760 – Electric Discharges in Ball Bearings of Wind Turbine Double Fed Generator

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Abstract: The Double Fed Induction Generator (DFIG) with a rotor fed by PWM converter through a slip ring is the most common architecture used for onshore windmills. Compared to motors fed by power electronic through the stator, this configuration is more severe for the electrical stresses in the ball bearings. The first part of this paper describes a 3.95MW DFIG system architecture powered by a 2-level voltage source inverter. The second part overviews the common mode voltage mechanisms from the drive inducing high frequencies currents in the bearings. A new indicator of bearing electric discharges is presented and completed by two others existing indicators for bearings electric lifetime. The last part focuses on recommendations of rotor grounding based on experimental measurements and lifetime prediction using the three indicators.