



Case study

Enhancing power stability at Barrick's North Mara mine through battery energy storage



Background

Mining remains a crucial pillar for many economies across the mineral-rich continent of Africa. This is particularly true for Tanzania, where the mining sector remains one of the major contributors to the country's Gross Domestic Product (GDP), providing 10.1% to the national GDP in 2024.¹ This surpassed the government's target of 10% for the fiscal year 2025/26.

However, the industry is beset by several challenges across the continent, including the ongoing energy crisis. Limited access to electricity in Tanzania, particularly within underserved rural areas, as well as power quality and grid reliability, continues to inhibit productivity and global competitiveness.

To help address these challenges at site level, a [Vertiv™ EnergyCore Grid battery energy storage system](#) (BESS) has been installed at Barrick Mining's North Mara gold mine, which is located in north-west Tanzania in the Tarime district of the Mara region. It is around 100 kilometres east of Lake Victoria and 20 kilometres south of the Kenyan border.

North Mara started commercial production in 2002. The mine is a combined open pit and underground operation from two deposits, Gokana (underground) and Nyabirama (open pit). The process plant has the capacity to process an average of 8,000 tonnes of ore per day.

Challenge

The North Mara mine is located approximately 400 km from its power source, operating across a long-distance transmission network where power quality management is essential to address harmonic distortion along the lines.

Variations in voltage levels, including dips and spikes, highlighted the importance of power quality management to support Barrick's critical mining operations and equipment.

Vertiv was appointed by Barrick due to its global reputation as a trusted solution provider, as well as the ability to customise its solutions offering to meet Barrick's specific technical and operational requirements.

Company profile:

Barrick Mining Corporation is a sector-leading gold and copper producer, with a portfolio spanning the world's most prolific gold and copper districts.

Industry: Mining

Region: Mara region, Tanzania

¹ <https://www.bdo-ea.com/en-gb/insights/tanzania-s-bold-shift-from-raw-mineral-exporting-to-domestic-mineral-refining>



Solution

The Vertiv™ EnergyCore Grid BESS offering, a transformative solution designed to support the stability of the essential power bus maintaining critical equipment across the site, was implemented by the mine.

The BESS solution was installed to address the challenges related to power disruptions, power quality variability and harmonic distortion.

This is achieved through the conversion of incoming power into a more stable output, providing fast responding voltage and frequency support. The system delivers rapid power switching capability, transitioning 4.5MW to battery power in just 46 milliseconds, allowing continuous stable operation.

One key distinction between a BESS and an uninterruptible power supply (UPS) is that the BESS is connected in parallel to the grid. This meant that Vertiv could eliminate the second switchgear connection for Barrick and offer a product that allows for power injection and stabilisation, without requiring additional switchgear connections.

Vertiv was able to customise the solution to meet Barrick's specific integration requirements, so that the Vertiv BESS can work with the mining system, delivering seamless operations with minimal downtime.

Outcome

The BESS solution has enabled Barrick's North Mara mine to reduce reliance on continuously running diesel generators, with generators now primarily reserved for specific network islanding scenarios.

The rapid response capabilities of the BESS allow for effective reactive power management, minimising voltage instability and providing uninterrupted power to essential systems.

Moreover, in the event of a grid disturbance, the BESS seamlessly assumes the load and automatically resynchronises with the grid once conditions normalise. This level of automation and resilience has enabled the North Mara mine to reduce the risk of interruptions to critical infrastructure.

Key benefits realised include:

- Enhanced power stability and operational continuity;
- Improving equipment protection through better voltage and frequency stability;
- Mitigating grid disturbances by rapidly responding to faults within 46 milliseconds;
- Supporting continuous operations even during grid instability helping maintain production and reduce downtime;
- The elimination of unnecessary generator use for voltage support;
- Seamless transition during grid disturbances; and
- Reductions in diesel use and generator runtime, contributing to improved operational efficiency.



“The deployment of Vertiv’s battery energy storage system at North Mara forms part of ongoing work to strengthen operational stability and support more efficient energy use at site.”

— **Jonathan de Wet,**
Barrick Mining AME
Lead Electrical Engineer

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