

## Case Study

# Improving Power Quality: Mitigating Reactive Energy Demand to Enhance Cable Car Performance in Italy



Power quality is crucial in cable cars, especially during emergency situations such as sudden power outages due to a severe storm or a fault in the main power supply. In such cases, the cable car system needs to switch to its backup generator to ensure uninterrupted operation and passenger safety. The backup generator kicks in automatically or through manual intervention to provide power to critical systems, such as control mechanisms, emergency lighting, and communication systems. During this transition to the backup generator, power quality becomes crucial. The backup generator must deliver stable and consistent power without voltage fluctuations or disruptions. This ensures a seamless transition and the continuous operation of essential systems until the main power supply is restored.

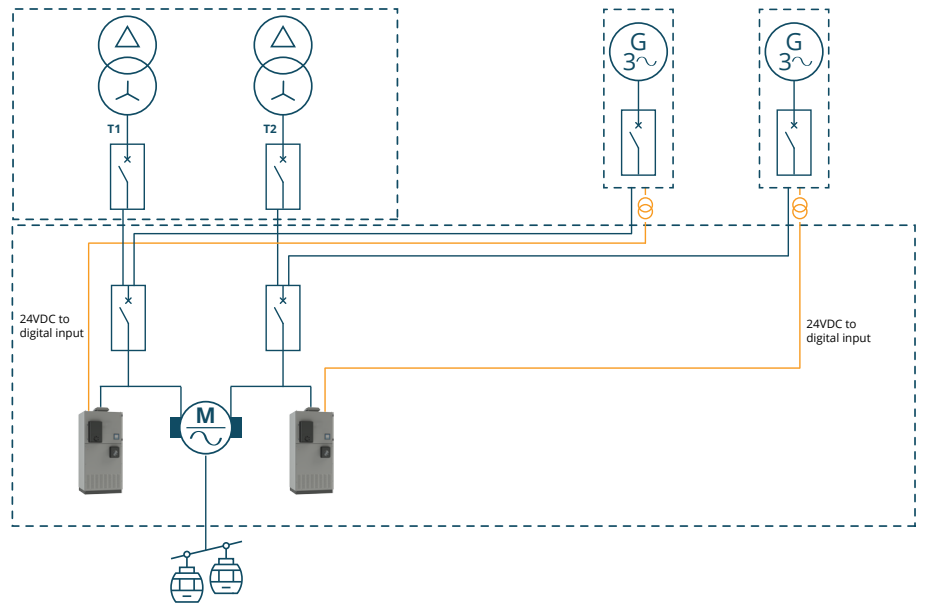


## Customer Situation

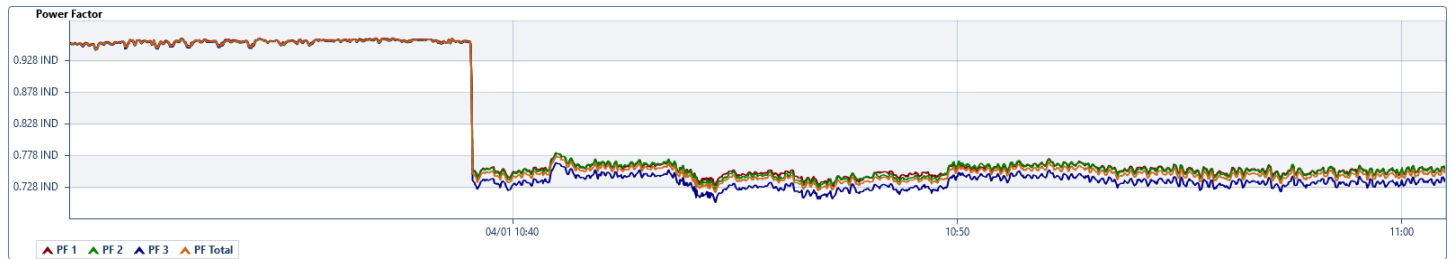
Funivie Piccolo San Bernardo is an Italian cable car transportation services company. With an impressive network spanning over 150 km of trails, 82 slopes, and 38 lifts, they provide exceptional skiing and mountain experiences to their customers. However, the company has been facing a challenge with their cable car system.

The cable car system is powered by two main power lines, ensuring reliable operation under normal circumstances. Yet, in the event of an emergency, the system switches to an emergency generator. This switch has resulted in an increased reactive energy demand,

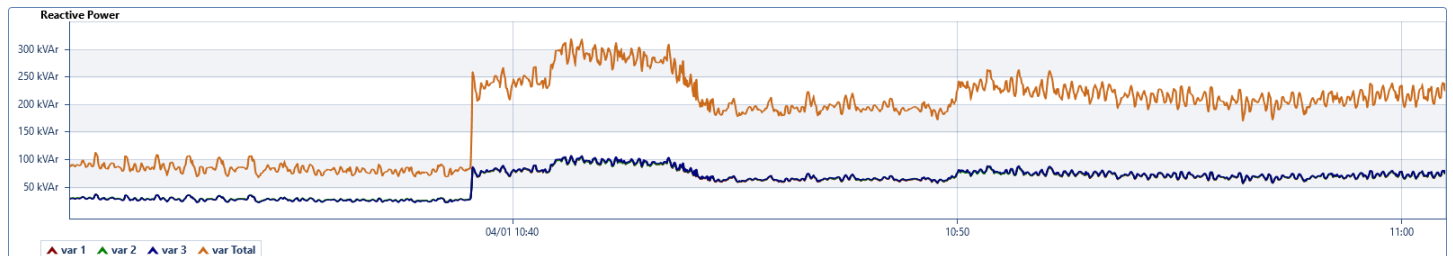
soaring from the usual 98kVAr to 305kVAr. Consequently, the motor was unable to operate at its full capacity, leading to a diminished speed for the lift. Funivie Piccolo San Bernardo reached out to Elspec's agent in Italy for assistance.



## Power Factor



## Reactive Power



## Solution

Following a comprehensive power quality analysis, Elspec recommended the installation of two 450kVAr systems of Elspec's Equalizer. This [real time reactive power compensation system](#) provides transient free smooth switching by connecting capacitors at zero-crossing.

## Results

Installing Elspec's [Equalizer systems](#) reduced the reactive energy demand in 67% (from 305kVAr to 98kVAr) and in some of the cases in 86% (to 42kVAr). This improvement allowed the motor to operate at its full capacity, restoring the lift to its acquired speed.

Furthermore, the power factor remained stable throughout the operation. While the Power Factor dropped from 0.98IND to 0.76IND on switching to the emergency generator without the Equalizer, with the Equalizer on, it kept being high 0.983IND, ensuring optimal power efficiency and utilization. This not only addressed the immediate challenge faced by Funivie Piccolo San Bernardo but also enhanced the overall reliability and performance of their cable car system.

## Conclusions

This case has shown the effectiveness of Elspec's Equalizer in improving power quality and mitigating the impact of reactive energy demands. As a result, the cable car transportation services company can now provide a seamless, safe, and enjoyable experience, providing the best possible mountain adventures for their visitors.



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