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Behavior Fatigue Life of Wind Turbine Rotor with Longitudinal Crack Growth

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Abstract : This study concerned the dynamic behavior of the wind turbine rotor. Before all, we have studied the loads applied to the rotor, which allows the knowledge their effect on the fatigue. We also studied the movement of the longitudinal cracked rotor in order to determine stress, strain and displacement. Moreover, to study the issues of cracks in the critical zone ABAQUS software is used, which based to the finite element to give the results. In the first we compared the first six modes shapes between cracking and uncracking of HAWT rotor. In the second part, we show the evolution of six first naturals frequencies with longitudinal crack propagation. Finally, we conclude that the residual change in the naturals frequencies can be used as in shaft crack diagnosis predictive maintenance.

Keywords : wind turbine rotor, natural frequencies, longitudinal crack growth, life time
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