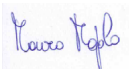




TEST REPORT

Report Number	177/20/00179/ER	
Date of Document	2020-06-08	
Total number of pages	167 pag	
OBJECT	Colombia Grid Code – CREG -123 - 2018 Resolution CREG - 060 - 2019	
CUSTOMER	Siel S.p.A.	
EQUIPMENT UNDER TEST – DESCRIPTION	DC/AC three-phase converter for Photovoltaic applications	
MODEL	SOLEIL DSPX 1415 TLH 1500	
SUMMARY		
1 IDENTIFICATION		2
1.1 Laboratory		2
1.2 Customer		2
2 EQUIPMENT UNDER TEST (EUT)		2
2.1 EUT identification		2
2.1.1 Electrical specification		2
2.1.2 Location and date of testing		3
2.1.3 Sampling and adopted criteria		3
2.2 EUT Auxiliary Equipments (AEs)		3
2.3 Test bench configuration		3
2.4 EUT Modifications		3
3 OBJECT OF THE TESTS		3
5 CONCLUSION		3
5 TEST RESULTS		4
Annex B	Test Instrumentations	1 pag
Annex C	Photographs of test configurations	2 pag
Annex D	Auxiliary Instrumentations	2 pag
Annex F	Judgment of compliance and measurements uncertainty	2 pag
Tested by (Name + Signature)	SEBASTIANO GRESPAN <i>Test engineer</i>	 Documento firmato da: GRESPAN SEBASTIANO 25.06.2020 07:22:36 UTC
Verified by (Name + Signature)	MAURO MAJOLO <i>Lab Manager</i>	 Documento firmato da: MAJOLO MAURO 24.06.2020 08:48:37 UTC
Approved and issued by (Name + Signature)	ALESSANDRO ZUCCATO <i>Lab Director</i>	 Documento firmato da: ZUCCATO ALESSANDRO 26.06.2020 16:50:36 UTC



1 IDENTIFICATION

1.1 Laboratory

Name : CREI Ven S.c.a.r.l.
CENTRO RICERCA ELETTRONICA INDUSTRIALE VENETO
Street: [HEAD OFFICE] Corso Spagna, 12 / [TEST SITE] Corso Stati Uniti, 4
City : 35127 Padova - ITALY
Phone : +39.049.8704036
Fax: +39.049.8707037
E-mail : info@creiven.it

1.2 Customer

Customer: Siel S.p.A.
Street: Via 1° Maggio 25
City: 20060 Trezzano Rosa, Milan, Italy
Phone: +39-02-909861
Refer to : Mr.Paride Carta

2 EQUIPMENT UNDER TEST (EUT)

2.1 EUT identification

EUT Description: DC/AC three-phase converter for Photovoltaic applications

Model: SOLEIL DSPX 1415M TLH 1500
Code: U170225
Software release: MC0190.00.xx
(xx value = "11" or following revision)
Size: 2000 x 1000 x 2000 mm (LxWxH)
Manufacturer: Siel S.p.A.
Supplier: Siel S.p.A.

2.1.1 Electrical specification

Output side A.C.

Rated voltage: 640 Vac (3 Ph, PE)
Voltage range: 85 ÷ 115 %
Rated frequency: 50 / 60 Hz
Frequency range: 47.5 ÷ 51.5 Hz / 57.5 ÷ 61.5 Hz
Rated Output Power: 1416 kW (*)
Maximum output current: 1278 A
cosφ range: 0 ÷ 1 (ind – cap)

(*) EUT is composed by two equal DC/AC converters: for laboratory test only one has been used, considering the Rated Output Power of 708 kW.

Input side A.C. for auxiliary circuit:

Voltage range: 400 Vac 3Ph+N
Frequency range: 50 Hz ± 10 %
Rated input current: 4.5 A

Input side D.C

Mpp voltage range: 950 ÷ 1400 Vd.c.
Start input voltage: 950 Vd.c.
Maximum input voltage: 1500 Vd.c.
Rated power: 1435 kW
Maximum input current: 1511 A

Climatic condition

Minimum ambient temperature for operation: -20°C
Maximum ambient temperature for operation: 60°C
Relative humidity: 5 ÷ 95 % without condensing
Maximum altitude for operation (without derating): 1000 m



2.1.2 Location and date of testing

Date of receipt of test item 2020-05-25

Date (s) of performance of tests: See the data specified in test results details

2.1.3 Sampling and adopted criteria

Equipment used for testing was selected by the customer. Sampling criteria adopted by the customer is unknown to CREI Ven laboratory.

2.2 EUT Auxiliary Equipments (AEs)

None.

2.3 Test bench configuration

The test bench was composed by the following components:

Auxiliary equipment AE N° 1

Description:	AC/DC three-phase Rectifier
Model:	SOLEIL DSPX 1415 TLH 1500
Manufacturer:	Siel S.p.a.

Auxiliary equipment AE N° 2

Description:	Transformer 750kVa 1500Vdc
Model:	COT0381AE (Siel Code)
Manufacturer:	Siel S.p.a.

2.4 EUT Modifications

None.

3 OBJECT OF THE TESTS

All the tests herein summarized, have been performed with the inverter equipped with the FW Rev. MC0190.00.11. This FW revision was used after being positively tested in SIEL LAB, and it was aimed at improving and smoothing the behavior of the inverter during LVRT events (i.e. no overcurrent protection intervention during LVRT)

The objective of the tests is:

- Compliance evaluation of the “SOLEIL DSPX 1415M TLH 1500” inverter to the voltage regulation requirements of “Resolucioin CREG-060-2019”

In particular, the evaluation concerns:

- Clause 14.c and 14.d Voltage Control (LVRT-HVRT)

The evaluation has been done using different K-factor (Reactive current feed-in depending on the magnitude of the voltage dip) set between 1 2 and 10.

- Verify the Active Power generation during LVRT
- Verify that as a consequence of many different LVRT tests, no overcurrent protection trip is triggered by the inverter (i.e. the peak current of the inverter during LVRT never reaches the protection threshold value of 1278A).

The results contained in this test report are related only to the “SOLEIL DSPX 1415M TLH 1500” inverter (EUT). In general, the reference standard is applied to the whole plant, of which the electronic converter is a component.

5 CONCLUSION

- All the LVRT tests have been passed with no overcurrent protection intervention by the inverter. The maximum current peak recorded was about 1020A
- All the LVRT tests have been passed in accordance to CREG-060-2019



5 TEST RESULTS

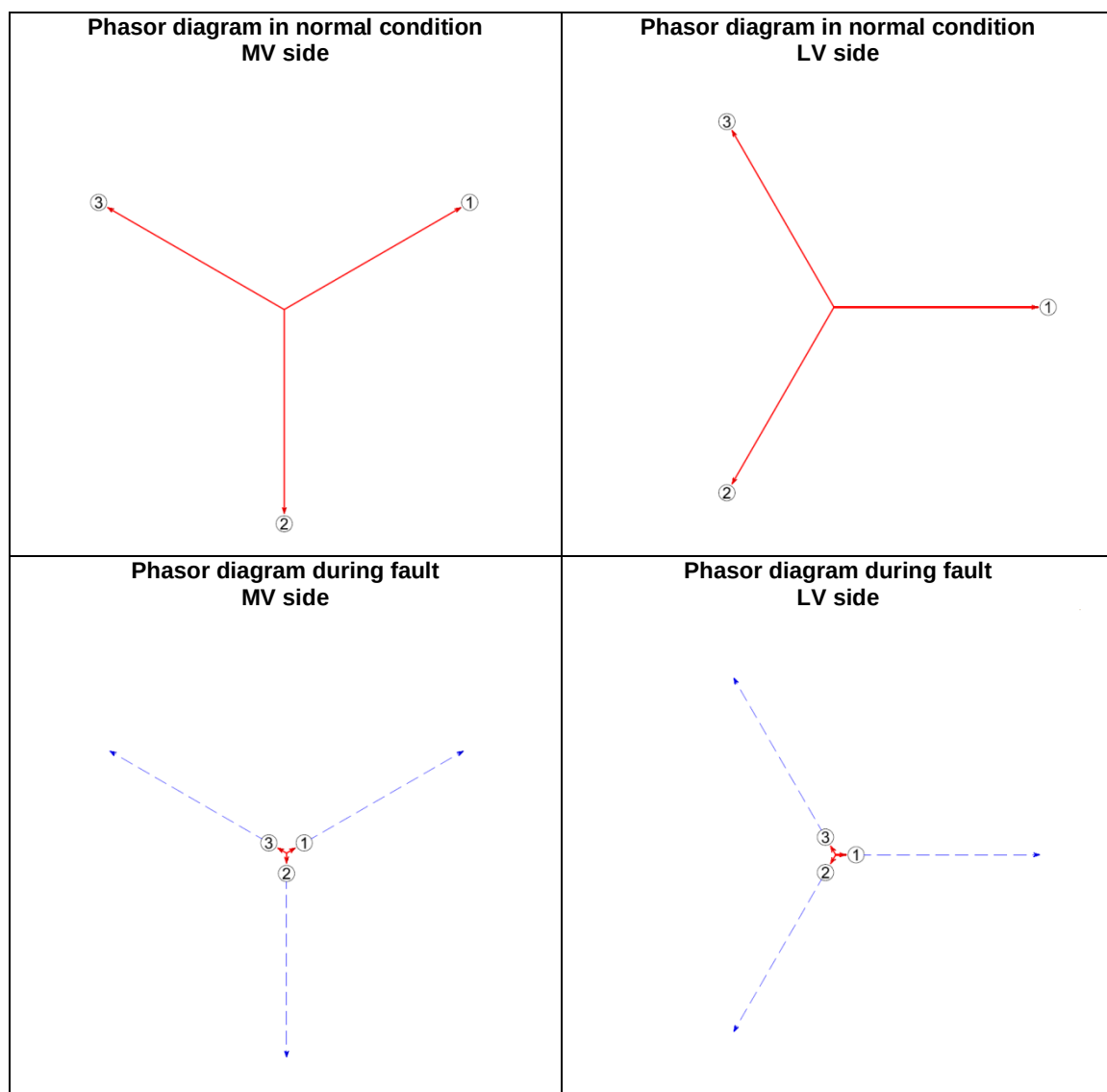
Art. 13 Verification of insensitivity to voltage variations (VFRT)

Number of test	Type	Un (640 V)	Pn (708 kW)	K	Phase
1	LVRT	10%	30%	1	Sym
2	LVRT	10%	30%	2	Sym
3	LVRT	10%	30%	10	Sym
4	LVRT	25%	30%	1	Sym
5	LVRT	25%	30%	2	Sym
6	LVRT	25%	30%	10	Sym
7	LVRT	50%	30%	1	Sym
8	LVRT	50%	30%	2	Sym
9	LVRT	50%	30%	10	Sym
10	LVRT	75%	30%	1	Sym
11	LVRT	75%	30%	2	Sym
12	LVRT	75%	30%	10	Sym
13	LVRT	10%	91%	1	Sym
14	LVRT	10%	91%	2	Sym
15	LVRT	25%	91%	1	Sym
16	LVRT	25%	91%	2	Sym
17	LVRT	50%	91%	1	Sym
18	LVRT	50%	91%	2	Sym
19	LVRT	50%	91%	10	Sym
20	LVRT	75%	91%	1	Sym
21	LVRT	75%	91%	2	Sym
22	LVRT	75%	91%	10	Sym
23	LVRT	10%	30%	1	Asym
24	LVRT	25%	30%	1	Asym
25	LVRT	25%	30%	2	Asym
26	LVRT	50%	30%	1	Asym
27	LVRT	50%	30%	2	Asym
28	LVRT	75%	30%	1	Asym
29	LVRT	75%	30%	2	Asym
30	LVRT	75%	30%	10	Asym
31	LVRT	10%	91%	1	Asym
32	LVRT	10%	91%	2	Asym
33	LVRT	25%	91%	1	Asym
34	LVRT	25%	91%	2	Asym
35	LVRT	50%	91%	1	Asym
36	LVRT	50%	91%	2	Asym
37	LVRT	75%	91%	1	Asym
38	LVRT	75%	91%	2	Asym
39	LVRT	75%	91%	10	Asym

For HVRT (overvoltage test) se report N° 192_19_191306LP

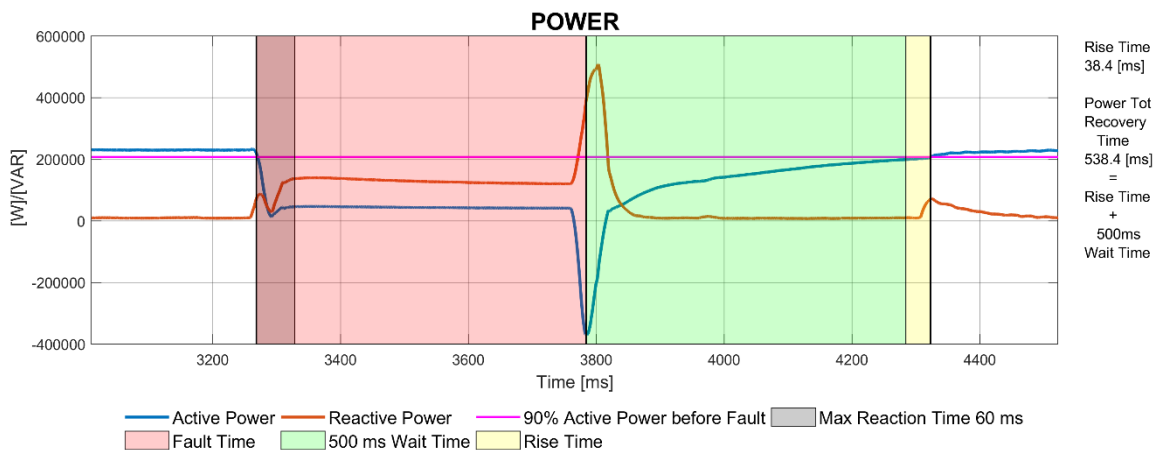
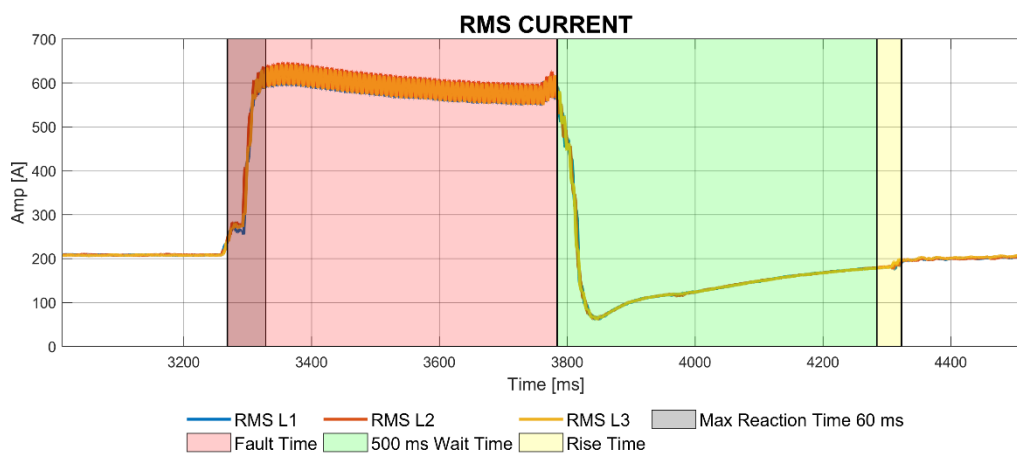
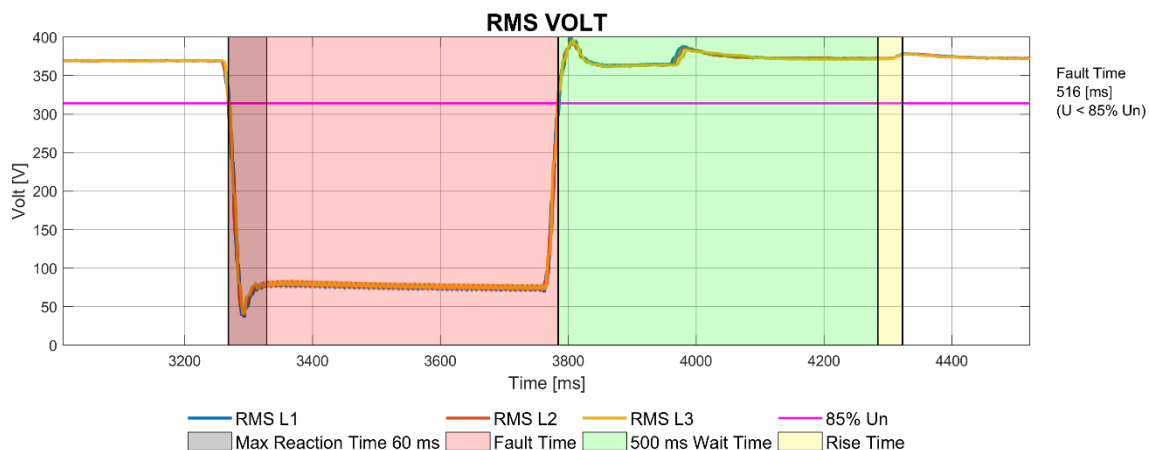


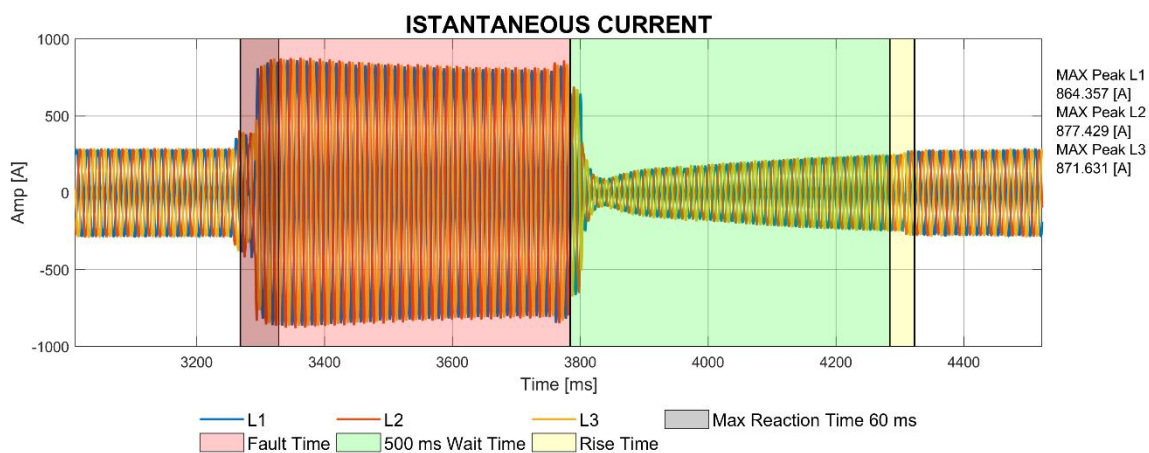
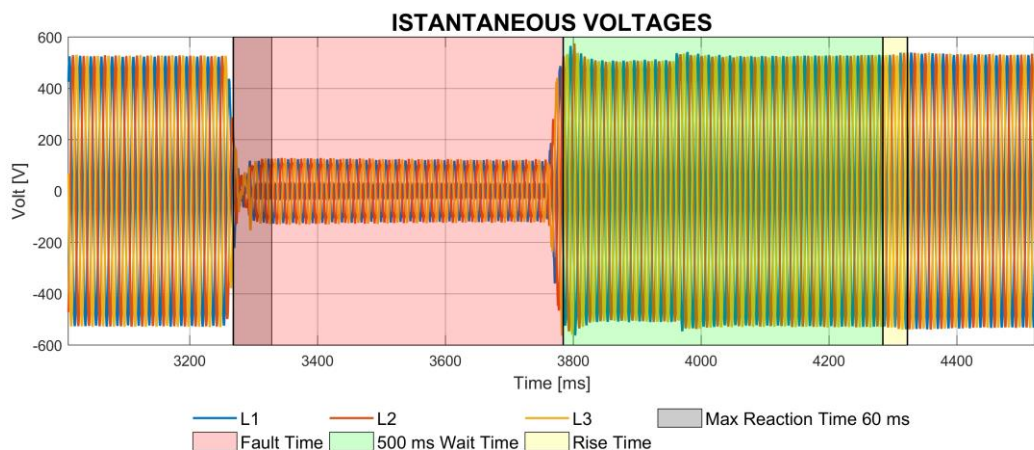
Test N° 1		LVRT - 10% Un - 30% Pn – Sym – K = 1					
Duration (ms): 500 ±20		$V_1/V_{1,nom}$	$V_2/V_{2,nom}$	$V_3/V_{3,nom}$	φ_{V1}	φ_{V2}	φ_{V3}
MV	Normal condition	1	1	1	30°	270°	150°
	During fault	0,10 ±0,05	0,10 ±0,05	0,10 ±0,05	30°	270°	150°
LV	Normal condition	1	1	1	0°	240°	120°
	During fault	0,10 ±0,05	0,10 ±0,05	0,10 ±0,05	0°	240°	120°

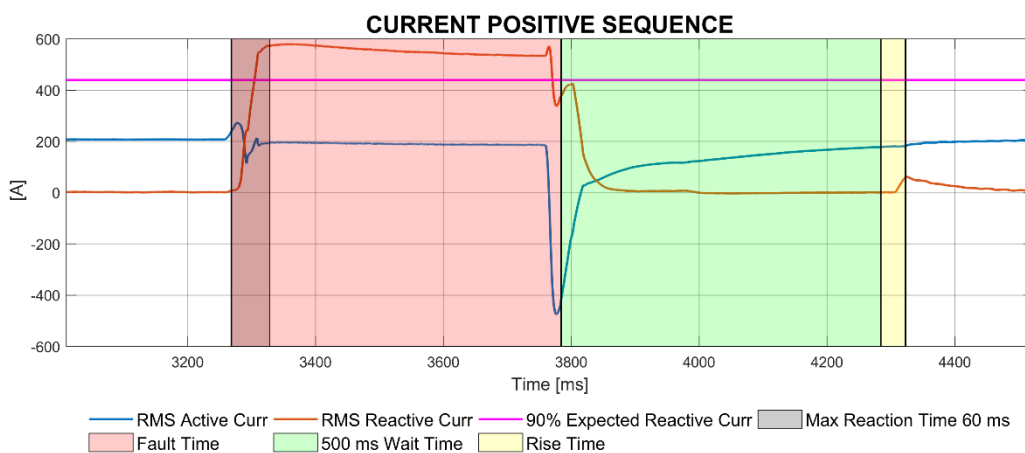
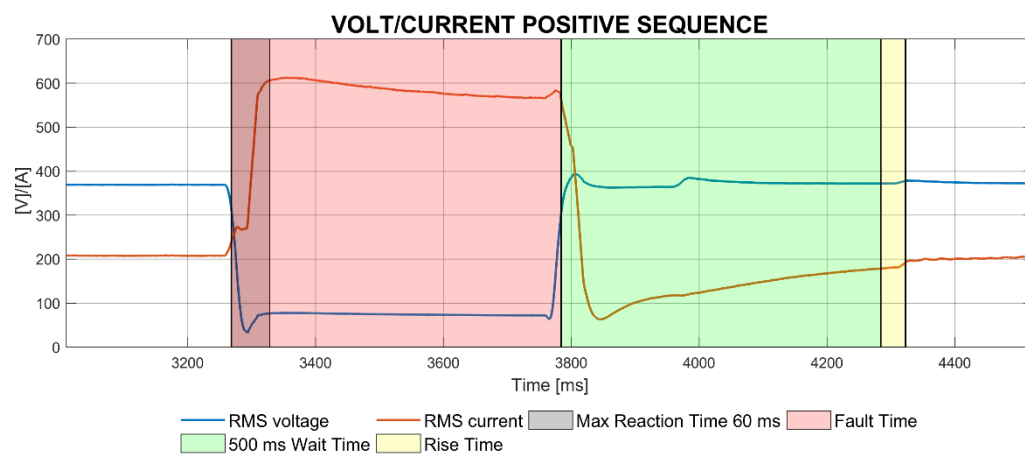




CREI Ven – Padova
Laboratorio Prove
Report n. 177/20/00179/ER

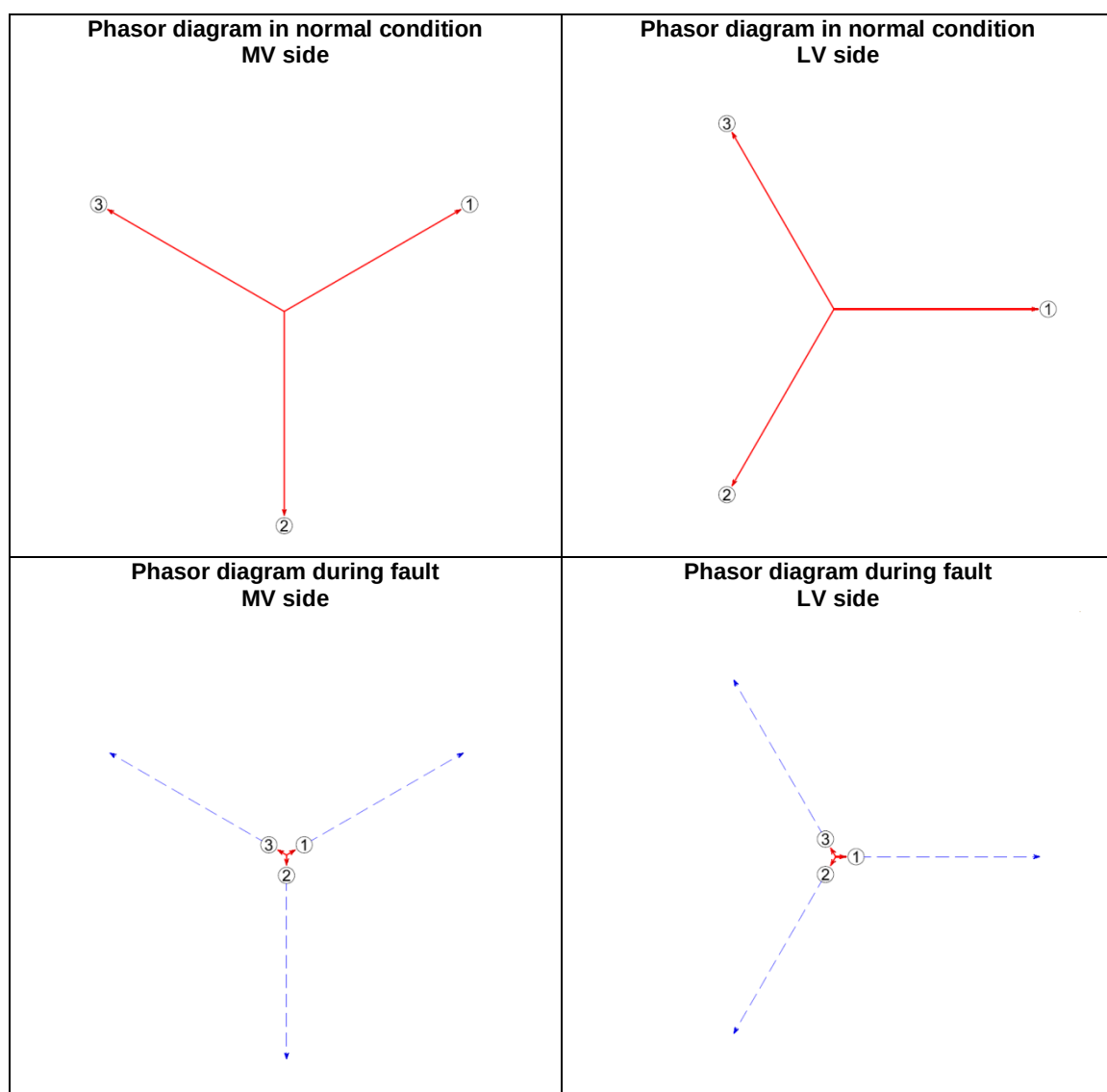








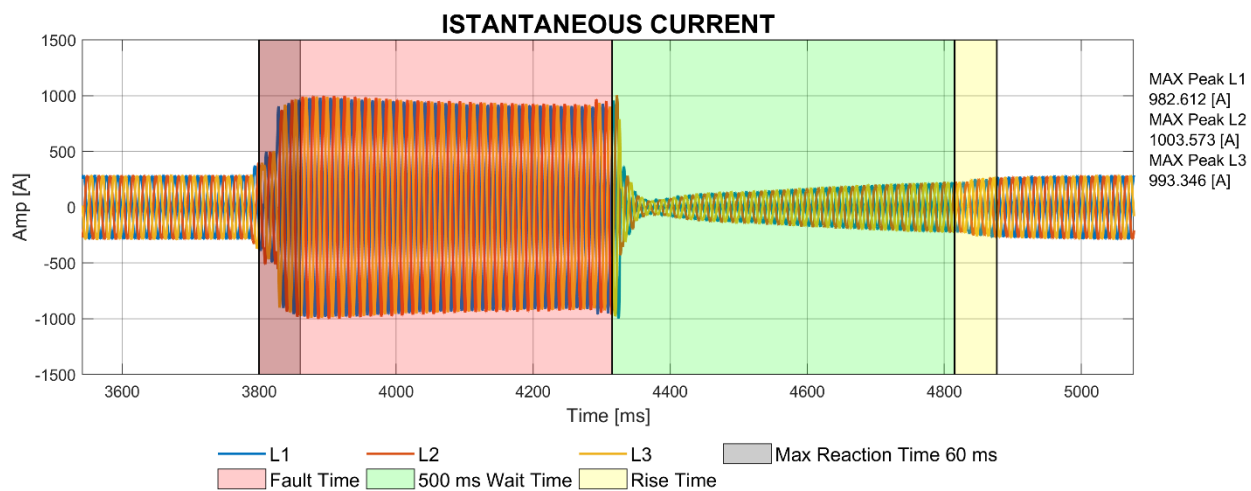
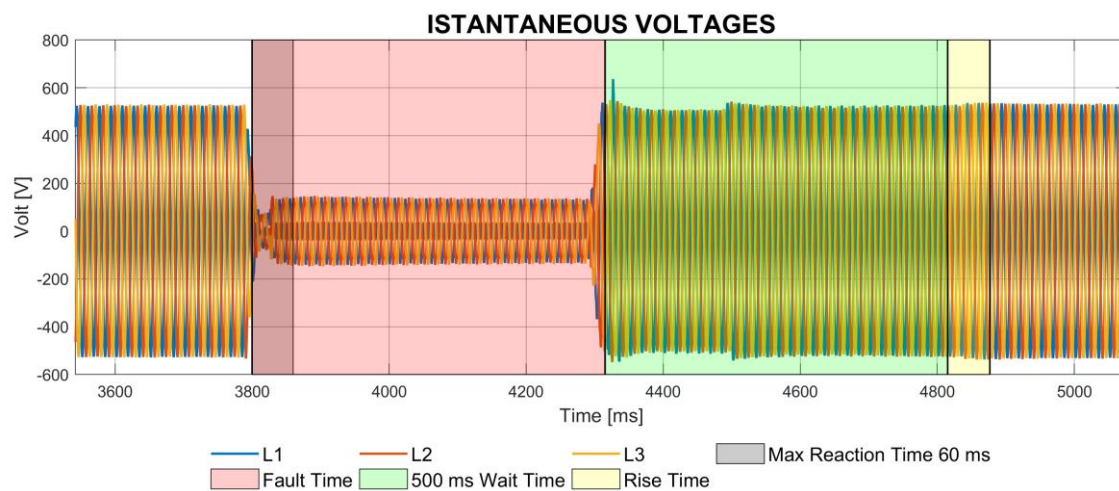
Test N° 2		LVRT - 10% Un - 30% Pn – Sym – K = 2					
Duration (ms): 500 ±20		$V_1/V_{1,nom}$	$V_2/V_{2,nom}$	$V_3/V_{3,nom}$	φ_{V1}	φ_{V2}	φ_{V3}
MV	Normal condition	1	1	1	30°	270°	150°
	During fault	0,10 ±0,05	0,10 ±0,05	0,10 ±0,05	30°	270°	150°
LV	Normal condition	1	1	1	0°	240°	120°
	During fault	0,10 ±0,05	0,10 ±0,05	0,10 ±0,05	0°	240°	120°

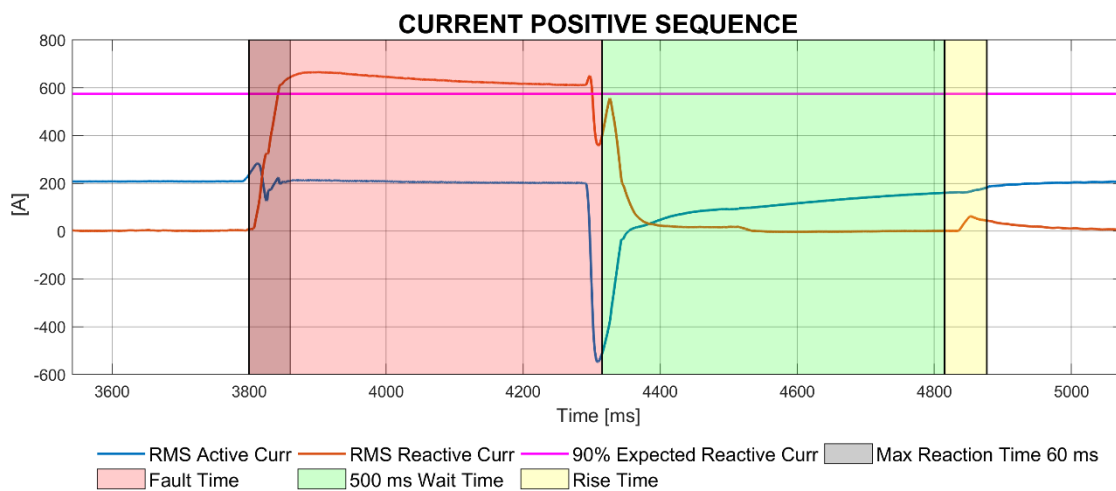
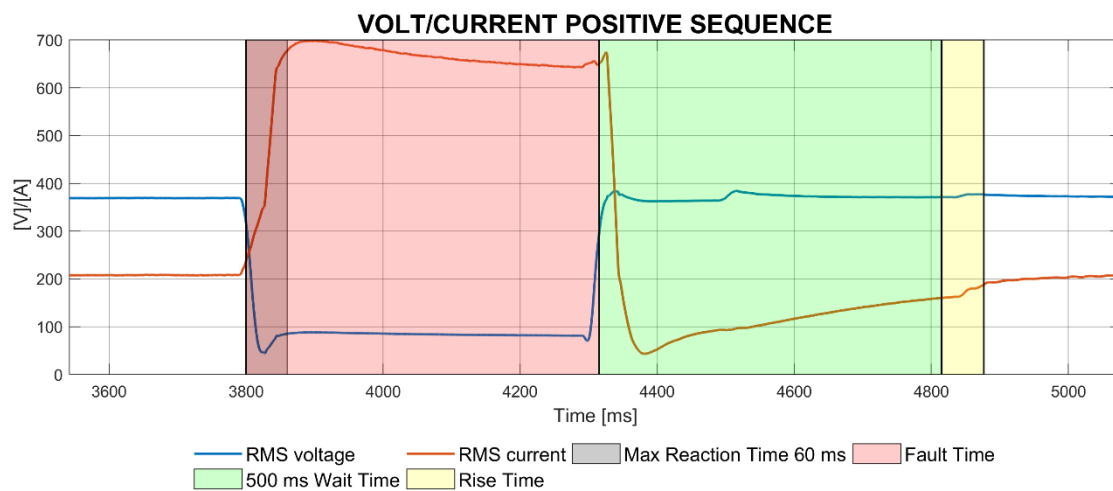




CREI Ven – Padova
Laboratorio Prove
Report n. 177/20/00179/ER

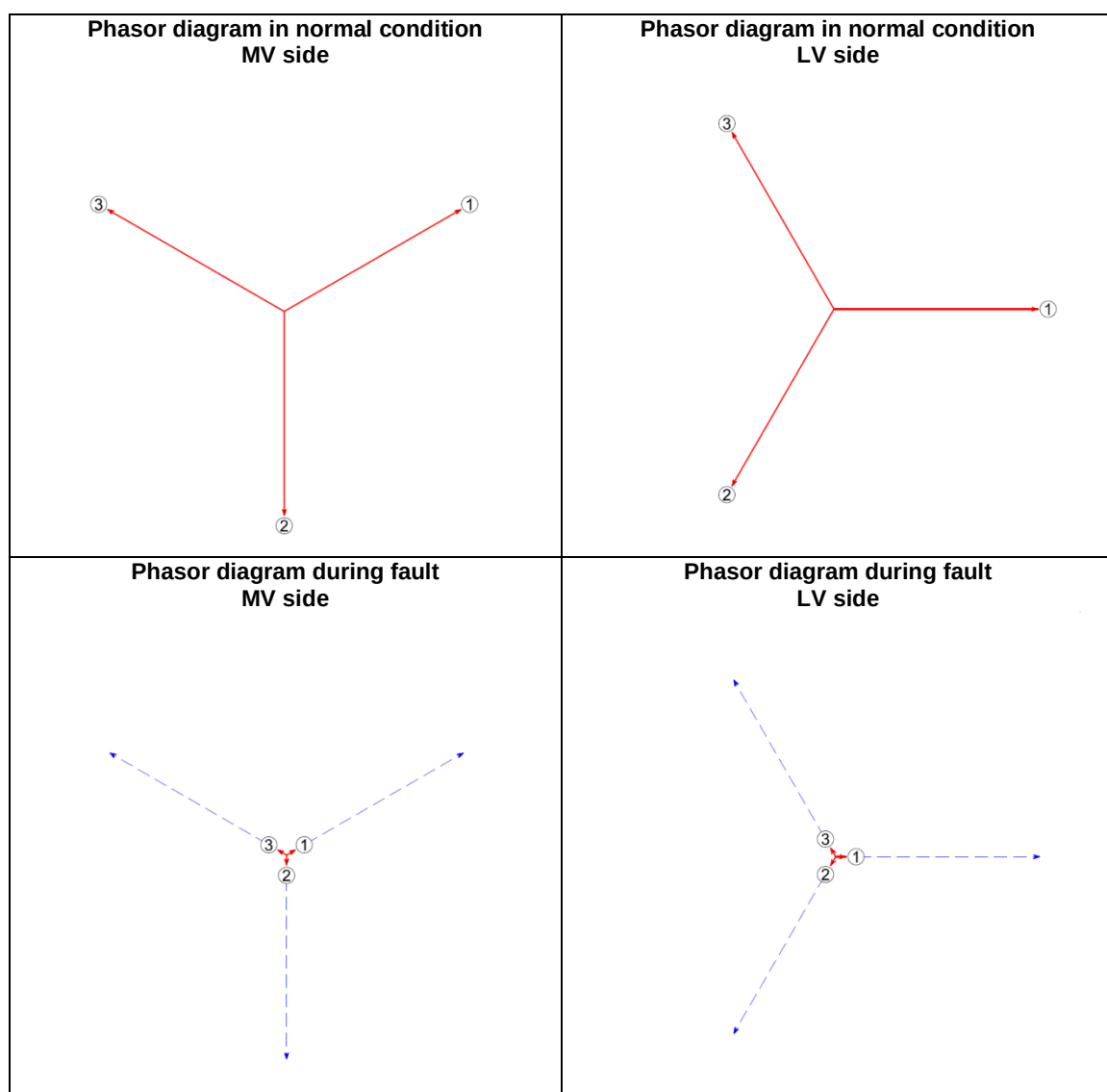




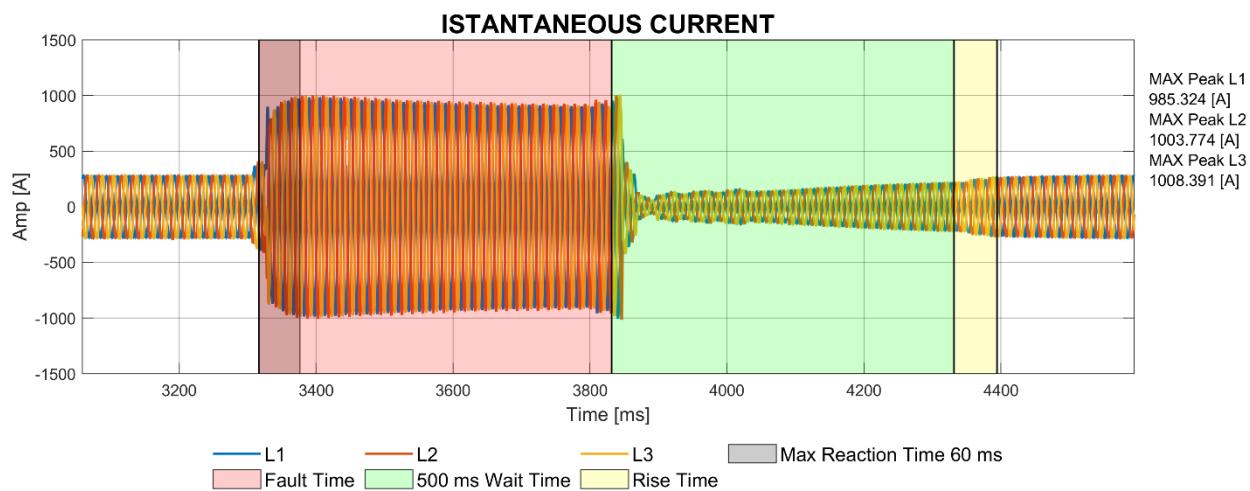
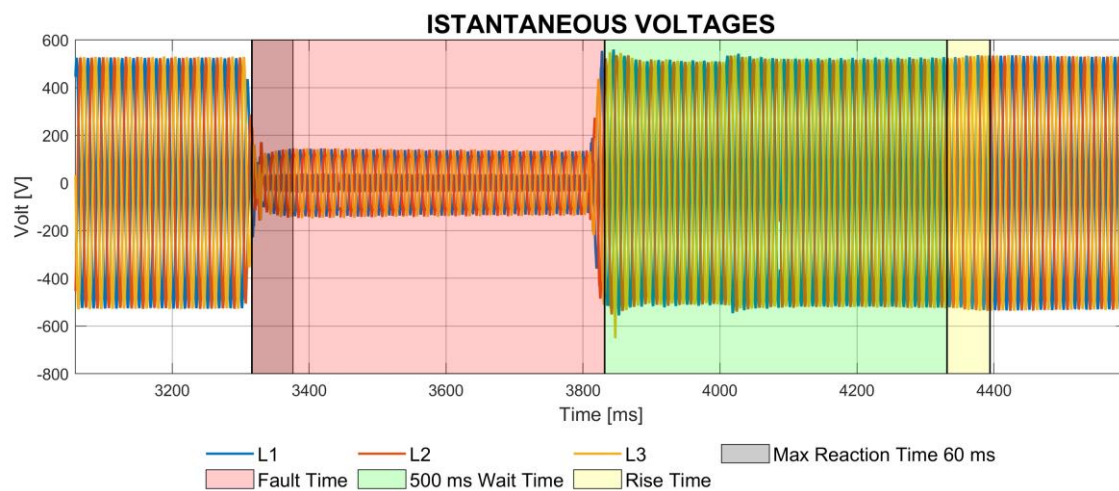


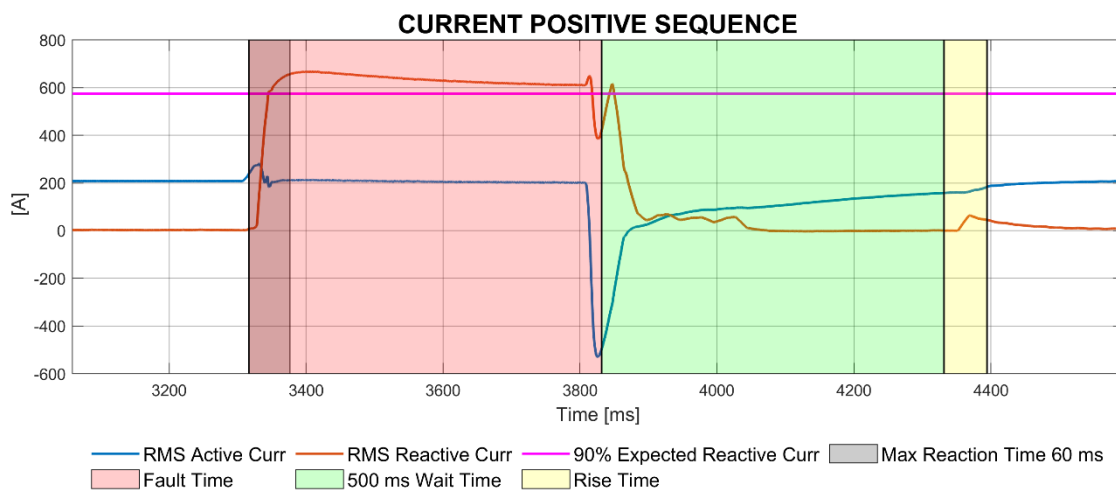
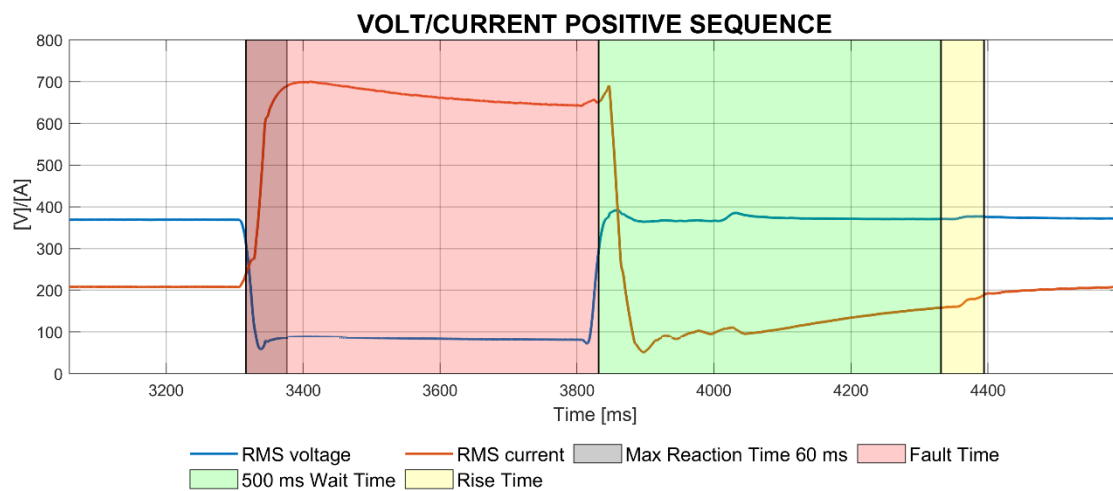


Test N° 3		LVRT - 10% Un - 30% Pn – Sym – K = 10					
Duration (ms): 500 ±20		$V_1/V_{1,nom}$	$V_2/V_{2,nom}$	$V_3/V_{3,nom}$	φ_{V1}	φ_{V2}	φ_{V3}
MV	Normal condition	1	1	1	30°	270°	150°
	During fault	0,10 ±0,05	0,10 ±0,05	0,10 ±0,05	30°	270°	150°
LV	Normal condition	1	1	1	0°	240°	120°
	During fault	0,10 ±0,05	0,10 ±0,05	0,10 ±0,05	0°	240°	120°



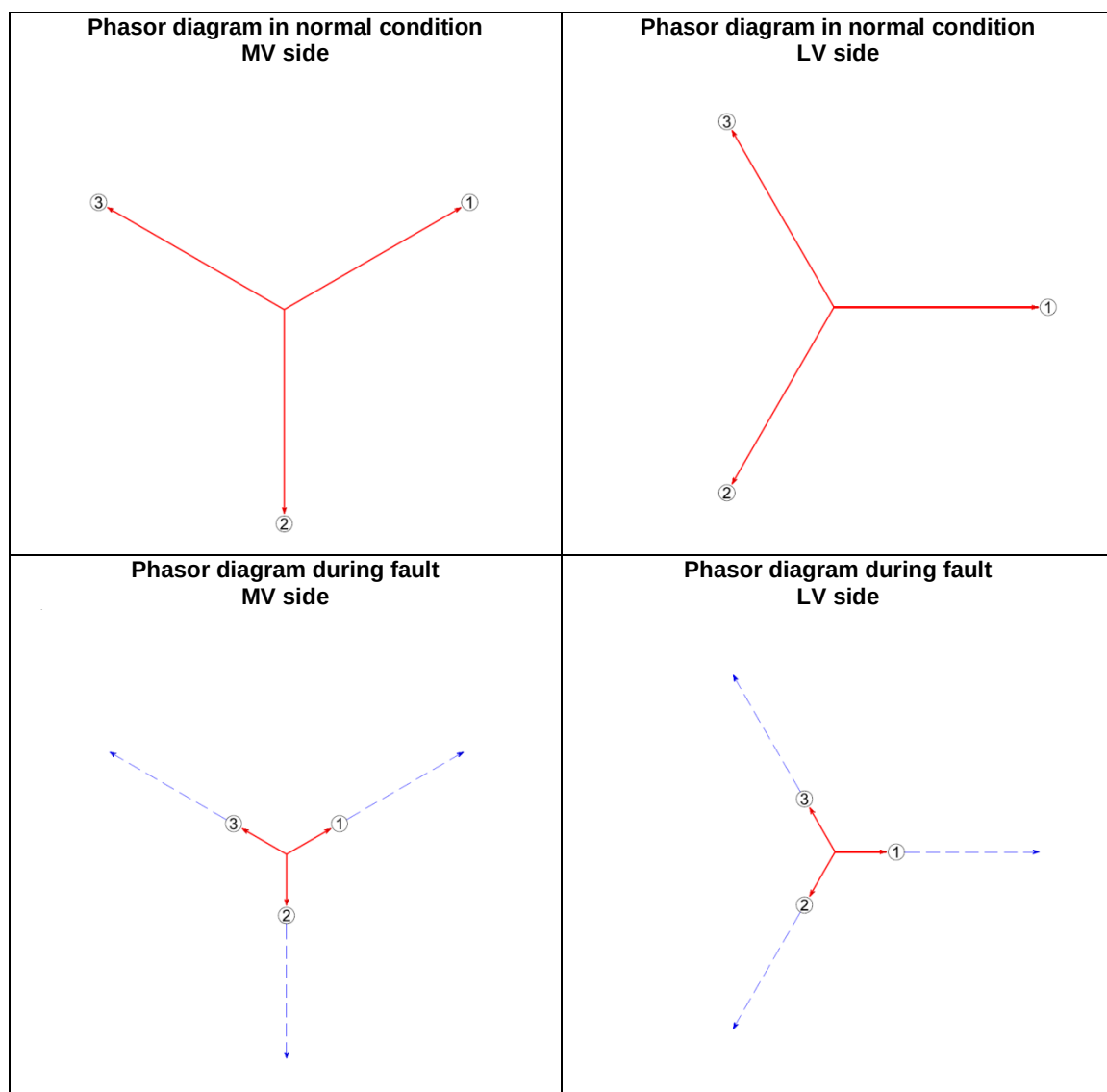


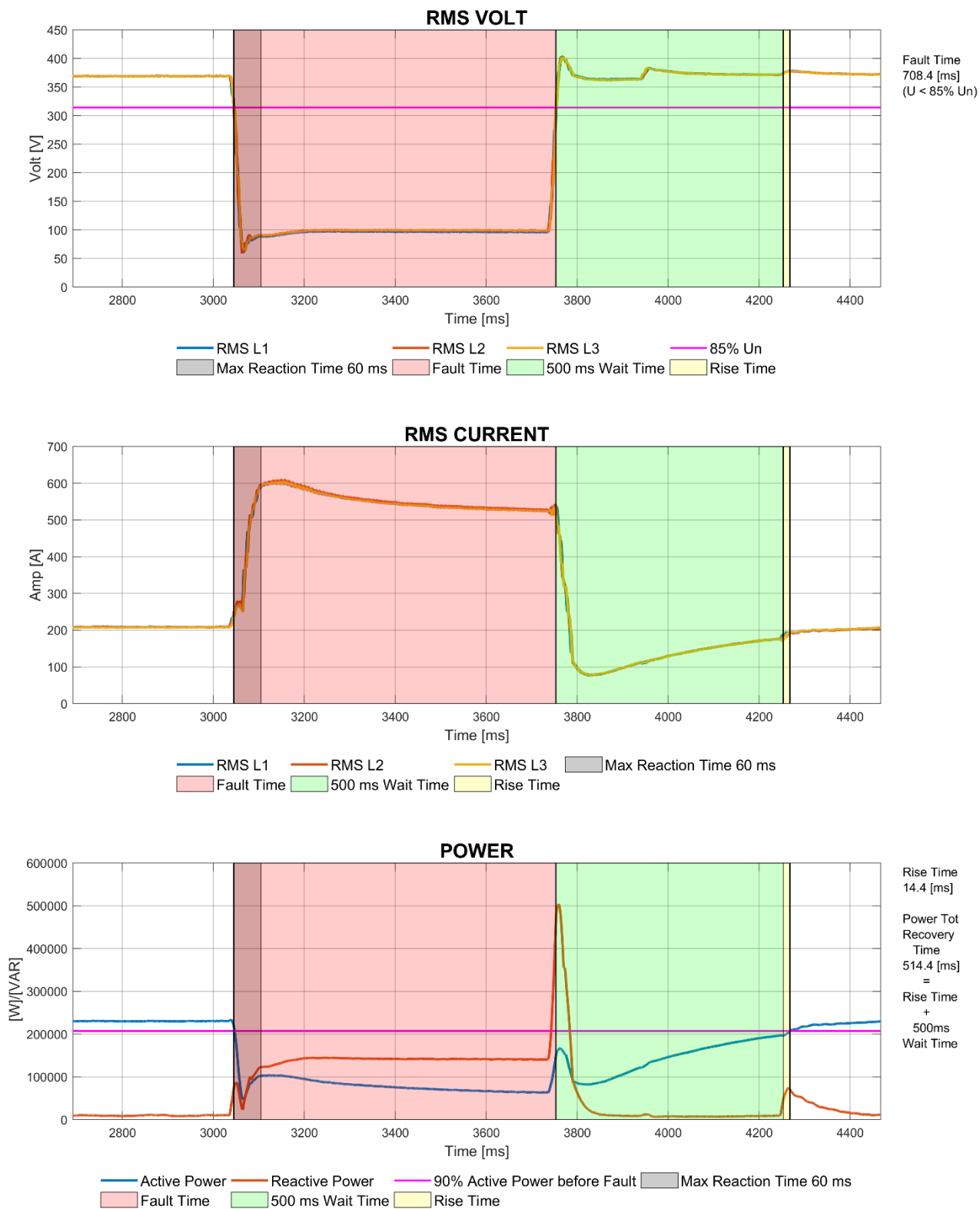


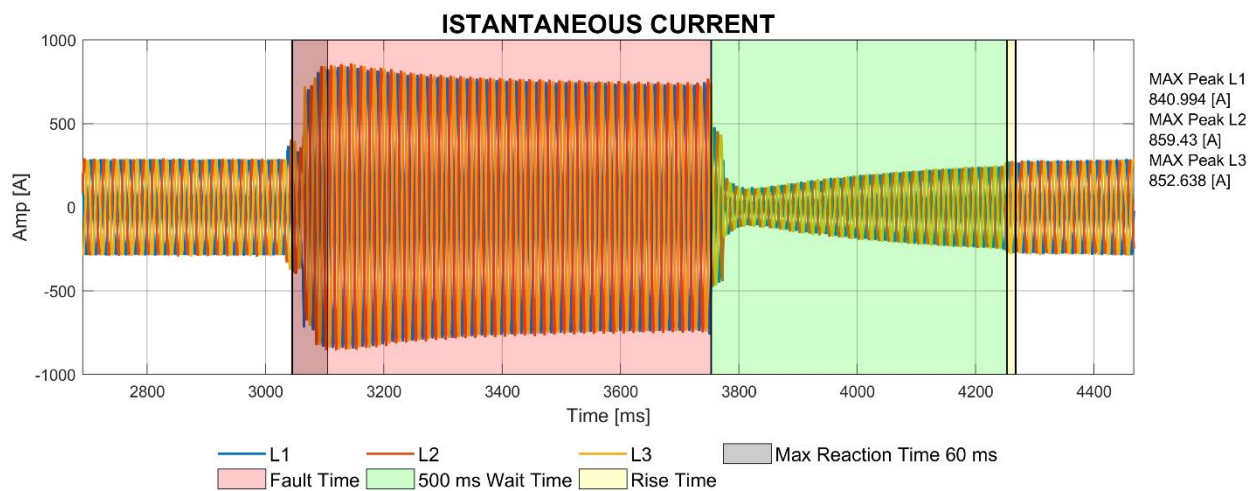
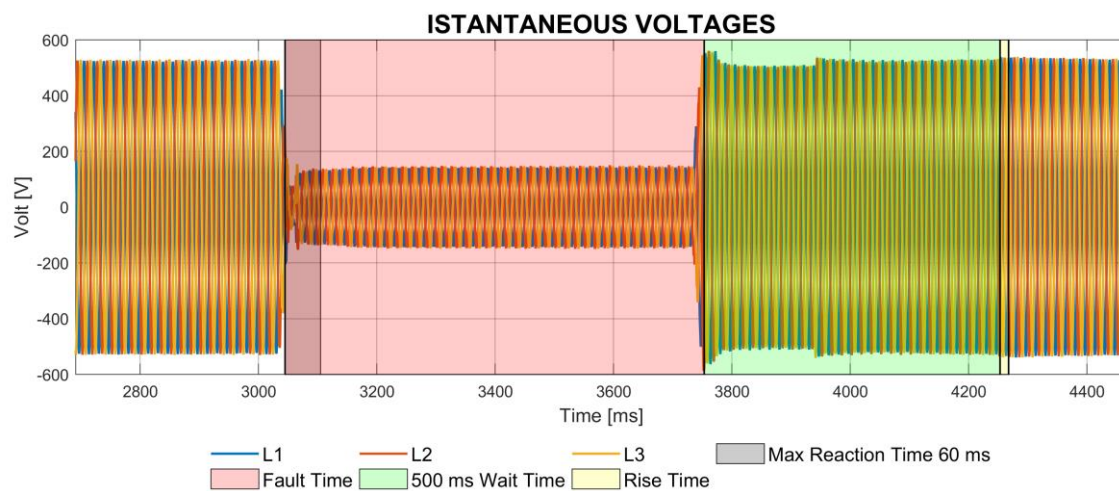


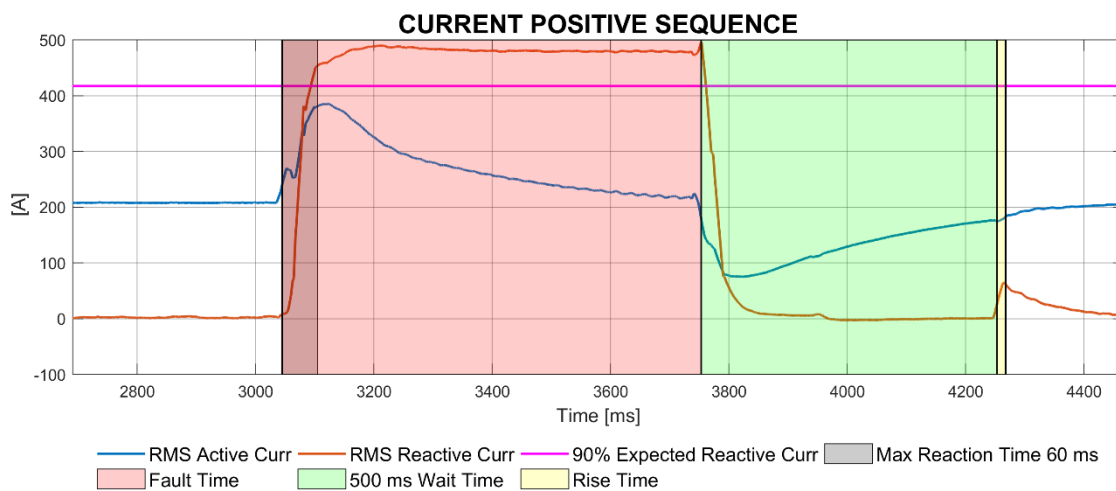
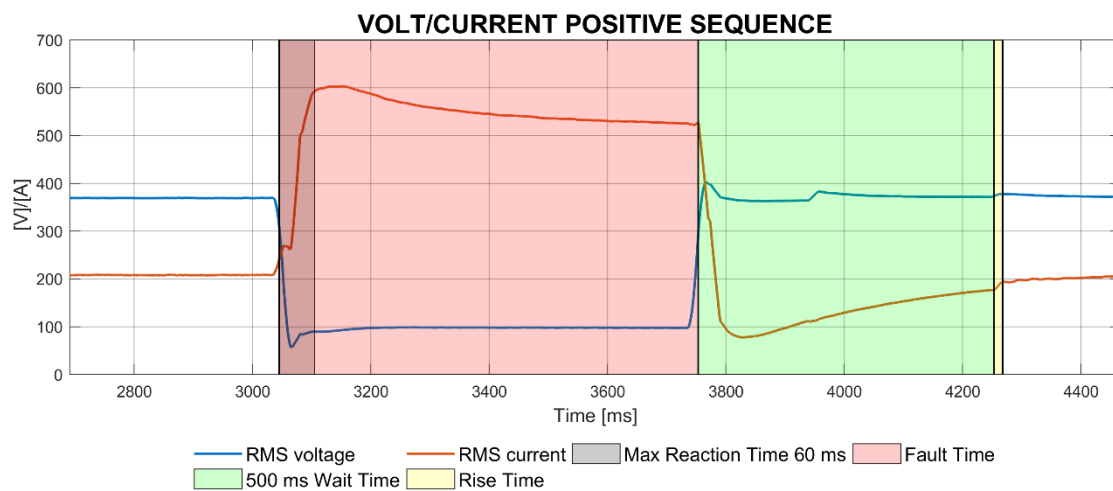


Test N° 4		LVRT - 25% Un - 30% Pn – Sym – K = 1					
Duration (ms): 700 ±20		$V_1/V_{1,nom}$	$V_2/V_{2,nom}$	$V_3/V_{3,nom}$	φ_{V1}	φ_{V2}	φ_{V3}
MV	Normal condition	1	1	1	30°	270°	150°
	During fault	0,25 ±0,05	0,25 ±0,05	0,25 ±0,05	30°	270°	150°
LV	Normal condition	1	1	1	0°	240°	120°
	During fault	0,25 ±0,05	0,25 ±0,05	0,25 ±0,05	0°	240°	120°



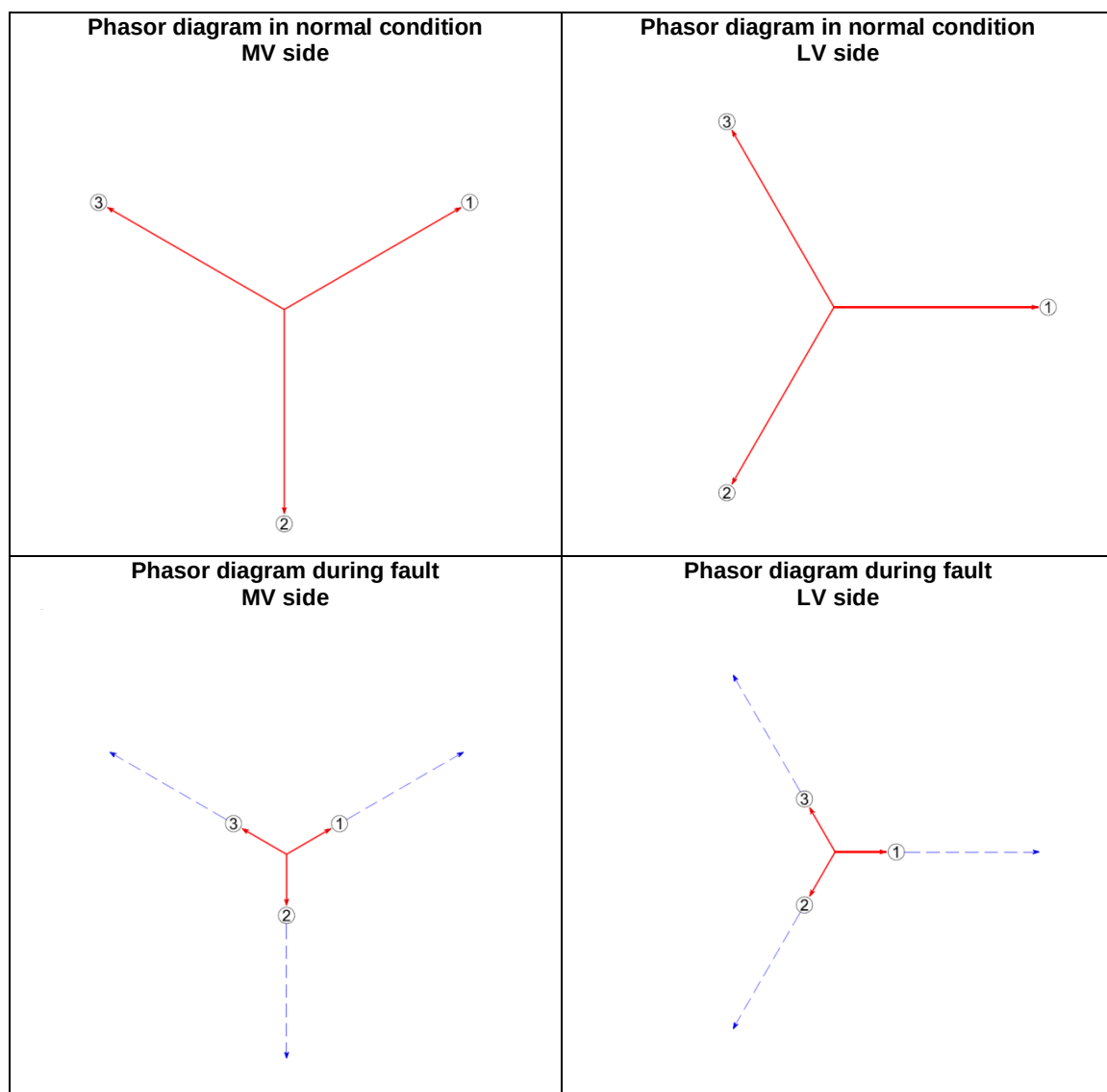


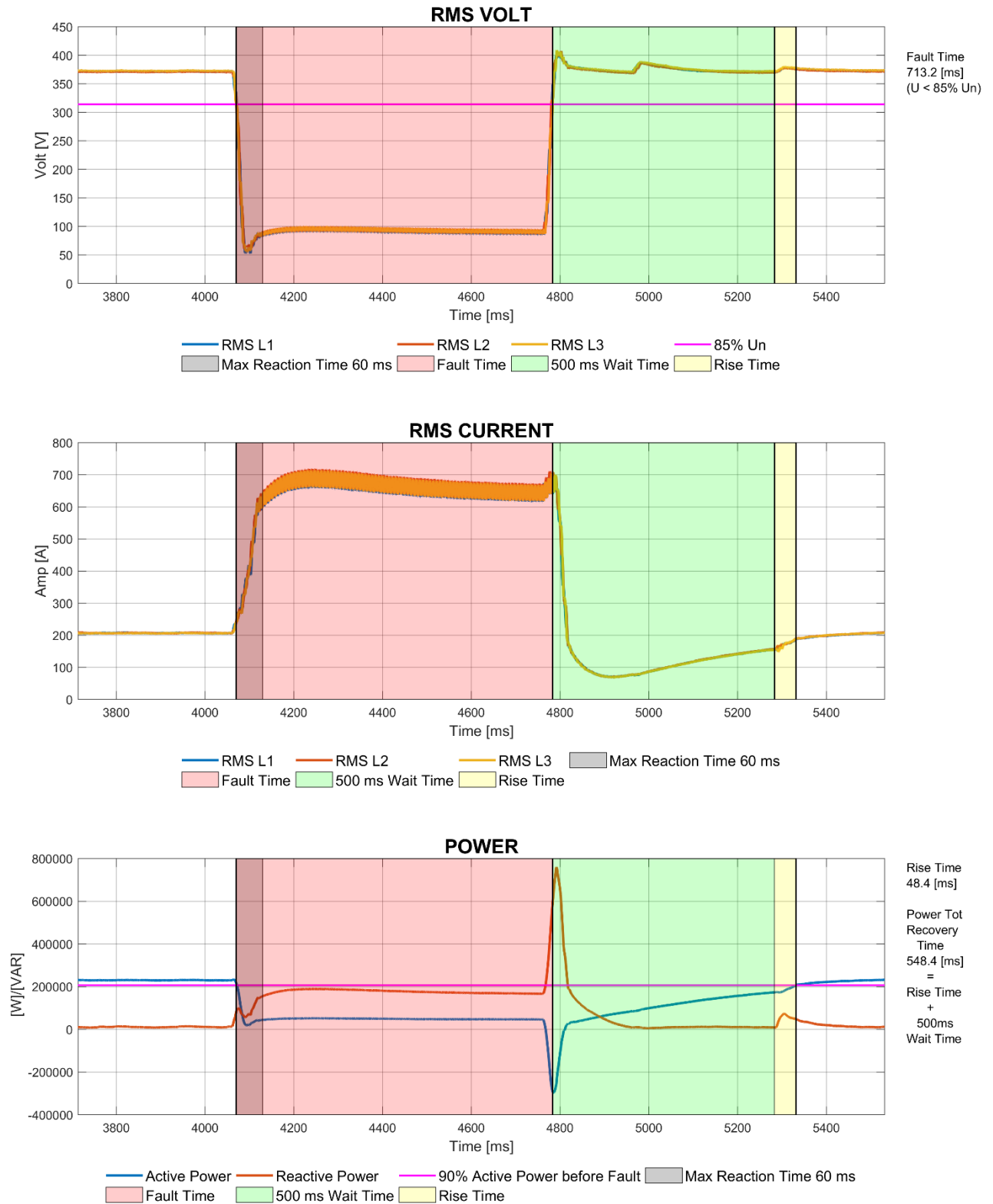


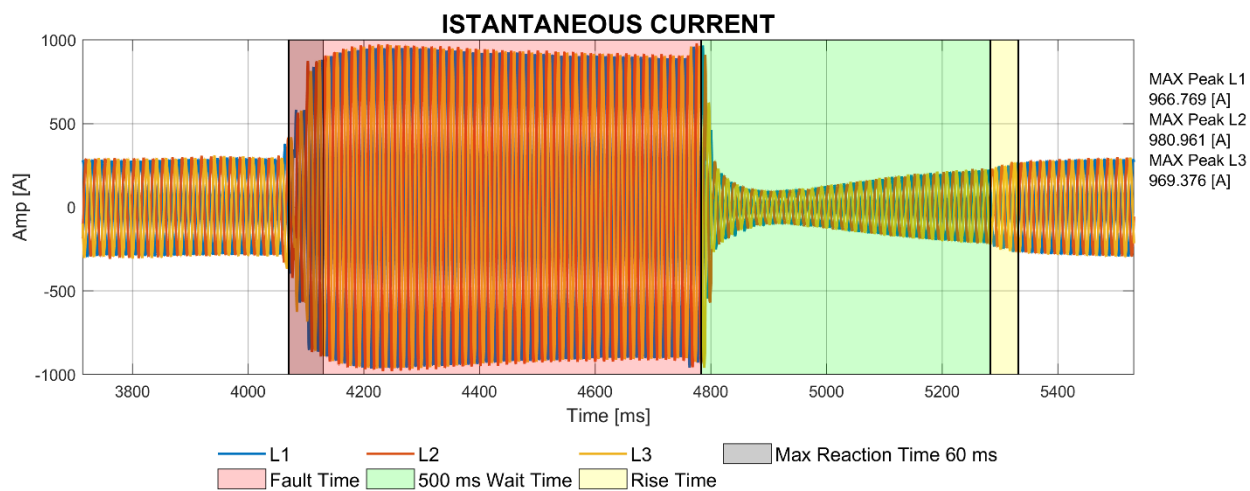
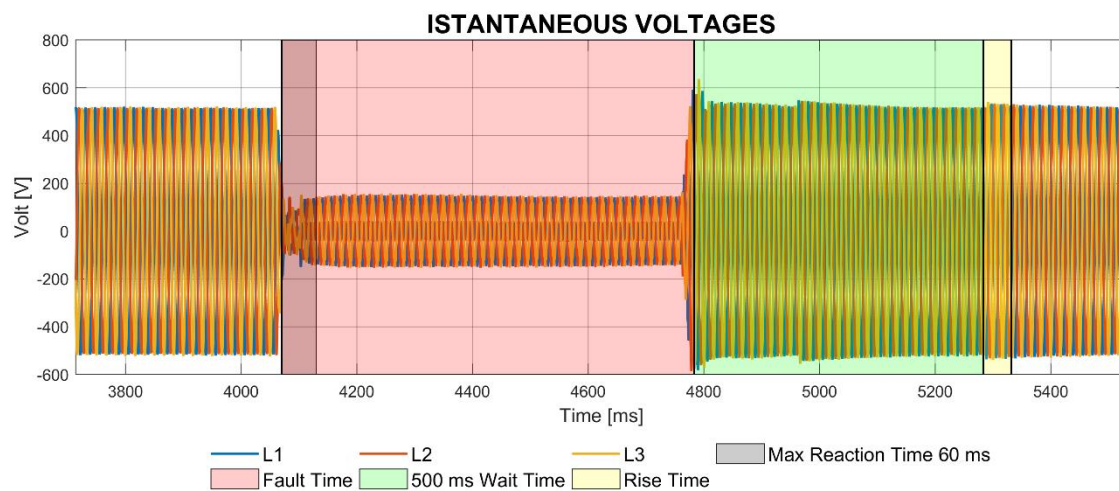


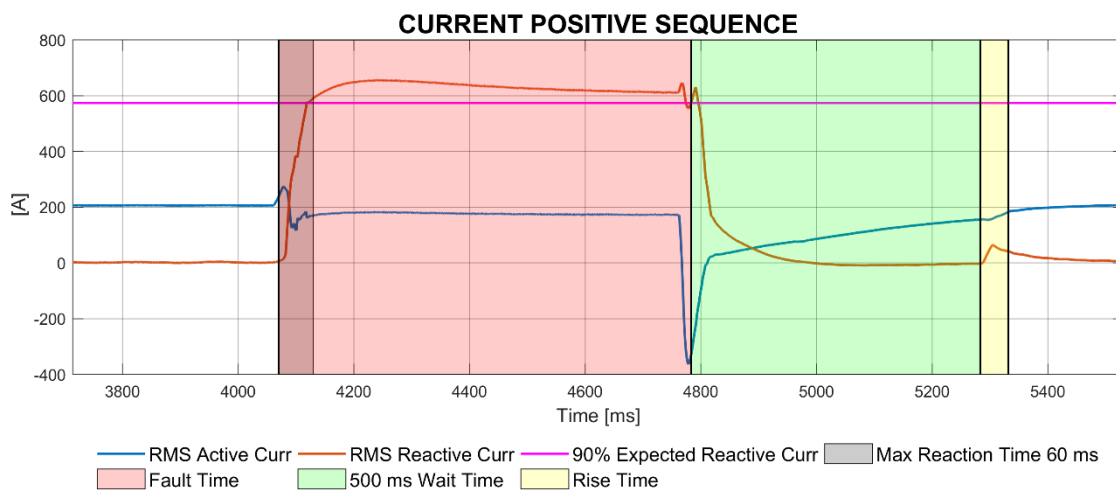
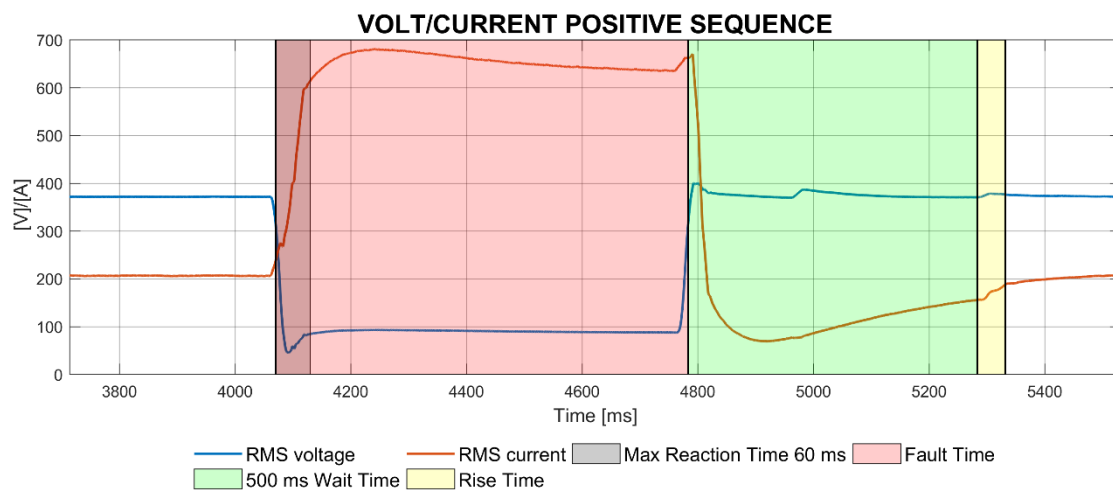


Test N° 5		LVRT - 25% Un - 30% Pn – Sym – K = 2					
Duration (ms): 700 ±20		$V_1/V_{1,nom}$	$V_2/V_{2,nom}$	$V_3/V_{3,nom}$	φ_{V1}	φ_{V2}	φ_{V3}
MV	Normal condition	1	1	1	30°	270°	150°
	During fault	0,25 ±0,05	0,25 ±0,05	0,25 ±0,05	30°	270°	150°
LV	Normal condition	1	1	1	0°	240°	120°
	During fault	0,25 ±0,05	0,25 ±0,05	0,25 ±0,05	0°	240°	120°



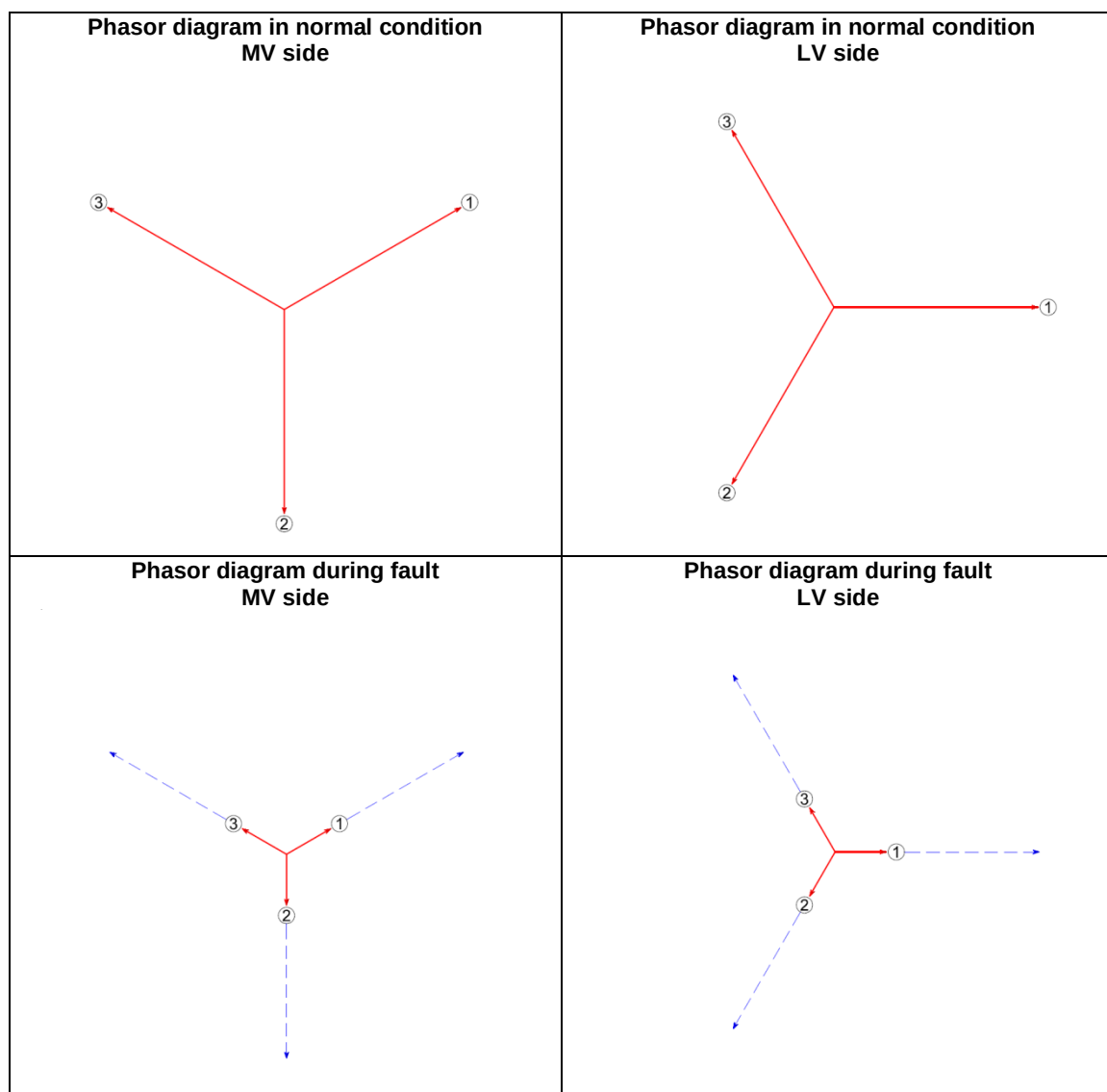






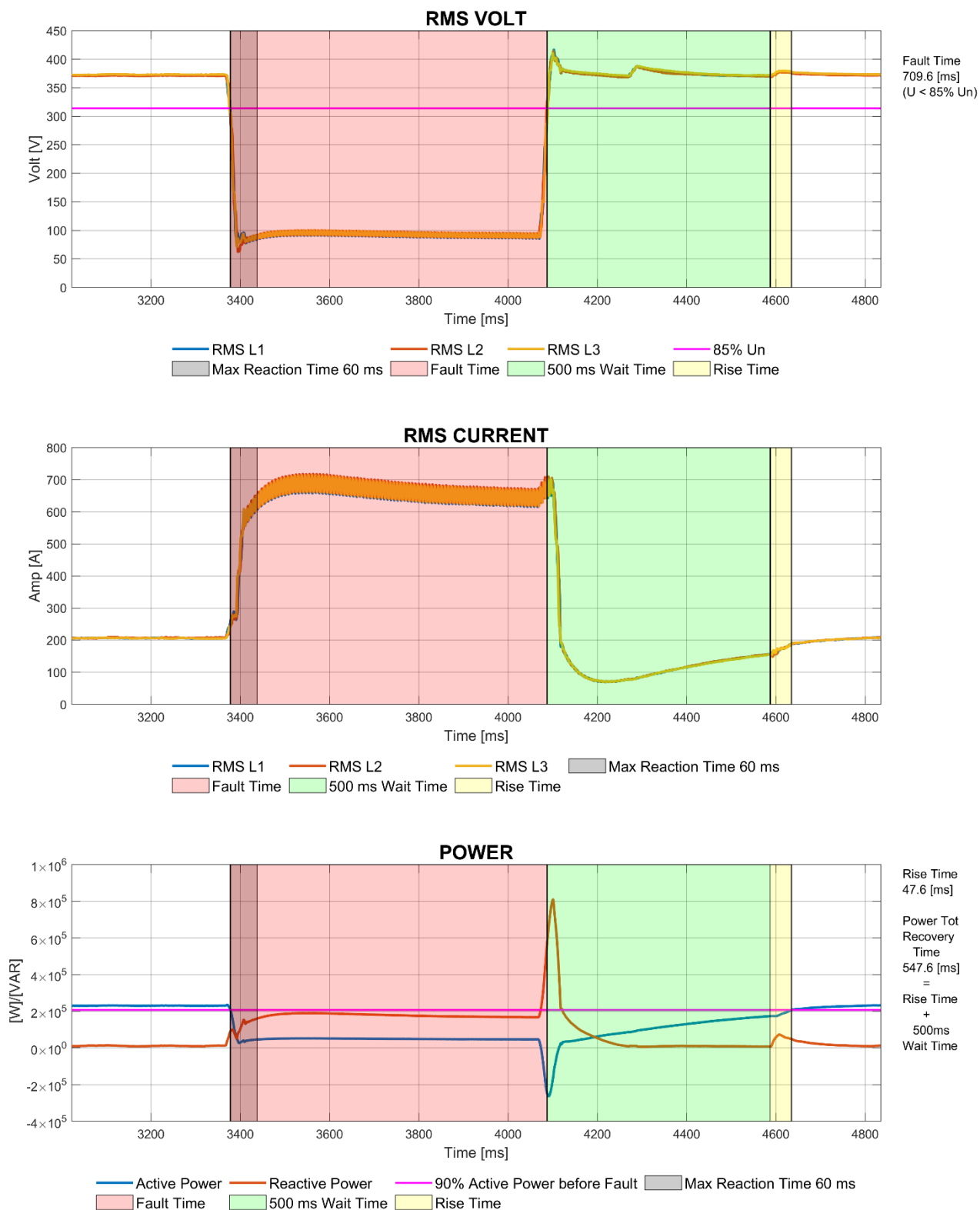


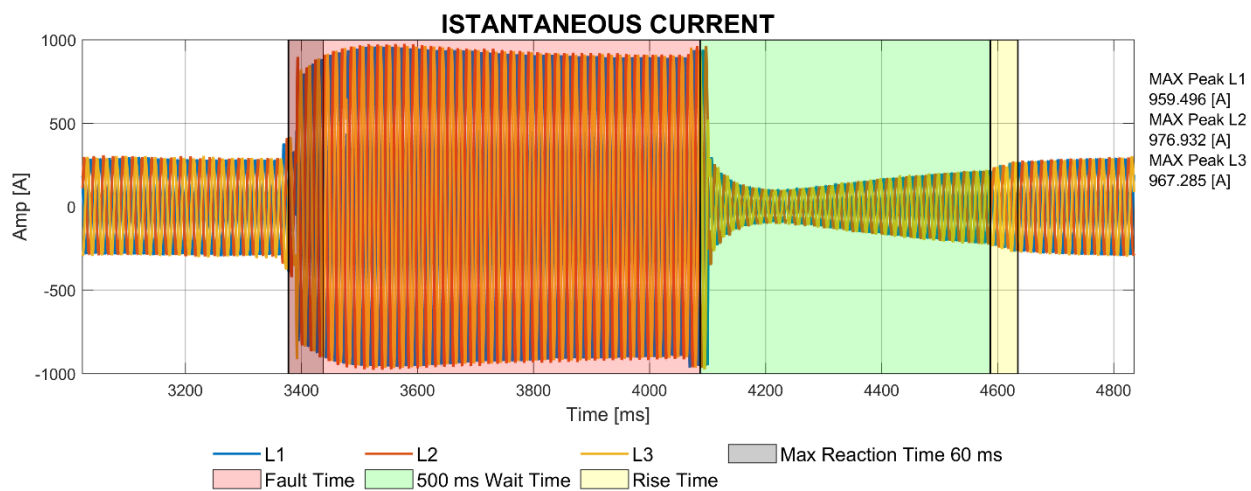
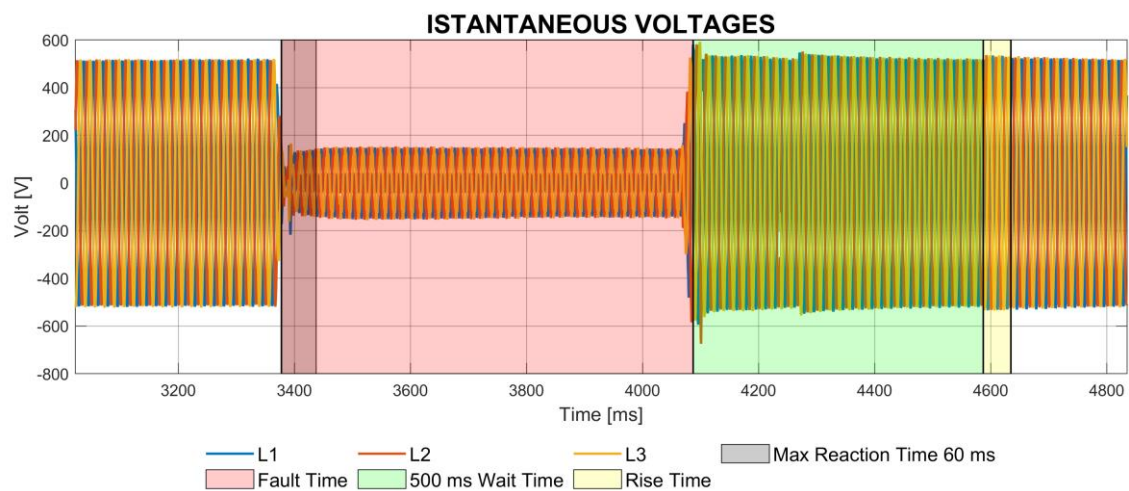
Test N° 6		LVRT - 25% Un - 30% Pn – Sym – K = 10					
Duration (ms): 700 ±20		$V_1/V_{1,nom}$	$V_2/V_{2,nom}$	$V_3/V_{3,nom}$	φ_{V1}	φ_{V2}	φ_{V3}
MV	Normal condition	1	1	1	30°	270°	150°
	During fault	0,25 ±0,05	0,25 ±0,05	0,25 ±0,05	30°	270°	150°
LV	Normal condition	1	1	1	0°	240°	120°
	During fault	0,25 ±0,05	0,25 ±0,05	0,25 ±0,05	0°	240°	120°

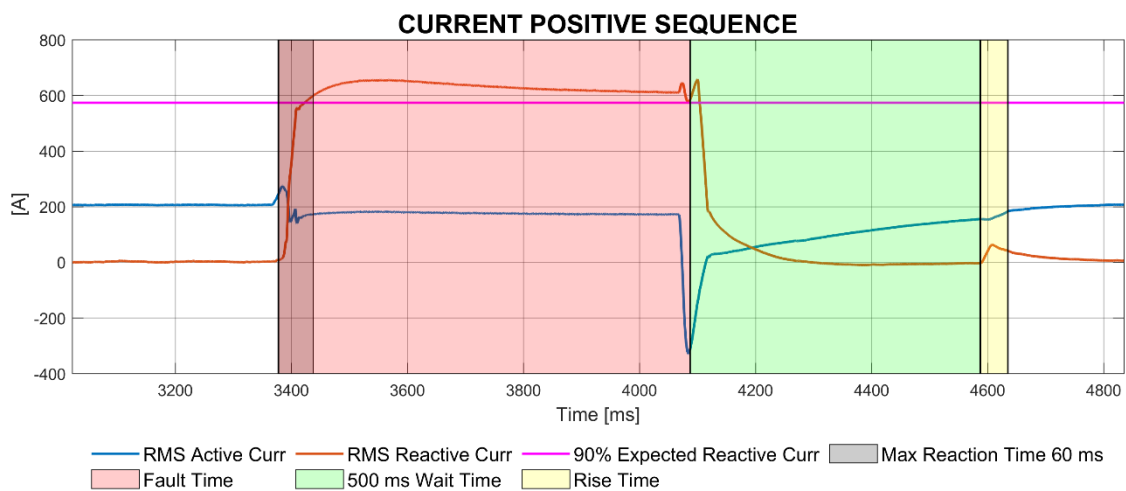
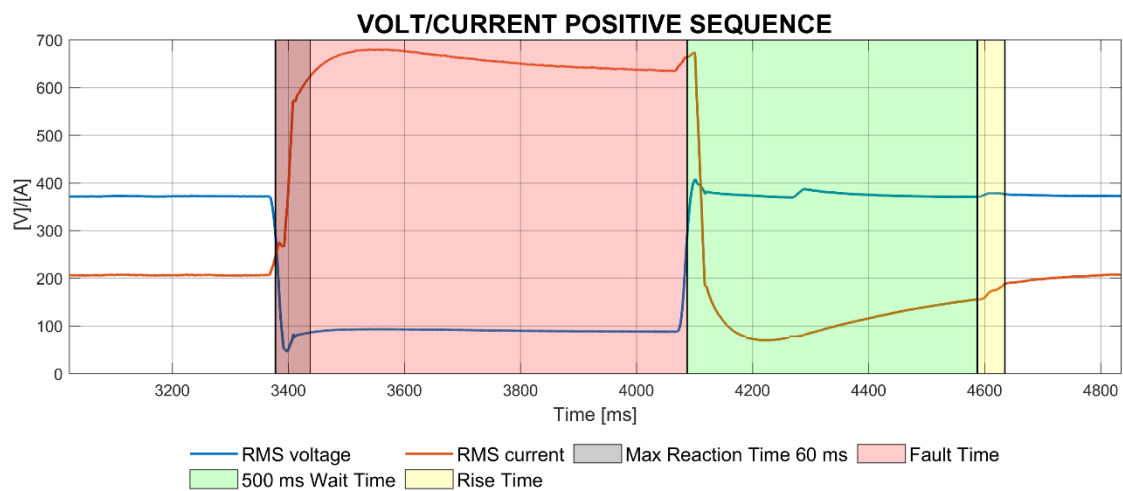




CREI Ven – Padova
Laboratorio Prove
Report n. 177/20/00179/ER

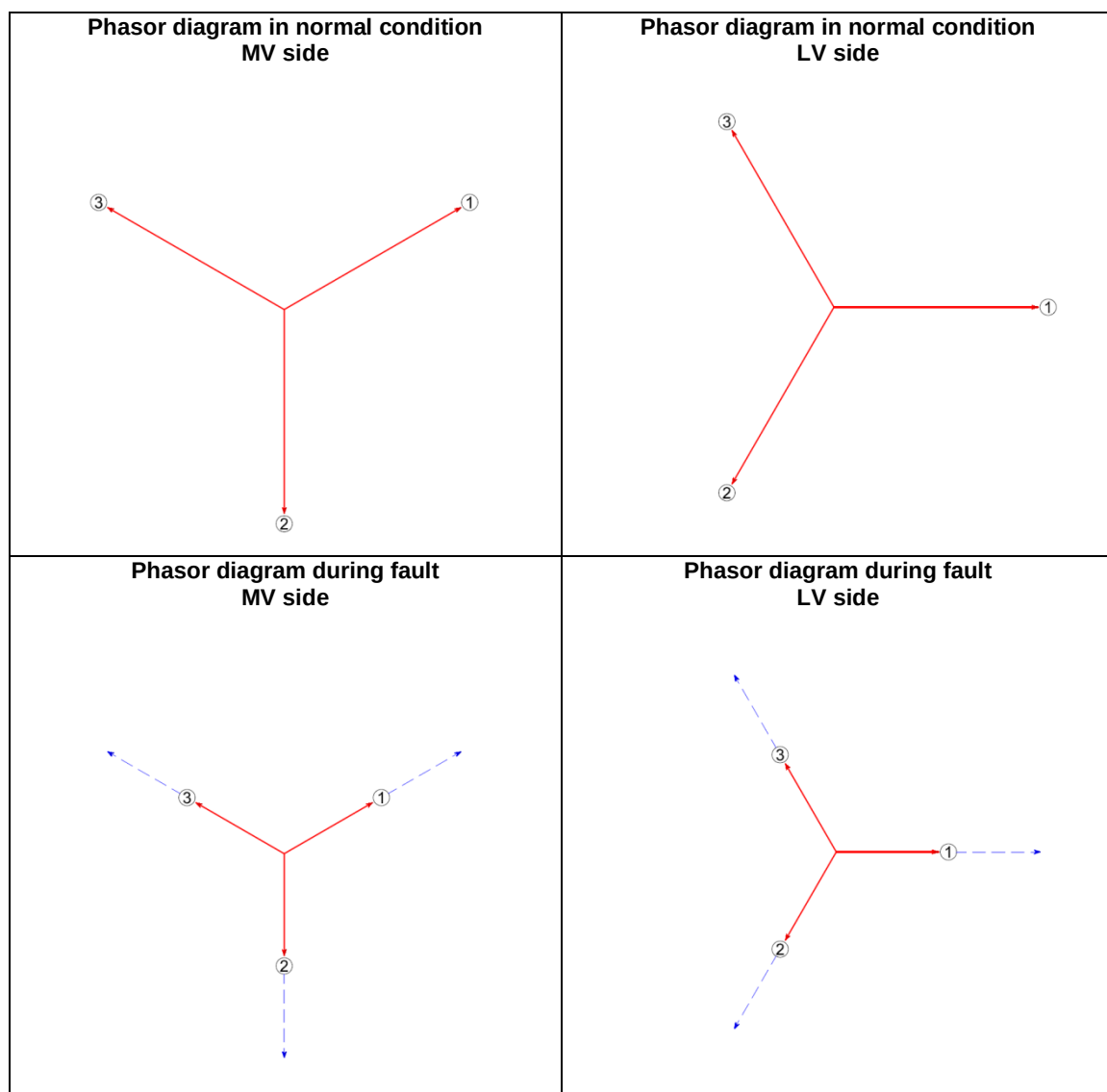


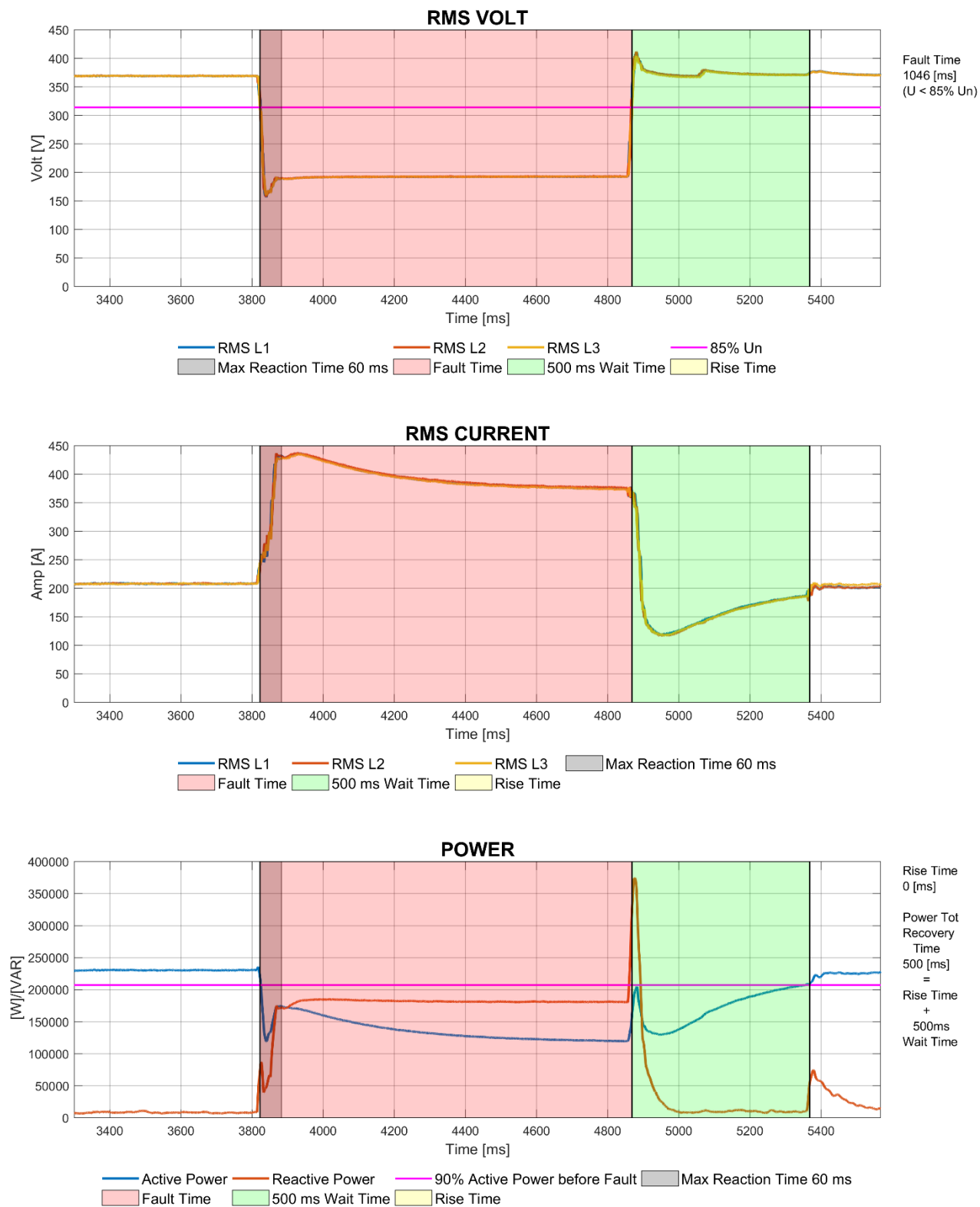


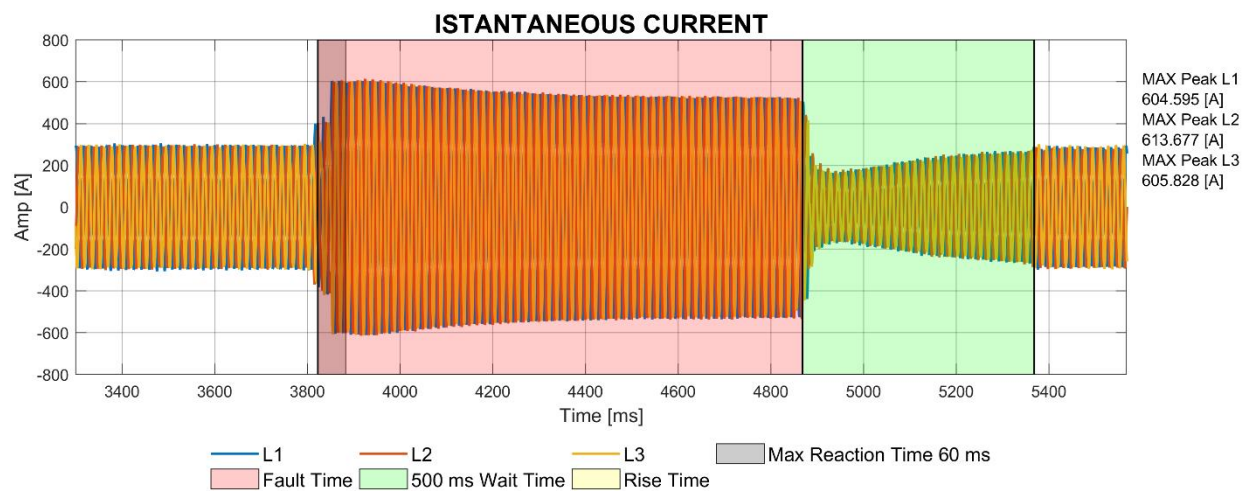
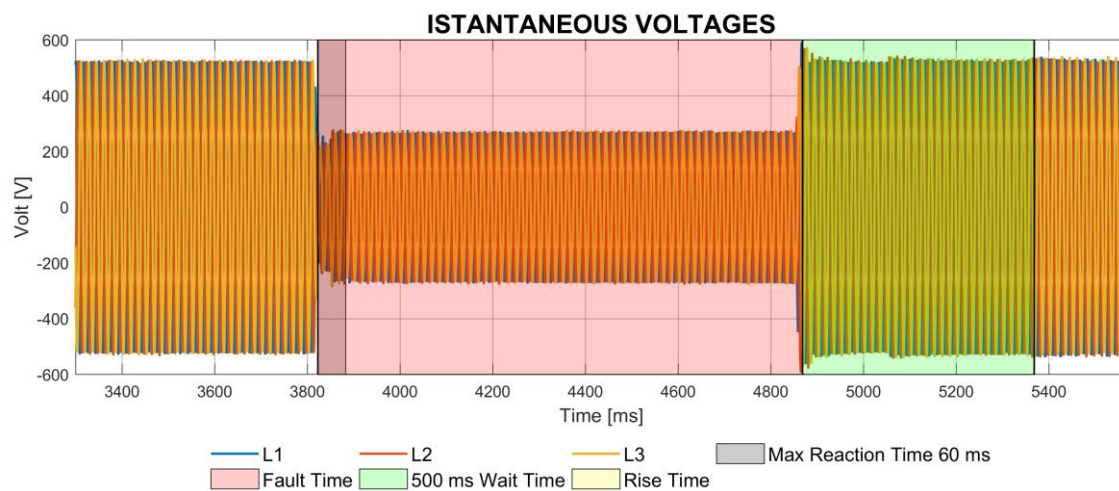


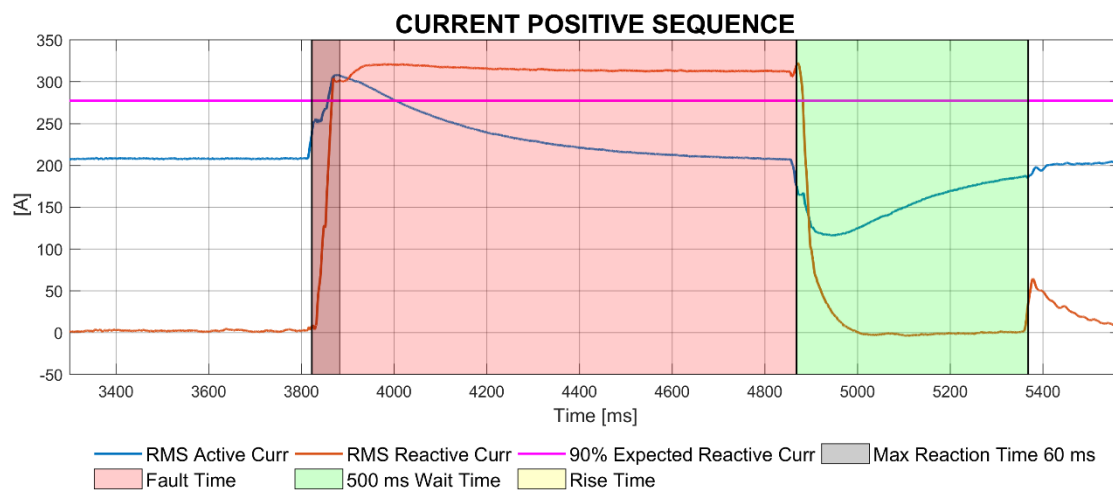
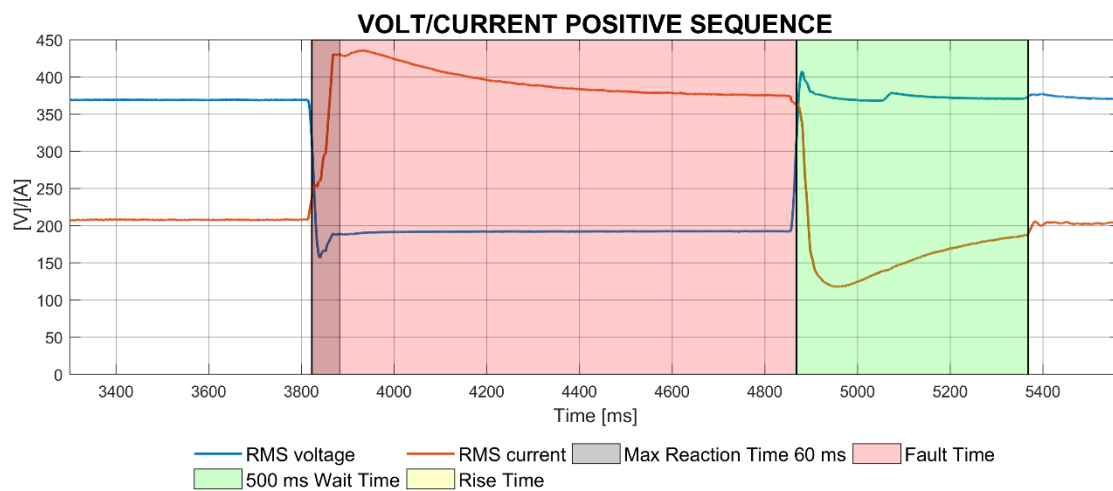


Test N° 7		LVRT - 50% Un - 30% Pn – Sym – K = 1					
Duration (ms): 1030 ±20		$V_1/V_{1,nom}$	$V_2/V_{2,nom}$	$V_3/V_{3,nom}$	φ_{V1}	φ_{V2}	φ_{V3}
MV	Normal condition	1	1	1	30°	270°	150°
	During fault	0,50 ±0,05	0,50 ±0,05	0,50 ±0,05	30°	270°	150°
LV	Normal condition	1	1	1	0°	240°	120°
	During fault	0,50 ±0,05	0,50 ±0,05	0,50 ±0,05	0°	240°	120°



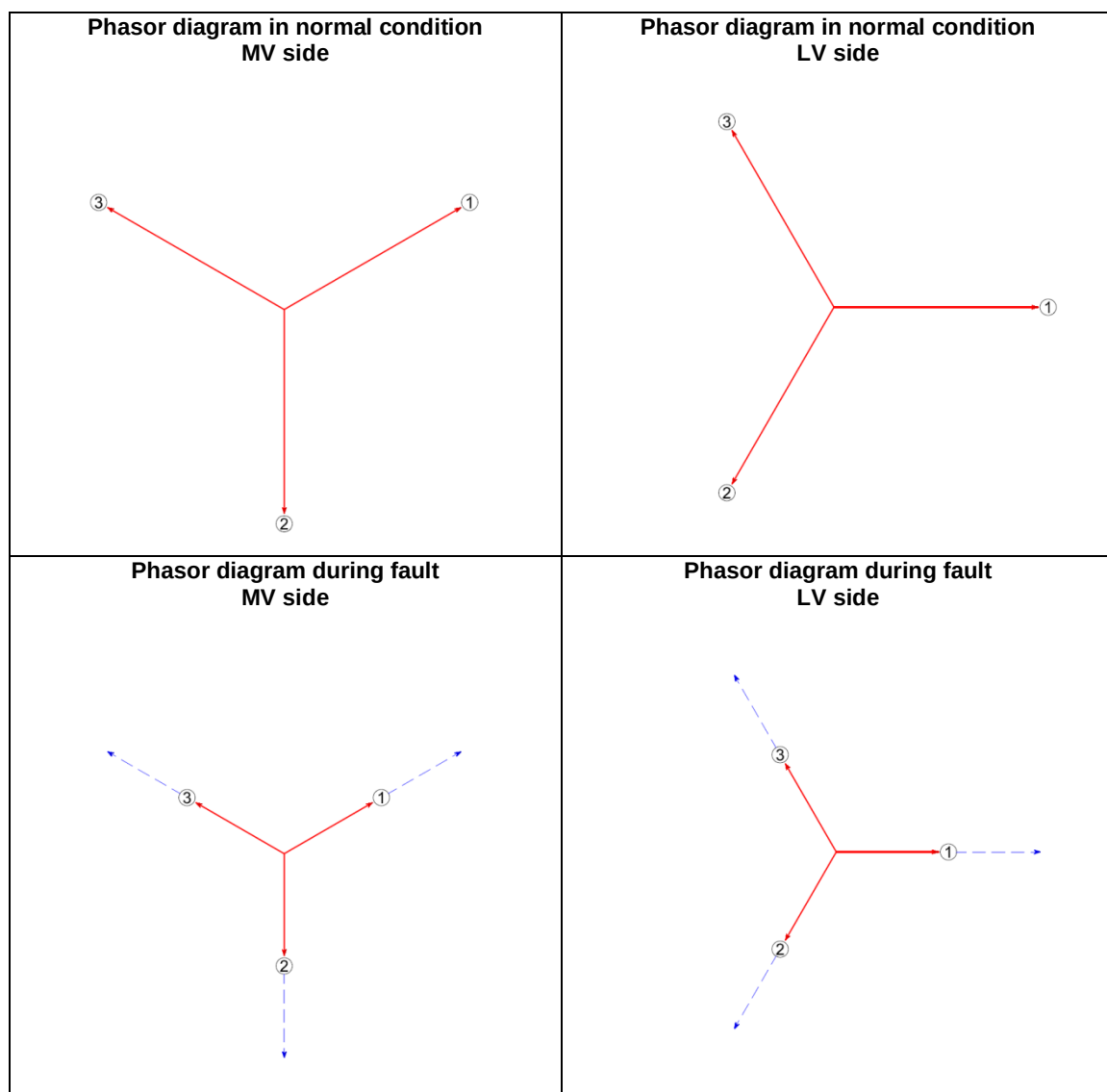






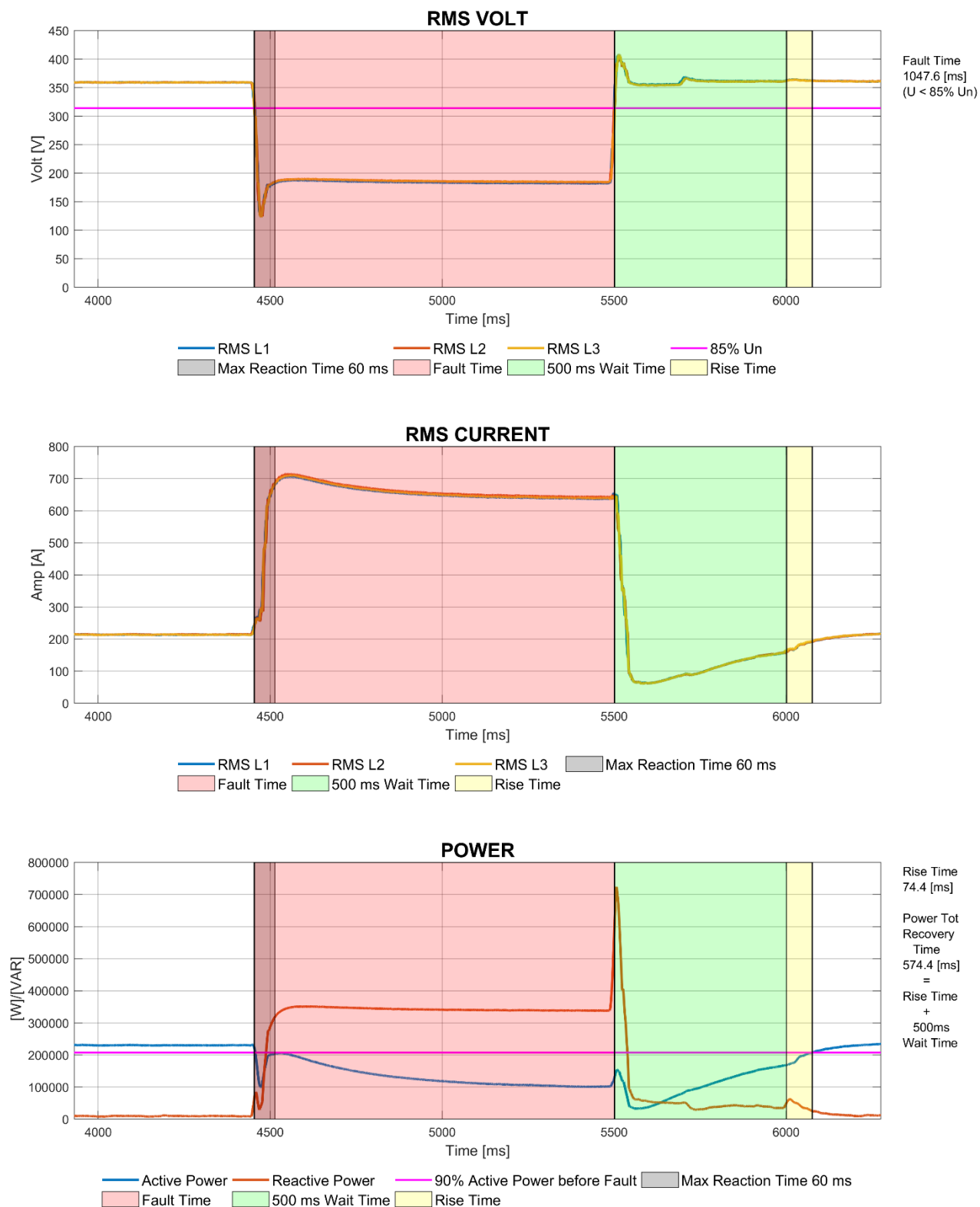


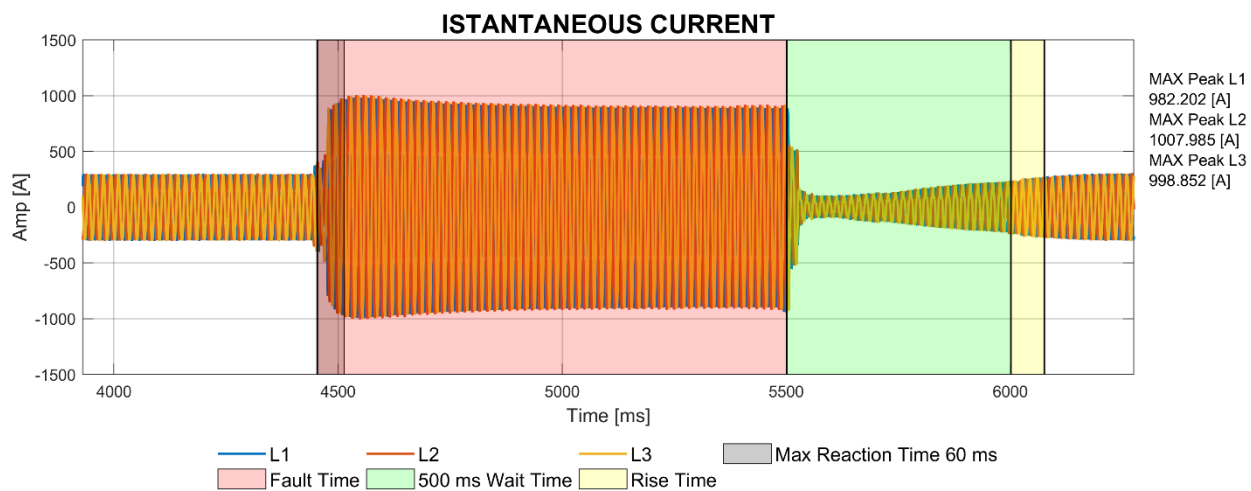
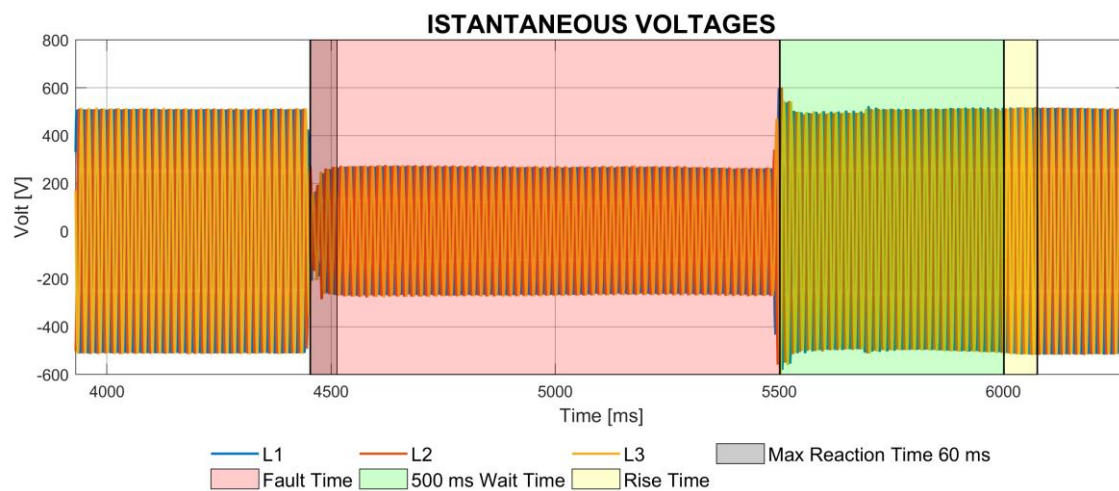
Test N° 8		LVRT - 50% Un - 30% Pn – Sym – K = 2					
Duration (ms): 1030 ±20		$V_1/V_{1,nom}$	$V_2/V_{2,nom}$	$V_3/V_{3,nom}$	φ_{V1}	φ_{V2}	φ_{V3}
MV	Normal condition	1	1	1	30°	270°	150°
	During fault	0,50 ±0,05	0,50 ±0,05	0,50 ±0,05	30°	270°	150°
LV	Normal condition	1	1	1	0°	240°	120°
	During fault	0,50 ±0,05	0,50 ±0,05	0,50 ±0,05	0°	240°	120°

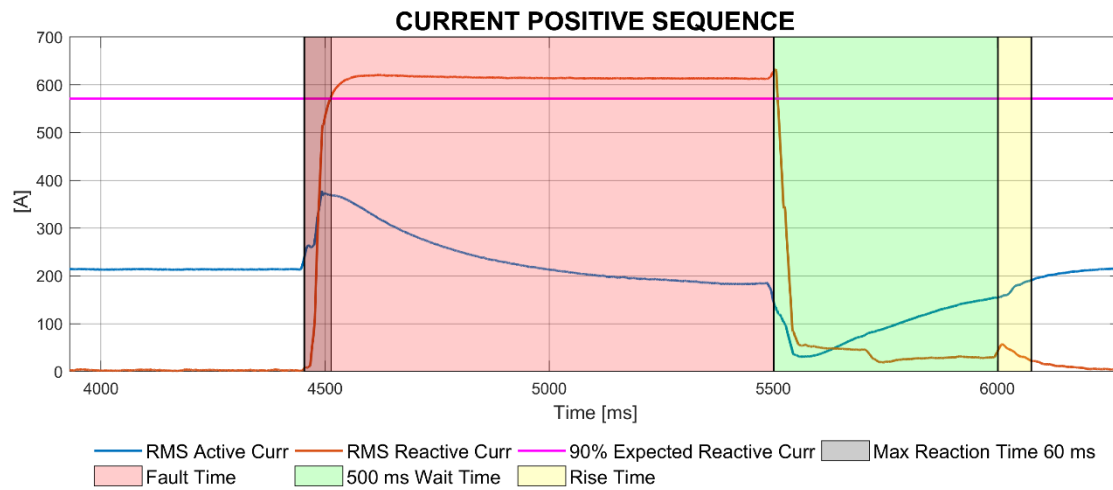
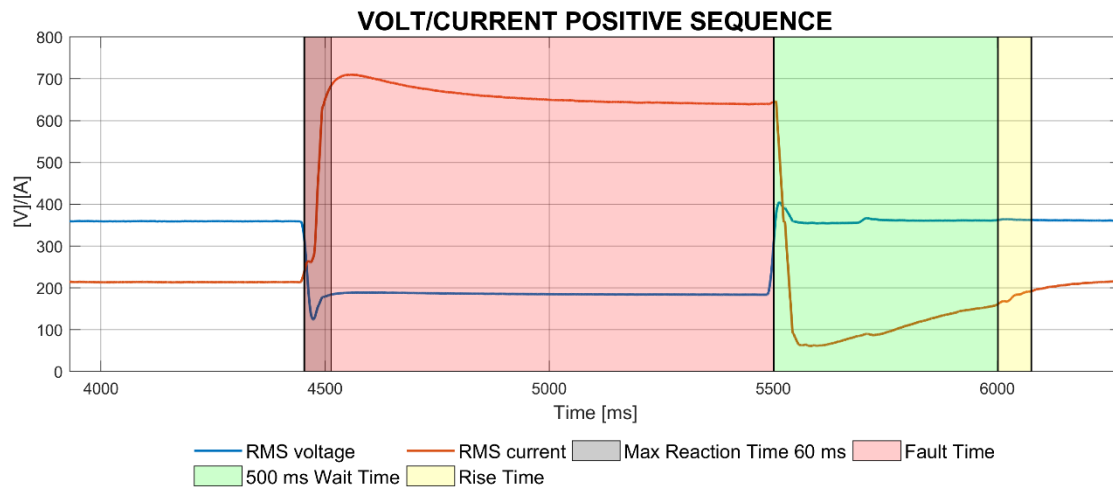




CREI Ven – Padova
Laboratorio Prove
Report n. 177/20/00179/ER

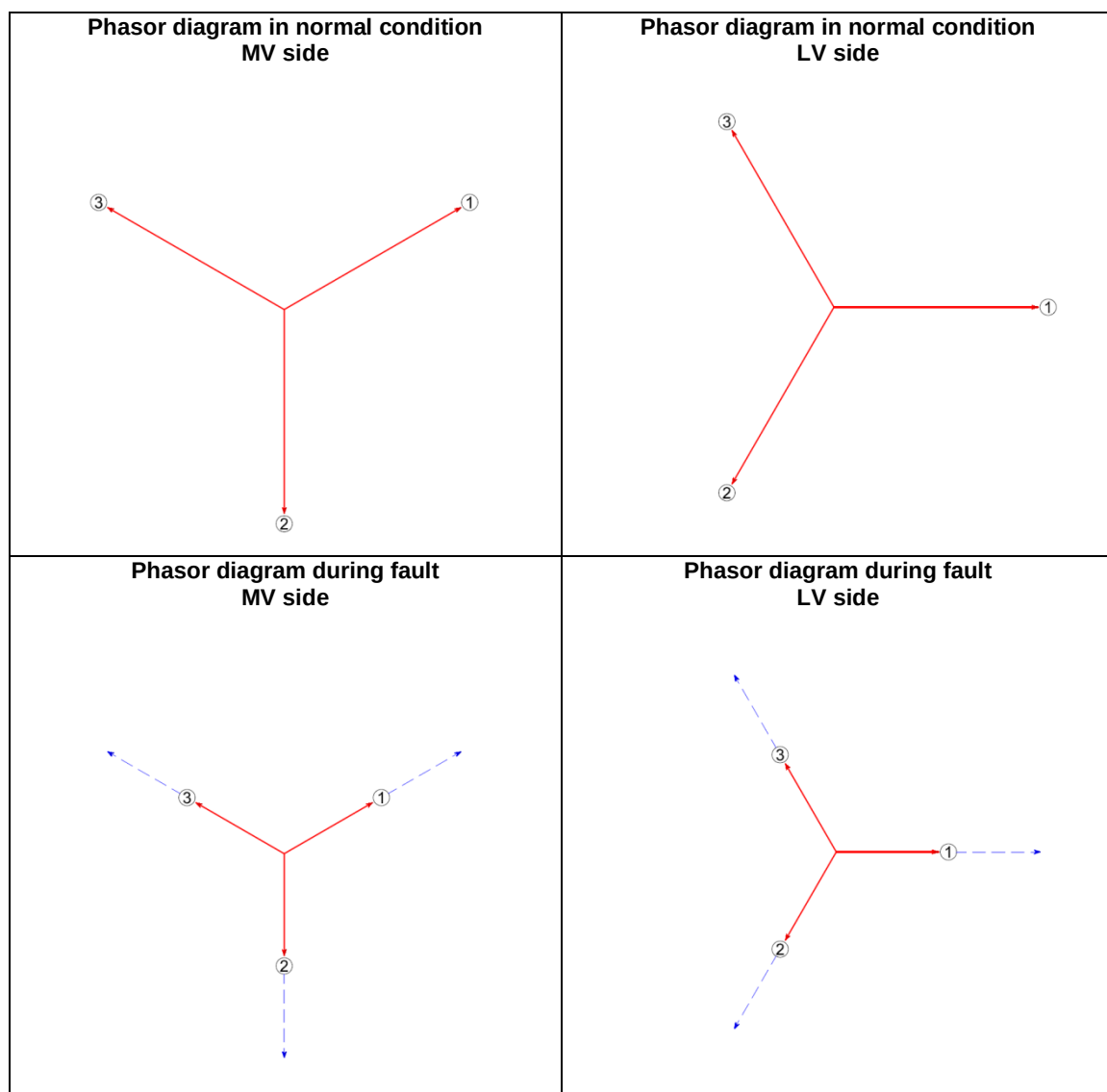


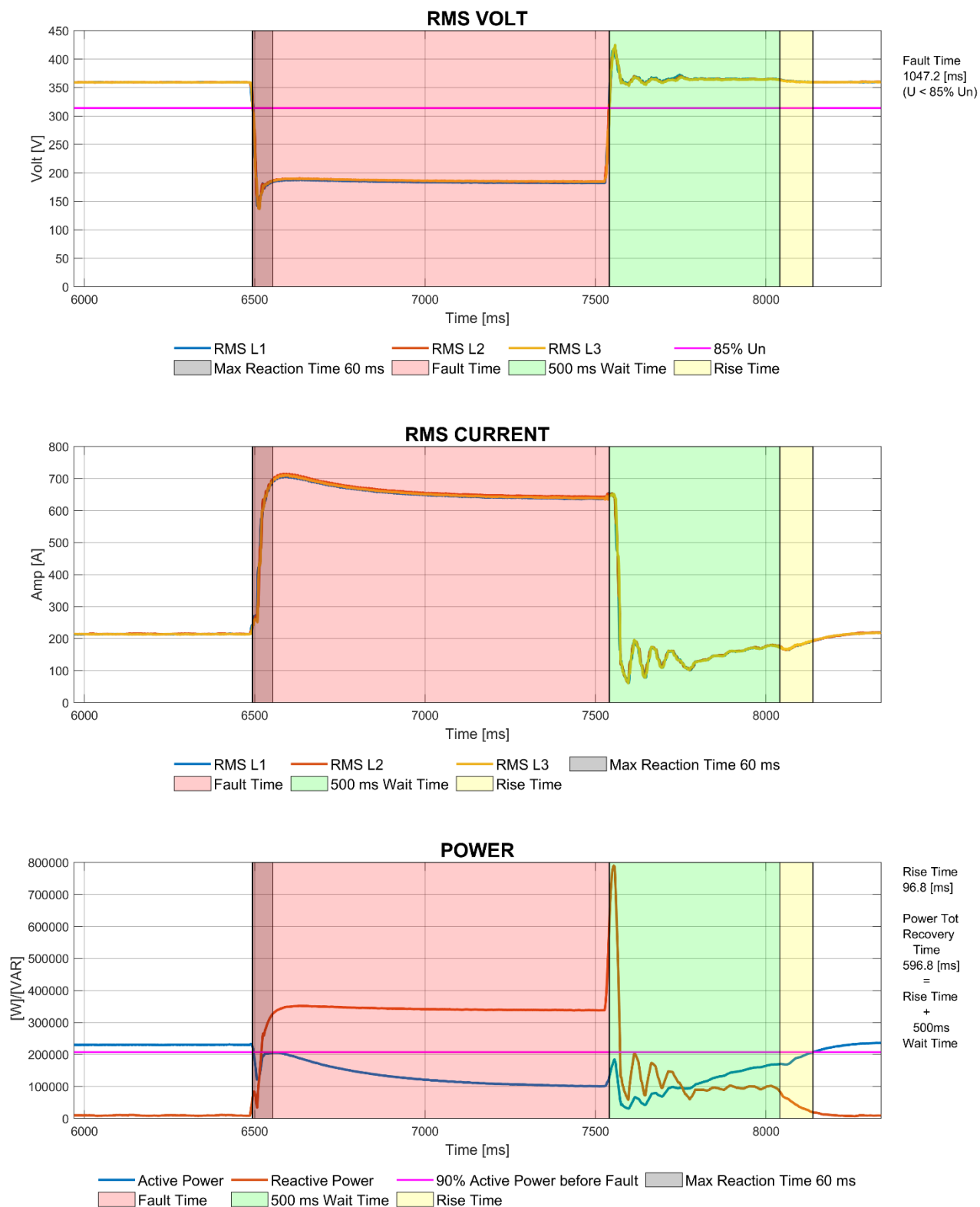


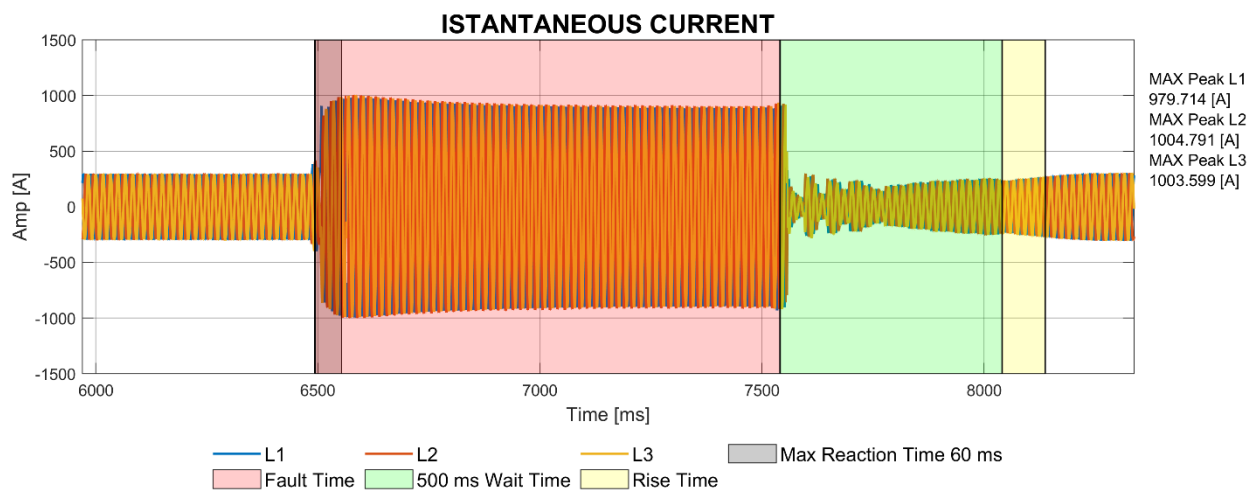
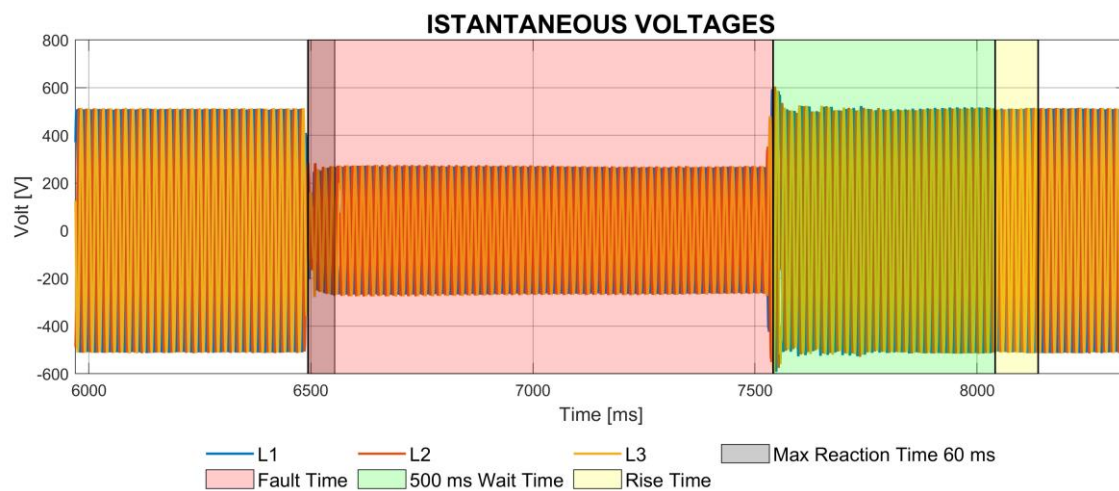


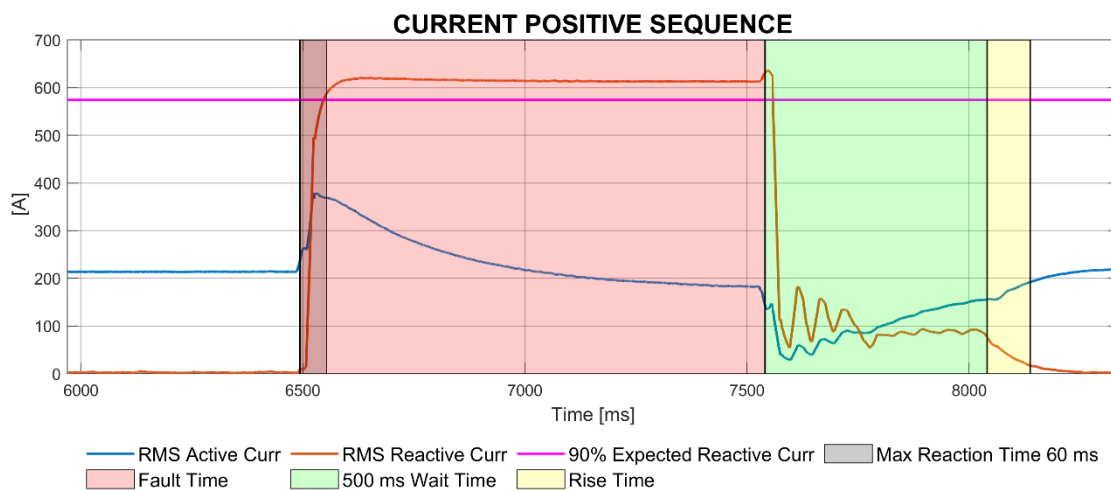
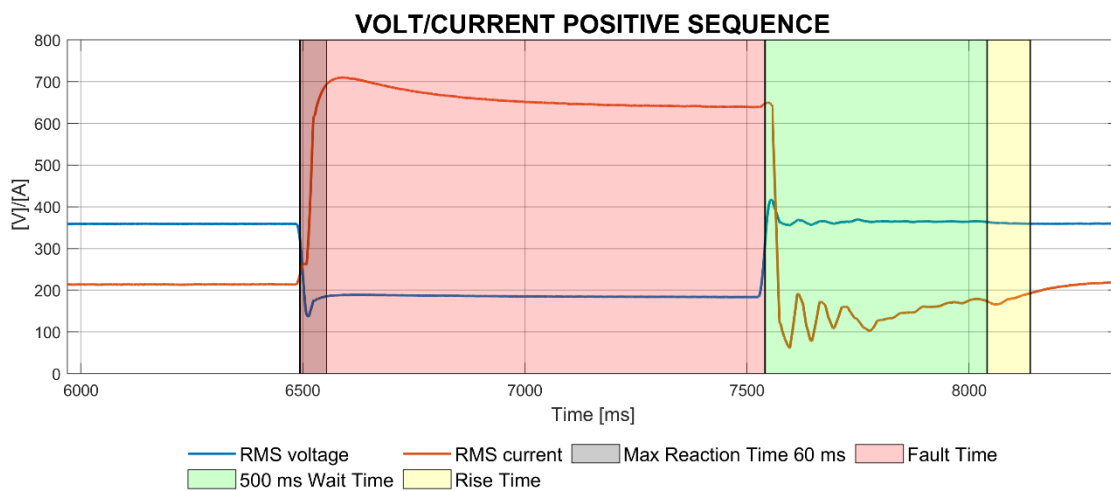


Test N° 9		LVRT - 50% Un - 30% Pn – Sym – K = 10					
Duration (ms): 1030 ±20		$V_1/V_{1,nom}$	$V_2/V_{2,nom}$	$V_3/V_{3,nom}$	φ_{V1}	φ_{V2}	φ_{V3}
MV	Normal condition	1	1	1	30°	270°	150°
	During fault	0,50 ±0,05	0,50 ±0,05	0,50 ±0,05	30°	270°	150°
LV	Normal condition	1	1	1	0°	240°	120°
	During fault	0,50 ±0,05	0,50 ±0,05	0,50 ±0,05	0°	240°	120°



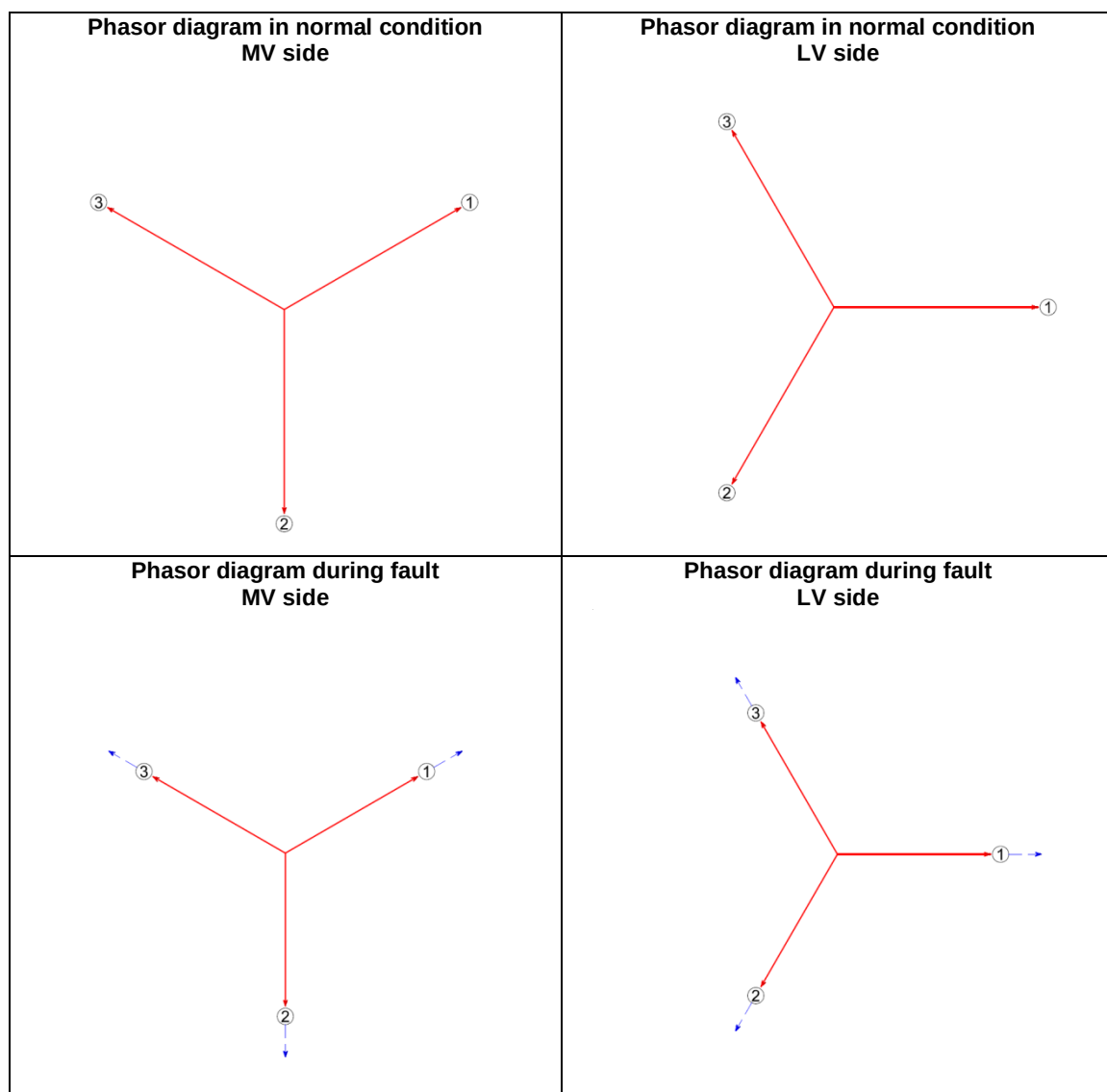


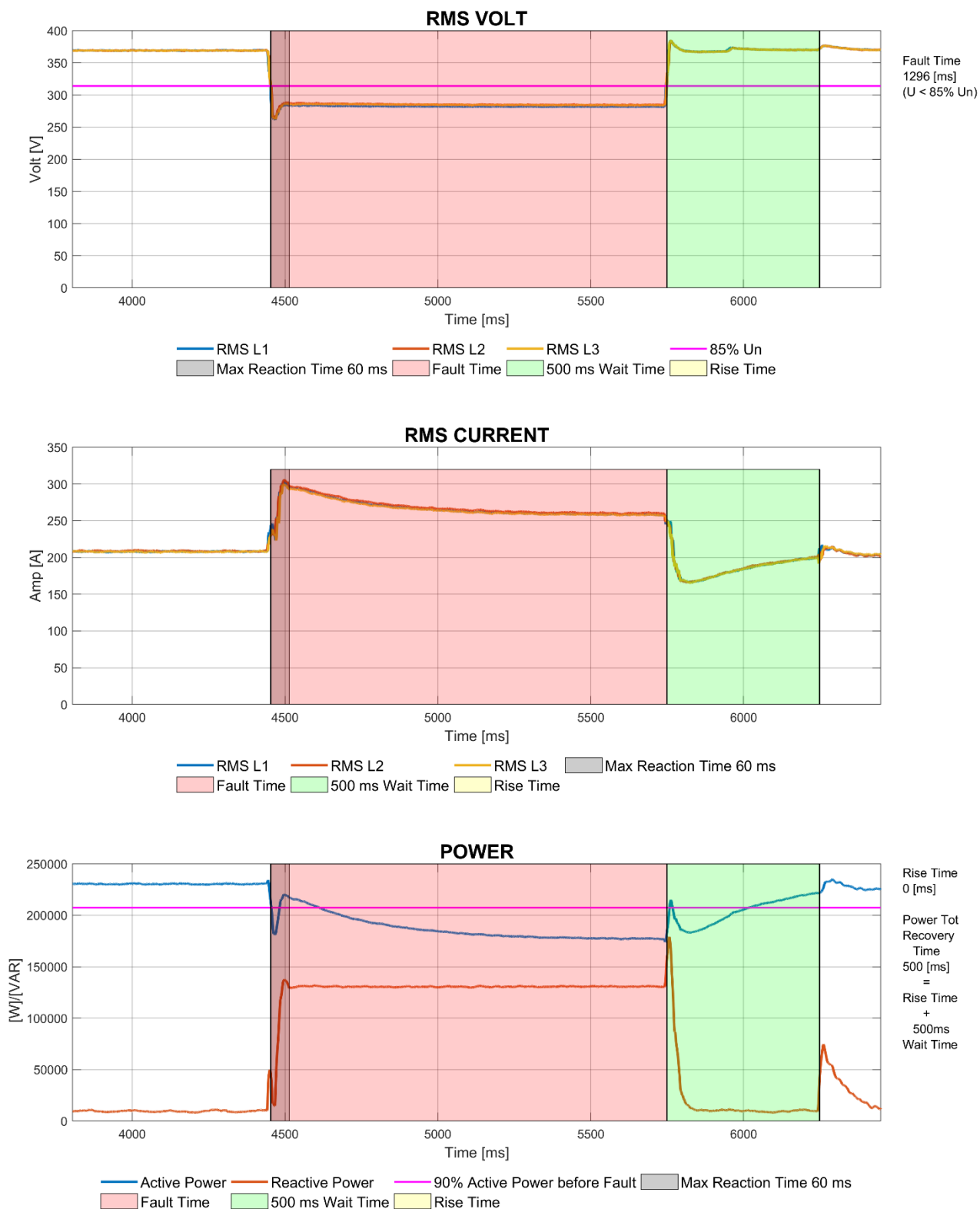


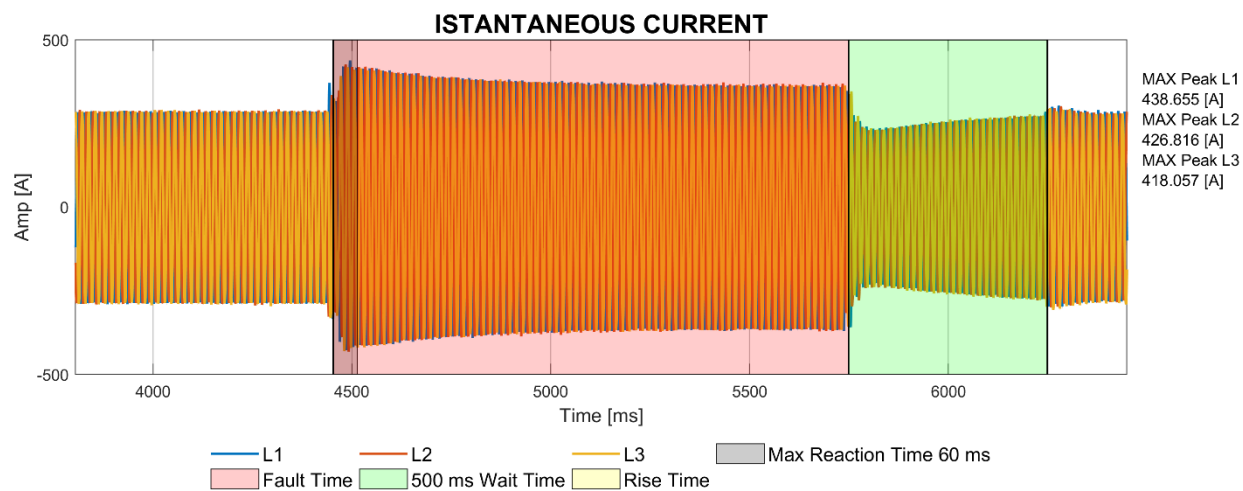
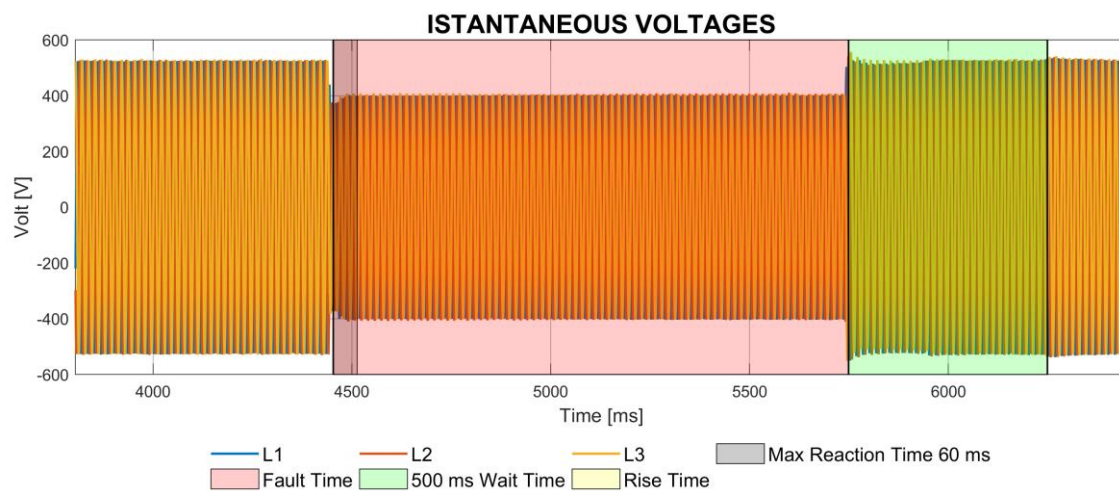


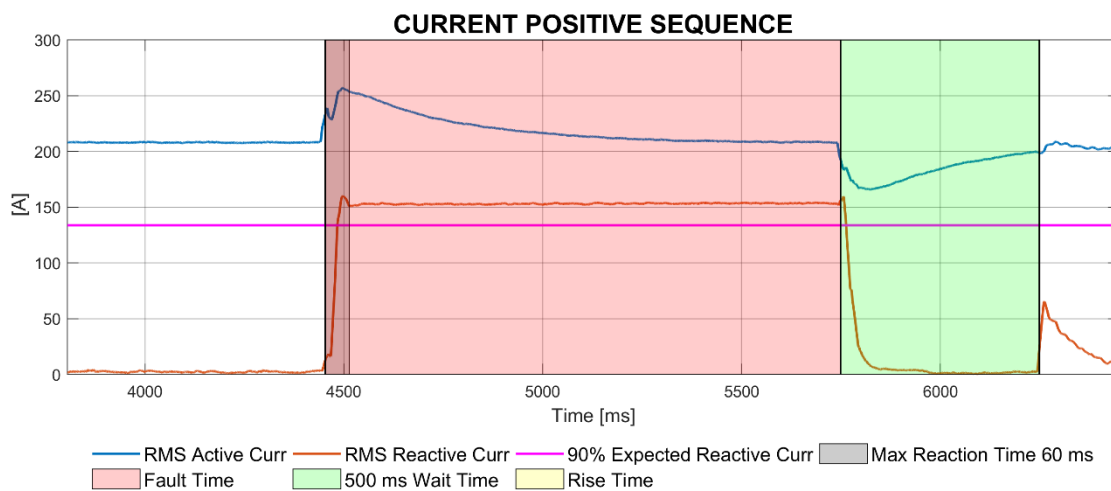
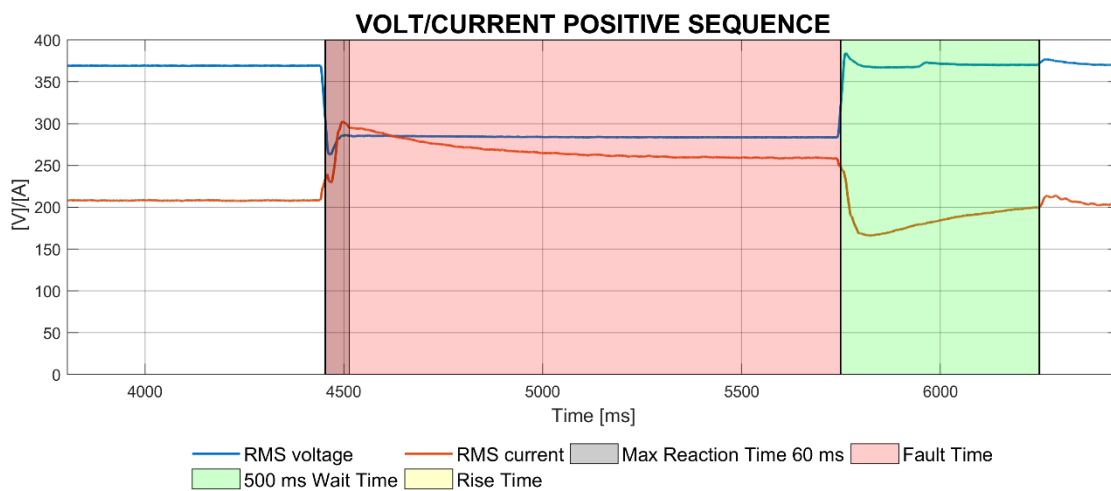


Test N° 10		LVRT - 75% Un - 30% Pn – Sym – K = 1					
Duration (ms): 1300 ±20		$V_1/V_{1,nom}$	$V_2/V_{2,nom}$	$V_3/V_{3,nom}$	φ_{V1}	φ_{V2}	φ_{V3}
MV	Normal condition	1	1	1	30°	270°	150°
	During fault	0,75 ±0,05	0,75 ±0,05	0,75 ±0,05	30°	270°	150°
LV	Normal condition	1	1	1	0°	240°	120°
	During fault	0,75 ±0,05	0,75 ±0,05	0,75 ±0,05	0°	240°	120°



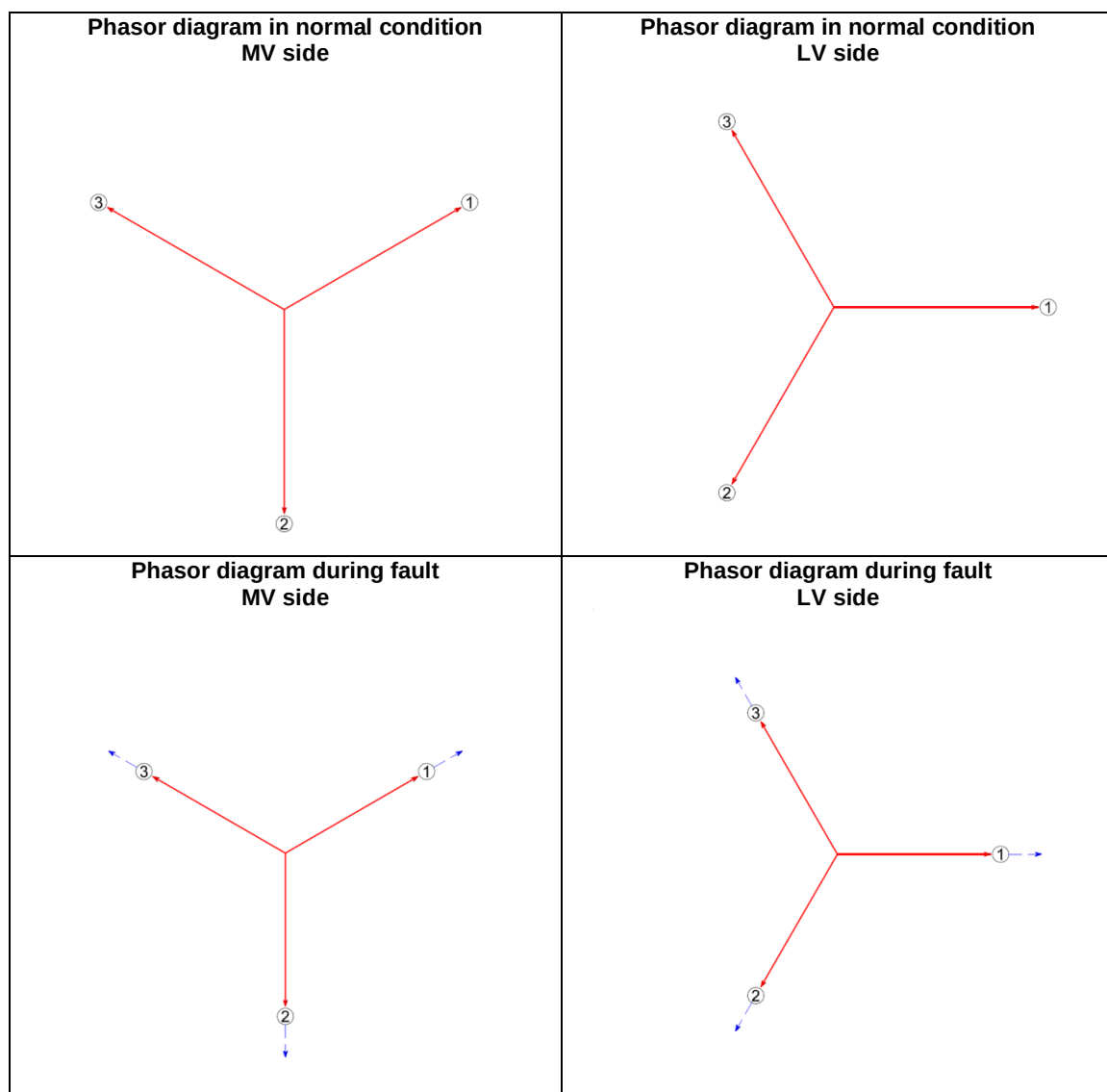






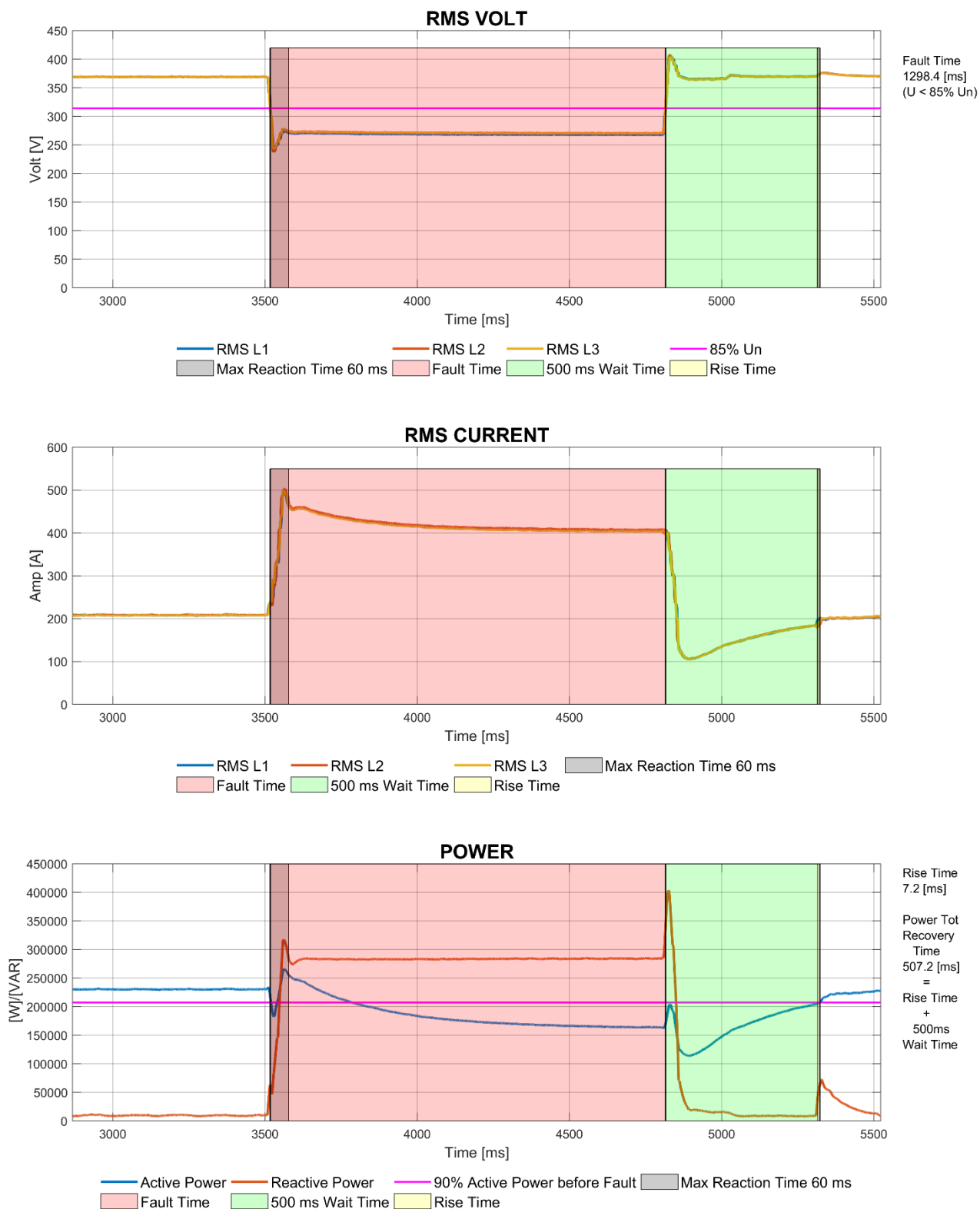


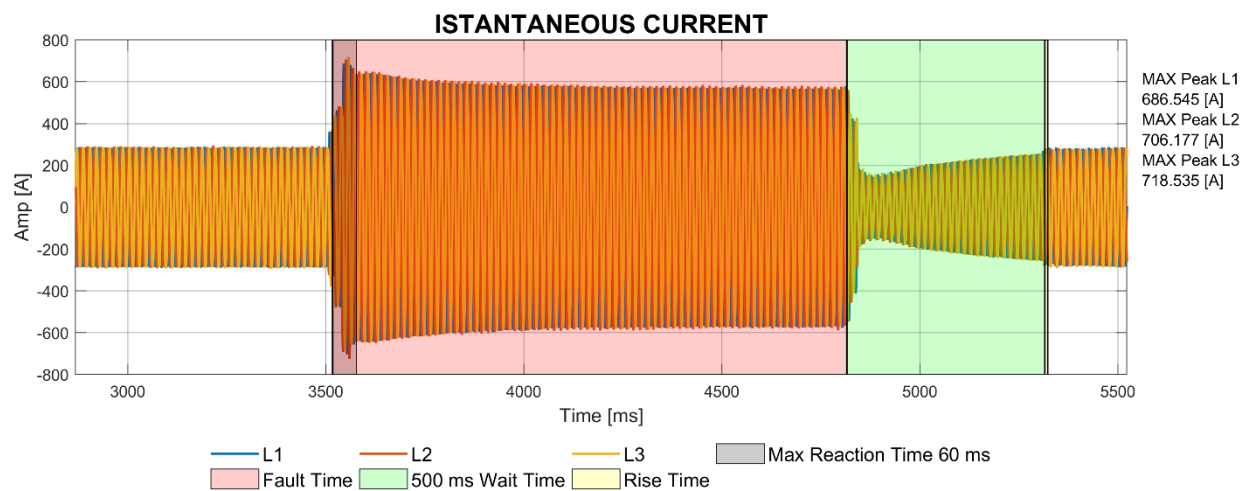
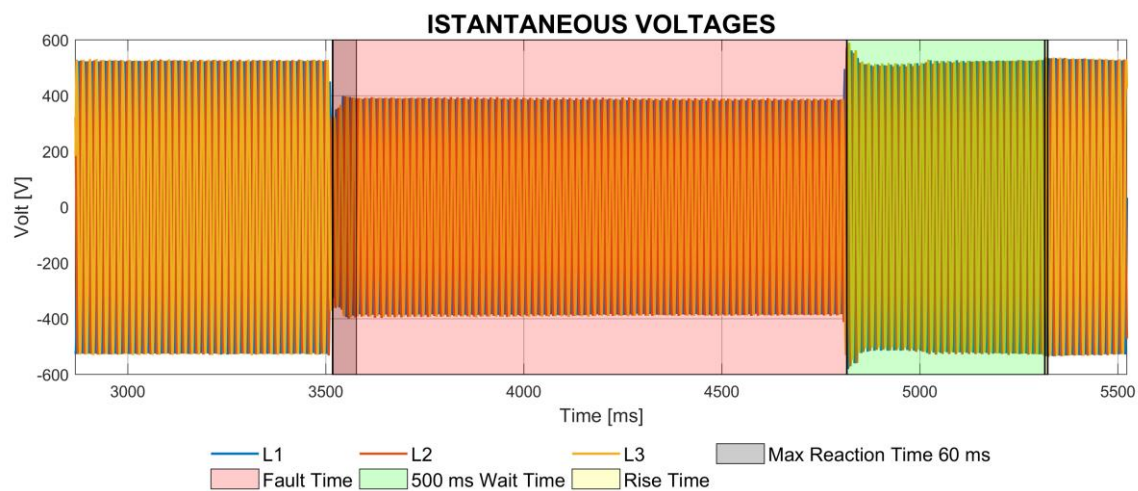
Test N° 11		LVRT - 75% Un - 30% Pn – Sym – K = 2					
Duration (ms): 1300 ±20		$V_1/V_{1,nom}$	$V_2/V_{2,nom}$	$V_3/V_{3,nom}$	φ_{V1}	φ_{V2}	φ_{V3}
MV	Normal condition	1	1	1	30°	270°	150°
	During fault	0,75 ±0,05	0,75 ±0,05	0,75 ±0,05	30°	270°	150°
LV	Normal condition	1	1	1	0°	240°	120°
	During fault	0,75 ±0,05	0,75 ±0,05	0,75 ±0,05	0°	240°	120°

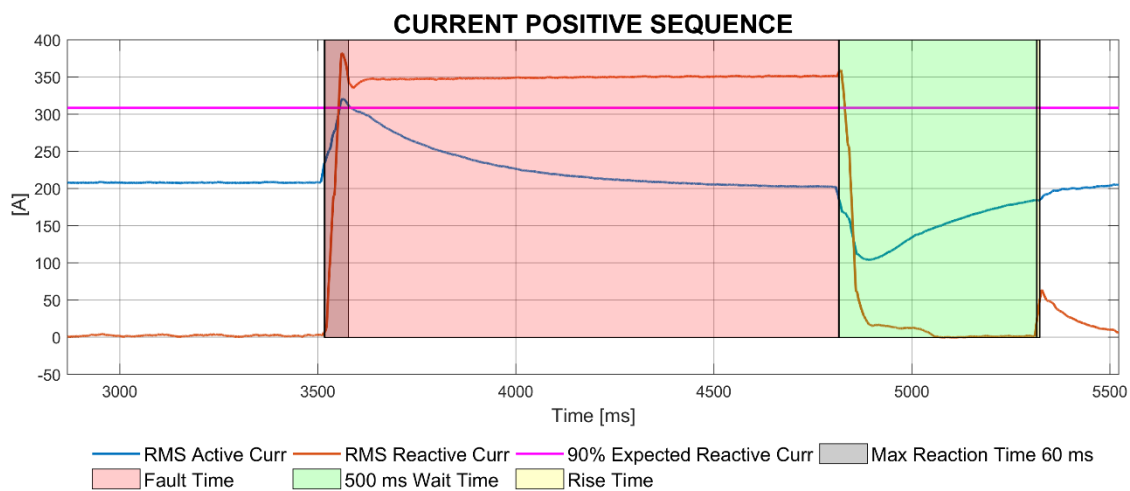
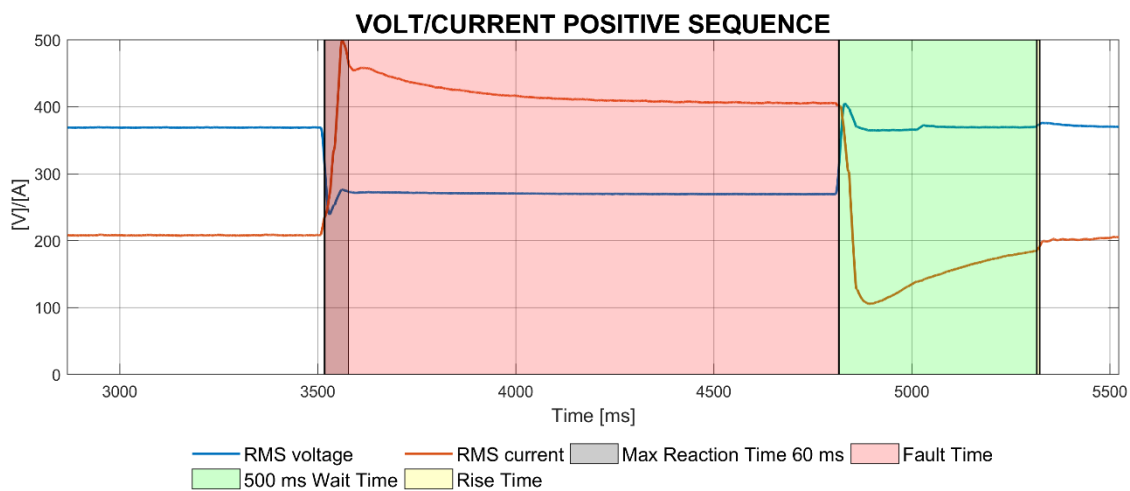




CREI Ven – Padova
Laboratorio Prove
Report n. 177/20/00179/ER

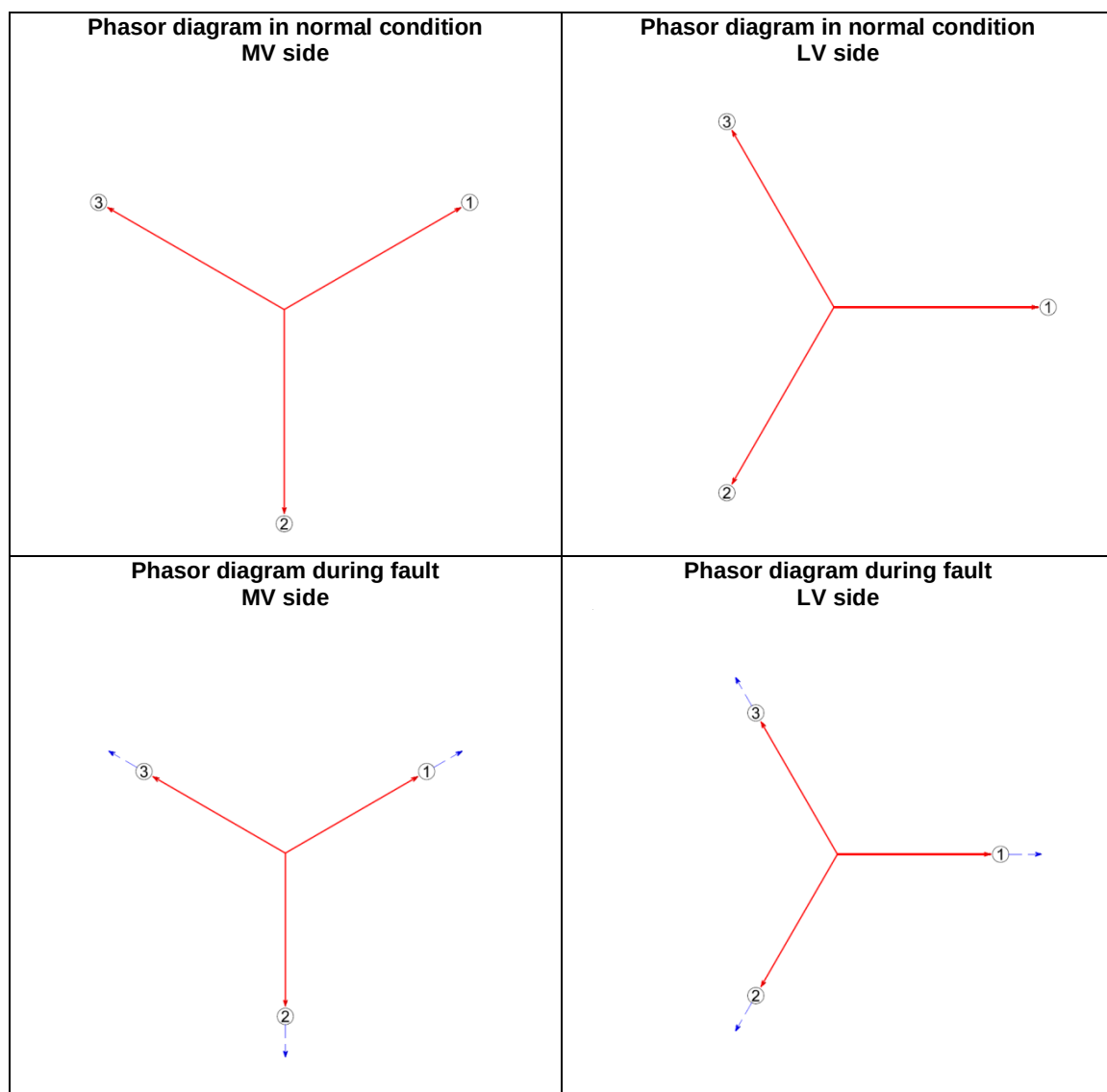






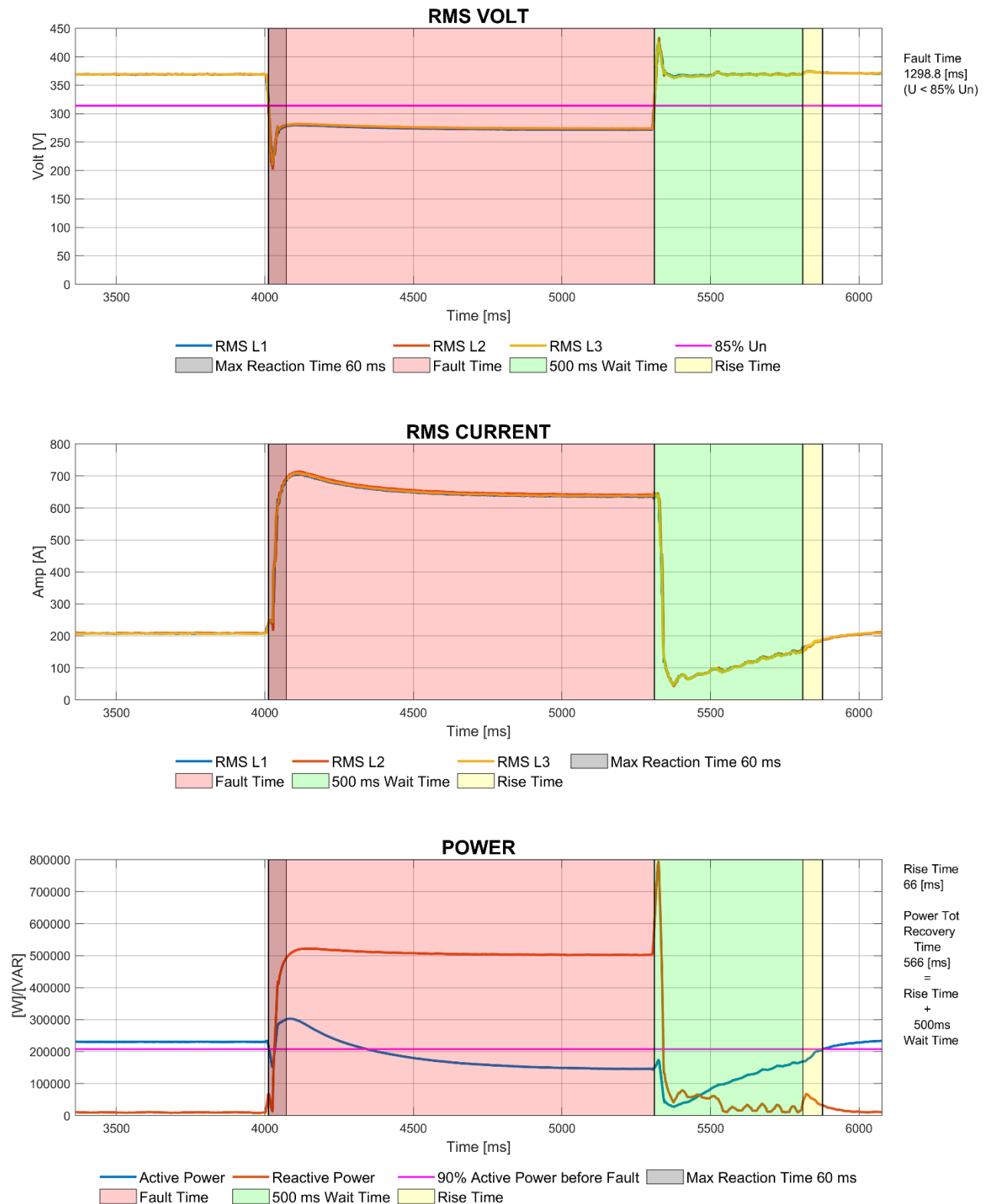


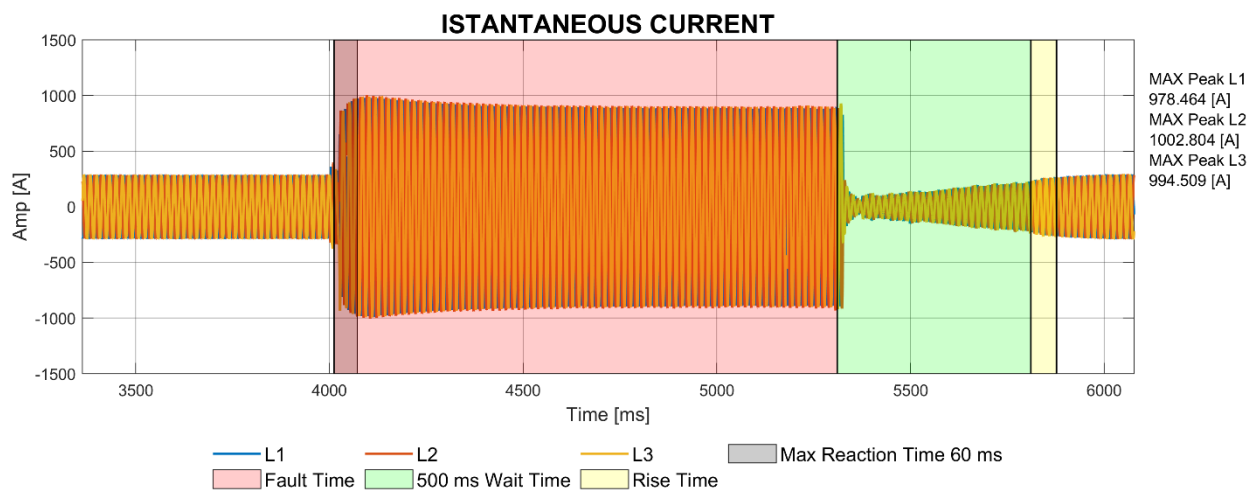
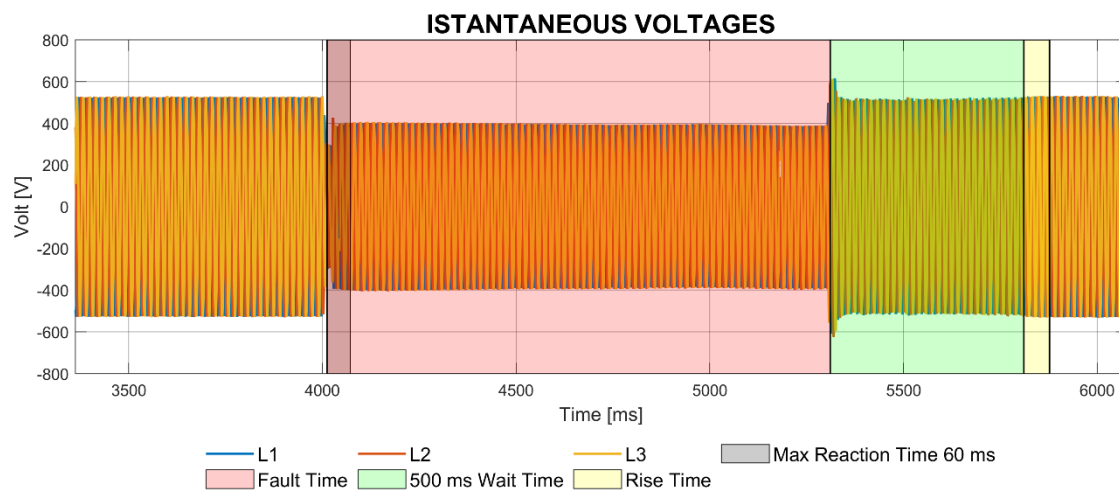
Test N° 12		LVRT - 75% Un - 30% Pn – Sym – K = 10					
Duration (ms): 1300 ±20		$V_1/V_{1,nom}$	$V_2/V_{2,nom}$	$V_3/V_{3,nom}$	φ_{V1}	φ_{V2}	φ_{V3}
MV	Normal condition	1	1	1	30°	270°	150°
	During fault	0,75 ±0,05	0,75 ±0,05	0,75 ±0,05	30°	270°	150°
LV	Normal condition	1	1	1	0°	240°	120°
	During fault	0,75 ±0,05	0,75 ±0,05	0,75 ±0,05	0°	240°	120°

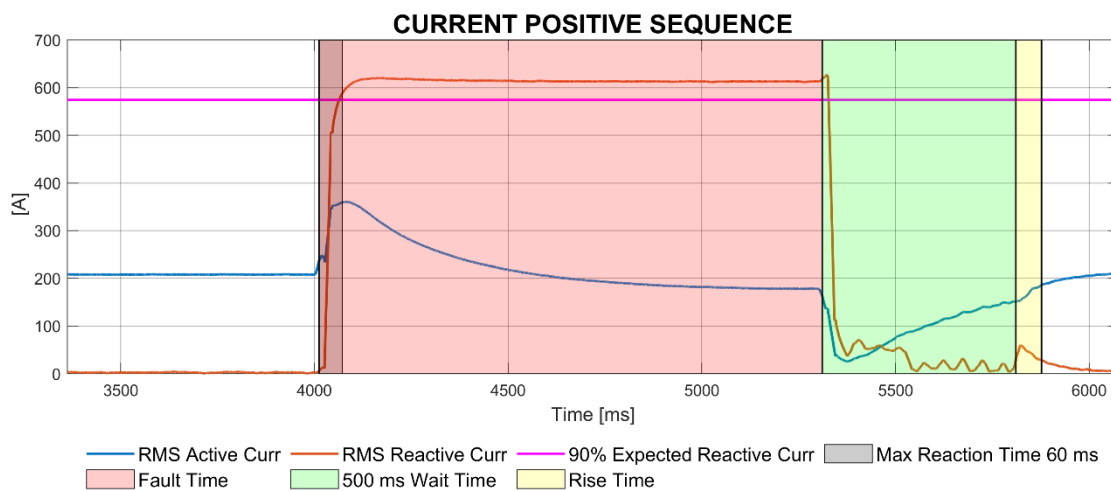
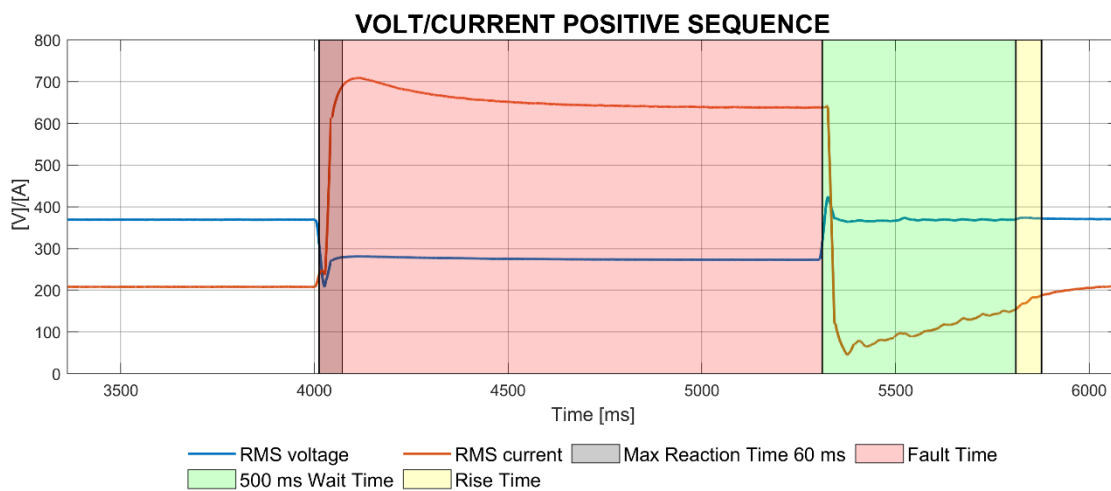




CREI Ven – Padova
Laboratorio Prove
Report n. 177/20/00179/ER

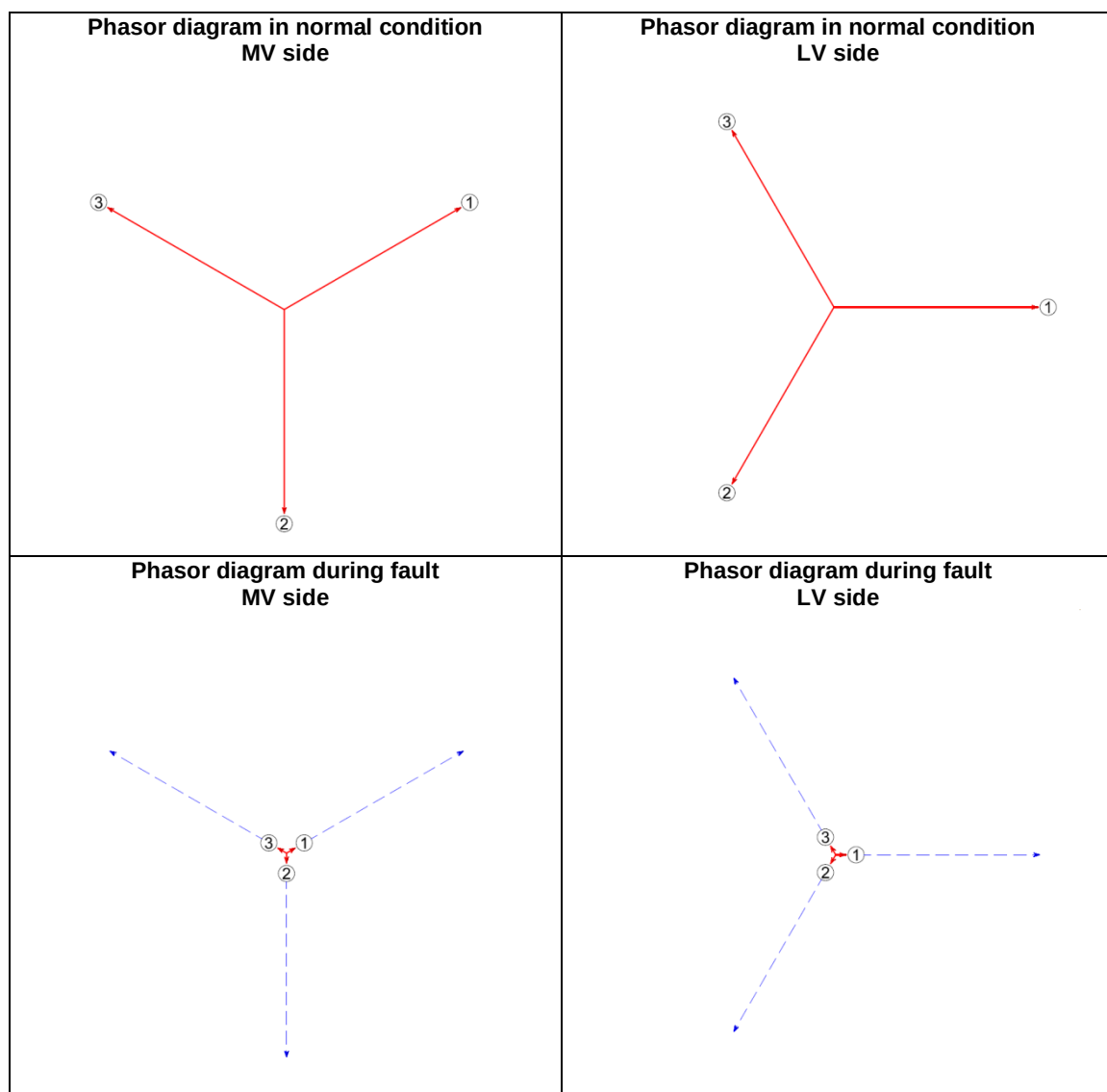


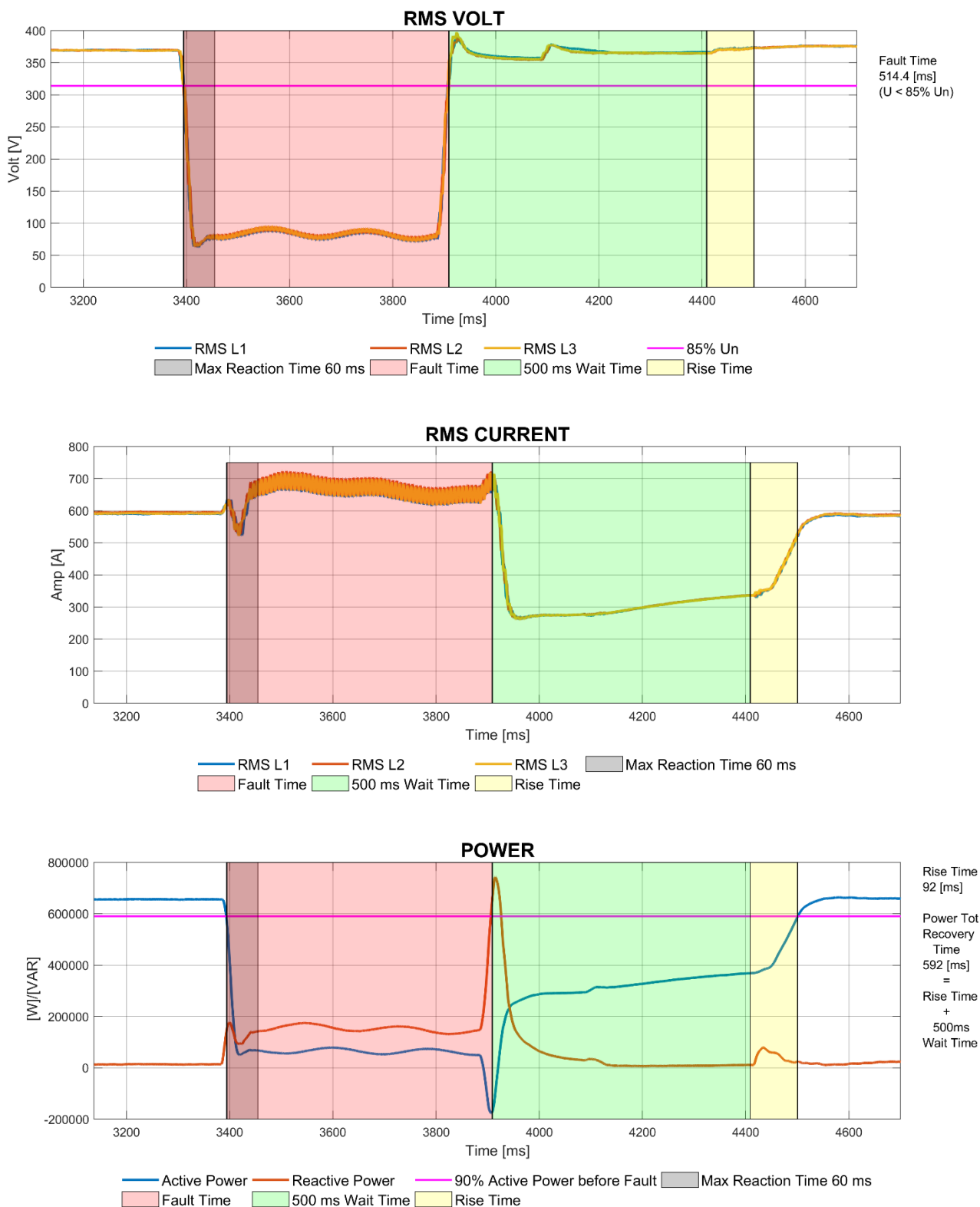


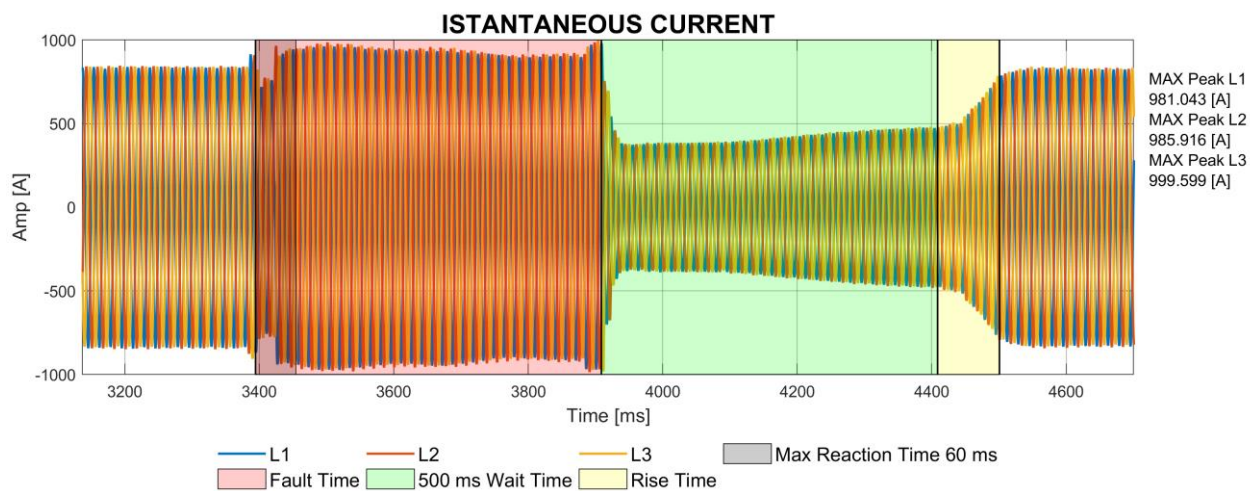
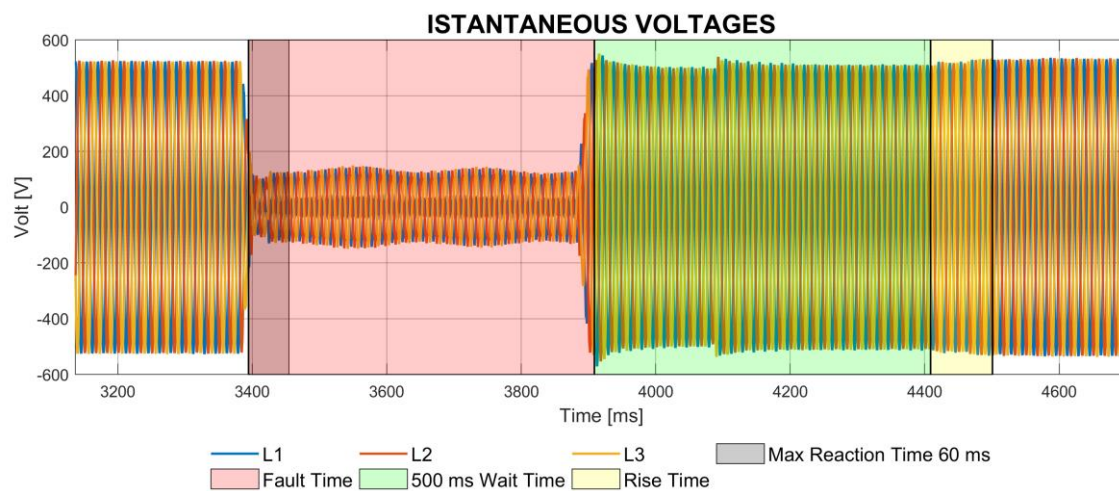


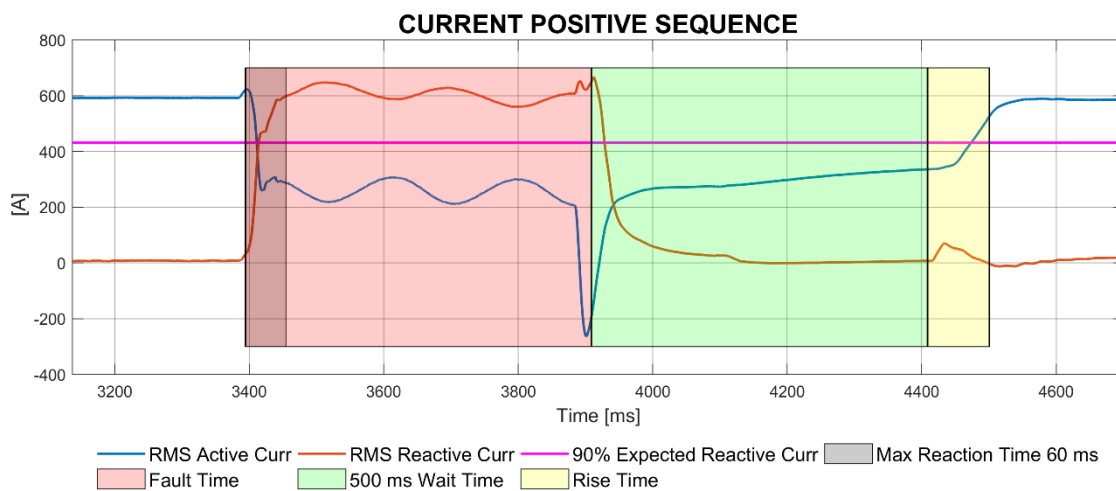
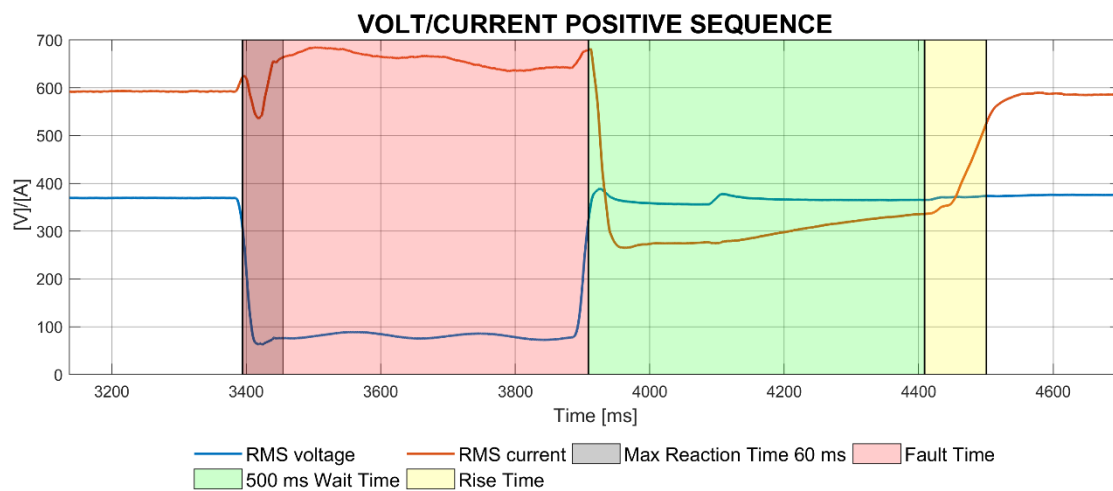


Test N° 13		LVRT - 10% Un - 91% Pn – Sym – K = 1					
Duration (ms): 500 ±20		$V_1/V_{1,nom}$	$V_2/V_{2,nom}$	$V_3/V_{3,nom}$	φ_{V1}	φ_{V2}	φ_{V3}
MV	Normal condition	1	1	1	30°	270°	150°
	During fault	0,10 ±0,05	0,10 ±0,05	0,10 ±0,05	30°	270°	150°
LV	Normal condition	1	1	1	0°	240°	120°
	During fault	0,10 ±0,05	0,10 ±0,05	0,10 ±0,05	0°	240°	120°



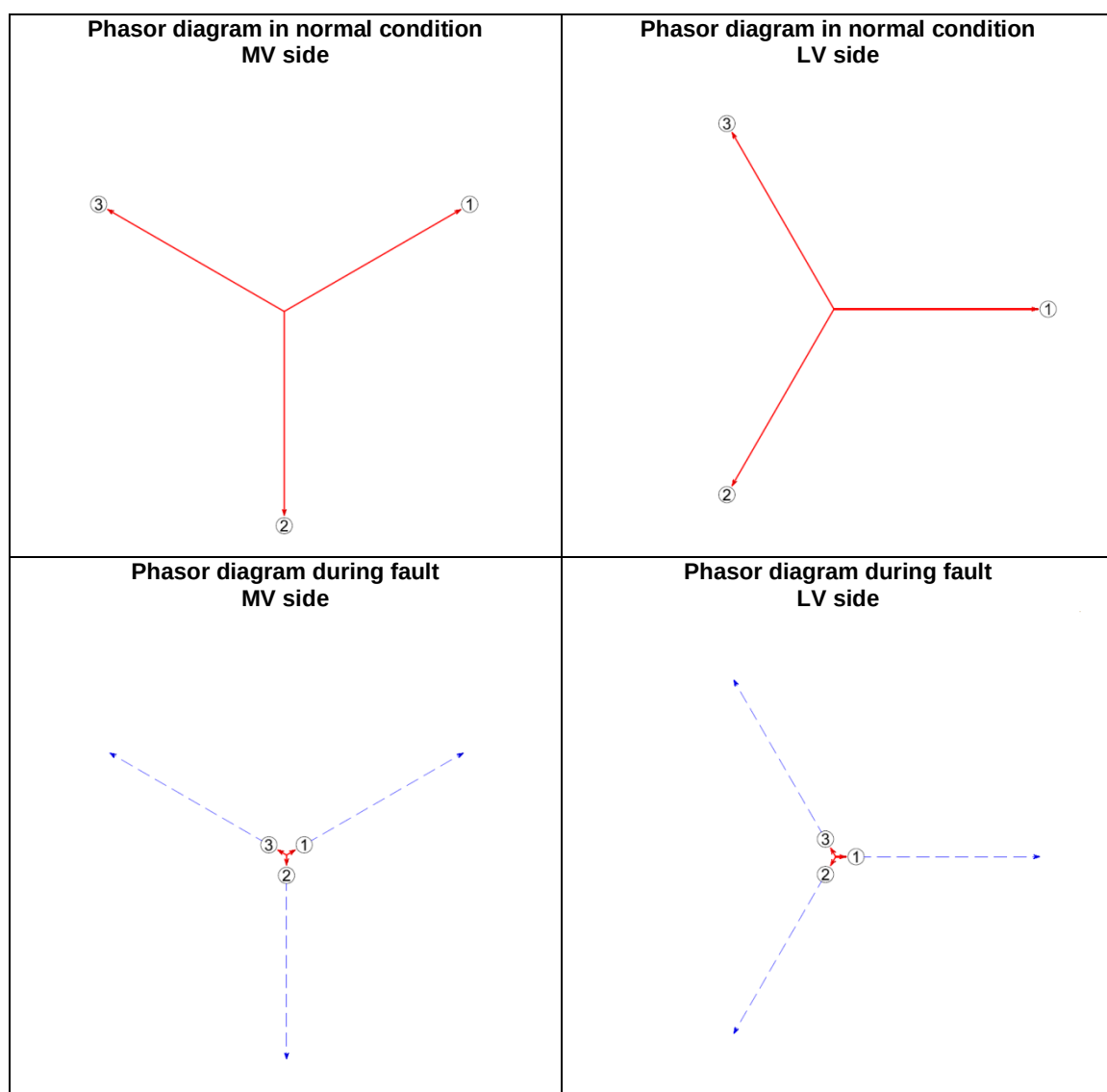






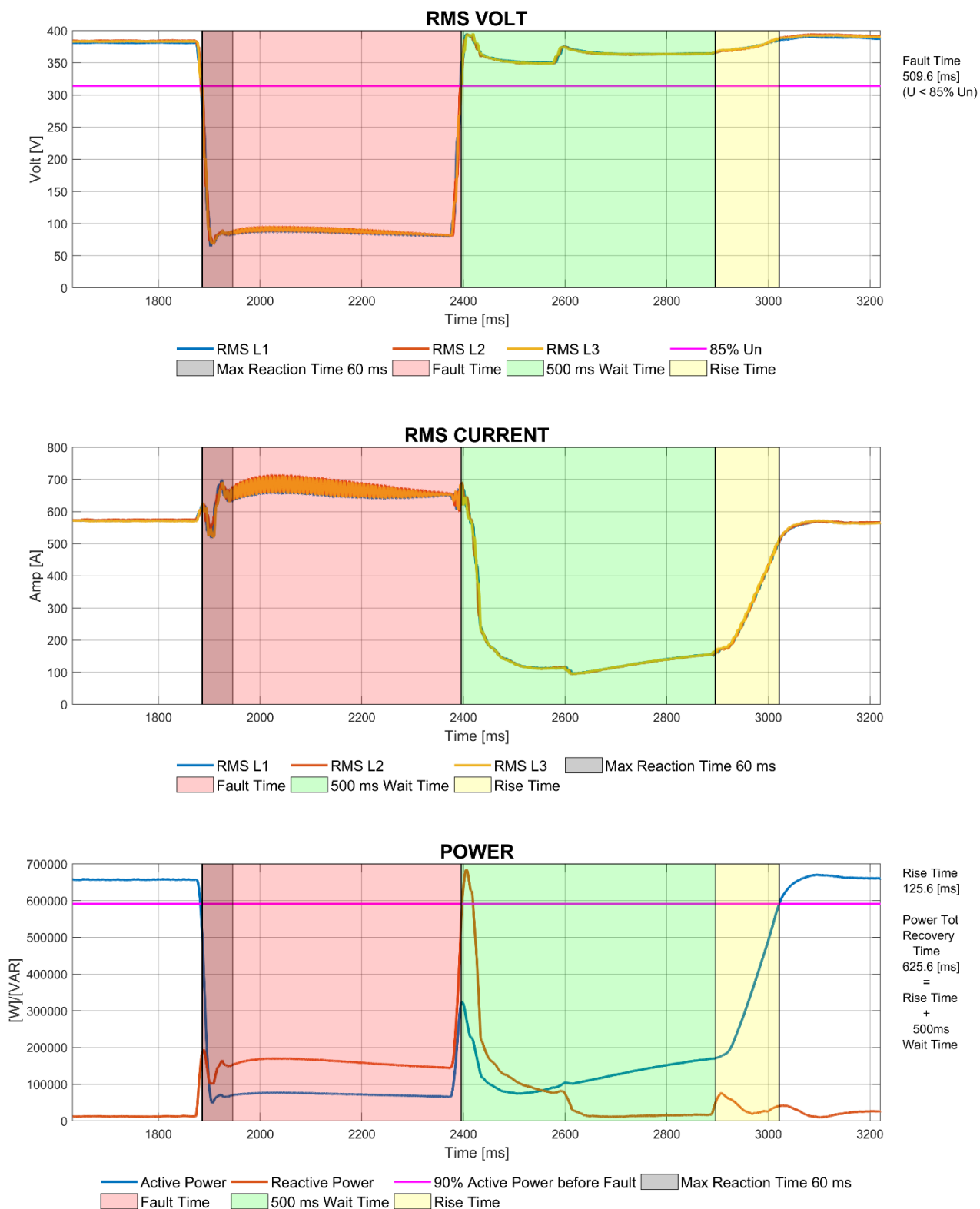


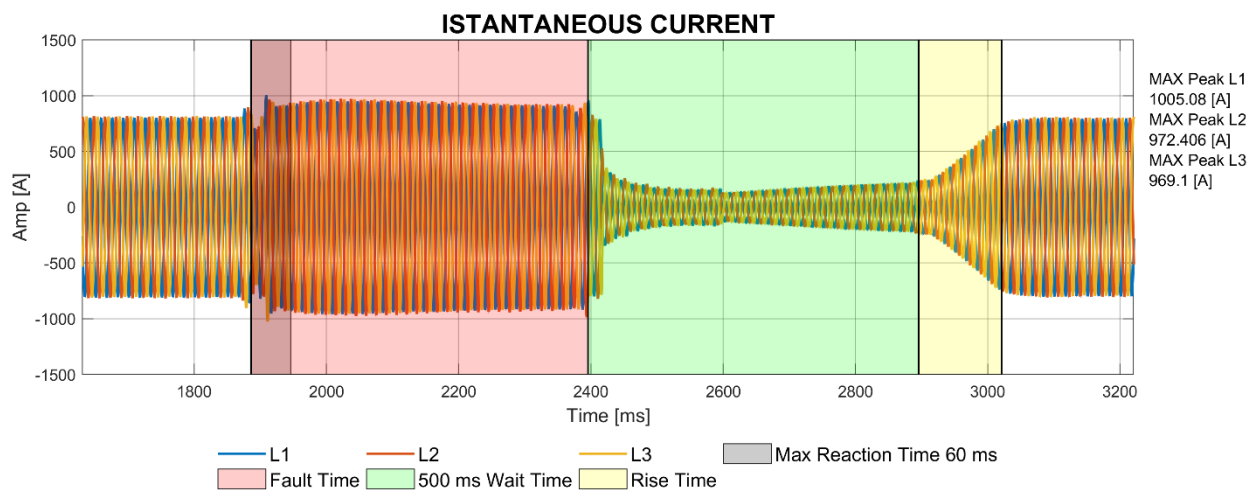
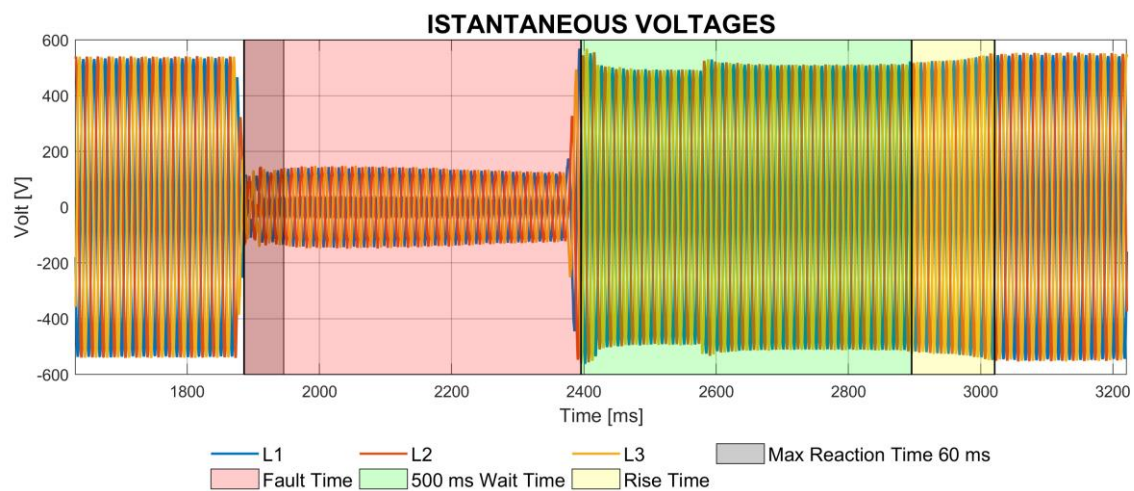
Test N° 14		LVRT - 10% Un - 91% Pn – Sym – K = 2					
Duration (ms): 500 ±20		$V_1/V_{1,nom}$	$V_2/V_{2,nom}$	$V_3/V_{3,nom}$	φ_{V1}	φ_{V2}	φ_{V3}
MV	Normal condition	1	1	1	30°	270°	150°
	During fault	0,10 ±0,05	0,10 ±0,05	0,10 ±0,05	30°	270°	150°
LV	Normal condition	1	1	1	0°	240°	120°
	During fault	0,10 ±0,05	0,10 ±0,05	0,10 ±0,05	0°	240°	120°

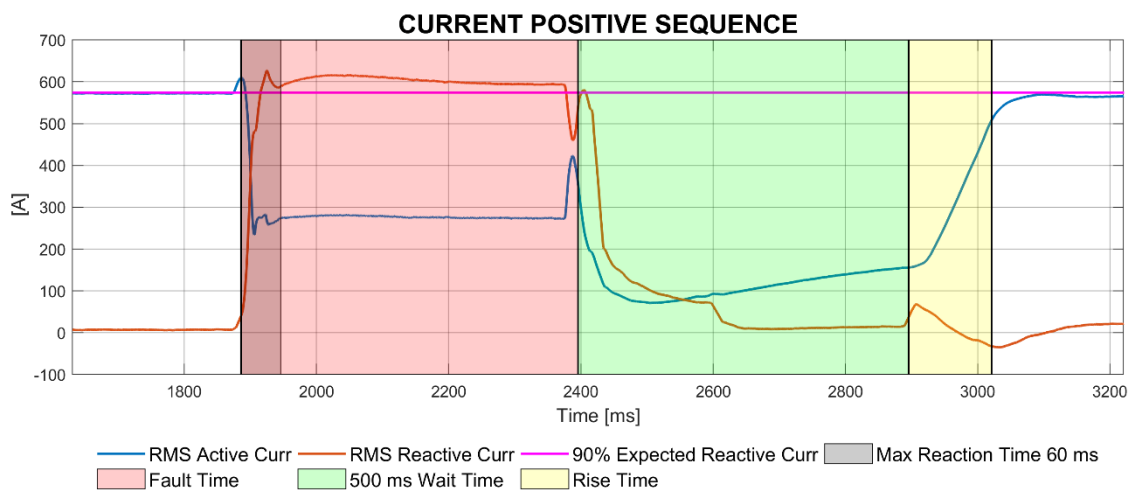
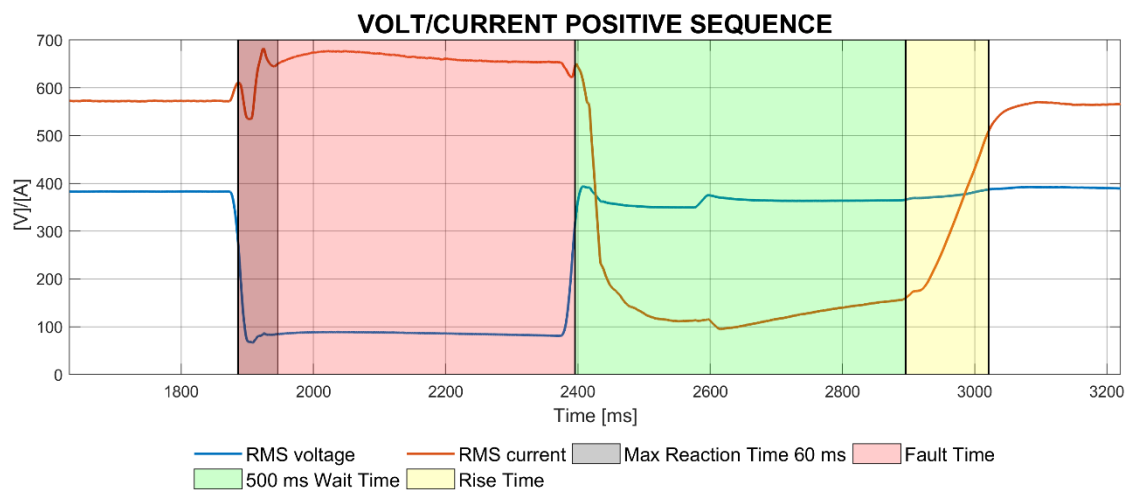




CREI Ven – Padova
Laboratorio Prove
Report n. 177/20/00179/ER

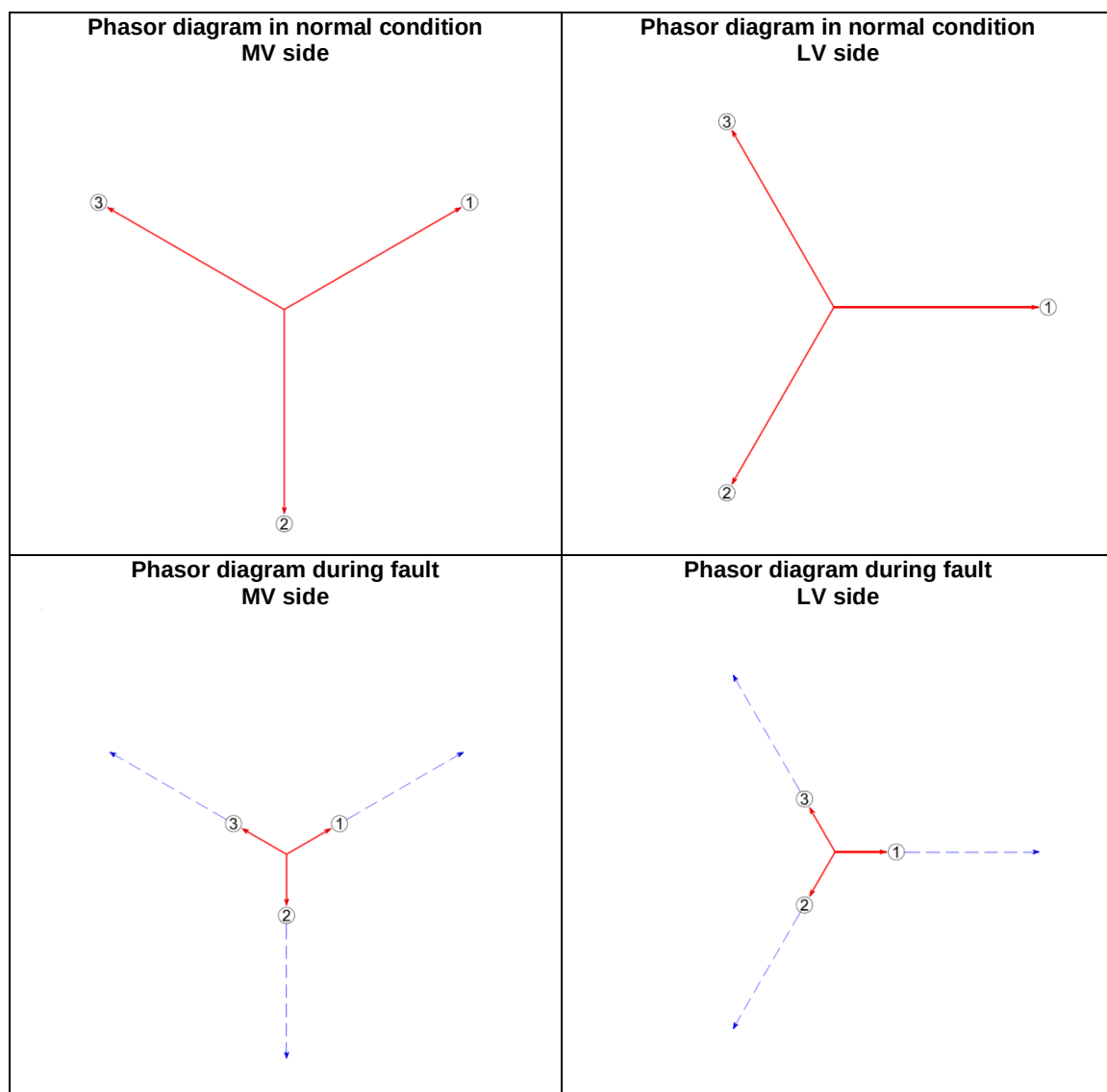


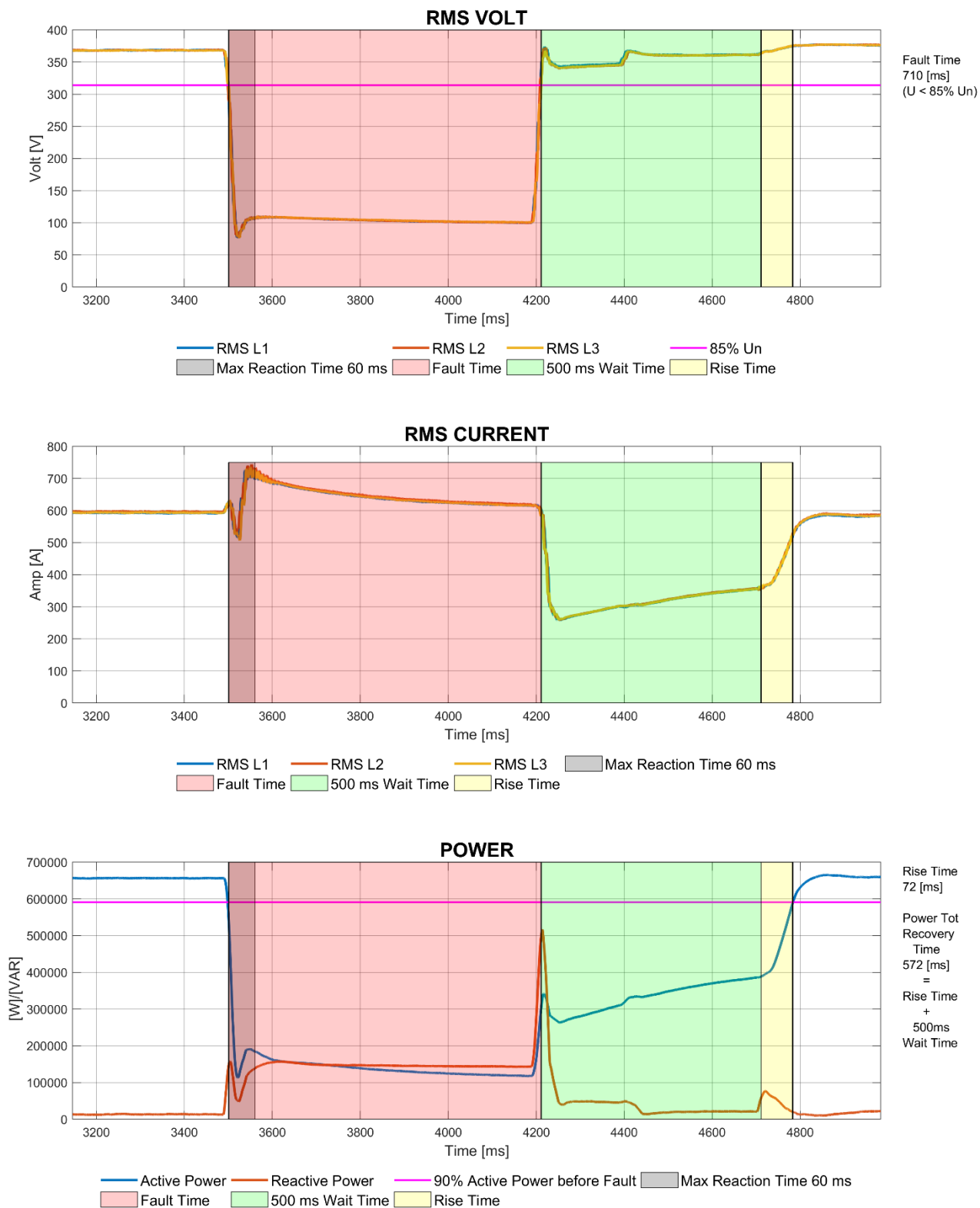


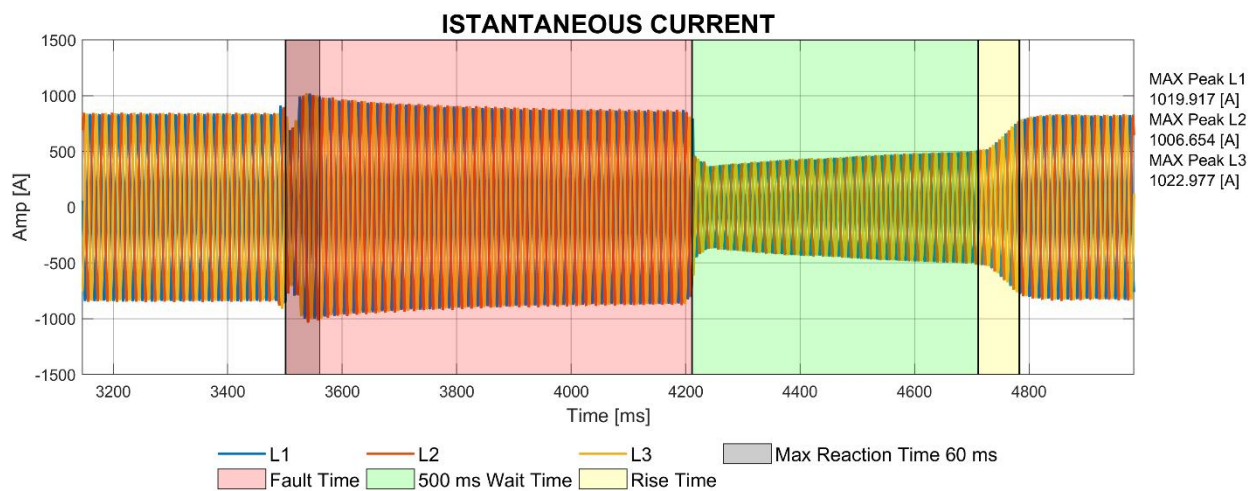
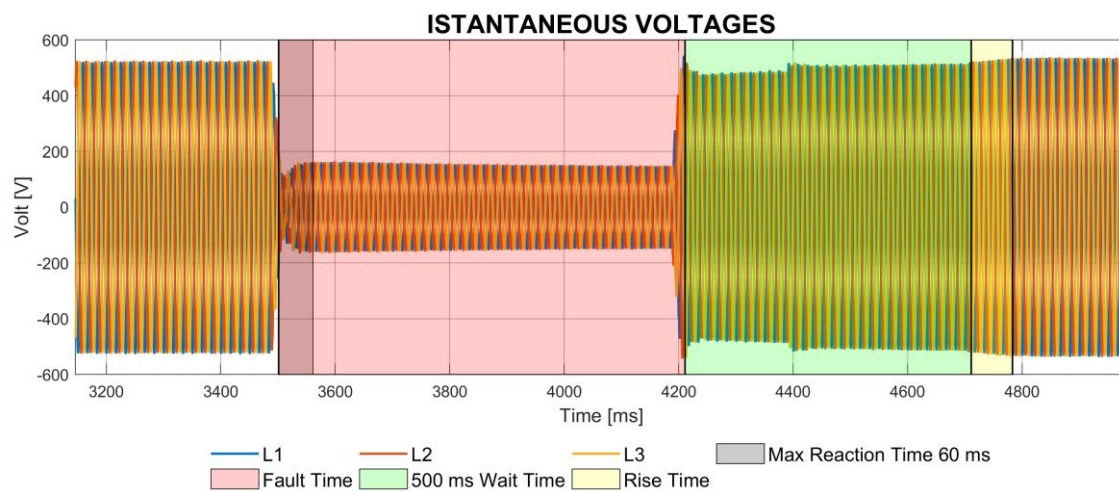


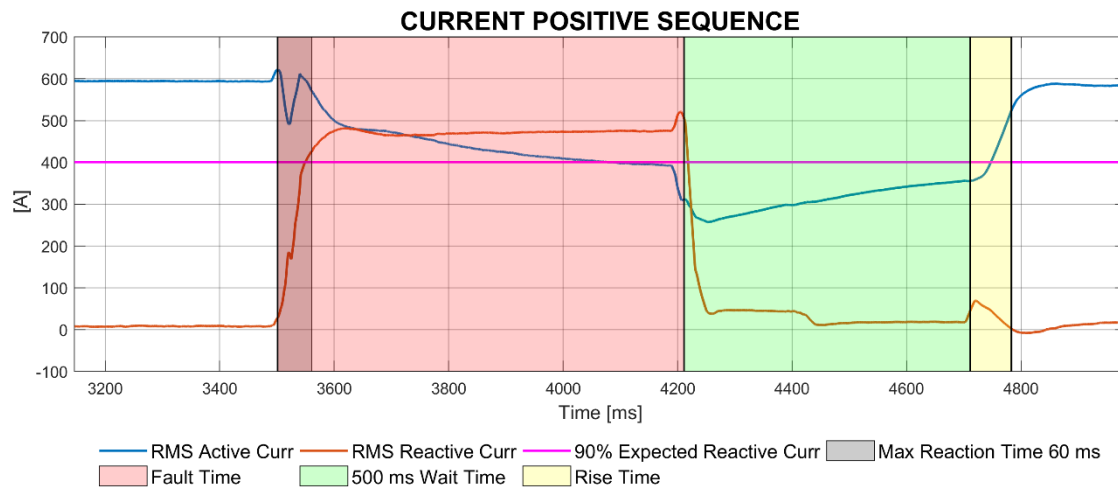
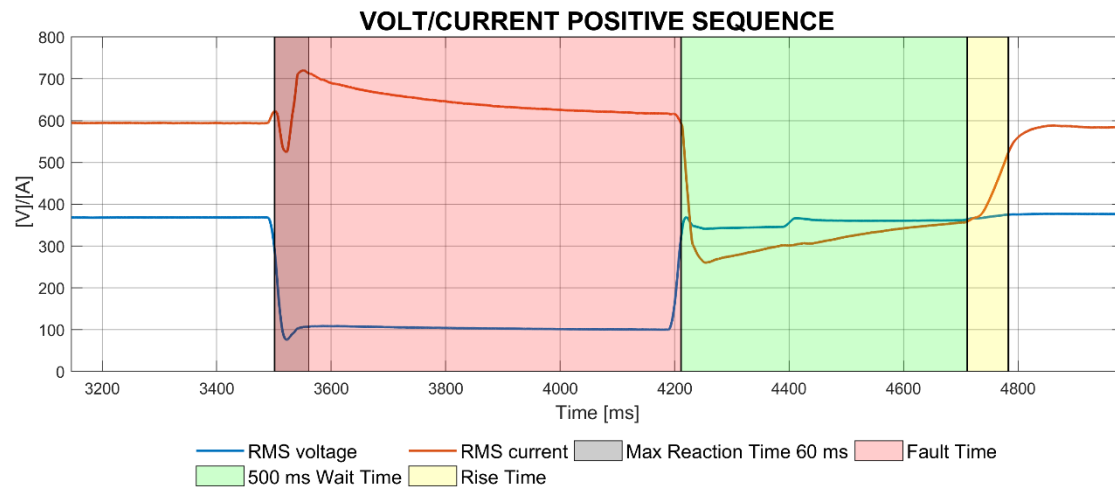


Test N° 15		LVRT - 25% Un - 91% Pn – Sym – K = 1					
Duration (ms): 700 ±20		$V_1/V_{1,nom}$	$V_2/V_{2,nom}$	$V_3/V_{3,nom}$	φ_{V1}	φ_{V2}	φ_{V3}
MV	Normal condition	1	1	1	30°	270°	150°
	During fault	0,25 ±0,05	0,25 ±0,05	0,25 ±0,05	30°	270°	150°
LV	Normal condition	1	1	1	0°	240°	120°
	During fault	0,25 ±0,05	0,25 ±0,05	0,25 ±0,05	0°	240°	120°



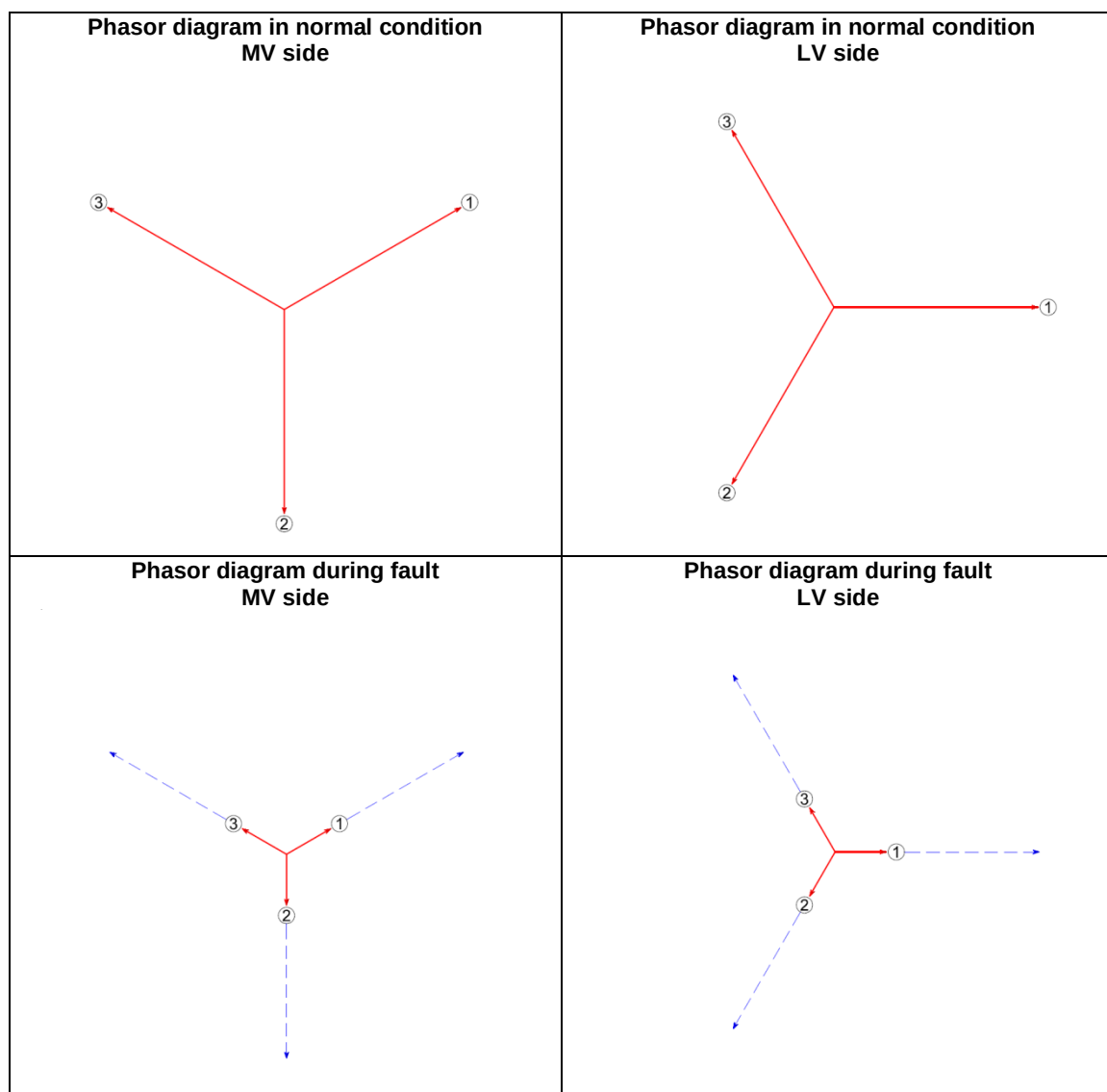


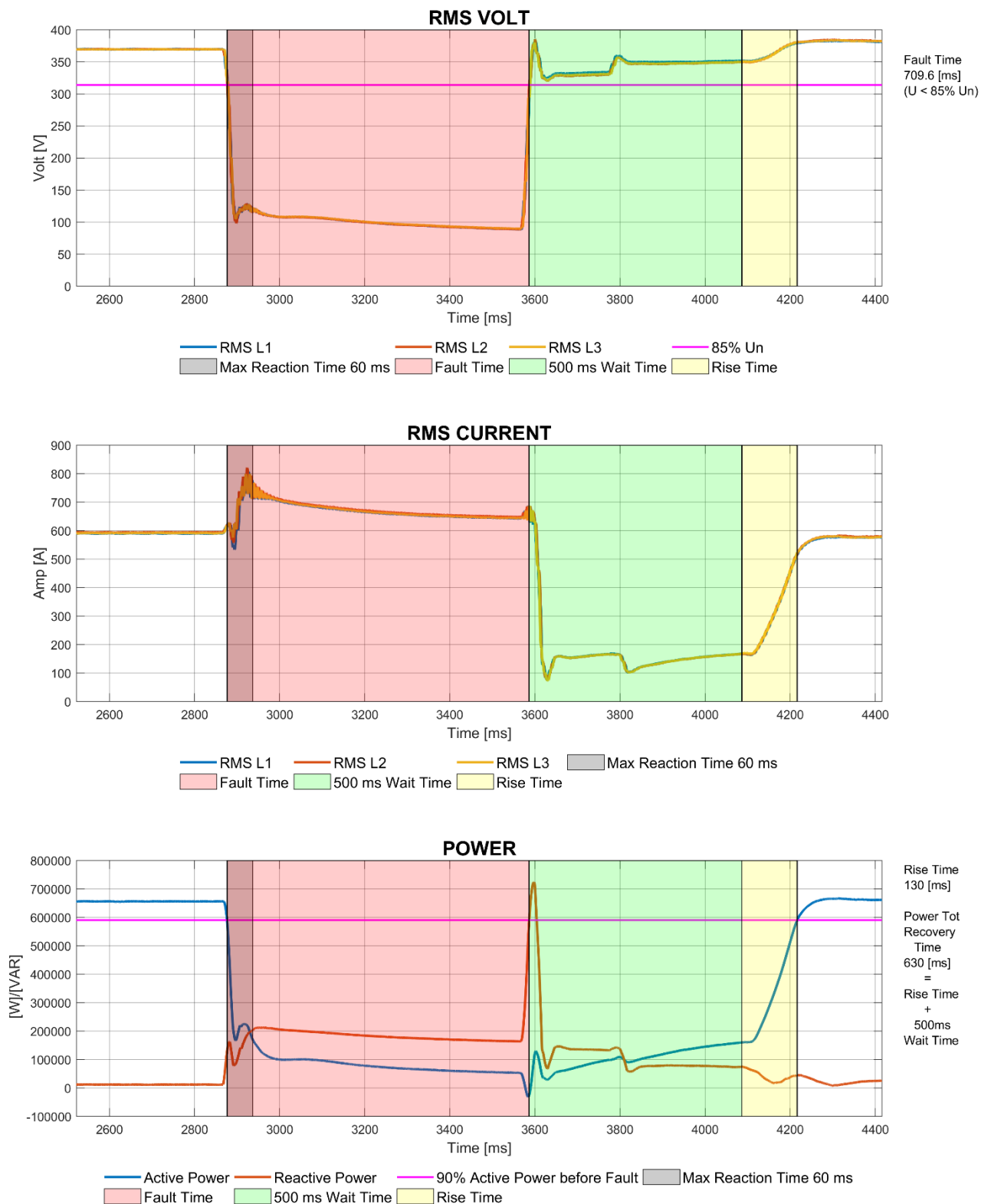


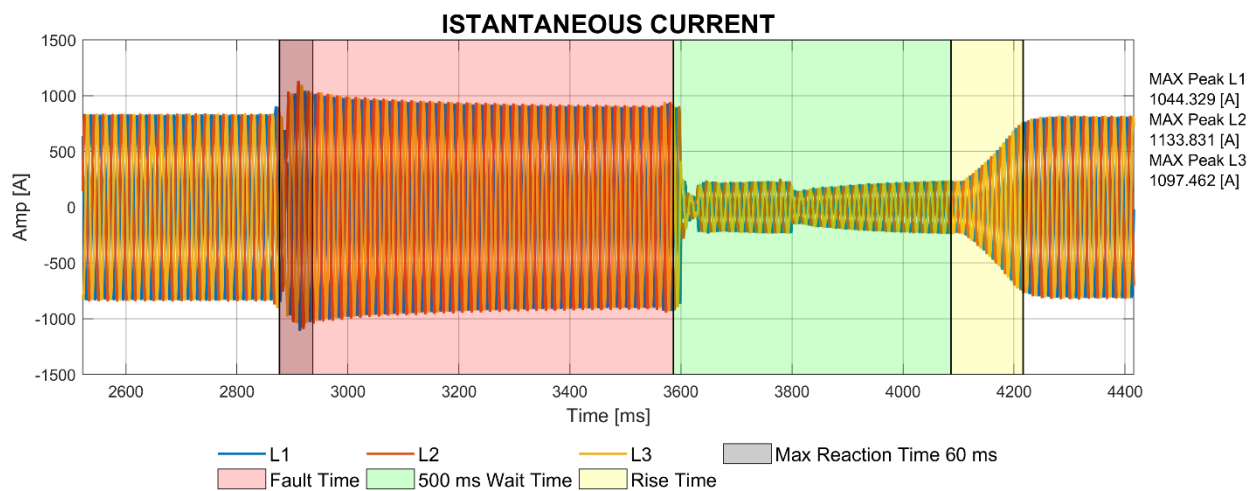
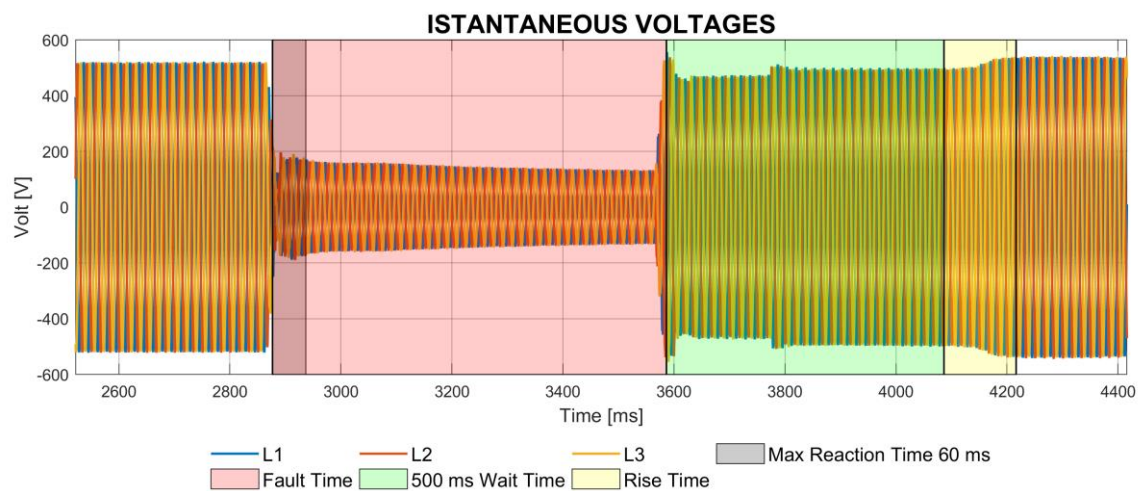


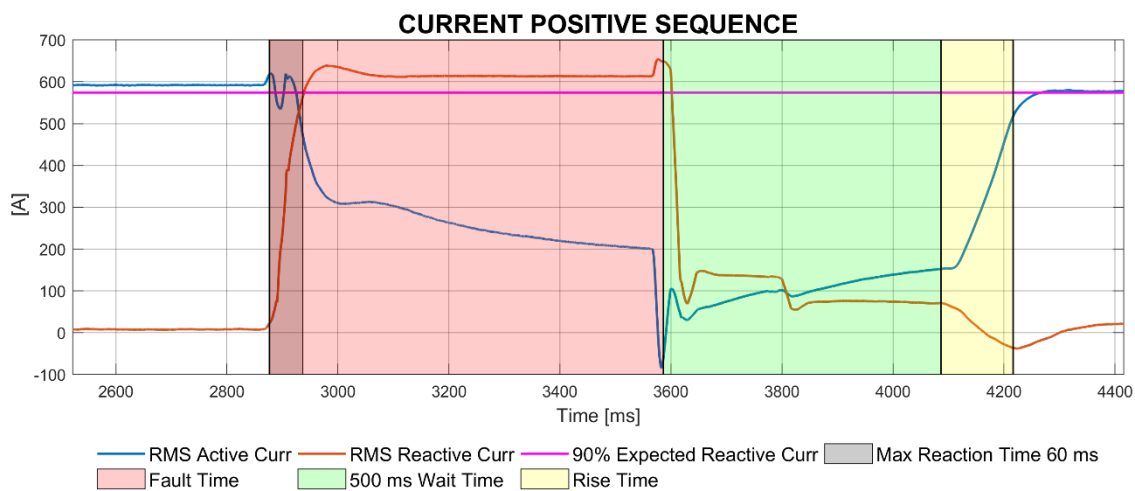
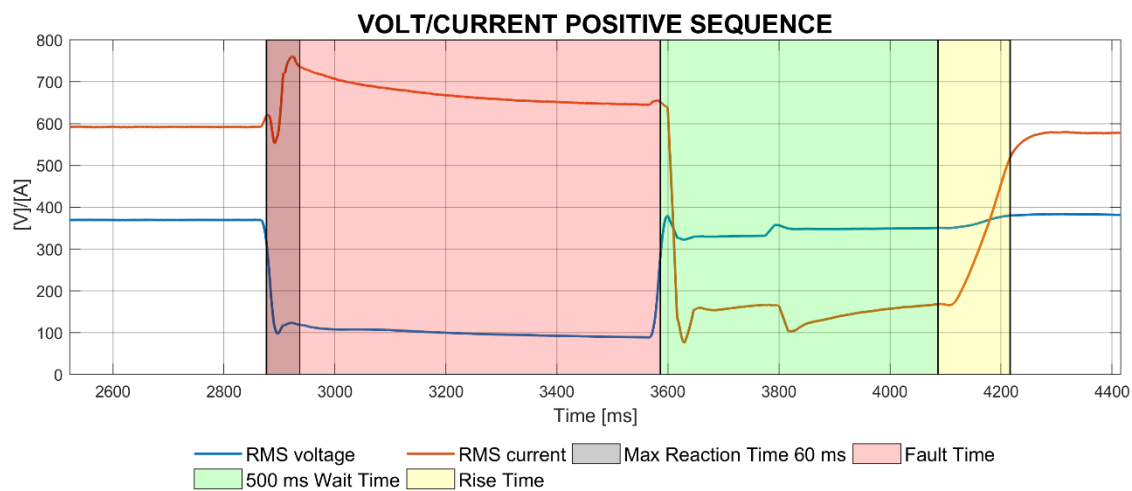


Test N° 16		LVRT - 25% Un - 91% Pn – Sym – K = 2					
Duration (ms): 700 ±20		$V_1/V_{1,nom}$	$V_2/V_{2,nom}$	$V_3/V_{3,nom}$	φ_{V1}	φ_{V2}	φ_{V3}
MV	Normal condition	1	1	1	30°	270°	150°
	During fault	0,25 ±0,05	0,25 ±0,05	0,25 ±0,05	30°	270°	150°
LV	Normal condition	1	1	1	0°	240°	120°
	During fault	0,25 ±0,05	0,25 ±0,05	0,25 ±0,05	0°	240°	120°



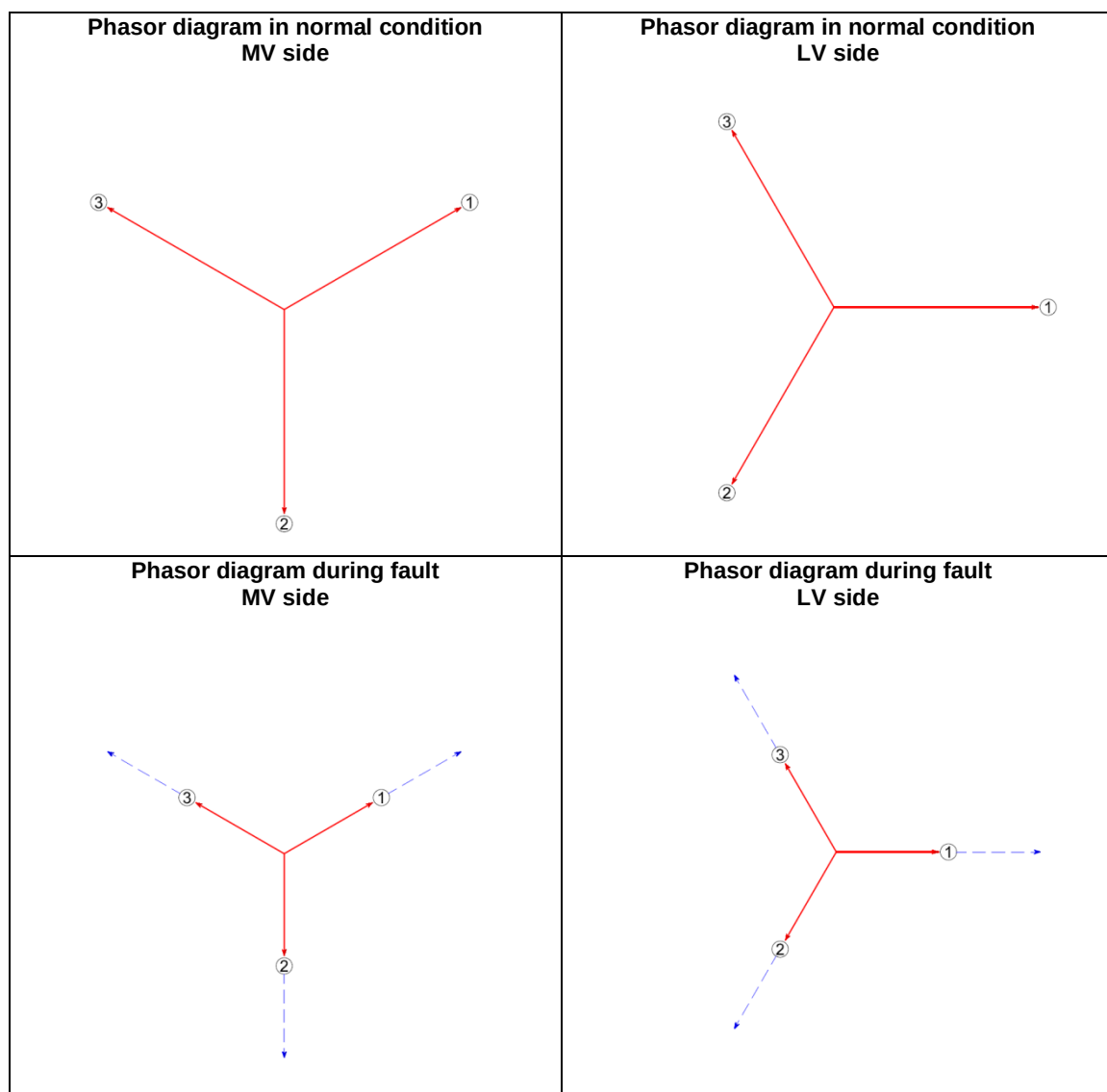






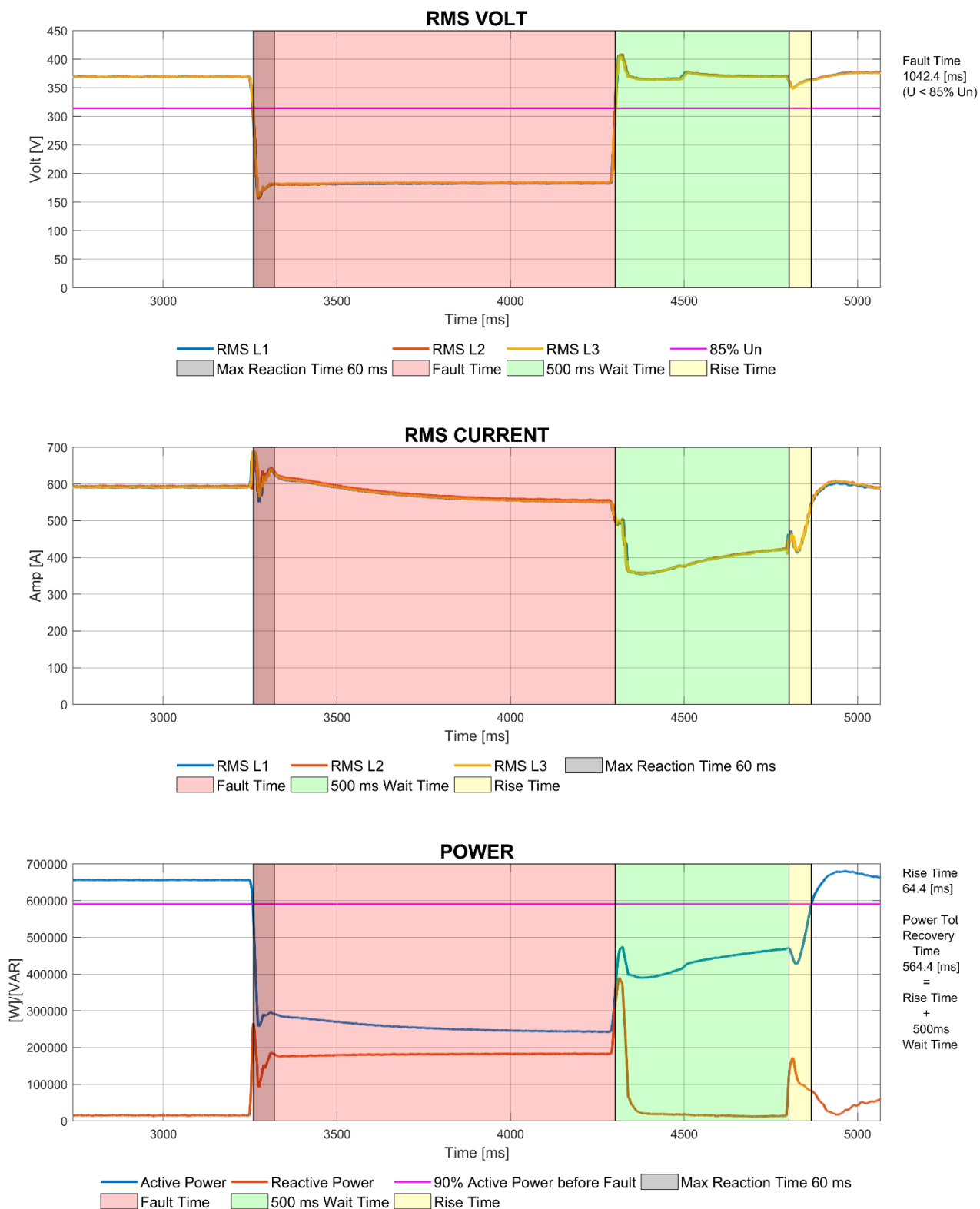


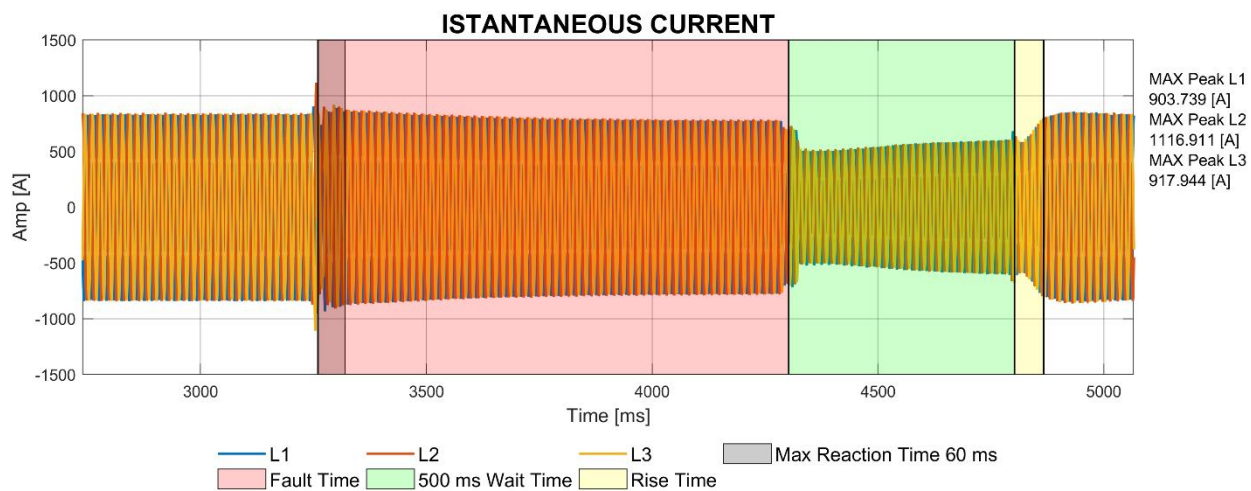
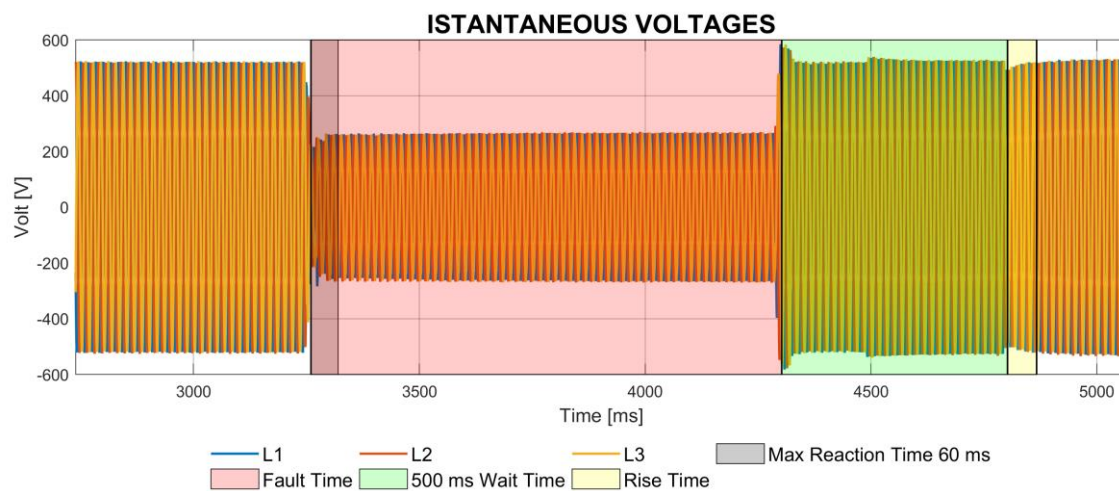
Test N° 17		LVRT - 50% Un - 91% Pn – Sym – K = 1					
Duration (ms): 1030 ±20		$V_1/V_{1,nom}$	$V_2/V_{2,nom}$	$V_3/V_{3,nom}$	φ_{V1}	φ_{V2}	φ_{V3}
MV	Normal condition	1	1	1	30°	270°	150°
	During fault	0,50 ±0,05	0,50 ±0,05	0,50 ±0,05	30°	270°	150°
LV	Normal condition	1	1	1	0°	240°	120°
	During fault	0,50 ±0,05	0,50 ±0,05	0,50 ±0,05	0°	240°	120°

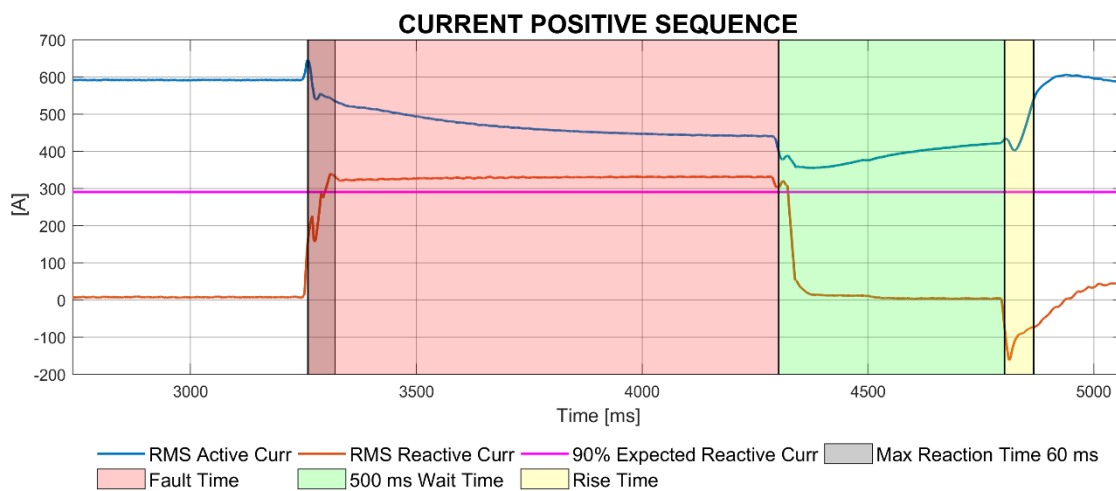
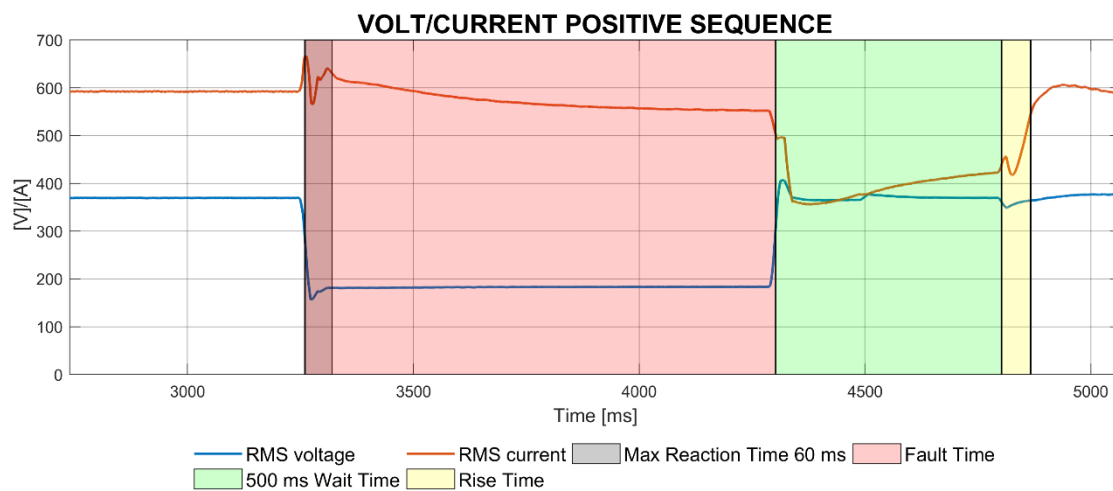




CREI Ven – Padova
Laboratorio Prove
Report n. 177/20/00179/ER

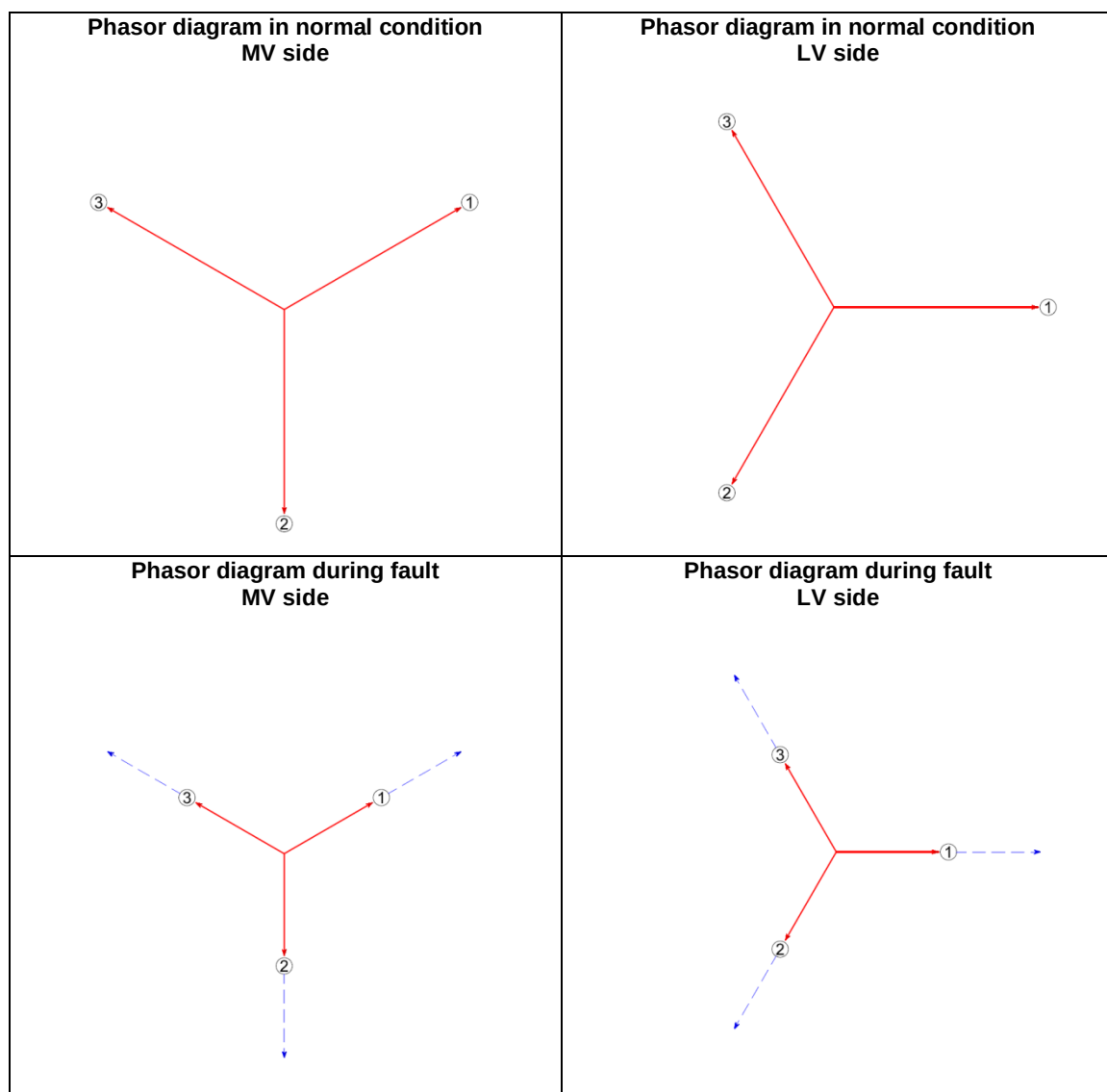






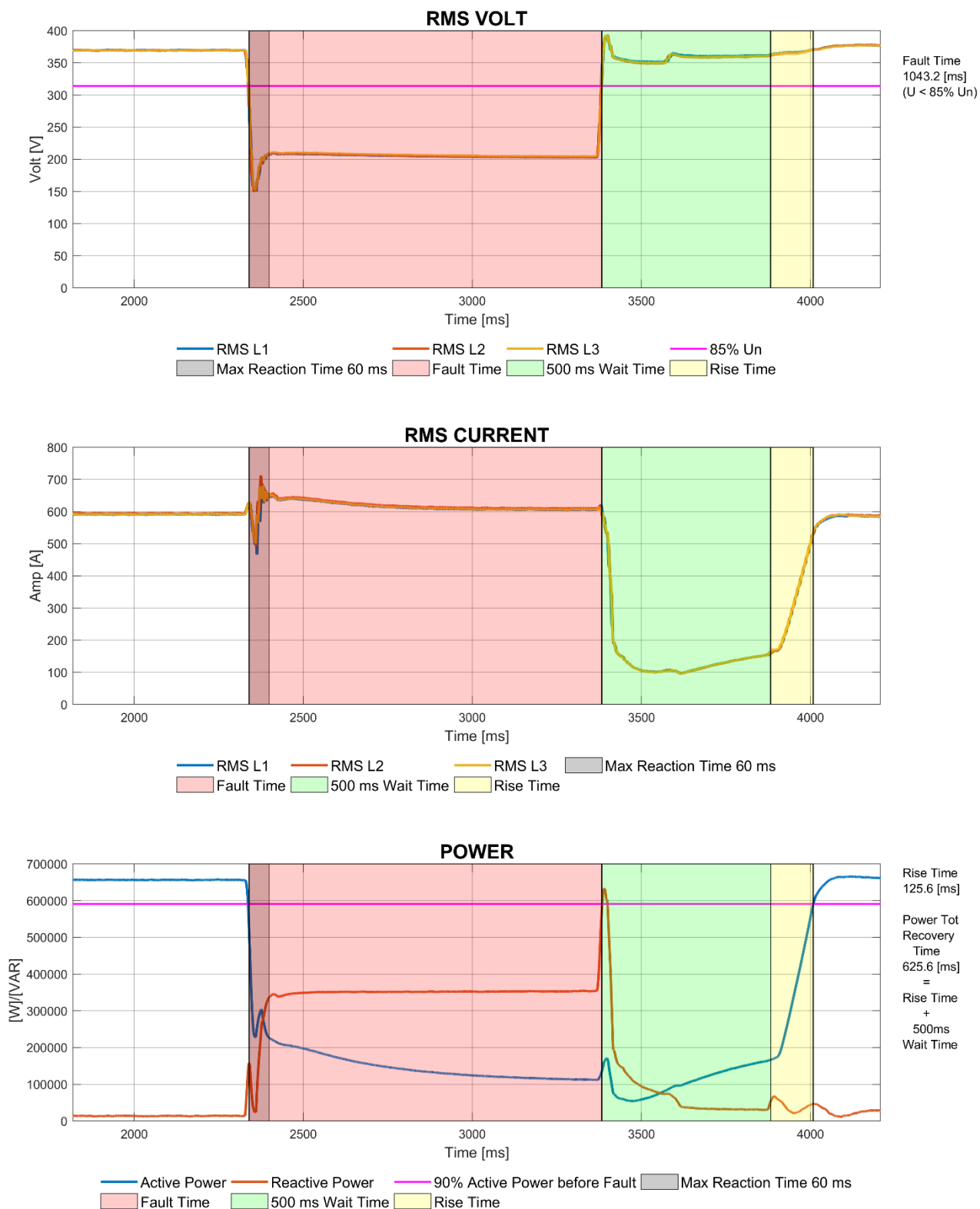


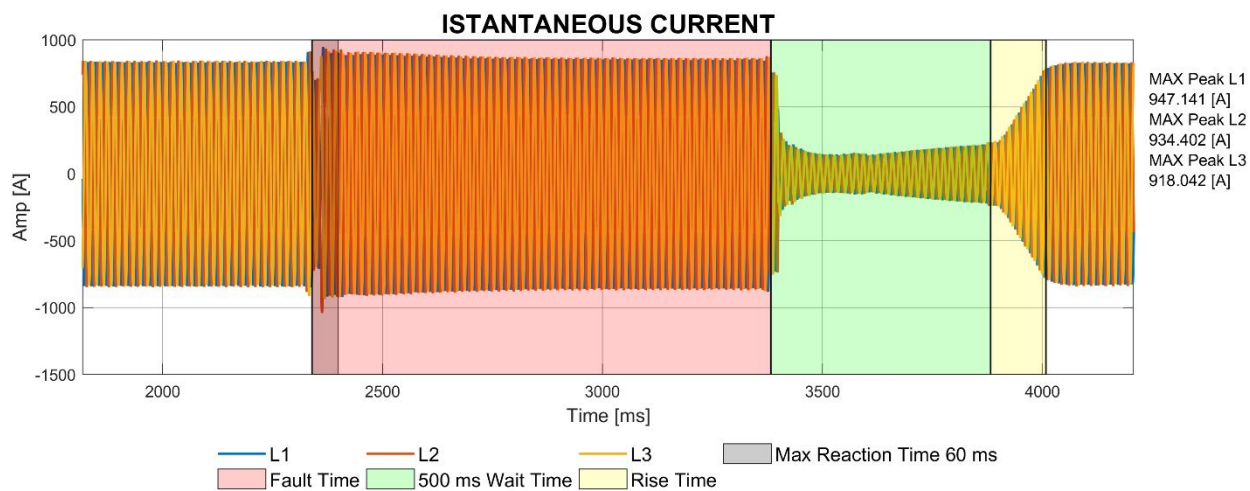
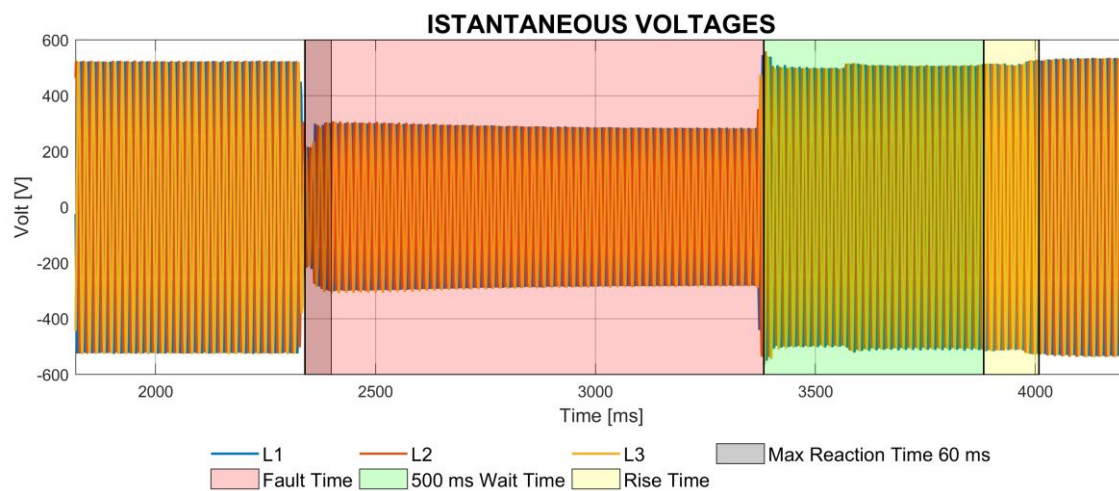
Test N° 18		LVRT - 50% Un - 91% Pn – Sym – K = 2					
Duration (ms): 1030 ±20		$V_1/V_{1,nom}$	$V_2/V_{2,nom}$	$V_3/V_{3,nom}$	φ_{V1}	φ_{V2}	φ_{V3}
MV	Normal condition	1	1	1	30°	270°	150°
	During fault	0,50 ±0,05	0,50 ±0,05	0,50 ±0,05	30°	270°	150°
LV	Normal condition	1	1	1	0°	240°	120°
	During fault	0,50 ±0,05	0,50 ±0,05	0,50 ±0,05	0°	240°	120°

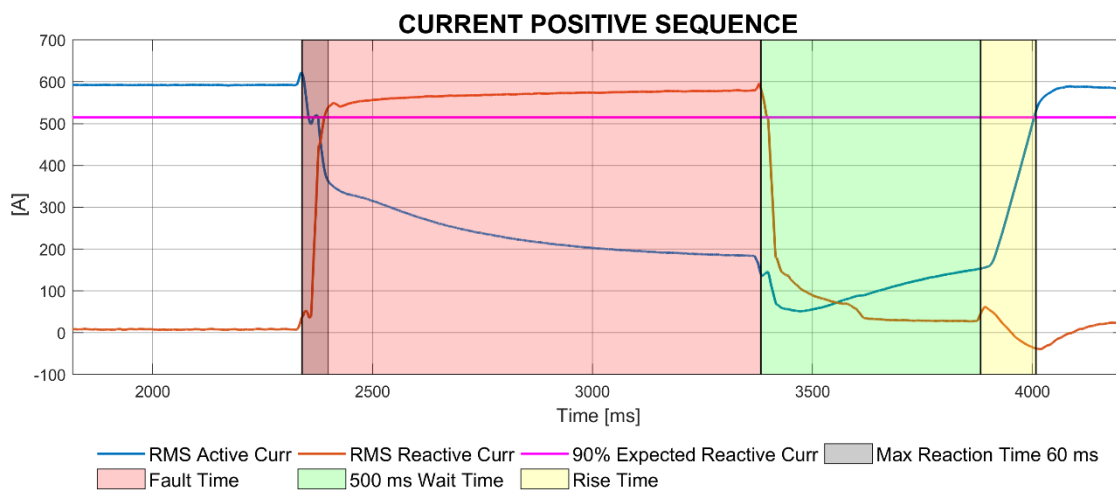
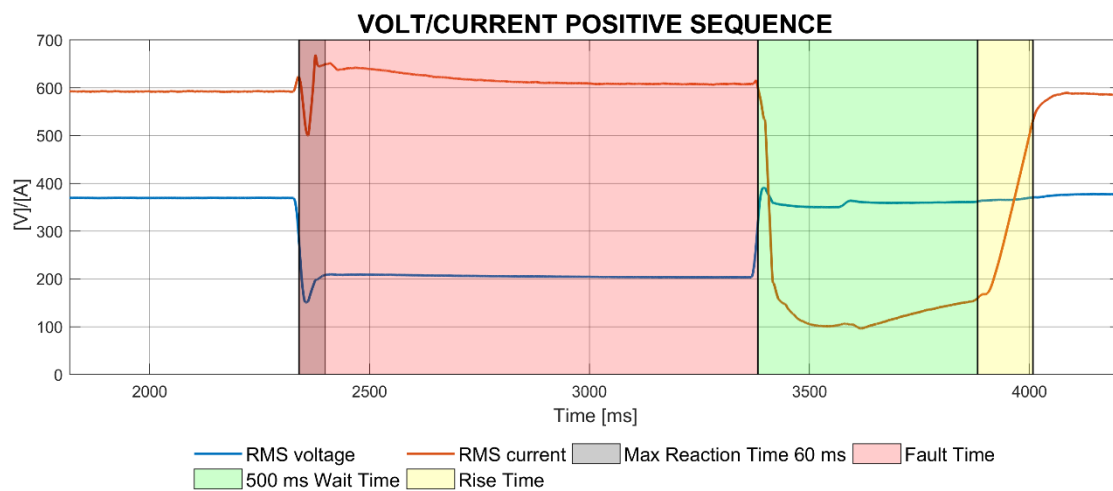




CREI Ven – Padova
Laboratorio Prove
Report n. 177/20/00179/ER

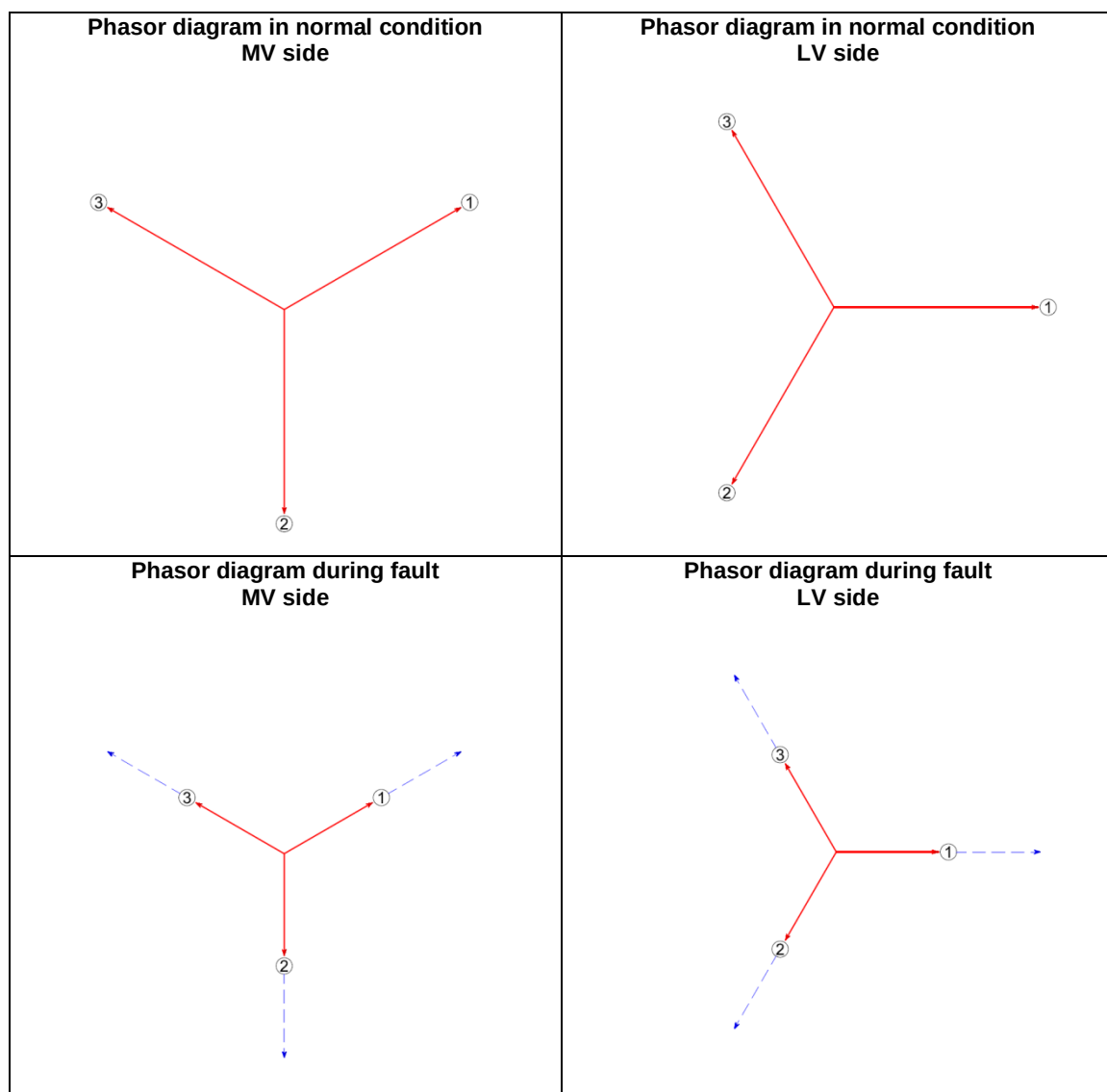


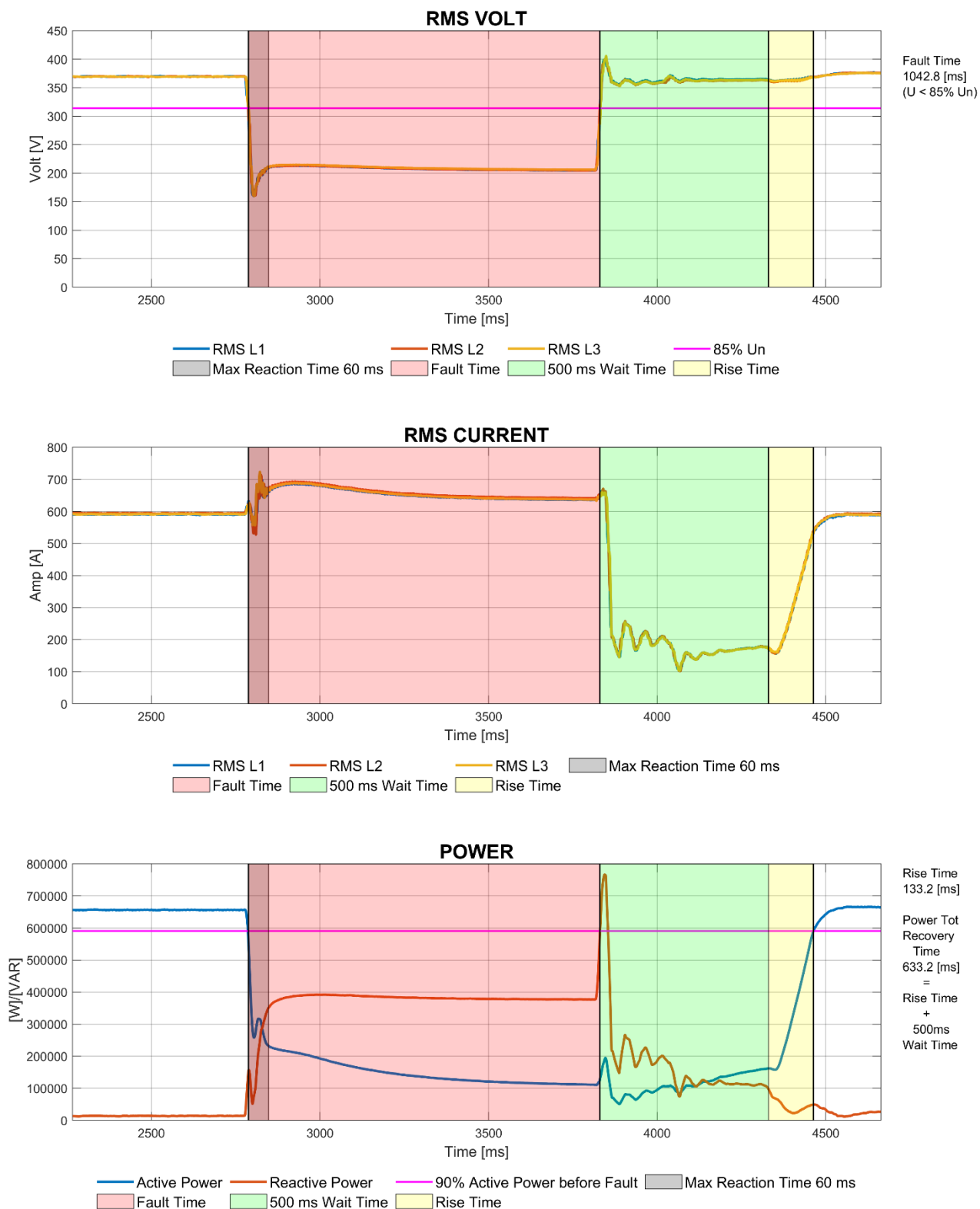


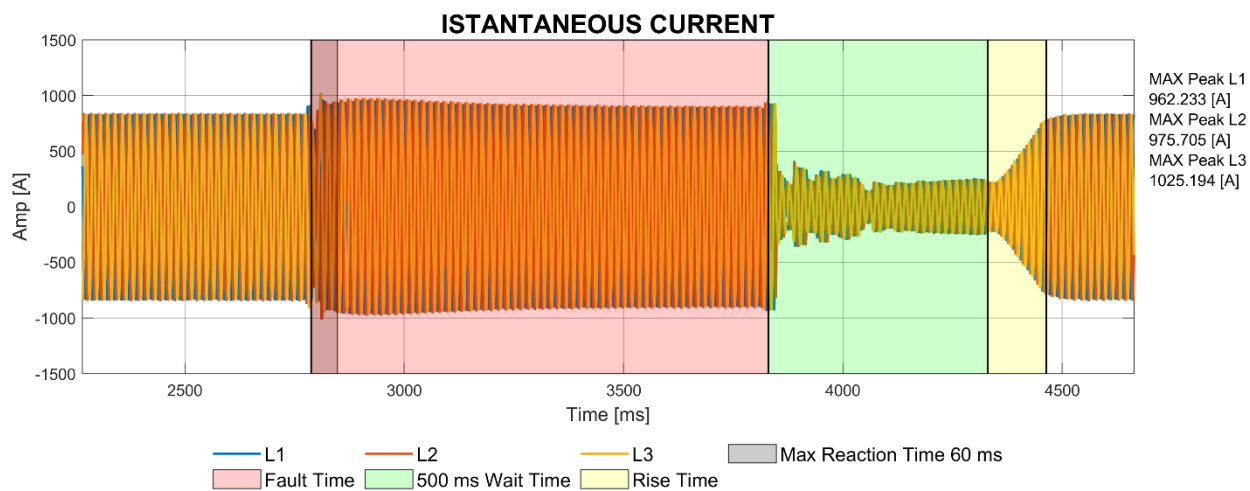
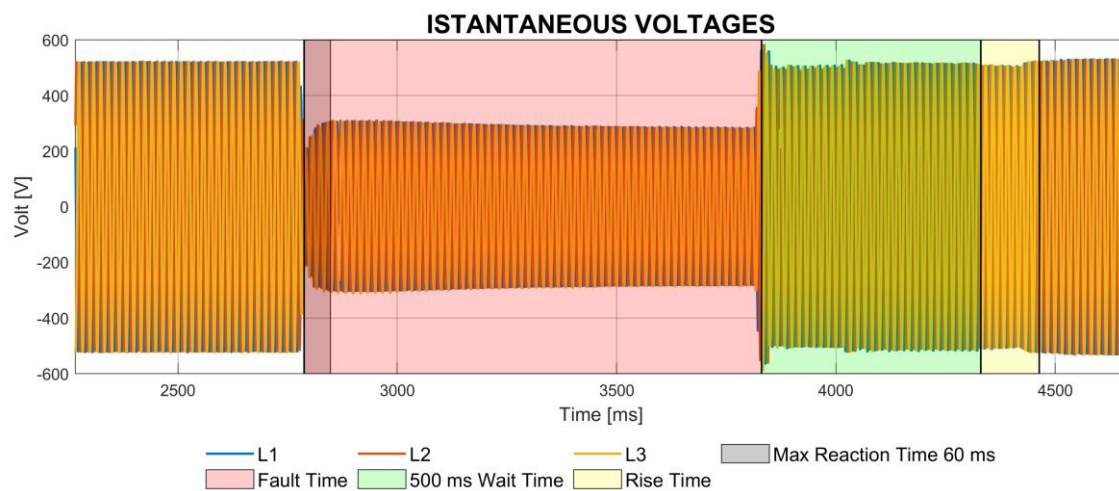


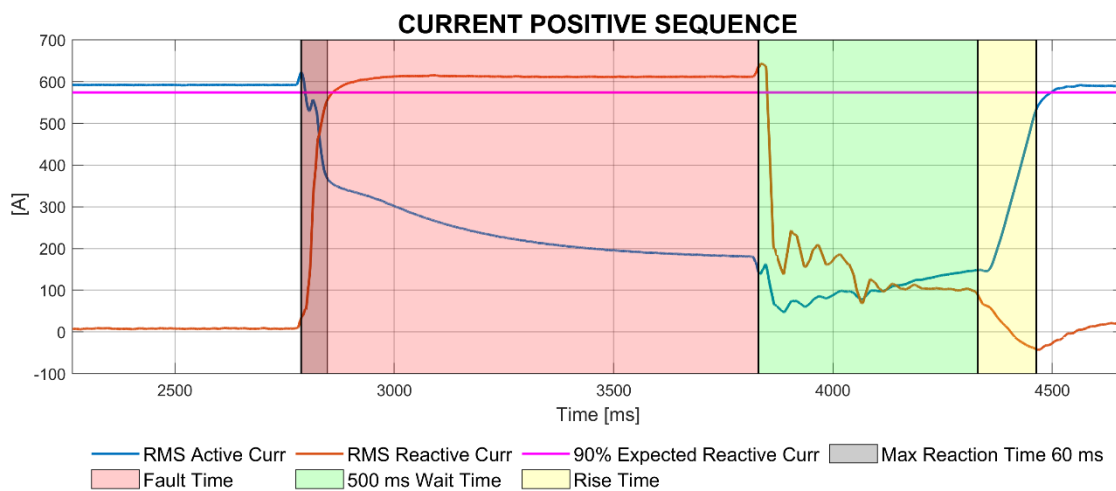
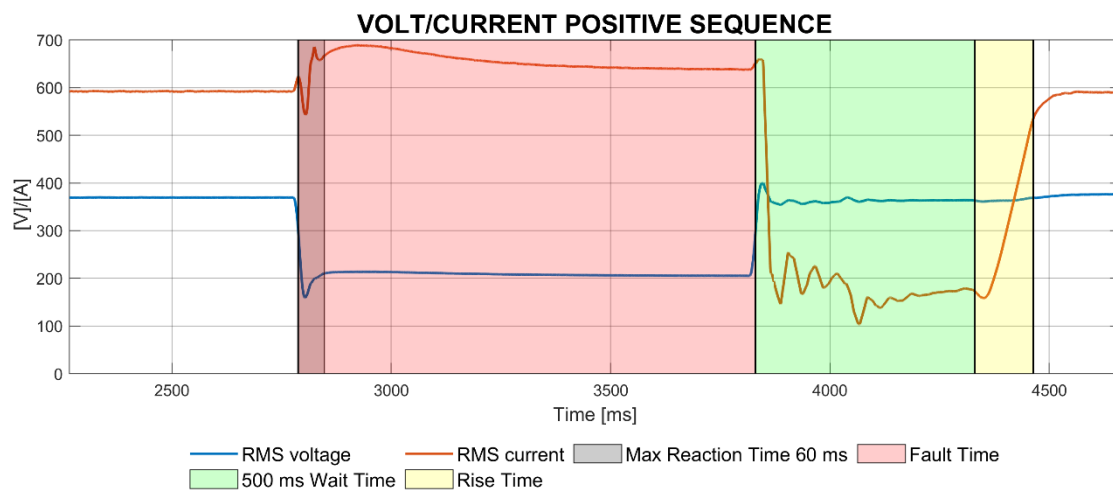


Test N° 19		LVRT - 50% Un - 91% Pn – Sym – K = 10					
Duration (ms): 1030 ±20		$V_1/V_{1,nom}$	$V_2/V_{2,nom}$	$V_3/V_{3,nom}$	φ_{V1}	φ_{V2}	φ_{V3}
MV	Normal condition	1	1	1	30°	270°	150°
	During fault	0,50 ±0,05	0,50 ±0,05	0,50 ±0,05	30°	270°	150°
LV	Normal condition	1	1	1	0°	240°	120°
	During fault	0,50 ±0,05	0,50 ±0,05	0,50 ±0,05	0°	240°	120°



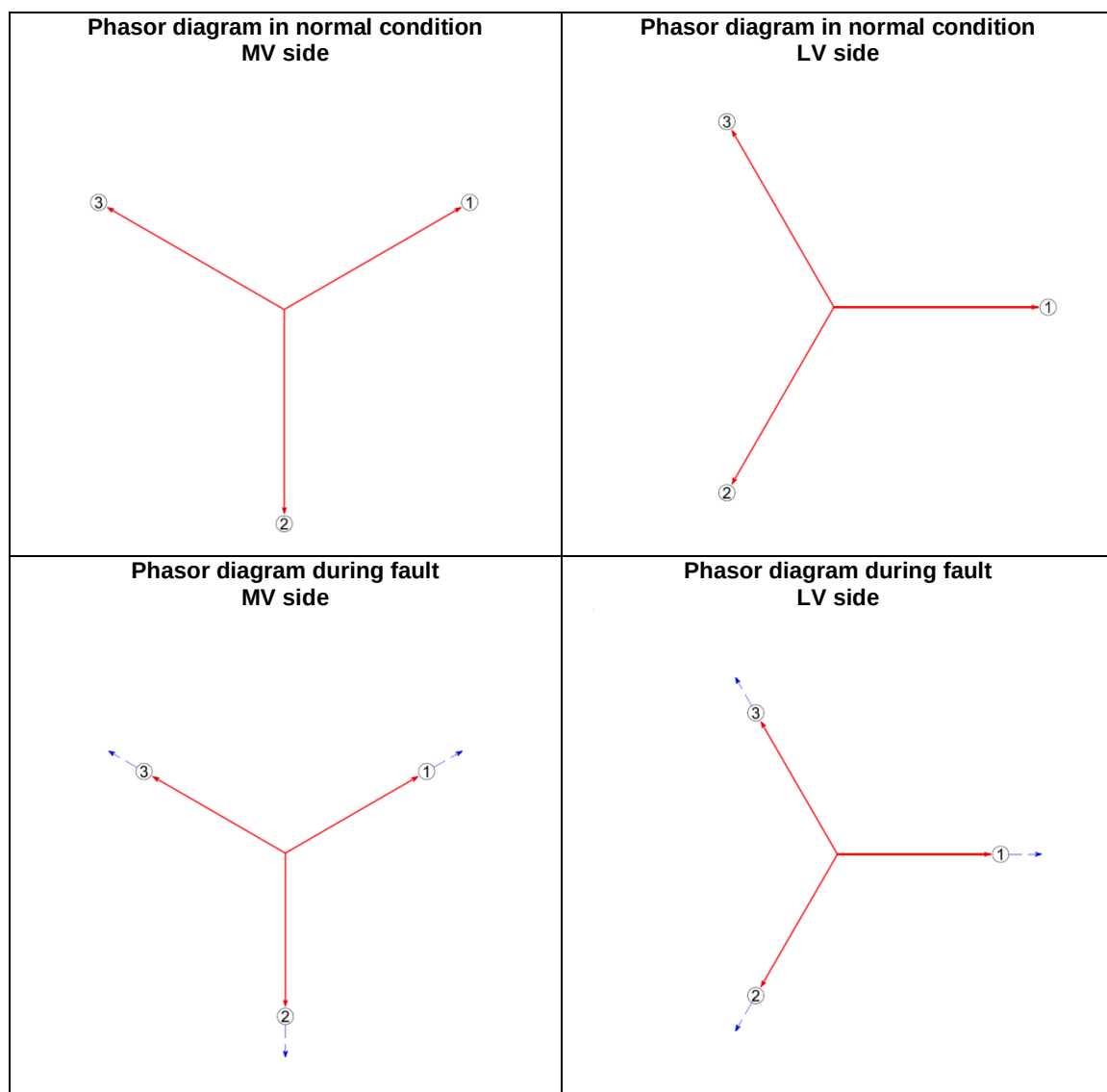


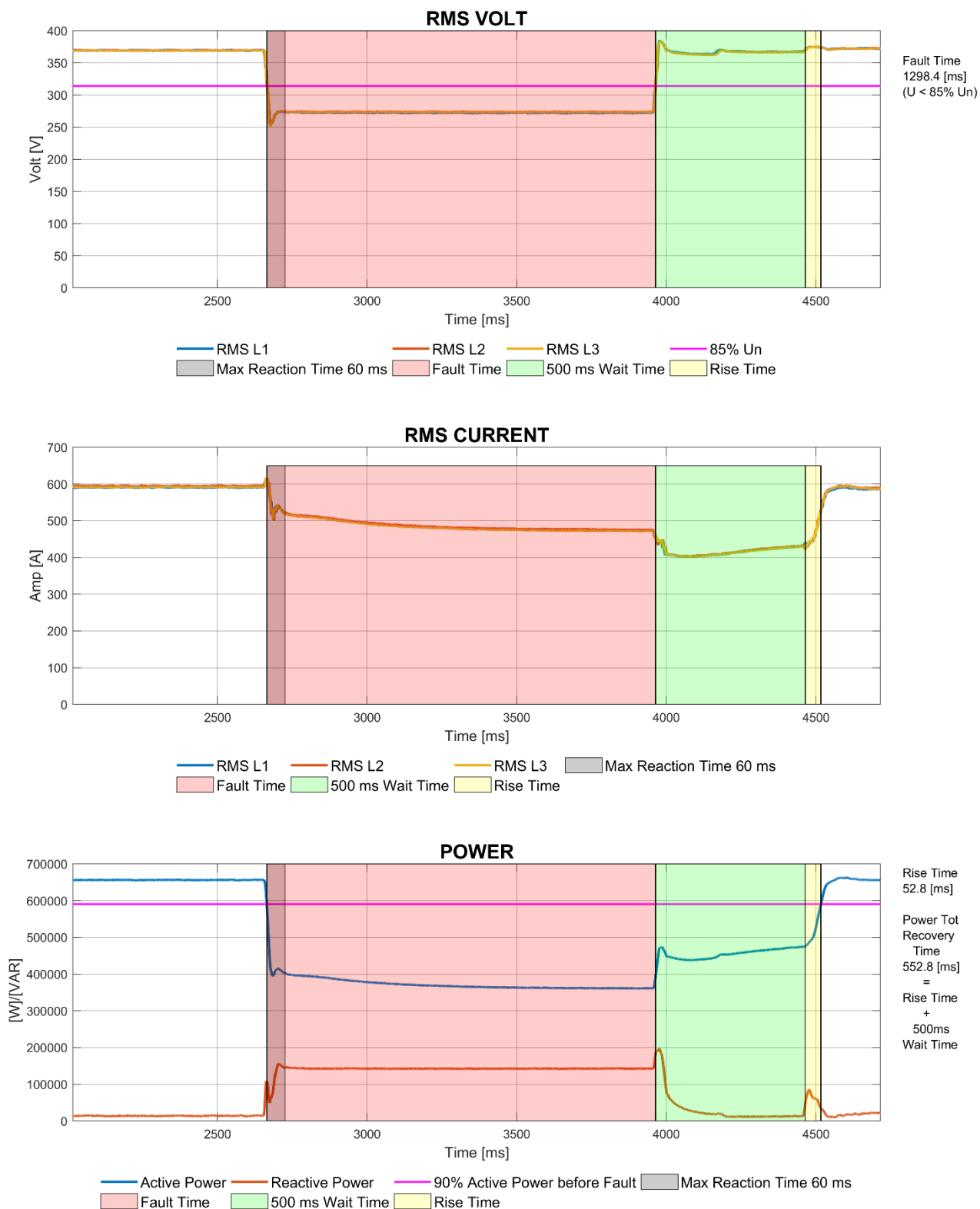


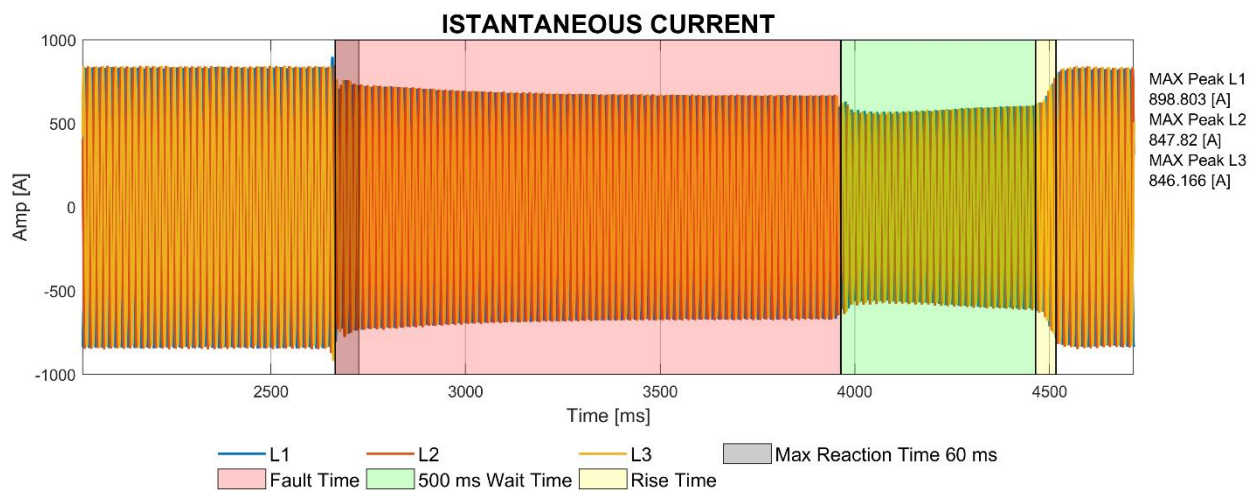
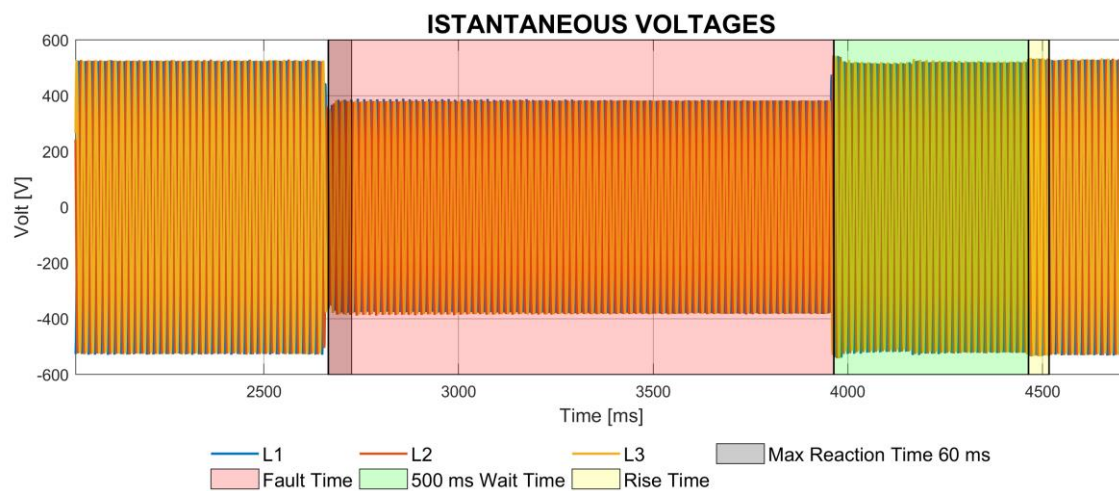


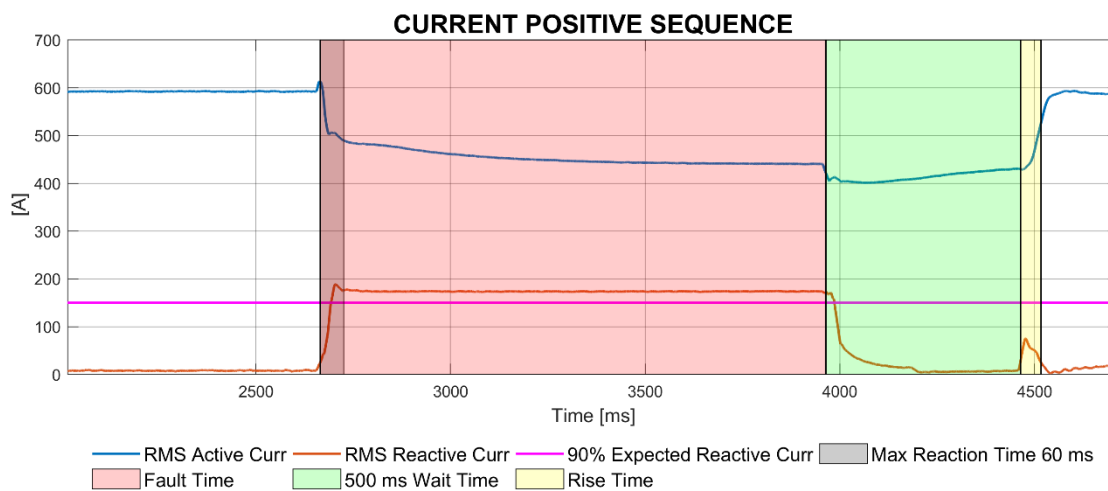
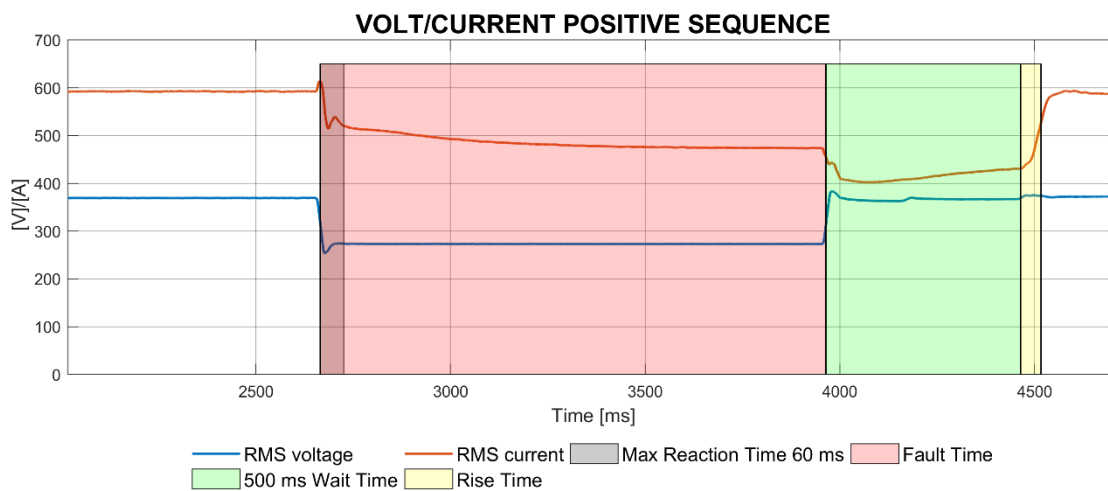


Test N° 20		LVRT - 75% Un - 91% Pn – Sym – K = 1					
Duration (ms): 1300 ±20		$V_1/V_{1,nom}$	$V_2/V_{2,nom}$	$V_3/V_{3,nom}$	φ_{V1}	φ_{V2}	φ_{V3}
MV	Normal condition	1	1	1	30°	270°	150°
	During fault	0,75 ±0,05	0,75 ±0,05	0,75 ±0,05	30°	270°	150°
LV	Normal condition	1	1	1	0°	240°	120°
	During fault	0,75 ±0,05	0,75 ±0,05	0,75 ±0,05	0°	240°	120°



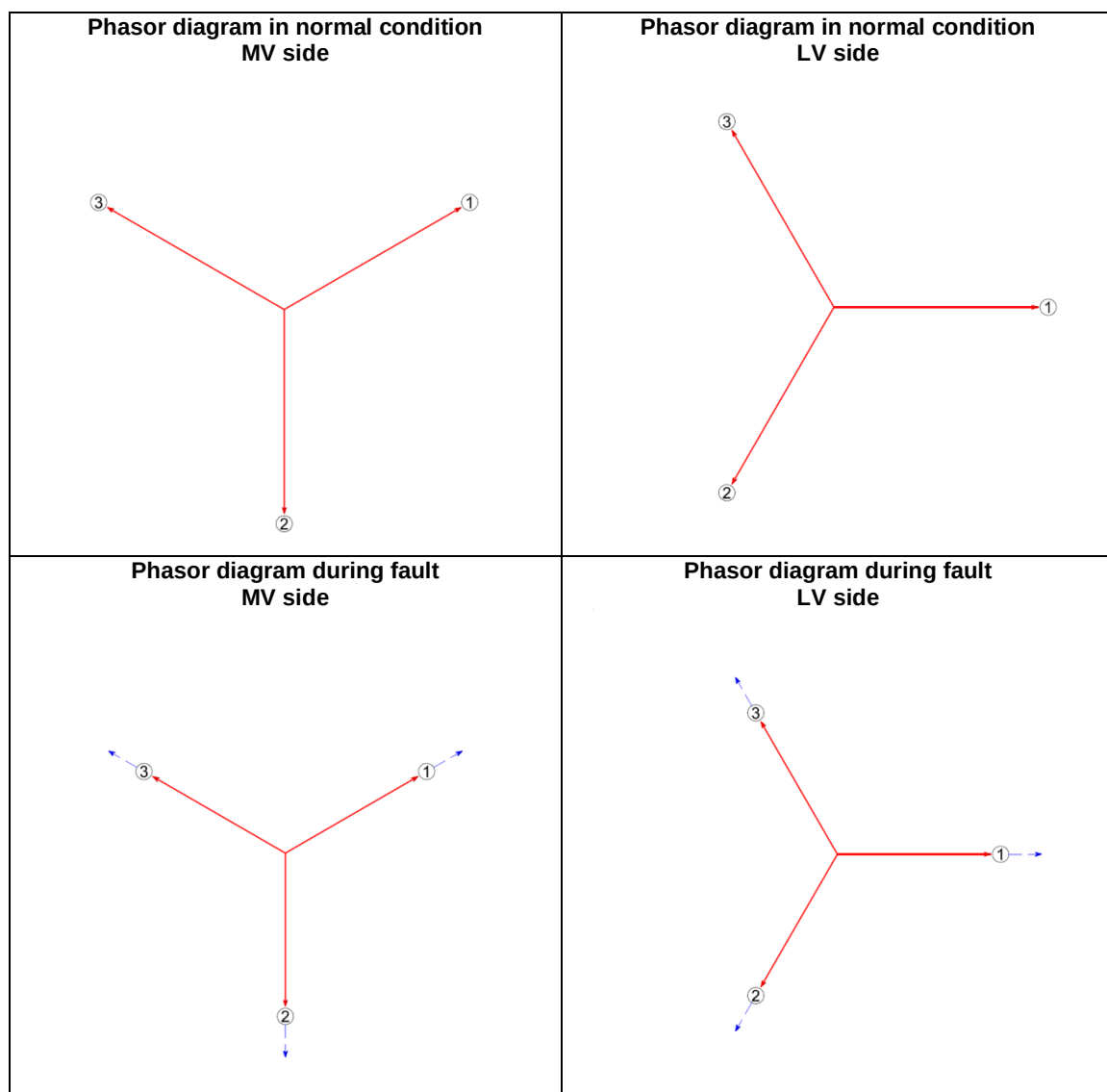


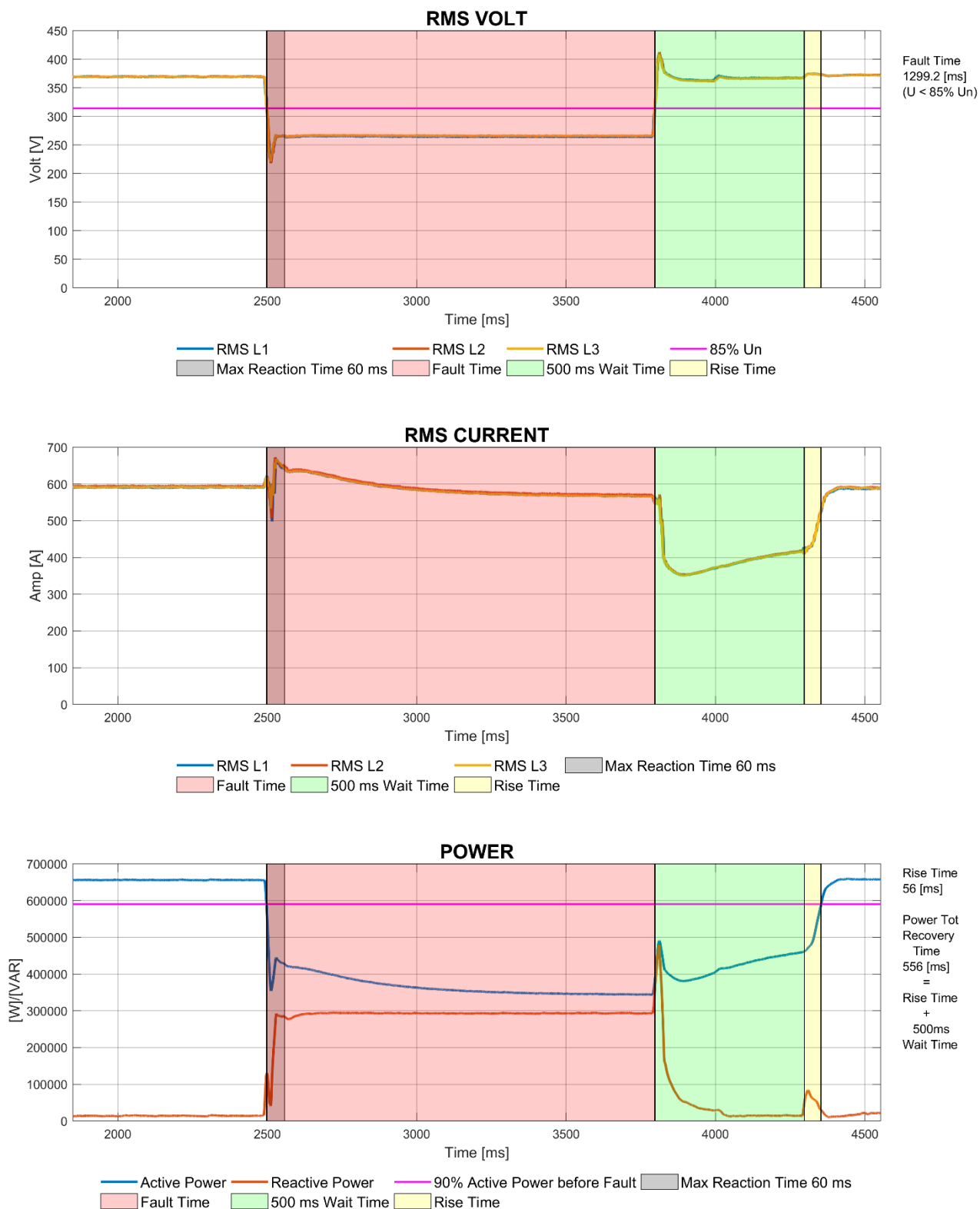


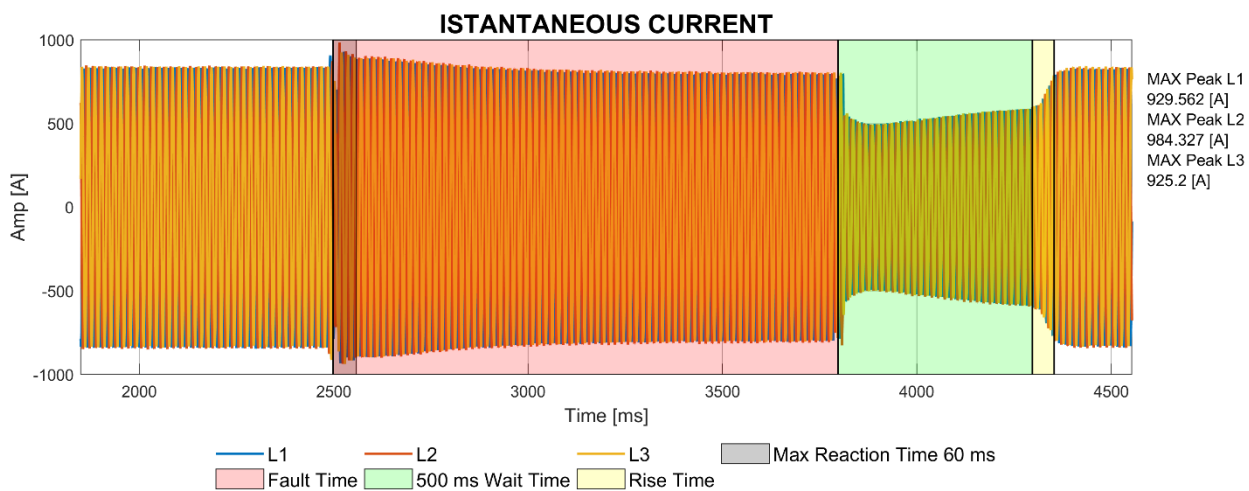
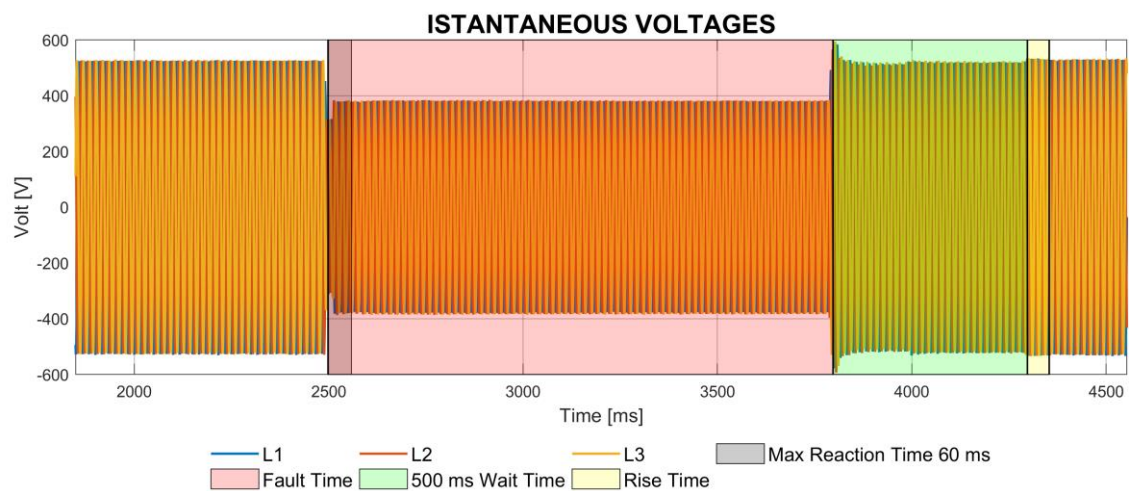


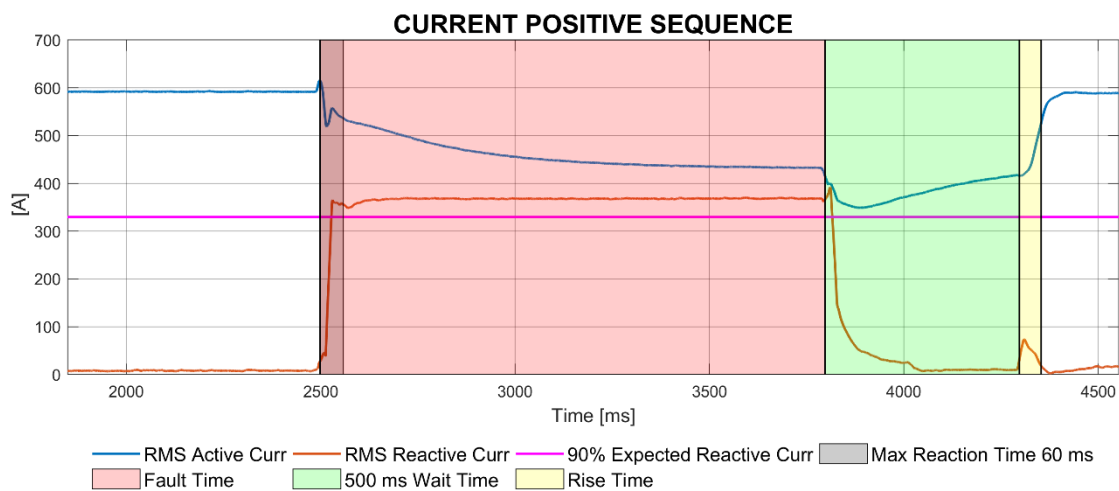
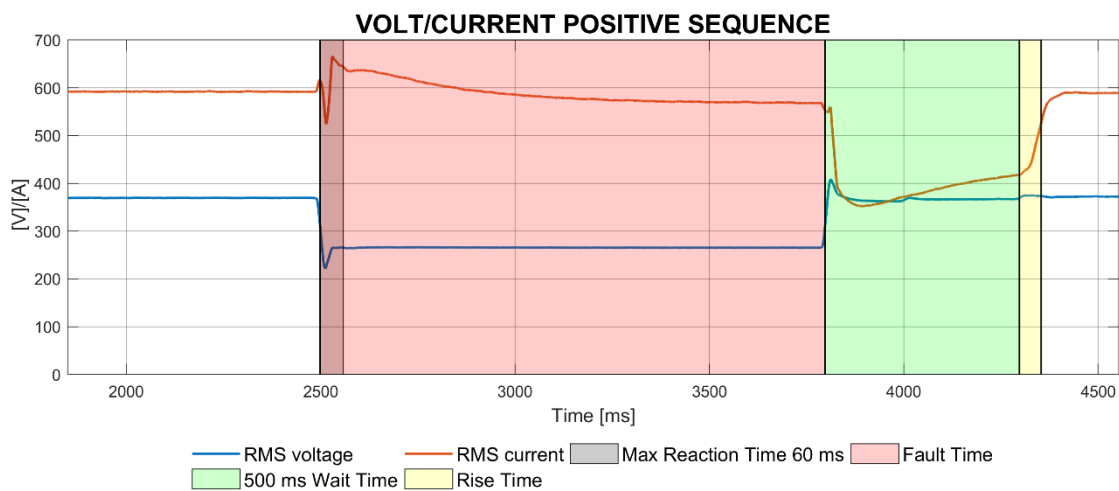


Test N° 21		LVRT - 75% Un - 91% Pn – Sym – K = 2					
Duration (ms): 1300 ±20		$V_1/V_{1,nom}$	$V_2/V_{2,nom}$	$V_3/V_{3,nom}$	φ_{V1}	φ_{V2}	φ_{V3}
MV	Normal condition	1	1	1	30°	270°	150°
	During fault	0,75 ±0,05	0,75 ±0,05	0,75 ±0,05	30°	270°	150°
LV	Normal condition	1	1	1	0°	240°	120°
	During fault	0,75 ±0,05	0,75 ±0,05	0,75 ±0,05	0°	240°	120°



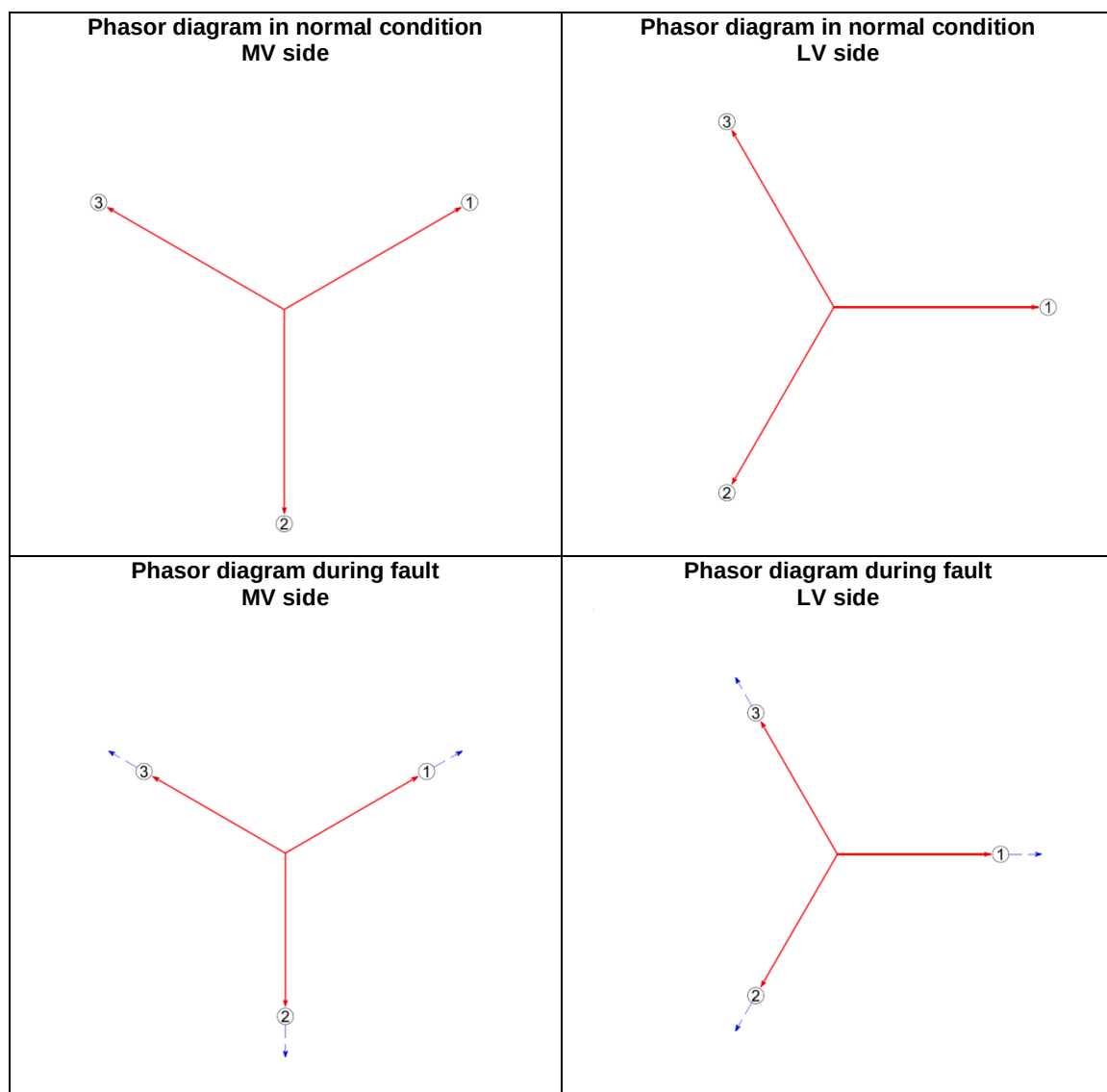






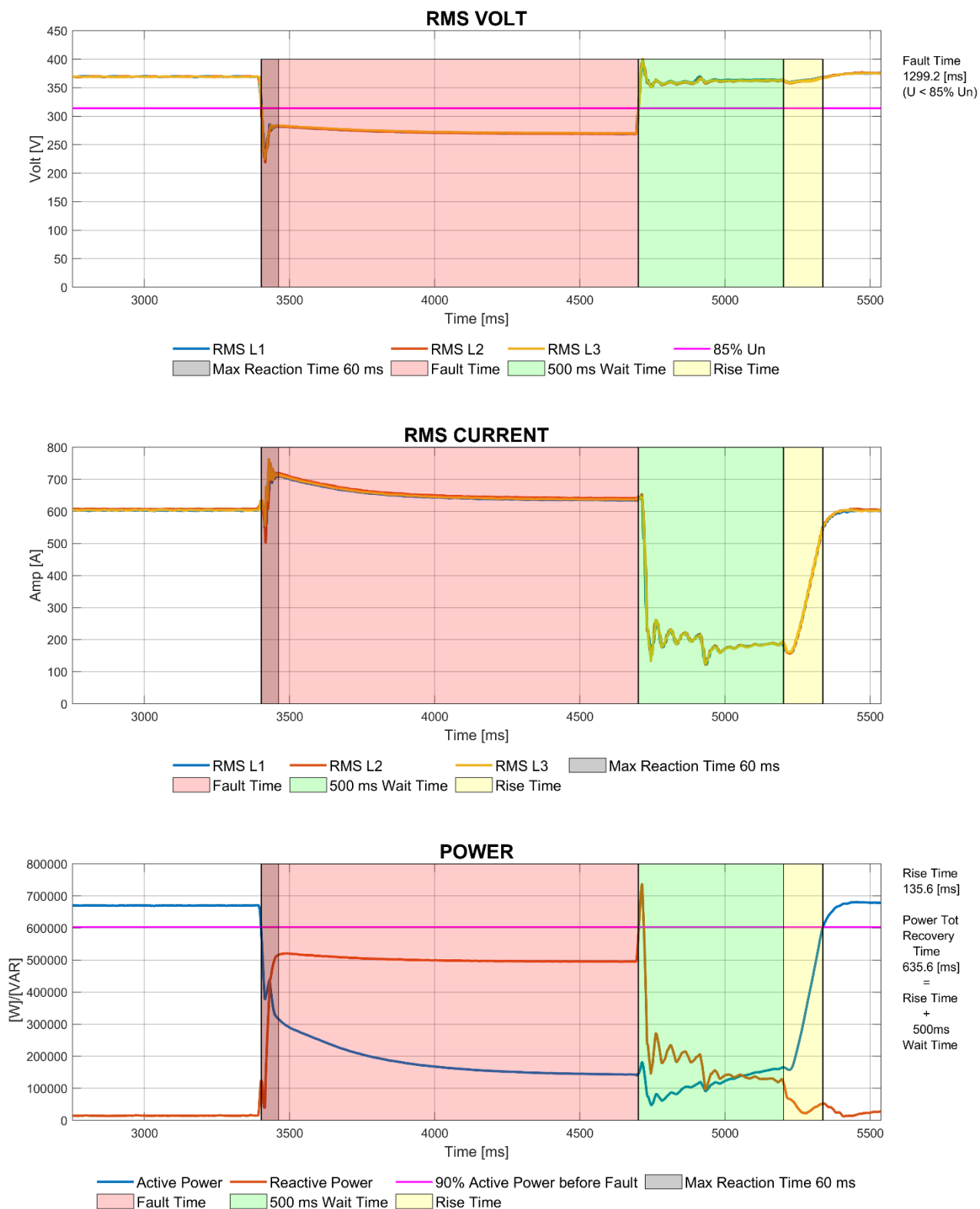


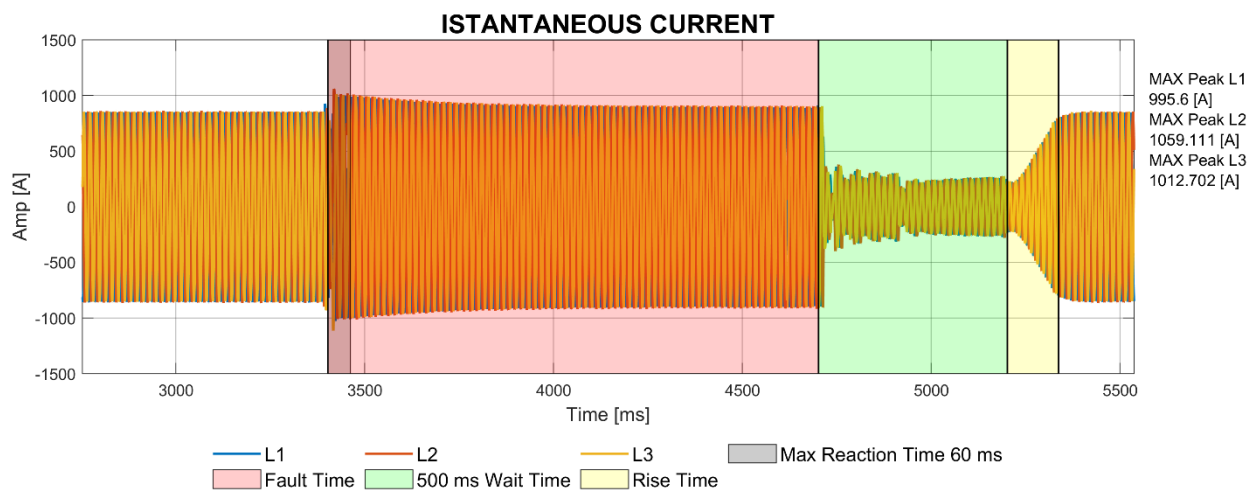
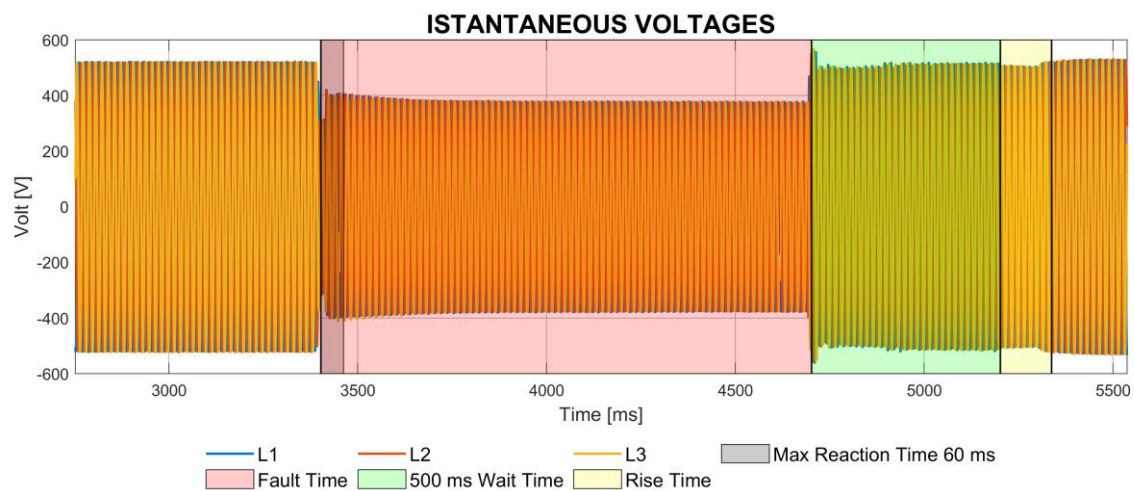
Test N° 22		LVRT - 75% Un - 91% Pn – Sym – K = 10					
Duration (ms): 1300 ±20		$V_1/V_{1,nom}$	$V_2/V_{2,nom}$	$V_3/V_{3,nom}$	φ_{V1}	φ_{V2}	φ_{V3}
MV	Normal condition	1	1	1	30°	270°	150°
	During fault	0,75 ±0,05	0,75 ±0,05	0,75 ±0,05	30°	270°	150°
LV	Normal condition	1	1	1	0°	240°	120°
	During fault	0,75 ±0,05	0,75 ±0,05	0,75 ±0,05	0°	240°	120°

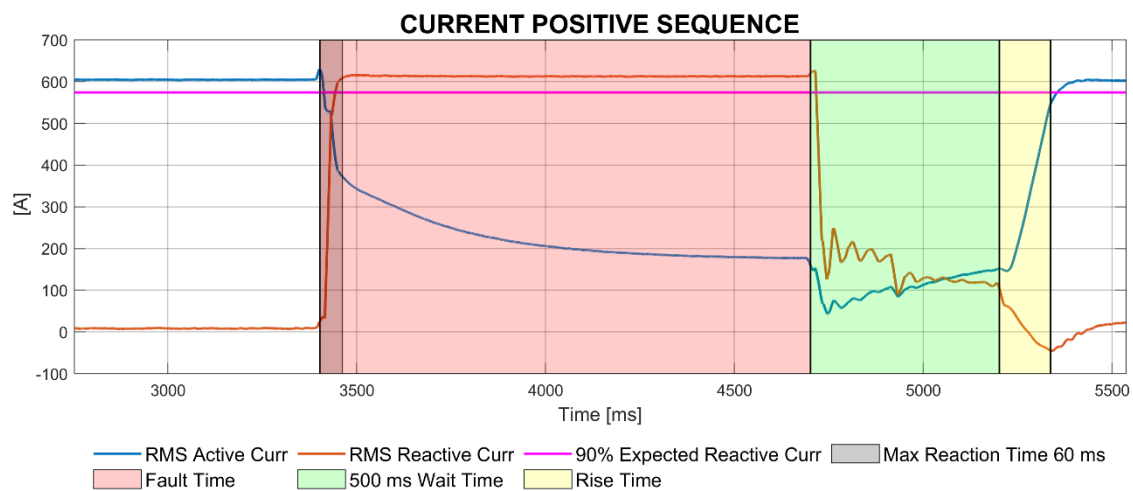
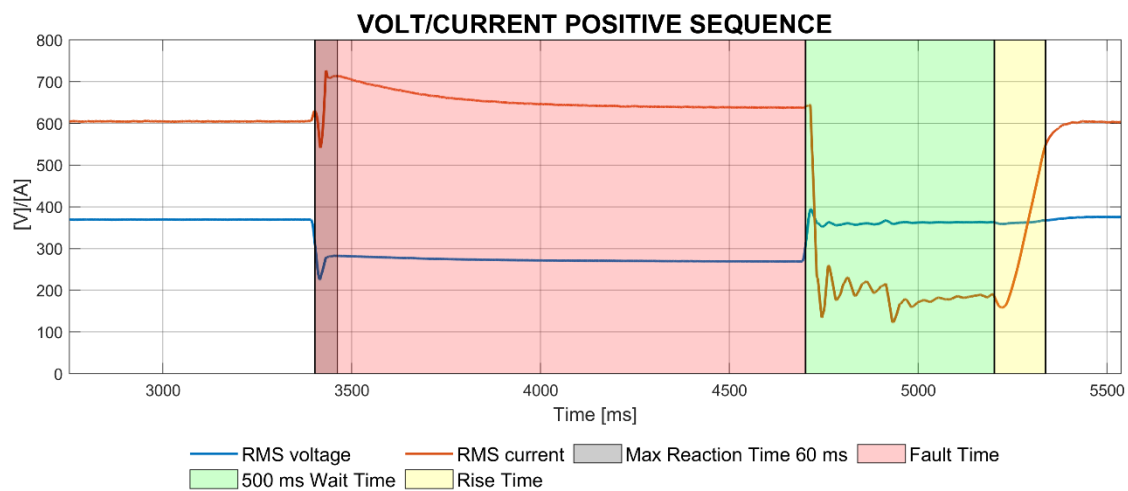




CREI Ven – Padova
Laboratorio Prove
Report n. 177/20/00179/ER

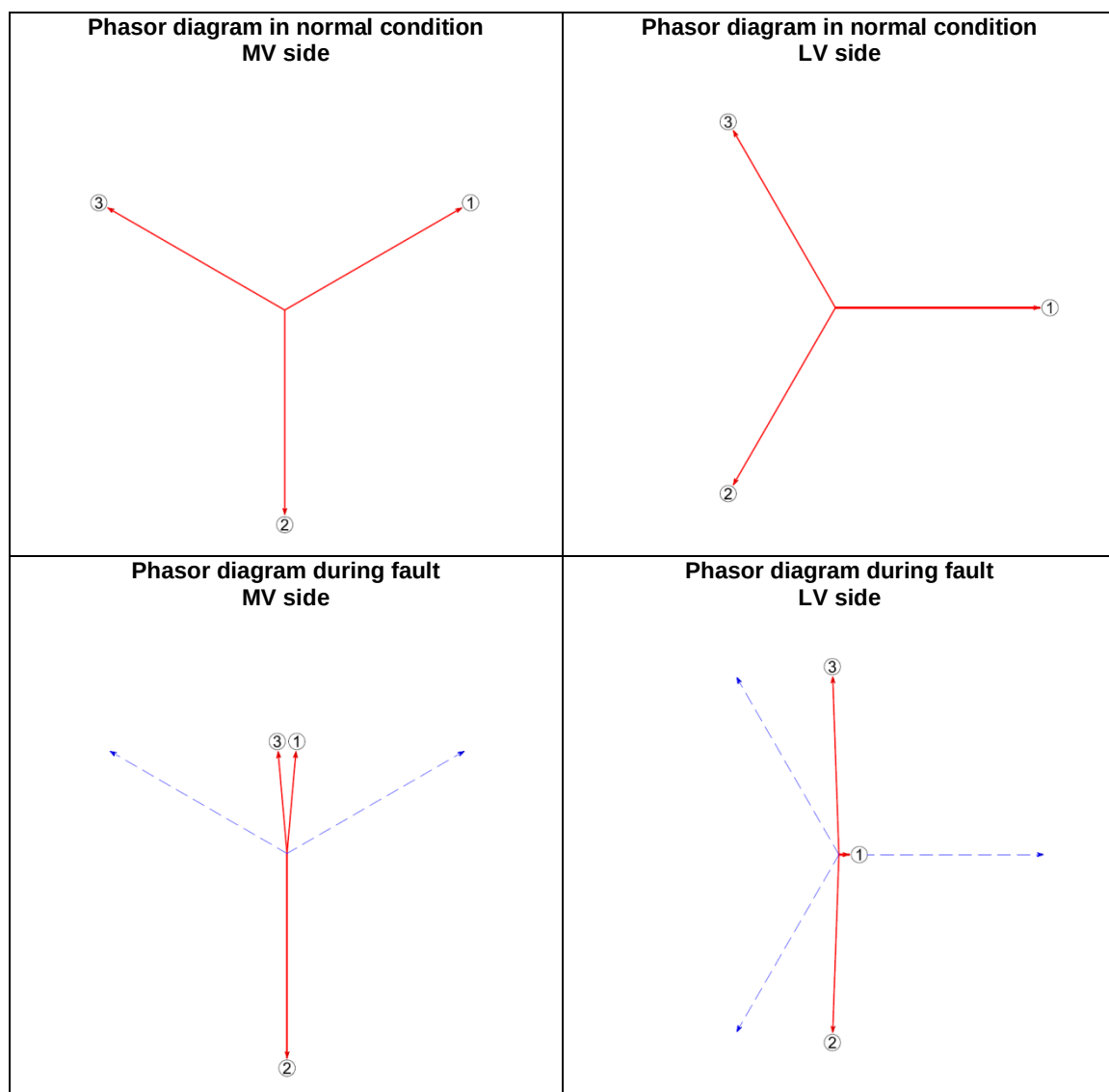


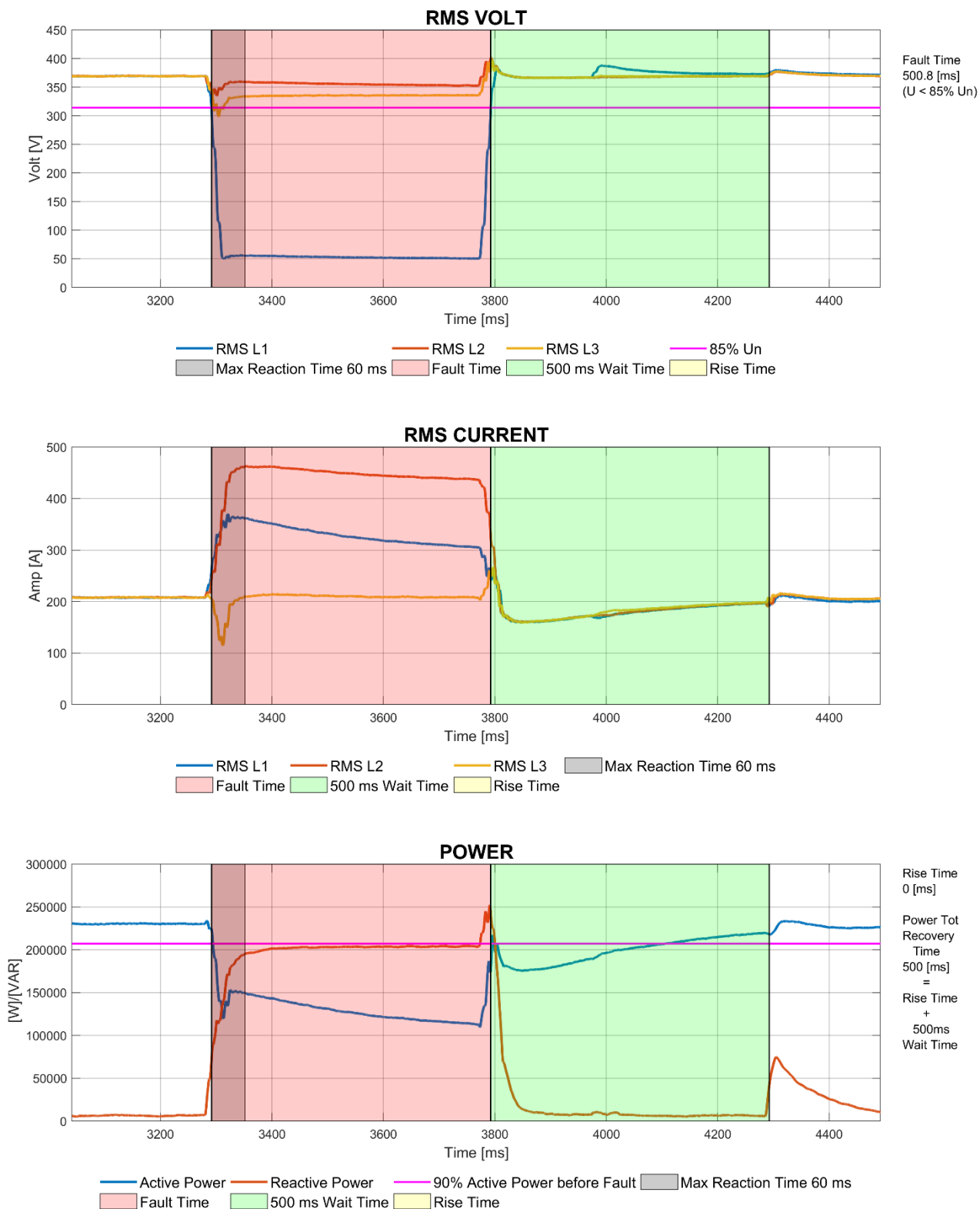


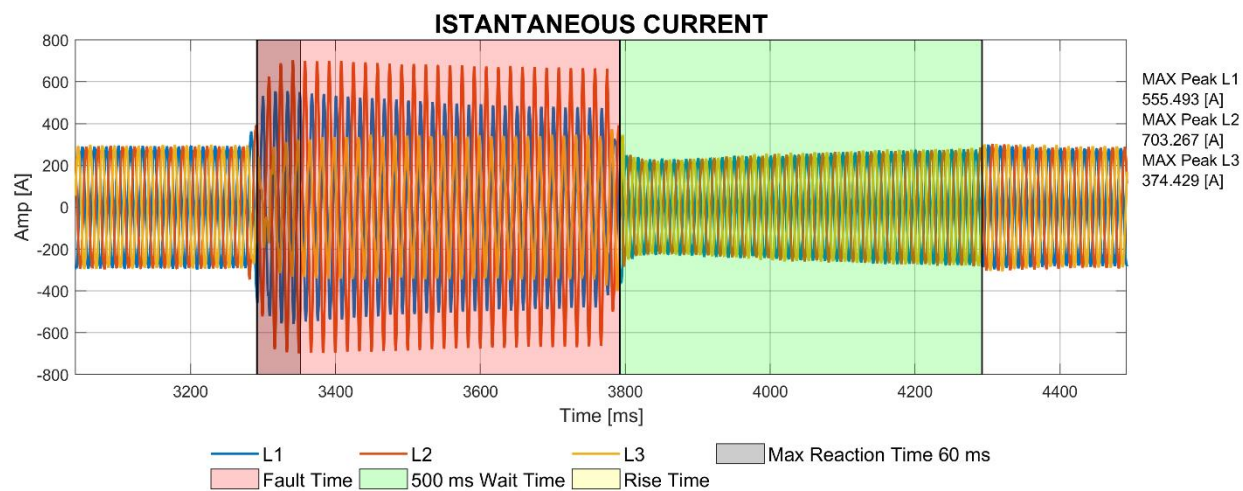
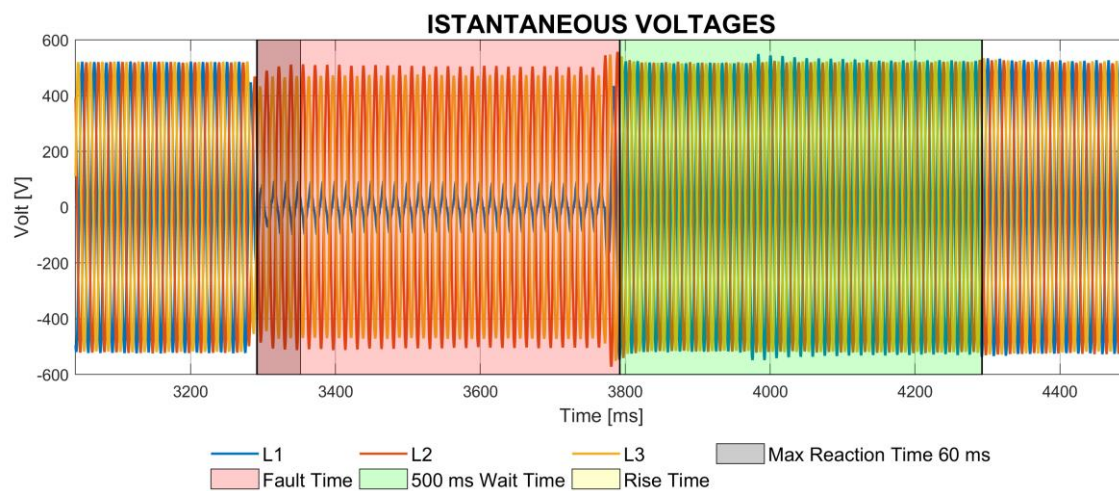


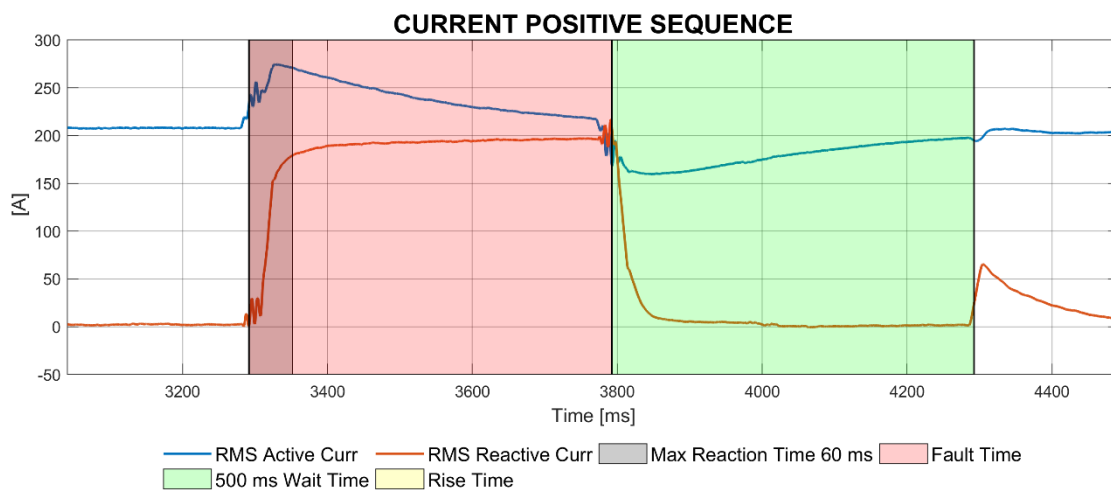
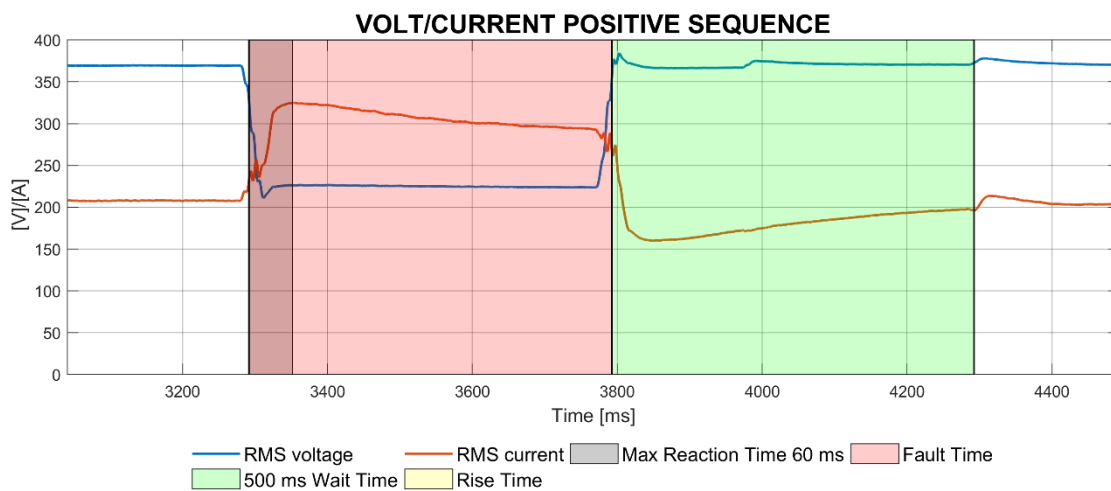


Test N° 23		LVRT - 10% Un - 30% Pn – Asym – K = 1					
Duration (ms): 500 ±20		$V_1/V_{1,nom}$	$V_2/V_{2,nom}$	$V_3/V_{3,nom}$	φ_{V1}	φ_{V2}	φ_{V3}
MV	Normal condition	1	1	1	30°	270°	150°
	During fault	0,50 ±0,05	1	0,50 ±0,05	85°	270°	95°
LV	Normal condition	1	1	1	0°	240°	120°
	During fault	0,05 ±0,05	0,87 ±0,05	0,87 ±0,05	0°	268°	92°



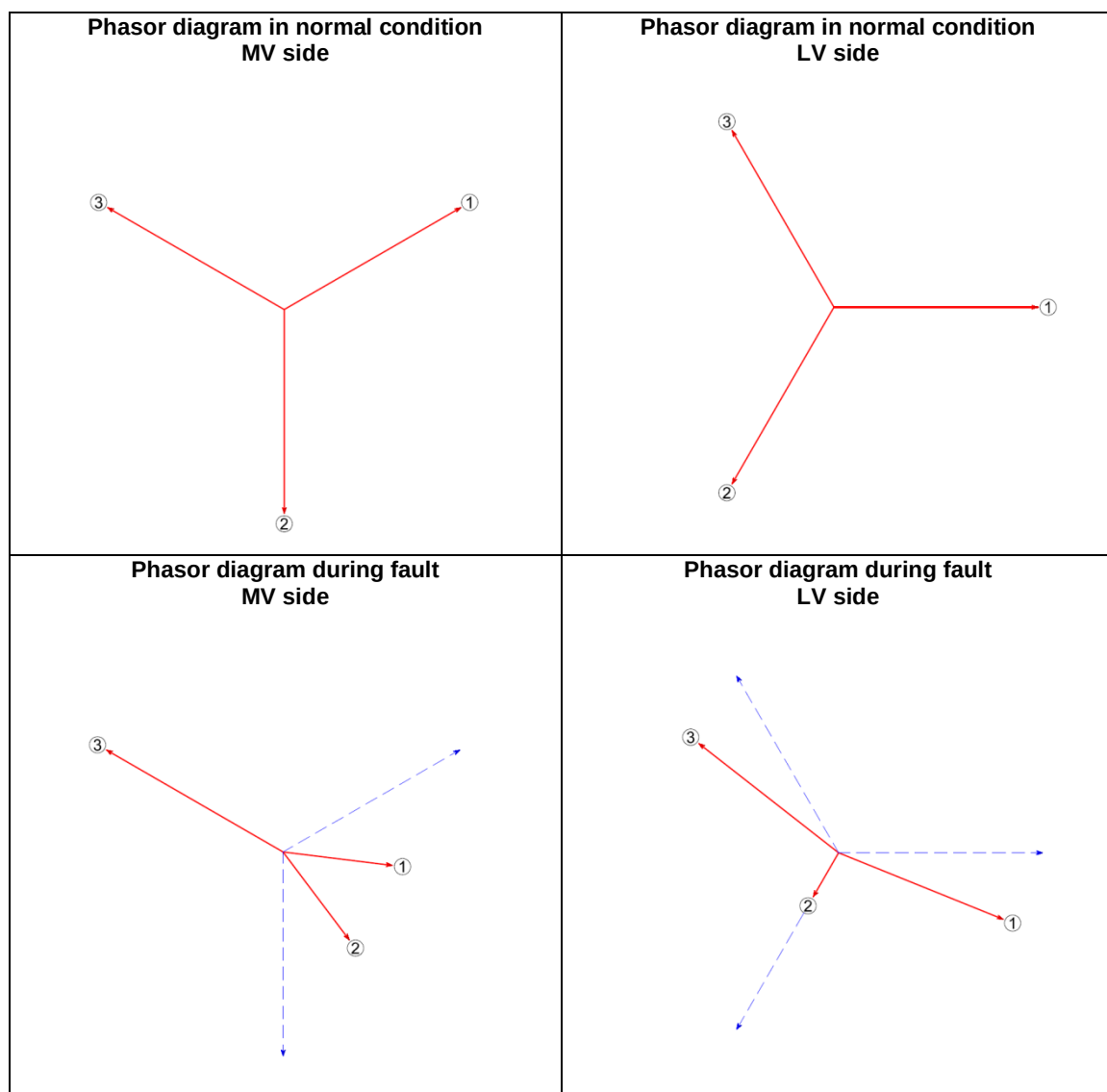






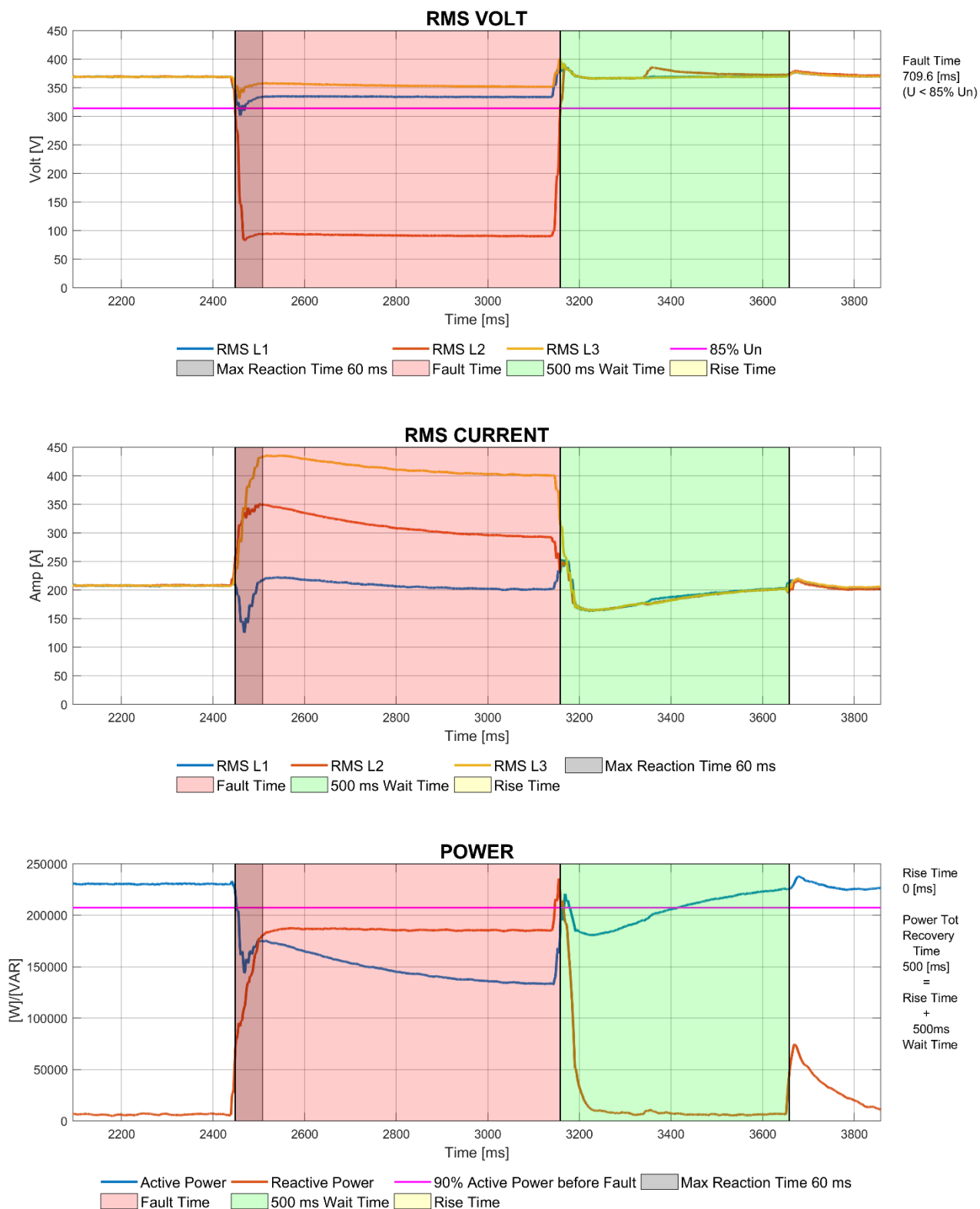


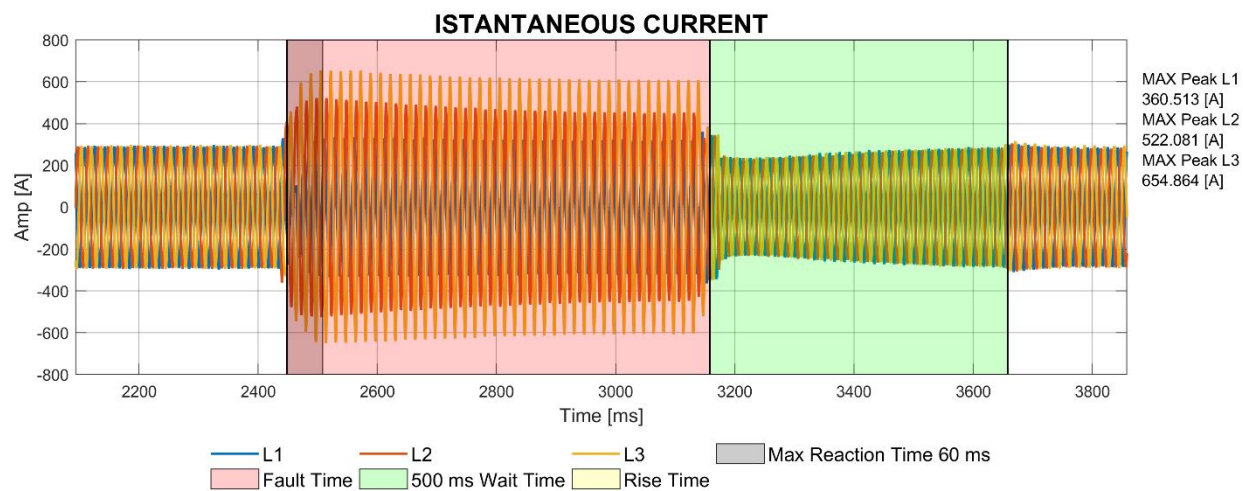
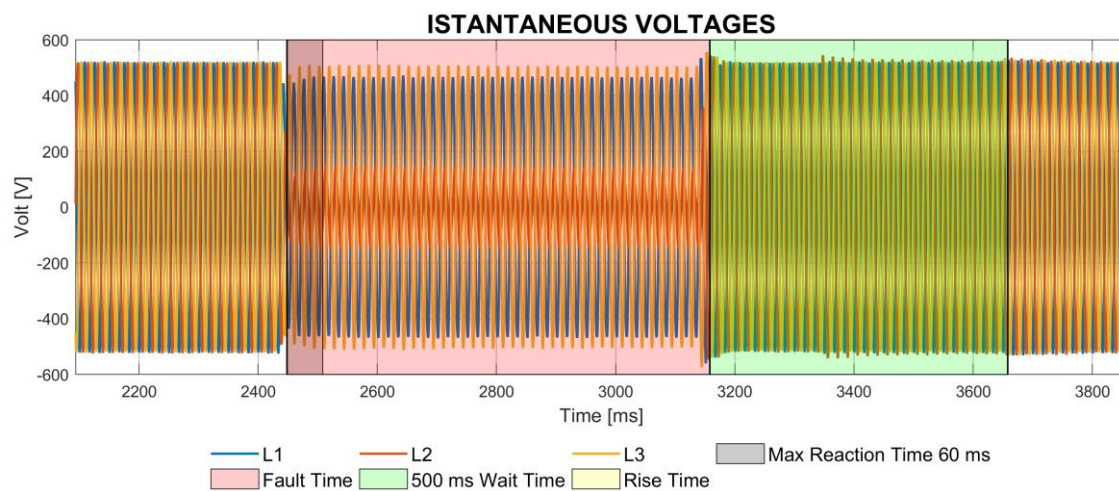
Test N° 24		LVRT - 25% Un - 30% Pn – Asym – K = 1					
Duration (ms): 700 ±20		$V_1/V_{1,nom}$	$V_2/V_{2,nom}$	$V_3/V_{3,nom}$	φ_{V1}	φ_{V2}	φ_{V3}
MV	Normal condition	1	1	1	30°	270°	150°
	During fault	0,54 ±0,05	0,54 ±0,05	1	353°	307°	0°
LV	Normal condition	1	1	1	0°	240°	120°
	During fault	0,87 ±0,05	0,25 ±0,05	0,87 ±0,05	338°	240°	142°

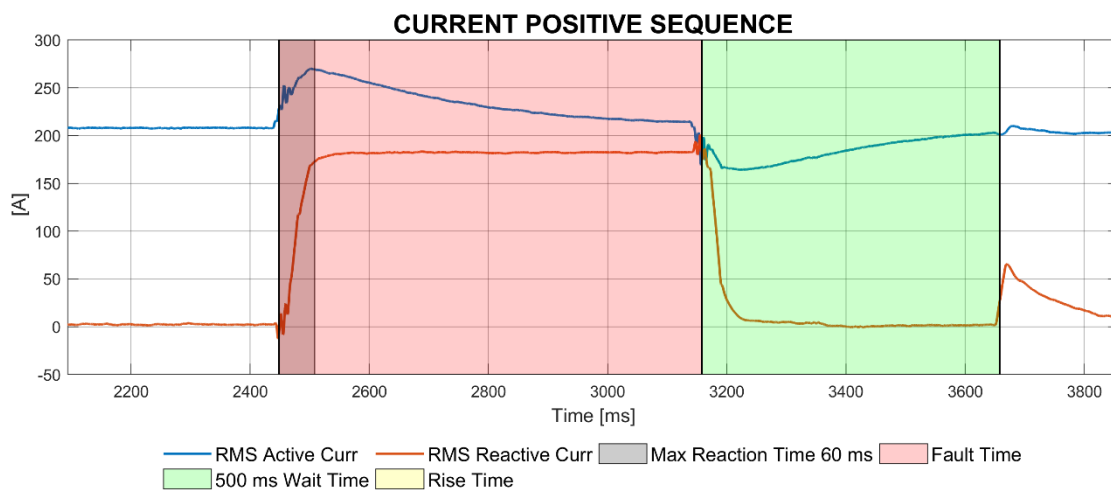
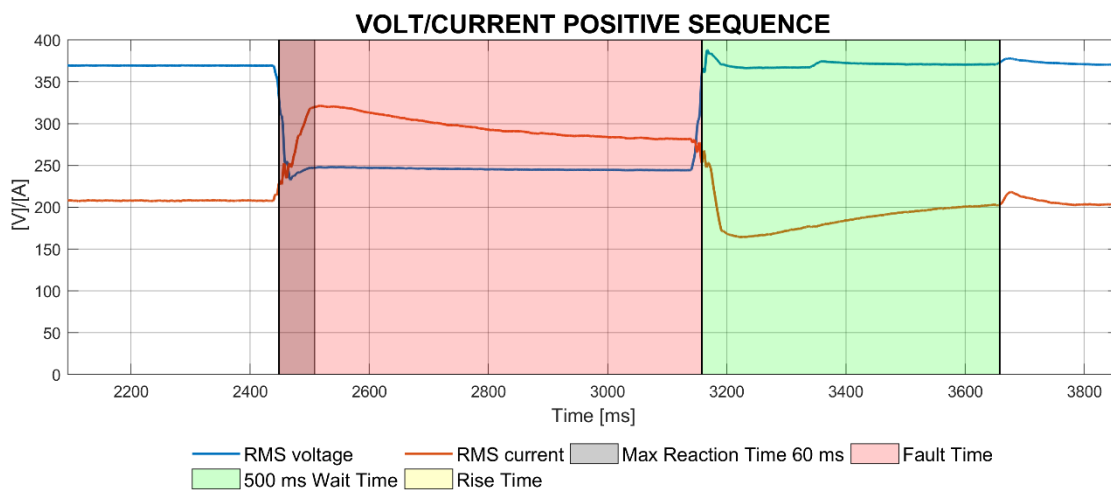




CREI Ven – Padova
Laboratorio Prove
Report n. 177/20/00179/ER

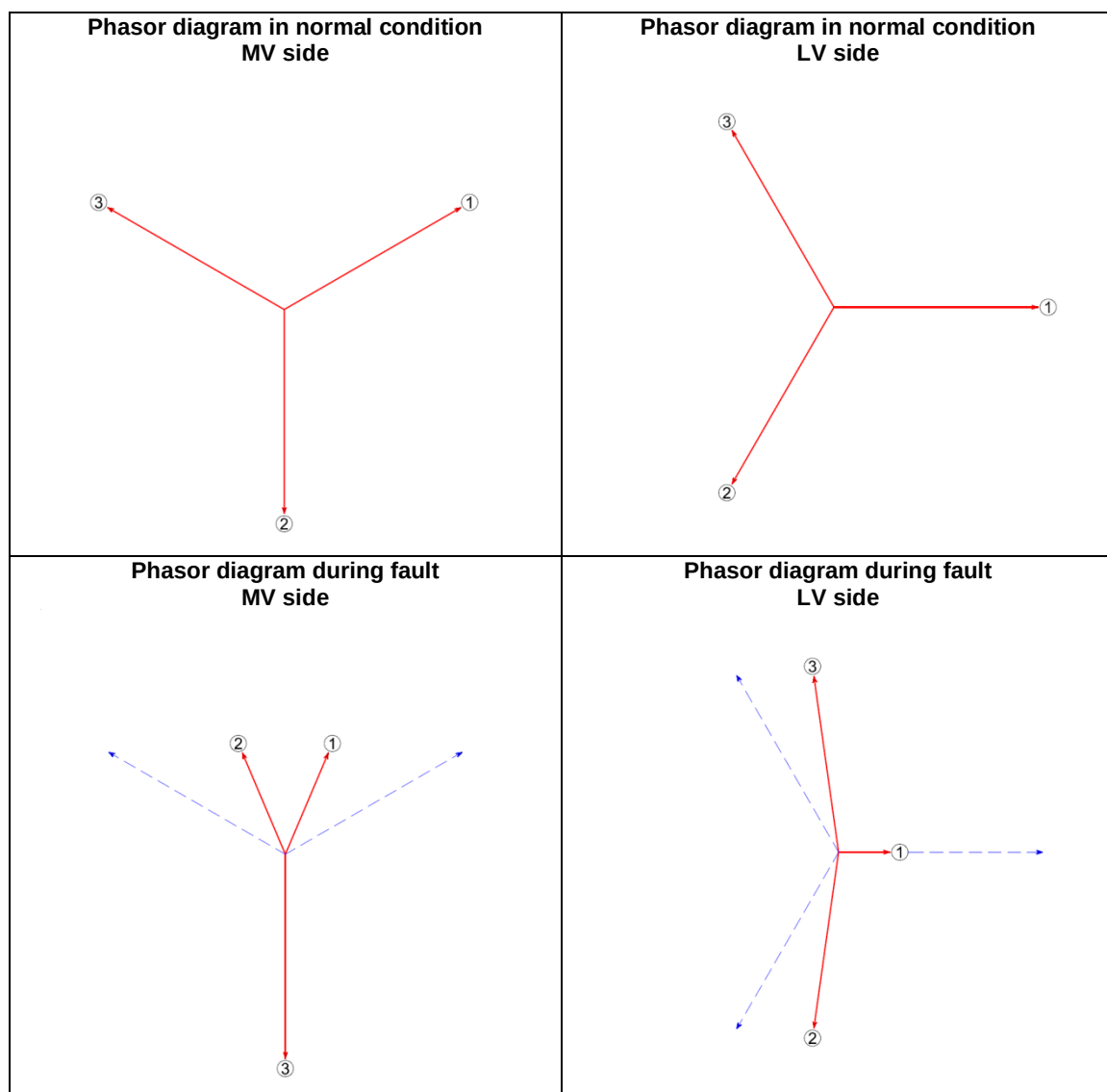






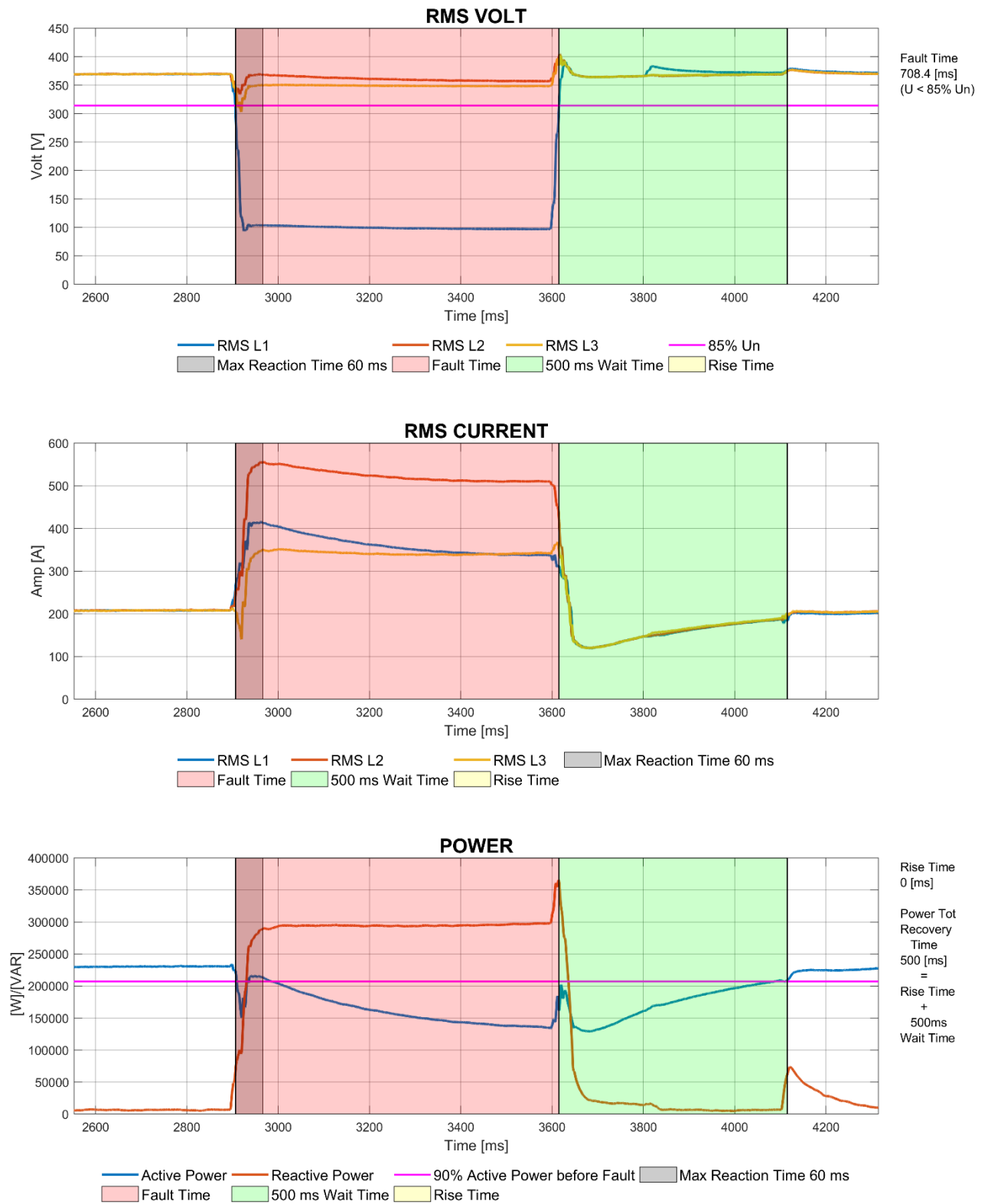


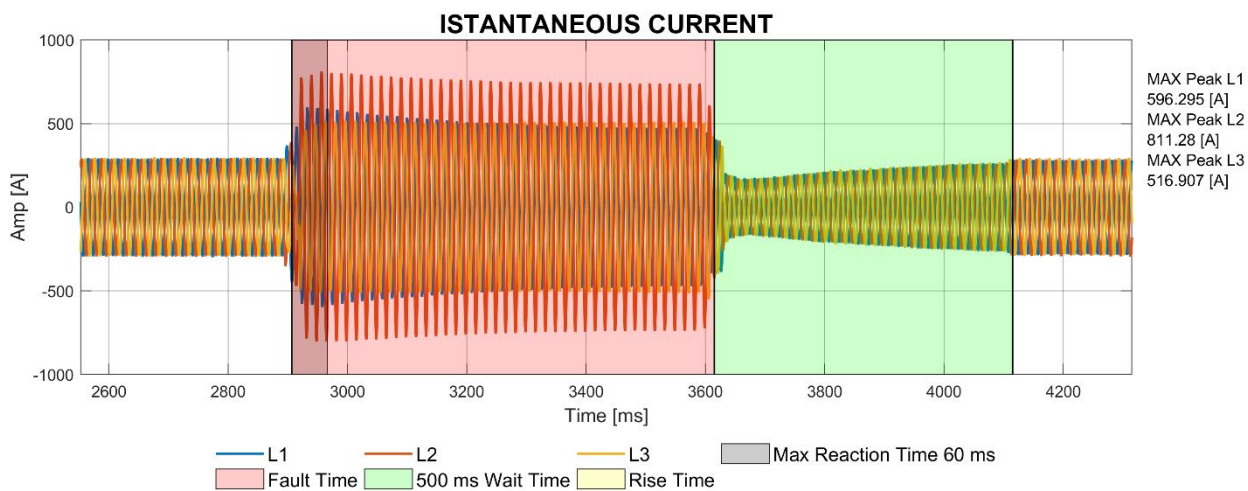
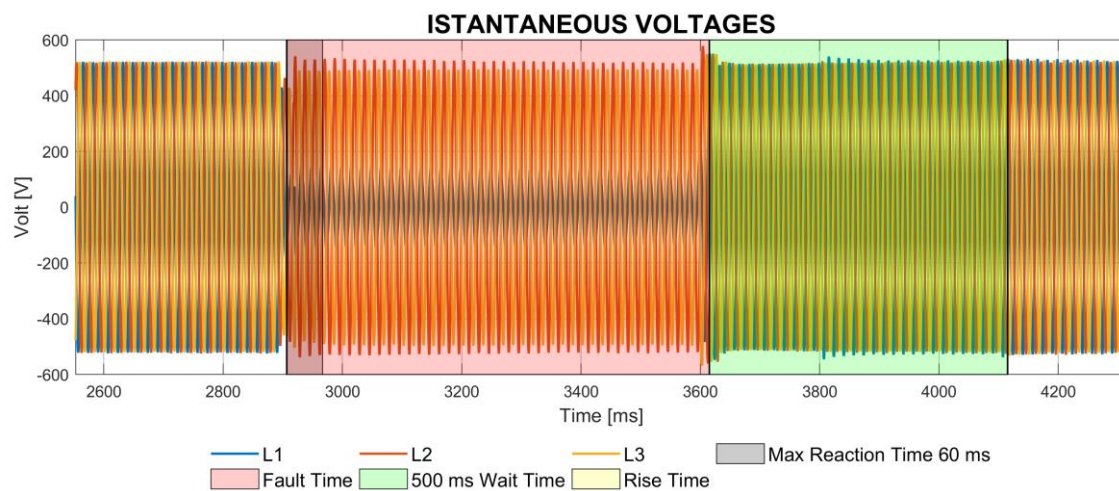
Test N° 25		LVRT - 25% Un - 30% Pn – Asym – K = 2					
Duration (ms): 700 ±20		$V_1/V_{1,nom}$	$V_2/V_{2,nom}$	$V_3/V_{3,nom}$	φ_{V1}	φ_{V2}	φ_{V3}
MV	Normal condition	1	1	1	30°	270°	150°
	During fault	0,54 ±0,05	1	0,54 ±0,05	67°	270°	113°
LV	Normal condition	1	1	1	0°	240°	120°
	During fault	0,25 ±0,05	0,87 ±0,05	0,87 ±0,05	0°	262°	98°

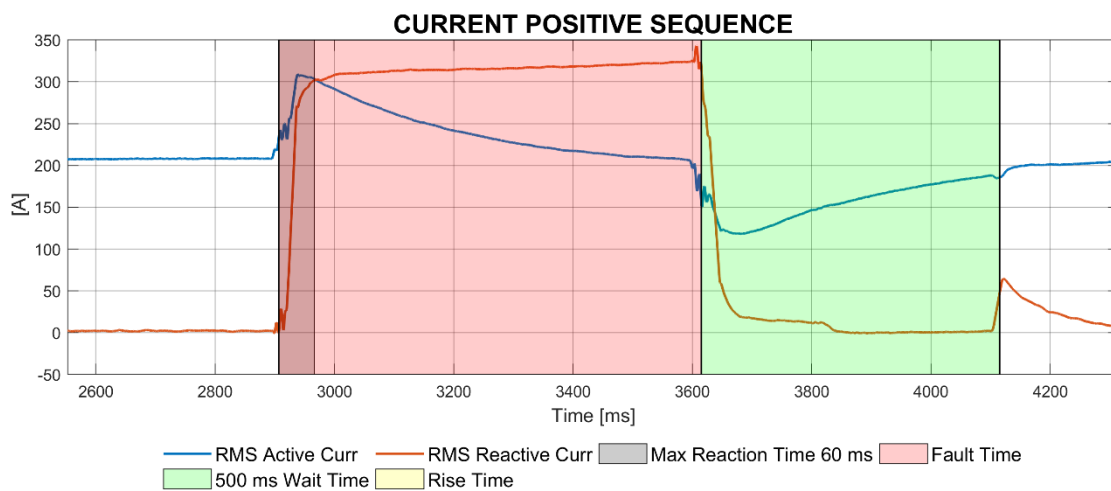
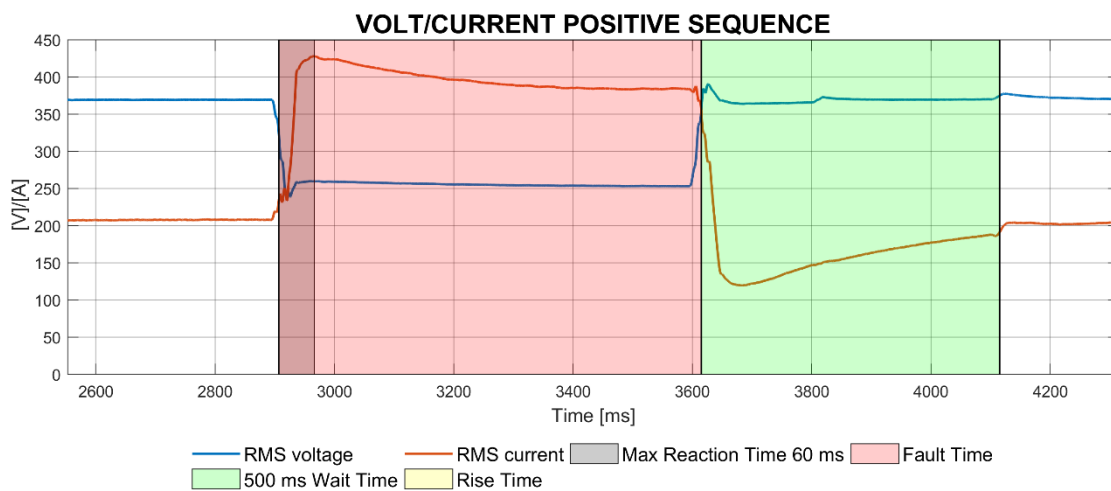




CREI Ven – Padova
Laboratorio Prove
Report n. 177/20/00179/ER

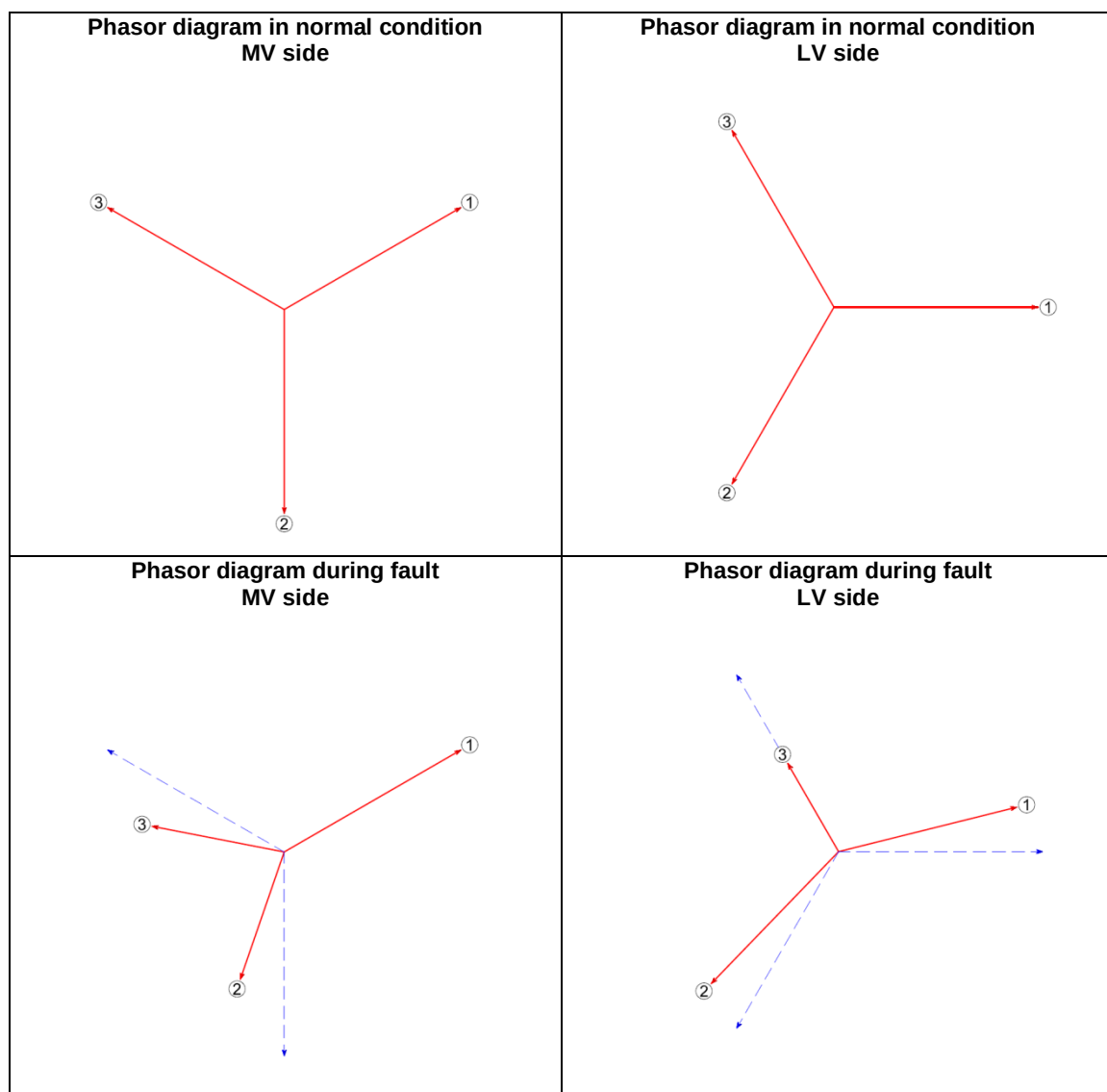






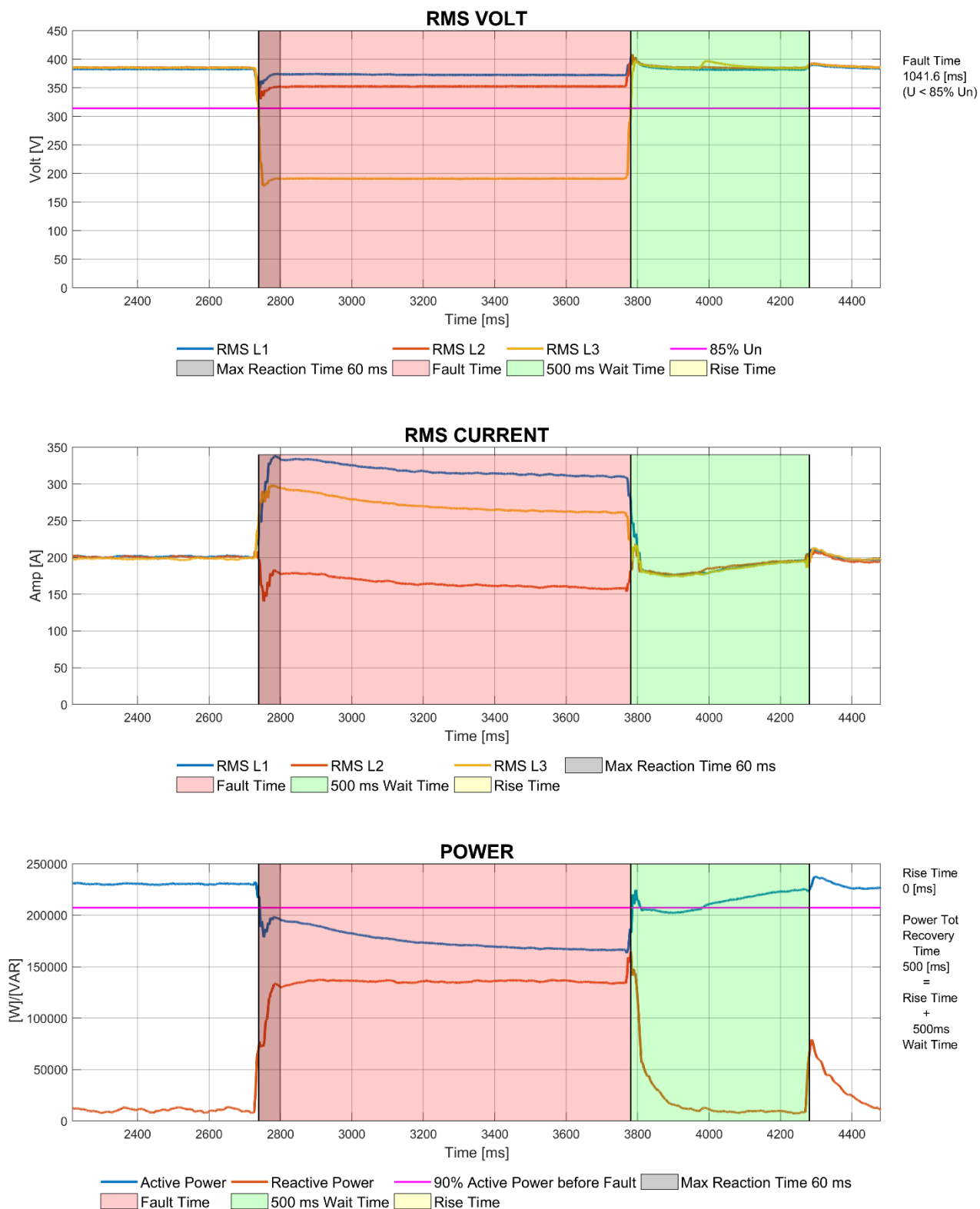


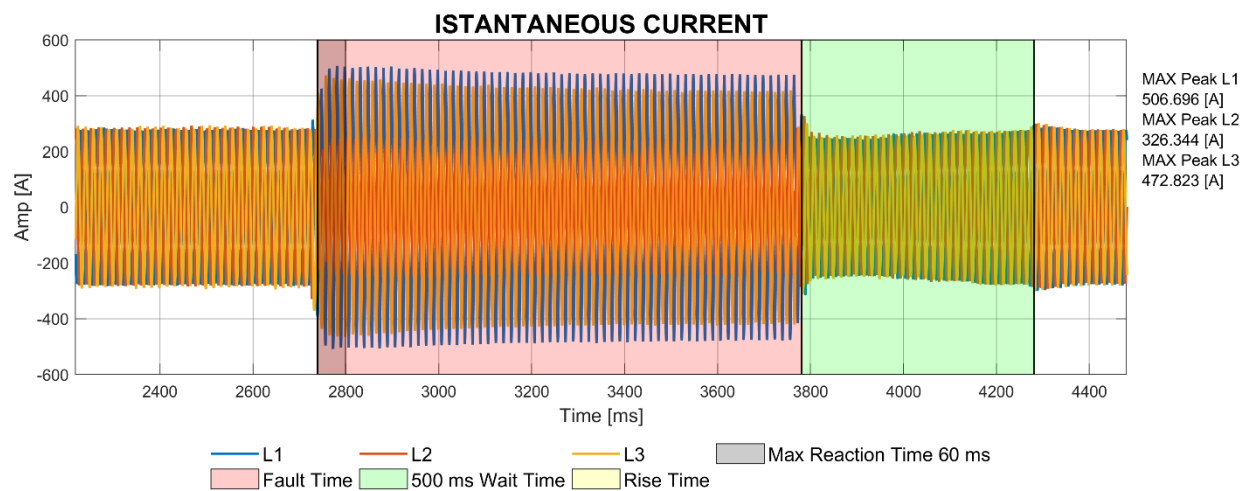
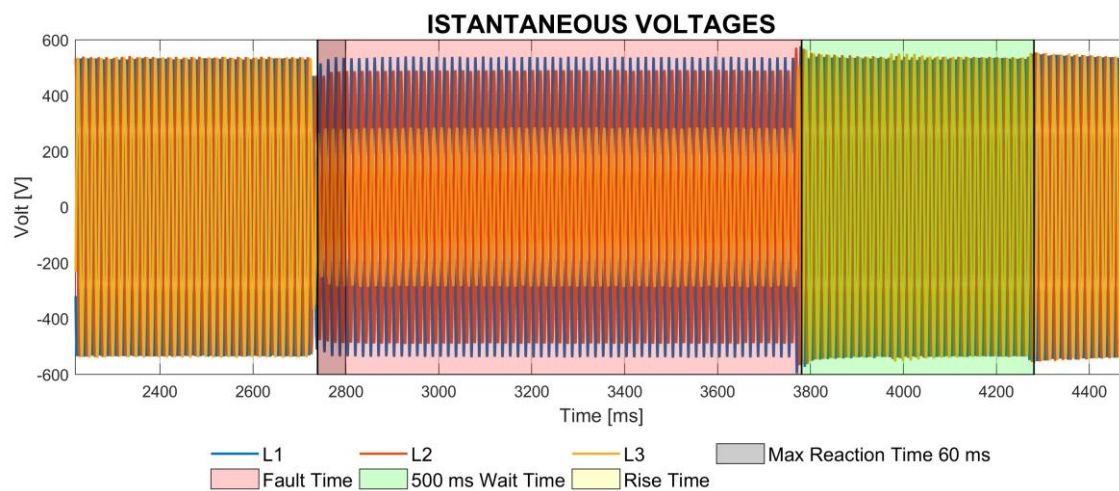
Test N° 26		LVRT - 50% Un - 30% Pn – Asym – K = 1					
Duration (ms): 1030 ±20		$V_1/V_{1,nom}$	$V_2/V_{2,nom}$	$V_3/V_{3,nom}$	φ_{V1}	φ_{V2}	φ_{V3}
MV	Normal condition	1	1	1	30°	270°	150°
	During fault	1	0,66 ±0,05	0,66 ±0,05	30°	251°	169°
LV	Normal condition	1	1	1	0°	240°	120°
	During fault	0,90 ±0,05	0,90 ±0,05	0,50 ±0,05	14°	226°	120°

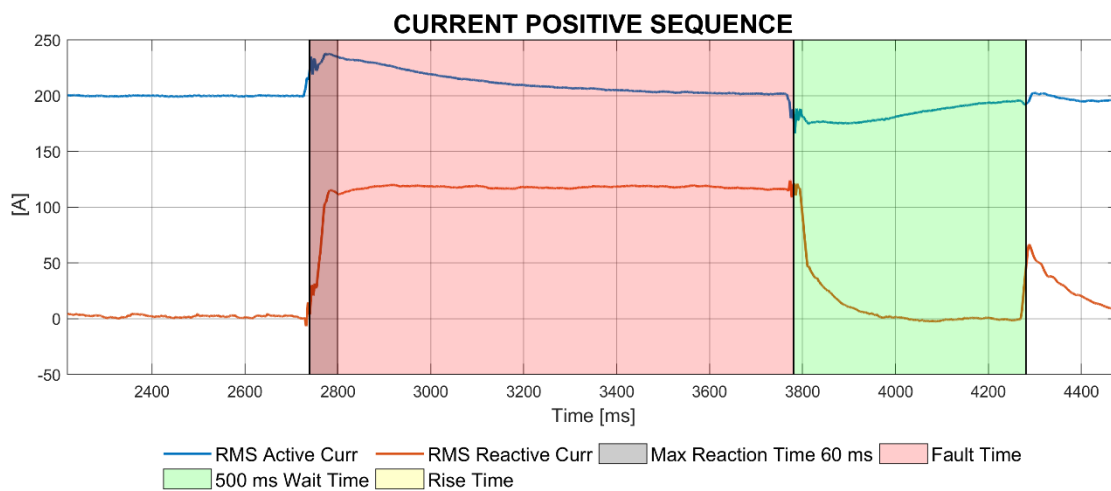
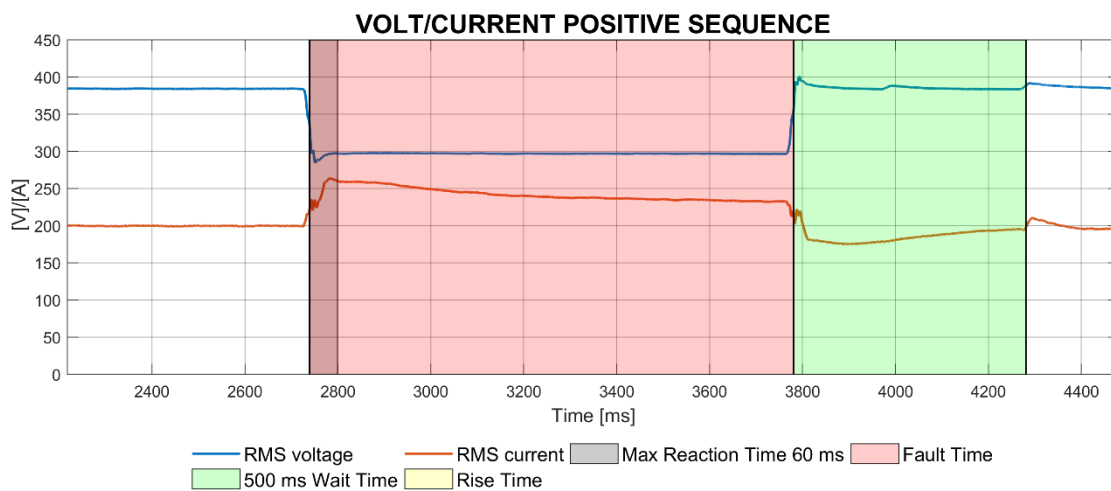




CREI Ven – Padova
Laboratorio Prove
Report n. 177/20/00179/ER

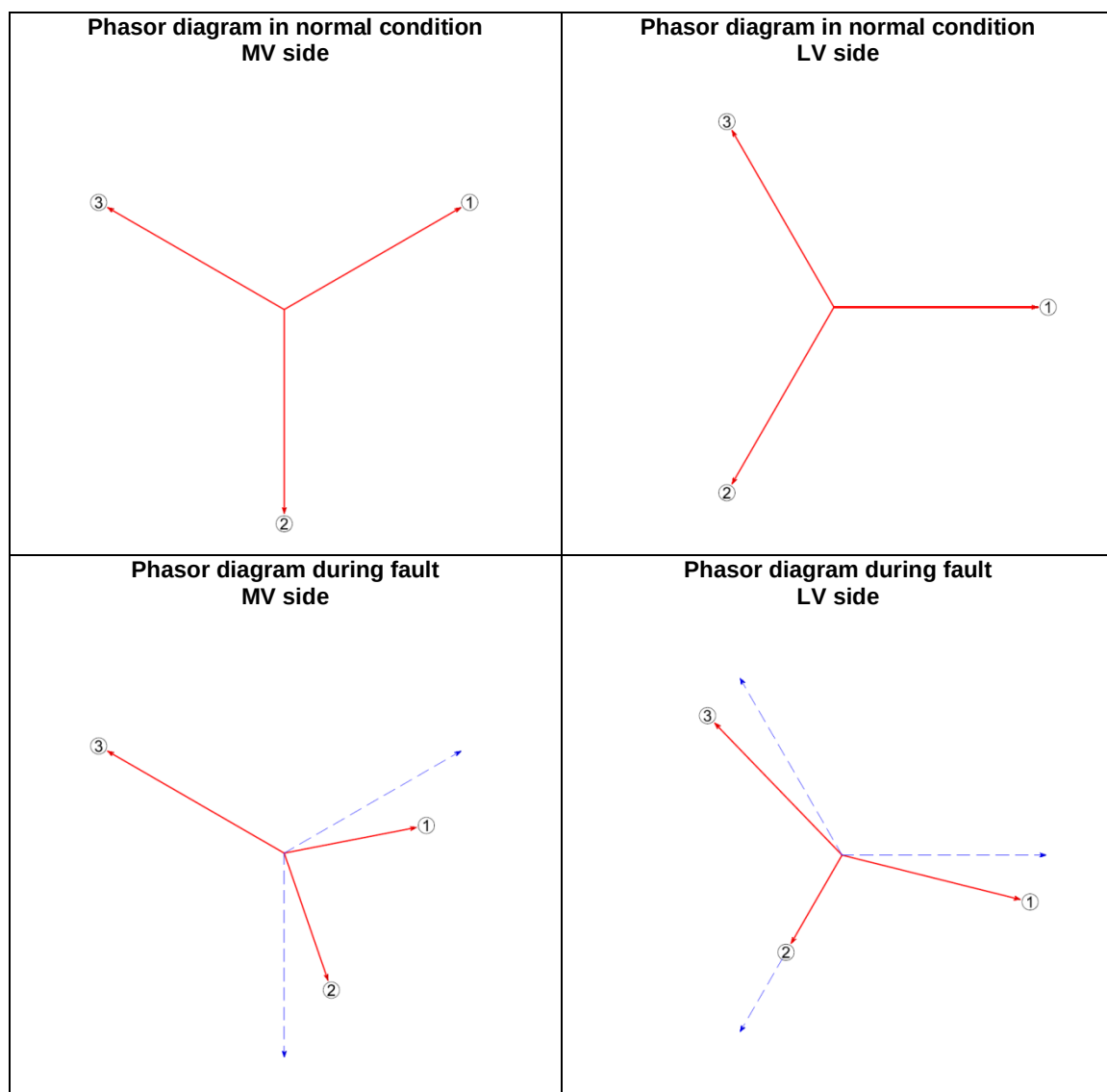


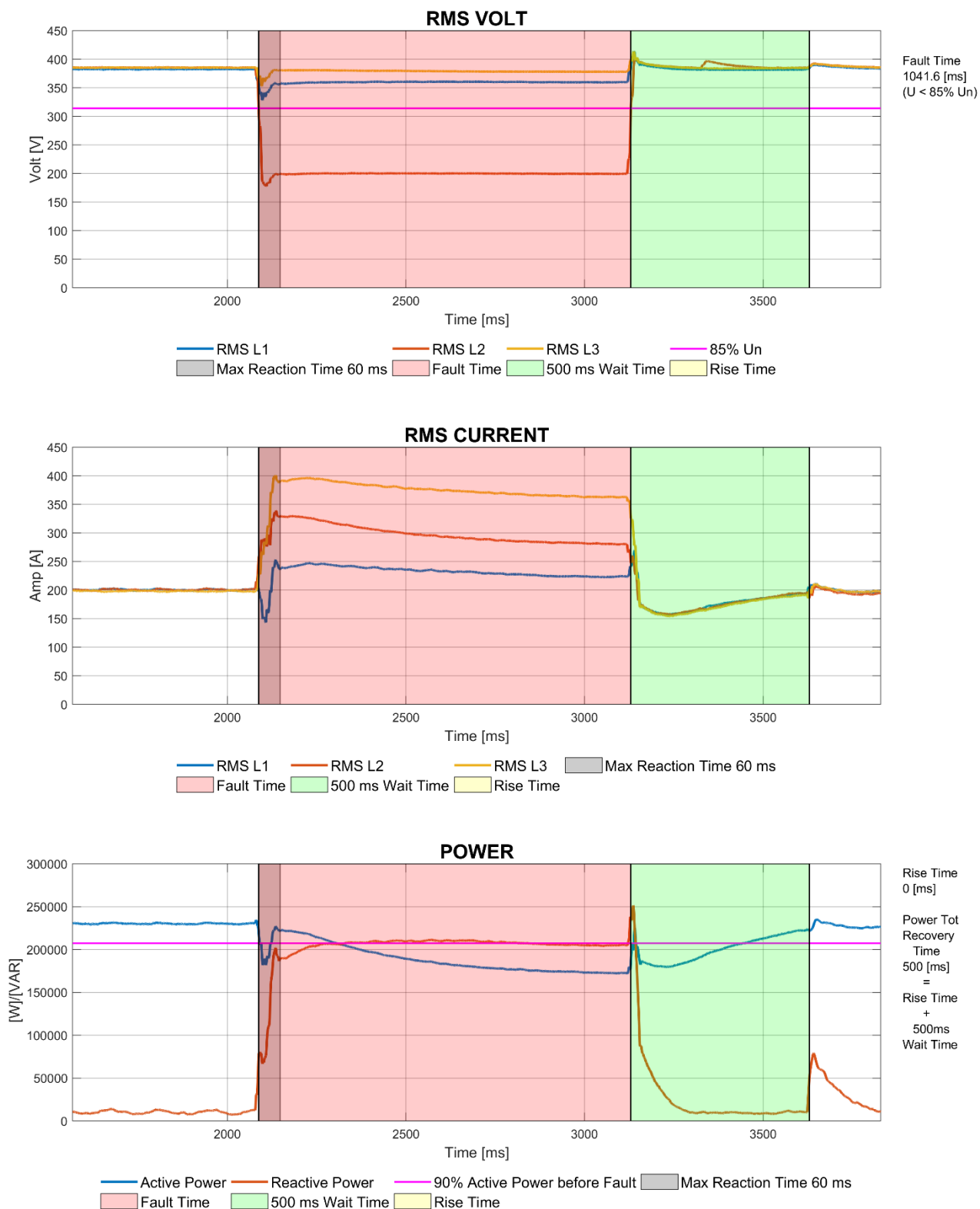


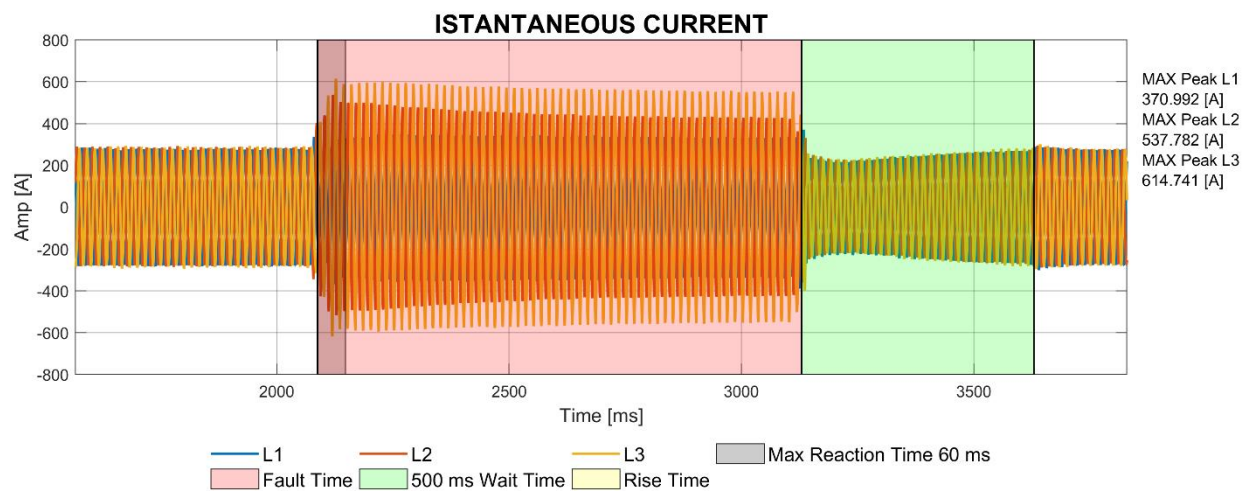
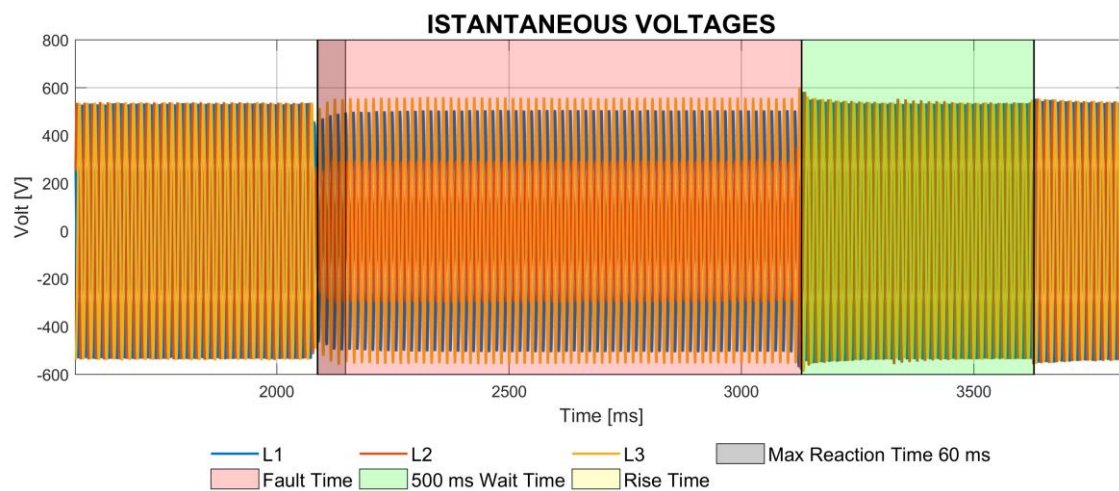


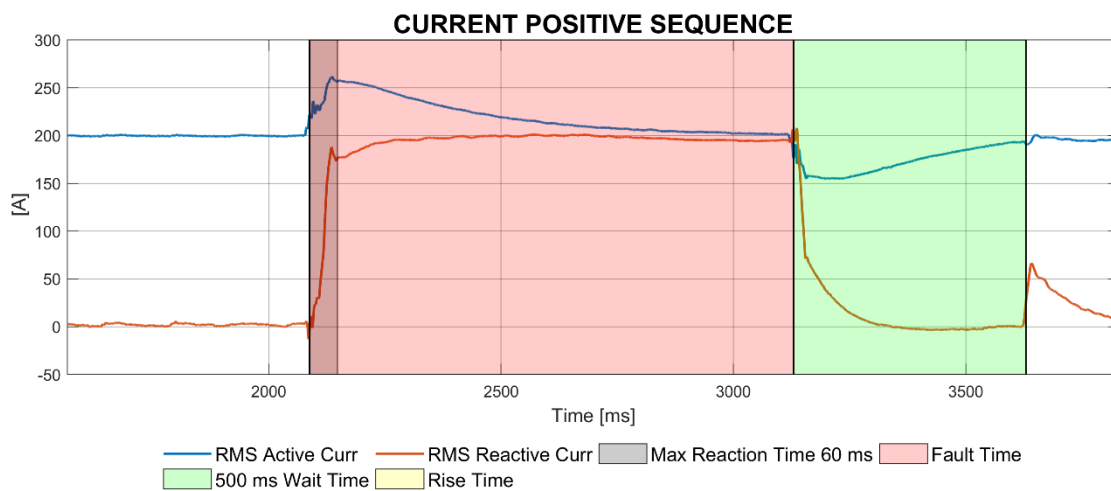
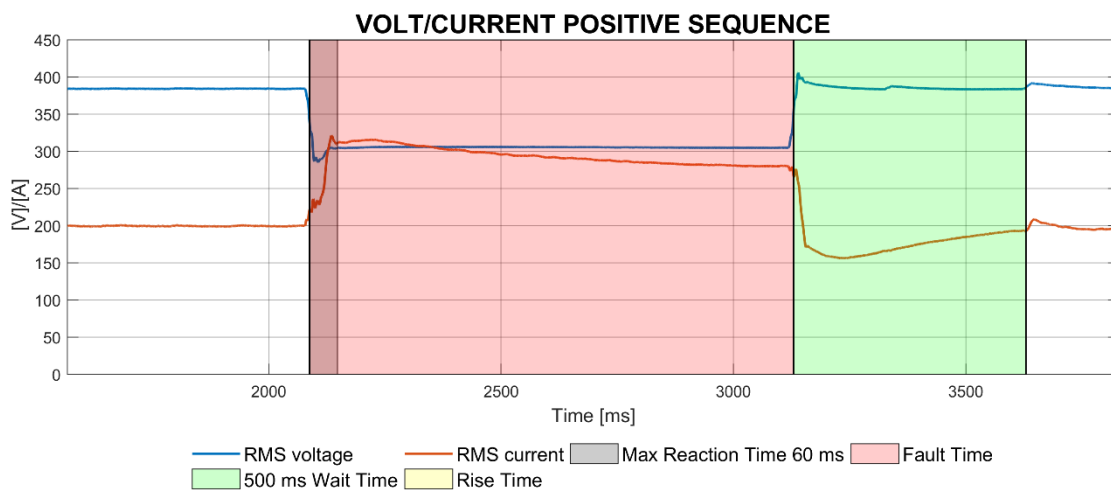


Test N° 27		LVRT - 50% Un - 30% Pn – Asym – K = 2					
Duration (ms): 1030 ±20		$V_1/V_{1,nom}$	$V_2/V_{2,nom}$	$V_3/V_{3,nom}$	φ_{V1}	φ_{V2}	φ_{V3}
MV	Normal condition	1	1	1	30°	270°	150°
	During fault	0,66 ±0,05	0,66 ±0,05	1	11°	289°	150°
LV	Normal condition	1	1	1	0°	240°	120°
	During fault	0,90 ±0,05	0,50 ±0,05	0,90 ±0,05	346°	240°	134°



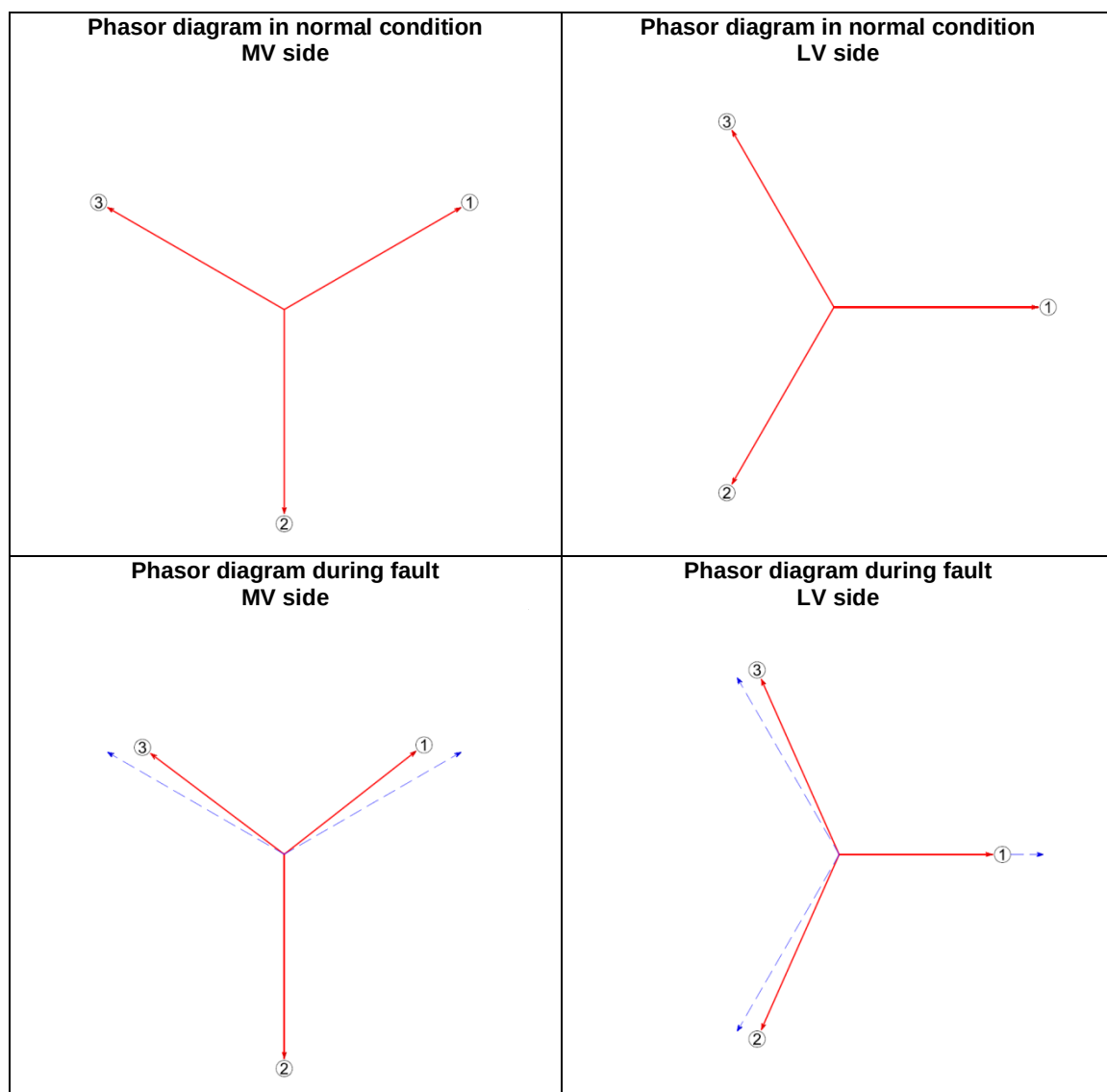






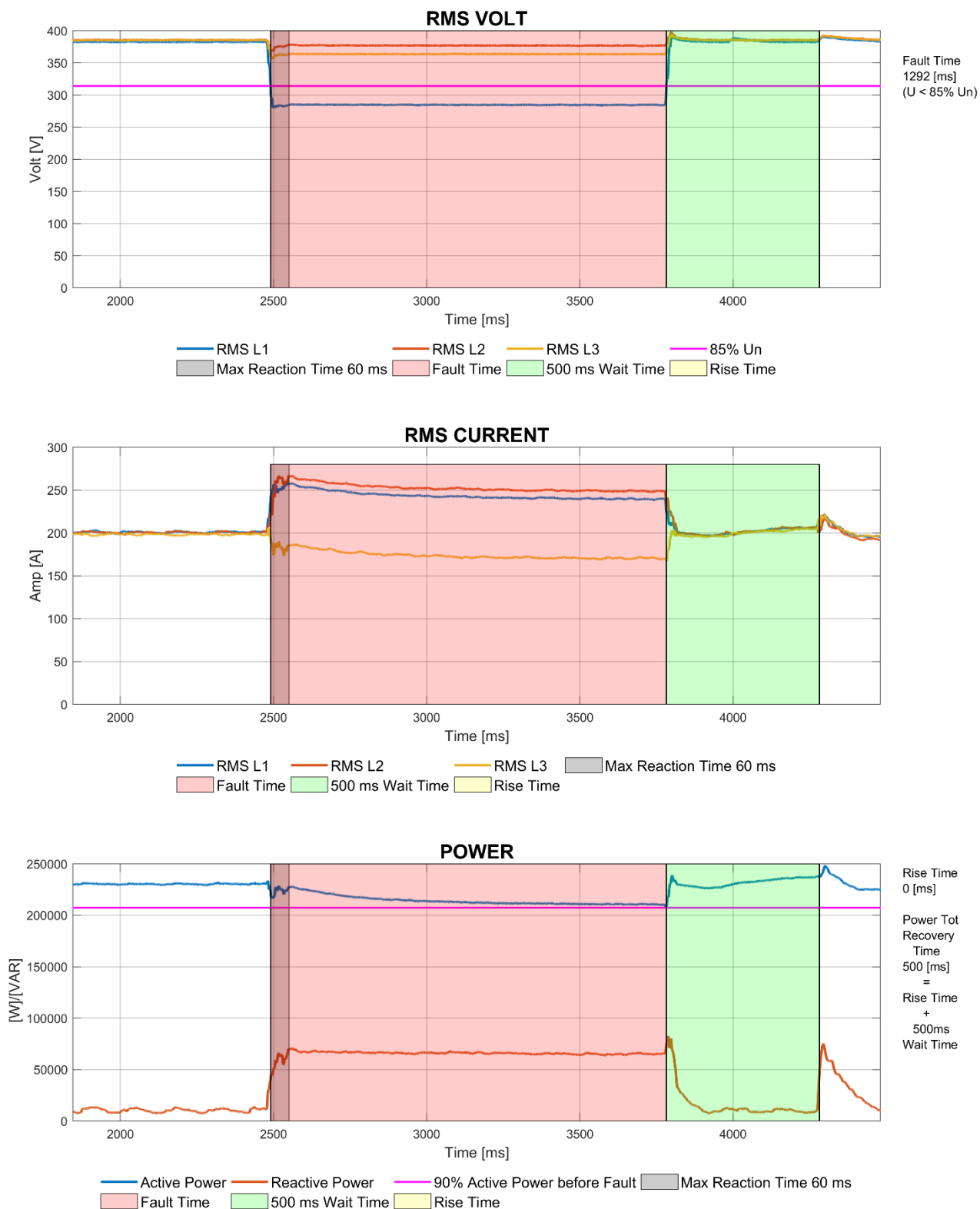


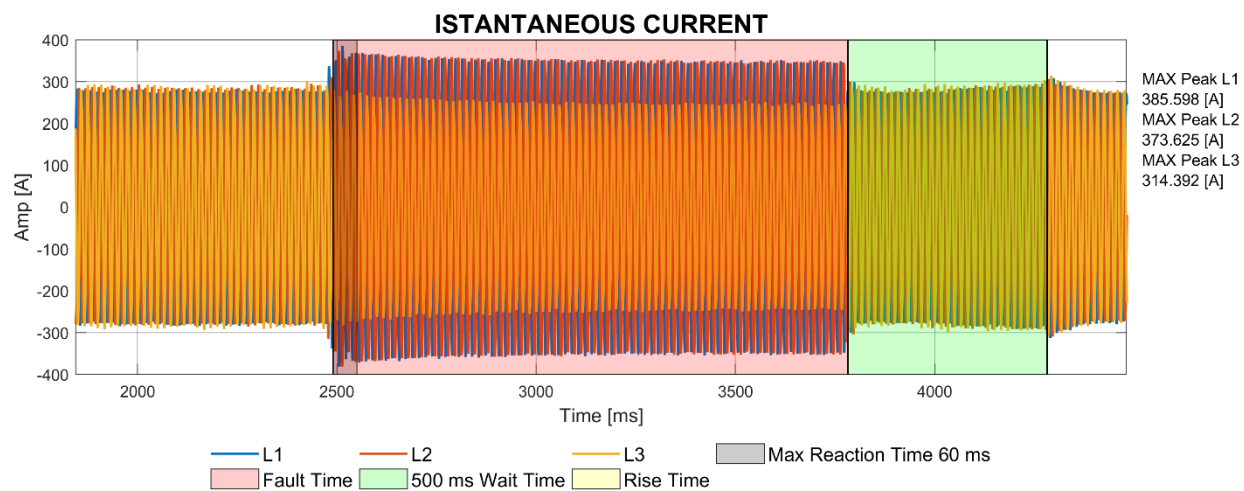
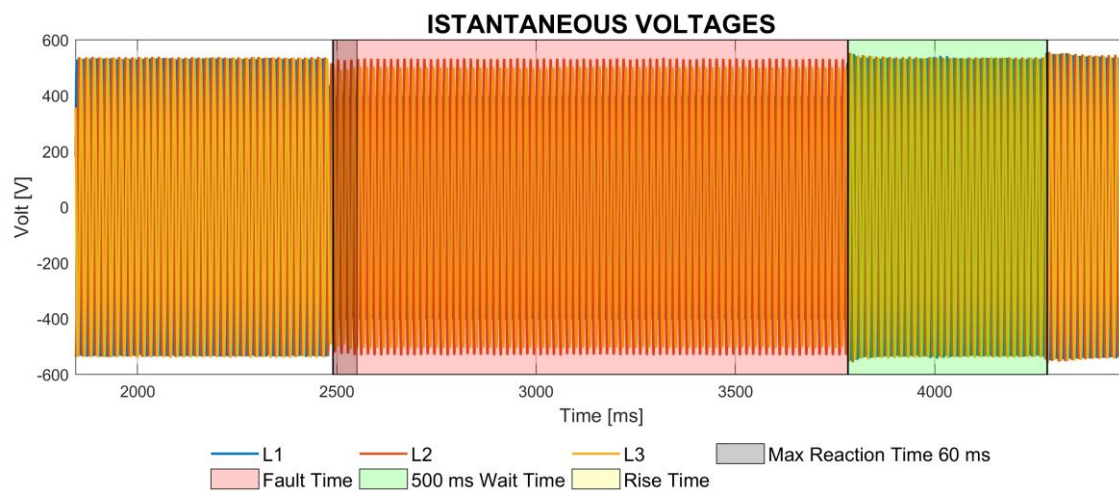
Test N° 28		LVRT - 75% Un - 30% Pn – Asym – K = 1					
Duration (ms): 1300 ±20		$V_1/V_{1,nom}$	$V_2/V_{2,nom}$	$V_3/V_{3,nom}$	φ_{V1}	φ_{V2}	φ_{V3}
MV	Normal condition	1	1	1	30°	270°	150°
	During fault	0,82 ±0,05	1	0,82 ±0,05	37°	270°	143°
LV	Normal condition	1	1	1	0°	240°	120°
	During fault	0,75 ±0,05	0,94 ±0,05	0,94 ±0,05	0°	246*	114°

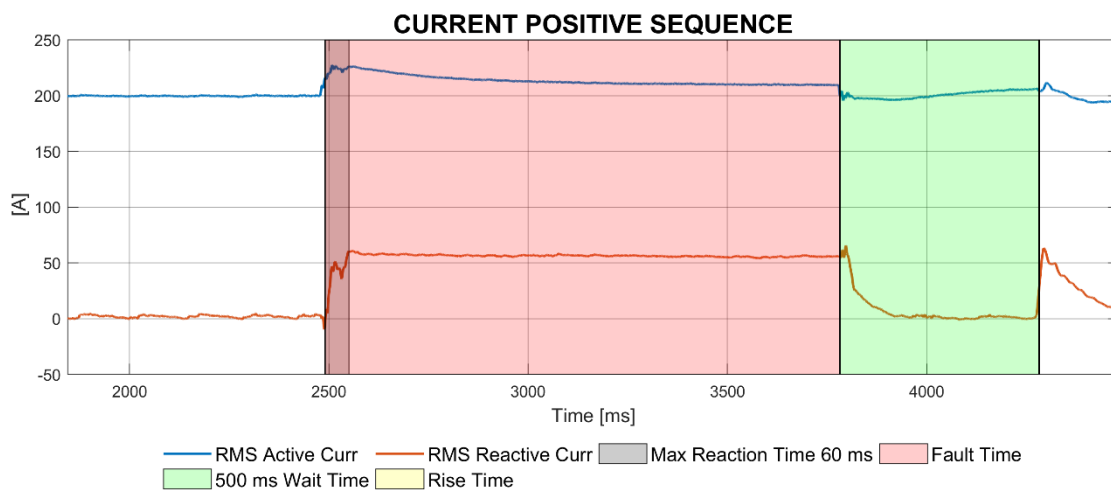
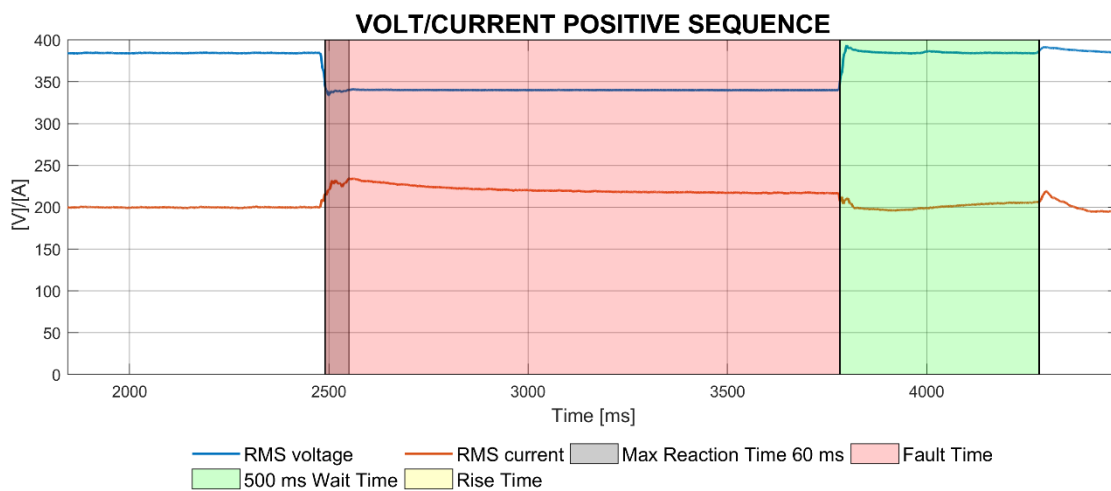




CREI Ven – Padova
Laboratorio Prove
Report n. 177/20/00179/ER

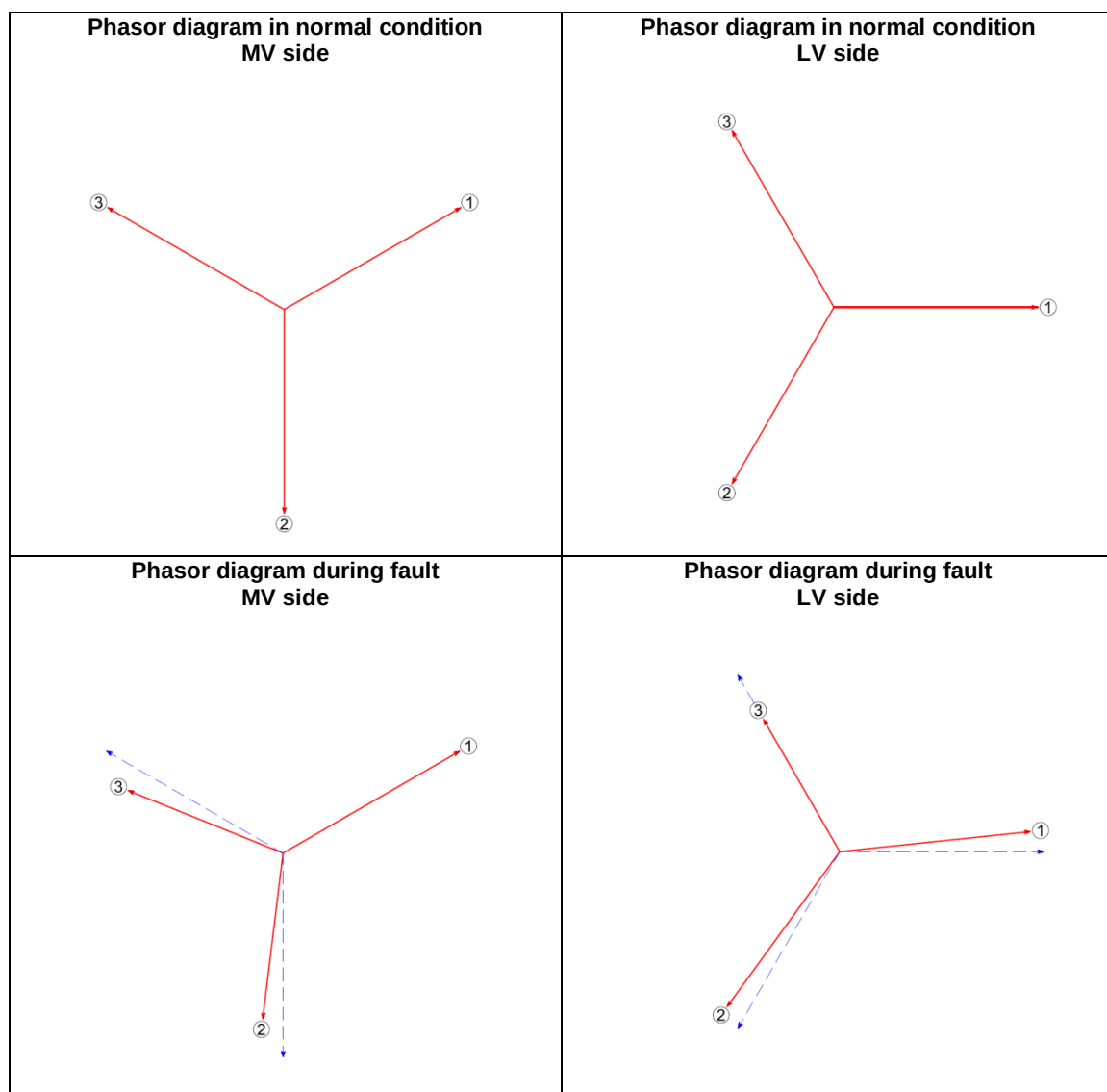








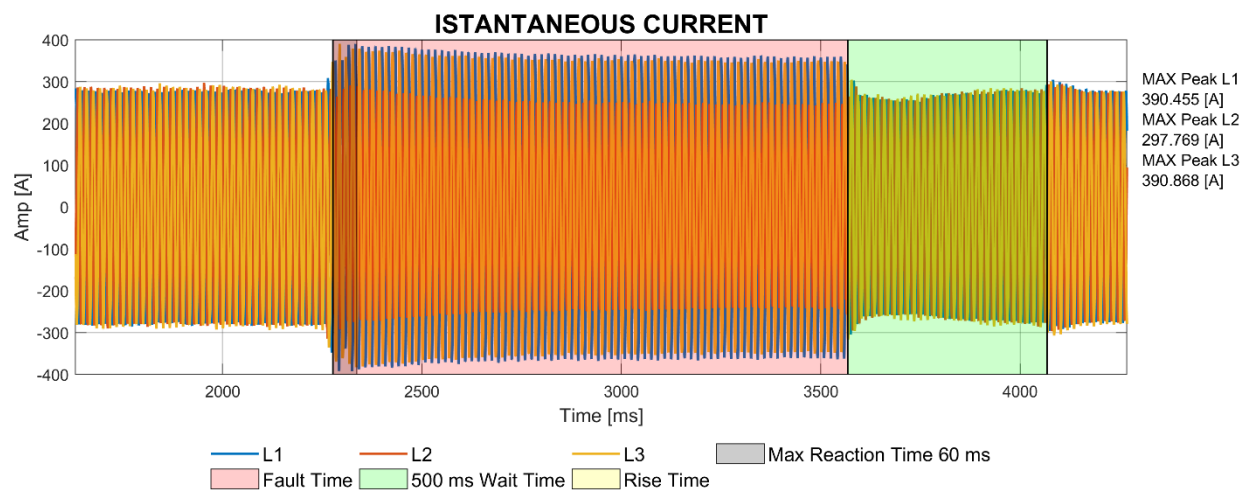
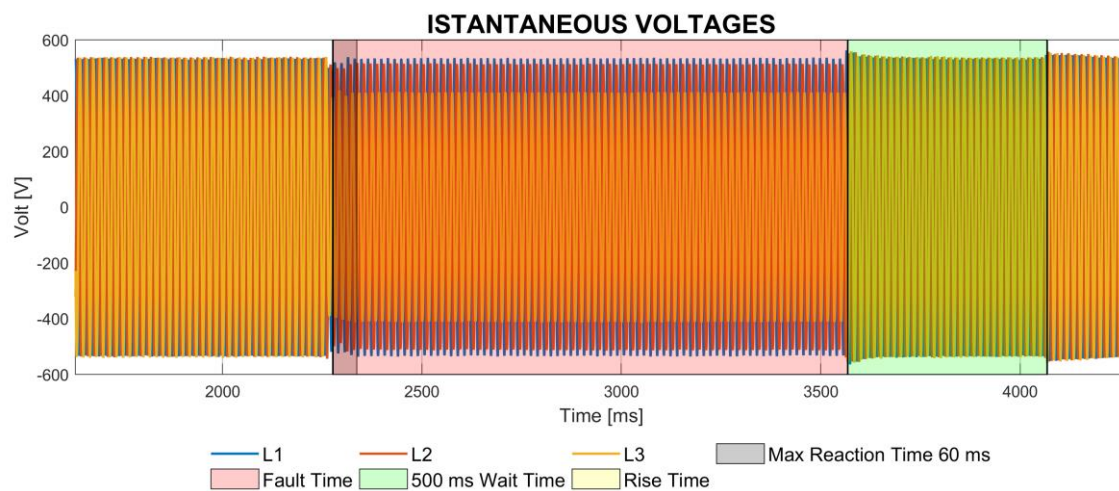
Test N° 29		LVRT - 75% Un - 30% Pn – Asym – K = 2					
Duration (ms): 1300 ±20		$V_1/V_{1,nom}$	$V_2/V_{2,nom}$	$V_3/V_{3,nom}$	φ_{V1}	φ_{V2}	φ_{V3}
MV	Normal condition	1	1	1	30°	270°	150°
	During fault	1	0,82 ±0,05	0,82 ±0,05	30°	263°	158°
LV	Normal condition	1	1	1	0°	240°	120°
	During fault	0,94 ±0,05	0,94 ±0,05	0,75 ±0,05	6°	234°	120°

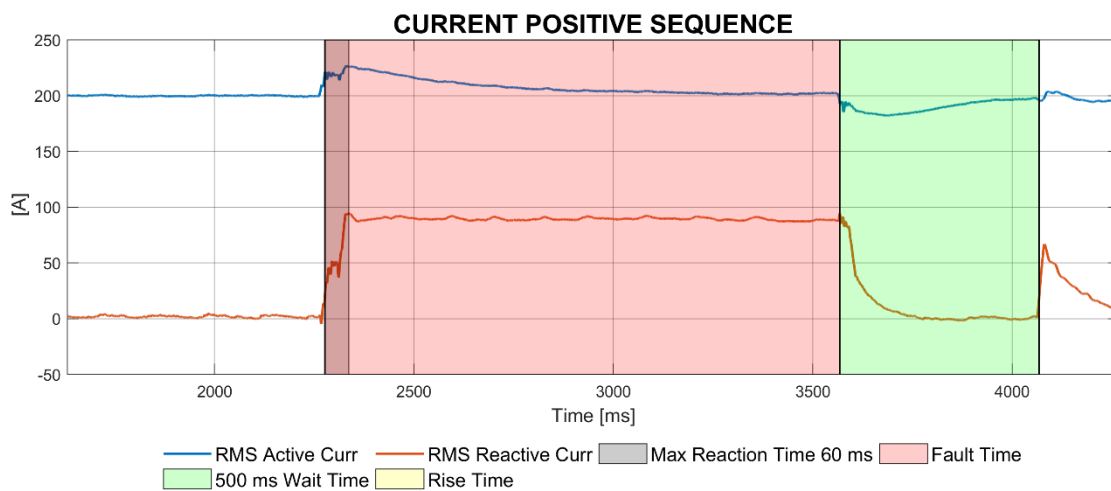
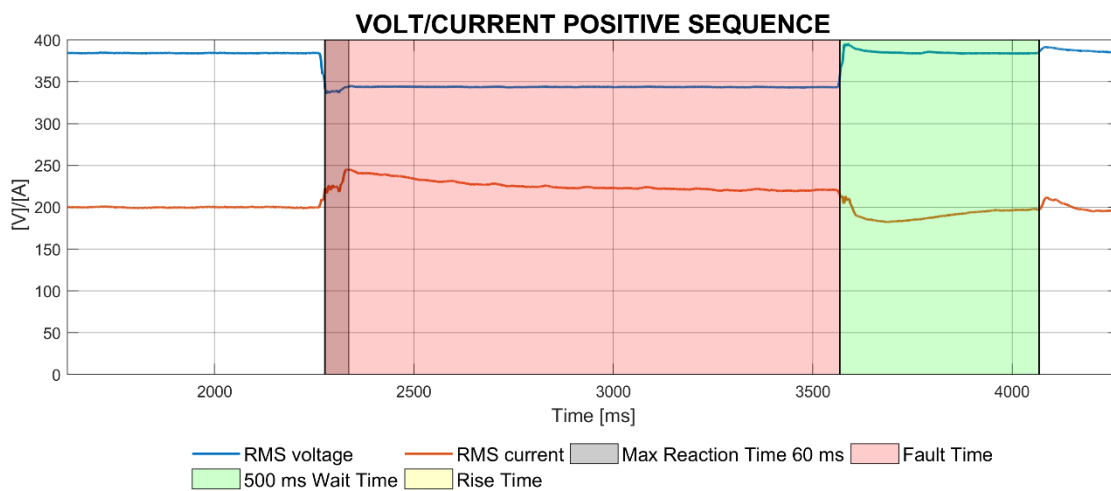




CREI Ven – Padova
Laboratorio Prove
Report n. 177/20/00179/ER

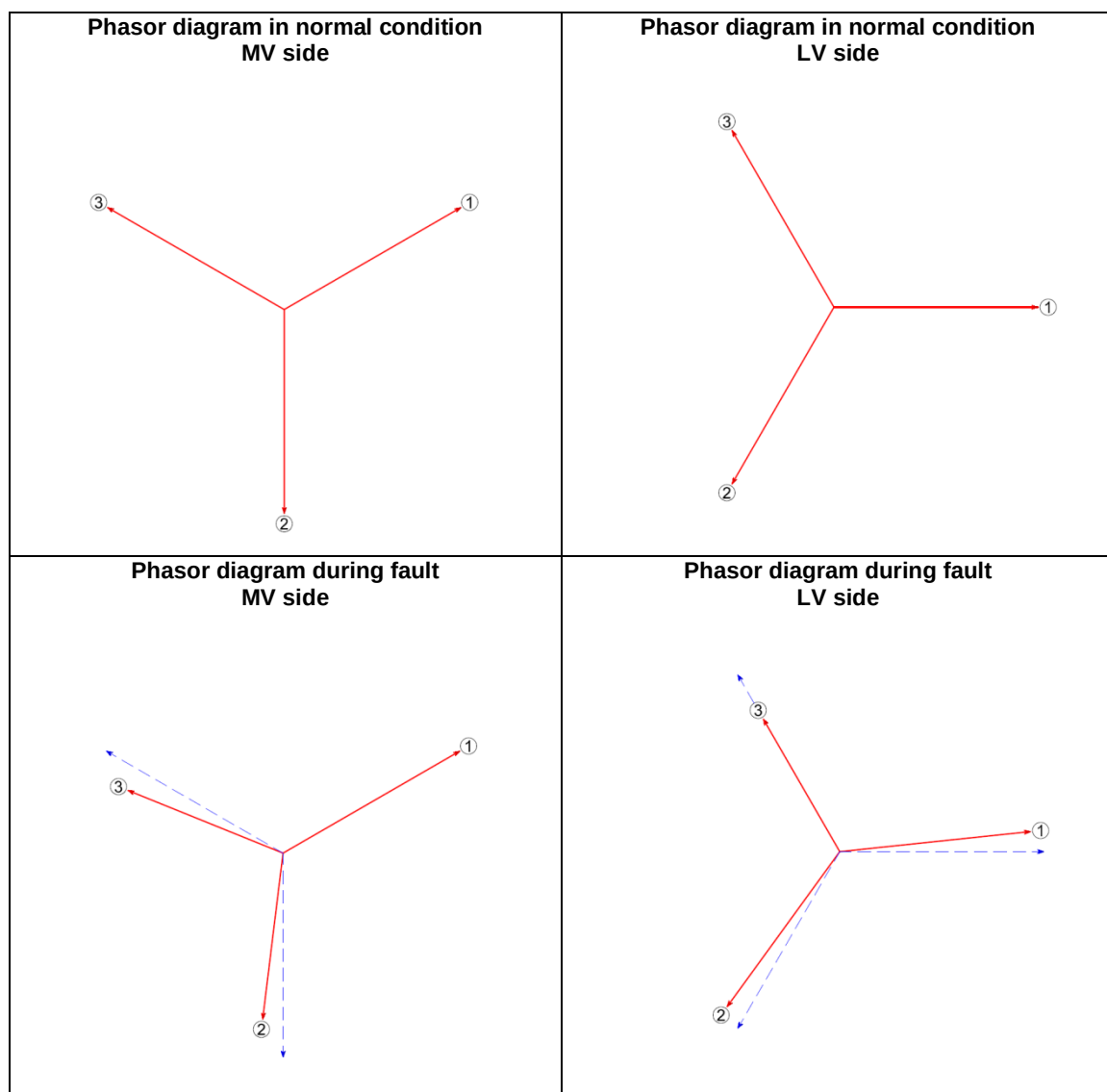






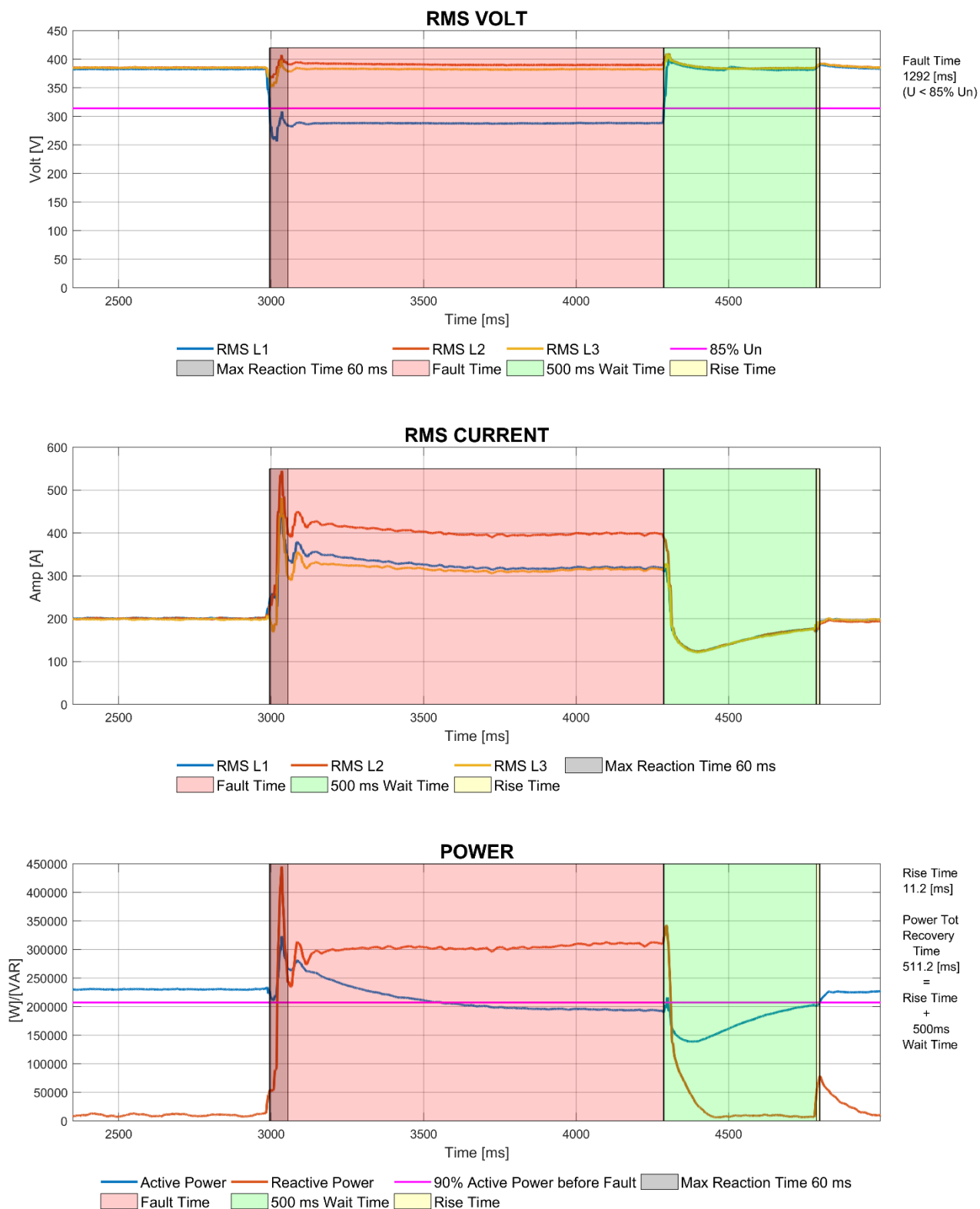


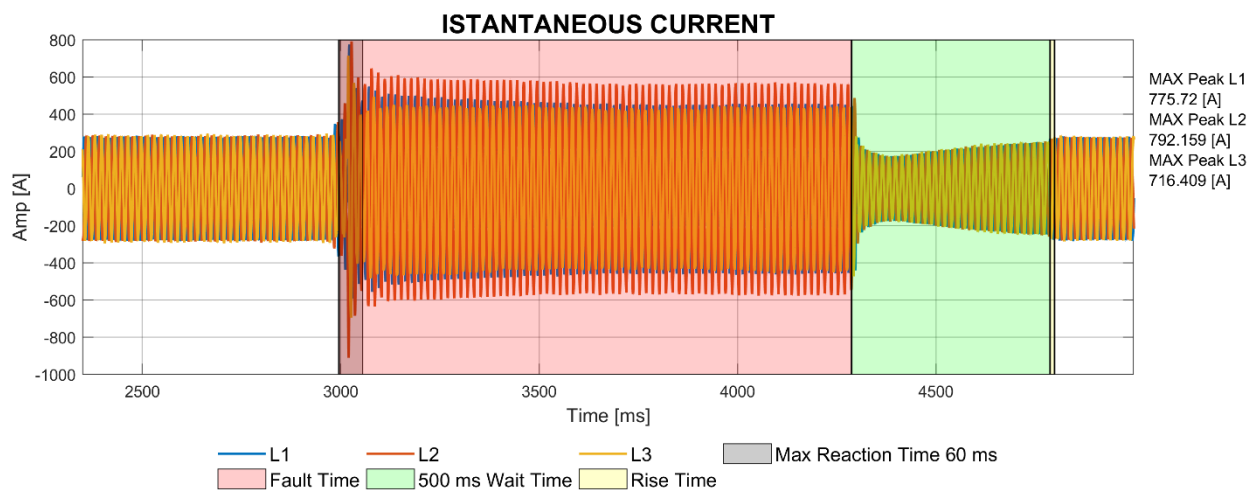
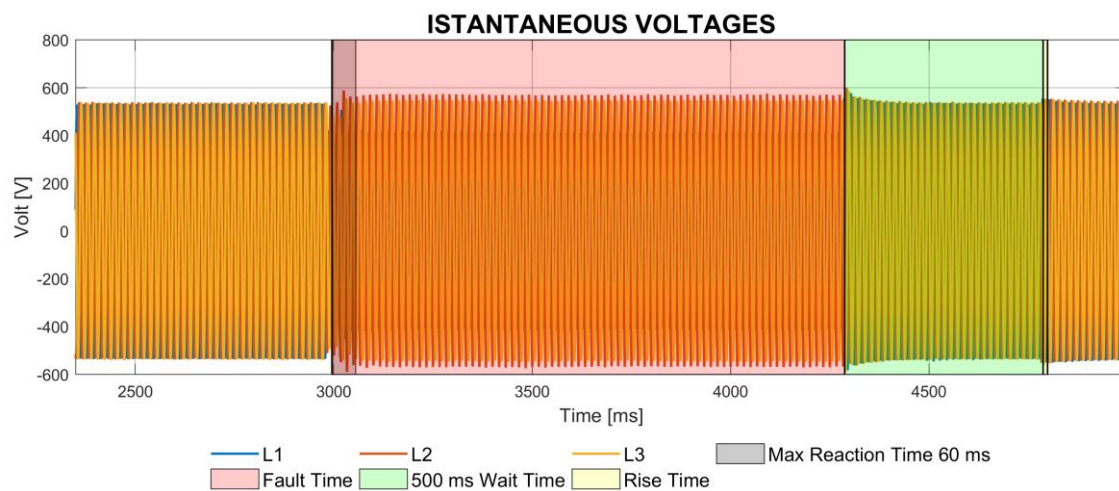
Test N° 30		LVRT - 75% Un - 30% Pn – Asym – K = 10					
Duration (ms): 1300 ±20		$V_1/V_{1,nom}$	$V_2/V_{2,nom}$	$V_3/V_{3,nom}$	φ_{V1}	φ_{V2}	φ_{V3}
MV	Normal condition	1	1	1	30°	270°	150°
	During fault	0,82 ±0,05	1	0,82 ±0,05	37°	270°	143°
LV	Normal condition	1	1	1	0°	240°	120°
	During fault	0,75 ±0,05	0,94 ±0,05	0,94 ±0,05	0°	246*	114°

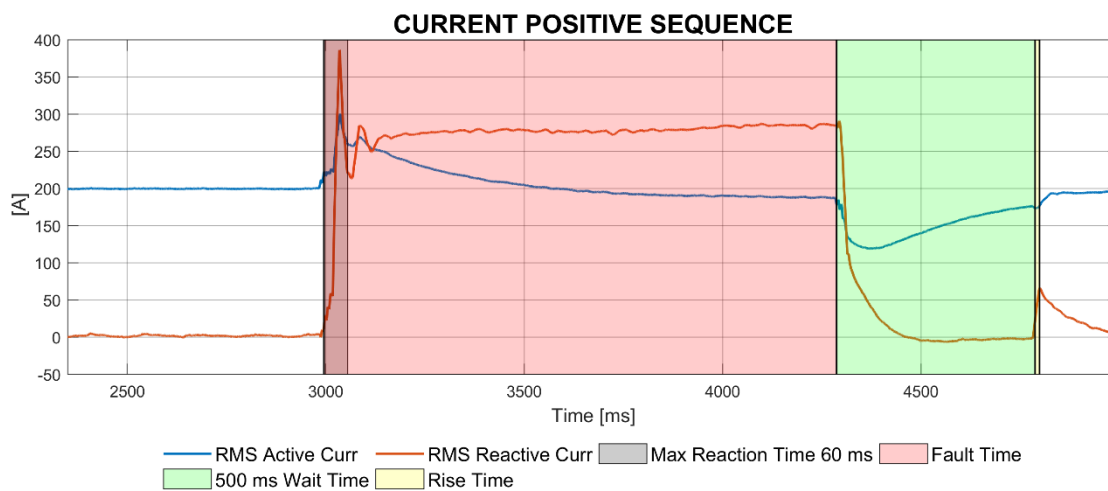
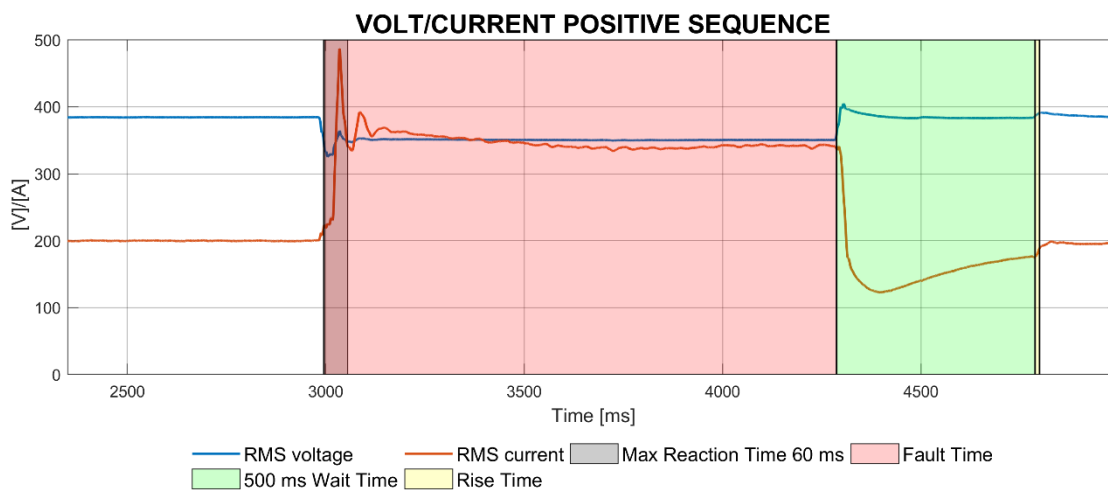




CREI Ven – Padova
Laboratorio Prove
Report n. 177/20/00179/ER

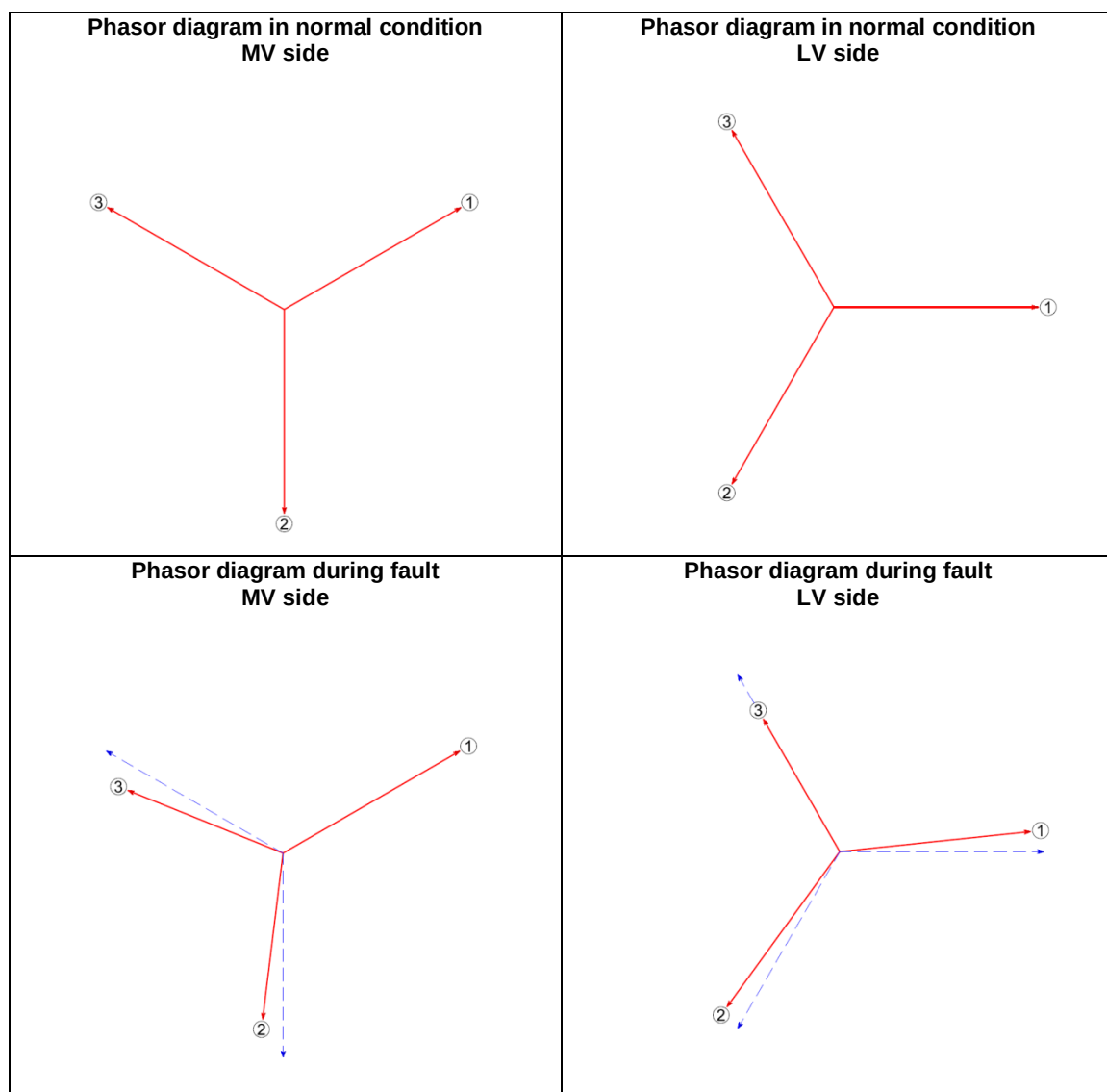






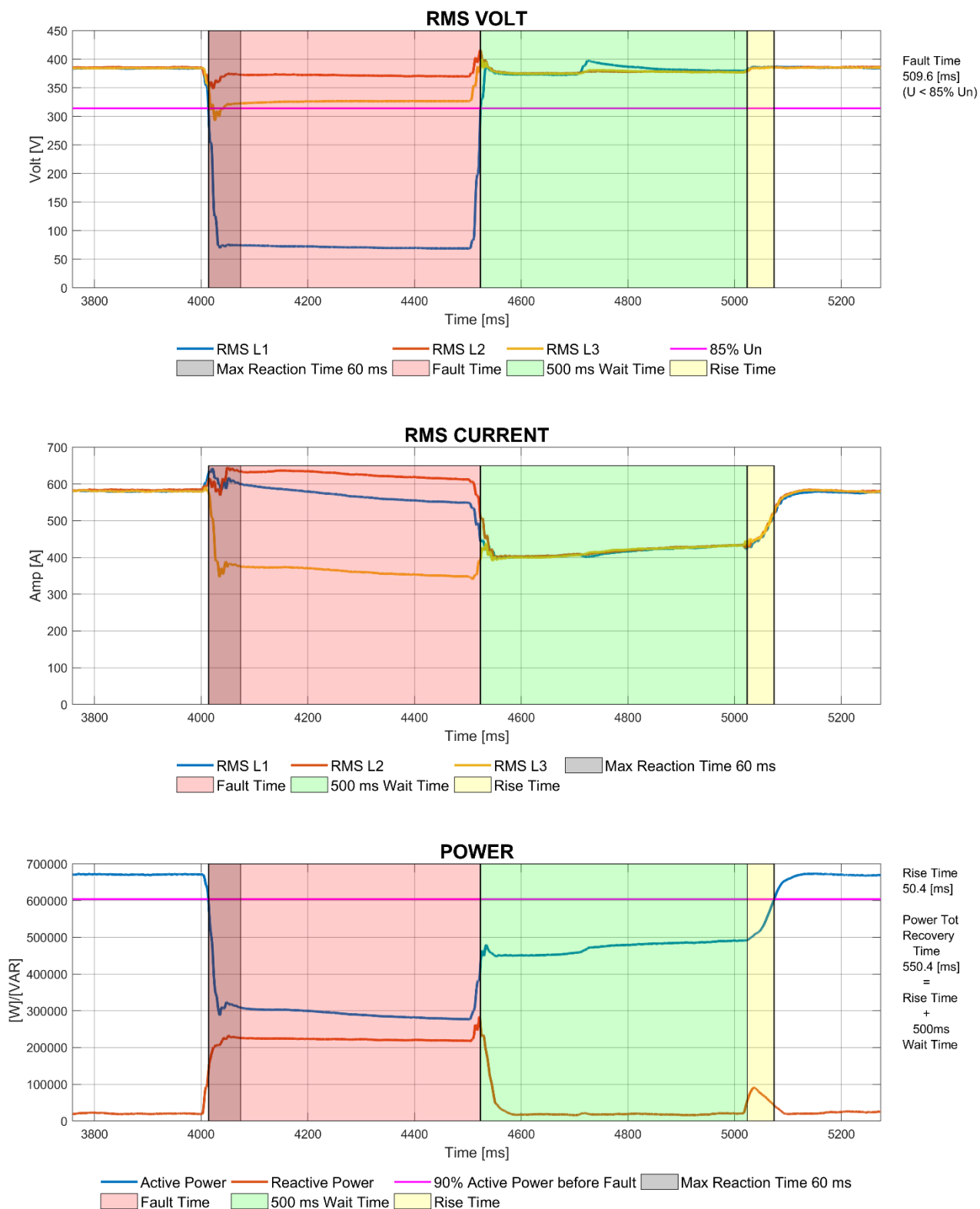


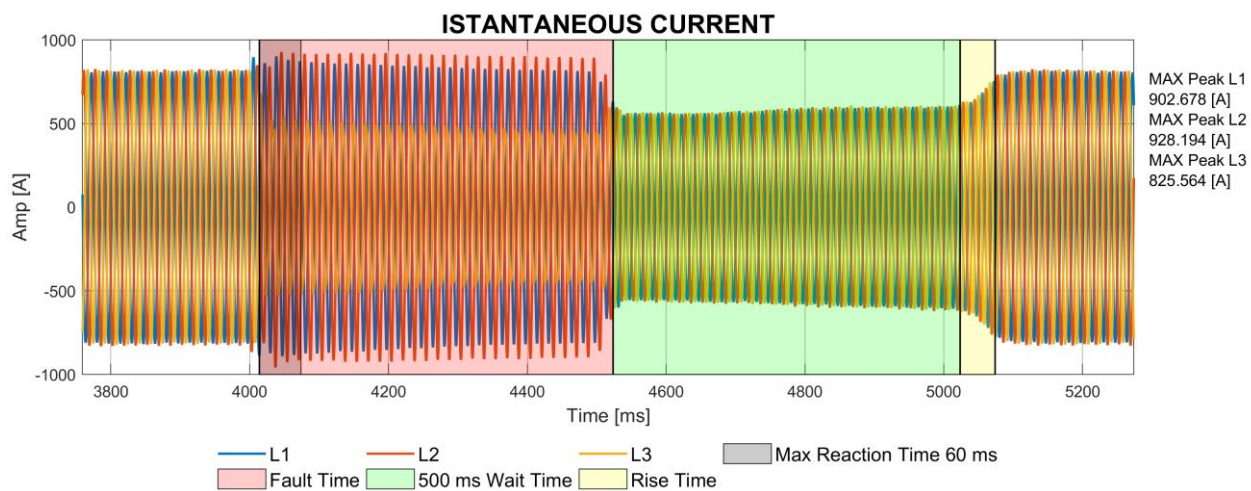
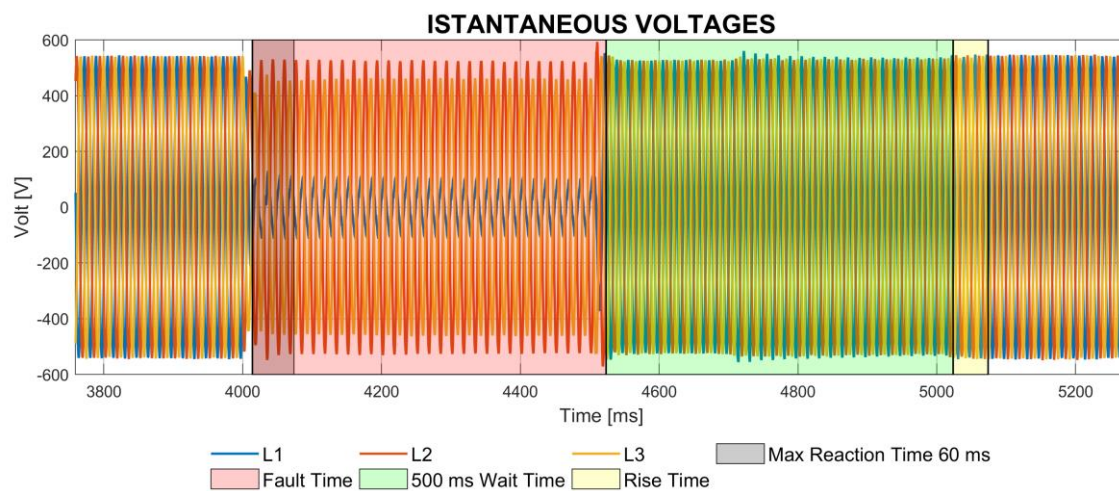
Test N° 31		LVRT - 10% Un - 91% Pn – Asym – K = 1					
Duration (ms): 500 ±20		$V_1/V_{1,nom}$	$V_2/V_{2,nom}$	$V_3/V_{3,nom}$	φ_{V1}	φ_{V2}	φ_{V3}
MV	Normal condition	1	1	1	30°	270°	150°
	During fault	0,50 ±0,05	1	0,50 ±0,05	85°	270°	95°
LV	Normal condition	1	1	1	0°	240°	120°
	During fault	0,05 ±0,05	0,87 ±0,05	0,87 ±0,05	0°	268°	92°

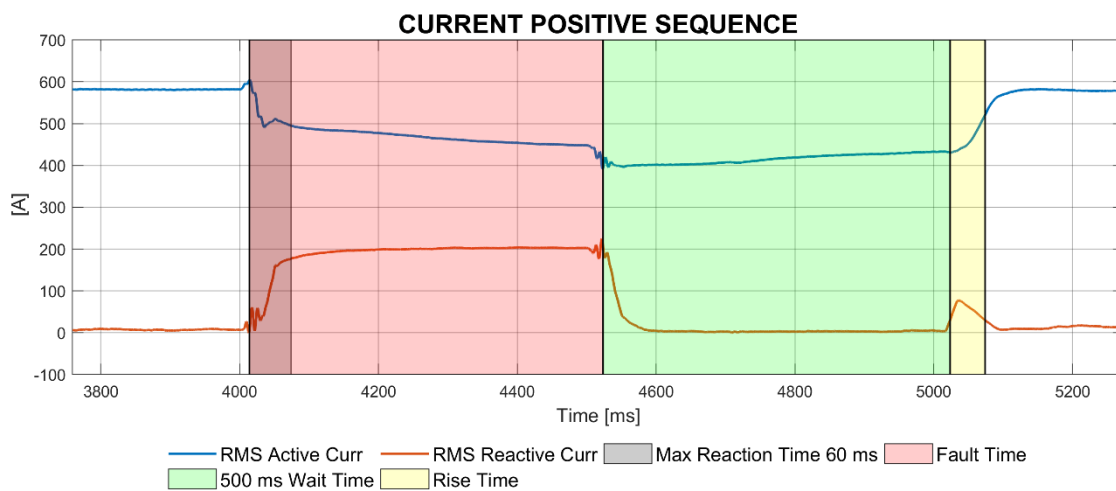
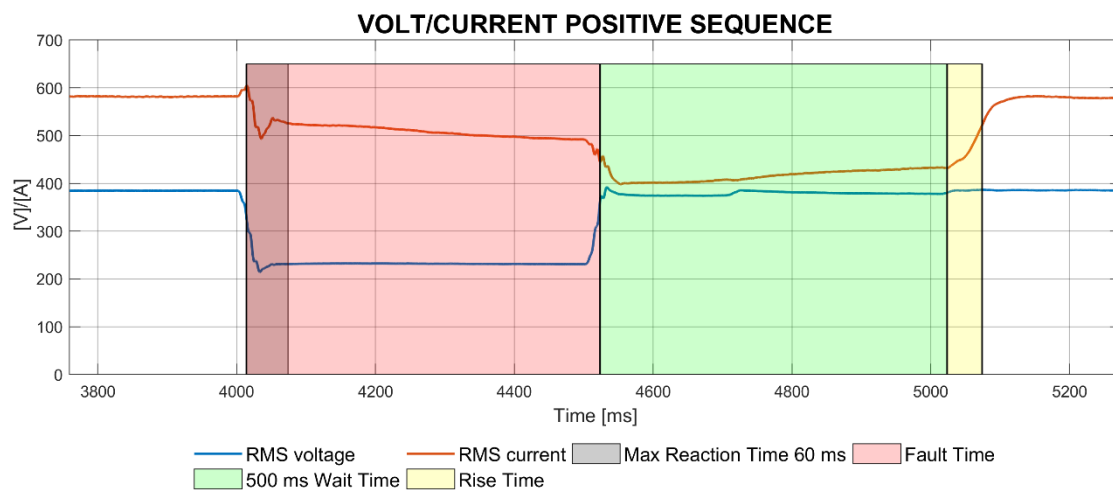




CREI Ven – Padova
Laboratorio Prove
Report n. 177/20/00179/ER

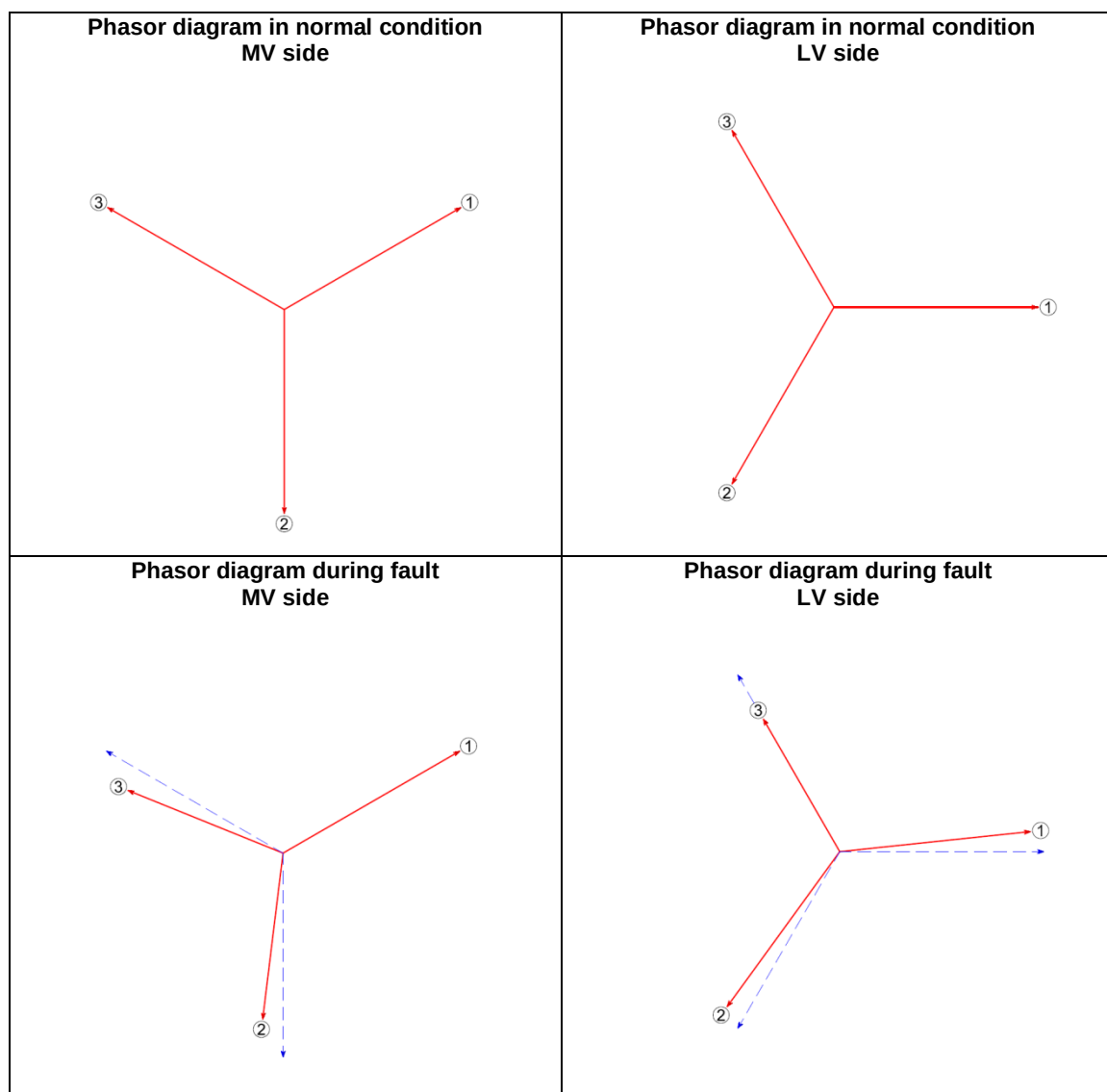






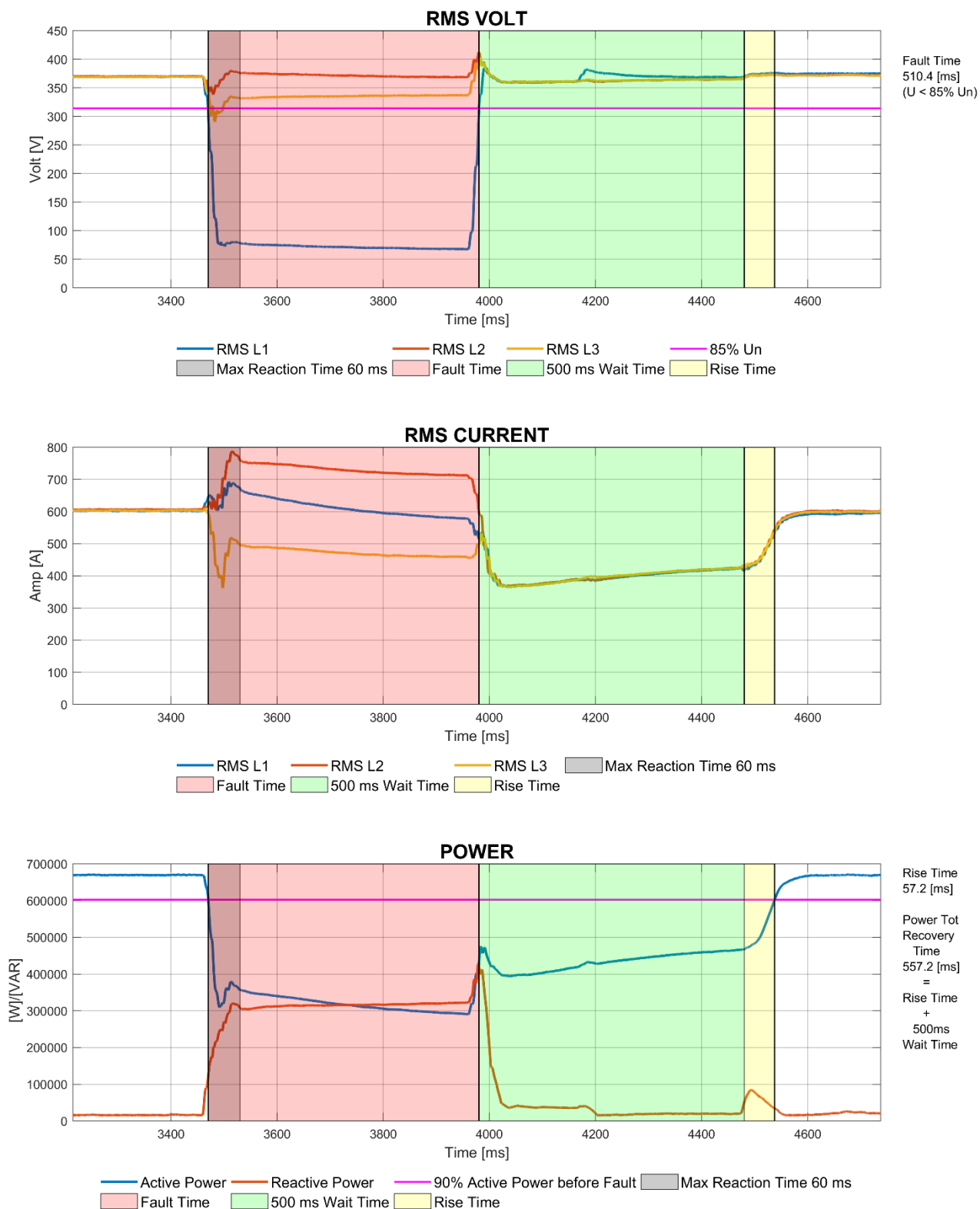


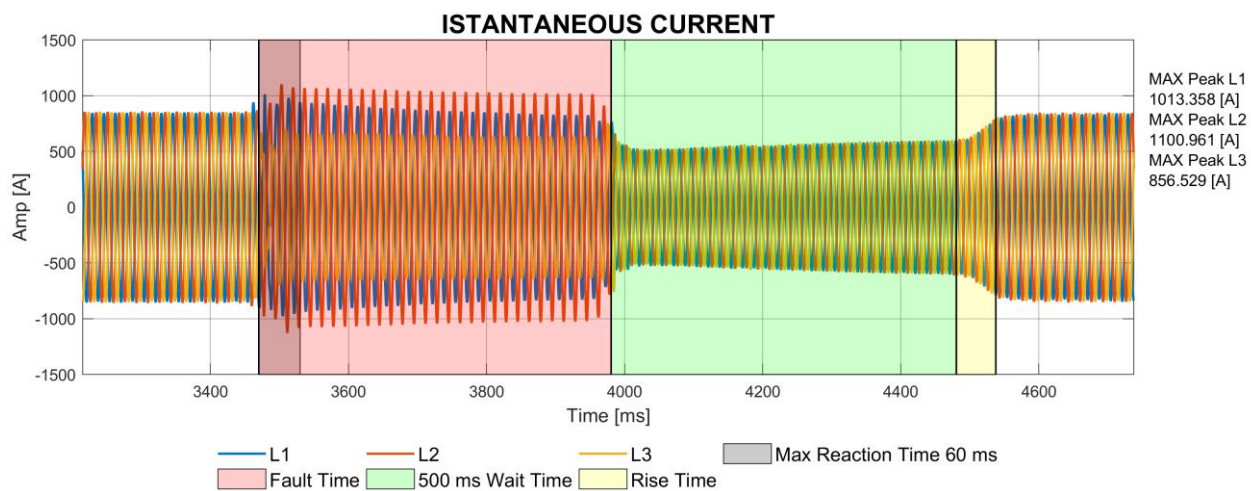
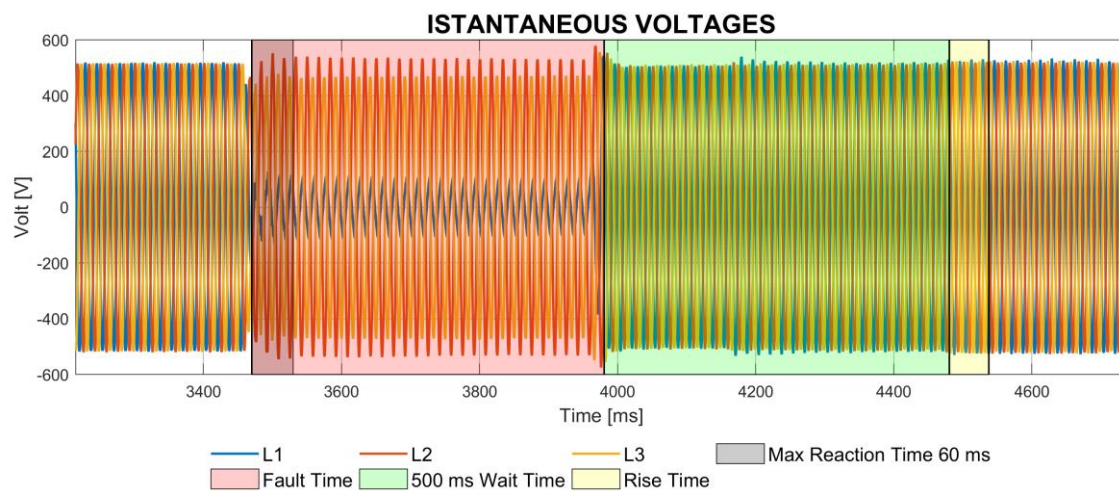
Test N° 32		LVRT - 10% Un - 91% Pn – Asym – K = 1					
Duration (ms): 500 ±20		$V_1/V_{1,nom}$	$V_2/V_{2,nom}$	$V_3/V_{3,nom}$	φ_{V1}	φ_{V2}	φ_{V3}
MV	Normal condition	1	1	1	30°	270°	150°
	During fault	0,50 ±0,05	1	0,50 ±0,05	85°	270°	95°
LV	Normal condition	1	1	1	0°	240°	120°
	During fault	0,05 ±0,05	0,87 ±0,05	0,87 ±0,05	0°	268°	92°

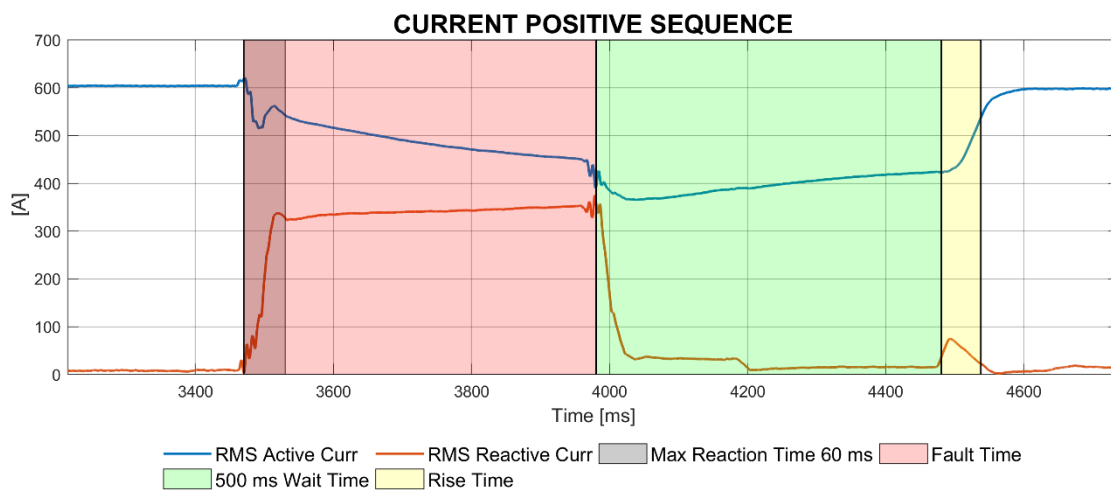
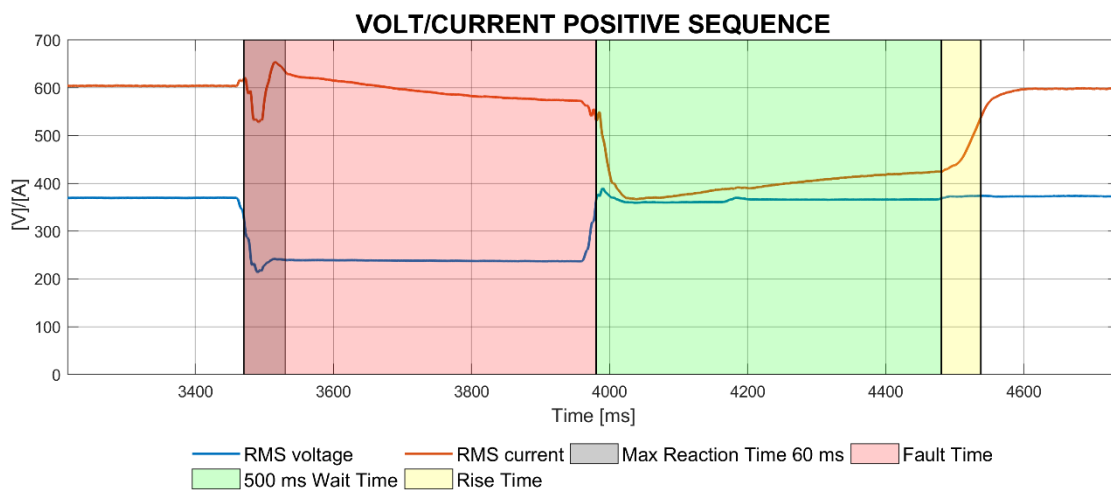




CREI Ven – Padova
Laboratorio Prove
Report n. 177/20/00179/ER

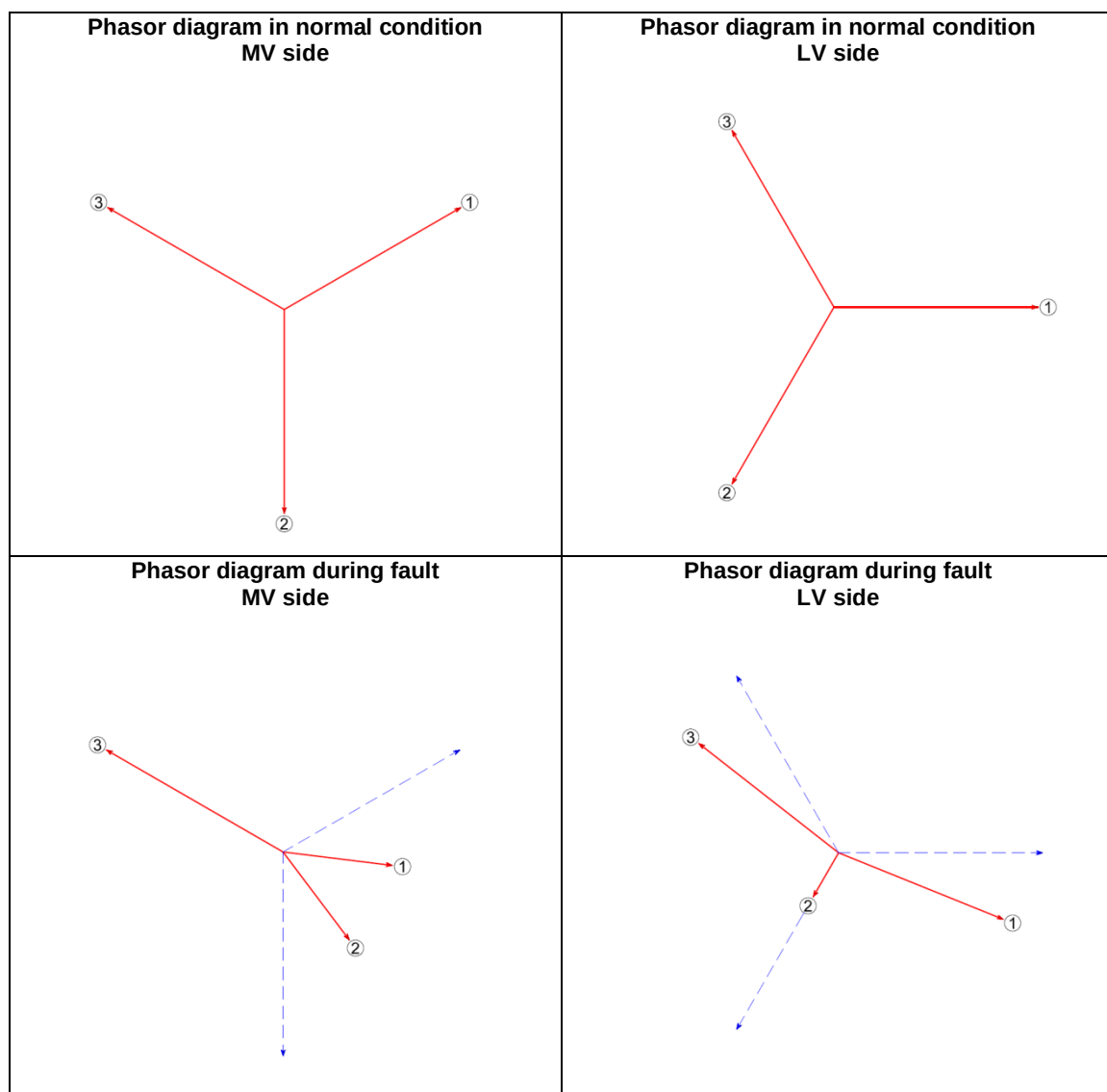






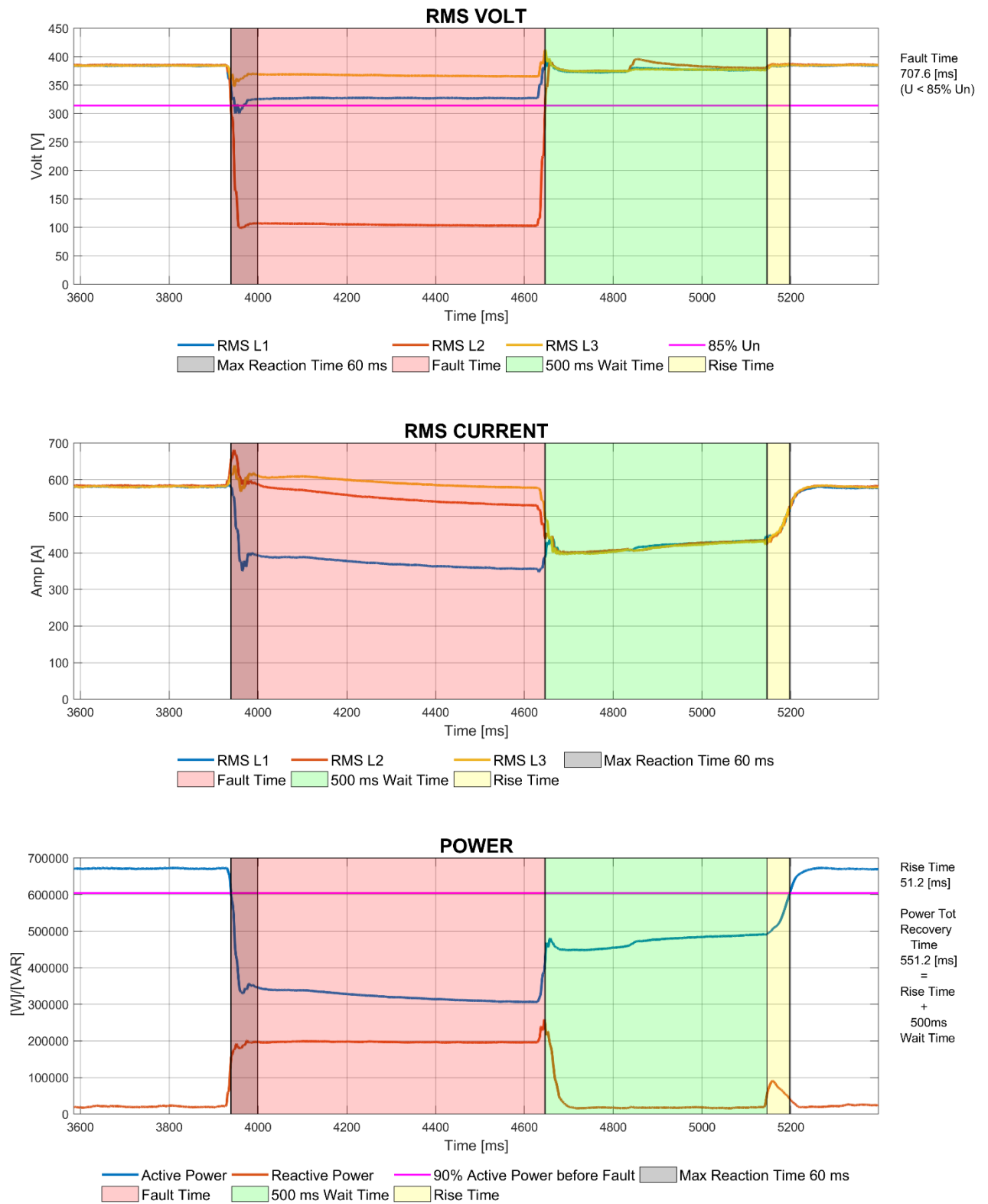


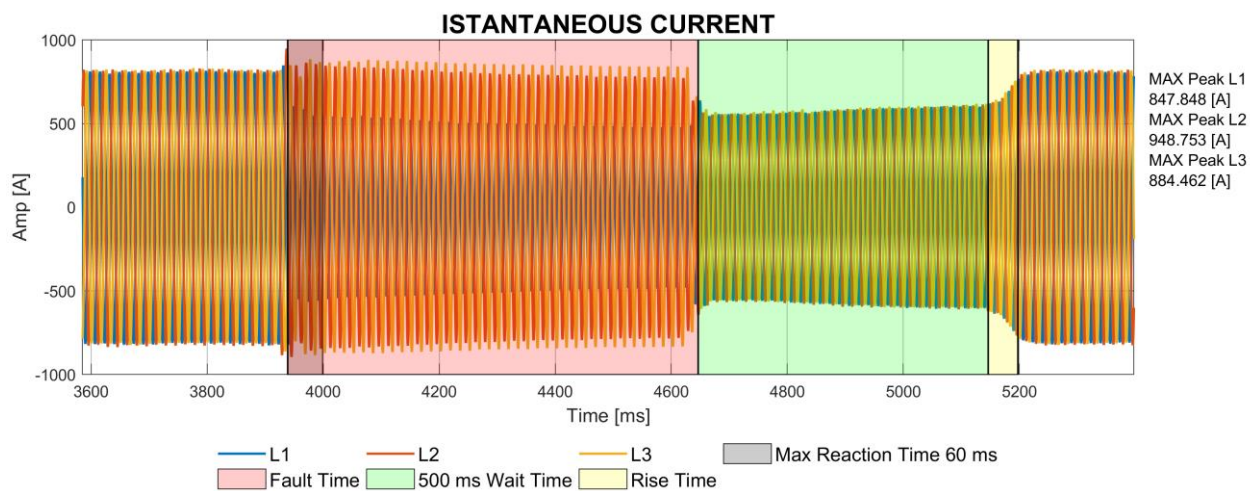
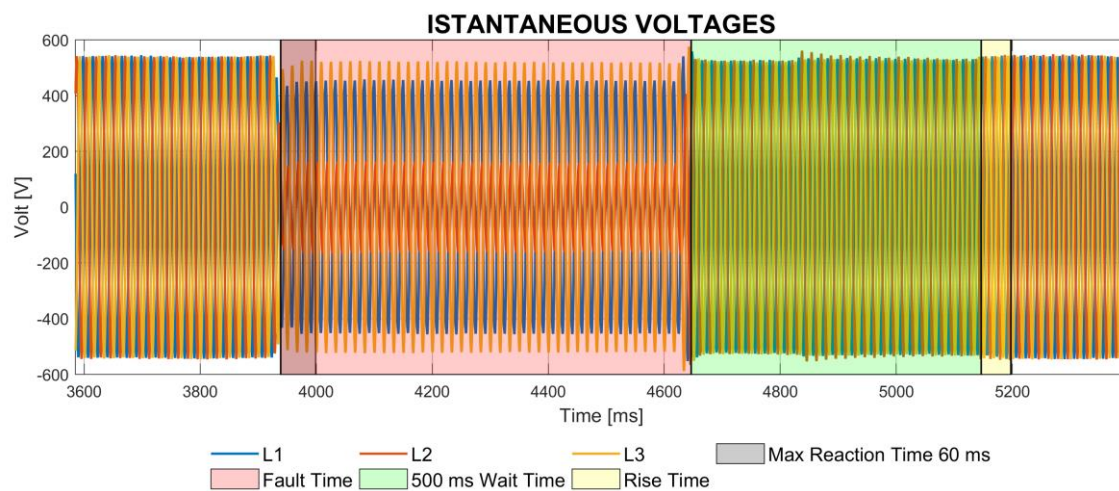
Test N° 33		LVRT - 25% Un - 91% Pn – Asym – K = 1					
Duration (ms): 700 ±20		$V_1/V_{1,nom}$	$V_2/V_{2,nom}$	$V_3/V_{3,nom}$	φ_{V1}	φ_{V2}	φ_{V3}
MV	Normal condition	1	1	1	30°	270°	150°
	During fault	0,54 ±0,05	0,54 ±0,05	1	353°	307°	0°
LV	Normal condition	1	1	1	0°	240°	120°
	During fault	0,87 ±0,05	0,25 ±0,05	0,87 ±0,05	338°	240°	142°

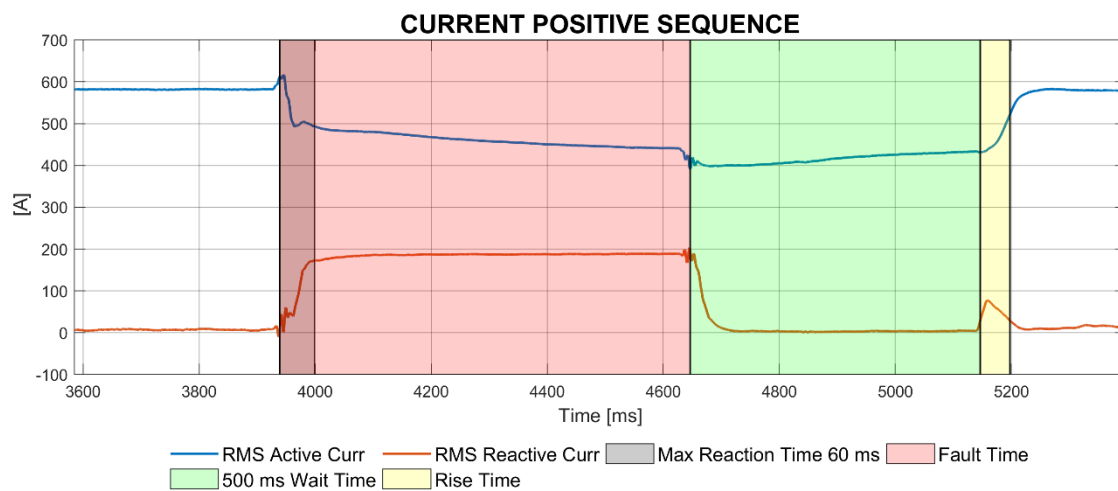
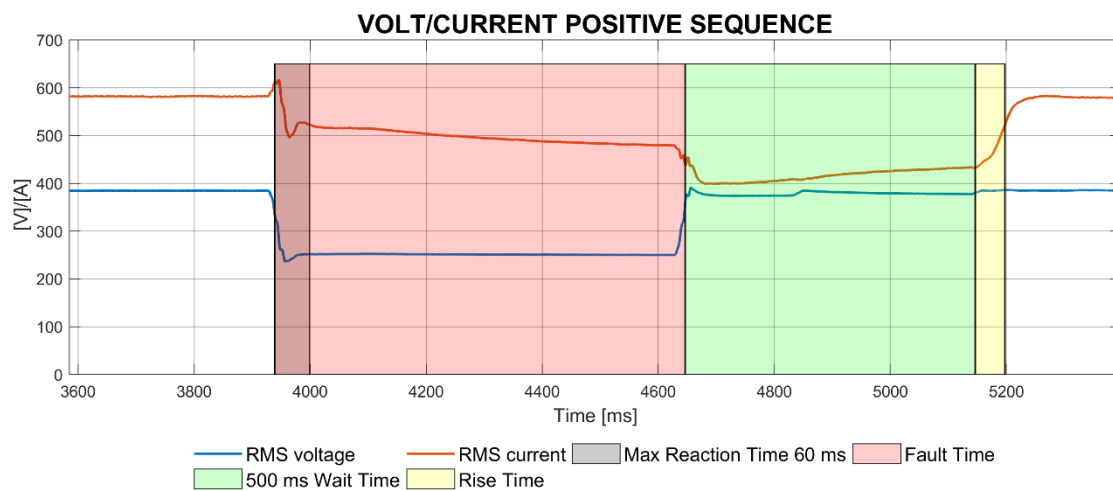




CREI Ven – Padova
Laboratorio Prove
Report n. 177/20/00179/ER

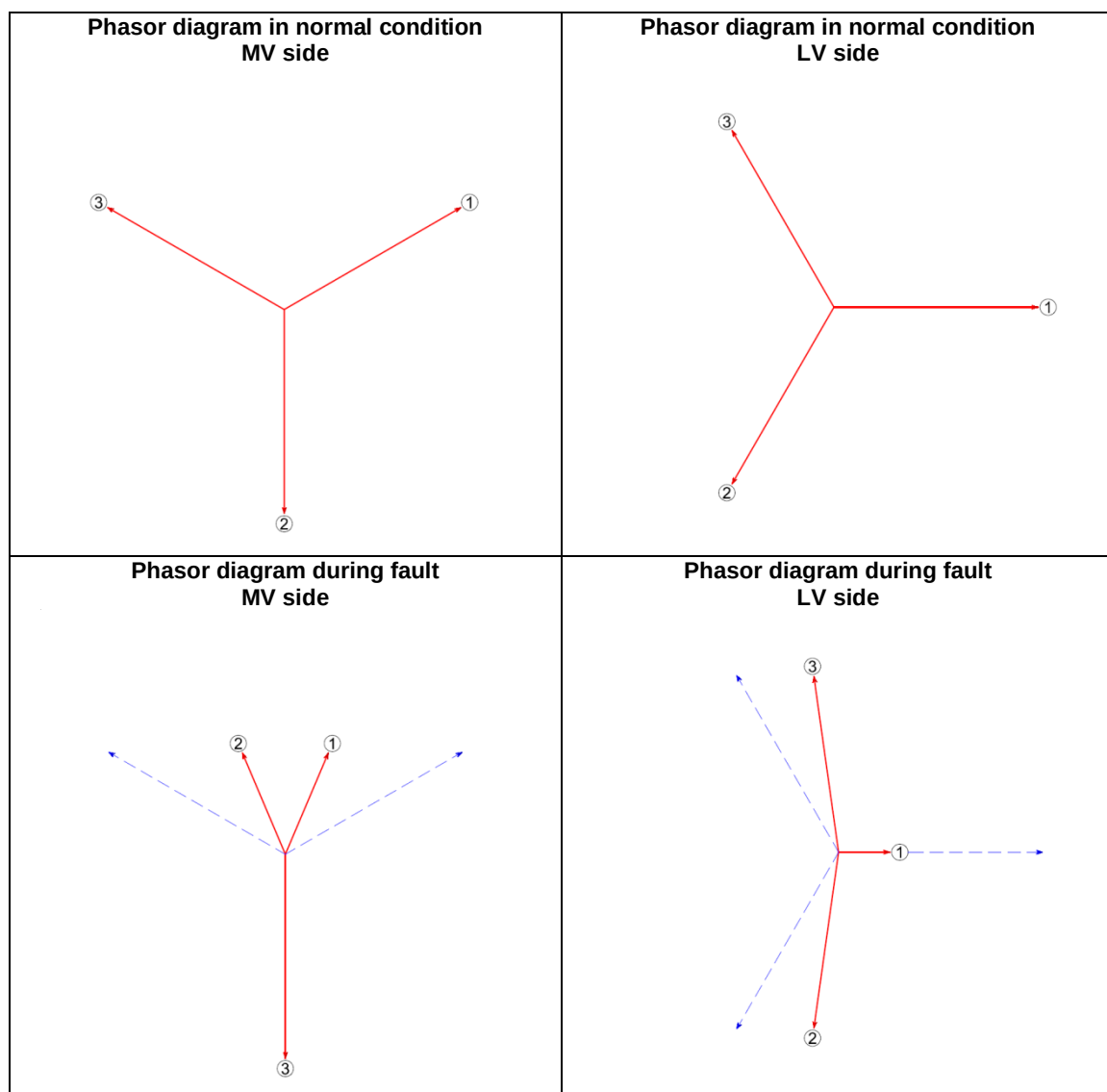






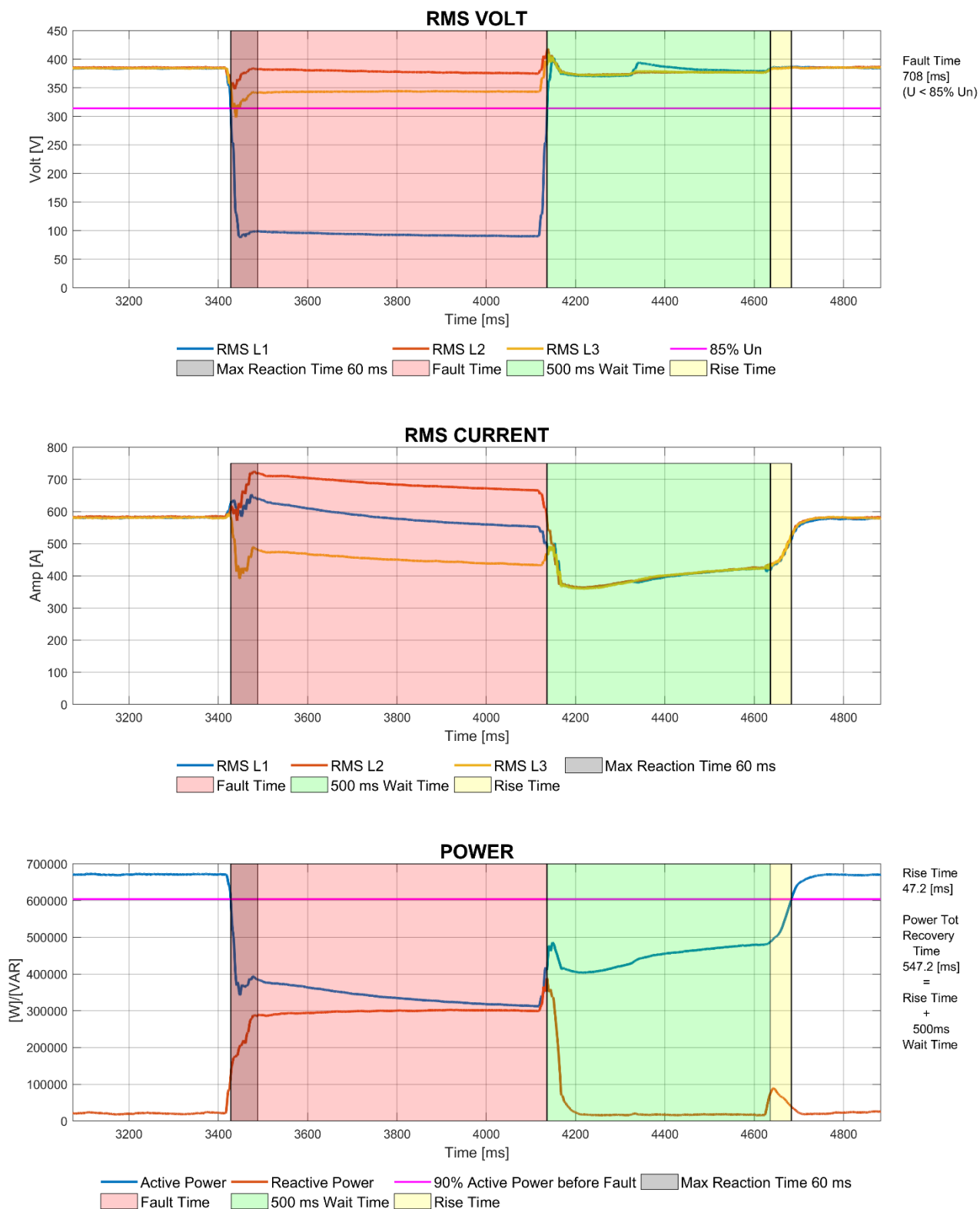


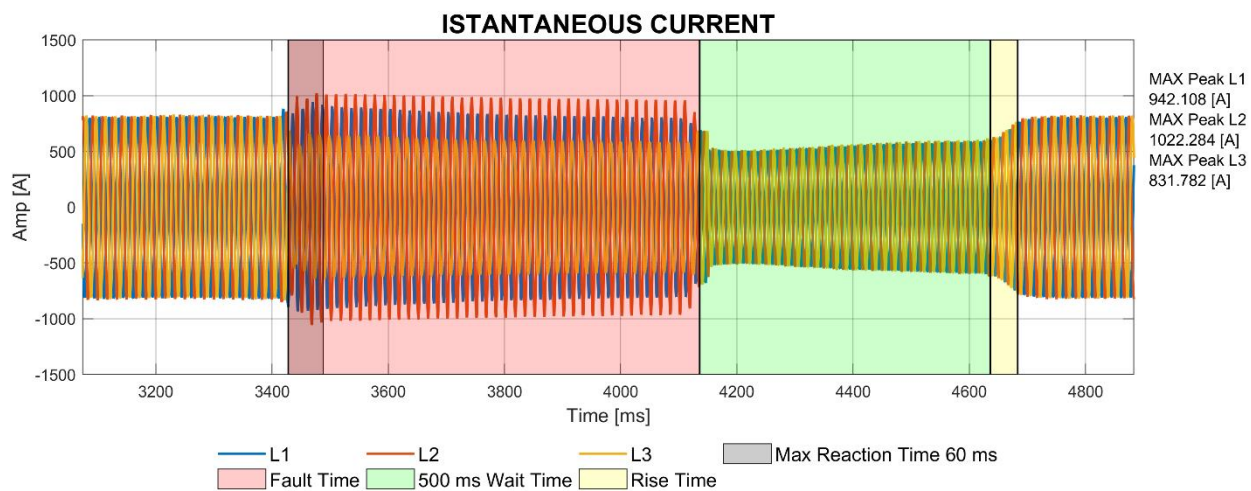
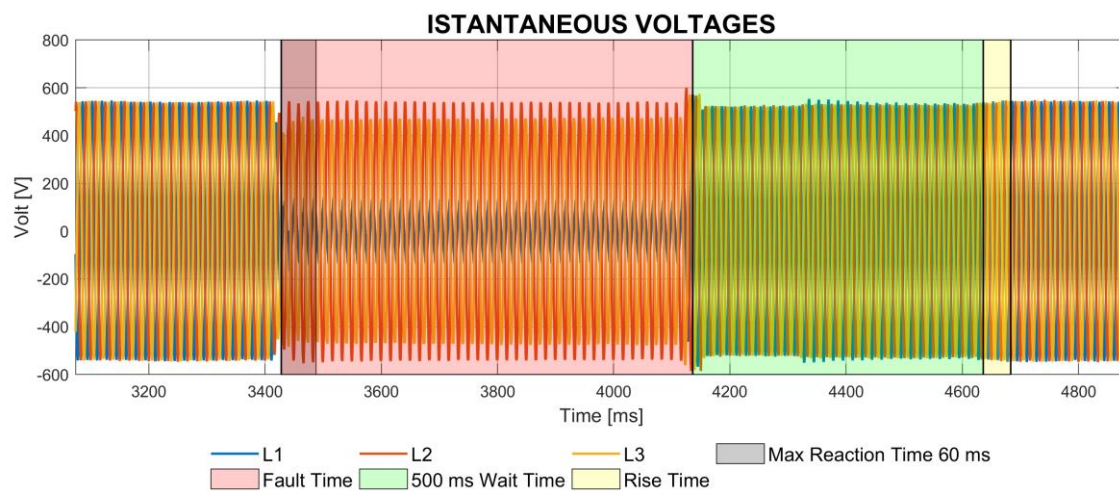
Test N° 34		LVRT - 25% Un - 91% Pn – Asym – K = 2					
Duration (ms): 700 ±20		$V_1/V_{1,nom}$	$V_2/V_{2,nom}$	$V_3/V_{3,nom}$	φ_{V1}	φ_{V2}	φ_{V3}
MV	Normal condition	1	1	1	30°	270°	150°
	During fault	0,54 ±0,05	1	0,54 ±0,05	67°	270°	113°
LV	Normal condition	1	1	1	0°	240°	120°
	During fault	0,25 ±0,05	0,87 ±0,05	0,87 ±0,05	0°	262°	98°

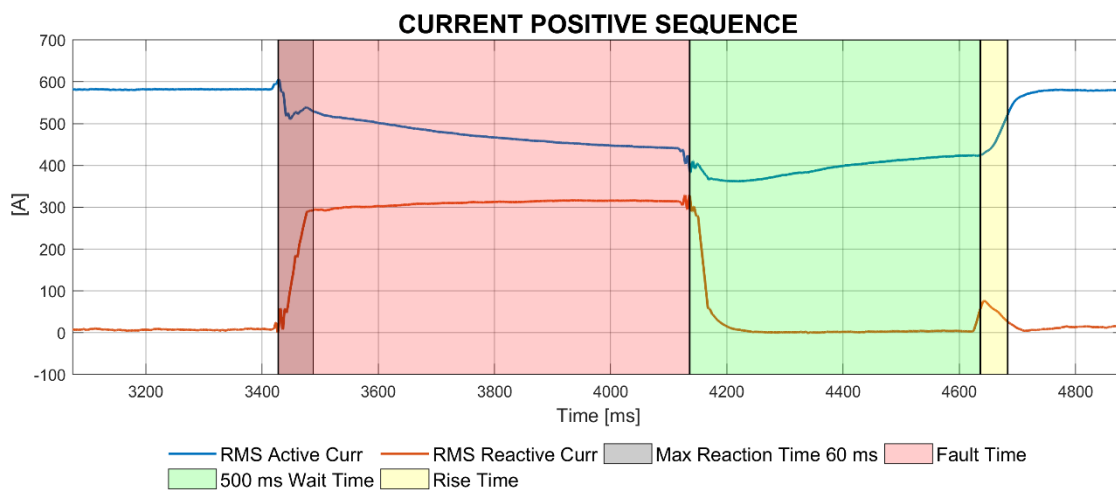
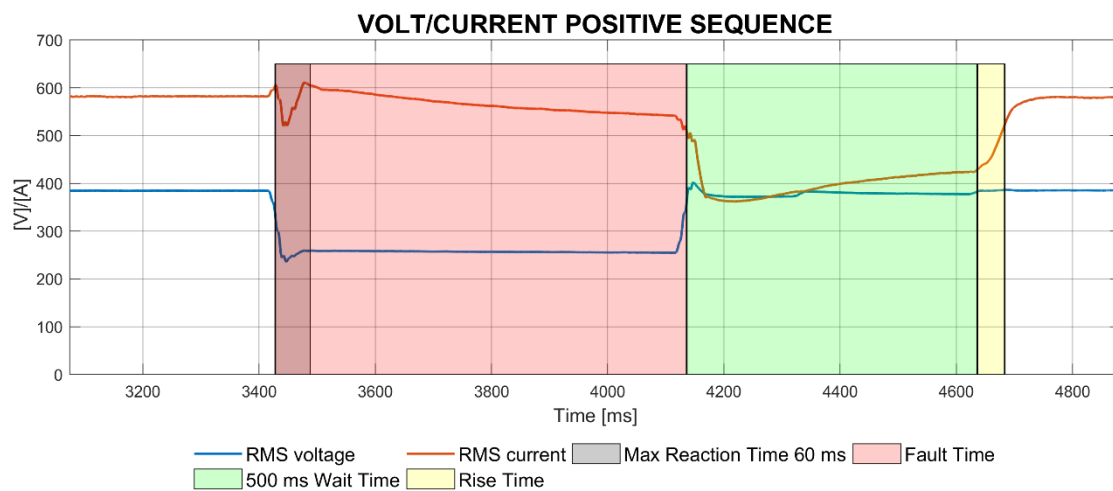




CREI Ven – Padova
Laboratorio Prove
Report n. 177/20/00179/ER

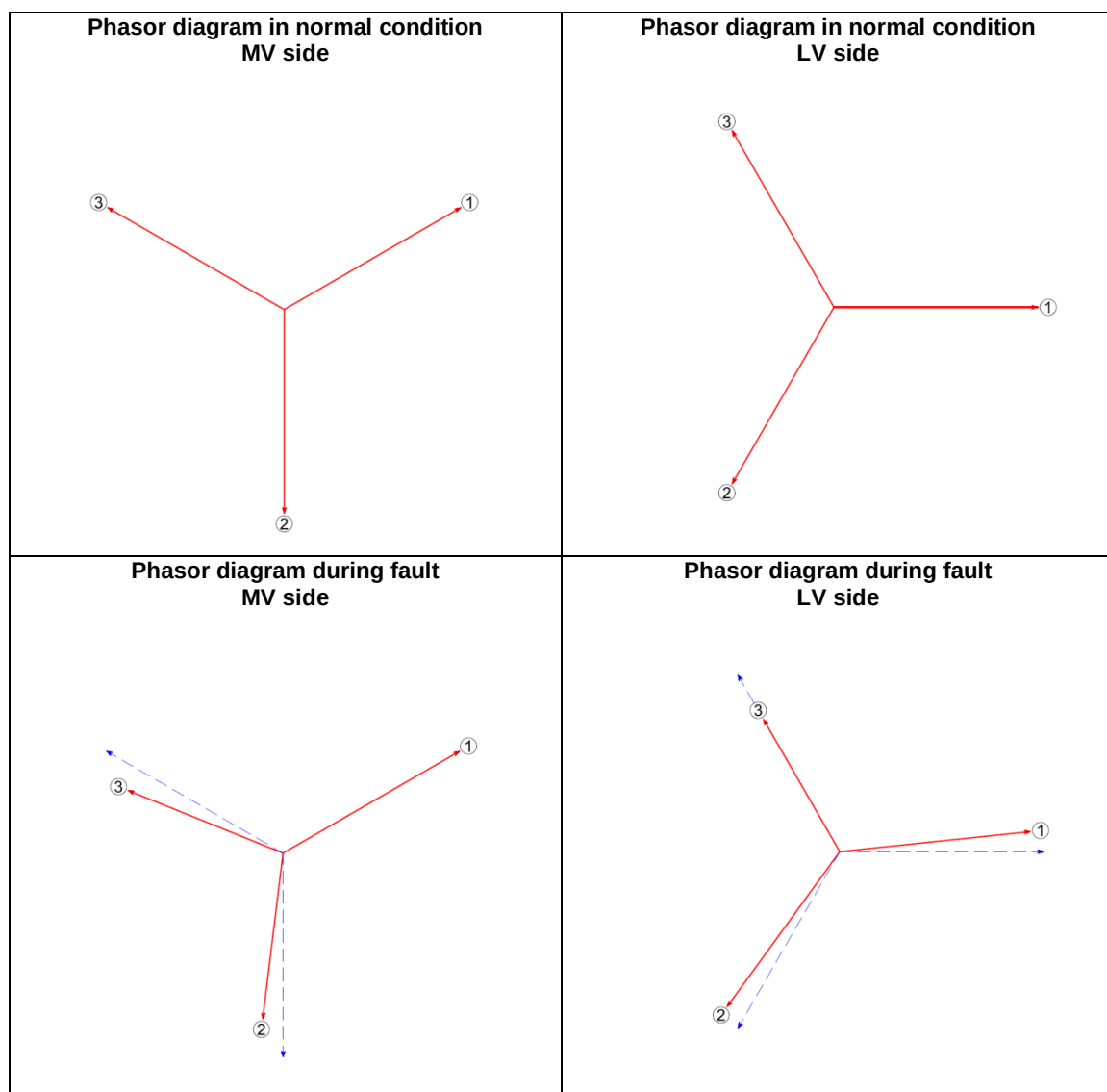






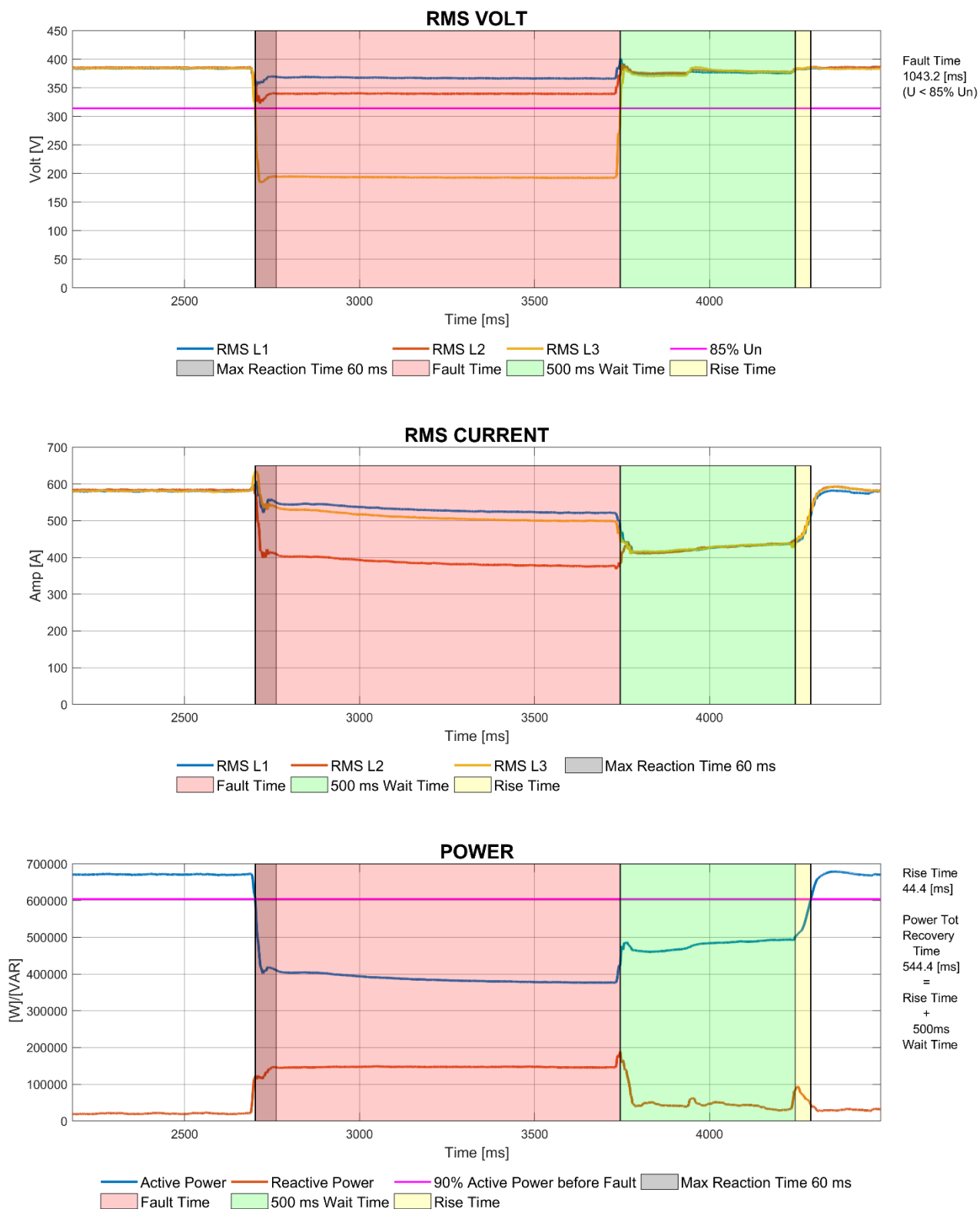


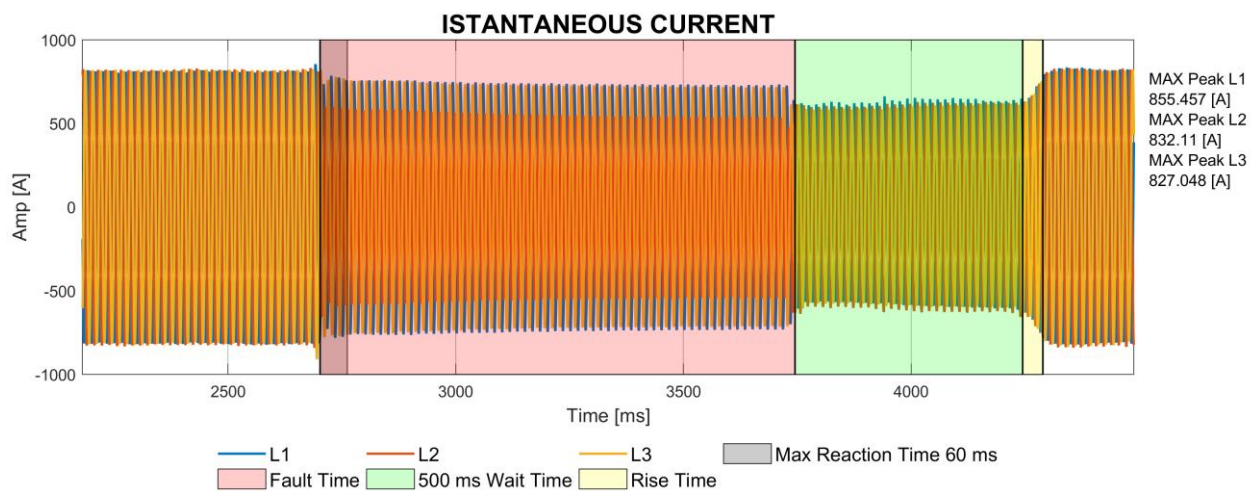
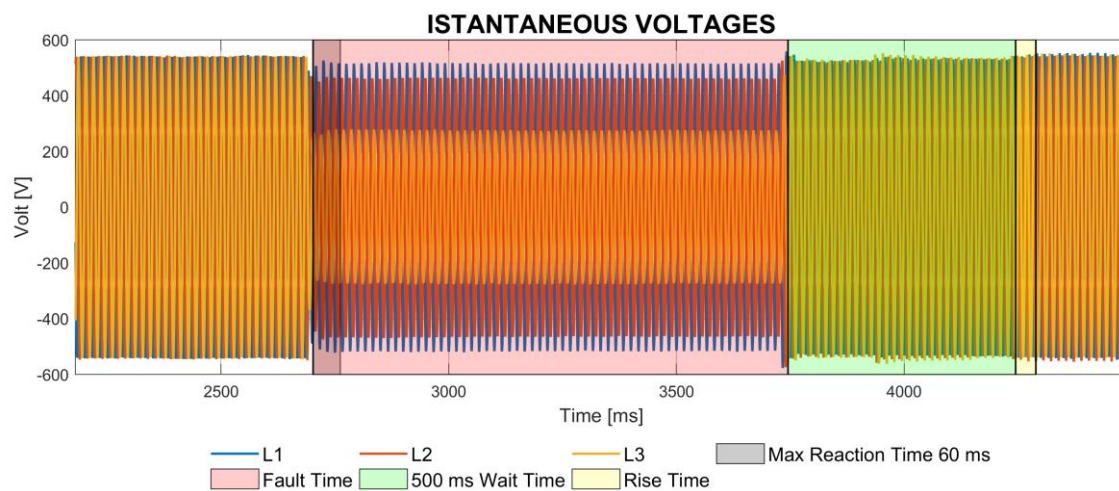
Test N° 35		LVRT - 50% Un - 91% Pn – Asym – K = 1					
Duration (ms): 1030 ±20		$V_1/V_{1,nom}$	$V_2/V_{2,nom}$	$V_3/V_{3,nom}$	φ_{V1}	φ_{V2}	φ_{V3}
MV	Normal condition	1	1	1	30°	270°	150°
	During fault	1	0,82 ±0,05	0,82 ±0,05	30°	263°	158°
LV	Normal condition	1	1	1	0°	240°	120°
	During fault	0,94 ±0,05	0,94 ±0,05	0,75 ±0,05	6°	234°	120°

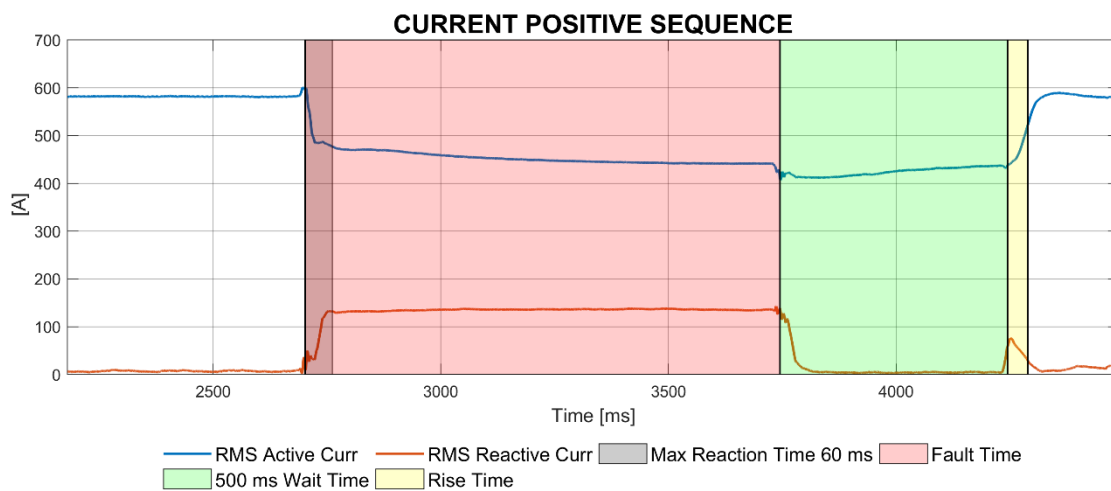
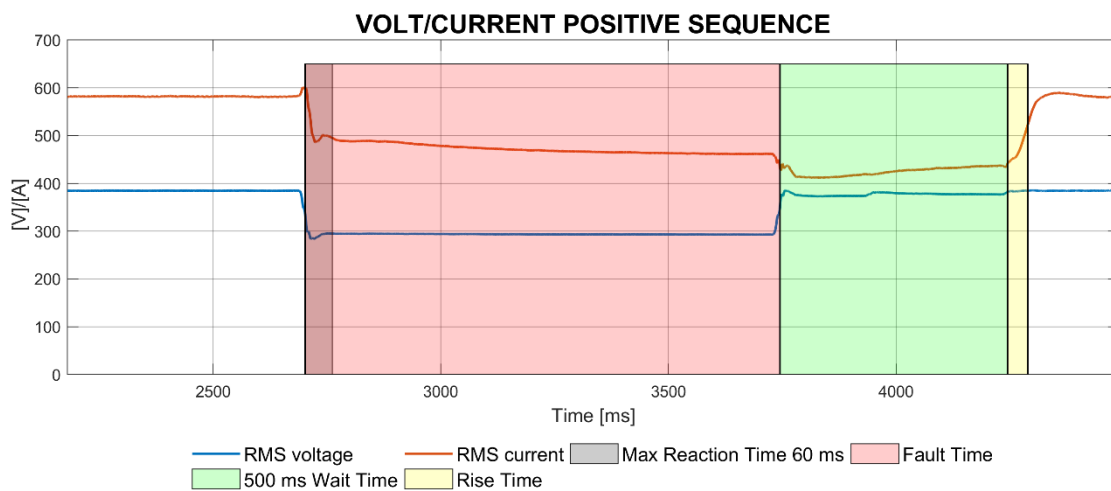




CREI Ven – Padova
Laboratorio Prove
Report n. 177/20/00179/ER

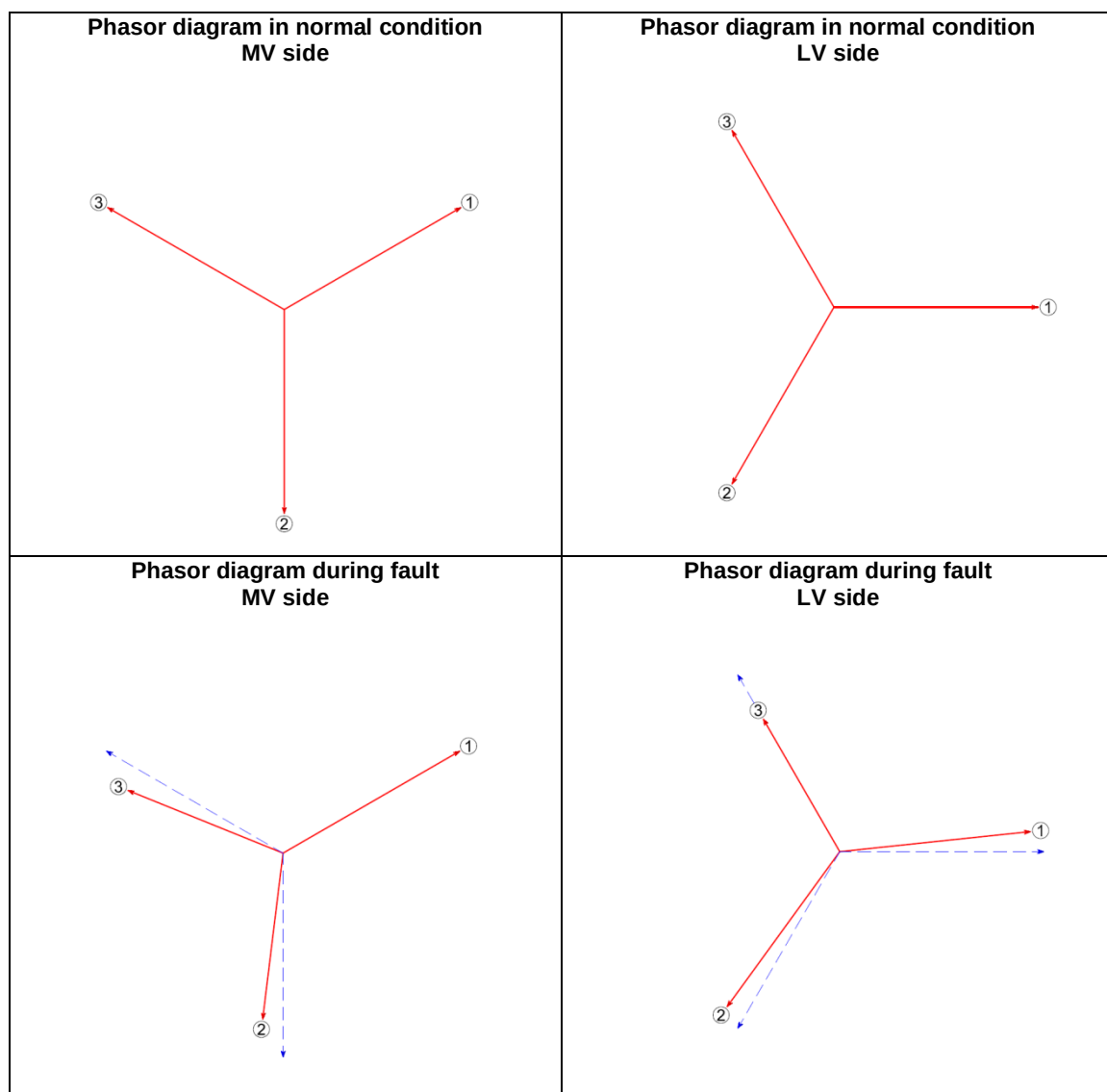






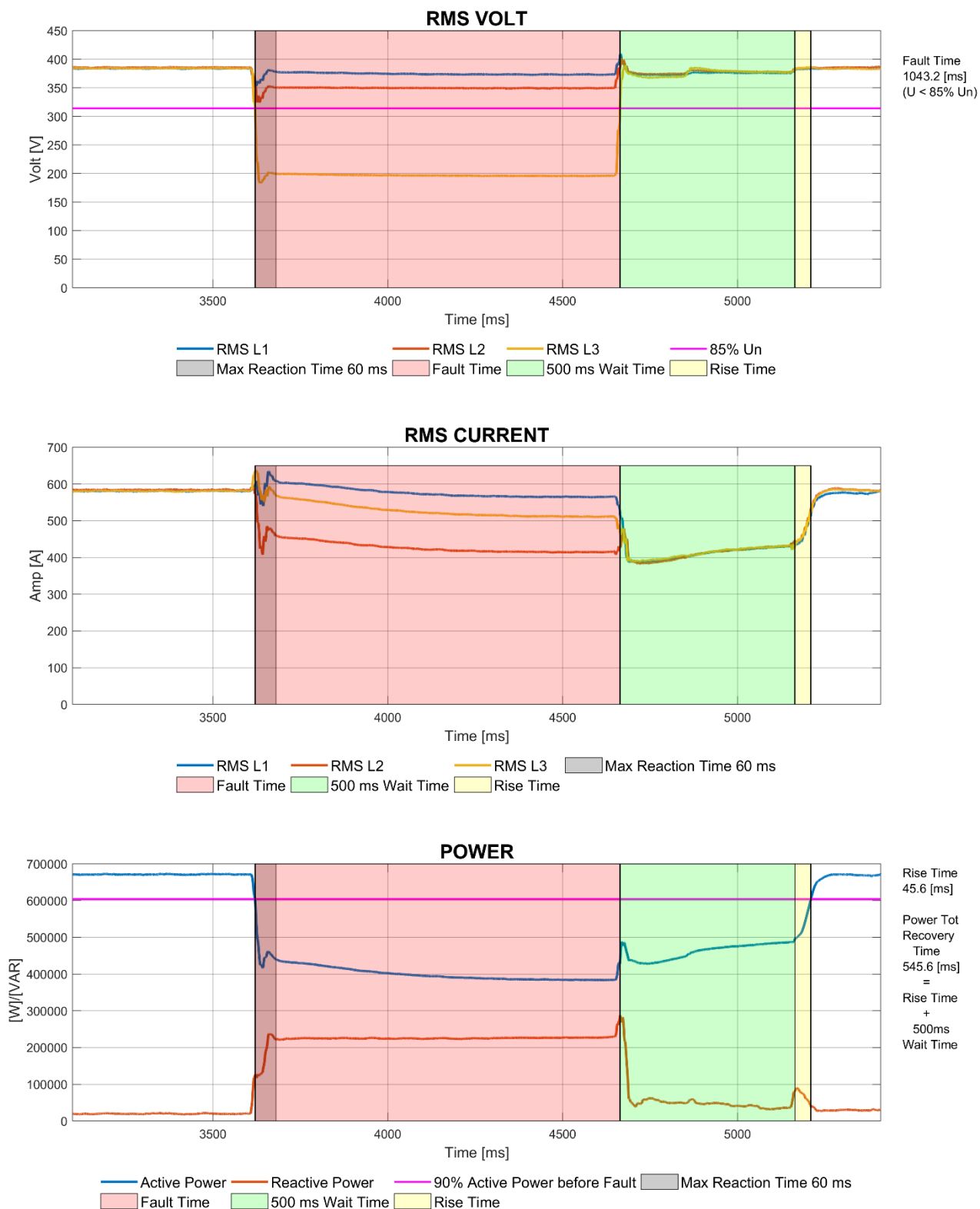


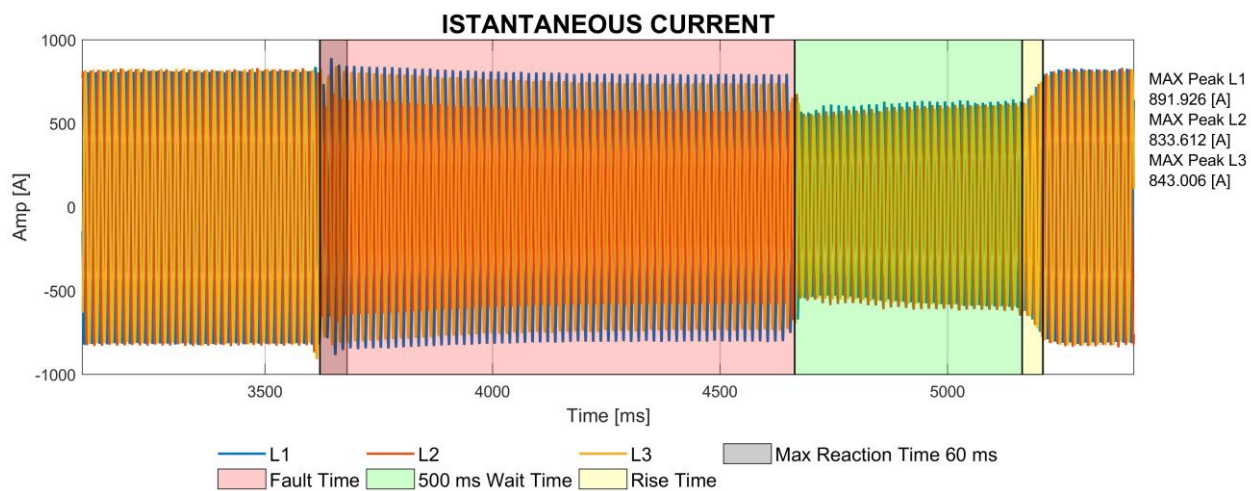
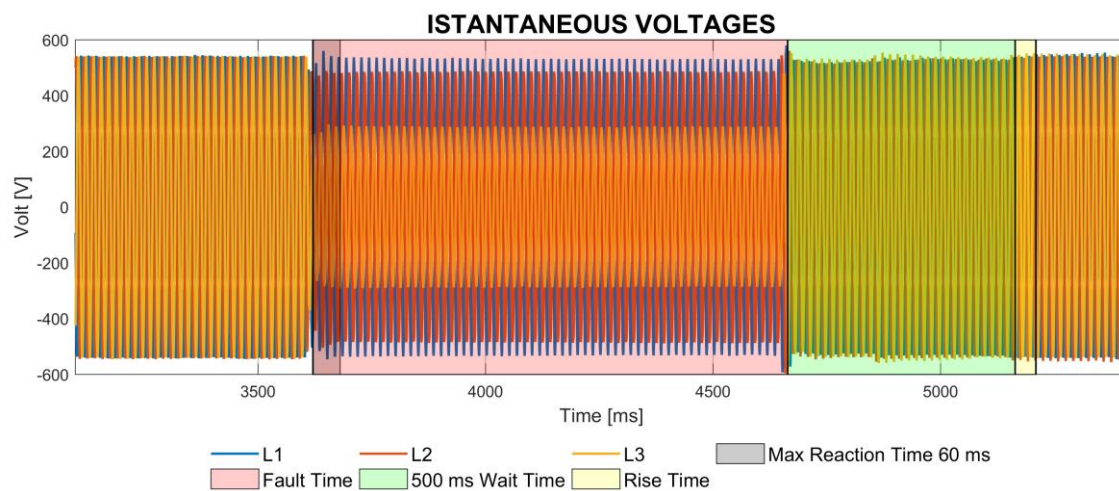
Test N° 36		LVRT - 50% Un - 91% Pn – Asym – K = 2					
Duration (ms): 1030 ±20		$V_1/V_{1,nom}$	$V_2/V_{2,nom}$	$V_3/V_{3,nom}$	φ_{V1}	φ_{V2}	φ_{V3}
MV	Normal condition	1	1	1	30°	270°	150°
	During fault	1	0,82 ±0,05	0,82 ±0,05	30°	263°	158°
LV	Normal condition	1	1	1	0°	240°	120°
	During fault	0,94 ±0,05	0,94 ±0,05	0,75 ±0,05	6°	234°	120°

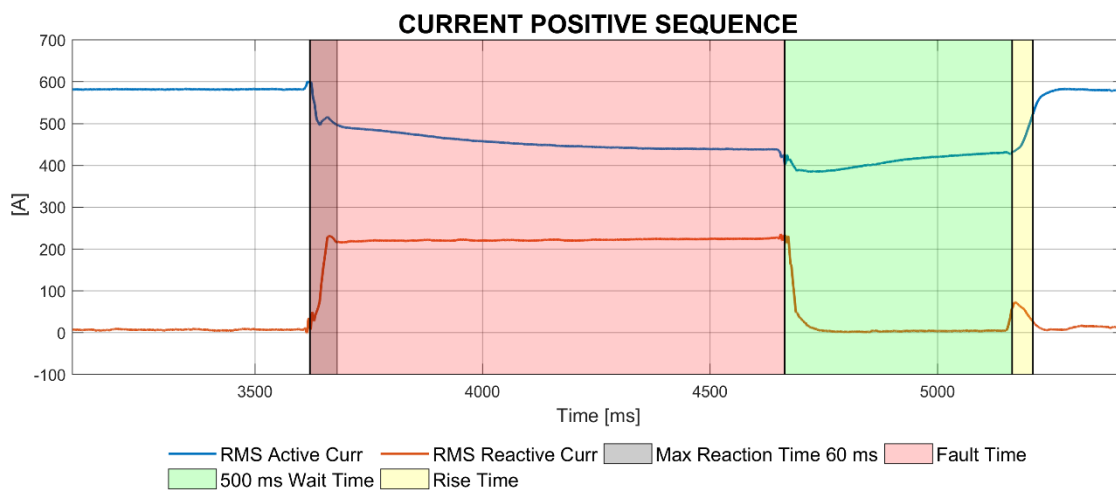
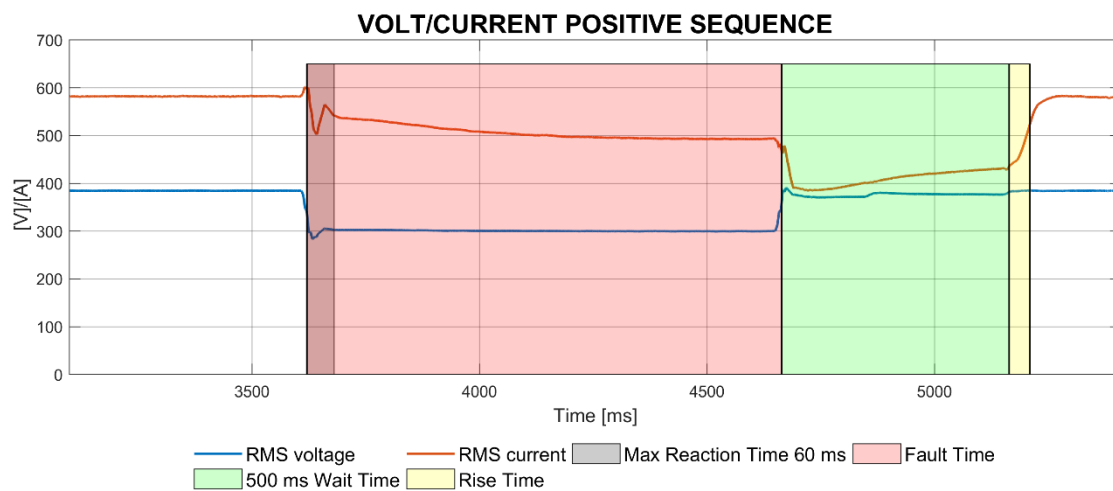




CREI Ven – Padova
Laboratorio Prove
Report n. 177/20/00179/ER

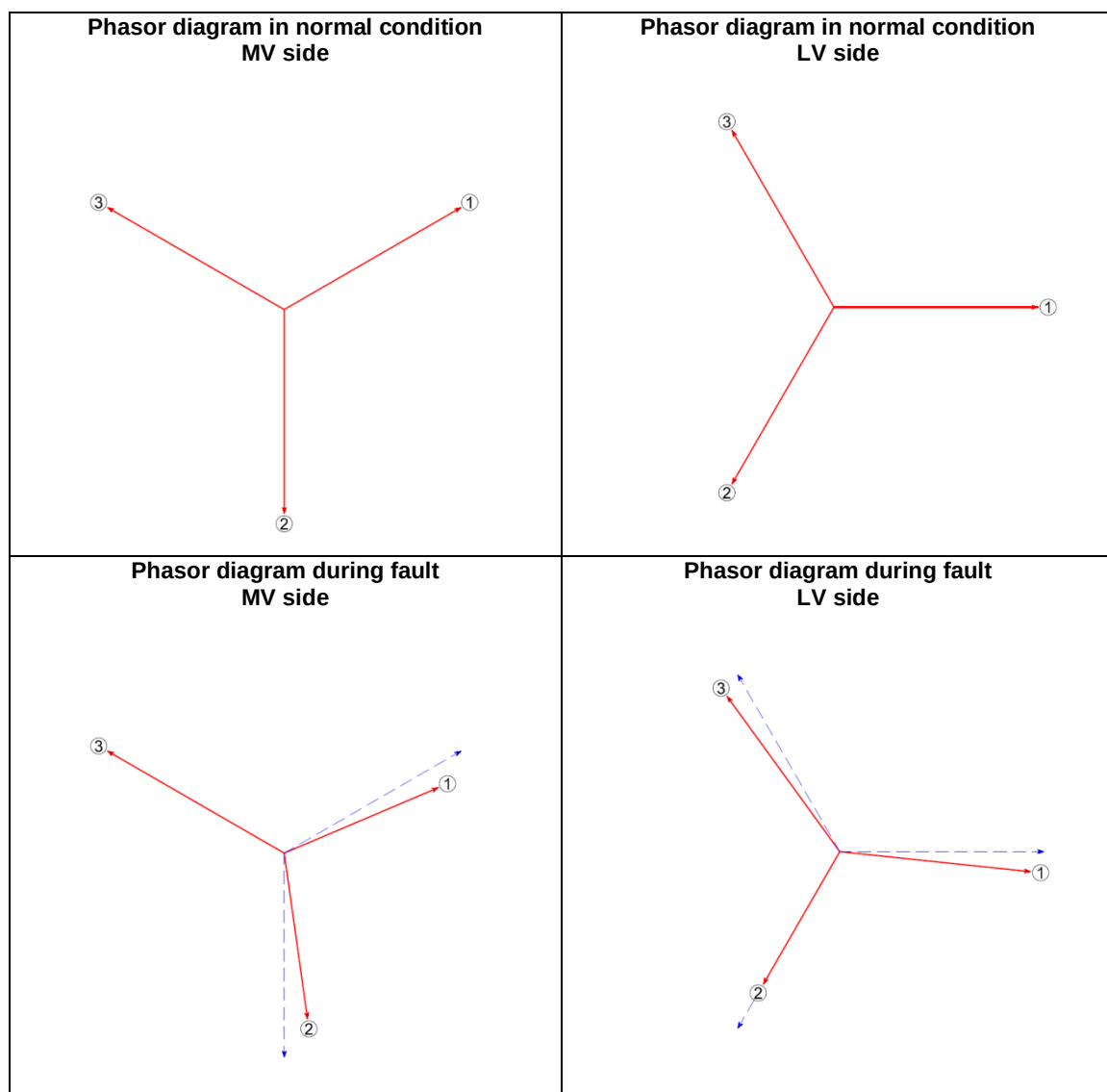






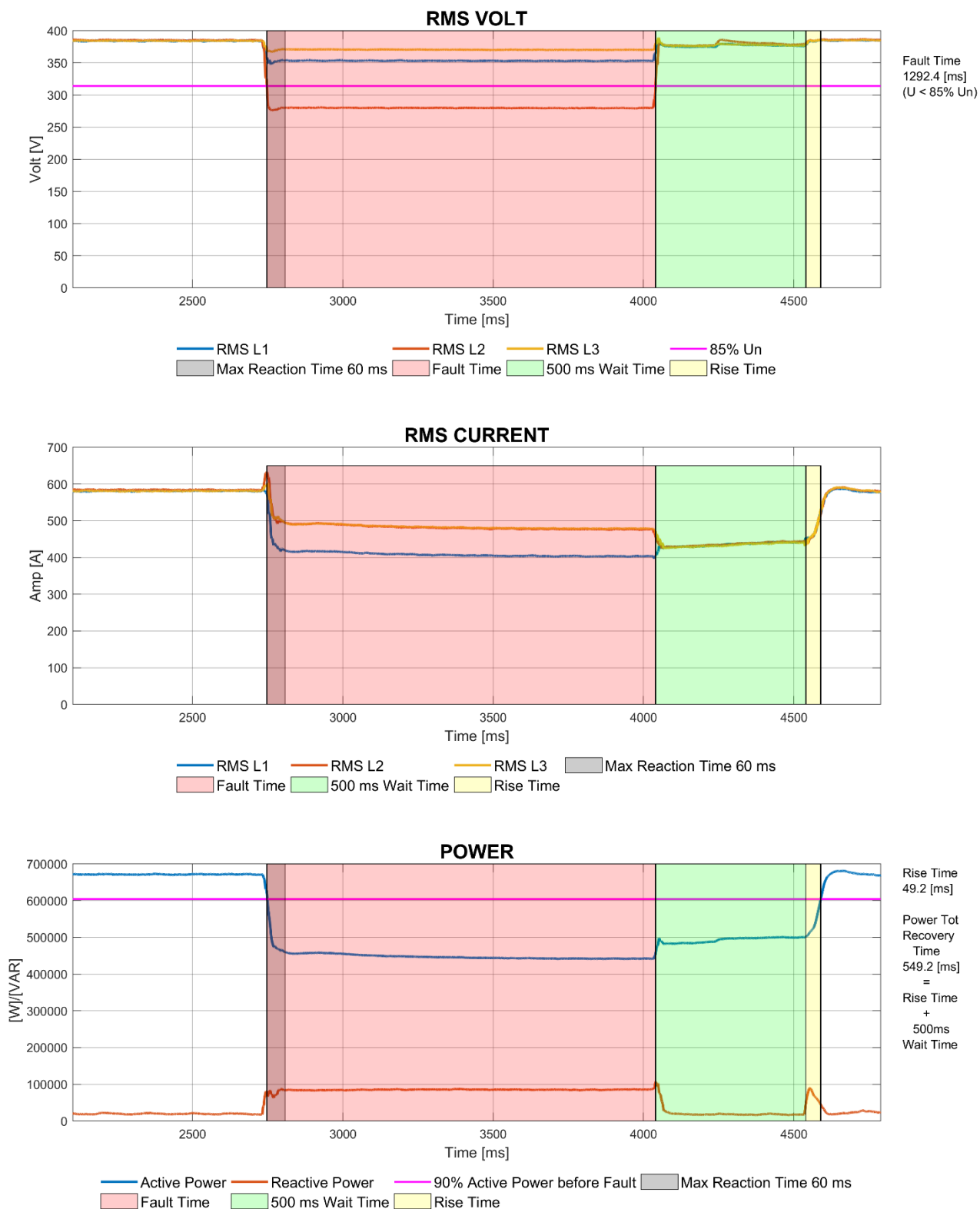


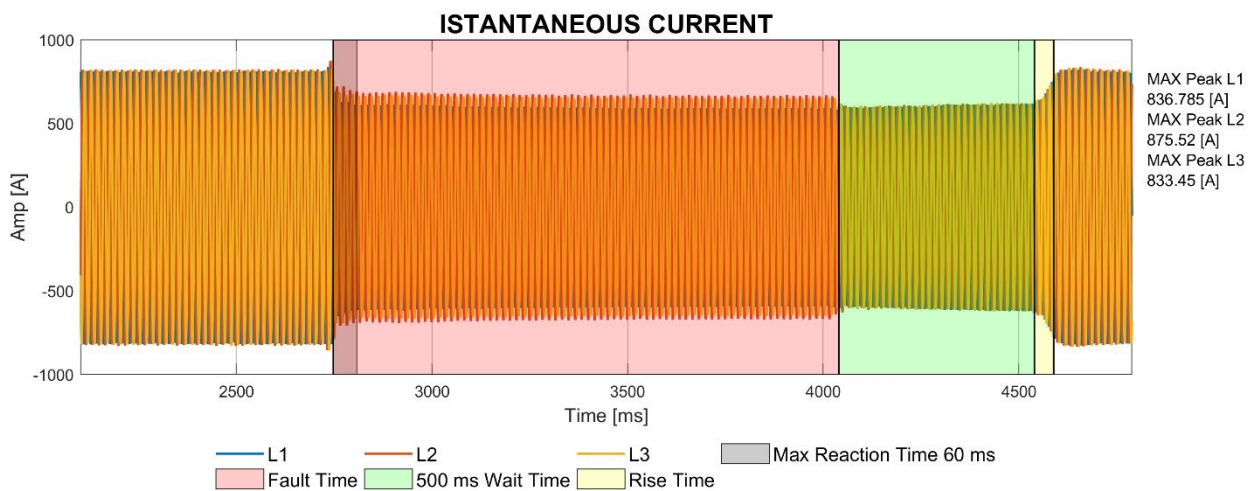
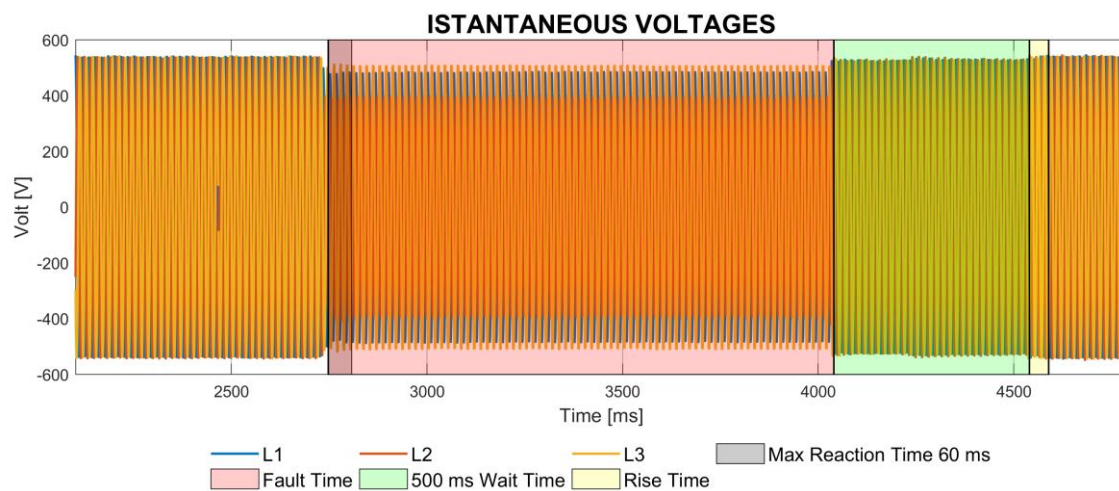
Test N° 37		LVRT - 75% Un - 91% Pn – Asym – K = 1					
Duration (ms): 1300 ±20		$V_1/V_{1,nom}$	$V_2/V_{2,nom}$	$V_3/V_{3,nom}$	φ_{V1}	φ_{V2}	φ_{V3}
MV	Normal condition	1	1	1	30°	270°	150°
	During fault	0,82 ±0,05	0,82 ±0,05	1	23°	277°	150°
LV	Normal condition	1	1	1	0°	240°	120°
	During fault	0,94 ±0,05	0,75 ±0,05	0,94 ±0,05	354°	240*	126°

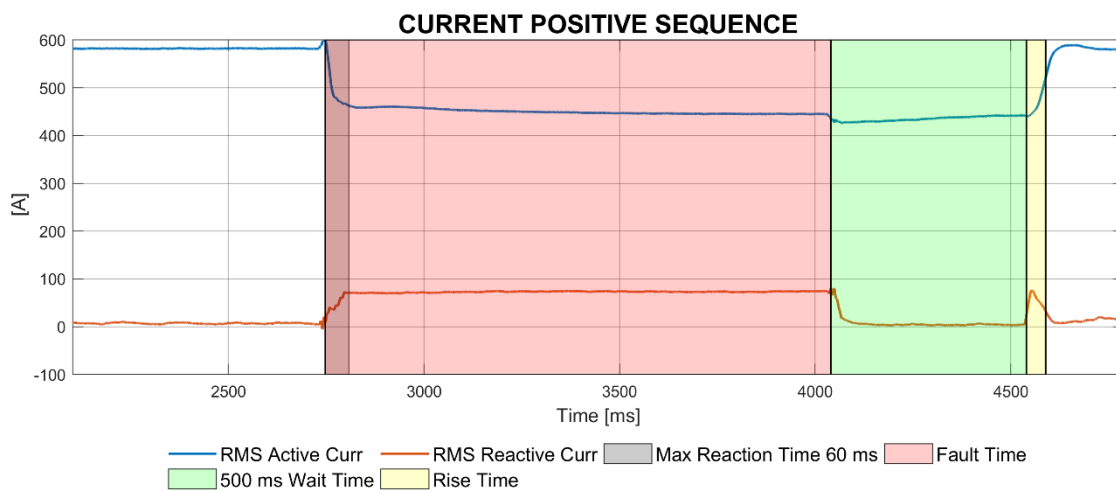
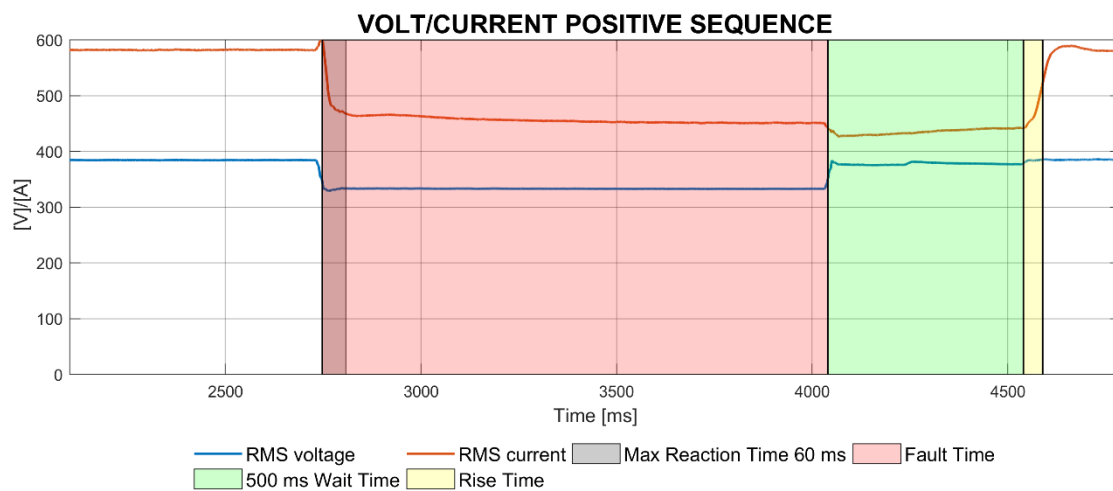




CREI Ven – Padova
Laboratorio Prove
Report n. 177/20/00179/ER

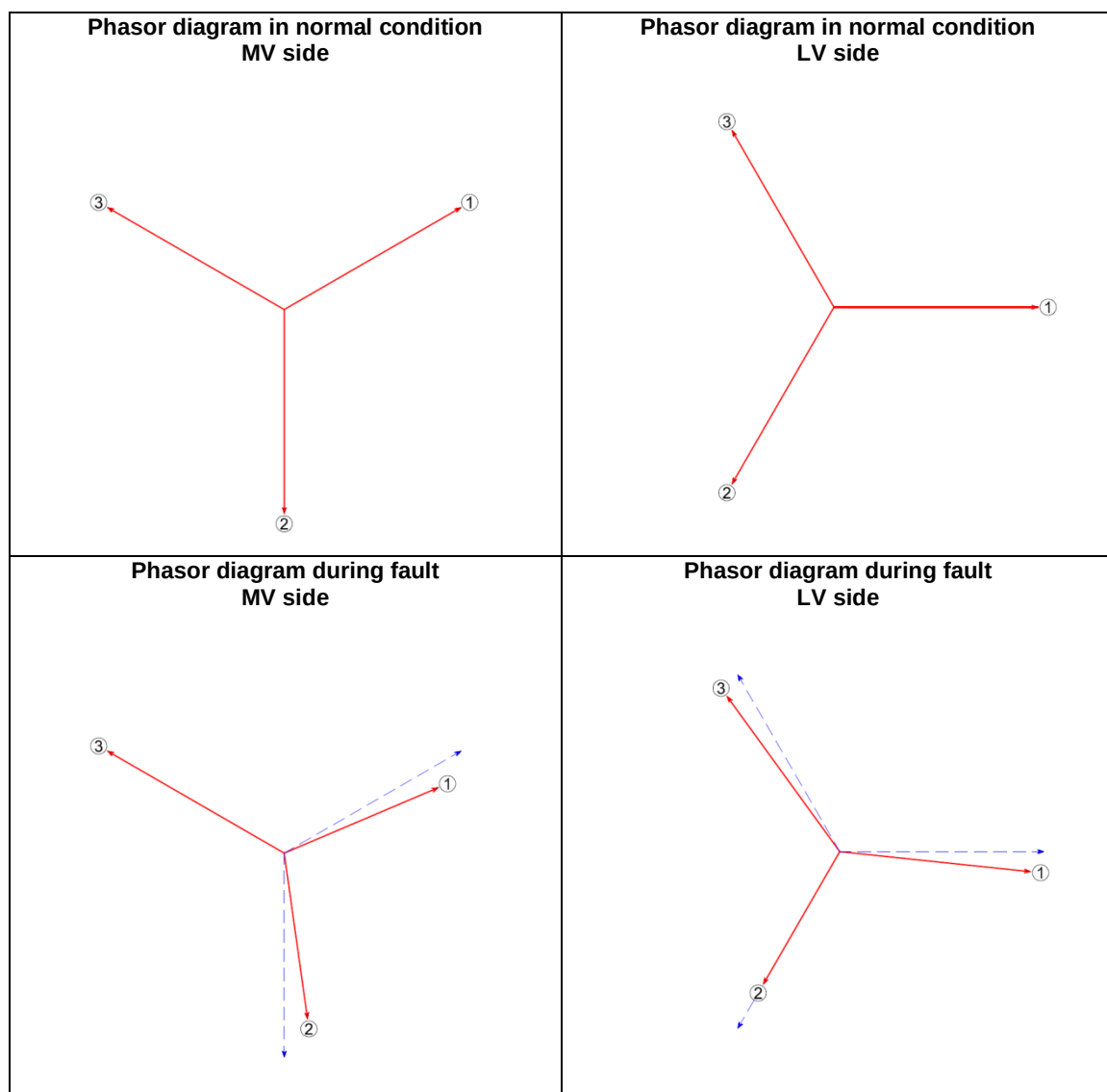








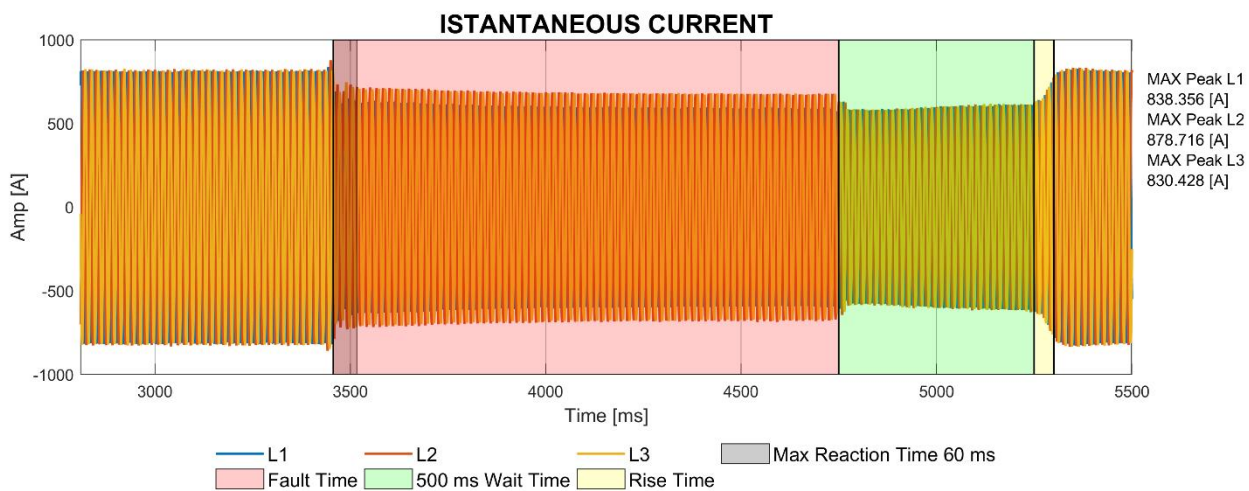
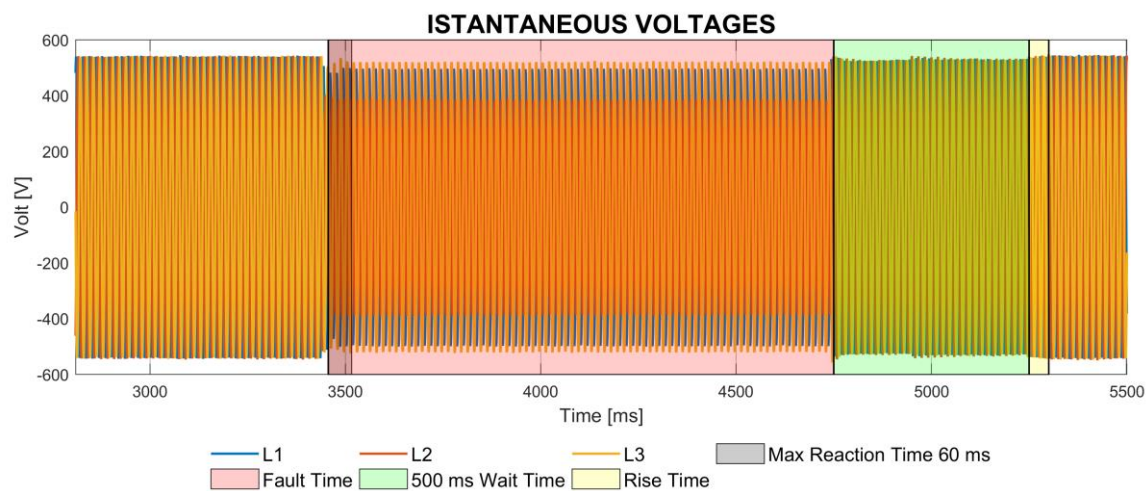
Test N° 38		LVRT - 75% Un - 91% Pn – Asym – K = 2					
Duration (ms): 1300 ±20		$V_1/V_{1,nom}$	$V_2/V_{2,nom}$	$V_3/V_{3,nom}$	φ_{V1}	φ_{V2}	φ_{V3}
MV	Normal condition	1	1	1	30°	270°	150°
	During fault	0,82 ±0,05	0,82 ±0,05	1	23°	277°	150°
LV	Normal condition	1	1	1	0°	240°	120°
	During fault	0,94 ±0,05	0,75 ±0,05	0,94 ±0,05	354°	240*	126°

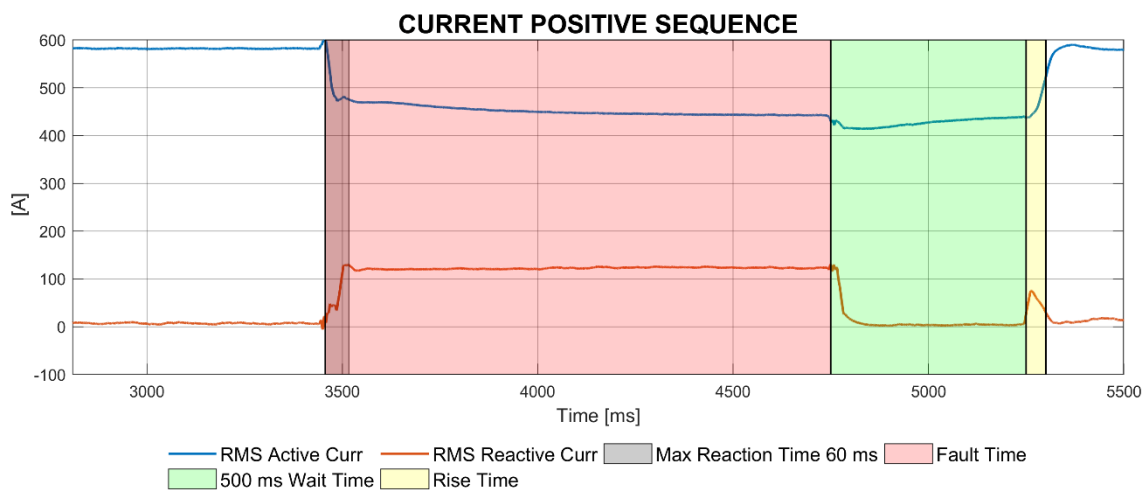
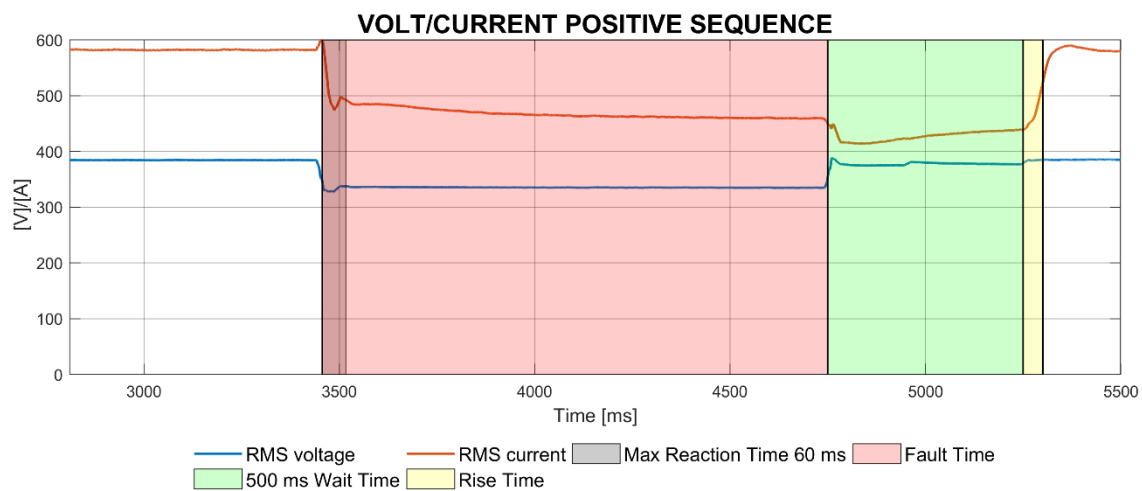




CREI Ven – Padova
Laboratorio Prove
Report n. 177/20/00179/ER

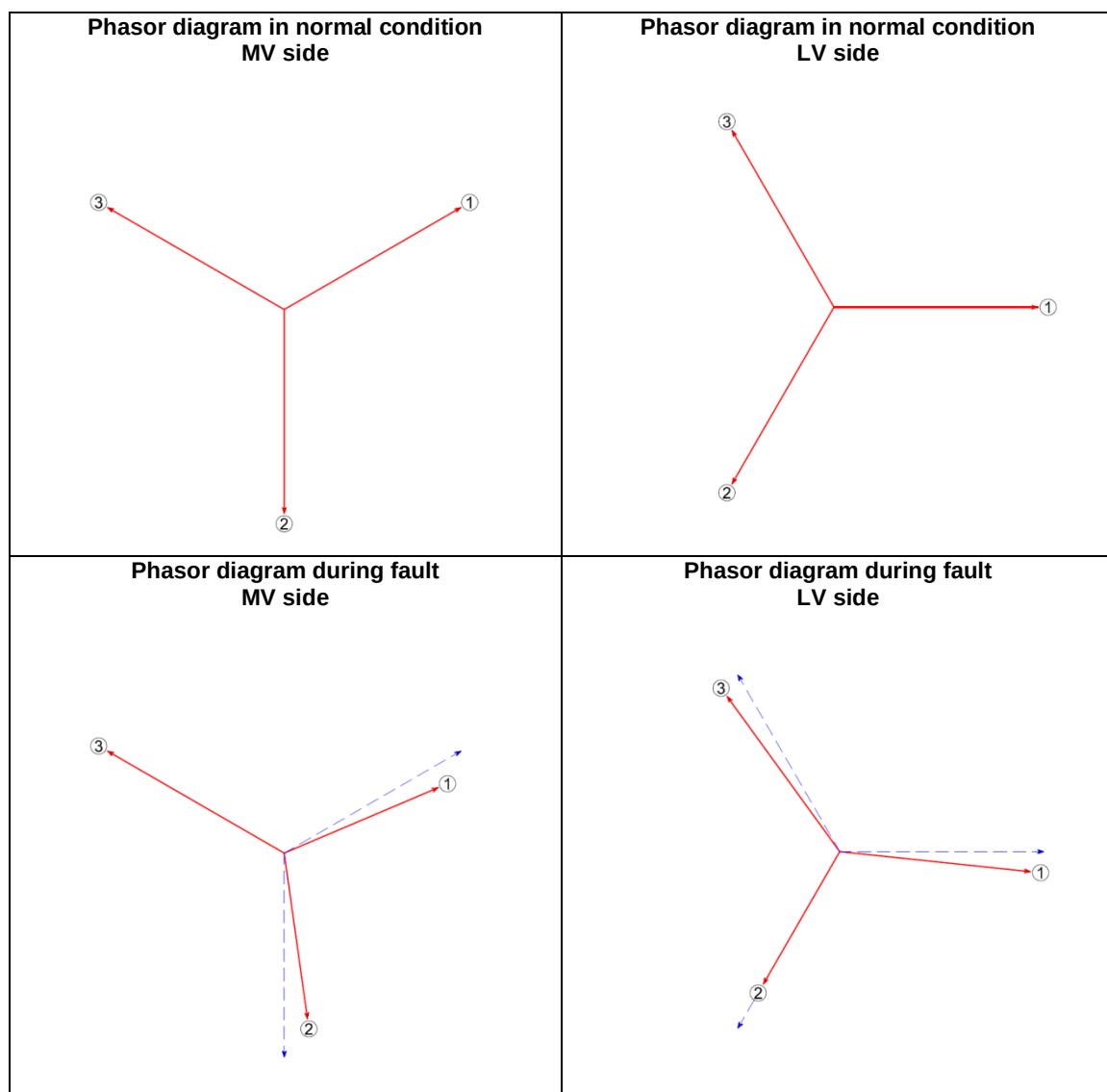






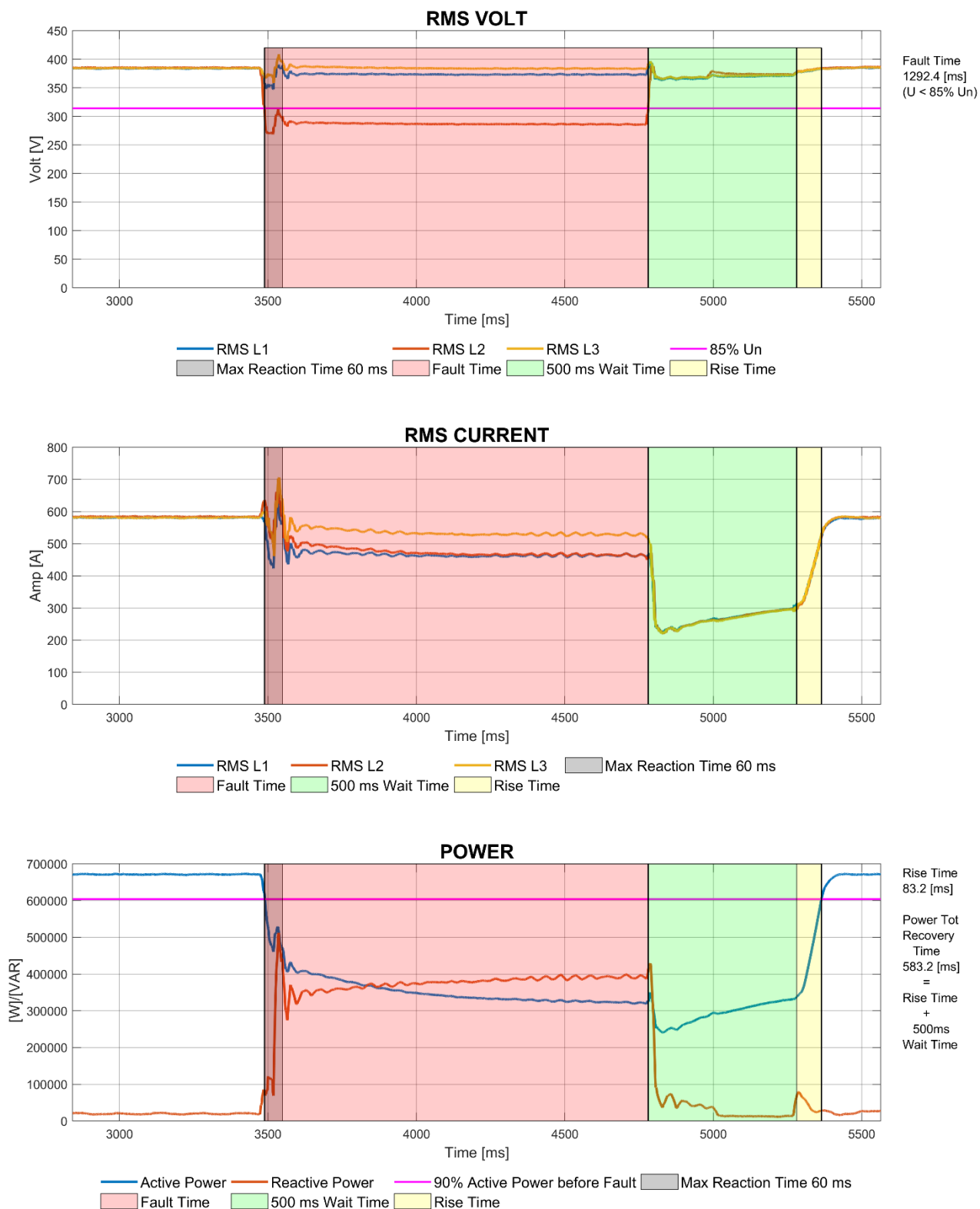


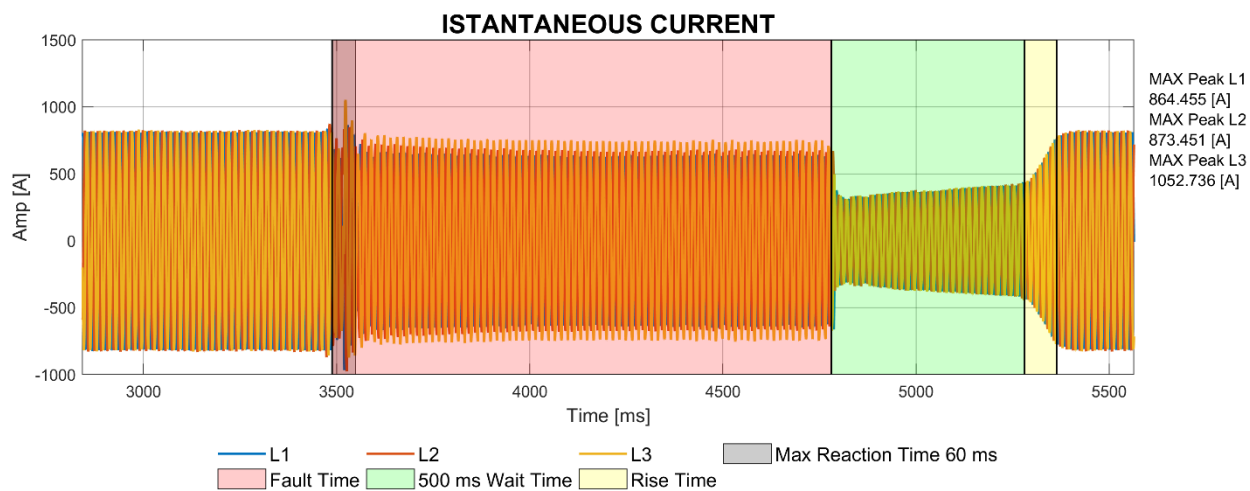
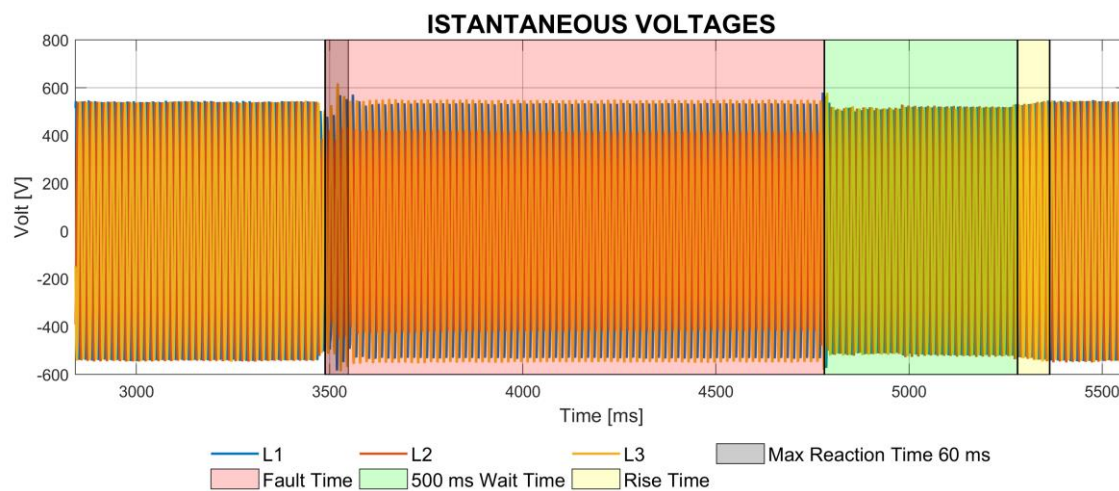
Test N° 39		LVRT - 75% Un - 91% Pn – Asym – K = 10					
Duration (ms): 1300 ±20		$V_1/V_{1,nom}$	$V_2/V_{2,nom}$	$V_3/V_{3,nom}$	φ_{V1}	φ_{V2}	φ_{V3}
MV	Normal condition	1	1	1	30°	270°	150°
	During fault	0,82 ±0,05	0,82 ±0,05	1	23°	277°	150°
LV	Normal condition	1	1	1	0°	240°	120°
	During fault	0,94 ±0,05	0,75 ±0,05	0,94 ±0,05	354°	240*	126°

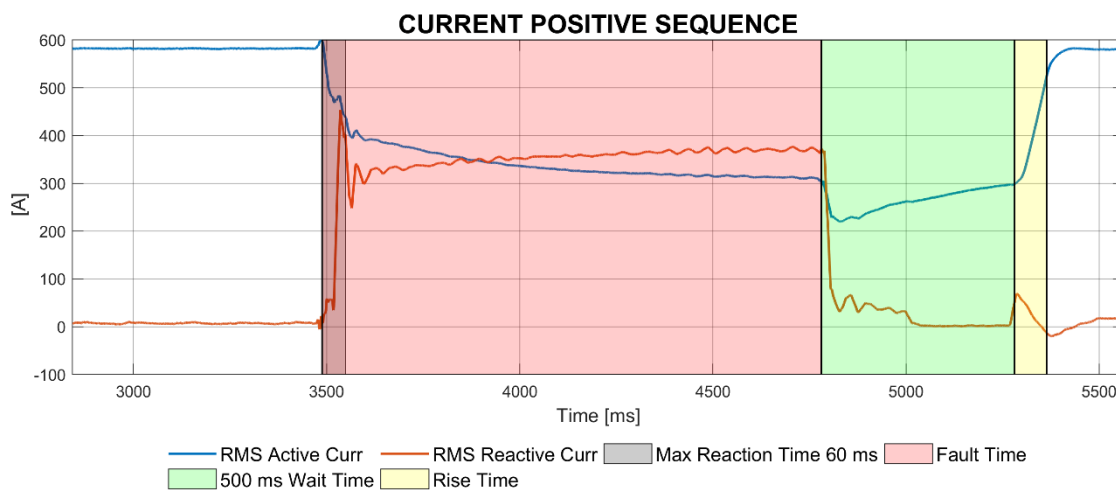
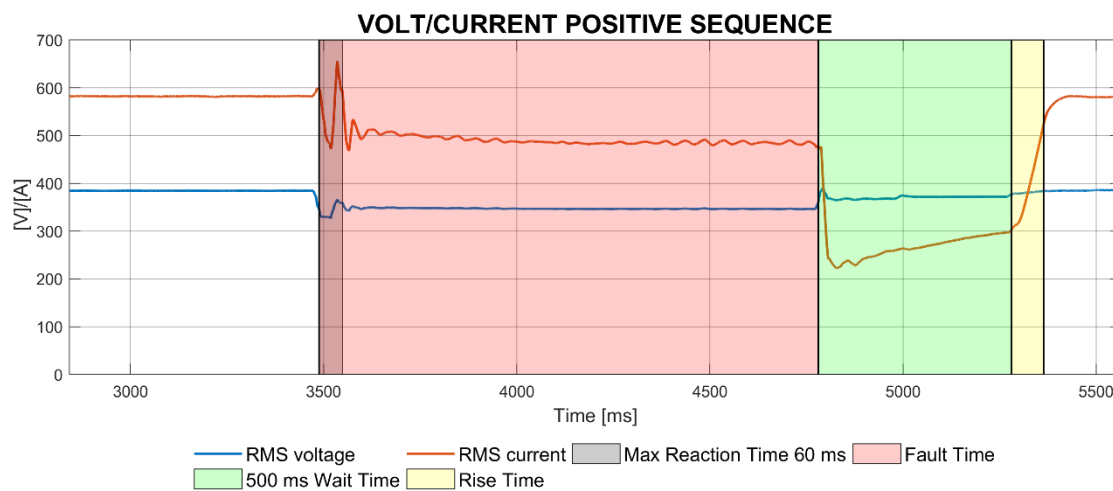




CREI Ven – Padova
Laboratorio Prove
Report n. 177/20/00179/ER









CREI Ven S.c.a.r.l. - Padova
Laboratorio Prove

Code 177/20/00179/ER

Annex B Test instrumentations

ER- E.R. / Grid code tests - Verification of functions and protection - INV01 Area

Description	Manufacturer	Model	Identifier	Cal data	Cal due
POWER ANALYZER	CREI Ven	CREI DAQ	1446/LAB	2019-08-08	2020-08-07
Current Transducer	ZES Zimmer	HALL2000	1318/LAB	2020-01-17	2021-07-15
Current Transducer	ZES Zimmer	HALL2000	1317/LAB	2020-01-17	2021-07-15
Current Transducer	ZES Zimmer	HALL2000	1316/LAB	2020-01-17	2021-07-15
SOURCE/SORGENTE AC Grid Simulator	EEI	800 kVA	1260/LAB	2020-04-16	2021-04-16



Annex C

Photographs of test configuration

EUT's Photographs





Annex C

Photographs of test configuration





CREI Ven S.c.a.r.l. - Padova
Laboratorio Prove

Code 177/20/00179/ER

Annex D Auxiliary instrumentations

<i>Application</i>	<i>Description</i>	<i>Manufacturer</i>	<i>Model</i>	<i>Identifier</i>	<i>Cal. data</i>	<i>Cal. due</i>
Monitoring of environmental conditions	STAZIONE METEO	IDT	BA888	054/LAB	2016-09-09	2017-09-09
Monitoring of environmental conditions	Barometer - Atmospheric pressure measurement	Delta Ohm	HD2001	1002/LAB	2016-04-11	2017-04-11
Monitoring of environmental conditions	Climatic Sensor (sec site) - GWT Area	HW-group	HWg-STE	1250/LAB	2016-05-27	2017-05-27
Monitoring of environmental conditions	Climatic Sensor (sec site) - Test corner	HW group	HWg-STE	1251/LAB	2016-05-27	2017-05-27
Monitoring of environmental conditions	Climatic Sensor (sec site) - Laboratory (Safety te	HW group	HWg-STE	1252/LAB	2016-05-27	2017-05-27
Monitoring of environmental conditions	Climatic Sensor (sec site) - INV02 Test Area / Wei	HW-group	HWg-STE	1253/LAB	2016-05-27	2017-05-27
Monitoring of environmental conditions	Climatic Sensor (sec site) - INV01 Test Area	HW-group	HWg-STE	1254/LAB	2016-05-27	2017-05-27

<i>Application</i>	<i>Description</i>	<i>Manufacturer</i>	<i>Model</i>	<i>Identifier</i>	<i>Cal. data</i>	<i>Cal. due</i>
Monitoring of environmental conditions	Climatic Sensor (sec site) - INV03 test Area	HW group	HWg-STE	1255/LAB	2016-05-27	2017-05-27
Monitoring of environmental conditions	Climatic Sensor (sec site) - Safety Office	HW group	HWg-STE	1256/LAB	2016-05-27	2017-05-27
Monitoring of environmental conditions	Climatic Sensor (pri site) - 049L/CA Immunity Anec	HW group	HWg-STE	1298/LAB	2016-06-24	2017-06-24
Monitoring of environmental conditions	Climatic Sensor (pri site) - 739/LAB Emission Anec	HW group	HWg-STE	1299/LAB	2016-06-24	2017-06-24
Monitoring of environmental conditions	Climatic Sensor (pri site) - 051L/CS Shielded Cham	HW group	HWg-STE	1300/LAB	2016-06-24	2017-06-24
Monitoring of environmental conditions	Climatic Sensor (pri site) - EMC Laboratory - ECAT	HW group	HWg-STE	1301/LAB	2016-06-24	2017-06-24
Monitoring of environmental conditions	Climatic Sensor (pri site) - IP test area / Low Fr	HW group	HWg-STE	1326/LAB	2016-06-24	2017-06-24
Monitoring of environmental conditions	STAZIONE METEO	OREGON SCIENTIFIC	BA888	384/LAB	2016-09-09	2017-09-09



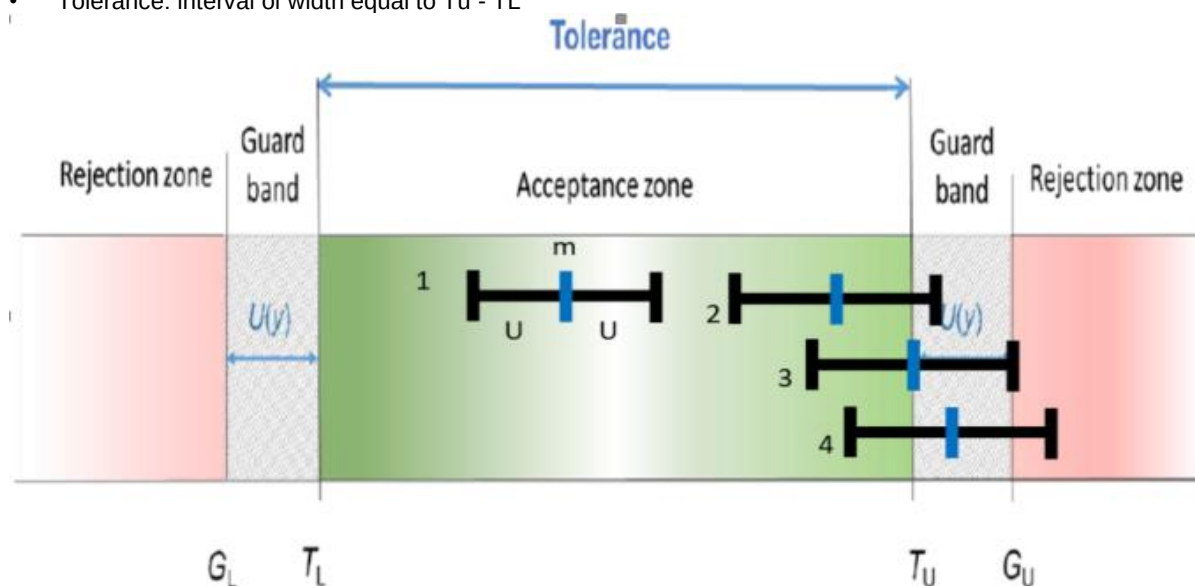
Annex F Compliance assessment and measurement uncertainty

F1: Decision Rule

- A decision rule defines the role of uncertainty in assessing the conformity of measured values with respect to specification limits.
- The CREI Ven decision rule uses the “guard band” method minimizing the “supplier risk” (type 1 risk or alpha risk), that is the risk of refusing a compliant product.
- The “guard band” is established equal to the extended uncertainty U beyond the tolerance limit; $G_u = T_u + U$
- The probability distribution of the measurement uncertainty is assumed to be Gaussian
- If a test does not provide any Tolerance Limit the conformity assessment and the decision rule are not needed.

Nomenclature

- G_u : (G_L) width of the Upper (lower) guard band
- m : measured value
- P : probability of correct acceptance, ($1-P$: probability of refusing a compliant product)
- T_u : Upper Tolerance Limit
- T_L : Lower Tolerance Limit
- Tolerance: interval of width equal to $T_u - T_L$



Case	Decision Rule	Note
Case 1, 2, 3	Measurement complies with specifications	$T_L \leq m \leq T_u$; the probability P of correct acceptance is: $100\% \geq P \geq 50\%$ $m+U$ ($m-U$) always falls into the G_u (G_L)
Case 4	Measurement NOT complies with specifications	$m > T_u$ (T_L): the probability P of correct acceptance is lower than 50% $m+U$ ($m-U$) falls into the upper (lower) rejection zone

Note about qualitative tests: The uncertainty balance is applicable only to tests whose result is numerical. For the qualitative tests, are verified the tolerance and repeatability of the quantities that stimulate the EUT. Tolerances and repeatability of these quantities are part of the instrumentation calibration.

In accordance with:

- IEC Guide 115 Application of uncertainty of measurement to conformity assessment activities in the electrotechnical sector
- ILAC-G8:03/2009 Guidelines on the Reporting of Compliance with Specification
- EUROLAB Technical report nr 01/2017
- JGCM guide 106:2012



Annex F Compliance assessment and measurement uncertainty

F.2 Measurements uncertainty

Test bench n° 99	Anti-islanding protection verification" a "ER- E.R. / Grid code / Anti-islanding protection verification	
<i>Test Uncertainty</i>	<i>Expanded Uncertainty (k=2 - coverage factor: 95%)</i>	
1260/LAB	Power Source EEI 800 kVA Expanded Uncertainty (k=2 - coverage factor 95%)	
<i>Expanded Uncertainty</i>	<i>U</i>	
<i>AC @400V [V]</i>	<i>0.23</i>	
<i>AC @690V [V]</i>	<i>0.39</i>	
<i>Phase Angle [deg]</i>	<i>2.7</i>	
<i>Dip Duration [ms]</i>	<i>2.6</i>	
<i>Dip Transition [ms]</i>	<i>2.3</i>	
<i>Frequency [Hz]</i>	<i>5.0E-03</i>	
<i>Harmonics Amplitude [V]</i>	<i>3.0E-02</i>	
Test bench n° 97	ER	
<i>Test Uncertainty</i>	<i>Expanded Uncertainty (k=2 - coverage factor: 95%)</i>	
1445/LAB	CREIDAQ (k=2 - coverage factor 95%)	
<i>CREDAQ with LEM Expanded Uncertainty</i>	<i>U</i>	
<i>Power (Single Phase) [W% VAR%]</i>	<i>0.83</i>	
<i>Three Phase Power [W% VAR%]</i>	<i>1.43</i>	
<i>Frequency Measurement [Hz%]</i>	<i>0.002</i>	
<i>Voltage RMS [V%]</i>	<i>0.31</i>	
<i>Current RMS [A%]</i>	<i>0.79</i>	
<i>Current DC [mA]</i>	<i>42</i>	
<i>Cosphi Measurement [%]</i>	<i>1.14</i>	
<i>Time [ms]</i>	<i>0.33</i>	

----- End of Test Report -----