Detection of generator bearing inner race creep by means of vibration and temperature analysis - DTU Orbit (13/12/2018)

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Vibration and temperature analysis are the two dominating condition monitoring techniques applied to fault detection of bearing failures in wind turbine generators. Relative movement between the bearing inner ring and generator axle is one of the most severe failure modes in terms of secondary damages and development. Detection of bearing creep can be achieved reliably based on continuous trending of the amplitude of vibration running speed harmonic and temperature absolute values. In order to decrease the number of condition indicators which need to be assessed, it is proposed to exploit a weighted average descriptor calculated based on the 3rd up to 6th harmonic orders. Two cases of different bearing creep severity are presented, showing the consistency of the combined vibration and temperature data utilization.

In general, vibration monitoring reveals early signs of abnormality several months prior to any permanent temperature increase, depending on the fault development.

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