Remote Monitoring of Slurry Pumps in Mining and Mineral Processing: Enhancing Reliability and Performance through Digitalisation

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# ABSTRACT

Mining and mineral processing operations depend heavily on slurry pumps for the hydraulic transportation of solids. These pumps operate under harsh conditions that place extreme stress on the pumps. Frequent pump failures not only disrupt operations but can also lead to significant financial losses. The challenges are further compounded by remote and often isolated locations of mines, coupled with shortage of skilled labour, and the necessity for continuous performance despite varying ore conditions. The rise of digitalisation technologies provides a strategic solution to these industry-wide issues. This paper explores the remote monitoring of slurry pumps using advanced digital tools, technologies and expert services to track their condition and performance. By leveraging condition monitoring technologies, such as wireless sensors and cloud-based platforms, coupled with expert analysis and real-time insights, mining operations can effectively track pump performance, enabling a proactive approach to maintenance and operational management. The condition monitoring process is outlined in a step-by-step manner, showcasing how these digital services, combined with data-driven reporting and timely action, ensure smoother and more efficient operations. Furthermore, the paper discusses the maturity of current digital technologies in pump monitoring and explores future pathways for advancement, aiming to enhance pump reliability and performance across various mineral processing applications. Illustrative case studies from copper, iron, lithium, and gold mining operations highlight the practical advantages of digitalisation. These examples demonstrate how remote monitoring improves pump reliability, reduces downtime, and optimizes maintenance schedules. Through these insights, this paper underscores the essential role of digitalisation and remote monitoring in maintaining consistent pump performance, reducing unexpected operational interruptions, and lowering maintenance costs across the plant.