



EIFS 2013:1

Site name: Wind Farm Kv O 33kV

Meter serial no: 22100000

Period start: 2018-06-01 00:00:00

Period end: 2018-09-01 23:59:59

Nominal voltage: 21,00kV

Version: 21.1

Summary

Unbalance	Passed
Voltage variations	Passed
THD	Passed
Individual harmonics	Passed
Voltage dips	Failed
Voltage swells	Passed
RVC	Passed



Table of contents

1.	<i>Voltage unbalance</i>	3
2.	<i>Voltage variation</i>	4
3.	<i>THD analysis</i>	5
4.	<i>Individual harmonic analysis</i>	6
5.	<i>Voltage dips</i>	7
6.	<i>Voltage swells</i>	8
7.	<i>Rapid voltage changes</i>	9

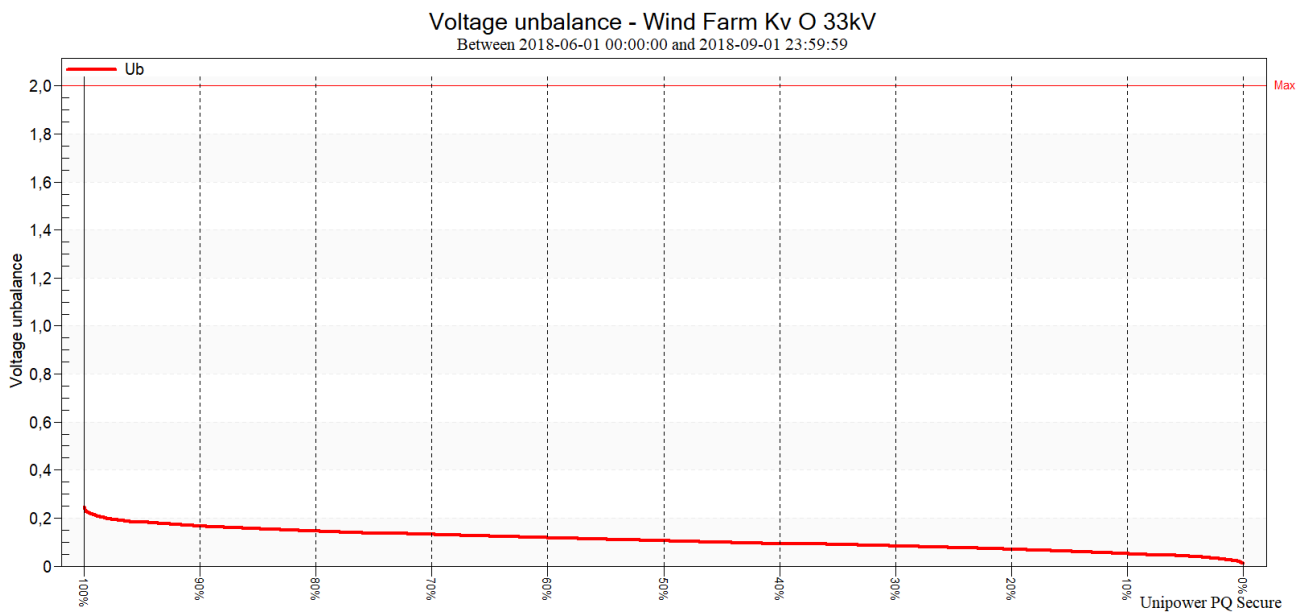
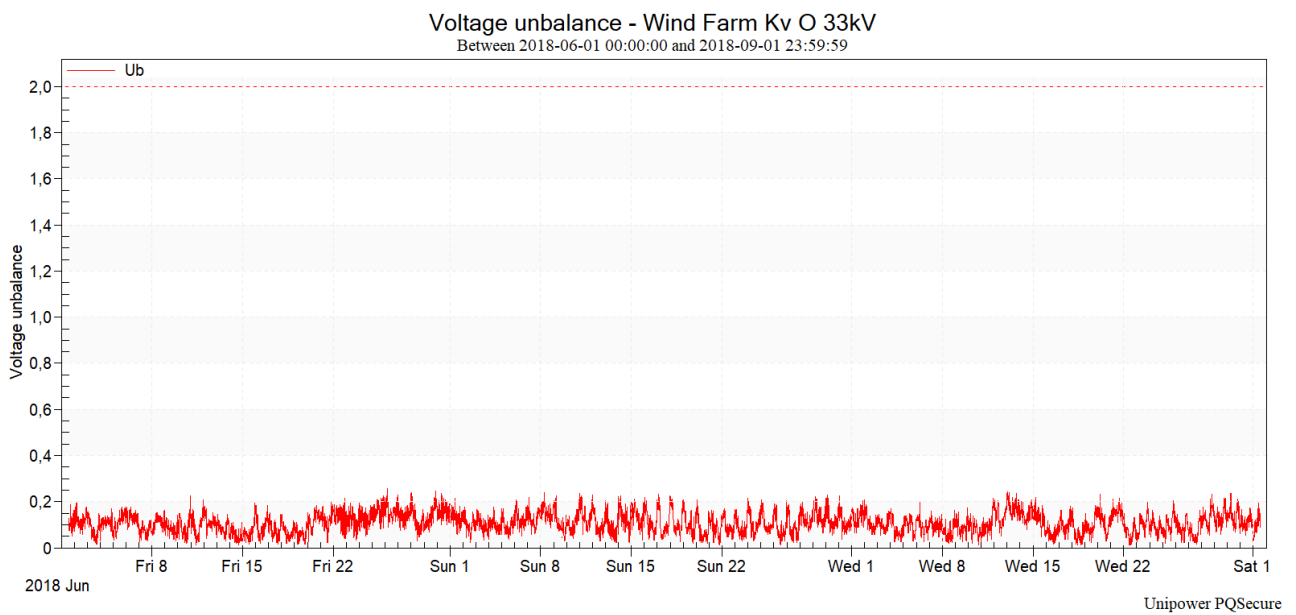
1 Voltage unbalance

During each period of one week, all of the 10 minute mean rms values of the negative phase sequence component of the supply voltage shall be within the range of 0 to 2% of the positive phase sequence component.

Max 2,00% during 100% of time.

Phase	Within limit [%]	Max [%]	Min [%]	95% [%]	Result
Ub	100	0,256	0,013	0,181	Passed

Excluded 18 flagged value(s) in the result



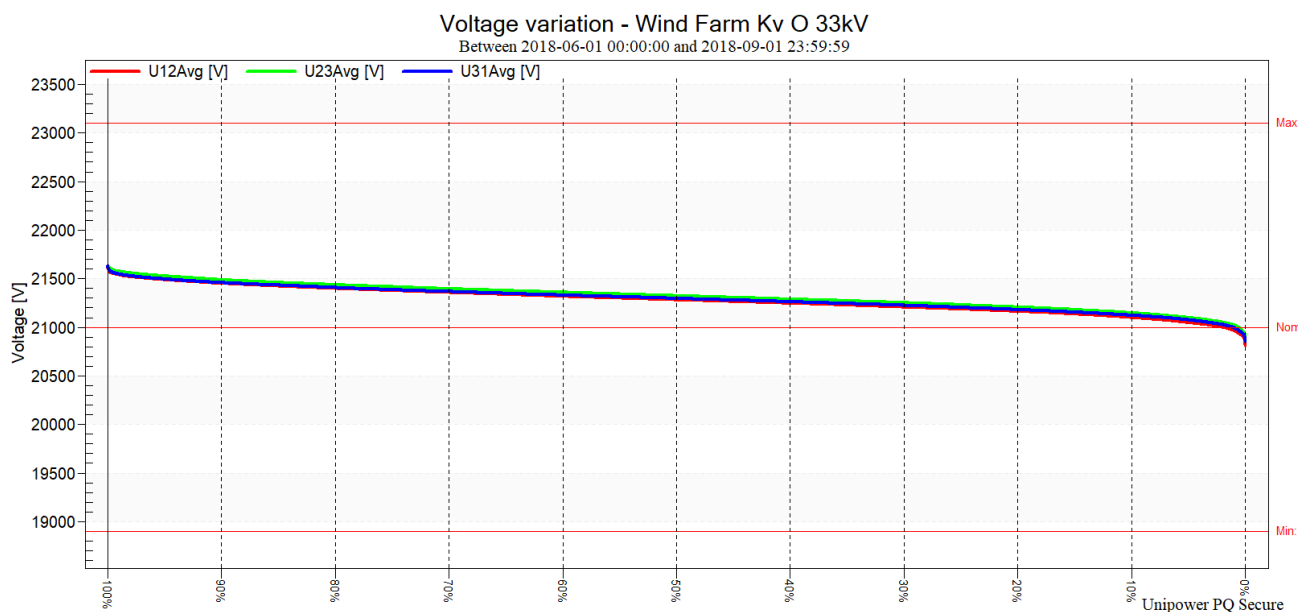
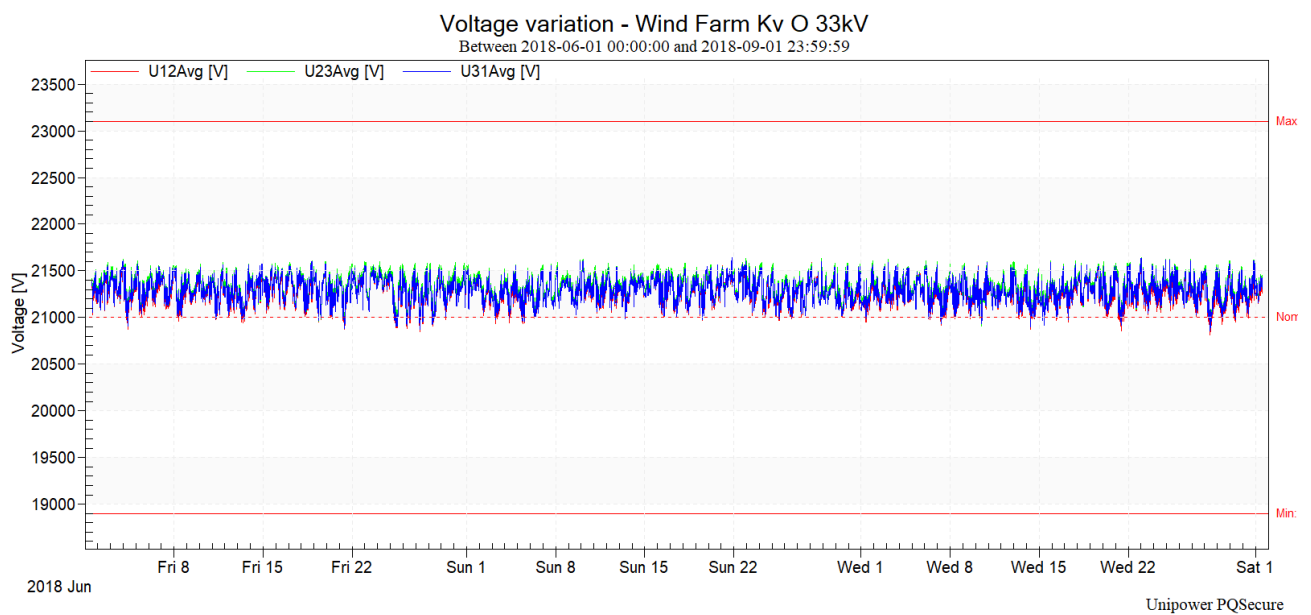
2 Voltage variation

During each period of one week, all of the 10 minutes mean rms values of the supply voltage shall be within the range of $U_{nom} \pm 10\%$.

Max 23,10kV, Min 18,90kV during 100% of time.

Phase	Within limit [%]	Max [kV]	Min [kV]	95% [kV]	Result
U12Avg	100	21,62	20,81	21,49	Passed
U23Avg	100	21,64	20,86	21,53	Passed
U31Avg	100	21,64	20,85	21,50	Passed

Excluded 18 flagged value(s) in the result



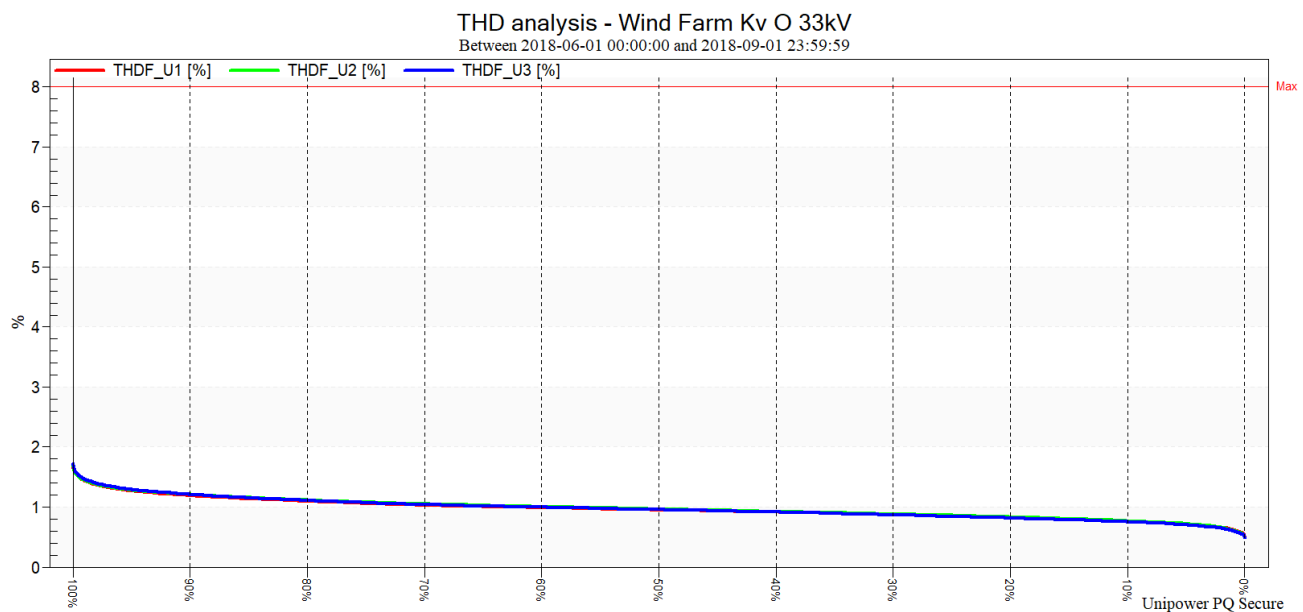
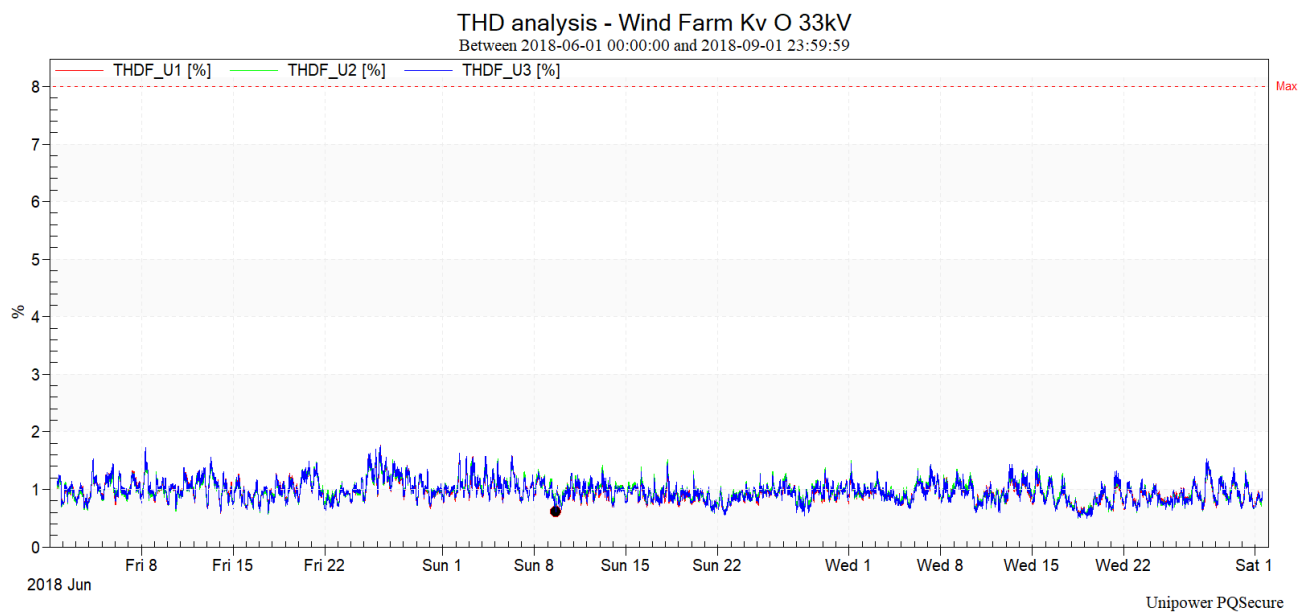
3 THD analysis

In any period of one week the THD (Total Harmonic Distortion) of the supply voltage shall be $\leq 8\%$.

Max 8,00% during 100% of time.

Phase	Within limit [%]	Max [%]	Min [%]	95% [%]	Result
THDF U1	100	1,76	0,510	1,27	Passed
THDF U2	100	1,72	0,490	1,28	Passed
THDF U3	100	1,76	0,490	1,29	Passed

Excluded 18 flagged value(s) in the result



4 Individual harmonic analysis

During each period of one week, all of the 10 minute mean rms values of each individual harmonic voltage shall be less than or equal to the value given in the table. Resonances may cause higher voltages for an individual harmonic.

Harmonic no: limit in % of fundamental

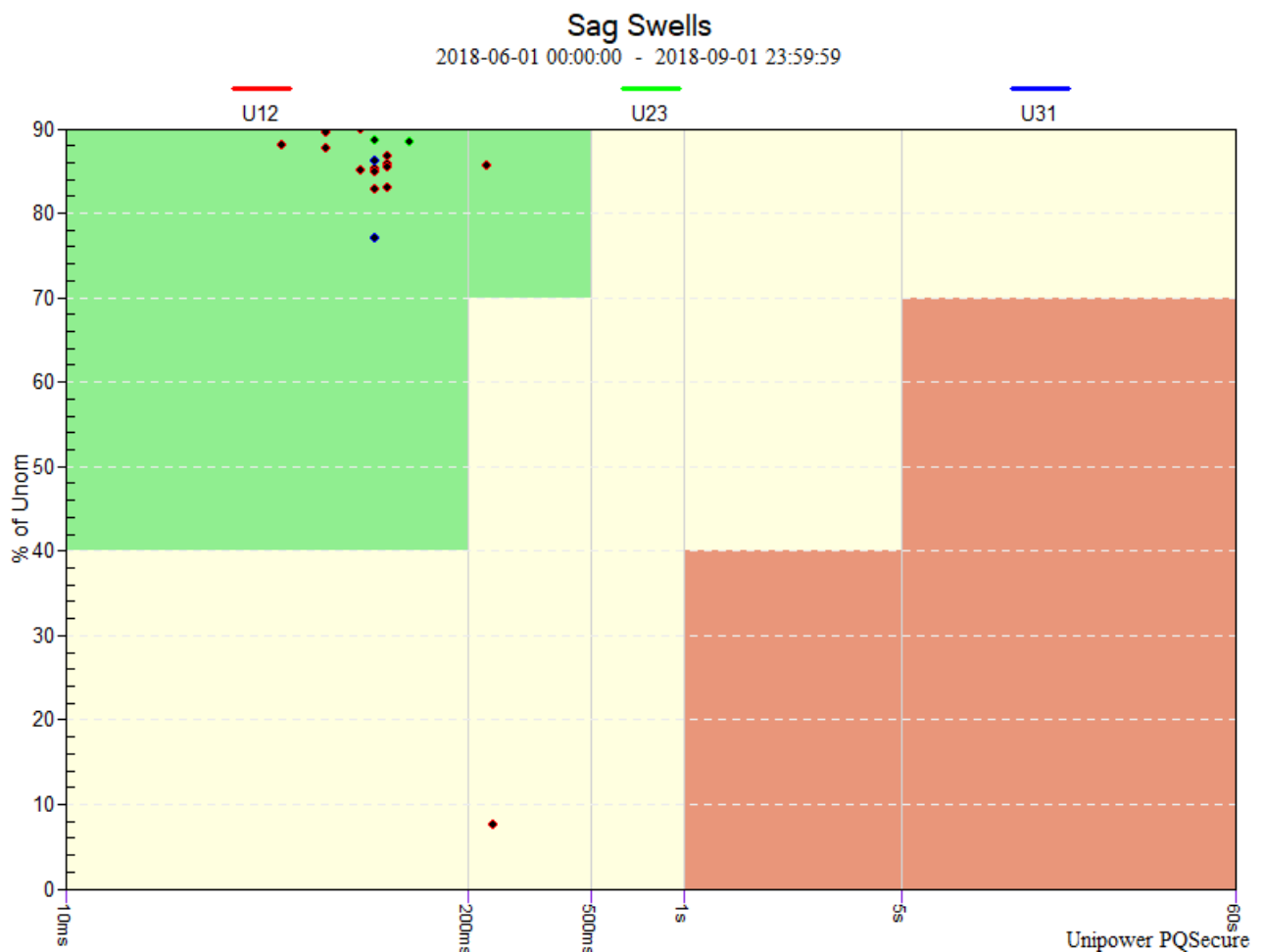
#	Limit [%]	MaxU12 [%]	95% U12 [%]	MaxU23 [%]	95% U23 [%]	MaxU31 [%]	95% U31 [%]	Result
2	2	0,06	0,03	0,05	0,03	0,07	0,05	Passed
3	5	0,25	0,16	0,22	0,13	0,17	0,11	Passed
4	1	0,11	0,07	0,08	0,05	0,09	0,07	Passed
5	6	1,51	1,06	1,47	1,05	1,50	1,05	Passed
6	0,5	0,11	0,07	0,13	0,06	0,09	0,05	Passed
7	5	1,39	0,98	1,49	1,03	1,47	1,02	Passed
8	0,5	0,09	0,05	0,09	0,05	0,10	0,05	Passed
9	1,5	0,09	0,05	0,07	0,04	0,07	0,05	Passed
10	0,5	0,05	0,04	0,06	0,04	0,06	0,03	Passed
11	3,5	0,24	0,14	0,22	0,13	0,24	0,14	Passed
12	0,5	0,04	0,03	0,03	0,02	0,03	0,02	Passed
13	3	0,26	0,15	0,27	0,15	0,28	0,15	Passed
14	0,5	0,05	0,03	0,05	0,03	0,05	0,03	Passed
15	0,5	0,07	0,04	0,06	0,04	0,04	0,03	Passed
16	0,5	0,05	0,03	0,05	0,02	0,04	0,03	Passed
17	2	0,19	0,15	0,21	0,17	0,19	0,16	Passed
18	0,5	0,03	0,00	0,03	0,00	0,03	0,00	Passed
19	1,5	0,14	0,11	0,15	0,12	0,14	0,11	Passed
20	0,5	0,02	0,00	0,03	0,00	0,03	0,00	Passed
21	0,5	0,03	0,00	0,02	0,00	0,03	0,00	Passed
22	0,5	0,00	0,00	0,00	0,00	0,00	0,00	Passed
23	1,5	0,10	0,06	0,11	0,07	0,09	0,07	Passed
24	0,5	0,00	0,00	0,00	0,00	0,00	0,00	Passed
25	1,5	0,07	0,06	0,09	0,06	0,08	0,05	Passed

5 Voltage dips

There should be no sags with depth and duration that corresponds to area C in the table below. The supplier of power is obliged to mitigate sags in area B in the table below if the mitigating actions are in reasonable proportion to the problems experienced by the consumers that are affected by the sags.

Område	Antal
A	18
B	1
C	0
Total:	19

Depth (d)	Duration (t)	10ms < t ≤ 0.2s	0.2s < t ≤ 0.5s	0.5s < t ≤ 1s	1s < t ≤ 5s	5s < t ≤ 60s
80% ≤ d < 90%		16	1	0	0	0
70% ≤ d < 80%		1	0	0	0	0
40% ≤ d < 70%		0	0	0	0	0
5% ≤ d < 40%		0	1	0	0	0
0% ≤ d < 5%		0	0	0	0	0

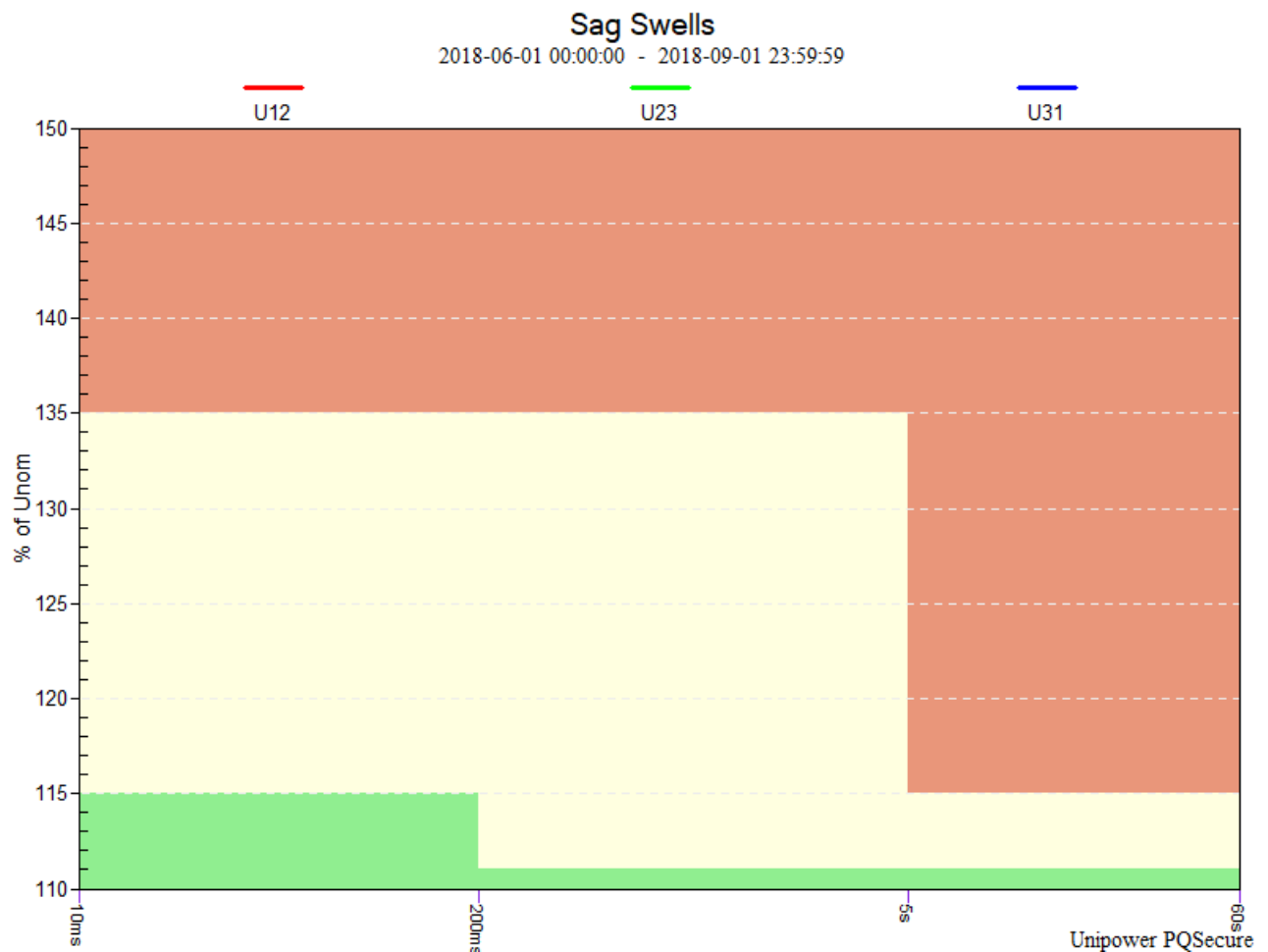


6 Voltage swells

There should be no swells with depth and duration that corresponds to area C in the table below. The supplier of power is obliged to mitigate swells in area B in the table below if the mitigating actions are in reasonable proportion to the problems experienced by the consumers that are affected by the swells.

Område	Antal
A	0
B	0
C	0
Total:	0

Depth (d)	Duration (t)	10ms < t ≤ 0.2s	0.2s < t ≤ 5s	5s < t ≤ 60s
$u \geq 135\%$		0	0	0
$115\% \geq u < 135\%$		0	0	0
$111\% \leq u < 115\%$		0	0	0
$110\% \leq u < 111\%$		0	0	0



7 Rapid voltage changes

The number of rapid voltage changes (Delta Ustationary $\geq 3\%$) added to the number of sags in area A (Sag A) must not exceed 24 per day.

At the same time, the number of rapid voltage changes (Delta Umax $\geq 5\%$) added to the number of sags in area A (Sag A) must not exceed 24 per day.

Summary of RVC analysis: Passed

Date	RVC Delta Ustationary $\geq 3\%$	RVC Delta Umax $\geq 5\%$	Sag A	Result
2018-06-12	0	1	0	Passed
2018-06-17	0	1	0	Passed
2018-06-18	0	1	0	Passed
2018-06-19	0	5	0	Passed
2018-06-20	0	1	0	Passed
2018-06-21	0	1	0	Passed
2018-06-30	1	0	0	Passed
2018-07-06	0	2	0	Passed
2018-07-09	0	7	9	Passed
2018-07-12	0	0	2	Passed
2018-07-13	0	1	0	Passed
2018-07-28	0	2	1	Passed
2018-07-29	0	1	0	Passed
2018-07-30	0	1	0	Passed
2018-07-31	0	1	0	Passed
2018-08-01	0	1	0	Passed
2018-08-04	0	2	0	Passed
2018-08-06	0	1	1	Passed
2018-08-08	0	1	0	Passed
2018-08-10	4	15	0	Passed
2018-08-11	0	1	1	Passed
2018-08-12	0	2	2	Passed
2018-08-17	0	1	0	Passed
2018-08-26	0	0	1	Passed
2018-08-29	0	1	1	Passed