or less shall be issued to wind turbine manufacturers or suppliers.

(3) Manufacturers or suppliers shall be responsible for ensuring that a valid type certificate has been issued before a wind turbine is installed and put into operation.

(4) Wind turbines with a rotor area of 5 sq. m. or less shall not subject to the requirements for project certification, cf. section 6, and the requirements for certification for testing and demonstration, cf. section 8, and the requirements for certification for modification, relocation

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and use of wind turbines after the expiry of a certificate for testing and demonstration, cf. section 10, and the requirements for maintenance and service, cf. section 15.

13. Applications for type certification of a wind turbine with a rotor area of 5 sq. m. or less, cf. section 12, shall be submitted to a certifying body, cf. section 16, with documentation relevant for evaluation and verification of the wind turbine in relation to the safety requirements, cf. Annex 4.

Grid connection

14. The electrical impact of a wind turbine on the grid connection shall be documented in connection with project certification, certification for testing and demonstration, certification for modification, relocation and use after the expiry of a certificate for testing and demonstration and certification of wind turbines with a rotor area of 5 sq. m or less, and in accordance with the system operator's regulations TF 3.2.5 "Wind farms connected to grids with voltages in excess of 100 kV" or TF 3.2.6. "Wind farms connected to grids with voltages less than 100 kV" cf. Annex 3, item 8.

Maintenance, service and major damage

15.-(1) Owners of a wind turbine certified pursuant to sections 2-14, certified or approved pursuant to previous executive orders shall ensure that the wind turbines are maintained and serviced by a certified or approved enterprise which has documented sufficient basis, experience and expertise in maintenance and service of the specific type of wind turbine, cf. subsections (2)-(5) and Annex 5, for as long as the wind turbines are in operation.

(2) A certified enterprise is an enterprise with a certified and implemented DS/EN ISO 9001:2000 quality management system or similar system including all the types and sizes of wind turbines which the enterprise can maintain and service.

(3) An approved enterprise is an enterprise which is approved by the Danish Energy Agency on recommendation from the Danish Energy Agency's Secretariat for the Danish Wind Turbine Certification Scheme. The enterprise may only perform maintenance and service on stall-regulated wind turbines with an output of less than 600 kW included in the approval.

(4) Under special circumstances, the Danish Energy Agency may approve that maintenance and service are carried out by an enterprise not included in subsection (2) or (3) on recommendation from the Danish Energy Agency's Secretariat for the Danish Wind Turbine Certification Scheme.

(5) The Danish Energy Agency's approvals, cf. subsections (3) and (4), are issued for periods of two years, after which it may be prolonged on the basis of an application with documentation of maintenance and service performed within the last two years.

(6) Wind turbine owners shall perform regular maintenance and service pursuant to the type and project certification. Where the required service interval is exceeded by more than three months, the Danish Energy Agency can order the owner to correct matters immediately or within a specified period, cf. section 19.

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(7) A service report shall be drawn up for each service, and sent to the owner immediately after each service. Wind turbine owners shall report the service performed, according to the service manual, to the TSO (Transmission System Operator) and file service reports for as long as the wind turbine is in operation.

(8) In the event of major damage and damage affecting safety, owners of wind turbines shall inform the Danish Energy Agency's Secretariat for the Danish Wind Turbine Certification Scheme immediately.

Certifying bodies

16.-(1) Certifying bodies that issue certificates for type and project certification, certificates for testing and demonstration, as well as certificates for modification, relocation and use after the expiry of a certificate for testing and demonstration shall be accredited by the Danish Accreditation and Metrology Fund, DANAK, in accordance with DS/EN 45011 (alternatively DS/EN 17020:2004 type A in the case of project certification), cf. however, subsection (3), or by a similarly recognized international accreditation body that is a co-signatory to the European Co-operation for Accreditation (EA) multilateral agreement on mutual recognition. Accreditation documentation shall state that accreditation encompasses the provisions of this Executive Order.

(2) Certifying bodies, certifying quality management systems for manufacture, installation, service and maintenance, shall be accredited by DANAK in accordance with DS/EN ISO/IEC 17021:2004 or by a similar recognised international accreditation body that is co-signatory to the European Cooperation for Accreditation (EA)'s multilateral agreement on mutual recognition.

(3) Project certification of onshore wind turbines, cf. section 6, certification for modification, relocation and use after the expiry of a certificate for testing and demonstration, cf. section 10, and certification of small wind turbines with a rotor area of 5 sq. m. or less, cf. section 12, may be carried out by a non-accredited certifying body. Such certifying body shall be approved by the Danish Energy Agency after recommendation by the Secretariat for the Danish Wind Turbine Certification Scheme on the basis of documentation about the necessary qualifications in respect of wind turbine installation, for example, through a certified quality management system.

(4) All certifying bodies that carry out:

- 1) type and project certification, including certification of quality management systems,
- 2) certification for testing and demonstration and certification for modification, relocation and use after the expiry of a certificate for testing and demonstration,
- 3) measurements and tests, and
- 4) certification of service bodies' quality management systems

shall be registered with the Danish Energy Agency's Secretariat for the Danish Wind Turbine Certification Scheme. If the certifying body is accredited, valid accreditation documentation shall be submitted. If the certifying body is not accredited, certification according to subsection (3) shall be submitted.

(5) The certifying body shall, once a year, report to the Secretariat for the Danish Energy Agency's Wind Turbine Certification Scheme on how the accreditation terms on monitoring certificates for type certification issued by the body are being observed.

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(6) The certifying body shall withdraw an existing type certification if the approved wind turbine type proves to have serious safety defects and if it is established that the turbine fails to meet the conditions for certification.

17.-(1) Certificates for type and project certification, certificates for testing and demonstration, and certificates for modification, relocation and use after the expiry of a certificate for testing and demonstration shall state that they have been issued in accordance with the provisions of this Executive Order. Copies of the certificates issued, together with accompanying certification reports and notifications about withdrawn certificates shall be submitted by the certifying body to the Danish Energy Agency's Secretariat for the Danish Wind Turbine Certification Scheme, which shall then update and publish lists of valid certificates.

(2) Documentation for issued certificates, cf. sections 2–14, shall be stored by the certifying body that issued the certificate. Documents related to certificates must be stored for at least 20 years.

(3) If project certification of onshore wind turbines or certification for modification, relocation and use after the expiry of a certificate for testing and demonstration were carried out by a non-accredited certifying body, cf. section 16(3), the wind turbine owner shall keep the documentation for as long as the wind turbine is in operation.

Administrative Provisions, Inspection, Monitoring etc.

18.-(1) The Danish Energy Agency's Secretariat for the Danish Wind Turbine Certification Scheme has been established by the Danish Energy Agency to manage the administration and maintenance of the technical basis for certification, including co-ordination of standardisation work. The Secretariat also acts as the Danish Energy Agency's information and knowledge centre for the certification scheme. The Certification Secretariat is located at Risø National Laboratory, Technical University of Denmark (DTU).

(2) To assist with the ongoing evaluation of the professional content and administration of the scheme, the Danish Energy Agency has appointed an advisory committee, the members of which include representatives of the wind turbine industry, wind turbine owners, system operators, grid and electricity supply companies, insurance companies, certifying bodies and standardisation and research institutes etc. The Secretariat for the Danish Wind Turbine Certification Scheme manages practical tasks in connection with the meetings of the advisory committee.

(3) The Secretariat for the Danish Wind Turbine Certification Scheme shall once a year submit a report on its activities to the Danish Energy Agency.

19.-(1) The Secretariat for the Danish Wind Turbine Certification Scheme may, independently of inspections of accredited bodies, collect information from certifying bodies, wind turbine manufacturers, suppliers and wind turbine owners for use in administration of the certification scheme.

(2) To monitor whether maintenance and service is performed as specified, cf. section 15, the Danish Energy Agency's Secretariat for the Danish Wind Turbine Certification may request information from wind turbine owners.

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(3) The TSO (Transmission System Operator) determine the requirements for the reporting format for maintenance and service, cf. section 15(7), and register when service has taken place.

(4) Regulations as mentioned in subsection (3) shall be approved by the Danish Energy Agency.

(5) The Danish Energy Agency may order that matters which are contrary to the provisions of this Executive Order be rectified with immediate effect or within a specified period. Orders relating to the certificates issued by accredited certifying bodies shall be notified to the accreditation body.

20.-(1) Type certification costs, including the related certification of quality management systems, necessary surveys, tests and inspections performed as part of the certification process shall be borne by the manufacturers and suppliers. Project certification costs, certification for testing and demonstration costs and costs associated with certification for modification, relocation and use after the expiry of a certificate for testing and demonstration shall be borne by the wind turbine owner.

(2) Costs for certification or approval of quality management systems for service and maintenance shall be borne by the service enterprises.

Appeals

21.-(1) Appeals about decisions made by a certifying body pursuant to the provisions of this Executive Order may be lodged with the Danish Energy Agency. Appeals shall be lodged in writing within four weeks of notification of the decision.

(2) Appeals about decisions made by the Danish Energy Agency under the provisions of this Executive Order may not be lodged with another administrative authority.

Penalties

22.-(1) Unless a more severe penalty is due under other legislation, fines shall be imposed on any person who:

- 1) fails to obtain type and project certification, certification for testing and demonstration, certification for modification, relocation and use after the expiry of a certificate for testing and demonstration and certification of wind turbines with a rotor area of 5 sq. m. or less, cf. sections 2, 6, 8, 10 and 12,
- 2) fails to provide information as described in section 5(2), section 7(2) and section 15,
- 3) carries out activities under this Executive Order without valid accreditation in accordance with section 16,
- 4) fails to store documentation in accordance with section 17,
- 5) gives incorrect or misleading information to a certifying body or the Danish Energy Agency or fails to give information if so requested,
- 6) fails to comply with an order concerning service and maintenance pursuant to section 15(1), or
- 7) fails to comply with an order issued pursuant to this Executive Order, cf. section 19(5).

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(2) Companies etc. (legal persons) may be subject to criminal liability in pursuance of the regulations in Chapter 5 of the Criminal Code.

Entry into Force, etc.

23.-(1) This Executive Order enters into force 1 July 2008. For up to one year after the Executive Order have entered into force, maintenance and service can be carried out by enterprise that are not yet certified or approved, cf. section 15, provided that the enterprise can document to the Danish Energy Agency's Secretariat for the Danish Wind Turbine Certification Scheme within three months after the Executive Order has entered into force that they have commenced the establishment of a quality management system.

(2) Executive Order No. 1018 of 20 August 2007 on technical certification scheme for the design, manufacture and installation of wind turbines shall be repealed. Certificates and approval issued pursuant to this and previous executive orders shall apply until the expiry date established in the certificate or the approval.

The Danish Energy Agency, 26 June 2008

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Annex 1

Requirements and Procedures for the Certification Scheme

The technical requirements for the design, manufacture and installation of onshore and offshore wind turbines are based on the International Electrotechnical Commission's document IEC WT01 (IEC System for Conformity Testing and Certification of Wind Turbines), which is a code for an internationally recognised certification system of wind turbines. The IEC WT01 system is based on the principle of mutual international recognition of certification and type testing carried out at national level and based on the IEC 61400 series of standards for wind turbines. The IEC WT01 system also provides a basis for the mutual recognition and certification of quality management systems employed in manufacturing and product control.

IEC WT01 establishes requirements and procedures for evaluating and verifying wind turbines in accordance with technical standards and other established technical requirements of importance for safety, functionality and output, testing, and electricity supply.

IEC WT01 contains the following main elements: type certification (including component certification) and project certification.

Type certification in accordance with IEC WT01, part 12, includes the following elements:

- Design Evaluation.
- Type Testing.
- Manufacturing Evaluation.
- Foundation Design Evaluation.
- Type Characteristic Measurements.
- Final Evaluation Report.
- Type Certificate.

Project certification in accordance with IEC WT01, part 13, includes the following elements:

- Site Assessment.
- Foundation Design Evaluation.
- Installation Evaluation.
- Project Certificate.
- Operation and Maintenance surveillance.

The basis for certification in IEC WT01 is supplemented with requirements as described in Annexes 2–3 and 4 concerning the certification of wind turbines with a rotor area of 5 sq. m. or less. Reference is also made to the Danish Energy Agency's guidelines for technical certification of wind turbines in Denmark.

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Annex 2

Type Certification

Type certification is carried out on the basis of evaluation and verification in accordance with part 12 of IEC WT01 of the manufacturer's or supplier's documentation of the wind turbine concerned or main components, supplemented with type tests. In addition, a Danish certificate for type certification may only be issued provided that the following supplementary conditions are satisfied:

1. Design Evaluation shall, as a minimum, be carried out to the extent described in IEC WT01, clause 12.2 and
 - Climatic conditions and other design conditions (such as foundation conditions) that form the basis for the type certification shall be typical of the relevant installation site in Denmark.
 - In addition to requirements and procedures relating to the control and safety system, the wind turbine shall have at least one braking system that acts aerodynamically.
 - The safety of the wind turbine shall be evaluated in accordance with valid standards in the DS/EN 61400 series.

The structural and mechanical safety shall be selected in the normal safety class. For main components, component class 2 shall be selected as a minimum. In the evaluation of the construction of the wind turbine in connection with renewal and updates of type A certification (including supplementary main components) as well as upgrading of type B certification to type A certification, documentation of the load basis may be completed in accordance with the standards used in the turbine's original type A or B certification.

- The assumed reflection conditions for blades shall be specified in the wind turbine documentation, cf. DS/ISO 2813.
 - The wind turbine shall be CE-Labelled. CE-labelling shall be accompanied by a conformity statement which includes specification of the design regulations (standards) in accordance with which the wind turbine has been built and a manufacturer's statement confirming compliance with personnel safety regulations and electrical installation regulations.
 - Wind turbine lightning protection shall be documented, cf. DS/IEC/TR 61400-24.
 - Electrical installations in wind turbines shall also be documented in accordance with paragraph 204-1/EN60204-1 of the Danish Executive Order on High Voltage.
2. Type Testing shall, as a minimum, be carried out to the extent described in clause 12.3 of IEC WT01, applying applicable standards in the DS/EN 61400 series, and
 - The type certifying body may require additional testing for evaluation and verification of wind turbine documentation, if documentation is uncertain, if figures in the documentation deviate from expected figures, or if normally accepted calculation procedures have not been used.
 3. Manufacturing Evaluation shall, as a minimum, be carried out as described in clause 12.4 of IEC WT01, and
 - A certified quality management system for the design and manufacture of wind turbines is required for wind turbines with type A and B certification.

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4. Foundation Design Evaluation shall, as a minimum, be carried out to the extent described in clause 12.5 of IEC WT01, and

- The safety of foundations shall be evaluated in accordance with valid standards in the DS/EN 61400 series. Structural and mechanical safety shall be selected in normal safety classes and component class 2 shall be selected as a minimum.

5. Supplementary Type Characteristic Measurements shall, as a minimum, be carried out as described in clause 12.6 of IEC WT01, and

- Measurement of noise emission or sound output level (source strength) shall be executed according to the requirements contained in the Annex to the Executive Order on Wind Turbine Noise issued by the Danish Ministry of the Environment. Wind speed can best be determined as described in standard DS/EN 61400-11 on the basis of the power produced (item 27), and the requirements for placement of reference position and measurement board in DS/EN 61400-11 may be used.
- Noise measurements shall be carried out and documented as accredited technical testing by certified accredited laboratories or persons, cf. the Executive Order on Quality Requirements for Environmental Measurements Performed by Accredited Laboratories, Certified Persons etc., issued by the Danish Ministry of the Environment.

6. The Final Evaluation Report shall, as a minimum, be prepared to the extent described in clause 12.7 of IEC WT01, and

- Together with type certification, there shall be an installation manual in Danish (or English in the case of offshore wind turbines) available containing details of transport, packing and unpacking, onsite handling, component identification and weight, initial acceptance inspection, assembly, installation and running-in, including bolt tensioning procedures and testing procedures.
- Together with type certification, there shall be an operating manual in Danish (or English in the case of offshore wind turbines) available which complies with the requirements for maintenance and service of the wind turbine for its entire useful life.
- A user manual in Danish (or English for offshore wind turbines) shall be available together with a type certification that complies with the requirements laid down in Directive 98/37/EC of the European Parliament and of the Council of 22 June 1998 on the approximation of the laws of the Member States relating to machinery (the Machinery Directive), as specified by the Executive Order of the Danish Working Environment Authority on the Use of Technical Equipment.

7. A Type Certificate shall be issued as described in clause 12.8 of IEC WT01, and

- The certification number shall consist of a specified type certification class (as the first part of the number), identification of the certification body, and a serial number.
- Date of issue and validity and accreditation number and name of the accreditation body shall be specified on the type certificate.

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Annex 3

Project Certification, Certification for Testing and demonstration and Certification for Modifications, Relocation and Use after the Expiry of a Certificate for Testing and demonstration

Project certification shall be completed on the basis of evaluation and verification in accordance with part 13 of IEC WT01. The certification may comprise one or more wind turbines at the same site. In addition, issue of Danish project certification shall also be based on the following supplementary conditions, in that the structural safety of the overall integrated system consisting of wind turbine and foundation design (including soil modelling) shall be approved for all critical load combinations. The aim is for offshore turbines to be subject to the same levels of safety as are normal for onshore wind turbines in Denmark, where wind turbines are selected in normal safety classes and, as a minimum, in component class 2 in accordance with the safety standards in the DS/EN 61400 series.

1. Site Assessment shall, as a minimum, be carried out to the extent described in clause 13.2 of IEC WT01, and

- Site assessment shall in particular consider the wind conditions in Denmark, including terrain, natural shelter and wind farm installation conditions.
- When installing offshore wind turbines, reports shall be prepared on the loads and load combinations produced by wind, current, waves and ice. The effect of wave propagation by passing ships shall be taken into consideration in areas protected against natural waves.
- The load basis used in wind turbine type certification shall be assessed on the basis of the specific location of the turbine.

2. Site Assessment shall, as a minimum, be carried out to the extent described in clause 13.3 of IEC WT01.

3. Installation Evaluation shall be carried out to the extent described in clause 13.4 of IEC WT01, with the following exceptions:

- Onshore wind turbines shall not be subject to installation evaluation and local manufacture.
- Offshore wind turbines shall be subject to installation evaluation and local manufacture, although third party surveillance is not required (clause 13.4.2 Surveillance/Audits).
- Evaluation of the installation quality system (clause 13.4.1 Installation Quality System) for offshore wind turbines shall encompass both manufacture and installation of the entire foundation, and certification may be based on standard DS/EN ISO 9001:2000. If the quality system is not certified, an audit agreement shall be established for the relevant project with a certifying body in accordance with standard DS/EN ISO 9001:2000.
- The service manual shall include the requirements laid down in the project certification for maintenance and service of the wind turbine.

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4. A Type Certificate shall be issued as described in clause 13.5 of IEC WT01, and taking the following conditions into account

- The certification number shall consist of identification of the certifying body and a serial number.
- The installation location of the wind turbine and name and address of the owner shall be specified.
- Date of issue of the project certificate shall be specified.
- Accreditation number and name of the accreditation body shall be specified, if the certifying body is accredited.

5. Operation and maintenance surveillance may be carried out upon agreement with the certifying body in accordance with WT01, clause 13.6. Maintenance and service must, as a minimum, be carried out in accordance with Annex 5.

6. Certification for testing and demonstration shall be carried out on the basis of evaluation and verification of safety conditions relating to type certification, cf. Annex 2, items 1, 2, 4, 5 and the safety conditions relating to project certification, cf. Annex 3, items 1-2. Certification shall contain an evaluation of the safety consequences of planned tests. The energy and quality conditions of wind turbines need not be evaluated and verified.

- Wind turbines with a rotor area of 5 sq. m. or less shall be approved in accordance with Annex 4.
- Certificates for certification for testing and demonstration shall specify:
- The name and address of the certifying body. The accreditation number and name of the accreditation body shall be specified, if the certifying body is accredited.
- References to the documentation used.
- The certification number shall consist of identification of the certifying body and a serial number.
- Location of the wind turbine and the owner's name and address.
- The date of issue of the certificate and the date of its expiry.

7. Certification for modifications, installation at a new location or use after the expiry of a certificate for testing and demonstration shall be carried out on the basis of a technical report describing the state of the wind turbine with the intended modifications and a safety and function test.

- Technical reports shall contain assessments of safety conditions for the wind turbine, a review of the technical documentation available for the wind turbine with the intended modifications and an evaluation of the justification for the intended modification, relocation and continued use.
- A safety evaluation shall be made of the new installation conditions.
- The technical report shall be supplemented by a report on safety and function tests performed in conjunction with the commissioning of the wind turbine.
- Certificates for certification of modification, certification for relocation and continued use of a test turbine shall specify the following:
- The name and address of the certifying body. The accreditation number and name of the accreditation body shall be specified if the certifying body is accredited.

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- References to the documentation used.
- A certification number which shall consist of identification of the certifying body and a serial number.
- Location of the wind turbine and the owner's name and address.
- The date of issue of the certificate.

8. Evaluation of the grid connection of wind turbines in connection with project certification, certification for testing and demonstration, certification for modification, relocation and use after the expiry of the a certificates for testing and demonstration and certification of wind turbines with a rotor area of 5 sq. m or less, and in accordance with the system operator's regulations TF 3.2.5 "Wind farms connected to grids with voltages in excess of 100 kV" or TF 3.2.6. "Wind farms connected to grids with voltages less than 100 kV".

- Evaluation shall include a decision about electricity quality produced by the wind turbine, including voltage changes, flicker and harmonics, and verification of overvoltage conditions, reserve capacity and power output conditions.

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Annex 4

Type Certification of Wind Turbines with a Rotor Area of 5 sq. m. or Less

Wind turbines with a rotor area of 5 sq. m. or less which comply with item 1 below may be type certified by a certifying body, cf. section 16, based on the requirements and procedures laid down in items 1-5. The term rotor area refers to the area swept by the rotor during one complete rotation around its axis.

1. Wind turbines shall be constructed to be automatically protected against runaway operation. This system shall be failsafe in the case of isolated breakdowns in the wind turbine.
2. Type certification shall, as a minimum, comprise verification of a test of the strength of the tower and rotor components (blades) and verification of a subsequent function test. In addition, verification shall be made of a calculation of rotors and towers with the loads used in testing. Testing shall, as a minimum, comprise:
 - Testing the strength of the installed turbine tower exposed to horizontal pulls of at least 300 Newton/sq. m. rotor area at hub height.
 - Static loads on the individual rotor components mounted in test stand with at least 300 Newton/sq. m. rotor area/number of rotor components. The rotor components are loaded at 2/3 radius from the root pulling in the direction of the flap.
 - A test of the wind turbine device preventing runaway operation. The device shall be tested at minimum wind speeds of at least 25% above nominal wind speed. Guidelines shall be drawn up informing users of the way the device works, ongoing inspection and testing.
 - Operational tests on one typical wind turbine set up in open countryside for a period of at least six months under Danish wind conditions, including the months of December to March or equivalent overseas wind conditions.
 - Function tests consisting of at least two 10-minute periods of medium wind speed of over 17 m/sec at a height of 10 metres. Testing at more than 17 m/sec can replace by a test in a wind tunnel.
3. For use in installation, the wind turbine's safety shall be evaluated relative to the desired foundation structure.
4. Requirements placed in accordance with other legislation, including requirements pursuant to building legislation, environmental protection acts (noise), health and safety at work acts, electrotechnical requirements pursuant to the Danish Electricity Supply Act and the High Voltage Executive Order and requirements in EU directives (including CE labelling requirements) shall be documented to the respective official bodies.
5. Certificates issued for type certification of wind turbines with a rotor area of 5 sq. m. or less shall specify:
 - The name and address of the certifying body. The accreditation number and name of the accreditation body shall be specified, if the certifying body is accredited.
 - References the documentation used in complying with the requirements in items 1-4.
 - A type certification number which shall consist of identification of the certifying body and a serial number.
 - The date of issue of the certificate.

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Annex 5

Maintenance and service

Maintenance and service of a wind turbine shall be performed by a certified or approved enterprise, cf. section 15, on the basis of specifications and time intervals specified for regular service of the wind turbine, cf. the type and project certification, and on the basis of the existing maintenance and service manuals, cf. Appendices 2 and 3. Service manuals and updates, which have safety implications for operating the wind turbine, shall be submitted to the owner of the wind turbine.

For existing wind turbines, where there are no specifications and service manuals prepared by the manufacturer, maintenance and service may be performed according to a service manual prepared by the service enterprise on the basis of the previous service performed on the wind turbine type concerned.

Certification of service enterprises

Certification of the quality management system and the regular audits of the service enterprise shall be performed by an accredited certifying body, cf. section 16.

Certification of the quality management system of a service enterprise must, as a minimum, document that maintenance and service is performed according to the requirements laid down in the type and project certification. This shall include a specification of the types of wind turbine covered. Furthermore, it must be ensured that the service enterprise has the following:

- service manuals for the turbine types concerned,
- the necessary tools,
- qualified personnel in relation to the nature of the task according to the service manual.

During each audit, it must be ensured that:

- service reports for each service visit are available in accordance with the service agreement entered into between the owner of the wind turbine and the service enterprise,
- maintenance and service are performed by qualified personnel in accordance with the intervals specified in the manuals on maintenance and service,
- to the extent necessary, a completed check list with documentation of operational conditions is available in accordance with the manuals on maintenance and service,
- any repairs and changes to and replacements of components have been performed in accordance with applicable service agreements.

The certifying body shall perform random controls to check that maintenance and service of the turbine have been performed as reported.

Following each audit, the service enterprise shall submit documentation hereof to the Danish Energy Agency's Secretariat for the Danish Wind Turbine Certification Scheme (the EGV Secretariat).

Approval of service enterprises

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Approval is granted to service enterprises that are able to document expertise in maintenance and service of wind turbines, including that they have personnel with documented experience.

Approval is granted on the basis of the application submitted to the EGV Secretariat, with the following enclosed:

- a list of the types of wind turbine the enterprise wishes certification to service,
- documentation that the enterprise has implemented a quality management system, including e.g.,
- list of the manuals on maintenance and service applied,
- previous experience with maintenance and service of the wind turbine types concerned,
- list of the training and formal qualifications of personnel.

The EGV Secretariat may request supplementary material for use in its recommendation.