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Experimental research on condition monitoring of belt conveyor idlers

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Abstract

Belt conveyor systems are widely used in bulk material handling and transport applications. Within a belt conveyor, depending on its distance, there can be tens of thousands of idler rolls which face random failure. However, condition monitoring solutions for belt conveyor idlers is underdeveloped. This is because the choice of monitoring parameters is still arbitrary. This paper aims to investigate which parameters can represent technical condition of idler rolls for the purpose of condition monitoring. A belt conveyor test rig is developed in laboratory. Temperature and vibration sensors are applied to monitor idler rolls induced with different types of failures. Pattern of temperature evolution and RMS level of vibration are extracted from the signal and analysed. It is concluded that temperature measurement at roll shafts is a straightforward and effective manner for condition monitoring of belt conveyor idlers.

Keywords: Condition monitoring, belt conveyor, idler roll, vibration, temperature

1. Introduction

Belt conveyor systems are widely utilized for continuous transport of dry bulk materials (i.e. coal, iron ore) over varying distances. However, random

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