A Case Study on the Condition Monitoring of a Critical Machine in a Tyre Manufacturing Plant

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Abstract : The machine's performance level drops down over a period of time due to the wear and tear of its components. The early detection of an emergent fault becomes very vital in order to obtain uninterrupted production in a plant. Maintenance is an activity that helps to keep the machine's performance at an anticipated level, thereby ensuring the availability of the machine to perform its intended function. At present, a number of modern maintenance techniques are available, such as preventive maintenance, predictive maintenance, condition-based maintenance, total productive maintenance, etc. Condition-based maintenance or condition monitoring is one such modern maintenance technique in which the machine's condition or health is checked by the measurement of certain parameters such as sound level, temperature, velocity, displacement, vibration, etc. It can recognize most of the factors restraining the usefulness and efficacy of the total manufacturing unit. This research work is conducted on a Batch Mill in a tire production unit located in the Southern Karnataka region. The health of the mill is assessed using amplitude of vibration as a parameter of measurement. Most commonly, the vibration level is assessed using various points on the machine bearing. The normal or standard level is fixed using reference materials such as manuals or catalogs supplied by the manufacturers and also by referring vibration standards. The Rio-Vibro meter is placed in different locations on the batch-off mill to record the vibration data. The data collected are analyzed to identify the malfunctioning components in the batch off the mill, and corrective measures are suggested.

Keywords : availability, displacement, vibration, rio-vibro, condition monitoring

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