

Wind Energy Component Life Cycle Solutions

When you think ISP, think PSI.



ISO 9001:2015
CAGE 5N884

psi-repair.com



PSI REPAIR SERVICES, INC.



Call us! The experts at PSI Repair Services are ready to help when your warranty runs out.

You are in charge of keeping things turning, and PSI Repair Services, Inc. has your back. PSI is your go-to source for out-of-warranty wind turbine components. PSI offers component repair and engineering services for GE, Vestas, Gamesa, Suzlon, Siemens, RePower, and Clipper wind turbines. PSI covers the critical electronic, hydraulic and precision mechanical components that drive the turbines' pitch and yaw systems and down-tower electronics. Commonly repaired components include printed circuit boards, pitch drive systems, inverters, IGBTs, PLCs, VRCC units, AEBIs, proportional valves, hydraulic pumps, pitch and yaw motors, encoders, slip rings, transducers, yaw modules, 3-phase bridge rectifiers, blade bearing automatic grease dispensers, active crowbars, line reactors, oil level sensors, battery chargers, cold climate converters, and more.

PSI uses the latest diagnostic tools to detect failures down to the microchip level. PSI can even detect which components are likely to fail in the near future and return your components to optimal working condition. You can count on PSI to diagnosis, fix and test your critical wind energy components.

Bringing cost savings to your O&M budget

PSI's innovations in engineering brings your critical parts back to life at a fraction of the cost to replace. You can decrease maintenance costs 30-70% by repairing versus replacing. Call us today at **800.325.4774** and experience the **Advantages of PSI Repair Services:**

- Optimize your legacy equipment by having PSI remanufacture your obsolete components back to peak performance
- Upgrade components to newer technology, which run cooler and have twice the operating life of the original OEM design and improved MTBF
- Increase component sustainment by using PSI manufactured replacement units
- Utilize drop-in replacements for obsolete assemblies
- Minimize downtime—quick turnaround and surplus parts availability
- Receive personalized account management
- Free evaluations

Industry leading service and repair capabilities:

- Advanced diagnostics
- Emergency service
- Failure analysis
- Product enhancement
- Technical engineering
- Reverse engineering
- Schematic engineering
- Preventive maintenance
- IC chip programming
- Board manufacturing



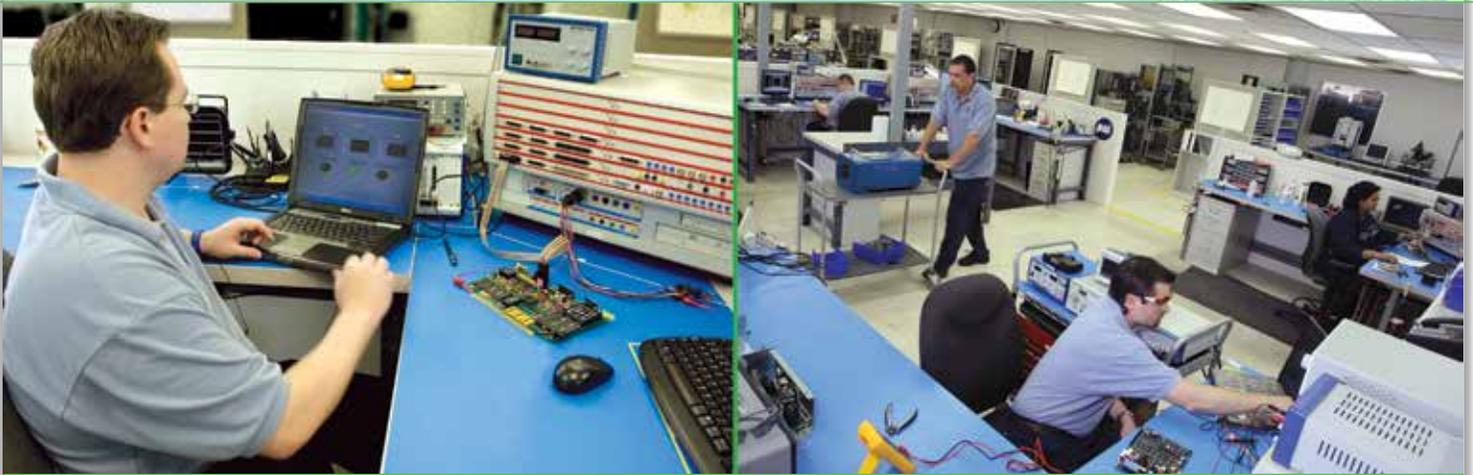
Include PSI in your wind turbine component preventative or planned maintenance. PSI can identify problems before they result in catastrophic failure.

Common Components Repaired:

3-phase bridge rectifiers
Active crowbars
AEBIs Hydraulic actuators
Anemometers
Battery chargers
Blade bearing automatic grease dispensers
Cold climate converters
Current controllers
Encoders
Gear Boxes- light duty
Hydraulic pumps
IGBTs
Inverters
Line reactors
Pitch drive systems
Printed circuit boards
Matrix converters
MET boards
Monitors and displays
Oil level sensors
Pitch and yaw motors
PLCs
Power converters
Proportional valves
SCADA
Slip rings
Thyristors
Transducers
VRCC units
Yaw modules...and many more

Common Manufacturers:

ABB
Allen Bradley
Balluff
Clipper® Windpower
Cotas
Eaton
Gamesa
GE Energy
Kenetech
Lenord + Bauer
Mitsubishi
NEG Micon
Nordtank
RePower
Second Wind
Servion
Siemens
Suzlon
Thies CLIMA Vickers
Vestas®
Zond ...and many more



PSI Repair Services, Inc. has 56,500 square feet of repair space.

PSI's Engineering Services Can Significantly Improve Component Reliability, Extend Service Life, and Save You Money

Have you ever been told that your critical component is unsalvageable? It might not be. PSI Repair Services repairs and remanufacturers what others cannot. The PSI Engineering Services Team completes a thorough root cause analysis and determines the corrective action necessary. In many cases, PSI can engineer a custom solution to repair or replace the failure and prevent future ones. We specialize in wind component product improvement. Read on to learn more.

Siemens Yaw Module Product Improvements

PSI repairs, rebuilds and improves Siemens Yaw Modules. Our remanufacturing services include—an upgrade 30 Amp IGBT with 45 Amp device, and recalibrated current sense resistors. Every yaw module is tested on a custom stand with full motor load. **These improved units provide additional current handling for peak energy and better cooling.**



IGBTs

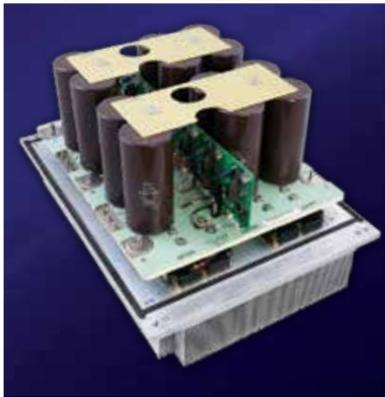
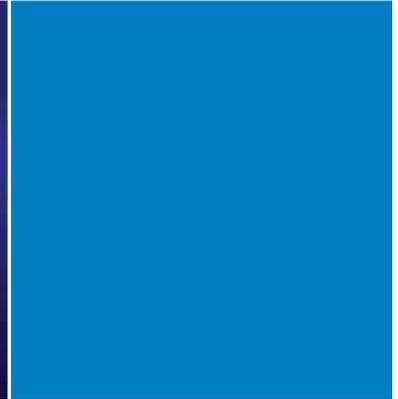
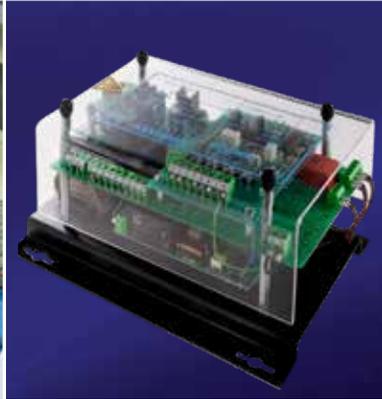
PSI has reengineered every possible failed component within an IGBT. Each rebuilt IGBT includes the following—advanced fault protection, water cooled heat sink with finned interior, heavy bus bars and balanced emitter circuit impedance, high voltage isolation, stronger mounting brackets, and custom IGBT driver board for longer life. Each rebuilt IGBT is shipped with shorting wires to protect the IGBT and includes new hose clamps and bus mounting hardware.



VRCC Rotor Current Controller Product Improvements

PSI manufactures an improved, redesigned VRCC Rotor Current Controller snubber board. This new design integrates mechanically secured capacitors to prevent damage due to vibration and failed solder joints. All VRCCs and resistor baskets are balanced to G2.5 custom external mounted weights and are mechanically secured to heat sink. Our custom designed high voltage test fixture allows for full testing of inputs and outputs on all VRCC units.





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