



A DIVISION OF DECATUR INDUSTRIAL ELECTRIC

Extending the Life of your Wind Turbine Generator

In an industry where new problems and technologies arise every day, Decatur Industrial offers a variety of products and services designed to meet the evolving needs of wind power generation customers. We pride ourselves on being a Strategic Partner you can call 24/7. From simple generator bearing changes, to catastrophic emergency rewinding, our goal is the same as yours: to keep you up and running.



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Advanced RCFA is key to troubleshooting and fixing equipment failures. Short and long-term improvements will bring improved wind farm reliability, reduce unscheduled maintenance, and keep machines working 24/7.

Many farms recognize their generators, from various OEMs, will fail within a TYPICAL number of years. Often these failures are accepted, anticipated, and an adopted part of our maintenance planning. The assumption is that the generator components are predestined to fail around this time frame of service, just like buying new tires for your automobile based on mileage. We use Root-Cause-Failure-Analysis (RCFA) expertise to proactively look for opportunities to improve the components.

Applying our knowledge from thousands of RCFAs from decades of investigations uniquely equips us to determine the root cause. The power to provide a logical and understandable relationship to the failure as well as potential solutions to bring greater generator reliability.

Common Examples Of Improvements Through RCFA Solutions:

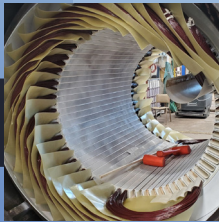
- ▶ Enhanced insulation systems
- ▶ Reduced voltage stresses
- ▶ Lowered thermal stresses
- ▶ Correcting multiple machining deviations through precision mechanical tolerances. We remove undesirable eccentricities that effect electromotive force (EMF) within the generator improving performance and reducing losses
- ▶ Shaft-current mitigation systems through multiple focus areas such as use of hybrid-ceramic bearings and advanced shaft grounding



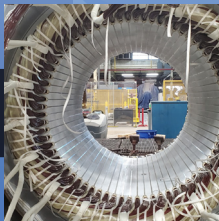
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Reliability Centered Approach to Wind Services

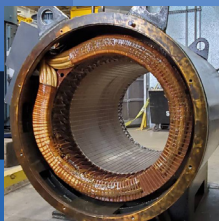
- ▶ Repair and service for generators up to 3 MW
- ▶ Rewinding using Class H materials
- ▶ D.I.EnduraLast Global Insulation System
- ▶ Full voltage testing
- ▶ 35 ton crane capacity
- ▶ C4 clearance bearing upgrades
- ▶ OEM parts and recommended upgrades
- ▶ Root cause failure analysis (RCFA)
- ▶ Climate controlled storage and maintenance
- ▶ Delivery Fleet



Oil resistant flex lead cable



Rewound generator Class H insulation



VPI processed twice

Wind Generator Repair Services and Capabilities

Electrical Repair

- ▶ Rewind of generators up to 3+ MW
- ▶ Repair to OEM specification
- ▶ Lamination replacement
- ▶ Electric Motors — Pitch and yaw, hydraulic pump

Mechanical Repair

- ▶ OEM parts
- ▶ Shaft seal and journal
- ▶ Slip rings
- ▶ Generator housings

D.I.EnduraLast Global Insulation System

- ▶ Premium VPI insulation system
- ▶ Duraseal VPI system 13.8 KV resin

Stator Coil Manufacturing

- ▶ Random-wound coils
- ▶ Form-wound coils

Upgrades & Modifications

- ▶ Upgrade kits- bearings/housings/ rotor
- ▶ Enhanced thermal dissipating materials

Decatur Industrial Electric follows our customer specifications, EASA AR 100, IEEE, and in-house quality procedures as defined in our QA manual.

Strategic Partners in Reliability Solutions

