

GRIDIN'S GROUP

INSPECTION AND MAINTENANCE OF WIND GENERATORS

Gridin's Group certificates

ISO 9001
ISO 14001
ISO 18001

ONSHORE / OFFSHORE

Wind power engineering is a rapidly developing branch in the field of electric energy production.

Wind power turbines are constantly affected by the environment, therefore they need regular maintenance.

Wind power turbines maintenance requires both extensive experience and deep technological knowledge. Regular technical maintenance as well as the use of up-to-date technologies allows both the extension of emergency-free lifetime and the avoidance of unforeseen idle time of wind turbines.

SERVICES

Bearing in mind the current trend for the rapid development of the renewable energy sources industry, the company is gradually expanding its range of services in the field of inspection and maintenance of wind generators.







By using the rope access method, Gridin's Group specialists can execute the following tasks:

- Visual inspection of the wind turbine and its elements;
- Inspection by non-destructive testing methods;
- Defect analysis and selection of repair technology;
- Repair of wind generator's rotor blades;
- Maintenance of electric equipment;
- Identification of defects and paint restoration;
- Repair of secondary steel constructions of wind
- generator (repair and welding works);
- Associated and rigging works for installation / dismantling of wind generators;
- Other works.

WIND GENERATOR INSPECTION

Preoperational and regular operational inspection of wind generator elements includes a complex of operations.
Using a system of different methods of inspection & analysis ensures the earliest possible detection of any departure from the norm and different defects, which allows the avoidance of subsequent potential damage and shortening the idle time of the wind power turbine.





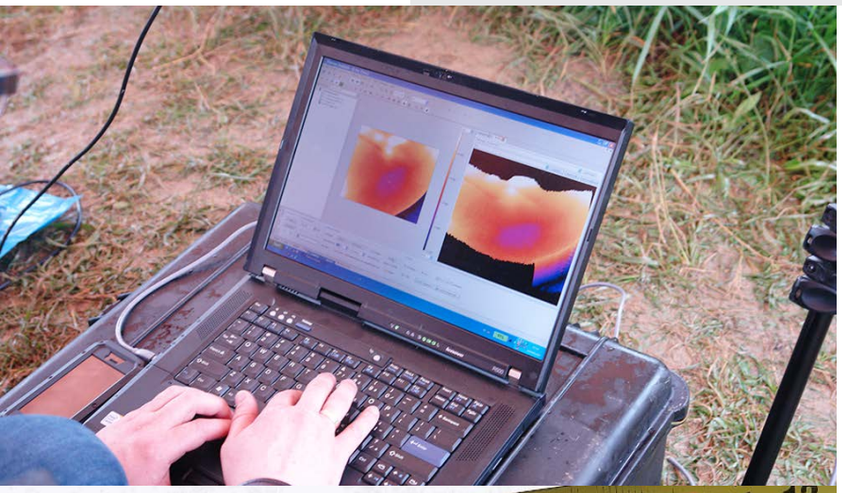
- Visual inspection;
- Liquid penetrant testing;
- Ultrasonic testing:
  - Manual UT and UTM method;
  - Automatic P-scan and T-scan method;
- Thermovision.

INSPECTION OF WIND GENERATORS' ROTOR BLADES

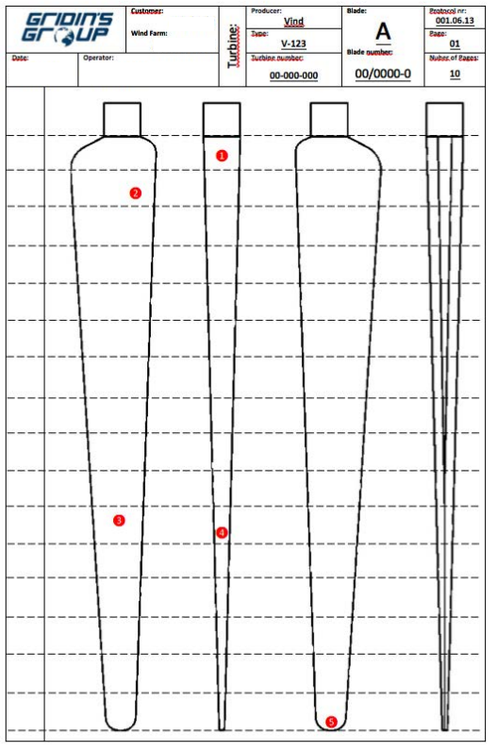
Rotor blades are most affected by the environment and receive the highest loads in comparison with other parts of wind turbines.

Depending on the scope and complexity of the inspection carried out for a blade, the specialists of Gridin's Group compile a protocol of inspection on the technical condition of the blade.









The report shall include:

- Schematic drawing of the blade with the location of detected defects specified;
- Detailed description of individual defects with the dimensions (level) of faults specified;
- Detailed description of the types of faults and the nature of detected defects;
- Photo and video material;
- Analysis of defects & recommendations for their elimination.

REPAIR OF ROTOR BLADES

By analyzing the results of the blade inspection report, the specialists of our company prepare recommendations and develop a technology for the repair of the detected defects. When developing the repair technology, account must be given to the kind and nature of the faults as well as the acceptability of the defects.

Blade repair is carried out by the specialists who have completed special training for working with composite materials (fiberglass and epoxy resin). To accelerate the repair process as well as to achieve the maximum quality of the blade repair, the UV curing system is applied.

After completing repair works for the structure, its paint coat is necessarily restored.

INSPECTION OF ELECTRIC REQUIPMENT

Apart from the main speciality, the electric technology personnel of Gridin's Group is trained to perform the works by the rope access method, which enables them to inspect and maintain the entire electrical part of the wind farm in the shortest time possible.

The inspection works performed:

- Diagnostics of vibration sensors;
- Diagnostics of lightning protection system;
- Diagnostics of inverter and transformer cooling systems;
- Weather stations monitoring;
- Elevators monitoring;
- Monitoring of control and power cable routes between the gondola and inverter / transformer;
- Ventilation systems monitoring;
- Power cable connections monitoring;
- Measuring the network parameters of the output voltage;
- Functional circuit breakers' verification;
- Installation of cable connections on bus rings.



MAINTENANCE OF ELECTRIC REQUIPMENT

Performing maintenance / adjusting:

- Of the main bearings' sensors;
- Diagnostics and calibration of rotor rotation speed meter;
- Of the magnetic meter of the high speed rotor shaft;
- Replacing the wear scanners;
- Installation / replacement of the XY slope sensors;
- Programming the smooth activation device;
- Generators' alignment;





- Of power and switch boards;
- Of end switches;
- Of the GPS and navigation lighting system;
- Of telephone communication;
- Of the systems of lighting inside the tower and the hub;
- Of emergency lighting systems.

SURFACE PREPARATION FOR PAINTING AND PAINTING



The specialists of Gridin’s Group have extensive experience in working with various anti-corrosion systems, used for protecting both metallic and composite surfaces.

Depending on the requirements provided by the painting specifications, the following works are performed:

- High pressure washing;
- Mechanical cleaning;





- Abrasive cleaning;
- Sandblasting;
- Painting by all types of paint and varnish materials (including sleet proof and hot-lay materials):
  - Polyurethane;
  - Epoxy;
  - Alkyd;
- Metalization;
- Paintwork with fire retardant paints.

REPAIR / REPLACEMENT OF SECONDARY STEEL CONSTRUCTIONS

The complex wind farm technical maintenance teams necessarily include specialists in the area of repairing wind power generators' secondary metallic structures. All the construction and welding specialists have extensive experience and all the necessary certificates for performing hull and welding works.







The specialists are experts in various welding processes:

136 – Semiautomatic welding using flux-cored wire and active gas;

135 – Semiautomatic welding using strand wire & active gas;

138/136 – Series welding with reverse formation performed by the combined method;

111 – Manual electrode arc welding;

141 – Tungsten inert gas welding (argon).

ROPE ACCESS

Rope access is a special technique used for accessing a high workplace as well as difficult-to-access places by using climbing techniques and safety devices.

The rope access method is just a way one has to pass in order to complete the work itself. For this reason, all the rope access technicians of Gridin's Group have various industrial professions: steel fitter, welder, sandblaster, painter, electrician, fitter, mechanic, rigger, non-destructive testing operator, etc.

INTERNATIONAL TRAINING CENTER

In 2006, our company launched its own education center for training and education in specialities that there was a shortage of.

In order to meet the market needs, over the time the educational center acquired the status of an International Training Center (ITC) and became an in-demand center offering a wide range of training programs for all those wishing to acquire a new speciality or improve his/her qualification.

In 2013, an area for training specialists for performing complex maintenance of wind farms was launched on the ITC base.





COMPULSORY ADITIONAL TRAINING

Before directly proceeding to work on a wind generator, all wind farm maintenance specialists of Gridin's Group must undergo additional health protection and safety training in compliance with the requirements of the owners of wind farms or operating companies.

COMPULSORY ADITIONAL TRAINING

The training program includes the following theoretical and practical courses:

- Introduction to the design of wind generators;
- To avoid accidents, additional instructing on the dangers arising during the work (falling from height, electric shock, fire, rotating elements and physical fatigue) is offered;







- Explanation of the meaning of safety signs;
- Attachment points of equipment preventing falls from height, introduction to the devices;
- Causes of fire and evacuation methods;
- Interaction and rules of conduct for operating personnel in case of emergency situations on wind turbines;
- Methods and procedure for alerting rescue services in case of emergency situations;
- First aid treatment. Plan and methods of evacuations of the injured from wind generators;
- Methods of moving around on the ladders and in the openings inside wind generators. Accessing the gondola of a wind generators;
- Working with the elevator and evacuation plan in case of its failure;
- Evacuation of an injured person inside the wind generators.



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