Slight Breaks, Major Headaches: Wind Energy Converter Failure Analysis Vignettes

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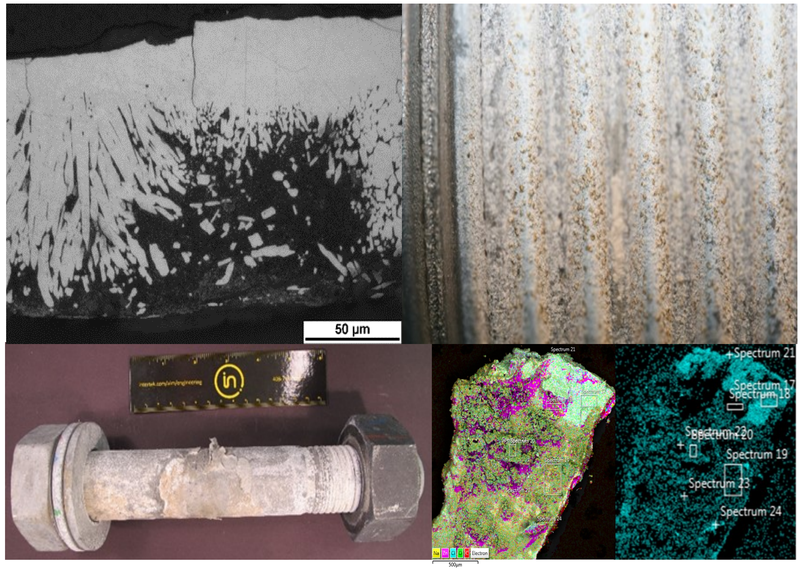
Tower Section Fasteners - Structural



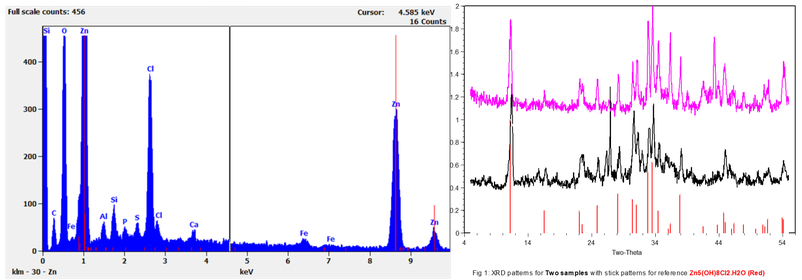


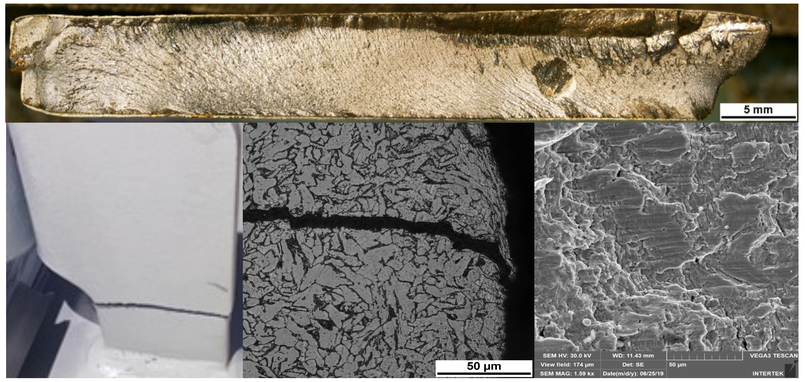
Fig 1: XRD patterns for **Two samples** with stick patterns for reference **Zn5(OH)8Cl2.H2O (Red)**

Problem — Corrosion observed on structural fasteners <1 year post installation.

Cause — Chloride salt ingress prior to installation lead to accelerated corrosion within flange.

Solution — Improve hardware tracking and remove salt residues prior to installation.

Platform Bracket – Ancillary Structural

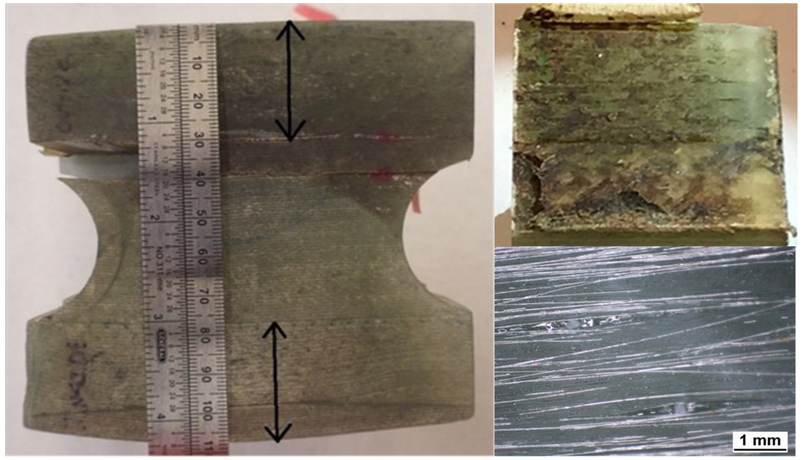


Problem — Broken tower platform lugs prior to service life.

Cause — High-cycle fatigue during overseas transport from harmonic amplification of vibration in 3rd tower section.

Solution — Add rubber blocks/vibration dampeners during shipping.

Fiberglass Blade Support Section – Drivetrain

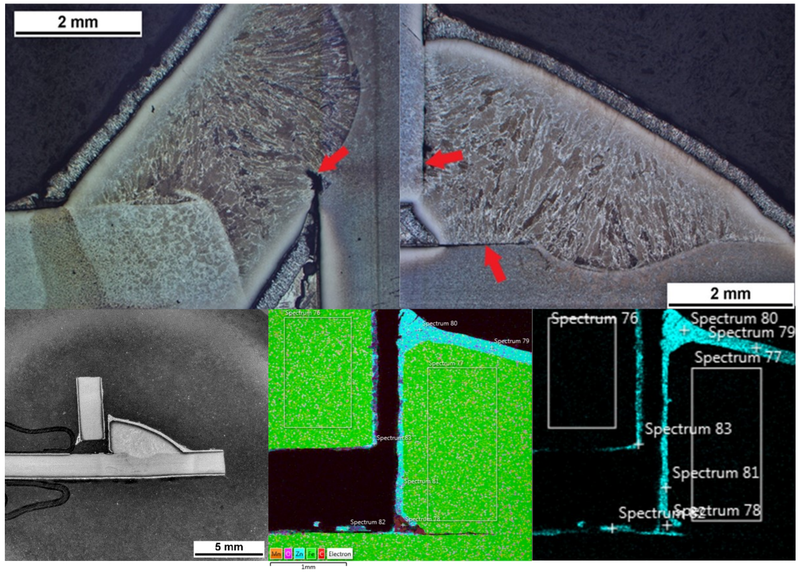


Problem — Cracked blade root support pin after 20,000 hours service life.

Cause — Grease ingress from bearing over-lubrication lead to delamination cracking, initiated within allowable microvoids in fiberglass.

Solution — Examine grease records and inspect blade adapter root region in high grease consumption units.

Ladder Rung – Ancillary Safety



Problem — Frequent early-life ladder rung failure at rung to siderail weld.

Cause — Welding process defects and insufficient quality control resulted in lack of fusion. Resulting reduced cross section fractured prematurely.

Solution — Operator to screen with magnetic particle testing, manufacturer to revise welding and quality control processes.

More Information

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