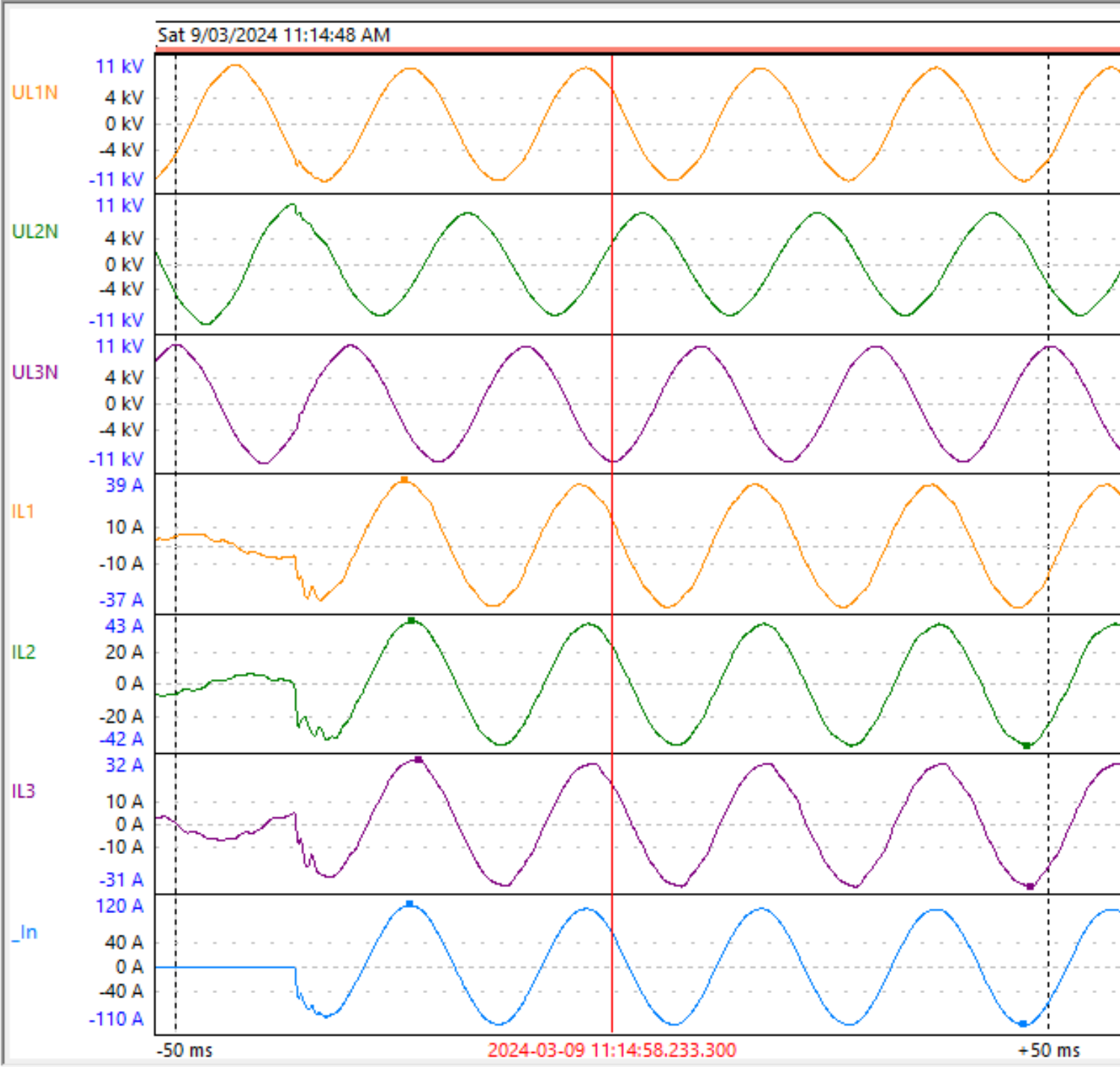


Power Quality – some recent observations at Powerco.

Robin Pittwood
Principal Engineer – Power Quality
Powerco Limited

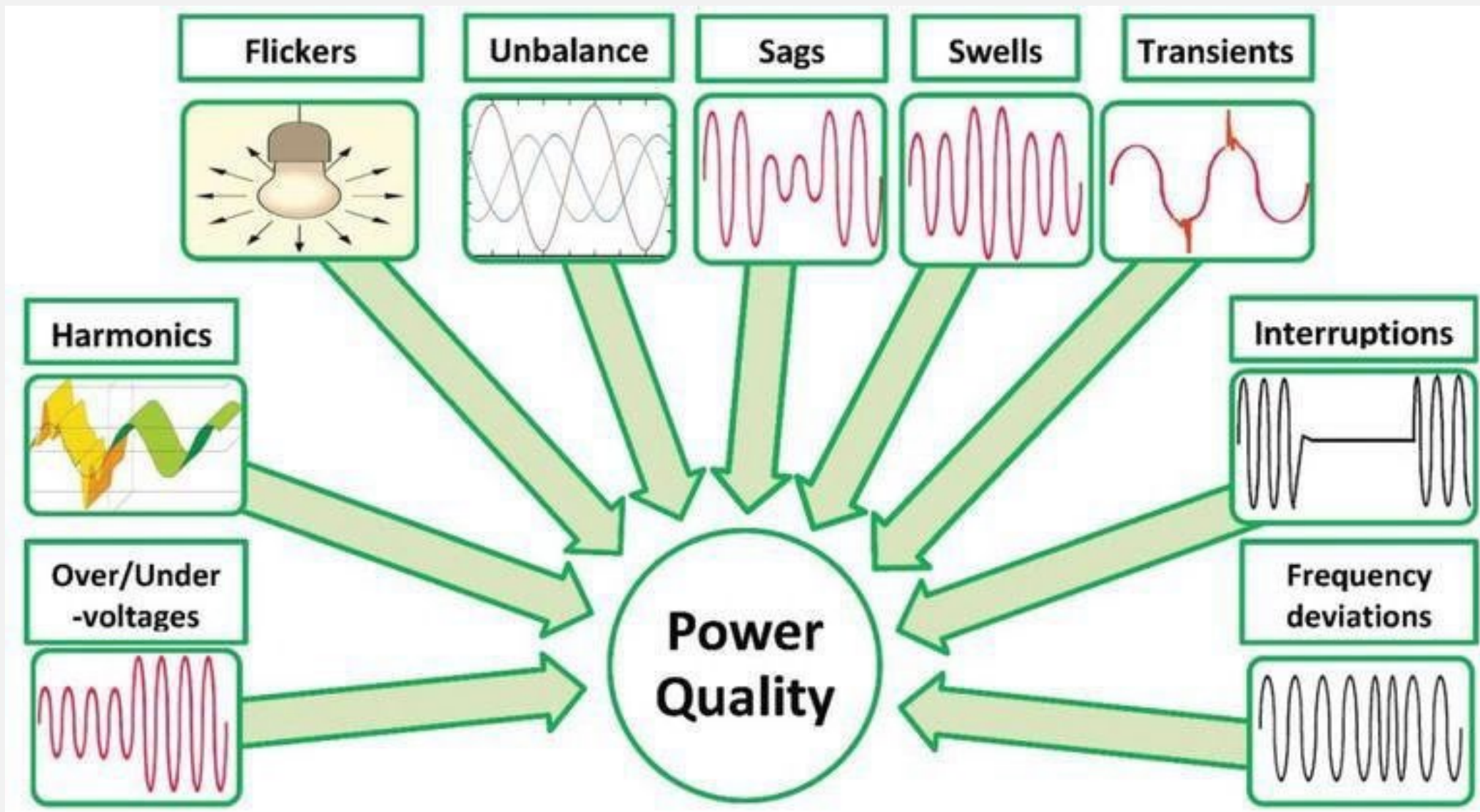
EEA Asset Management Workshop
Wellington, NZ
12 June 2024



Opening premise

Power quality information and understanding can provide key guidance in three important areas:

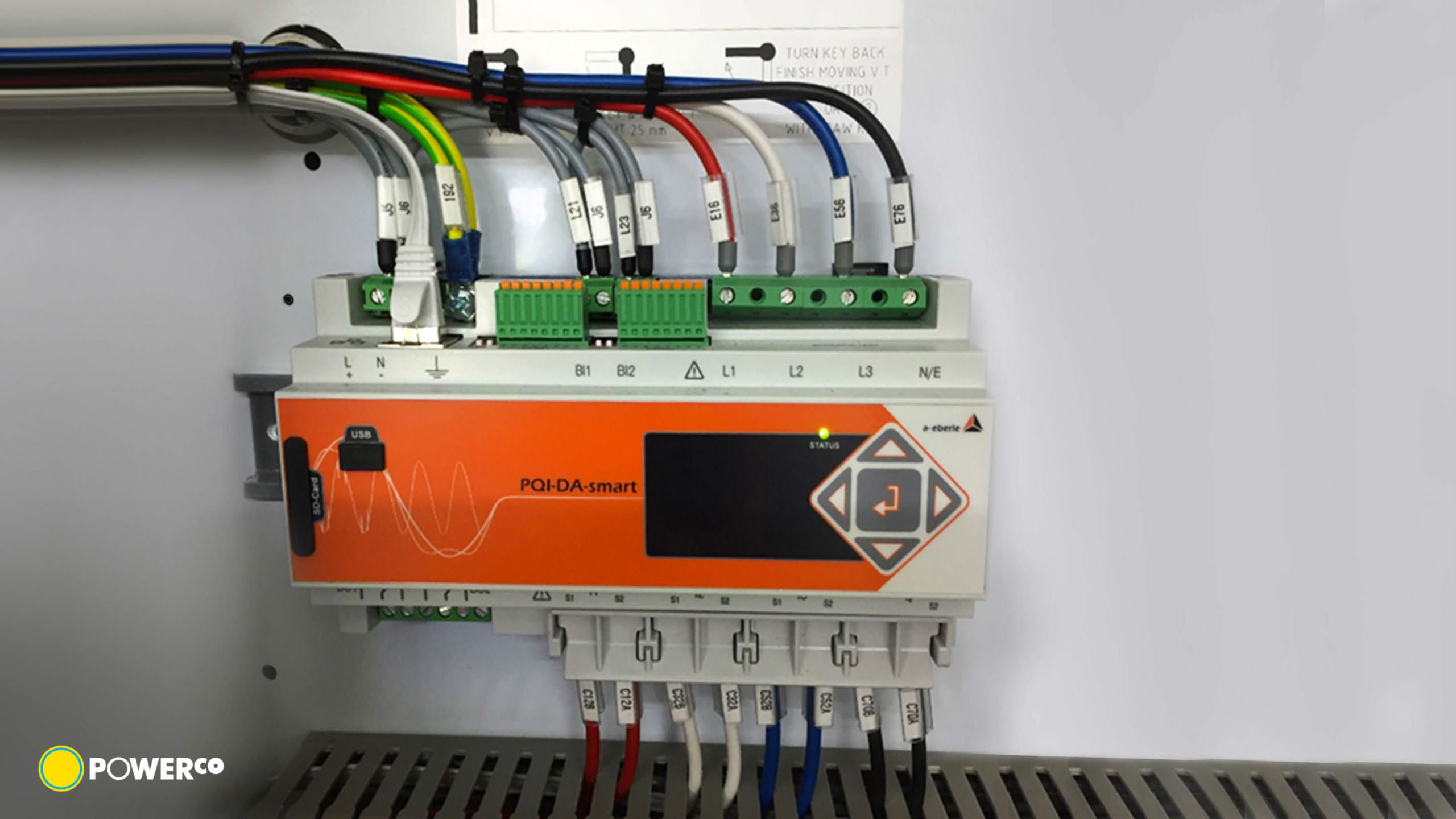
- system performance
- economic performance
- customer satisfaction



Challenges coming up

The addition of new inverter-based devices and distributed generation the list now also includes:

- excessive reactive power flows
- complex and messy disturbance responses
- inter-harmonics
- high frequency noise
- reducing fault level
- reducing inertia



TURN KEY BACK
FINISH MOVING V T
POSITION
WITH AW K

L N
B1 B2 ⚠ L1 L2 L3 N/E

USB
SD-Card

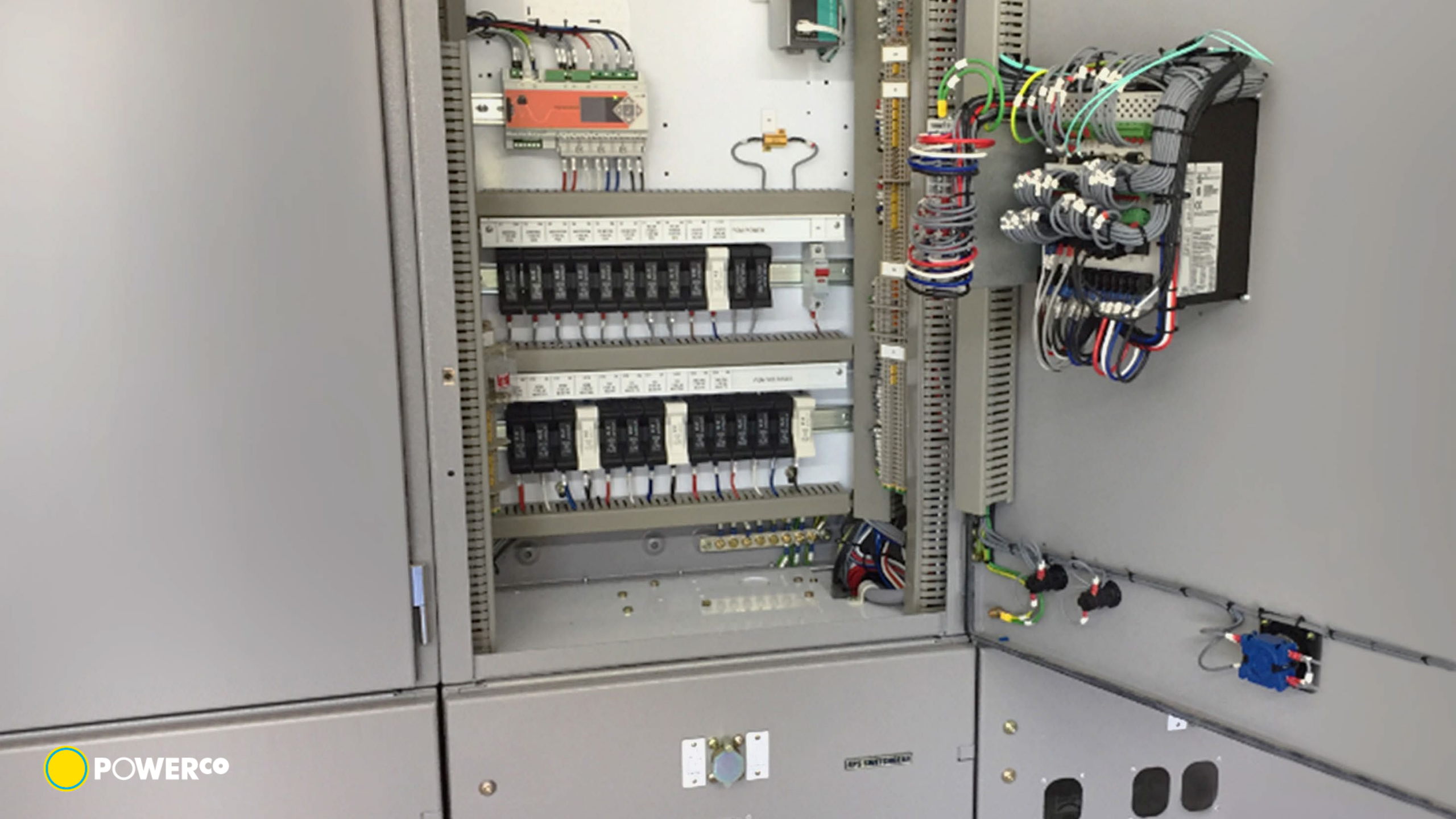
PQI-DA-smart

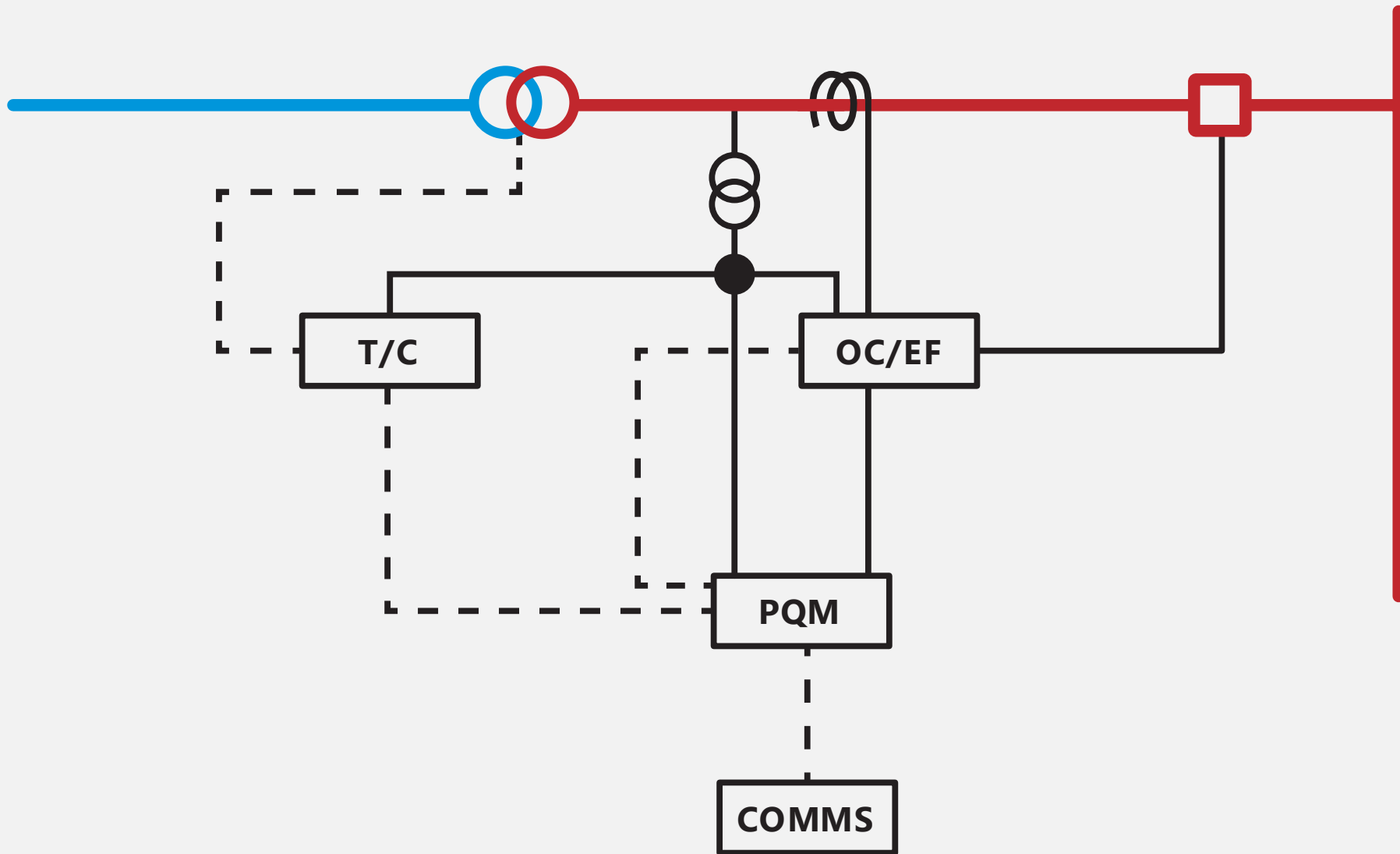
STATUS

a-berie

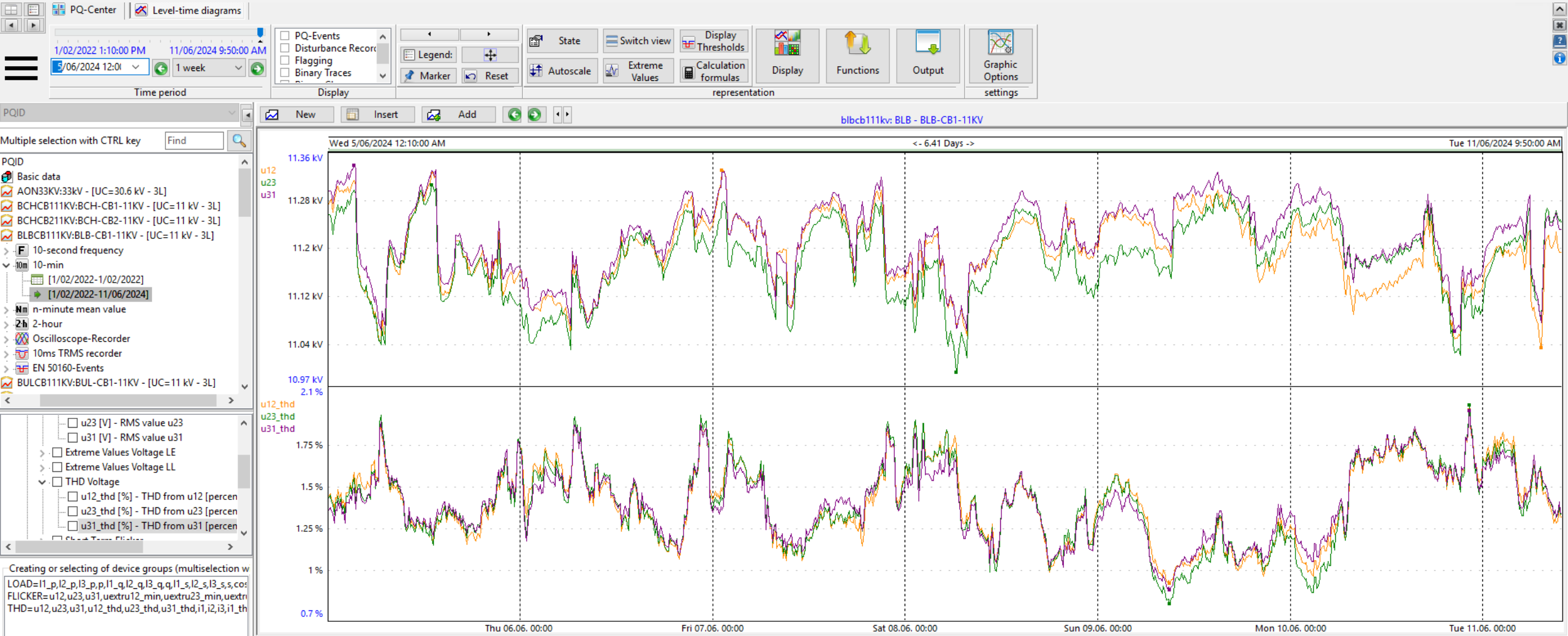
⚠ S1 S2 S1 S2 S1 S2 S1 S2

C118 C121 C123 C124 C125 C126 C127 C124





Extensive time series database



1 June 2024 10:40am - notice



TRANSPOWER



Excursion Notice

To: Excursion NI Participants

Sent: 01-jun-2024 10:46

Ref: 5418746601

From: The System Operator

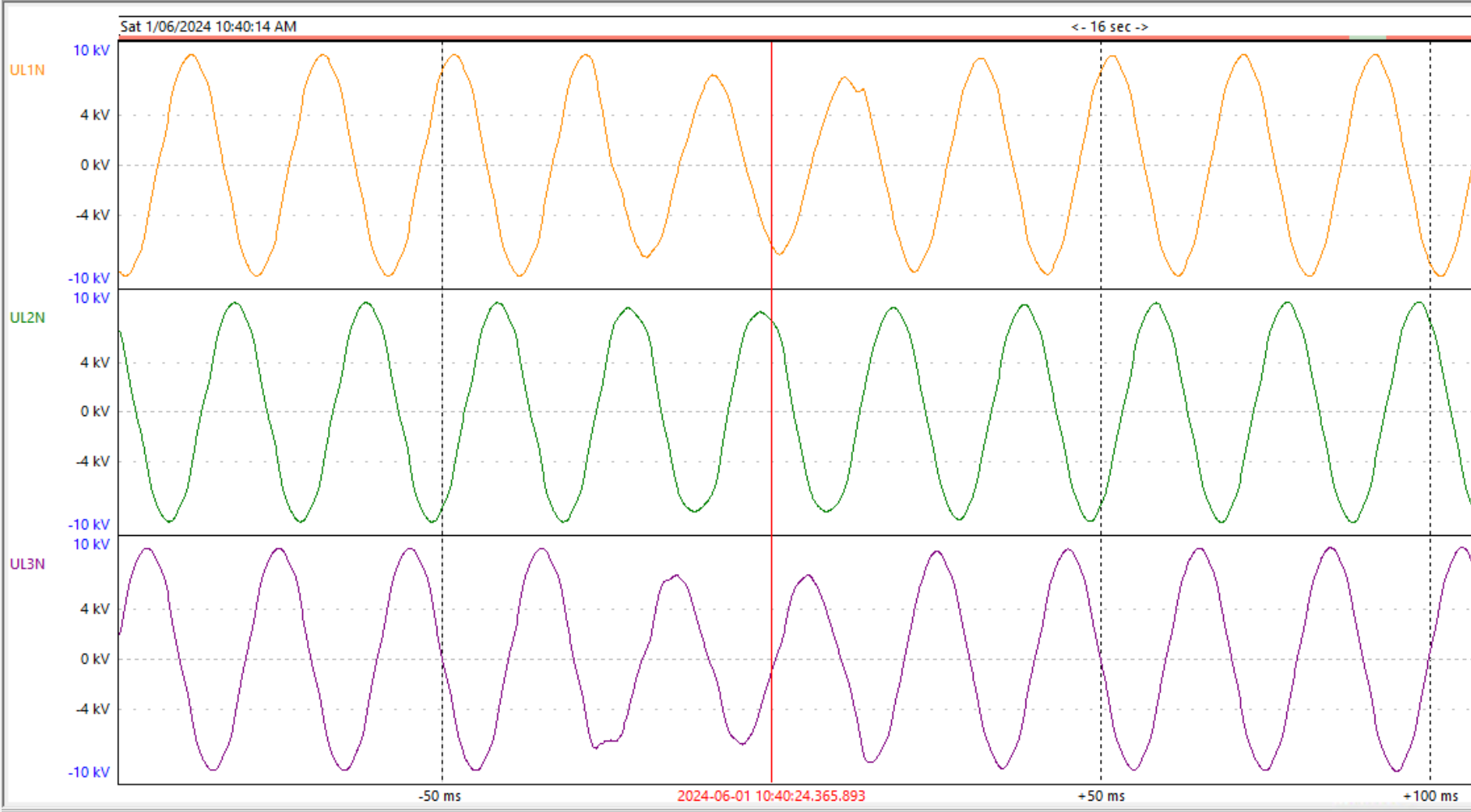
Telephone: 0800 488 500

Email: NMData@transpower.co.nz

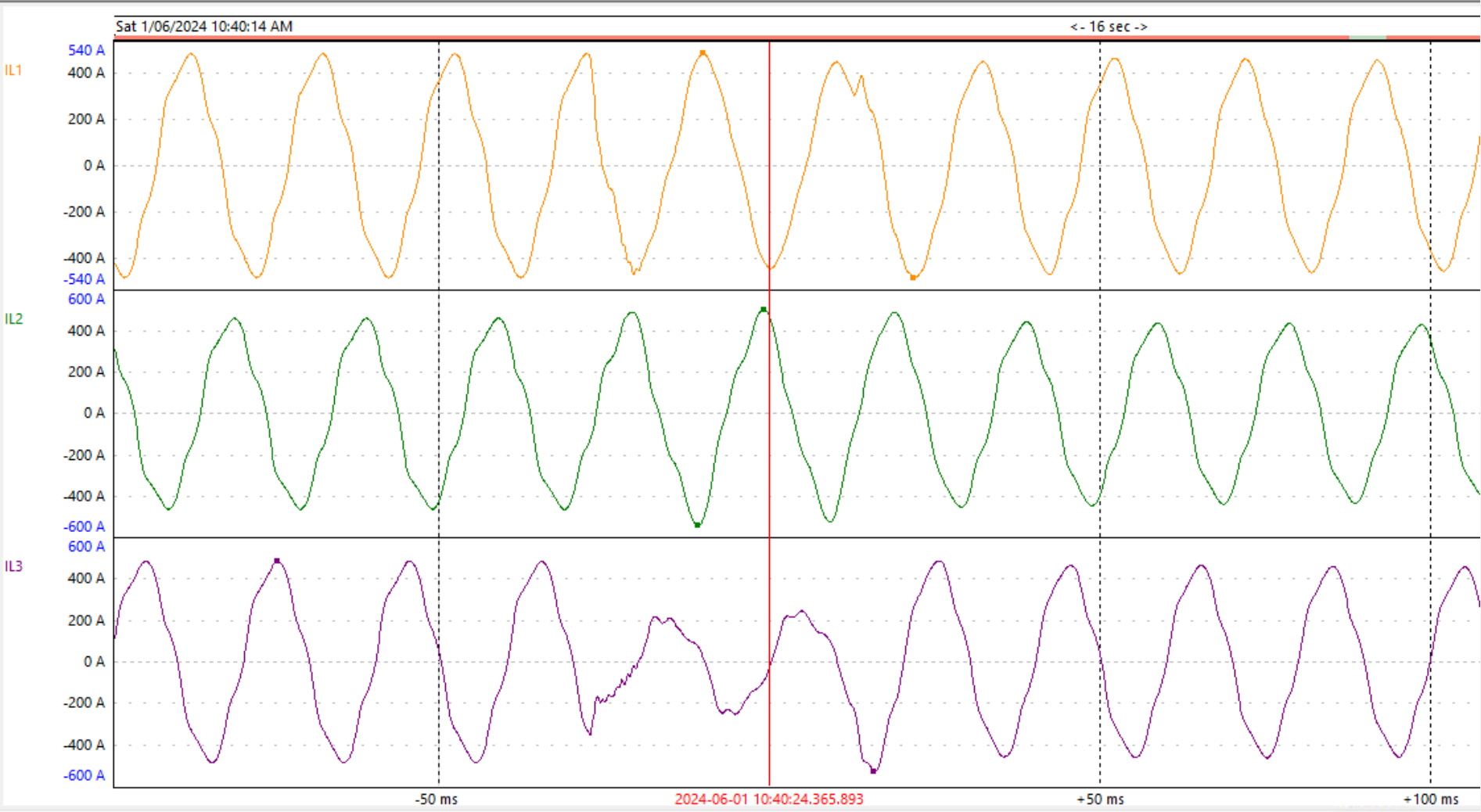
Revision of:

Excursion:	Voltage
Time:	01-jun-2024 10:40
Location:	North Island
Affected Plant:	Otahuhu Whakamaru 2 Auto-reclosed
Comments:	

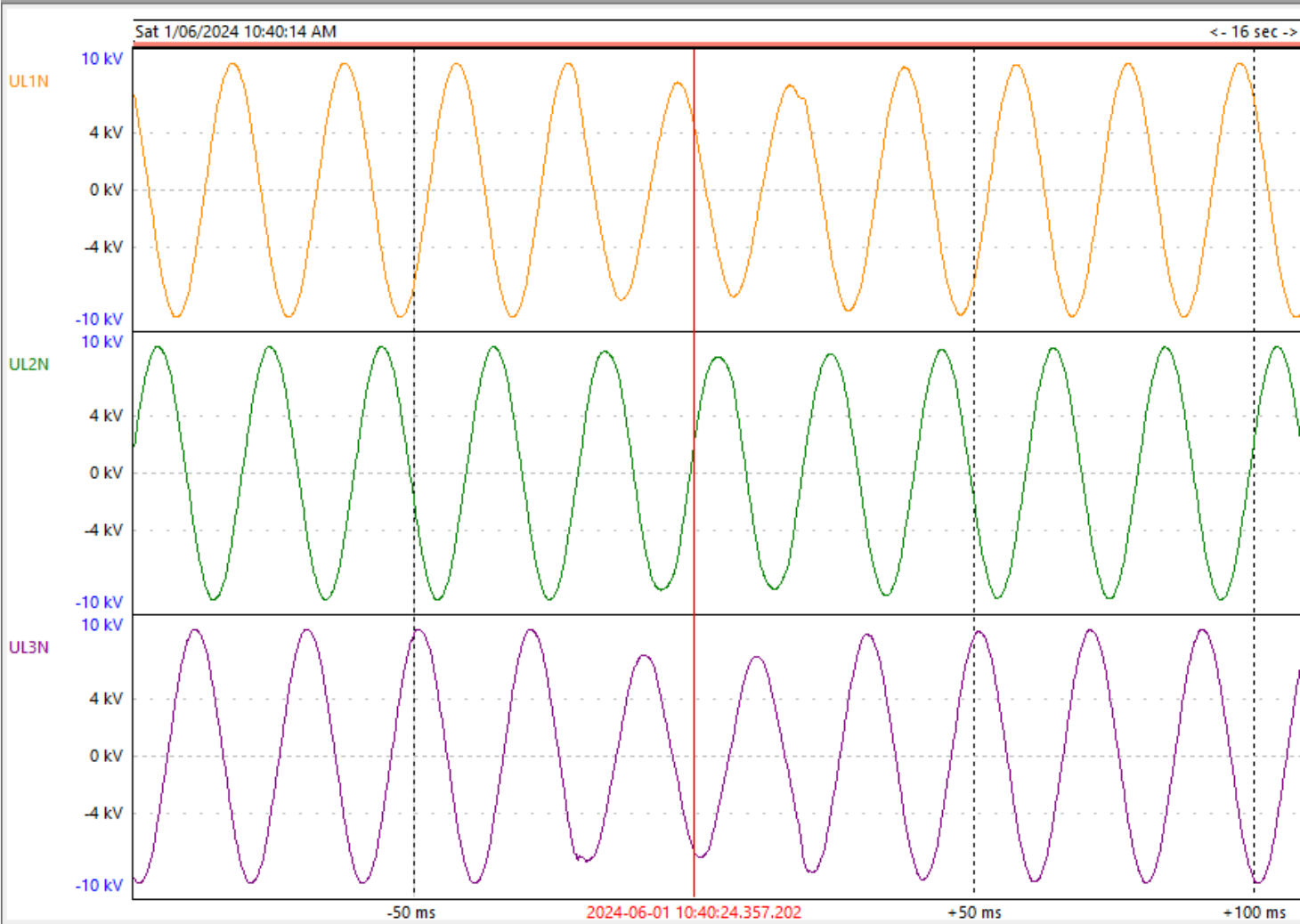
1 June 2024 10:40am – Pyes Pa, voltage



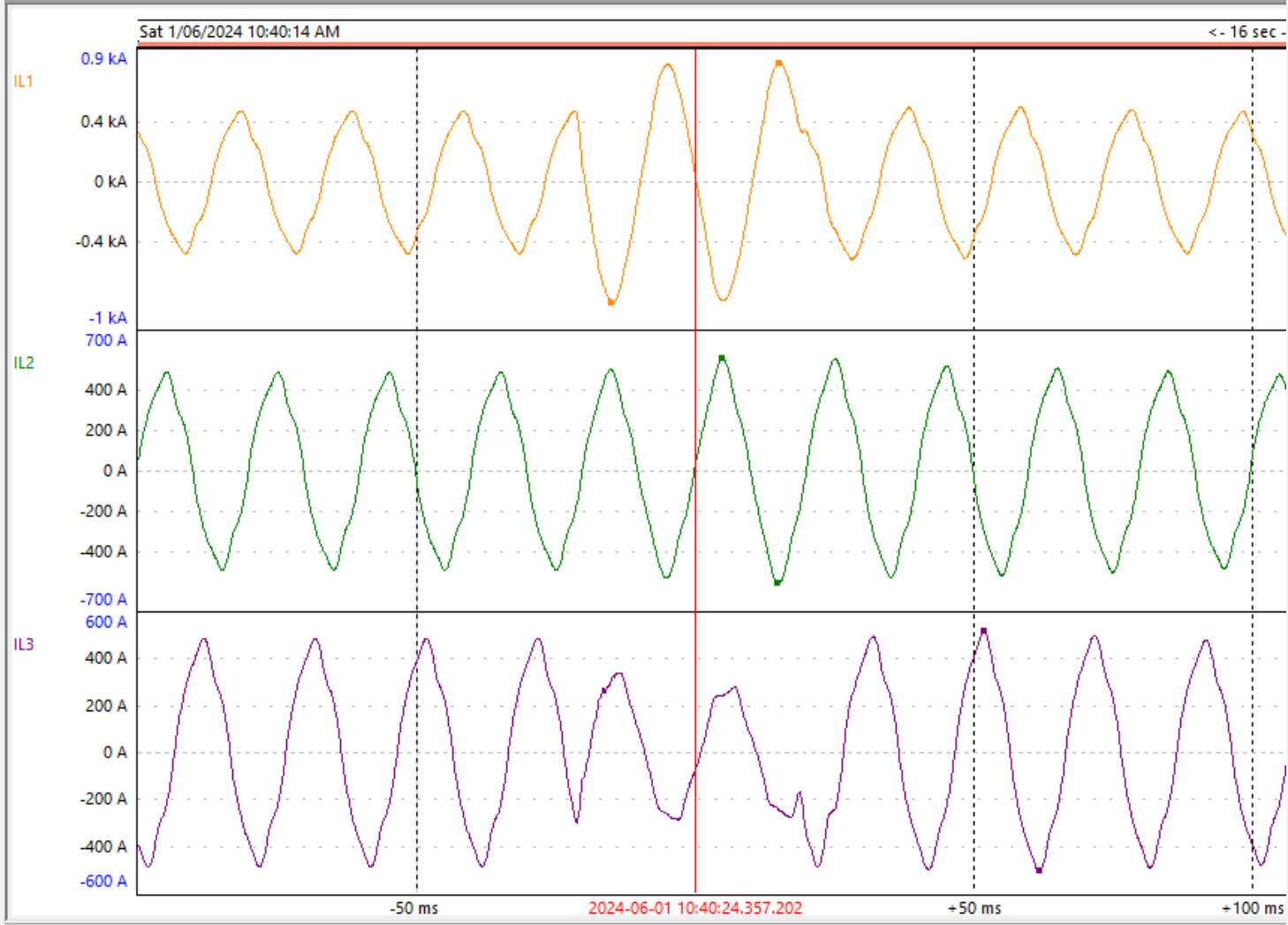
1 June 2024 10:40am – Pyes Pa, current



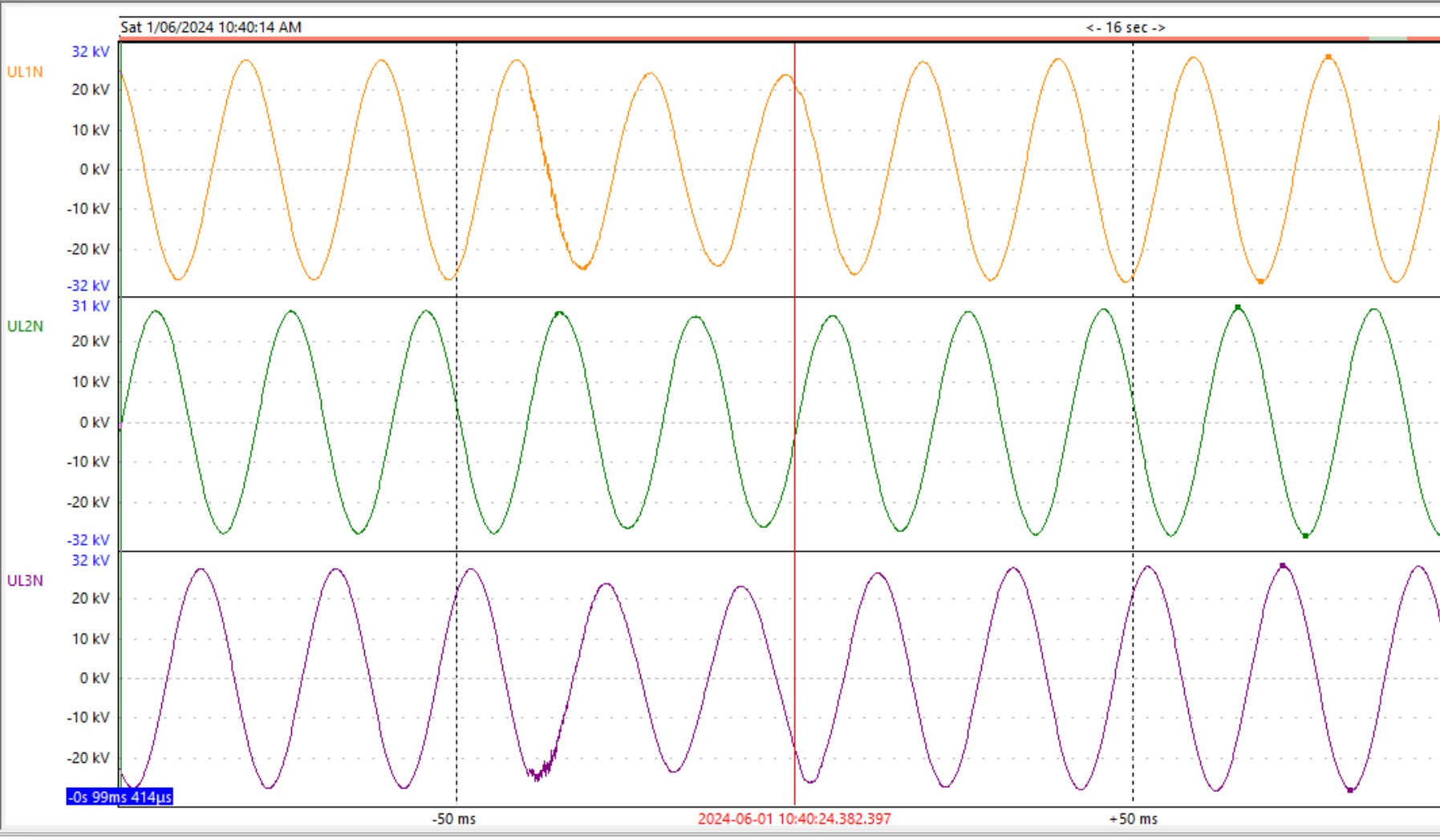
1 June 2024 10:40am – Triton, voltage



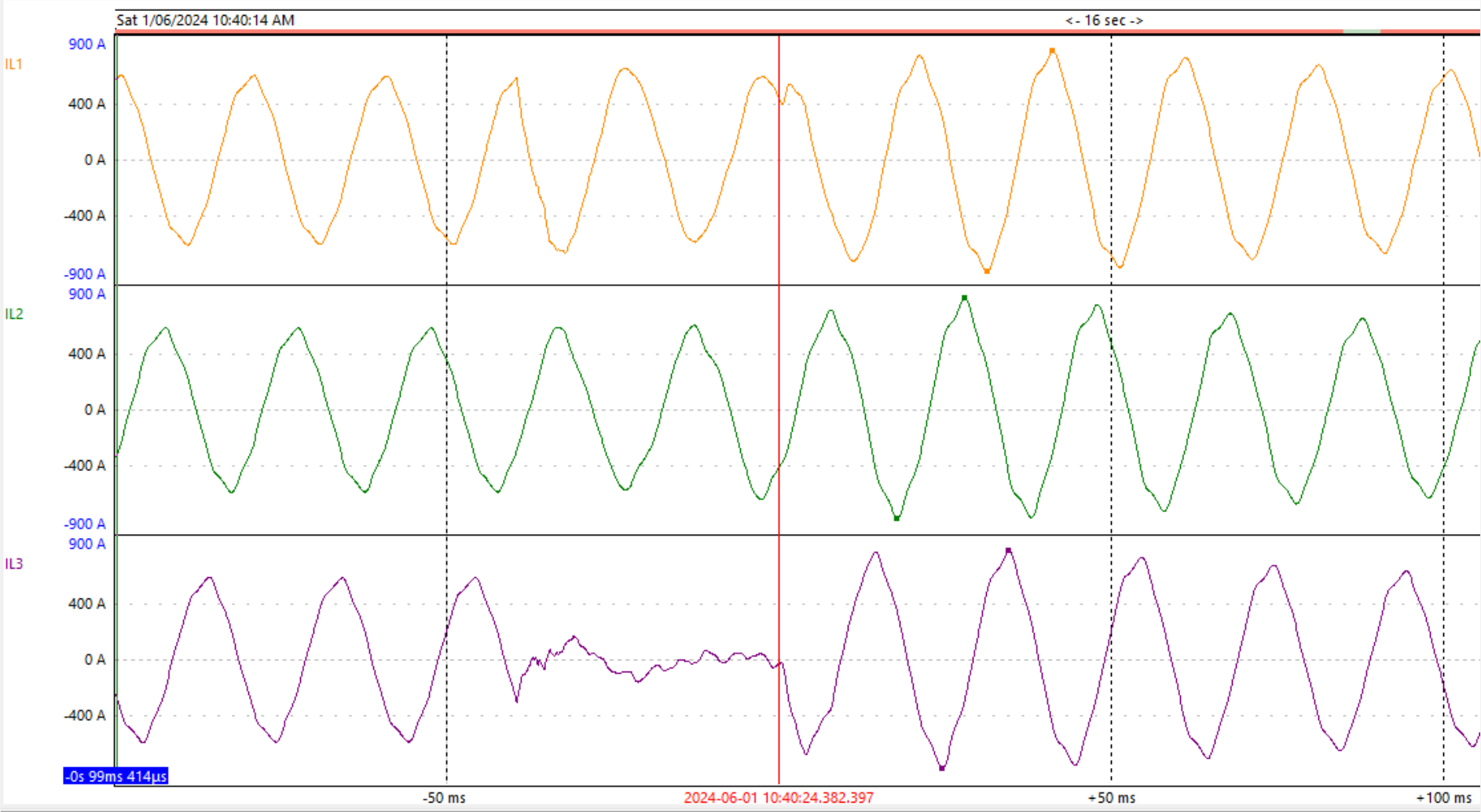
1 June 2024 10:40am – Triton, current



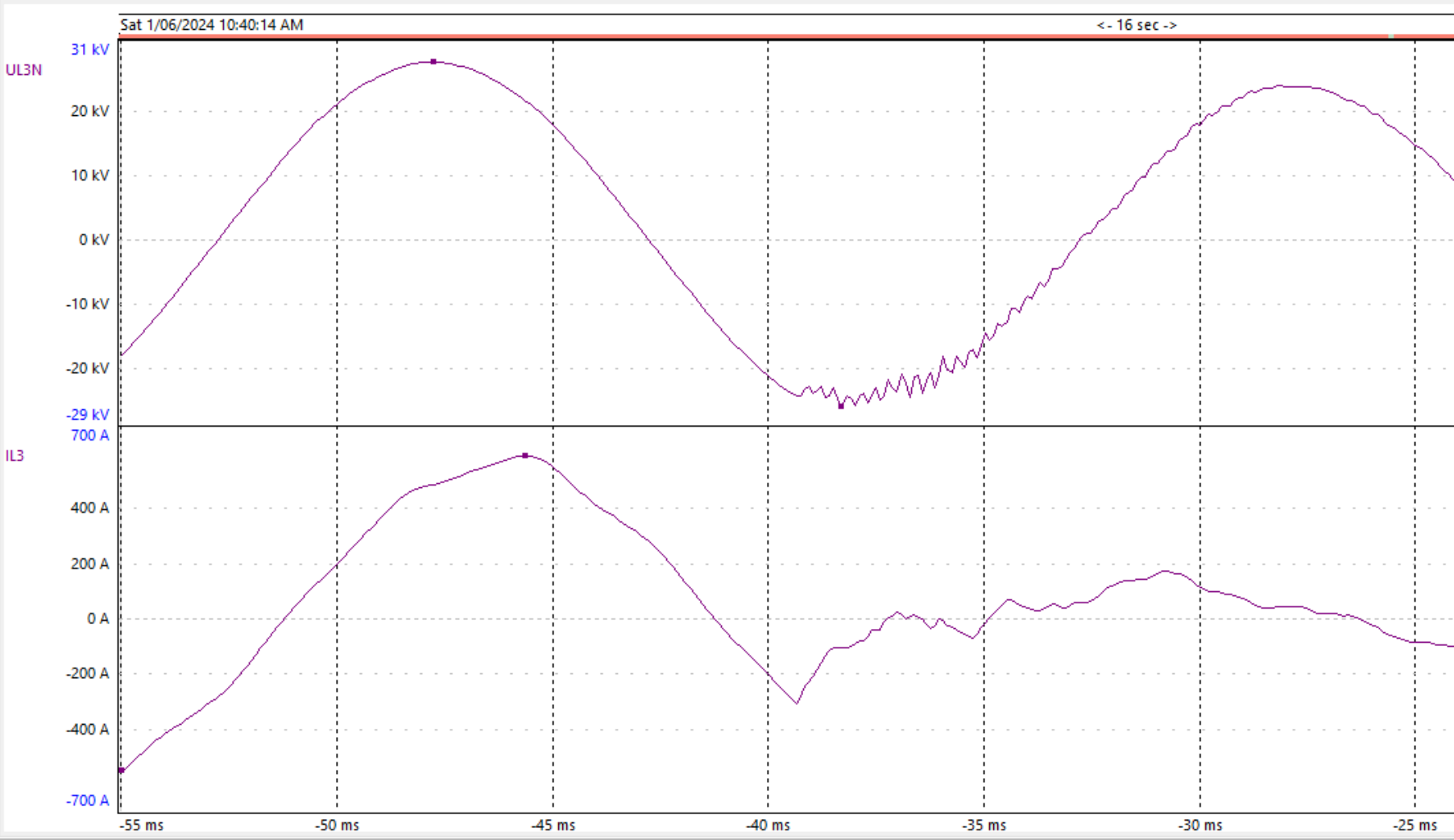
1 June 2024 10:40am – Bunnythorpe GXP, voltage



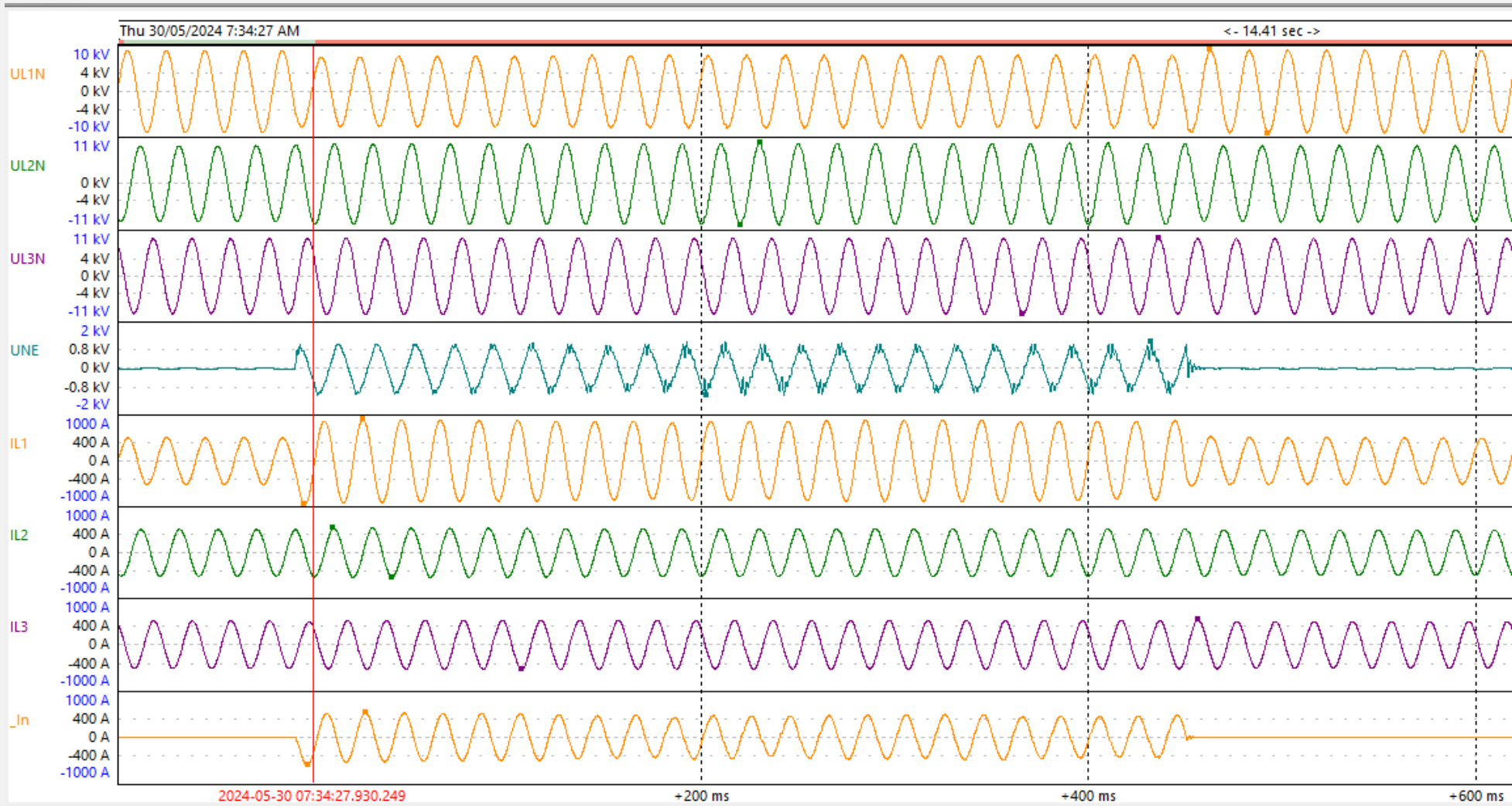
1 June 2024 10:40am – Bunnythorpe GXP, current



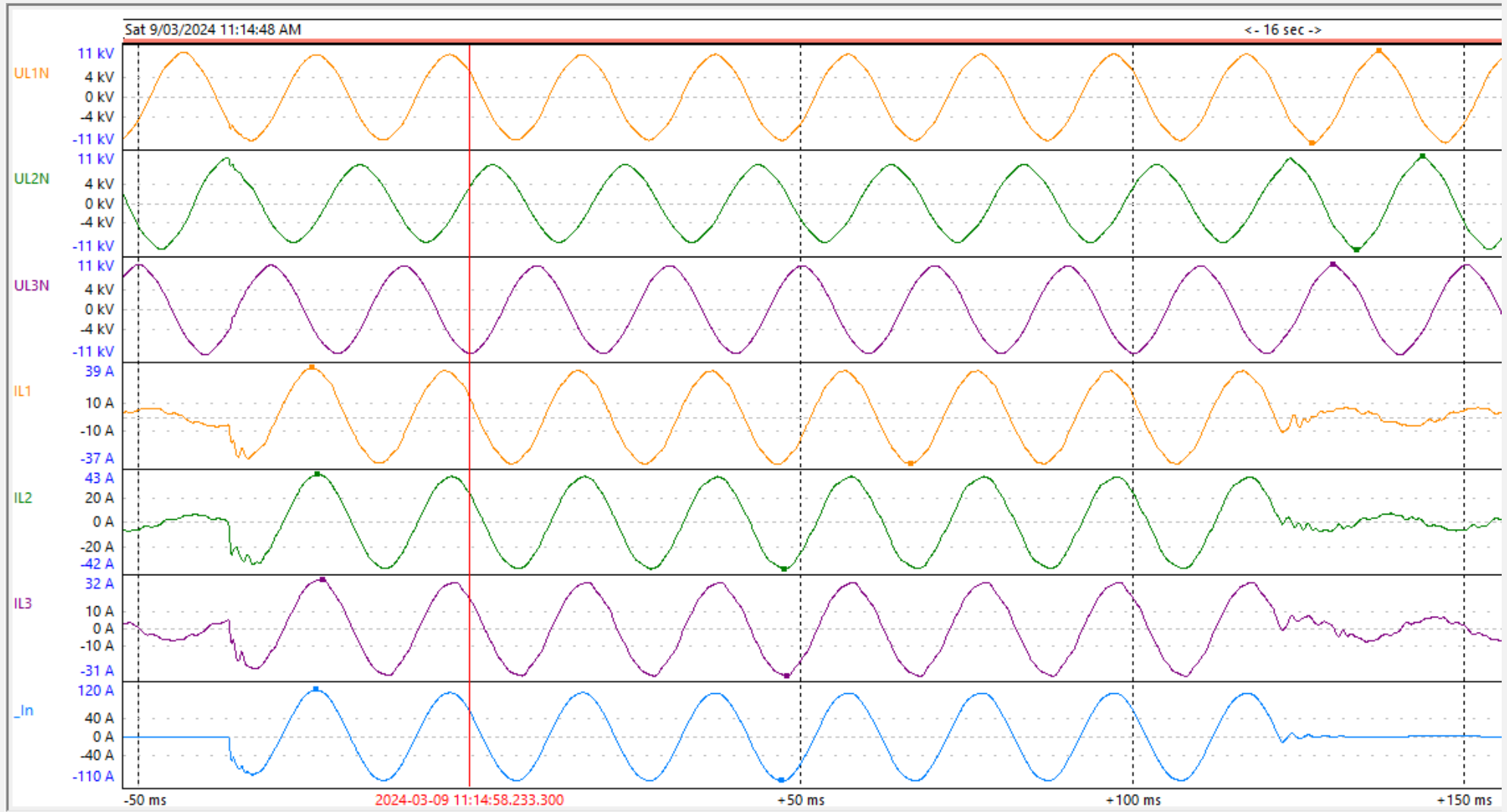
1 June 2024 10:40am – Bunnythorpe GXP, u3 and i3



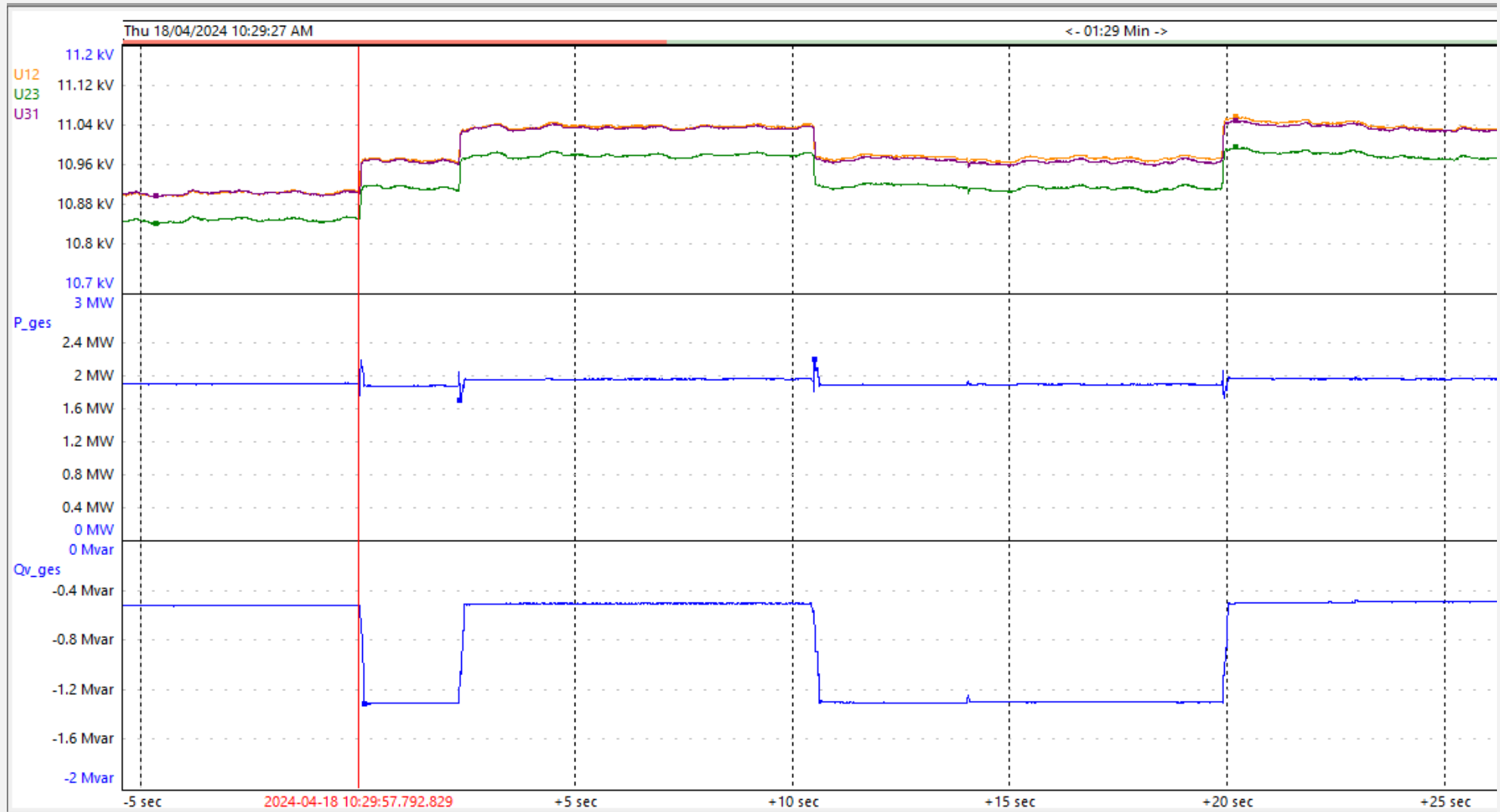
A star-star transformer supplying an earth-fault



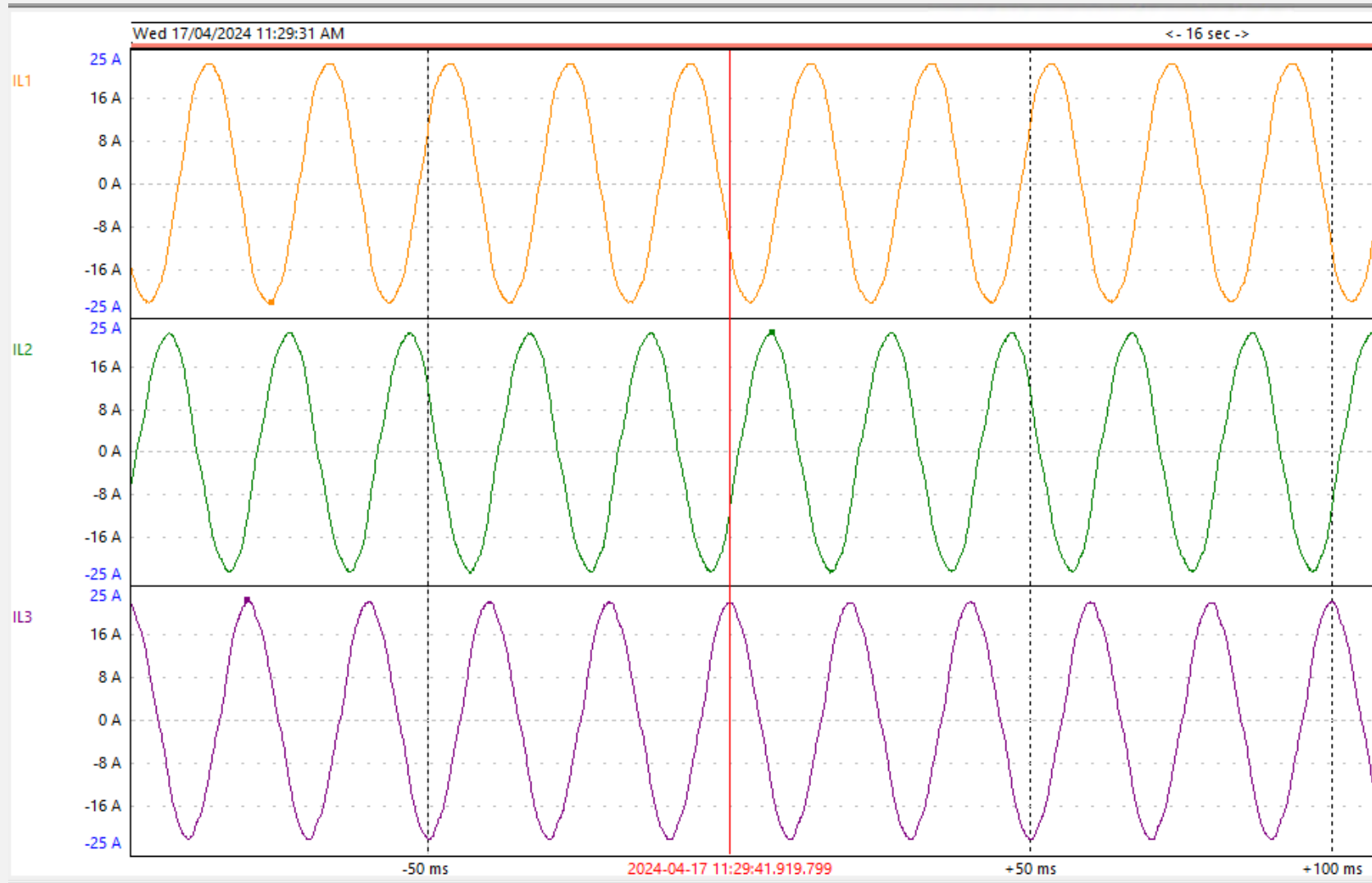
An injection error creating an earth-fault



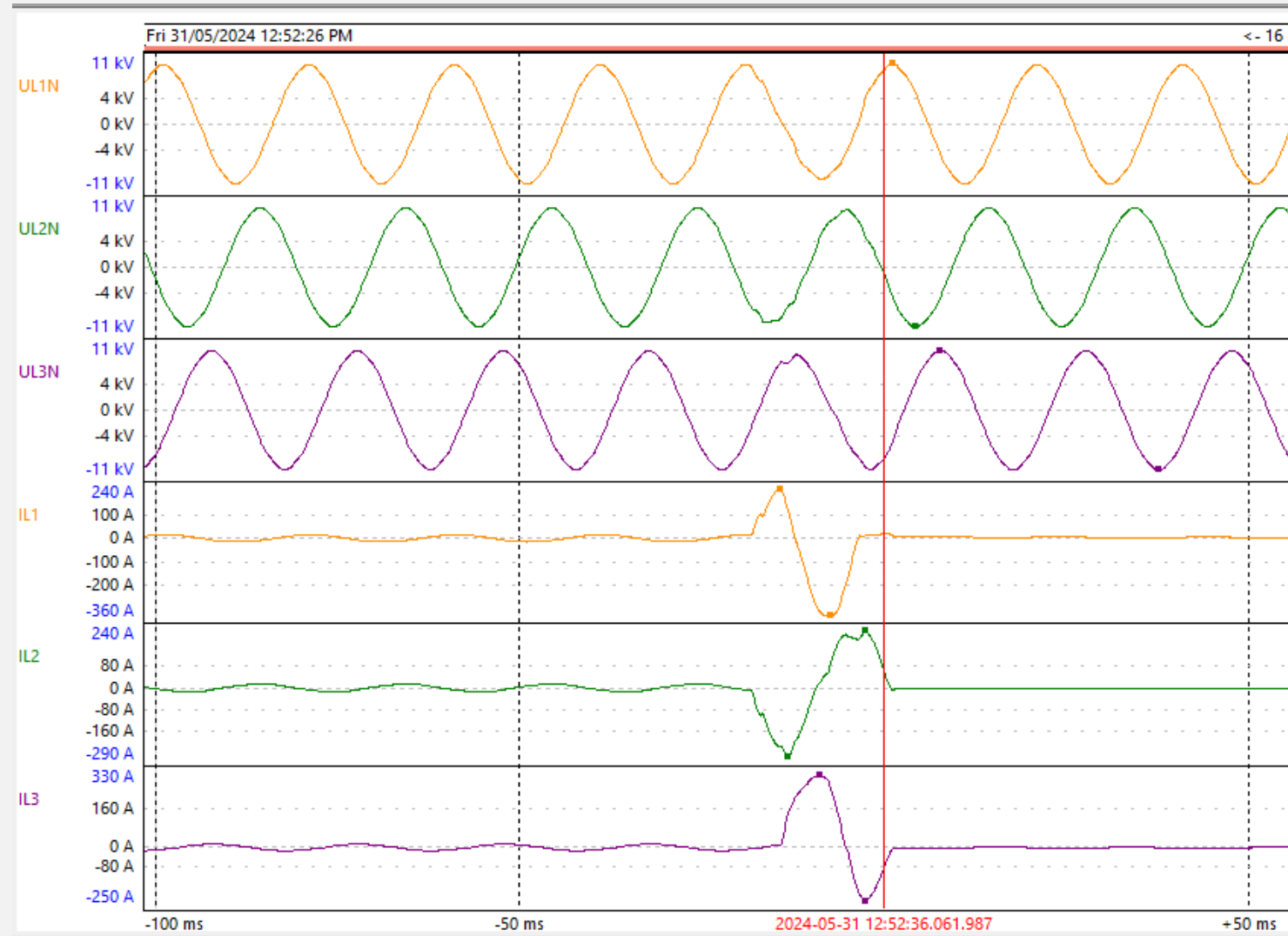
A transformer doing unnecessary/incorrect tap steps



A fast EV charger, current waveform on 11kV side of TX



The fast EV charger has a hiccup



20 May 2024 - Excursion



TRANSPOWER



Excursion Notice

To: Excursion NI Participants

Sent: 29-may-2024 20:13

Ref: 5413474538

From: The System Operator

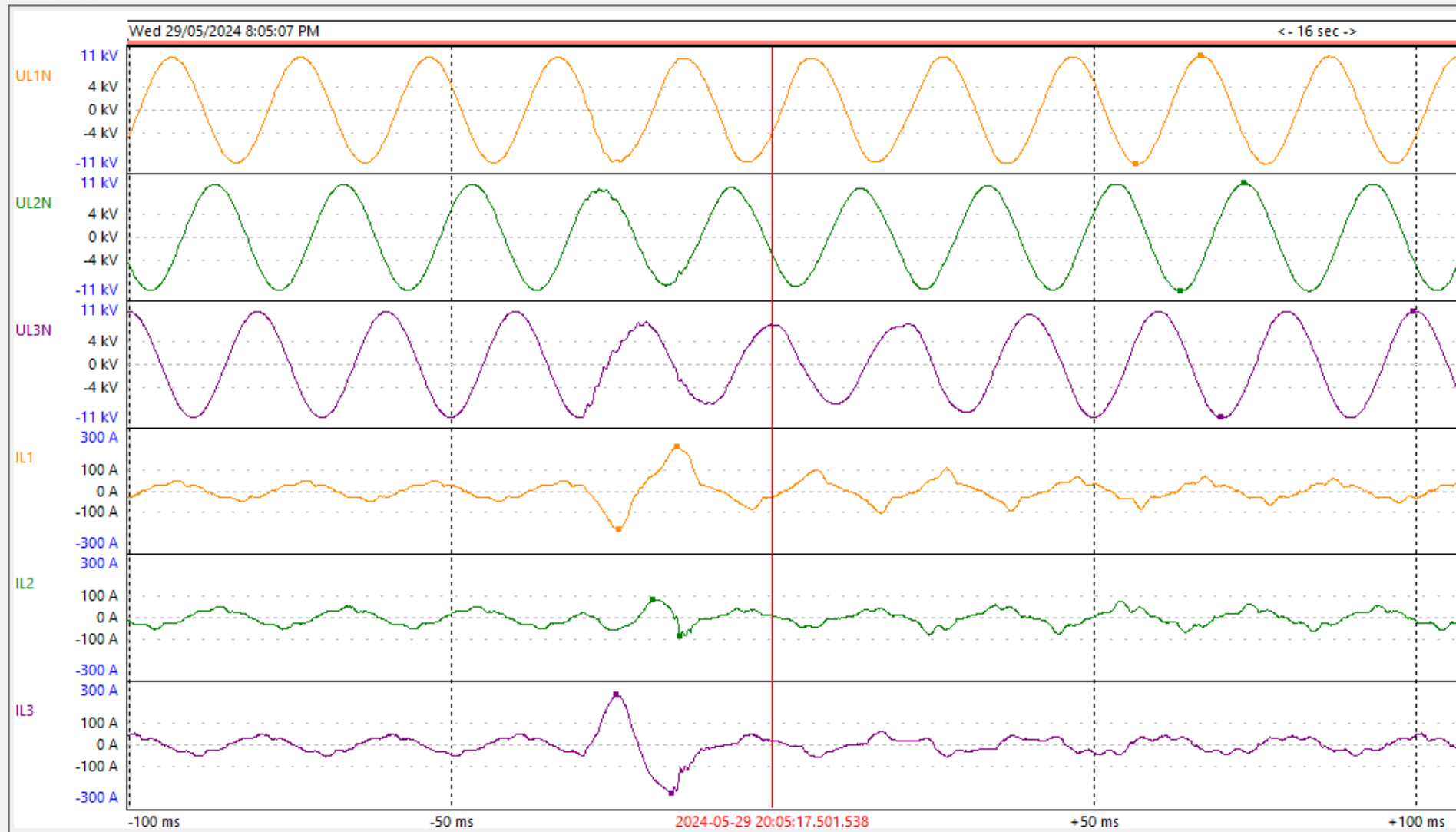
Telephone: 0800 488 500

Email: NMData@transpower.co.nz

Revision of:

Excursion:	Voltage
Time:	29-may-2024 20:05
Location:	North Island
Affected Plant:	Otahuhu Southdown Auto-reclosed
Comments:	

20 May 2024 – disturbance seen at Tirau



11 April 2024 – frequency drop / Huntly trip



Excursion Notice

To: Excursion NZ Participants
Sent: 11-apr-2024 00:40
Ref: 5323040652

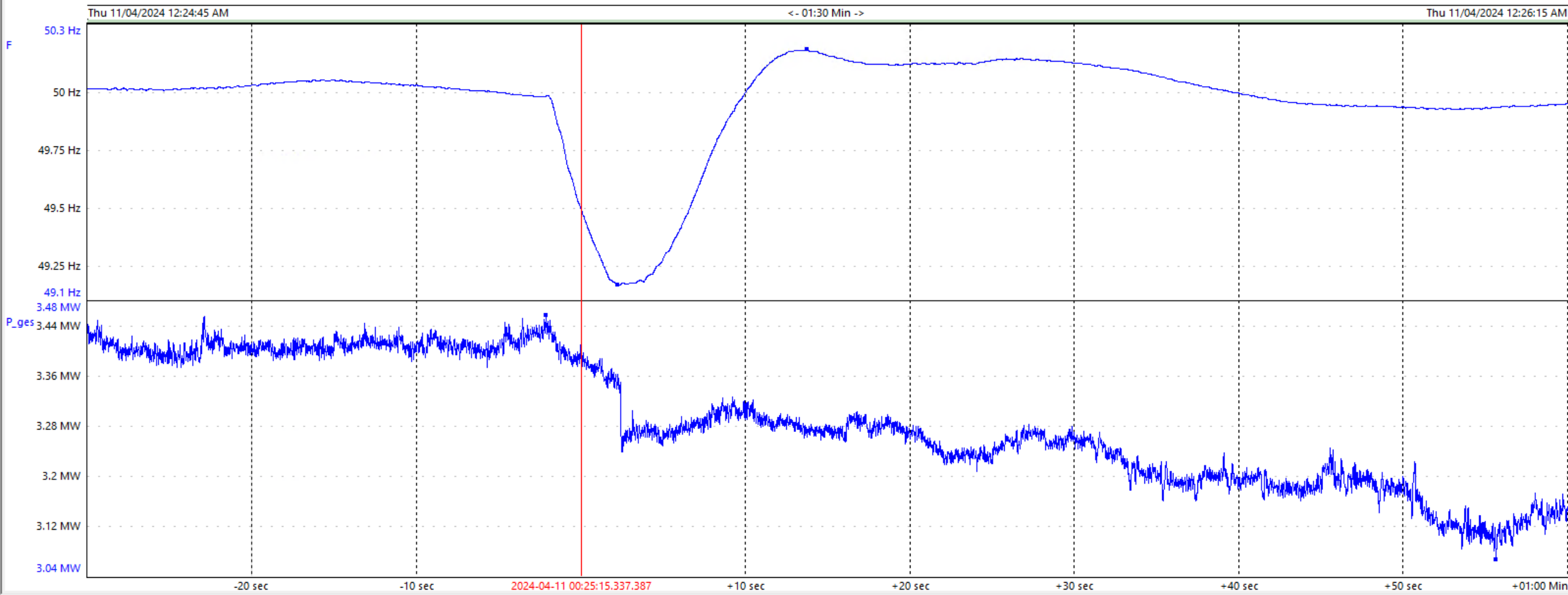
From: The System Operator
Telephone: 0800 488 500
Email: NMDData@transpower.co.nz

Revision of:

Excursion:	Frequency		
Time:	11-apr-2024 00:25		
Location:	National		
Affected Plant:	HLY Generation unit tripped.		
SI Hz Level:	49.25	NI Hz Level:	49.17
Comments:	HLY Generation unit tripped.		

Frequency Excursion notices are only issued if the deviation is out side 49.5 and 50.5 Hz.

11 April 2024 – frequency drop / load shed at Cambria



Thank you



powerco.co.nz