WEC ROTOR BLADE INSPECTION

Rotor blades are at the beginning of the energy conversion process of a wind energy converter and are thus a fundamental guarantor for reliable plant operation. Their aerodynamic properties, as well as the quality of their manufacturing process, determine the running times in daily use. Their design and profile accuracy are reflected in the so-called “coefficient of power". This in turn directly influences the yield of the plant and is ultimately reflected in the profitability of the entire investment.

Inspection

During the rotor blade inspection, the condition of the rotor blades should be documented and any existing damage and deficiencies should be pointed out. Depending on the task, a statement must be made as to whether:
- the rotor blades conform with the documents provided,
- damage or deficiencies must be repaired in the short or long term,
- dangerous deficiencies exist that require the WEC to be shut down until these have been remedied,
- safety concerns exist because of their condition, and/or
- there are other fundamental deficiencies that would justify refusal of acceptance by the customer/operating company or that would justify making warranty claims.

Scope of inspection

The condition of the rotor blades is inspected closely during the inspection. The check of the supporting structure is done, amongst other ways, by tapping the rotor blade. Inspection of the interior of the blade is usually limited to the area which is accessible without the use of other aids. In the case of special tasks, the use of a special camera system also allows the examination of the inaccessible part. Depending on the technical requirements, the respective rotor blade to be inspected internally is also locked in a horizontal position on certain types of WEC.
The Veltrup Technical Inspection Bureau works with various access techniques which have proven themselves over many years in practice. The local and technical peculiarities of the project ultimately determine the choice of technique. The inspection is often carried out using an elevating work platform or rope access technique. For machines where the hub is at great height, in terrain that is difficult to access, abroad or in individual plants, economic aspects favour of the use of the rope access technique.
Rotor blades are, amongst other things, inspected for:
- cracks,
- cavities, pinholes,
- delamination by knock test,
- damage through lightning stokes
- permeability of the drainage holes,
- function of the tip mechanics (stall control),
- the execution of the bonds,
- the condition of the webs,
- unusual running noises,
- the function of the internal lightning conductor by measuring the resistance.

The aerodynamic properties are checked by inspecting the:
- condition, completeness and positioning of the flow elements.

Further special services: (optional - at extra cost)
- determining the rotor mass distribution and calculating balance weights if necessary,
- material examination by means of ultrasonic testing
- functional check of the internal lightning stroke arrester path by measuring the resistance,
- verification of the blade pitch with the aid of a special optical measuring procedure,
- blade pitch (and their synchronization with one other) checked, (optional)
- complete inspection of the interior of the blade using special camera technology.

Furthermore, the inspection of the rotor blades is a focal point of a "recurring periodic inspection". Under the aspect of operational safety, the blades are primarily inspected for the presence of structural defects.
The participation of the client/operating company/investor in the on-site inspection is possible. It is also advisable that a representative of the manufacturer (e.g. service technician) participates to operate the system.

Von der Oldenburgischen Industrie- und Handelskammer
ö.b.u.v. Sachverständiger für Windkraftanlagen

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Inspection Result

We value your cooperation in reducing the impact on the environment. Therefore, the client/operating, company/investor will receive a detailed digital condition report of every plant in the shape of a Word or PDF file in which all deficiencies identified are named, described and documented to a large extent by photos. The inspection report is used for submission to the manufacturer or construction company, in order to request rectification of the deficiencies that were found. It can also be used for submission to an insurance company or possible prospective buyer. A certificate, for submission to the authorities, can be provided upon request.

The recommended deadlines for follow-up inspections are also included in the inspection report. Special attention is drawn to fundamental deficiencies which could impair the usability of the WEC and which, in accordance with customary contractual agreements, would justify refusal to accept the plan

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