

Success Story

Elevating Power Quality for Bangalore Metro Rail Corporation Limited (BMRCL)



In a significant move to enhance the power quality of its metro operations, Bangalore Metro Rail Corporation Limited (BMRCL) in Karnataka, India, chose to use Elspec's advanced power quality analyzers. Recognizing the critical need for reliable and efficient metro services, BMRCL approached Elspec Engineering (India) Pvt. Ltd. to install advanced power quality monitoring solutions across its substations.

Project Objectives

- Utilize continuous waveform recording technology to systematically trace the origins of events, distinguishing between upstream (grid) and downstream (load side) factors, instead of relying solely on event-based recording.
- Conduct harmonics studies in accordance with IEEE 519 compliance requirements.
- Analyze key power quality parameters including RMS, Active Power, Reactive Power, Apparent Power, and critically, Power Factor profiles throughout the loading cycle, discerning between capacitive and inductive loads.

About Bangalore Metro Rail Corporation Limited (BMRCL)

BMRCL is a joint venture of Government of India and the State Government of Karnataka. Bengaluru Metro is a rapid transit system serving the city of Bengaluru, the capital city of the state of Karnataka, India. It is the second longest operational metro network in India with an operational length of 73.75 kilometers, just behind Delhi Metro. This metro system has an average daily ridership of about 688,000 passengers.

Solution

To address these objectives, BMRCL metro approached Elspec Engineering team in India. Elspec's analyzers stand out for their unique continuous waveform recording technique, allowing for the capture and storage of all waveform data at a resolution of up to 1024 samples per cycle, eliminating the necessity for trigger and threshold configurations. This ensures thorough and accurate long-term monitoring of power quality.

These G4430 fixed [class A power quality analyzers](#) were strategically installed across four of the customer's RSS substations, with a total of eight units deployed. Each substation was outfitted with two analyzers, specifically tasked with monitoring the 33KV outgoing metro supply feeders. This comprehensive deployment ensures a granular understanding of power quality dynamics at critical junctures within the metro network, facilitating proactive management and optimization of the electrical infrastructure.

Implementation

Elspec India's expert team facilitated the seamless installation and integration of the [G4430 analyzers](#). The process included:

- Strategic placement of analyzers to cover all critical feeders.
- Continuous data collection and high-resolution recording without the need for threshold settings.
- Real-time monitoring and analysis of power quality data to identify and address issues promptly



G4430

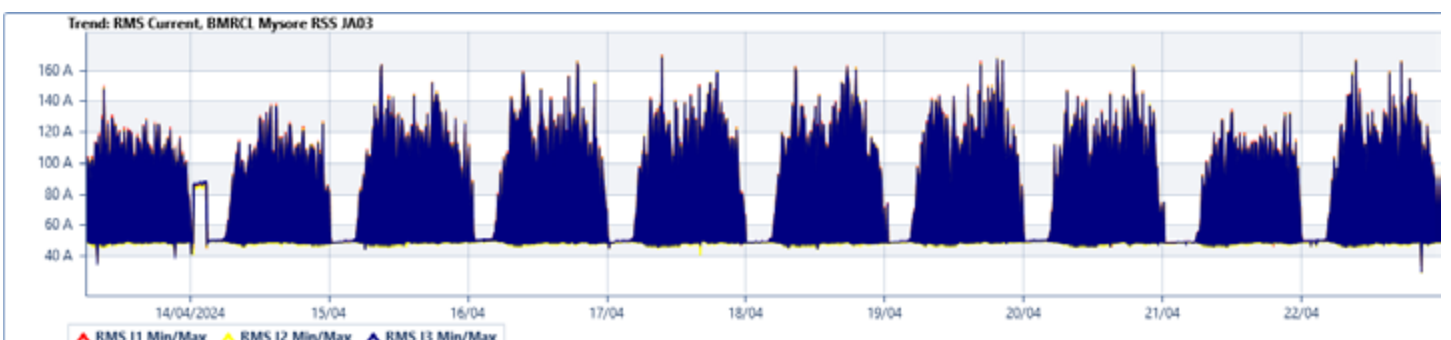
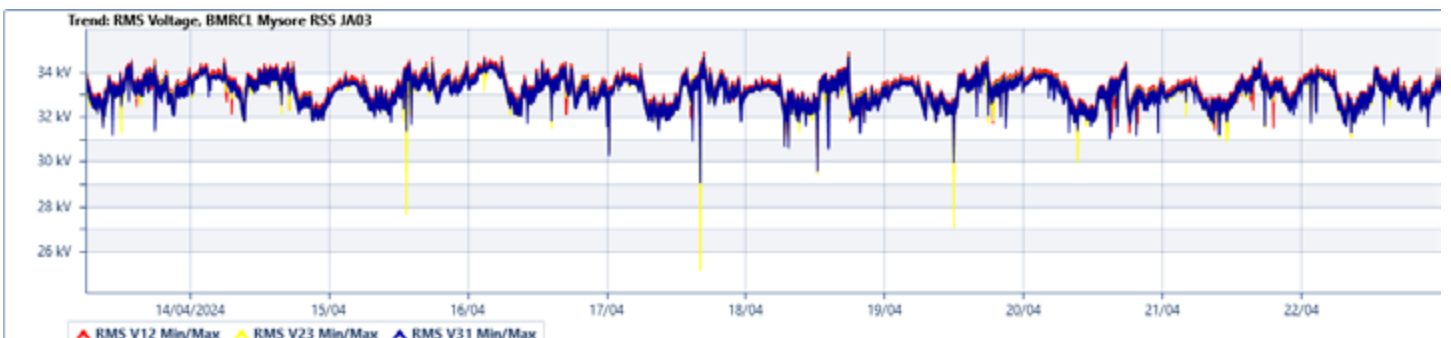
Results

The implementation of Elspec's analyzers provided a comprehensive overview of the power quality at BMRCL's substations, revealing the current state and allowing for proactive management.

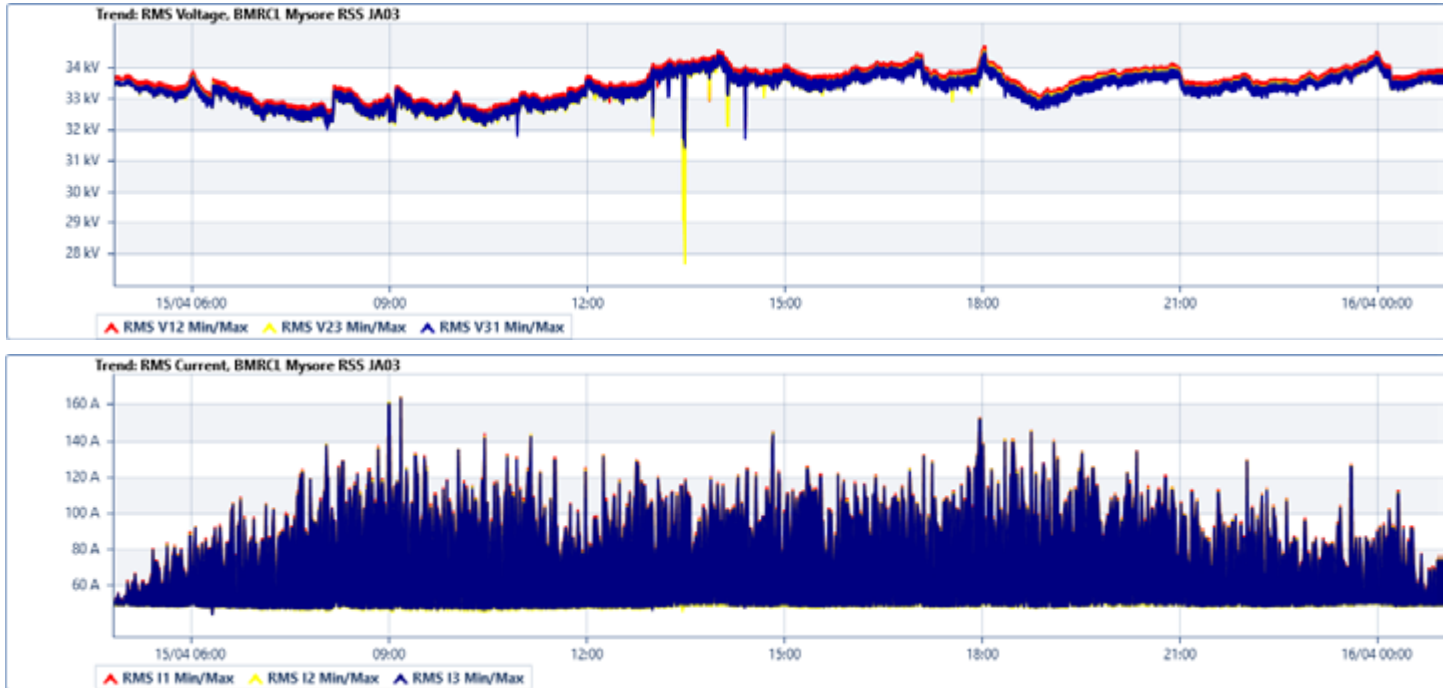
The data analysis provided valuable insights into the sources of power quality issues, including enabling BMRCL to differentiate between upstream (grid) and downstream (metro operations) problems.

The comprehensive data supported proactive maintenance and strategic planning.

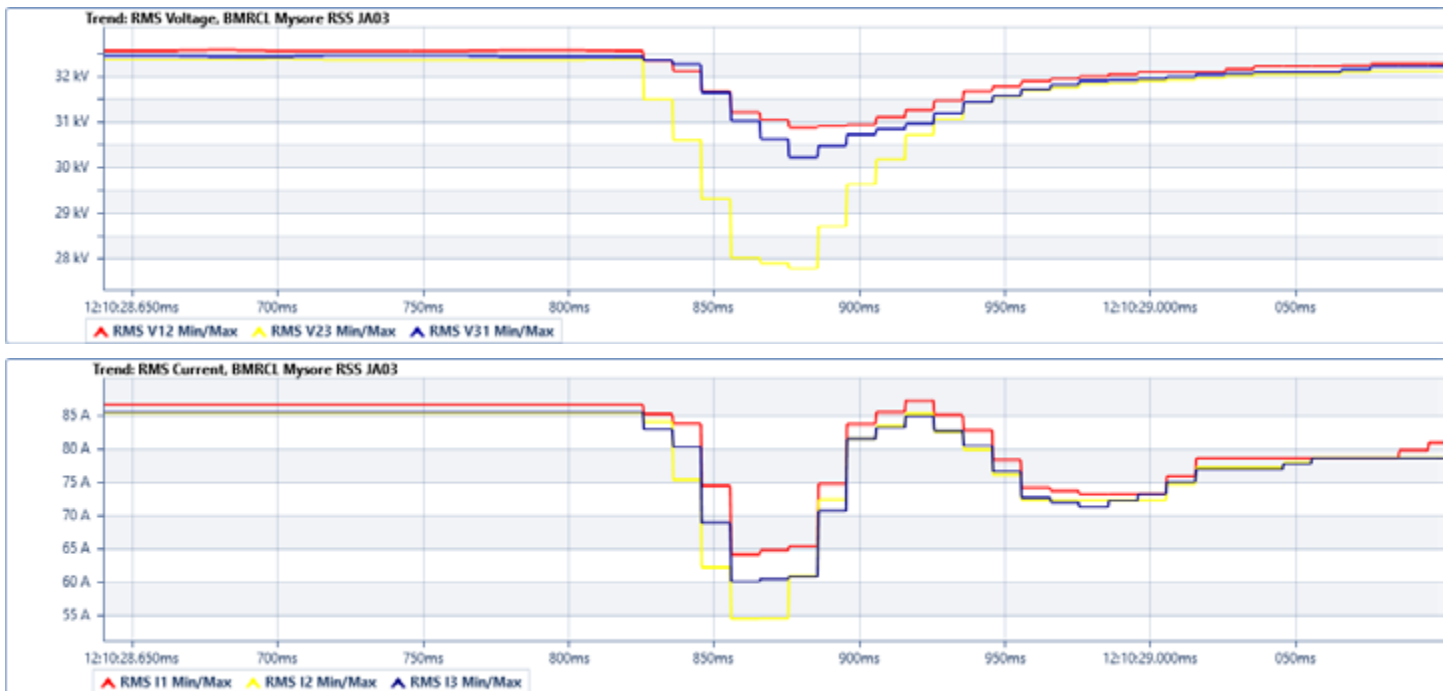
Weekly view: RMS voltage & current



Focus: one day loading cycle



Event source detection: upstream voltage dip



Conclusion

The installation of Elspec's power quality analyzers has significantly enhanced the customer's ability to monitor and manage power quality, to comply with international power quality standard and to enhance operational efficiency and reliability of metro services.

Looking Ahead

This success story highlights the current achievements of BMRCL in enhancing its power quality using advanced monitoring solutions, demonstrating the benefits of continuous waveform recording. BMRCL metro continues to leverage the data and insights provided by the Elspec's analyzers to maintain and improve power quality, setting new benchmarks for metro systems in India.



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Headquarters
Elspec Ltd.
info@elspec-ltd.com

North America
Quality Energy
info@quality-energy.com

Europe
Elspec Portugal Lda.
info@elspeceurope.com

India
Elspec Engineering India Pvt Ltd.
info@elspec.in

Región Andina
Elspec Andina
info@elspec.com.co