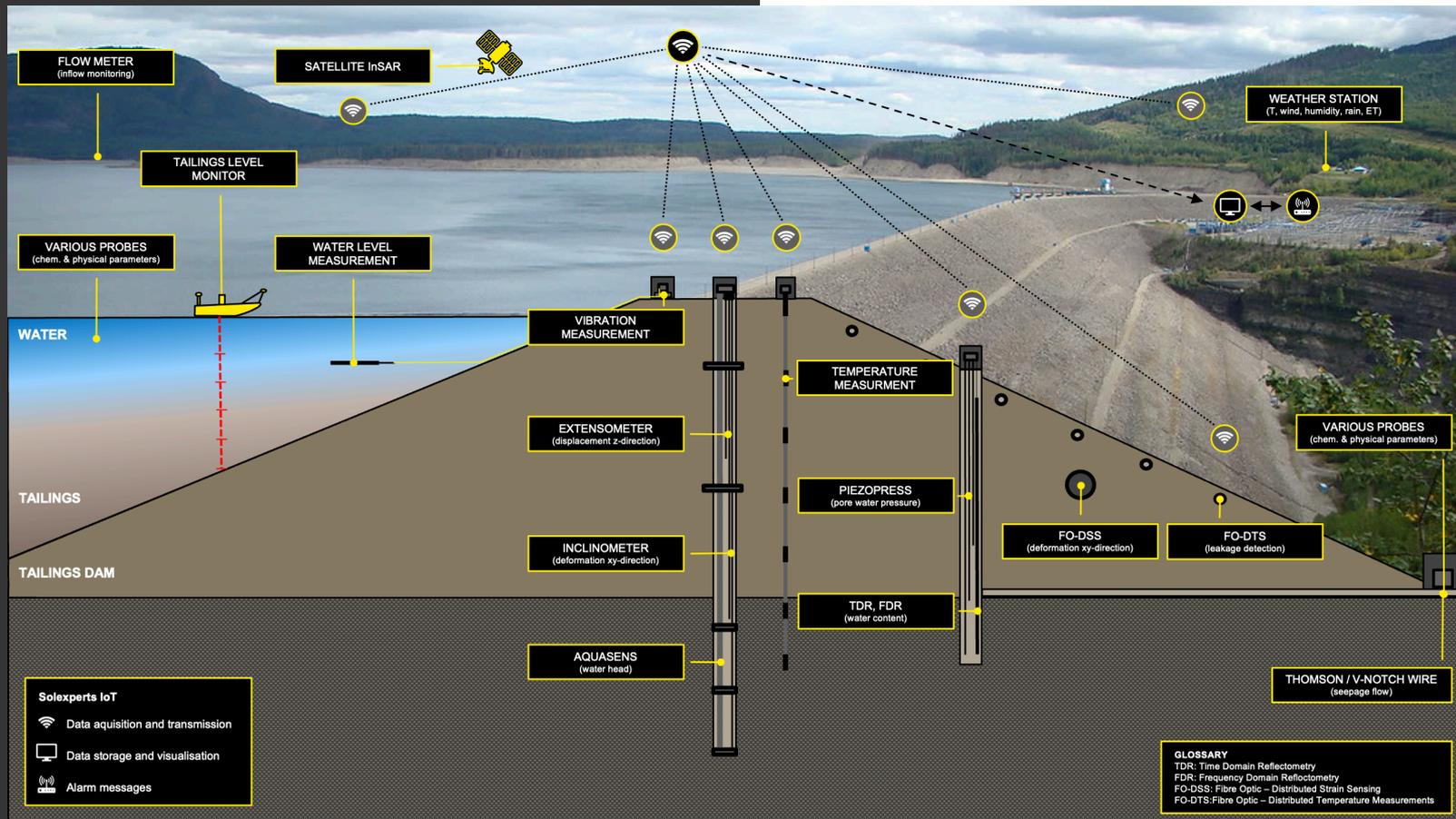


Advanced Tailings Storage Facility (TSF) Monitoring Solution: Ensuring Safety and Compliance.



Introduction Solexperts

At Solexperts, we are committed to providing advanced monitoring solutions for tailings dams, ensuring safety, environmental responsibility, and operational efficiency. With our expertise and cutting-edge technologies, we help mining companies mitigate risks, comply with regulations, and make data-driven decisions for the sustainable management of tailings dams.

Tailings Dams

Tailings dams are dams used to safely contain waste products from mining and ore processing facilities (tailings) and keep them out of the environment. Dam failures can have devastating effects on the environment and people, or infrastructure, in the surrounding area. To prevent dam failures, tailings dams must be monitored by using sensors and monitoring systems to measure movement, deformation, and flow through the dam.

Main Reasons for Dam Breaches

- Seepage
- Foundation Failure & Overtopping
- Earthquake

Action Steps Monitoring

- **Phase 1: Establish a baseline**
Establish a baseline of the tailings dam by conducting a thorough inspection and analysis to identify the physical condition, structure, and existing risks.
- **Phase 2: Develop a monitoring program** **SOLExperts**
Develop a comprehensive monitoring program to include a schedule of monitoring activities, the parameters to be monitored, and the means of collecting data.
- **Phase 3: Implement the monitoring program** **SOLExperts**
Implement the monitoring program by installing and operating the necessary monitoring equipment and systems, conducting inspections, and collecting data.
- **Phase 4: Prepare the data** **SOLExperts**
Collect data from the monitoring program to identify trends, changes, and potential risks. The data can be visualized for direct interpretation.
- **Phase 5: Report findings** **SOLExperts**
Report the findings of the monitoring program to the stakeholders and appropriate authorities. Data can be looked into on Solexperts IoT platform. Automated report or alarm notifications can be implemented.
- **Phase 6: Interpretation & corrective actions**
The interpretation of the data is the responsibility of the tailings dam consultants (engineers, geologist, geotechnical engineer, ...). The operator takes corrective action, as necessary, to mitigate any identified risks.

What are the advantages of implementing a monitoring solution?

- 1. Safety enhancement:** A monitoring solution enables real-time monitoring of critical parameters such as dam stability, water levels, and structural integrity. This helps to identify potential risks and issues promptly, allowing for timely intervention and mitigation measures. By ensuring the safety of tailings dams, the risk of dam failures and associated hazards can be significantly reduced.
- 2. Environmental risk mitigation:** Tailings dams pose a potential risk to the environment due to the possibility of leaks, seepage, or breaches. A monitoring solution helps to detect and prevent such incidents by identifying early warning signs, appropriate actions can be taken to minimize the environmental impact and protect nearby ecosystems.
- 3. Regulatory compliance:** Monitoring solutions provide evidence and can help ensure compliance with regulations and standards set by environmental authorities and bodies. By continuously monitoring key parameters and keeping detailed records, companies can demonstrate their commitment to environmental protection and compliance with applicable regulations.
- 4. Operational efficiency:** Monitoring solutions provide valuable data and insights about the performance of tailings dams. This information can be utilized to optimize operations, improve efficiency, and identify areas for process improvement. By having access to real-time data, decision-makers can make informed decisions, streamline workflows, and reduce downtime.
- 5. Risk management and early warning:** By continuously monitoring various parameters, a monitoring solution can provide early warning signs of potential issues or abnormal conditions. This allows for proactive risk management, enabling timely interventions and preventive measures to avoid major incidents or failures.
- 6. Data-driven decision-making:** A monitoring solution generates a wealth of data that can be analyzed and utilized for informed decision-making. By utilizing historical data and trend analysis, organizations can gain valuable insights into the behavior of tailings dams, optimize maintenance schedules, and plan for future expansions or modifications.
- 7. Stakeholder confidence:** Implementing a monitoring solution demonstrates a commitment to responsible and sustainable mining practices. This can enhance stakeholder confidence, including investors, regulators, local communities, and environmental advocacy groups, by showcasing proactive efforts to ensure the safety and environmental integrity of tailings dams.

Technologies

- Pore Pressure Measurement
- Mass Balance
- Deformation Measurement
- Displacement Measurement
- Seismic Measurement
- Leakage Detection & Monitoring

IoT Platform by Solexperts

With the rapid development of digitalisation, many new possibilities are opening up, so today we are taking a very comprehensive approach based on the latest IoT technology. Data acquisition, data transmission (with and without cables), database, automated processes such as analysis and visualisation of data, alarms, controls, documentation or interfaces to advanced analysis tools (e.g. digital twin) are components of this integral monitoring system.



Reference Project / Success Stories

Curdworth Sludge Lagoon, UK
Further references:



Our Partners



Our Brands



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