

The use of IoT technologies for advanced risk management in tailings dams

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ABSTRACT

Tailings dam management systems require technologies to both alert on potential emergency scenarios and respond to the threats that can result in serious safety incidents with unwanted consequences. This usually requires the effective integration of physical and digital technologies that mining operators can adopt in a robust but also user-friendly way. In fact, the orchestration of heterogeneous tools, such as predictive algorithms, visualization software and a risk management platform, is crucial to provide meaningful information to the decision-making stakeholders.

In this context, the effective capture and consolidation of data become a cornerstone to ensure that tailings dam management systems will lead to meaningful outputs. Historically, this required the use of complex data collection campaigns, and because of this, data availability was limited to gain a holistic view of such complex infrastructures. Here, we propose the adoption of IoT technologies to overcome this problem.

The deployment of end-to-end data acquisition and monitoring systems which combine wireless IoT nodes with multiple sensors together with data processing tools has demonstrated that they can make mining operations safer while reducing OPEX costs by reducing the need for manual inspections or unnecessary travel. Here, some examples of how commercial IoT technologies are contributing to increase safety in tailings dams will be presented and discussed. This also actively contributes to more environmental-friendly management of the infrastructures.

REFERENCES

- [1] “5 Ways that Wireless Monitoring Systems Improve the Safety of Tailings Dams”. <https://www.worldensing.com/article/wireless-monitoring-systems-dams/>. Last access: January 18th 2023.