Audit report

Subject of measurement	***Electricity quality audit***	
Measurement requester	***ELI Beamlines***	
	Za Radnicí 835	
	25241 Dolní Břežany	
Measurement location	***Substation***	
Measured points	*Transformer output*	
Purpose of measurement	*Determination of actual power quality*	
Date	*May 4, 2020*	*Measurement provider*
Measurement performed by	*Petr Nedorost*	***Blue Panther, s.r.o.*** *Mezi Vodami 29,* *143 00 Prague 4* *Tel: 241 762 724*
Protocol prepared by	*Petr Nedorost*	
Equipment used	*Installed network analyzer*	
List of attachments		

Measurement report

The measurement was performed to determine the actual status of the electrical network parameters at **ELI Beamlines.**

The data was processed on May 4, 2020.

Measurements were taken at the transformer output and UPS output using an Elspec analyzer, class A with recording, type Elspec G4410 BlackBox.

The voltage of all three phases L1, L2, L3, and Ln, and the currents L1, L2, L3, at the transformer output were monitored.

Measured results

Since the measurements were performed to determine the actual state of the electrical network at **ELI Beamlines,** the following basic parameters were monitored: the voltage of individual phases L1, L2, L3, and conductor N, the currents of individual phases L1, L2, L3, their envelopes, and frequencies.

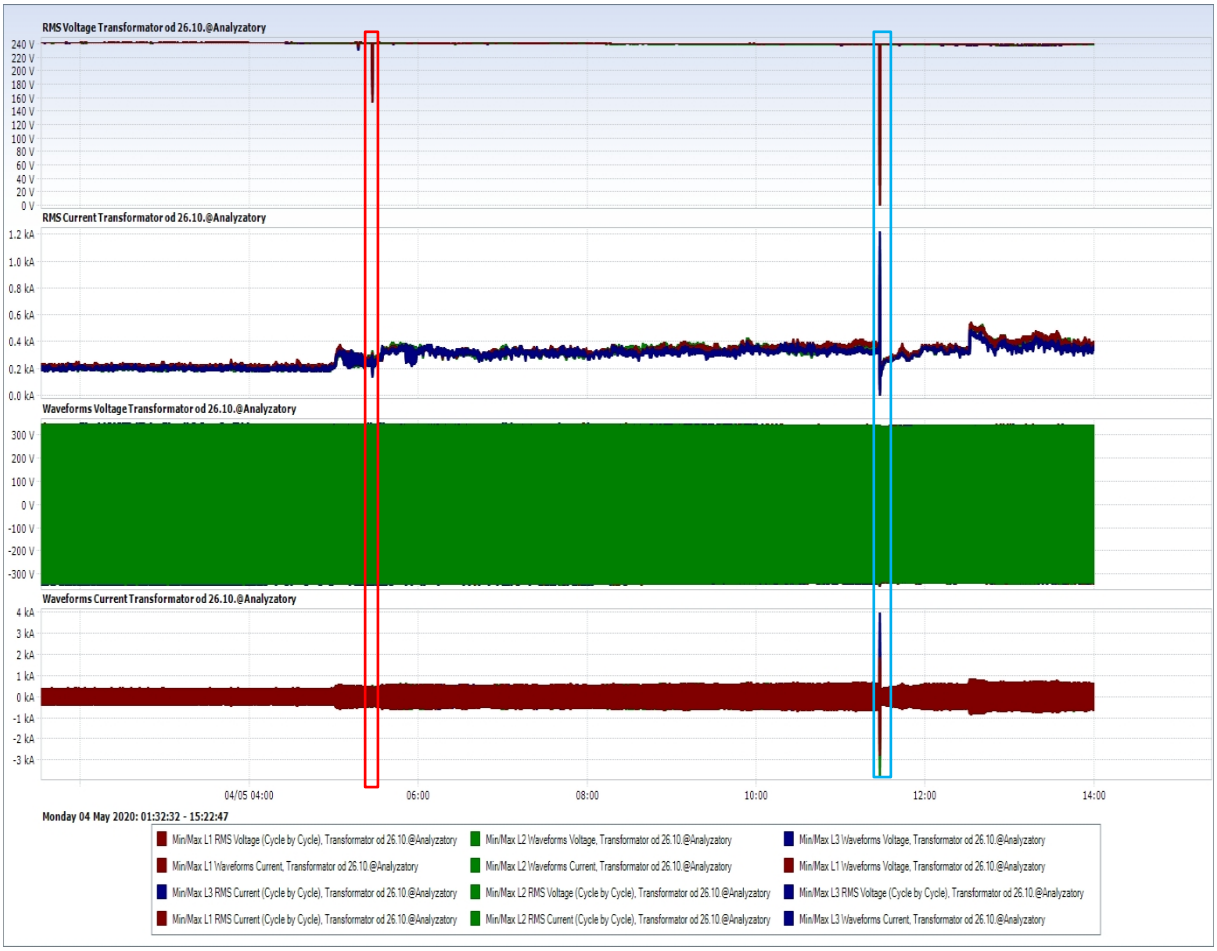

Fig. 1 shows the time course of the recording of phase U, I, and their envelopes during the day. Two significant drops are recorded in the network voltage. The marked details are shown in the following figures.

Fig. 2 The CBEMA curve shows voltage drops in the superordinate network. All voltage drops are outside the tolerance limits of EN 50160 (white field).

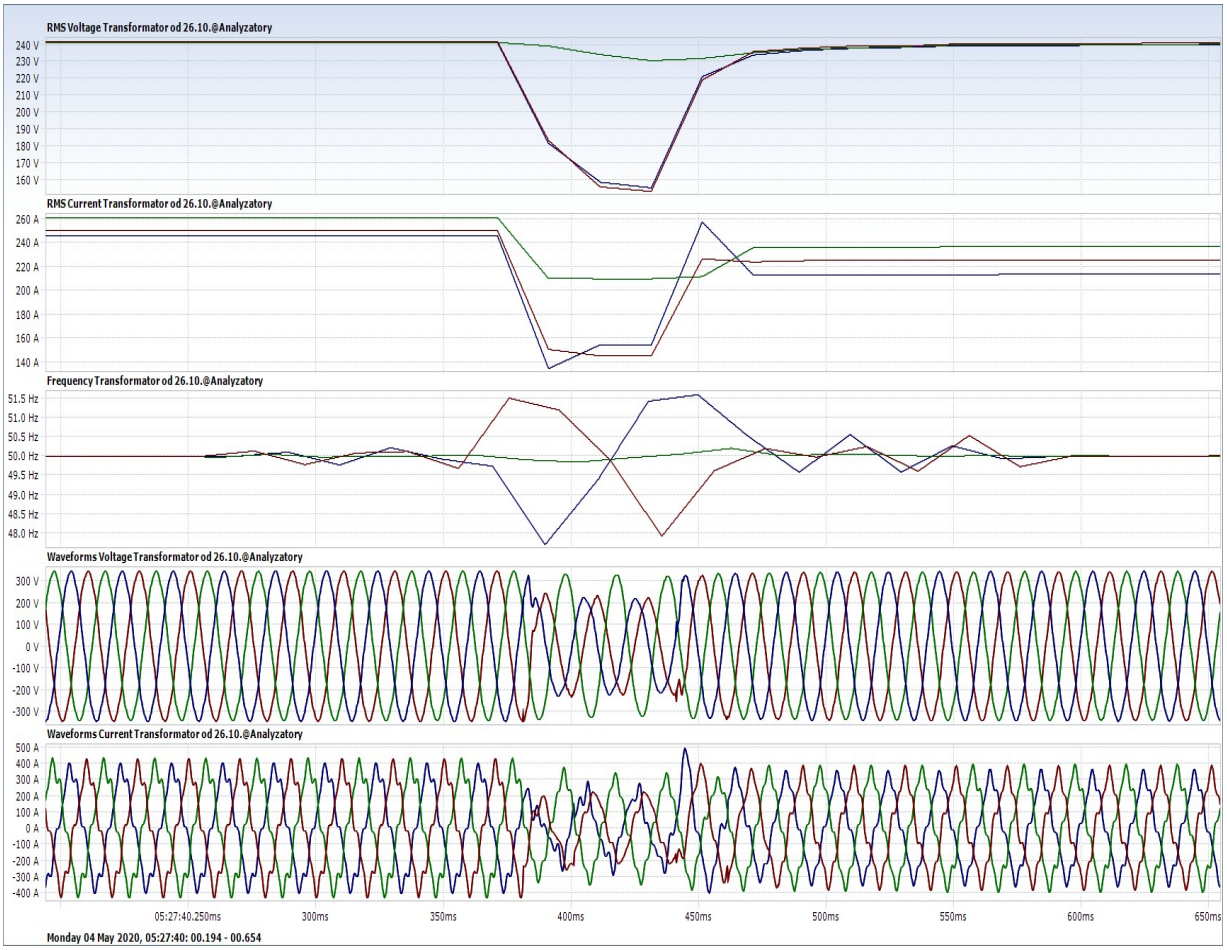

Fig. 3 shows a red detail **of Fig. 1.** The middle trace frequency shows deviations from normal (51.5 Hz) in phases 1 and 3. The voltage dropped below 160 V in these two phases.

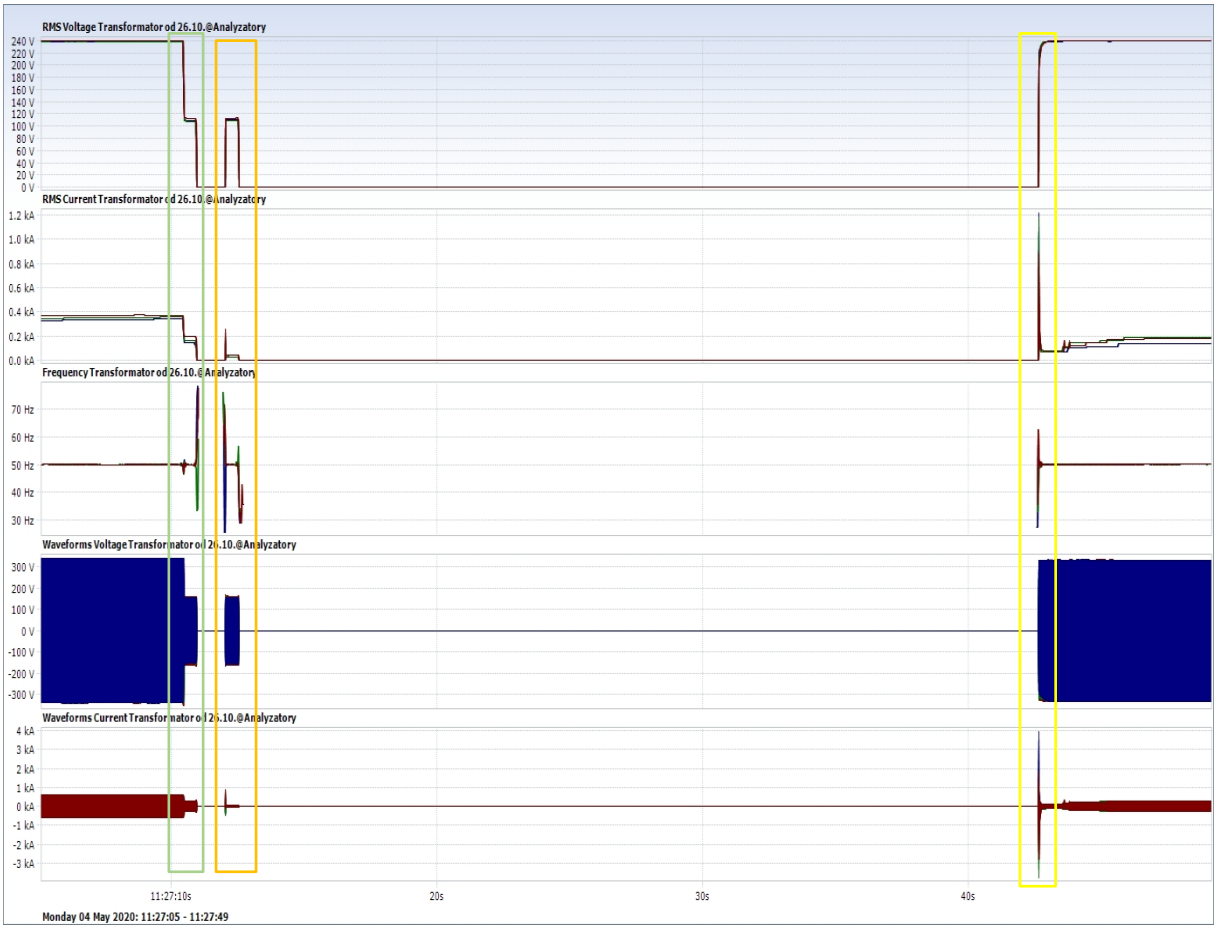

Fig. 4 shows the blue detail **of Fig. 1.** The middle trace frequency shows significant changes. The duration of the outage was approximately 30 s. The curves can be seen in the following figures.

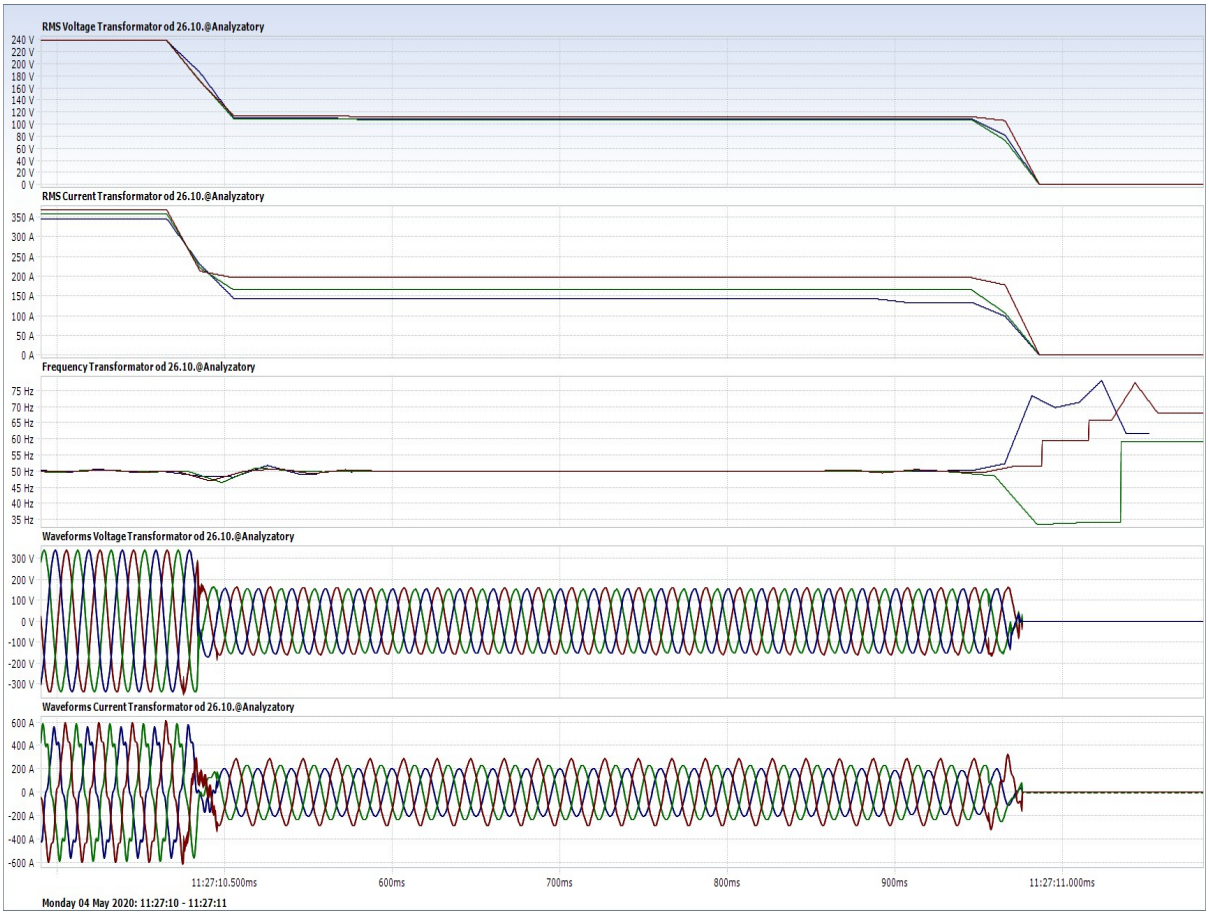

Fig. 5 shows the green detail **of Fig. 4.** The middle trace frequency shows slight fluctuations. At this time, the voltage dropped to approximately 110 V.

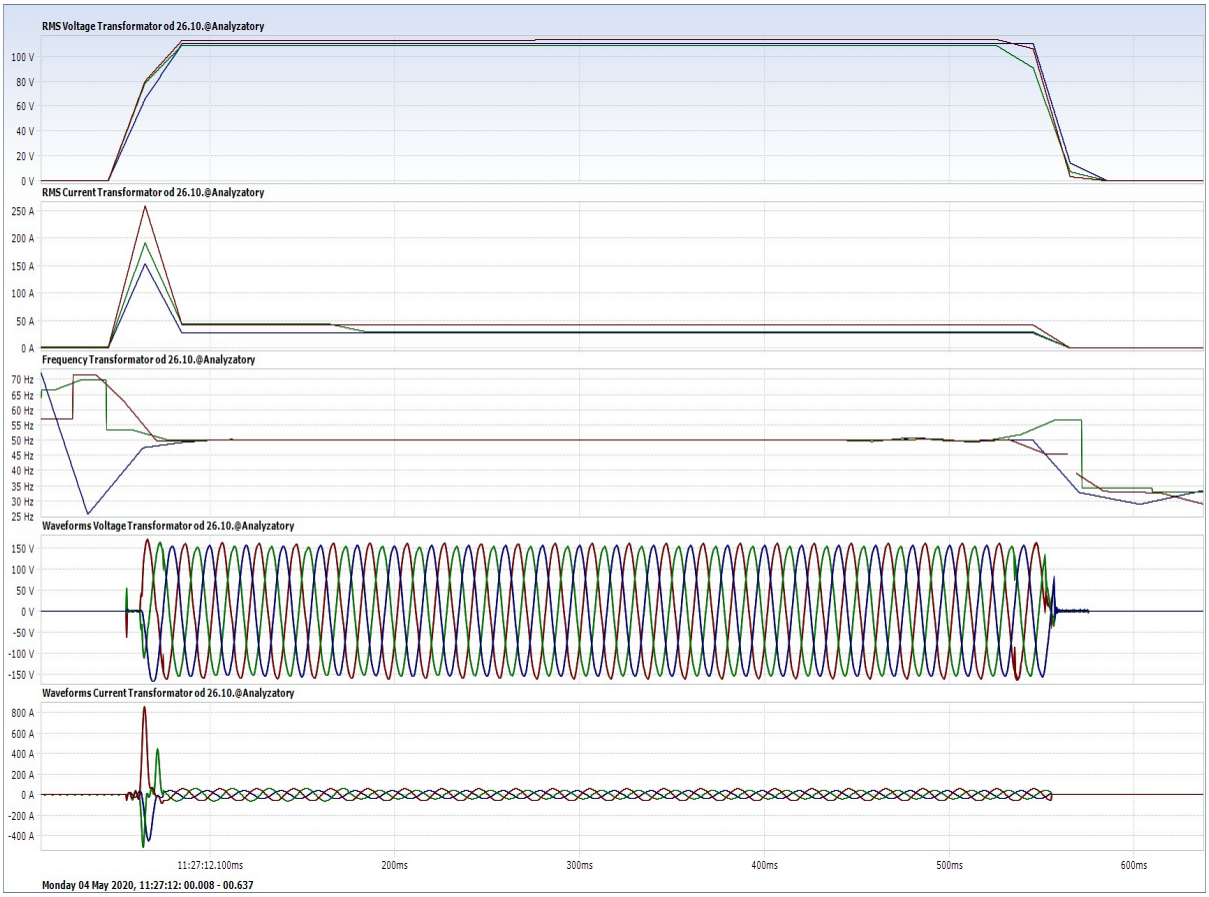

Fig. 6 shows the orange detail **of Fig. 4.** The voltage was switched on and off again for a total duration of 500 ms, and the voltage was again 110 V.

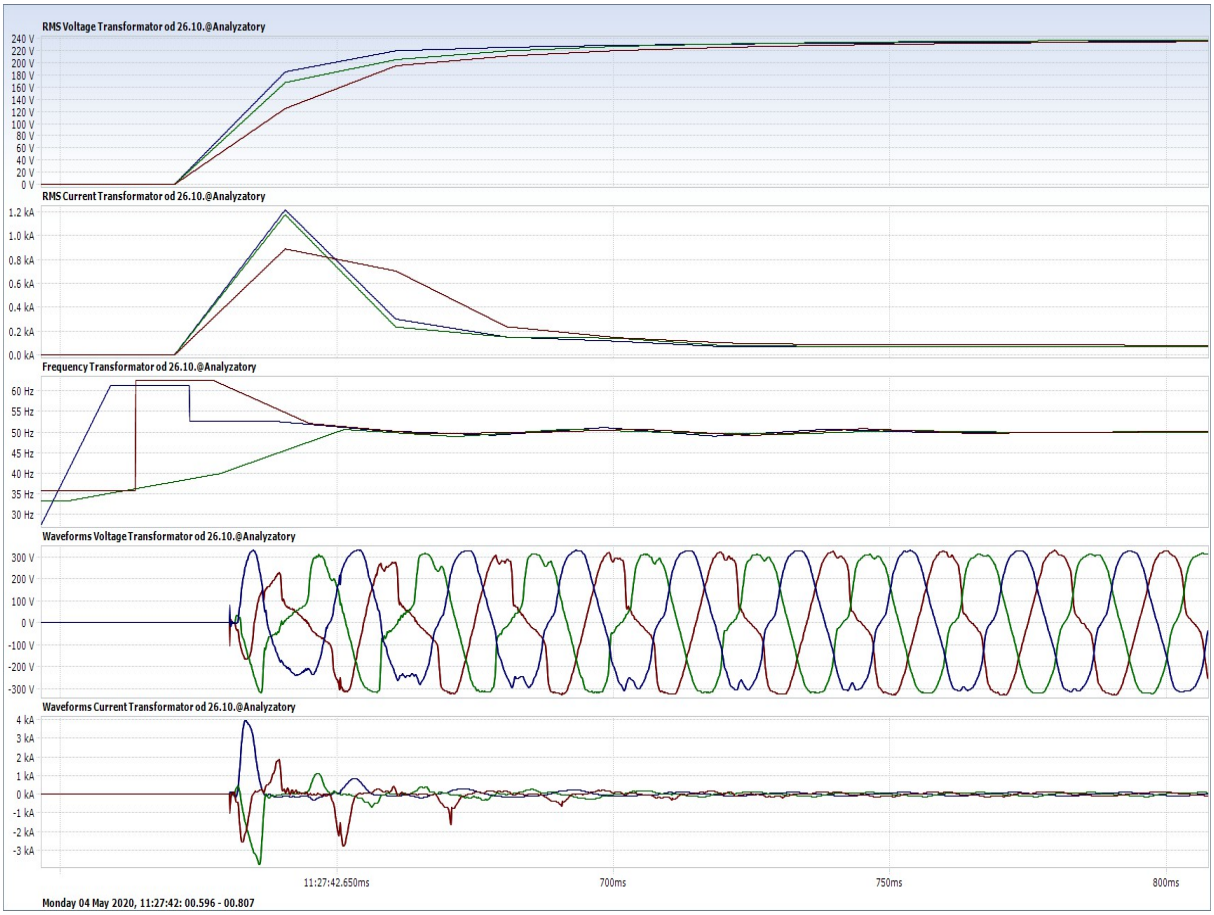

Fig. 7 shows the yellow detail **in Fig. 4.** Restarting with normal voltage.