SPECIFICATION

RFP UJ 39/2024: Supply and Installation of a Real-Time System for the Monitoring of the Ash Dam Facilities (ADF)

1. PURPOSE

The purpose of the study is to develop a real-time monitoring and early warning system for ash dam facilities (ADF) at a power plant. The system will monitor various types of data, including water quality, structural integrity, water seepage, and seismic activity. The specific benefits of the real-time data monitoring system include improved safety, environmental compliance, and early warning of potential problems. The target audience for the system includes engineers, regulators.

2. BACKGROUND

Eskom, the seventh-largest electricity utility globally, supplies 90% of the electricity used in South Africa and is central to its people, South African economy and prosperity. Despite the drive to diversify the plant mix currently dominated by coal at 84% and reduce the carbon footprint by 2030, fossil fuel will remain a major source given the rich abundance of coal in the country's mineral reserves. However, there are immense concerns about the environmental impact of continued usage of coal and the health and safety of people who live or work near generating plants. Pressure to find ways to produce more with fewer resources and meet SDG7 to "ensure access to affordable, reliable, sustainable and modern energy for all" (SDG Compass, 2015) is a stark reality.

Eskom generates electricity by burning coal, generating ash as a waste product from the process. Ash is stored in ash dams referred to as the Ash disposal facility (ADF). The ADF accommodates waste generated as a by-product of coal combustion in the form of sludge containing heavy metals and other toxic elements. ADF can fail due to a variety of factors, including structural instability, seepage, or seismic activity. Studies have shown that seepage weakens AD. Together with spills from power plant waste ponds contaminate drinking and irrigation water with toxic pollutants Therefore, there is a need for threats to be identified and responded to promptly to mitigate consequences such as loss of life and property that can occur from dam failures. A recent example is the 2022 Jagersfontein Tailings Dam Collapse due to structural failure of a mine tailings dam in the Free State province. This suggests that methods utilized to collect and transform data fall short hence there is a critical need for alternative approaches to managing ADFs based on real-time monitoring and processing. By using sensors to monitor dam stability, volume of seepage and quality of water entering public streams, and local seismic activity, operators can take action to prevent a problem if any of these measurements indicate one. With this proactive approach, dangers to the community are reduced, and environmental compliance is improved.

South Africa is still faced with the challenge of electricity supply, and the future strategy is based on energy mix; with no doubt, coal will still play a major role. Therefore, a successful pilot can lead to optimised productivity by ensuring the smooth running of the power plant and elimination of partial/total shutdown through environmental requirements compliance and maintaining the structural stability of the ADFs. Ensuring ash from power generation has minimal impact on the surrounding environment, vegetation, and ecosystem will contribute to the case for coal as a source of clean energy, thereby improving the Nation's delivery according to global sustainability

best practices.

3. <u>**SCOPE OF WORK**</u>

Develop a state-of-the-art real-time pilot system for monitoring and early-warning at a nominated power plant including data acquisition, communication infrastructure, and data management/analysis. The tailings dam sensor project comprises the following:

1. Monitoring water quality parameters, including pH, turbidity, and chemical composition.
2. Monitoring integrity of the ADF, including deformation, settlement, and stability.
3. Installation and configuration of sensors, data acquisition systems, and communication infrastructure.
4. Integrating all monitoring systems into a centralized data management platform for real-time data collection, storage, and analysis.
5. A visualization and user-friendly interface to access and interpret the monitored data on mobile, tablet, desktop and laptop with early warning systems and alert mechanisms to notify relevant stakeholders in case of potential problems or anomalies.
6. Testing and validation of the monitoring system to ensure accuracy, and reliability.
7. Documentation of the monitoring system, including user manuals, technical specifications, and operational guidelines.
8. Training sessions for researchers in the use of sensor installation, data extraction, manipulation, and maintenance of the system.
9. The entire system must be installed with relevant software in order to be fully functional once handed over.
10. Integration with InSAR
11. Support and Maintenance is required after the installation of the system.
12. Warranties must be provided.
13. Please state anticipated delivery period / dates for each component

4. <u>**EVALUATION CRITERIA**</u>

The tender will be evaluated in three (3) stages.

Stage 1: Tender Compliance

Stage 2: Technical / Functionality Compliance

Stage 3: Financial and B-BBEE

Stage 2: Technical / Functionality Evaluation Criteria

	Requirements	Weighting
	Bidder's relevant experience and evidence of similar projects done (The bidder must attach reference letters from the clients where similar projects were done to qualify for the indicated points) 1. Bidder with no reference letter or without a similar contract = 0 points 2. Bidder with one reference letter of contracts of similar services = 5 points. 3. Bidder with two reference letters of contracts of similar services = 10 points. 4. Bidder with three reference letters of contracts of similar services = 15 points. 5. Bidder with four reference letters of contracts of similar services = 20 points.	20
	A bidder must include a Company Profile of their company.	15
	A bidder must include evidence of previous similar projects undertaken from start to completion. Evidence can be presented in the form of a case study or a web reference or any other document to demonstrate capacity and capabilities. 1. No evidence provided – 0 points 2. Case study of a solution as advertised in the tender – 35 points	35
	Quality and relevance of the solution • Completely provides quality and relevant solution - 30 points.	30

• Provides somehow relevant solution – 15 points. • Does not provide relevance of the solution - 0 Points	
Total	**100**

A bidder is required to obtain a minimum of 70 out of 100 points in stage 2, to be considered for further evaluation in terms of stage 3, financial and B-BBEE.

Bidders who obtain 70 points or more will be invited to do a demonstration of their proposed solution to the UJ bid evaluation committee, for clarification purposes.

Stage 3: Financial and B-BBEE Evaluation Criteria

Category	Points Allocation
Price	**80**
Broad Based Black Economic Empowerment	**20**