



# DEWI-OCC

DEWI-OCC Offshore and Certification Centre GmbH



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DEWI-OCC Offshore and  
Certification Centre GmbH

# DEWI-OCC

Offshore Certification Centre  
Type Certification Component Certification Specific Certification Certification during Development



**DEWI-Offshore and Certification Centre GmbH (DEWI-OCC)** was founded in 2003 as a subsidiary of the German Wind Energy Institute (DEWI) with the city and the district of Cuxhaven as partners. Maritime competence and a special know-how in the field of wind energy represent the basis for the technical

and scientific support of the growing offshore industry. For the wide variety of services offered by **DEWI-OCC** the interdisciplinary team of motivated and qualified engineers is prepared to meet all demands.

**DEWI-OCC** is a generally accepted certification body for on- and offshore wind turbines and their components, accredited by the DAP (Deutsches Akkreditierungssystem Profiswesen). In the field of wind energy **DEWI-OCC** carries out certifications as well as expertises for investors (due diligence) and for government authorities, type approvals, examinations, periodic inspections, risk- and damage analyses.

In Cuxhaven (North Germany) **DEWI-OCC** operates a test site for offshore prototypes. This location is predestined due to the marine climate conditions and therefore allows the inshore testing of newly developed technologies.

**DEWI-OCC** supports the necessary knowledge- and technology transfer within in scope of the designated wind farms at the European coast line. To consolidate international relations, **DEWI-OCC** participates in several research projects, is actively involved in the development of standards and sets high value on permanent education of the staff.



# DEWI-OC

Offshore Certification Centre  
Type Certification Component Certification Site Specific Certification Certification during Development



## CERTIFICATION OF WIND TURBINES AND WIND FARMS

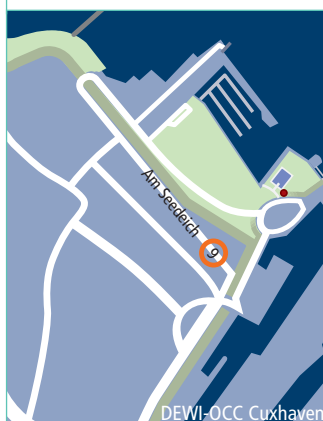
Certification is the confirmation of compliance of a product or service in accordance with defined standards or rules. In the scope of certification the focus lies on complete wind turbines or components, such as rotor blades, machinery components or towers. The suitability of a wind turbine for specific locations, especially those with particular environmental conditions, will be confirmed with the site specific certificate.

To accelerate the certification process the assessment can be performed during the development as well.

**DEWI-OC** is accredited to carry out certifications in accordance with all relevant standards and offers the complete scope of services for certifying wind turbines.



Type Certification  
Component Certification  
Site Specific Certification  
Certification during Development





## SERVICES ON- / OFFSHORE



- > Type Approval
- > Turbulence Analysis
- > Periodic Inspections
- > Personnel Safety

### > Type Approval

For the erection of wind turbines in Germany a building permission is required. This permission will be issued by the responsible authorities after verification of the building documents. Wind turbines are mostly series products. Therefore the structural examination will be usually carried out as a type approval which rates nationwide and is used as a general verification for the stability against collapse of the wind turbine. Technical reports for rotor blades, control system and machinery components accomplish the type approval. DEWI-OCC offers the process of type approval for the complete wind turbine.

### > Turbulence Analysis

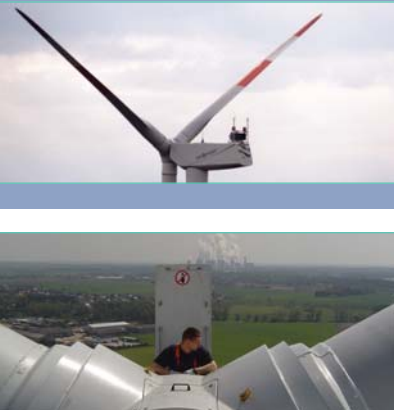
For a turbulence analysis the interaction of neighbouring wind turbines resp. wind farms will be examined. An important part is the so called wake-effect, which arises through the increased air turbulence behind the rotor blade. If distances are too small higher fatigue loads and shrinking profits will occur to the adjacent wind turbines. This analysis has to be carried out within the scope of a site specific certification or for a building permission.

### > Periodic Inspections

Wind turbines need regular inspections to ensure safe operation. Both complete wind turbines and whole wind farms as well as just parts like rotor blades or machinery components have to be inspected. DEWI-OCC offers these inspections in the scope of commissioning, on delivery to the operator, due diligence and end of guarantee.

### > Personnel Safety

Wind turbines are temporary workplaces and have to be appropriately equipped concerning personnel safety. DEWI-OCC rates wind turbines according to DIN EN 50308 standard. This can be part of the certification or can be done within the CE-evaluation of the wind turbine.



Type Certification  
Component

Site Specific Certification

Certification

Certification during Development

## SERVICES ON- / OFFSHORE

# DEWI-OCC

- > Due Diligence
- > Damage Analyses and Damage Expertises
- > Risk Analyses

### > Due Diligence

In the scope of authorisation for major projects in many cases the expertise of an independent surveyor is required. During project planning as well as operation of wind farms significant questions may occur, i.e. arising damages. Expert assistance can be very important for investors and insurances of the wind energy industry. DEWI-OCC offers independent expertises for authorities and insurances at home and abroad.

### > Damage Analyses and Damage Expertises

In case of damage at or caused by wind turbines the reason can be revealed in a damage analysis. An independent surveyor is requested to record the circumstances of the damage and to furnish an opinion. A damage analysis resp. expertise is essential for insurance-relevant questions and can be requested at DEWI-OCC.

### > Risk Analyses

If the erection of wind turbines is planned near pipelines, heavily frequented transport routes, high voltage lines etc. authorisation bodies usually require a risk analysis. The fracture of a rotor blade resp. rotor blade part, the dropping of ice parts as well as the collapse of the complete wind turbine are under consideration. Assessments have to be made concerning the damage probability of the protected objects and the acceptable risk.





## SERVICES OFFSHORE



- > Assessment of Construction and Foundation
- > Evaluation of Design Concepts
- > Offshore Staff Training

### > **Assessment of Construction and Foundation**

A new challenge for the construction and erection of offshore wind turbines are the loads. For the safe design of the turbine, including its particular foundation construction, the proper knowledge of the operational and additional loads resulting from waves, current and/or ice, is needed. The development of international rules resp. standards for the assessment of foundation constructions is still in progress. DEWI-OCC offers support for application of the existing rules and the calculation methods as well as the assessment of construction documents.

### > **Evaluation of Design Concepts**

In close connection with the assessment of the construction is the selection of design concepts adapted to the particular requirements of offshore locations. Amongst others priority has to be given to the appropriate combination of structural loads due to wind and waves as well as the range of appropriate methods of fatigue analyses. DEWI-OCC offers the expert evaluation of design concepts for offshore wind turbines. Together with several cooperation partners DEWI-OCC participates in a research project for the evaluation of design relevant load-parameters for wind turbines in the German Bight, which is funded by the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU).

### > **Offshore Staff Training**

Particular needs will arise from the future wind energy use at sea not only in connection with constructions but also regarding erection, operation and maintenance. In connection with cooperation partners a special harmonised training of offshore service-staff will be developed. It is the aim to consolidate the existing know-how of the maritime- and wind energy industry.



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## DEWI-OCC Test Site Port of Cuxhaven

# DEWI-OCC

### > DEWI-OCC Test Site

#### > DEWI-OCC Test Site

The DEWI-OCC test site is a first step for the offshore basis Cuxhaven. The outstanding feature of the test site for five offshore prototypes in Cuxhaven is its perfect position directly behind the sea dike. On this test site the technical reliability and efficiency of a new generation of multi megawatt wind turbines will be tested under marine climate conditions at the North Sea coast. The view and the technical data are impressive and attract attention among experts.

End of 2005 one ENERCON E-112 with a hub height of 116 m, a rotor diameter of 114 m and a capacity of 6 MW has been erected which is operated by the EWE AG. A second E-112 is under construction and will be finished end of 2007.

In 2006 two REpower 5M wind turbines with a hub height of 117 m and a rotor diameter of 126 m and a capacity of 5 MW have been erected. Operators are the EWE AG and the Essent Wind GmbH together with the E.ON Energy Projects GmbH.

End of 2006 the installation of the prototype of a D8.2 of DeWind Ltd. was completed. With a hub height and a rotor diameter of 80 m each the capacity of the turbine is 2 MW. The D8.2 is equipped with a newly-developed variable hydrodynamic gear unit which should now demonstrate its efficiency.

