

AT INCEPTION

Manufacturing Quality Assurance

CWC's Inspectors are embedded at the blade manufacturing facility during production of new blades.

DURING CONSTRUCTION

Site Delivery

CWC Inspectors will be at the port of entry (where applicable) and on site to verify and document, as blades arrive, any transport damage. Noted damage is addressed immediately to ensure repair cost accountability is clearly defined.

Erection

Blade handling is monitored to ensure that any incidental installation damage is repaired prior to the rotor installation on the tower. CWC Inspectors will confirm composite repair processes are followed to a defined procedure. All repairs are documented and records are kept to support any repair warranty issues or life-time failures.

AT COMMISSIONING

Through CWC vibration testing procedures, a baseline is established for future preventative maintenance. Dynamic Balancing at the start of the turbine operation ensures desired performance expectations will be met.

END OF WARRANTY

A documented, complete internal and external review is completed prior to end of warranty. Vibration testing is measured to evaluate rotor balance. If requested, CWC will provide technical support to the owner/operator in the presentation of inspection results with the turbine manufacturer.

POST WARRANTY

Blades are inspected annually as a preventative measure against minor damage, such as leading edge erosion in order to realize expected performance. Repairs to noted damage can be performed during the inspections or scheduled during low wind conditions.

PAYBACK BENEFITS

Assurance

Assurance that blades have been manufactured according to manufacturer process specifications and quality control criteria.

Supplier Accountability & Claims

Independent confirmation that blades have been delivered to the site in factory condition to ensure clarity of accountability for damage repair claims.

Knowledge

An understanding that the installed rotor is ‘operation ready’ to meet power performance expectations and prevent unnecessary component wear. Knowledge that damaged blades have been correctly repaired.

Guarantee

Guarantees that rotor blades are in optimal condition prior to the expiration of warranty. Questionable blade condition issues are reported to the warranty issuer.

Comparison

Vibration levels are compared to Post Commissioning levels to alert operator of potential dynamic balance issues.

“FIT TO FLY” COMPOSITE REPAIR PROGRAMS



REPAIR SERVICE

CWC Blade Service Technicians are deployed quickly to support repairs on site. Repairs such as:

- Lightning strike damage
- Leading edge erosion
- Delaminating

PREVENTATIVE MAINTENANCE

CWC's Blade Service Technicians will inspect and repair rotor blades on turbine, ensuring that the performance and life expectancy of rotor blades are realized.

EMPLOYING BLADE MANUFACTURING EXPERIENCE

CWC Blade Service Technicians are trained in composite repair principals and practices based on rotor blade manufacturing experience. Rotor blade repairs can be executed both on and off tower.

TECHNICAL KNOWLEDGE & SUPPORT

CWC's Blade Service Technicians are supported by a technical management team with over 15 years experience in the blade manufacturing and repair services industry. Repair processes and procedures are established and followed under strict quality control by CWC technicians.

SAFE & EFFICIENT

CWC's Blade Service Technicians are trained and equipped to work on turbine, inside of blades, from suspended lifts, and in the use of composite materials and tools.

VALIDATING ROTOR BALANCE

CWC will ensure that the rotor of the turbine is operating under optimal conditions. The process involves verifying that Aerodynamic and Blade Mass are within acceptable industry tolerances. Validating rotor balance protects power performance and unnecessary component wear.

VIBRATION ‘FOOTPRINT’

CWC will establish a vibration footprint of the turbines optimal rotor balance. These levels can be used as part of a preventative maintenance program as an early detection method that the rotor is experiencing an imbalance. Typical causes for imbalance are blocked water drain holes, lightning strikes, and blade adhesives dislodging.



FOCUS

Complete Wind's Management Team have been in the wind industry since 1995 and have a proven depth of experience in:

- Blade manufacturing processes, tooling and materials
- Blade inspections, remediation and repairs both on and off turbine
- Quality Audits
- Rotor Balancing and Vibration Analysis
- The management of Single & Multi site inspection, maintenance and repair projects.

CWC's "Fit to Fly" Blade programs provide a full range of "*life cycle features & options*" aimed at cost control management, risk mitigation, and improved performance over the life of the Turbine.

All services are performed by competent teams of fully trained and qualified technicians. Training in composite repair principals and practices based on our depth of rotor blade manufacturing are conducted "in house" to insure that our high standards are achieved in the field.

CWC is structured to provide services in both the United States and Canada.