

Studies on Influence of Rub on Vibration Signature of Rotating Machines

Authors : K. N. Umesh, K. S. Srinivasan

Abstract : The influence of rotor rub was studied with respect to light rub and heavy rub conditions. The investigations were carried out for both below and above critical speeds. The time domain waveform has revealed truncation of the waveform during rubbing conditions. The quantum of rubbing has been indicated by the quantum of truncation. The orbits for light rub have indicated a single loop whereas for heavy rub multi looped orbits have been observed. In the heavy rub condition above critical speed both sub harmonics and super harmonics are exhibited. The orbit precess in a direction opposite to the direction of the rotation of the rotor. When the rubbing was created above the critical speed the orbit shape was of '8' shape indicating the rotor instability. Super-harmonics and sub-harmonics of vibration signals have been observed for light rub and heavy rub conditions and for speeds above critical.

Keywords : rotor rub, orbital analysis, frequency analysis, vibration signatures

Conference Title : ICMME 2015 : International Conference on Mechanical and Mechatronics Engineering

Conference Location : Singapore, Singapore

Conference Dates : July 04-05, 2015