REGIONI LIGURIA

Comuni:
CASTELVECCHIO DI ROCCA BARBENA(SV): LOCALITA' "MONTE LINGO"

PROGETTO DEFINTIVO PER LA REALIZZAZIONE DI UN IMPIANTO DI PRODUZIONE DI ENERGIA ELETTRICA DA FONTE EOLICA 1 AEROGENERATORI

Soluzione alternativa al progetto approvato al procedimento di verifica screening ex lr 38/98 con decreto del dirigente n. 2655 del 31/07/2012

Sezione 10:
ALLEGATI

Titolo elaborato:
CERTIFICATI AEROGENERATORI

N. elaborato 10.2 Data FEBBRAIO 2014

Committente

Via Malipiero, 20
20138, Milano
p.iva 00814870986

Rappresentante Legale
Dott. Elio Rosario Gheza

00	FEBBR 2014	GV	Ghitti V.	GV	Ghitti V.	ZL	Zani L.	
REV.	DATA	sigla	nome	sigla	nome	sigla	nome	DESCRIZIONE
		REDAZIONE		CONTROLLO		EMISSIONE		

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DET NORSKE VERITAS

TYPE CERTIFICATE

Vestas V90 3MW

IEC TC-205703-7
Type Certificate number

2010-05-17
Date of issue

Manufacturer:
Vestas Wind Systems A/S
Alsvej 21
DK-8940 Randers SV

Valid until: 2014-06-07

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:	IEC DE-205703-7
Foundation Design Evaluation Conformity Statement:	IEC FE-205703-1
Type Test Conformity Statement:	IEC TT-205703-6
Manufacturing Conformity Statement:	IEC MC-205703-6
Type Characteristics Measurement Conformity Statement(s):	IEC TM-205703-5
Final Evaluation Report:	WTDK-2554 rev.3 and WTDK-3077 rev.1

Wind Turbine specification:

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

Date: 2010-05-17

Jørge Dahl
Management Representative
Det Norske Veritas, Danmark A/S

PRODUCTS
RvA C257

Date: 2010-05-17

Torben Søndergaard
Project Manager
Det Norske Veritas, Danmark A/S

DET NORSKE VERITAS, DANMARK A/S

T05 7958243 Ver 07 - Approved - Exported from DMS: 2010-06-22 by HTTHO

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DET NORSKE VERITAS

COMPONENT CERTIFICATE

Vestas V90 3MW Offshore Rotor-Nacelle Assembly

IEC CC-205704-3
Component Certificate number

2009-06-16
Date of issue

Manufacturer:
Vestas Wind Systems A/S
Alsvej 21
DK-8940 Randers SV

Valid until: 2014-06-07

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:	IEC DE-205703-6
Type Test Conformity Statement:	IEC TT-205703-5
Manufacturing Conformity Statement:	IEC MC-205703-5
Type Characteristics Measurement Conformity Statement(s):	IEC TM-205703-4
Final Evaluation Report:	WTDK-2554 rev.2 and WTDK-3077 rev.1

Wind Turbine Component specification:
See Appendix 1 of this Certificate.

Date:2009-06-16

Christer Eriksson
Management Representative
Det Norske Veritas, Danmark A/S

PRODUCTS
RvA C 257

Date: 2009-06-16

Torben Søndergaard
Project Manager
Det Norske Veritas, Danmark A/S

DET NORSKE VERITAS, DANMARK A/S

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APPENDIX 1 - ROTOR-NACELLE ASSEMBLY SPECIFICATION

General Characteristics:

IEC WT class:	S
Rotor diameter:	90 m
Rated power:	3000 kW
Rated wind speed V_r:	13.4 m/s
Operating wind speed range V_{in}-V_{out}:	4 – 25 m/s
Design life time:	20 years

Component Description:

Vestas V90 3MW Rotor-Nacelle Assembly with the following main components:

Blade type:	Vestas 44m blade
Gear box alternatives:	Hansen EF901EE55-K1, i=104.6 (50 Hz)
	Hansen EF901EE55-K1, i=109.0 (60 Hz)
Main bearing alternatives:	FAG: F-809597
	FAG: F-807110
	SKF: BT2-8125 C/HA1
Generator alternatives:	Leroy Somer G54-10/4P: Mk 6 (50 Hz VCS)
	Leroy Somer G54-9/4P: Mk 7 (60 Hz VCRS)
	Weier DVSGM 560/4L: V5 (50 Hz VCS)
	Weier DVSGM 560/4L: V6 (60 Hz VCRS)
Transformer alternatives:	Siemens AG 4GB6580-9KA
	SGB DTTHIL 2500/30
Yaw gear	SOM PG 1604 R=1391/1
Tower type:	Not part of certification
Crane and service load	Integrated, 800kg
Service Lift	Avanti, type Shark, max working load 240 kg
Controller	VMP 6000

The tower top module (370 mm high tower top neck flange) and its bolted connection to the nacelle is included as part of the certification

Wind conditions:

According to IEC 61400-1 Ed.3 class 1A

Design Loads:

Design Load Documents are listed in WTDK-3077 rev.1

Electrical network conditions:

According to IEC 61400-1 Ed.3 class 1A

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Other environmental conditions:

The below parameters are intended to cover a typical offshore location.

Normal ambient temperature range	-20 to 40 °C
Extreme ambient temperature range	-40 to 50 °C
Relative humidity	100 % (max 10% of lifetime)
Solar radiation	The turbine shall resist solar radiation (including UV) with 1000 W/m² and 8000 MJ/m² per year throughout the design lifetime.
Salinity	Offshore conditions
Description of lightning protection system	Protection level 1 according to IEC 61024

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APPENDIX 1 - WIND TURBINE TYPE SPECIFICATION

General:

IEC WT class acc. to IEC 61400-1:2005:	S (IEC WT class 1A/2A except for temperature range)
Rotor diameter:	90 m
Rated power:	3000 kW
Rated wind speed V_r:	13.4 m/s
Hub heights	65m, 75m, 79.8m, 80m, 90m (IEC1A, 50Hz/60Hz) 105m (IEC 2A, 50Hz / 60Hz)
Operating wind speed range V_{in}-V_{out}:	4 – 25 m/s
Design life time:	20 years

Wind conditions:

	1A	2A
V_{ref} (hub height)	50 m/s	42.5 m/s
V_{e50} (hub height)	70 m/s	59.5 m/s
V_{ave} (hub height):	10 m/s	8.5 m/s
I_{ref} at V_{hub} = 15 m/s:	0.16	0.16

Electrical network conditions:

Normal supply voltage and range:	6-33 kV (50 Hz) 10-34.5 (60 Hz)
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	
Normal ambient temperature range:	Standard version:	-20°C to 40°C
	LT version:	-30°C to 40°C
	(however maximum air density according to IEC 61400-1 Ed.3 at wind speed above 10m/s: 1.34 kg/m^3)	
Extreme ambient temperatures range:	Standard version:	-40°C to 50°C
	LT version:	-40°C to 50°C

Main components:

Blade type:	Vestas 44m blade
Gear box alternatives:	Hansen EF901EE55-K1, i=104.6 (50 Hz) Hansen EF901EE55-K1, i=109.0 (60 Hz)
Main bearing alternatives:	FAG: F-809597 FAG: F-807110 SKF: BT2-8125 C/HA1

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Generator alternatives:	Leroy Somer G54-10/4P: MK61S (50 Hz VCS) Leroy Somer G54-9/4P: MK71S (60 Hz VCRS) VND DVSGM 560/4L: V5 (50 Hz VCS) VND DVSGM 560/4L: V6 (60 Hz VCRS)
Transformer alternatives:	Siemens AG 4GB6580-9KA SGB DTTHIL 2500/30 ABB DTE 3140/36
Yaw gear	SOM PG 1604 R=1391/1
Tower type:	Tubular steel towers: HH65m IEC 1A (Drawing no.: 960109.V05) HH75m IEC 1A (Drawing no.: 960904.V01) HH75m IEC 1A (Drawing no.: 962995.V03) HH79.8m IEC 1A (Drawing no.: 958412.V06) HH80m IEC 1A (Drawing no.: 75950000.V00) HH80m IEC 1A (Drawing no.: 960558.V04) HH80m IEC 1A (Drawing no.: 75950001.V00) HH90m IEC 1A (Drawing no.: 75950028.V02) HH105m IEC 2A (Drawing no.: 75950010.V00) HH105m IEC 2A (Drawing no.: 75950009.V00) HH105m IEC 2A (Drawing no.: 960567.V04) HH105m IEC 2A (Drawing no.: 960121.V08)
Foundation	Gravity Base Slab HH80 IEC1A, GWL at terrain level (75959509.R2) Gravity Base Slab HH80 IEC1A, GWL at foundation level (75959508.R3) Gravity Base Slab HH105 IEC2A, GWL at terrain level (75959511.R2) Gravity Base Slab HH105 IEC2A, GWL at foundation level (75959510.R2)
Crane and service load	Integrated, 800kg
Service Lift	Avanti, type Shark, max working load 240 kg
Controller	VMP 6000

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