# Fretting Corrosion of Wind Turbine Drivetrains: Causes to Cures

Fretting corrosion is a mechanical process, rather than a chemical corrosion process. It is often self-aggravating – once initiated, it can worsen at an ever increasing rate.

Fretting corrosion requires the following conditions:

- Surface-to-surface contact between two solid metallic surfaces.
- Minute repetitive oscillatory relative motion between two surfaces.
- Contact pressure sufficient to result in shearing off of asperities under minute repetitive oscillatory relative motion.
- Exclusion of lubricants and anti-wear additives i.e. direct metal to metal contact.
- Hematite and Magnetite is the abrasive agent in fretting corrosion.

Analysis data will be shown from over 72 wind turbines, this data comes from drivetrains, gearboxes, blades and other surfaces. It will be shown that a direct correlation between diminishing lubricants and minute vibratory motion over time, creates abrasive minerals. It will be shown that XRD can be used as a monitor to assure that abrasion does not cause long-term deleterious effects on metal surfaces.