



Statement of Compliance

GL Wind Statement No.: WT 00-006A-2004, Rev. 1

This Statement of Compliance for the Design Assessment of the Wind Turbine

GE Wind Energy 3.6s

is issued to

GE Wind Energy GmbH
Holsterfeld 16 / 48499 Salzbergen / Germany

The Design Assessment is based on the calculations and fabrication drawings listed in the relevant certification reports referenced below and the characteristic data given in the attached Annex.

Certification Report numbers and titles:

71491-1, version 2	dated 12.12.2002	Load Assumptions according to IEC 61400-1 WTGS class IIa and Ib (Hub Height 100 m)
71491-2	dated 30.06.2004	Safety System and Manuals
71491-3	dated 17.04.2003	Rotor Blade GE 50.5
71491-4, Rev.2	dated 24.01.2003	Machinery Components
71491-5	dated 05.05.2003	Tubular Steel Tower, Hub Height 100 m
71491-6	dated 02.02.2004	Electrical Equipment
71491-8	dated 30.06.2004	Commissioning

Normative references: International Standard IEC 61400-1 "Wind turbine generator systems – part 1: Safety requirements", second edition, dated February 1999.

Germanischer Lloyd "Regulations for the Certification of Wind Energy Conversion Systems", 1999 Edition.

Changes in design are to be approved by Germanischer Lloyd WindEnergie GmbH, otherwise this statement loses its validity. Fabrication surveillance is not part of this Statement of Compliance for the Design Assessment.


Due to a restriction clause in the Certification Report 71491-2 this statement is valid until 31st December 2004.

Hamburg, 8th October 2004
Woeb/MRat

Germanischer Lloyd
WindEnergie



Chr. Nath



i.V. M. Woebbeking

By DAP German Accreditation System for Testing
accredited Certification Body for products
The accreditation is valid for the fields of certification
listed in the certificate



DAP-ZE-3443.00

Germanischer Lloyd WindEnergie GmbH
Steinhöft 9
20459 Hamburg
Germany



Annex

8th October 2004

page 1/3

GL Wind Statement No.: **WEC 00-006A-2004, Rev. 1**

Characteristic Data GE Wind Energy 3.6s

General	Type:	horizontal axis wind turbine with variable rotor speed
	Power regulation:	independent electromechanical pitch system for each blade
	Rated power:	3600 kW
	Hub height:	100 m
	Rated rotational speed:	15.3 rpm
	Operating range rotational speed:	9.2... 17 rpm
	Cut-in wind speed:	3 m/s
	Rated wind speed:	12.2 m/s
	Cut-out-wind speed (30 s mean):	27 m/s
	Extreme wind speed (50-year-gust):	70 m/s
	Annual average wind speed:	10 m/s
	IEC 61400-1-Type class:	Ila and Ib

Nacelle	Manufacturer:	GE Wind Energy GmbH
	Drawing No.:	200000, sheet 1 + 2

Rotor	Diameter:	104 m
	Number of blades:	3
	Orientation:	upwind
	Blade type:	GE 50.5
	Blade material:	glass fibre reinforced epoxy
	Manufacturer:	GE Wind Energy GmbH
	Drawing No.:	905300, Rev. 3, sheet 1-14

Rotor Hub	Type:	cast
	Material:	EN-GJS-400-18U-LT
	Drawing No.:	200011, sheet 1-3



Statement of Compliance

Germanischer Lloyd
WindEnergie GmbH

Annex

8th October 2004
page 2/3

GL Wind Statement No.: **WEC 00-006A-2004, Rev. 1**

Main Shaft	Type: Material: Drawing No.:	forged 34CrNiMo6 200020, Rev. 3
Main Braking System	Design: Drawing No. pitch drive: Pitch gear:	see power regulation 905104 RES 2500 GR3, s.me.i
Auxiliary Braking System	Design: Location: Brake calliper:	spring applied disc brake with 2 brake callipers at high speed shaft BSAI 3000-MSxxS-205 and -206, Svendborg Brakes
Generator	Design: Rated power: Rated voltage: Rated speed: Degree of protection: Type:	double fed induction generator 4100 kW 3300 V 1800 rpm IP 54 DASAA 6332-4U, VEM
Main Carrier	Type: Material: Drawing No.:	cast EN-GJS-400-18U-LT 200019, Rev. 2 (Bottom) 200018, Rev. 3 (Top)
Gear Box	Type:	CPNFZ-264 (i = 117.971), Eickhoff


Germanischer Lloyd
WindEnergie



Annex

8th October 2004

page 3/3

GL Wind Statement No.: **WEC 00-006A-2004, Rev. 1**

Yaw System	Design:	4 active electric yaw drives with brake motor and slewing ring
	Drawing No. yaw drive:	904900, s.me.i
	Drawing No. slewing gear:	RES 10000 GR4-KT, s.me.i
	Drawing No. slewing ring:	062.70.3393.000.48.1501, Rothe Erde
Tower 100m Hub Height	Design:	tubular steel tower with 5 sections
	Length:	94.54 m
	Drawing No.:	200330, Rev. 1 200629, Rev. 2 for US-version
Control and Safety System	Manufacturer:	GE Wind Energy GmbH

End of Annex


Germanischer Lloyd
WindEnergie

Class 1
Item no. 950046.R1
2004-06-16

IEC Design Evaluation Statement

V90 – 3.0 MW

Issued by DNV (Det Norske Veritas)



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DET NORSKE VERITAS

DESIGN EVALUATION CONFORMITY STATEMENT

Vestas V90 3MW

IEC DE-205703-2

Conformity Statement number

2004-06-07

Date of issue

Manufacturer:

Vestas Wind Systems A/S

Smed Sørensens Vej 5

DK-6950 Ringkøbing

This conformity statement attests compliance with IEC 61400-1 ed. 2: 1999 concerning the design. 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". Any change in the design is to be approved by DNV. Without approval the Statement loses its validity.

Evaluation reports:

Final Verification Report: RDPWTG-7143, rev. 1 (Design loads, hub and nacelle),
RDPWTG-8433, rev. 1 (Blade)
RDPWTG-8768 (Towers)

Wind Turbine specification:

See Appendix 1 of this Statement.

Date: 2004-06-07


Jan B. Ibsø

**Management Representative
Det Norske Veritas, Danmark A/S**



Date: 2004-06-07


Jakob Wedel-Heinen

**Project Manager
Det Norske Veritas, Danmark A/S**

DET NORSKE VERITAS, DANMARK A/S



APPENDIX 1 - WIND TURBINE TYPE SPECIFICATION

General:

IEC WTGS class:	1A
Rotor diameter:	90
Rated power:	3000 kW
Rated wind speed V_r :	15 m/s
Hub height:	80 m
Operating wind speed range V_{in} - V_{out} :	4 – 25 m/s
Design life time:	20 years

Wind conditions:

IEC 61400-1, ed. 2, wind class	1A
V_{ref} (hub height):	50 m/s
V_{c50} (hub height):	70 m/s
V_{ave} (hub height):	10 m/s
I_{15} at $V_{hub} = 15$ m/s:	0.18
Mean flow inclination:	8°

Electrical network conditions:

Normal supply voltage and range:	6-33 kV
Normal supply frequency and converter types:	50 Hz VCS 60 Hz VCRS

Other environmental conditions (where taken into account):

Air density:	1.225 kg/m ³
Operational ambient temperatures	-20 to 45 °C
Stand still ambient temperatures	-40 to 50 °C

Main components:

Blade type:	Vestas 44m blade
Gear box type:	Hansen EF901 (i=104.6 for 50Hz VCS and i=109.0 for 60Hz VCRS)
Main bearing alternatives:	FAG: U60-807110QFAG TIMKEN: NP163814-NP520636-NP609752 SKF: BT2-8125/HA1
Generator alternatives:	Leroy Somer G54-10/4P Mk 4, Mk 5 & Mk 6 (50 Hz VCS) Leroy Somer G54-9/4P Mk 7 (60 Hz VCRS)
Yaw gear	SOM PG 1804R
Tower type:	Tubular steel tower
Crane and service load	Integrated, 500kg
Controller	VMP 6000

Class 1
Item no. 958246.R0
2004-06-16

Manufacturing Conformity Statement, IEC MC-205703-1 V90 – 3.0 MW

VCS 50 Hz



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DET NORSKE VERITAS

MANUFACTURING CONFORMITY STATEMENT

Vestas V90 3MW

IEC MC-205703-1

Conformity Statement number

2004-03-11

Date of issue

Manufacturer:

Vestas Wind Systems A/S

Smed Sørensens Vej 5

DK-6950 Ringkøbing

This conformity statement attests compliance with IEC 61400-1 ed. 2: 1999 concerning the manufacturer's quality system. 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". Any change in the manufacturer's quality system is to be approved by the ISO 9000 Certification Body. Without approval the Statement loses its validity.

Reference documents:

Final Verification Report:

RDPWTG-8296

Quality System Certificate:

Germanisher Lloyd Certification GmbH: QS-038 HH

Wind Turbine specification:

See Appendix 1 of this Statement.

Date: 2004-03-11

Jan B. Ibsø
Jan B. Ibsø

**Management Representative
Det Norske Veritas, Danmark A/S**

Date: 2004-03-11

Jakob Wedel-Heinen
Jakob Wedel-Heinen

**Project Manager
Det Norske Veritas, Danmark A/S**



APPENDIX 1 - WIND TURBINE TYPE SPECIFICATION

General:

IEC WT class:	IEC 1A
Rotor diameter:	90 m
Rated power:	3000 kW
Rated wind speed V_r :	15 m/s
Operating wind speed range V_{in} - V_{out} :	4-25 m/s
Design life time:	20 years

Electrical network conditions:

Normal supply voltage and range:	6-33 kV
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Other environmental conditions (where taken into account):

Air density:	1.225 kg/m ³
Operational ambient temperatures:	-20 to 45°C
Stand still ambient temperatures:	-40 to 50°C

Main components:

Blade type:	V90
Gear box type:	Hansen EF901
Tower type:	Tubular steel tower

Class 1
Item no. 958245.R0
2004-06-16

Type Test Conformity Statement, IEC TT-205703-1 V90 – 3.0 MW

VCS 50 Hz



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DET NORSKE VERITAS

TYPE TEST CONFORMITY STATEMENT

Vestas V90 3MW

IEC TT-205703-1

Conformity Statement number

2004-06-03

Date of issue

Manufacturer:

Vestas Wind Systems A/S

Smed Sørensens Vej 5

DK-6950 Ringkøbing

This conformity statement attests that the wind turbine has been evaluated by DNV concerning Type Testing. 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". Any change in the design is to be approved by DNV. Without approval the Statement loses its validity.

Reference documents:

Final Verification Report:	RDPWTG-8433, rev. 1 (Blade testing) & RDPWTG-8703 (other type tests)
Safety and Function Test:	Vestas reports and DNV verification listed in RDPWTG-8703
Power Performance Measurements:	RISØ-I-2079, Jan. 2004
Load Measurements:	Vestas reports and Risø verification listed in RDPWTG-8703
Blade Test:	Risø reports listed in RDPWTG-8433, rev. 1

Wind Turbine specification:

See Appendix 1 of this Statement.

Date: 2004-06-03

Jan B. Ibsø

**Management Representative
Det Norske Veritas, Danmark A/S**

Date: 2004-06-03

Jakob Wedel-Heinen

**Project Manager
Det Norske Veritas, Danmark A/S**



APPENDIX 1 - WIND TURBINE TYPE SPECIFICATION

General:

IEC WTGS class:	1A
Rotor diameter:	90
Rated power:	3000 kW
Rated wind speed V_r :	15 m/s
Hub height:	80 m
Operating wind speed range V_{in} - V_{out} :	4 – 25 m/s
Design life time:	20 years

Wind conditions:

IEC 61400-1, ed. 2, wind class	1A
V_{ref} (hub height):	50 m/s
V_{e50} (hub height):	70 m/s
V_{ave} (hub height):	10 m/s
I_{15} at $V_{hub} = 15$ m/s:	0.18
Mean flow inclination:	8°

Electrical network conditions:

Normal supply voltage and range:	6-33 kV
Normal supply frequency and converter types:	50 Hz VCS

Other environmental conditions (where taken into account):

Air density:	1.225 kg/m ³
Operational ambient temperatures	-20 to 45 °C
Stand still ambient temperatures	-40 to 50 °C

Main components:

Blade type:	Vestas 44m blade
Gear box type:	Hansen EF901 i=104.6
Main bearing alternatives:	FAG: U60-807110QFAG TIMKEN: NP163814-NP520636- NP609752 SKF: BT2-8125/HA1
Generator type:	Leroy Somer G54-10/4P
Yaw gear	SOM PG 1804R
Tower type:	Tubular steel tower
Crane and service load	Integrated, 500kg
Controller	VMP 6000

Class 1
Item no. 958243.R1
2004-06-28

Type Certificate, IEC TC-205703-1 V90 – 3.0 MW

VCS 50 Hz



WWW.VESTAS.COM



DET NORSKE VERITAS

TYPE CERTIFICATE

Vestas V90 3MW

IEC TC-205703-1 rev.1
Type Certificate number

2004-06-28
Date of issue

Manufacturer:
Vestas Wind Systems A/S
Smed Sørensens Vej 5
DK-6950 Ringkøbing

Valid until: 2009-06-07

This certificate attests compliance with IEC 61400-1 ed. 2: 1999 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:	IEC DE-205703-2
Type Test Conformity Statement:	IEC TT-205703-1
Manufacturing Conformity Statement:	IEC MC-205703-1

Final Evaluation Report:	RDPWTG-8702 rev.1
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Wind Turbine specification:

See Appendix 1 of this Certificate.

Date: 2004-06-28

Peter Peterse
f. Jan B. Ibsø

Management Representative
Det Norske Veritas, Danmark A/S



Date: 2004-06-28

Jakob Wedel-Heinen

Jakob Wedel-Heinen
Project Manager
Det Norske Veritas, Danmark A/S



APPENDIX 1 - WIND TURBINE TYPE SPECIFICATION

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Main bearing alternatives:	FAG: U60-807110QFAG TIMKEN: NP163814-NP520636- NP609752 SKF: BT2-8125/HA1
Generator type:	Leroy Somer G54-10/4P
Yaw gear	SOM PG 1804R
Tower type:	Tubular steel tower
Crane and service load	Integrated, 500kg
Controller	VMP 6000