

Case Study

Enhancing Energy Efficiency and Power Quality in Pharmaceutical Production with Elspec's Equalizer System

Resolve Low Voltage Issues and Boost Operational Efficiency



This case study highlights how Elspec's Equalizer system significantly improved energy efficiency and power quality for one of the largest pharmaceutical production companies in Colombia, addressing challenges with low voltage and fluctuations that impacted their operations.

Customer Situation

A pharmaceutical production plant in southwestern Colombia, part of a leading company with over 4,000 products and more than 8,600 employees across multiple plants in Latin America, was facing frequent failures in critical electronic equipment due to low voltage and voltage fluctuations. These issues caused significant operational disruptions and economic losses, prompting the company to approach Elspec's Colombia team in Latin America for assistance. The team conducted a detailed power quality analysis of the electrical network using the PureBB plug-and-play [power quality analyzer](#) and Elspec's PQSCADA [power management software](#). The analysis revealed not only low voltage but also high current and reactive power levels as well as high levels of harmonics in the system.

Solution: Elspec Equalizer System for Reactive Power Compensation and Voltage Stabilization

To address these issues, Elspec recommended the installation of its 690kVAr Equalizer system. The Equalizer is a high-performance [power quality solution](#) that uses thyristor switching technology to compensate for reactive power, stabilize voltage, filter harmonics, and reduce voltage fluctuations. This system is designed to enhance energy efficiency and reliability, offering a real-time solution that stabilizes voltage in less than one cycle.

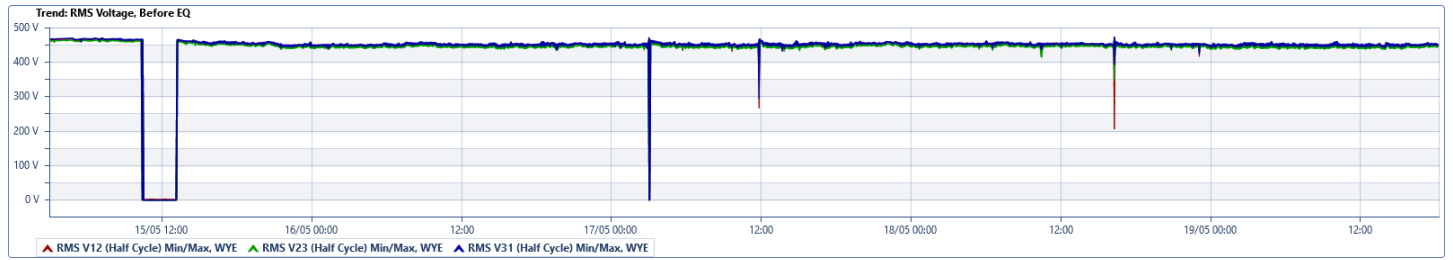


The Results

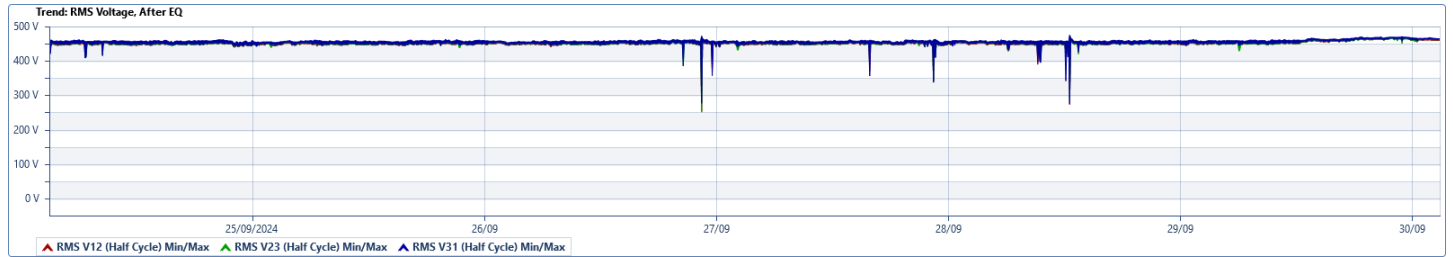
After installing the Equalizer system, voltage levels increased from 447V to 456V and were stabilized at this level, addressing the plant's low voltage issues.

Voltage levels:

Before EQ

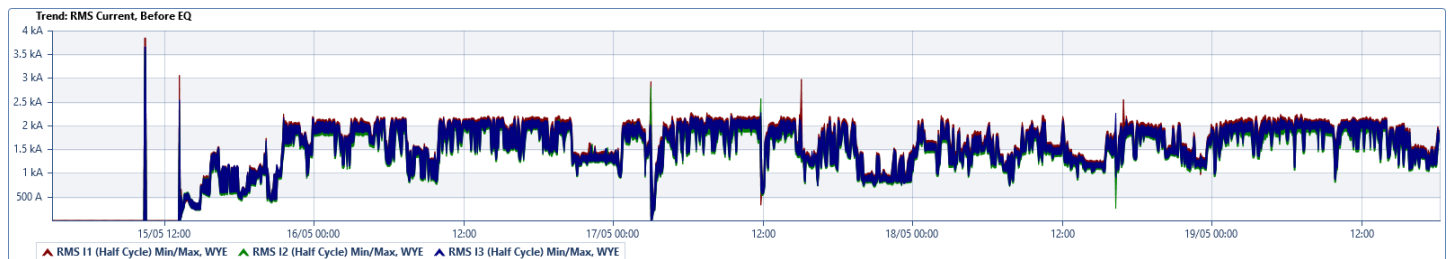


After EQ

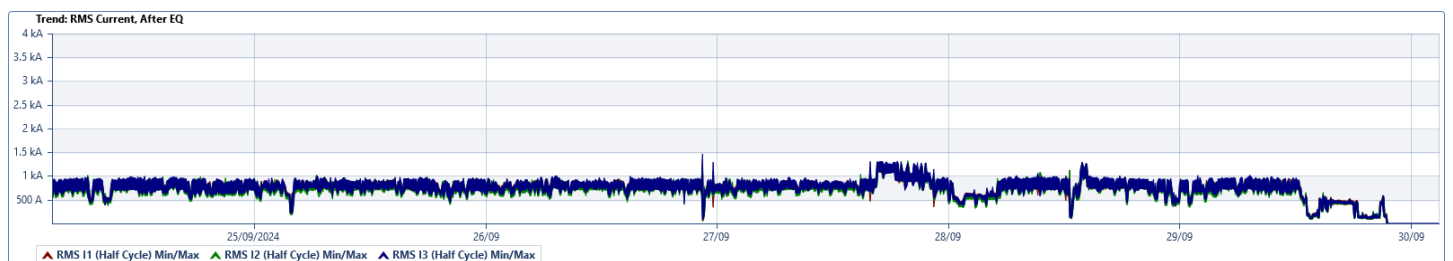


Current levels:

Before EQ



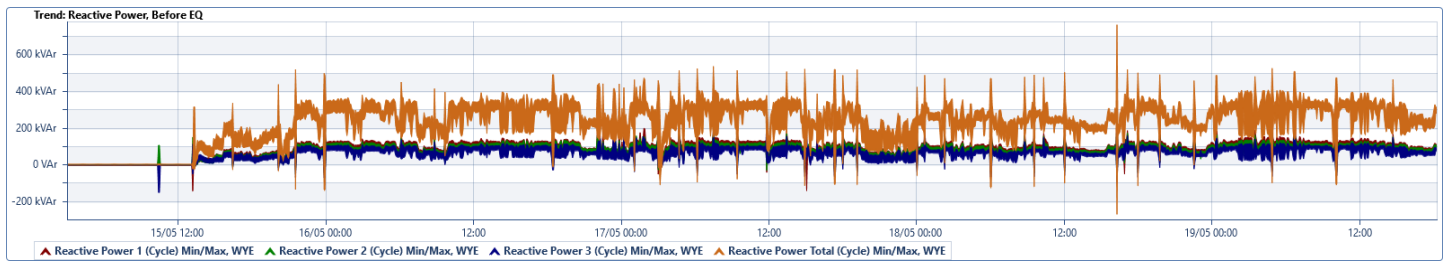
After EQ



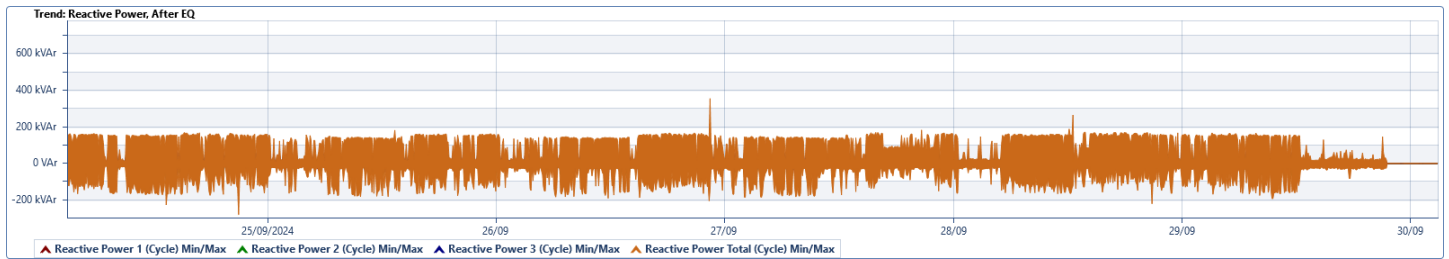
Reactive power demand was reduced from an average of 540kVAr to nearly 186kVAr, which led to a significant reduction in apparent power by approximately 420kVA.

Reactive power:

Before EQ

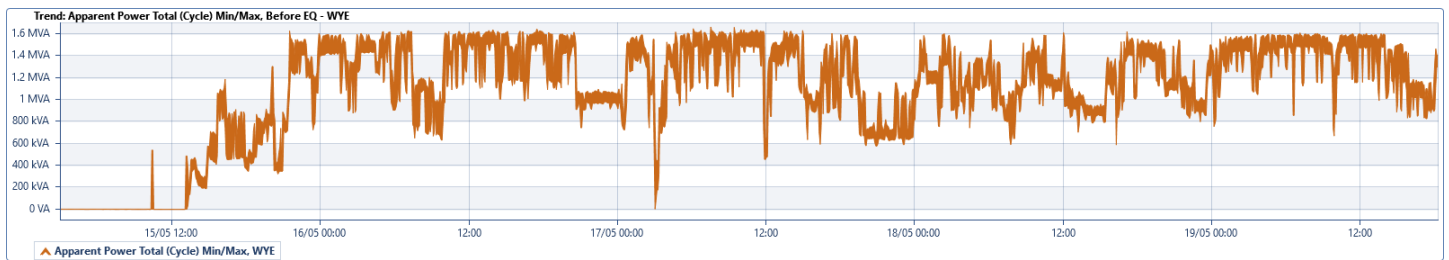


After EQ

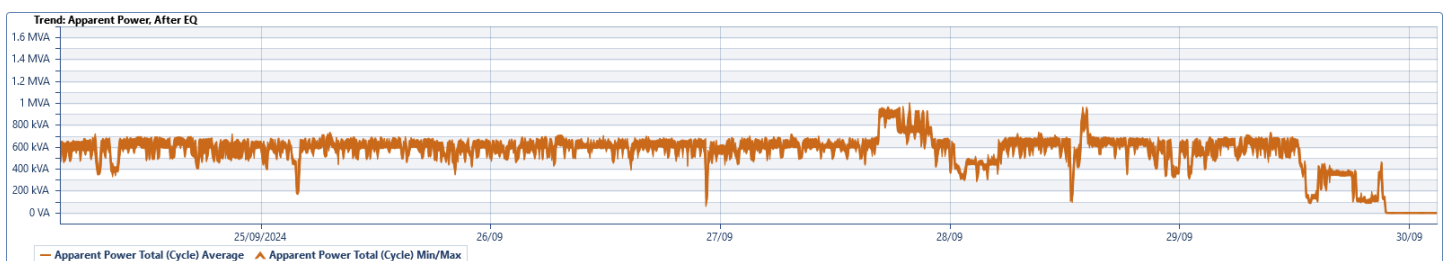


Apparent power:

Before EQ

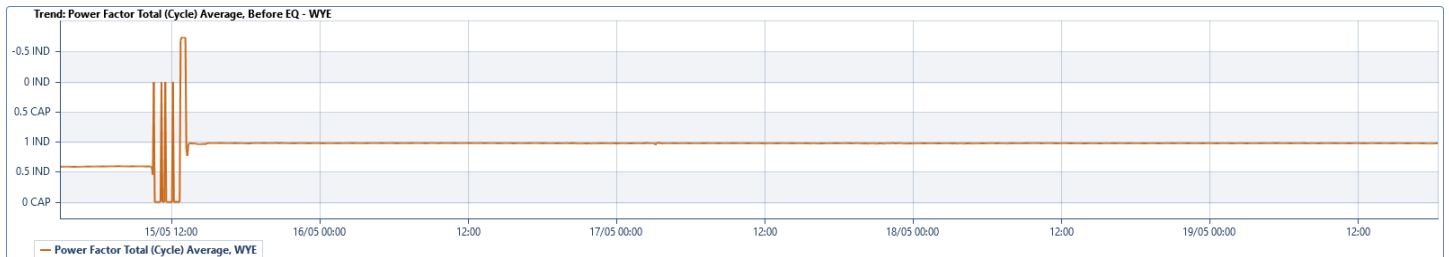


After EQ

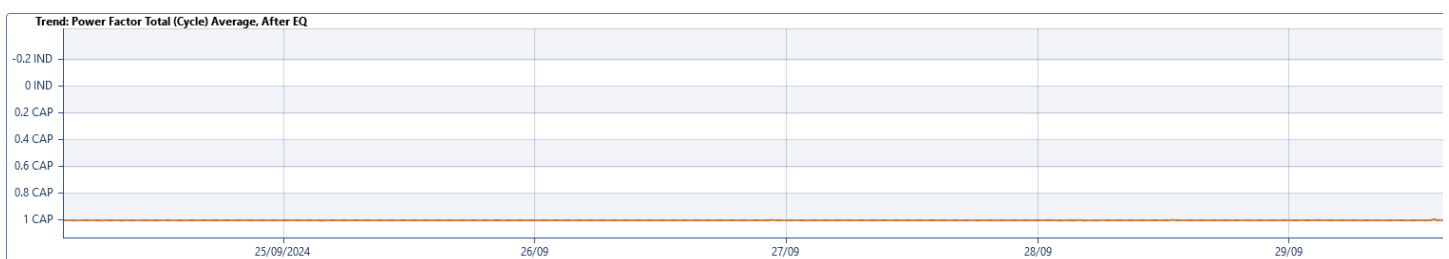


Additionally, the power factor improved from 0.95 (inductive) to 0.99 (inductive), indicating more efficient use of electricity and less strain on the infrastructure.

Before EQ

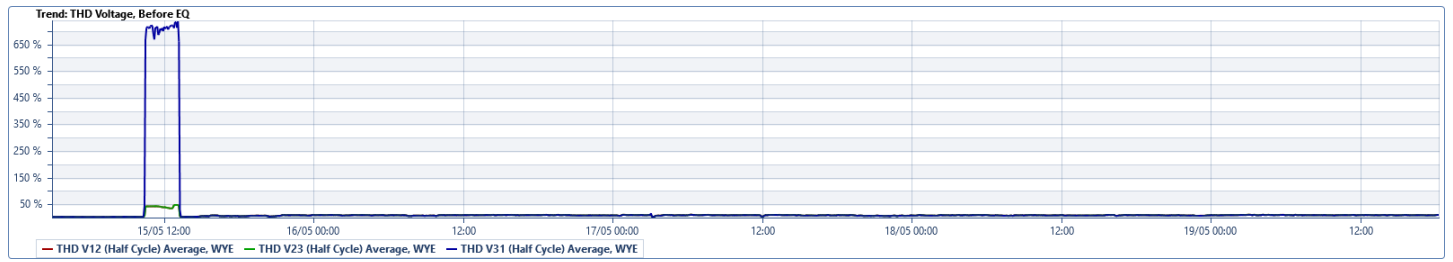


After EQ

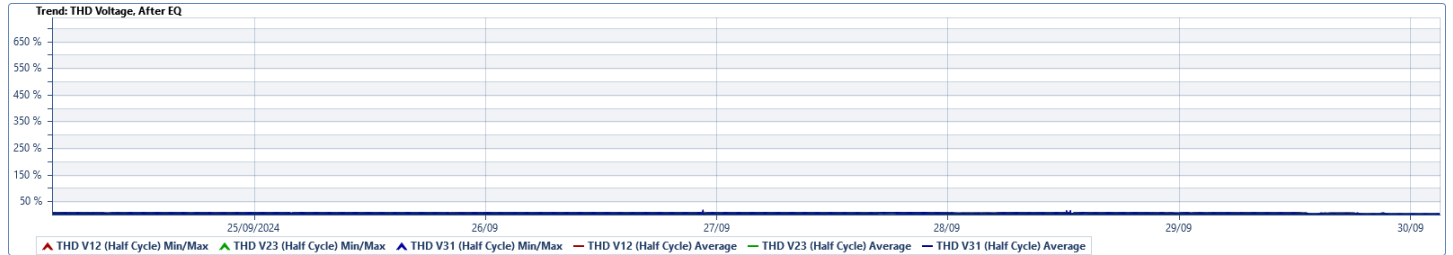


Total Harmonic Distortion in Voltage (THDv):

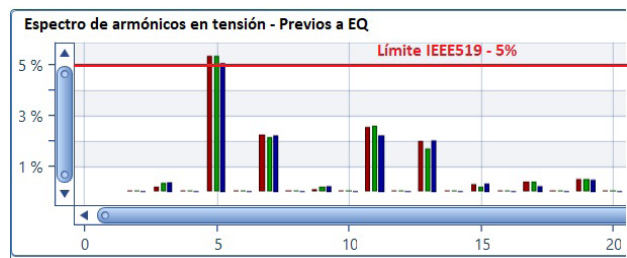
Before EQ



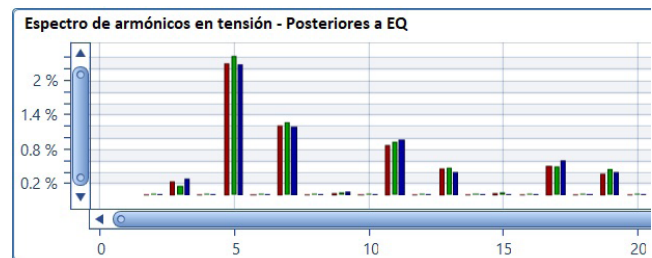
After EQ



Before EQ

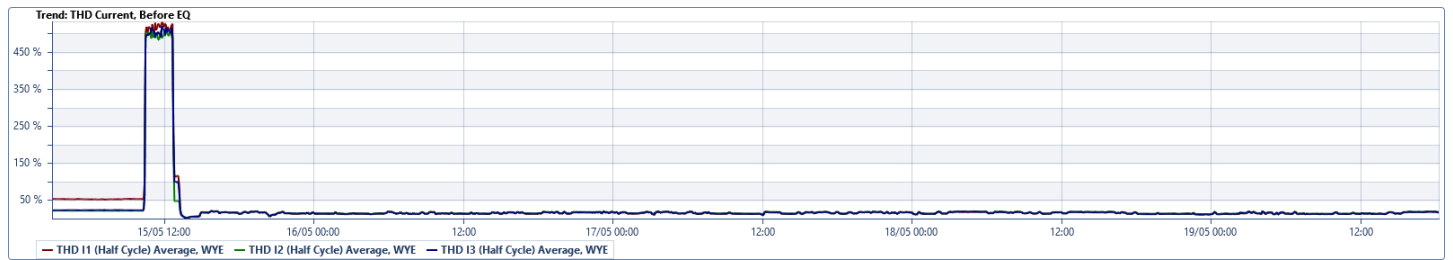


After EQ

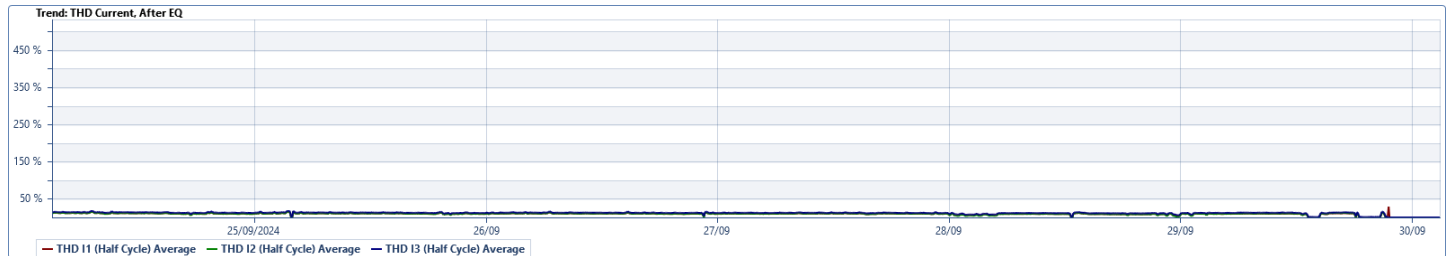


Total Harmonic Distortion in Current (THDi):

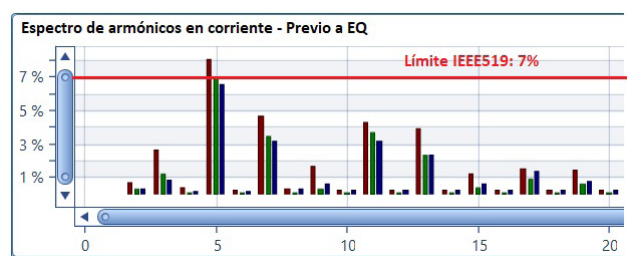
Before EQ



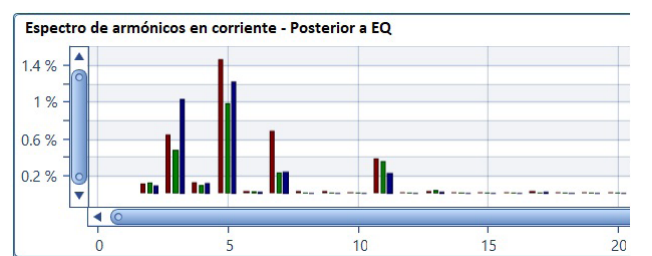
After EQ



Before EQ



After EQ



Conclusions

The [Elspec Equalizer system](#) effectively addressed the plant's low voltage and power quality issues, leading to improved energy efficiency, reduced operational disruptions, and cost savings. By increasing and stabilizing voltage, reducing reactive power, and improving power factor, the system optimized the plant's electrical system, ensuring the reliability of its sensitive equipment and preventing costly failures. This solution provided a significant return on investment, enhancing operational efficiency and reducing energy-related costs in the Pharmaceutical Production industries.



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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