

Report Analysis of the Electrical Supply Quality in Low Voltage at the Las Varillas Sector



Operator

Engineer

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Installation

Las Varillas Farm

Agrícola Super Ltda.

Fundo La Estrella

Frequency Behavior

Tendency Report

Record Beginning Date 04/02/2008 - 13:30:00
Record extend 7:00:00:00 (d:h:m:s)
Instrument ID Model: 3945 - 1 1:261525 240.9

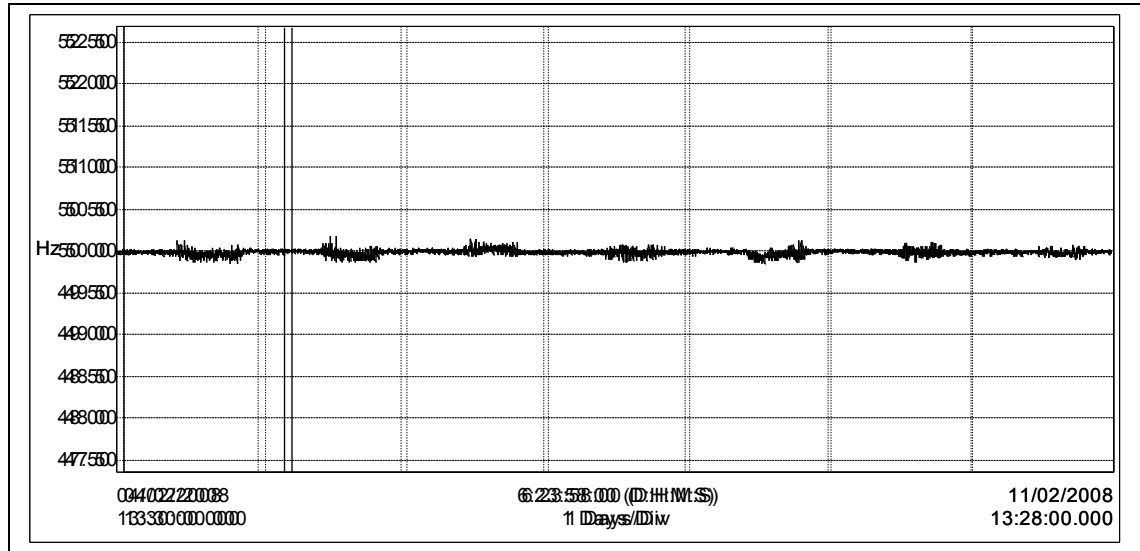


Chart 1

Hz 04/02/2008 13:30:00.000 7:00:00:00 (D: H: M: S) 49.984278 49.850000 50.180000 5040

According to Chart 1, it is observed that during the period of sampling the frequency has behaved in a uniform way, is important to say that the variations shown are not significant and they do not represent any risk.

RMS Lineal Voltage Behavior

Channel Name: Vrms Line1

Voltage Ratio: 1.000

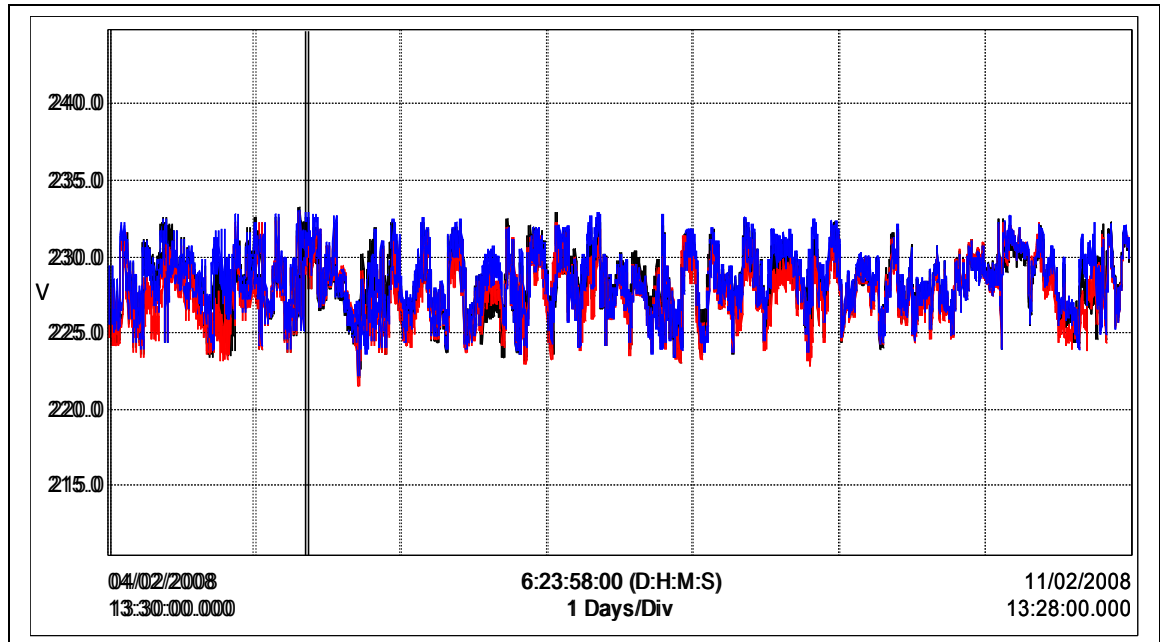


Chart 2

Name	Date	Hour	Average	Min	Max	Units
Vrms Linea	104/02/08	13:30:00.00	228.17	222.10	233.20	Volt
Vrms Linea	204/02/08	13:30:00.00	227.75	221.50	232.90	Volt
Vrms Linea	304/02/08	13:30:00.00	228.39	222.00	233.00	Volt

The above showed chart (Chart 2) shows the behavior acquired by the neutral voltage phase during the period of sampling, is to observed a uniform behavior of the voltage, and it shows that during the seven days the behavior does not shows greater variants. A minimum of 221,5 volt is registered for the 2nd phase and a 233,2 volt maximum was registered in the 3rd phase. According to the results the neutral voltage phase marked an average of 228,39 volt.

RMS Lineal Voltage Behavior

Chanel Name: Urms Line1
Voltage Ratio: 1.000

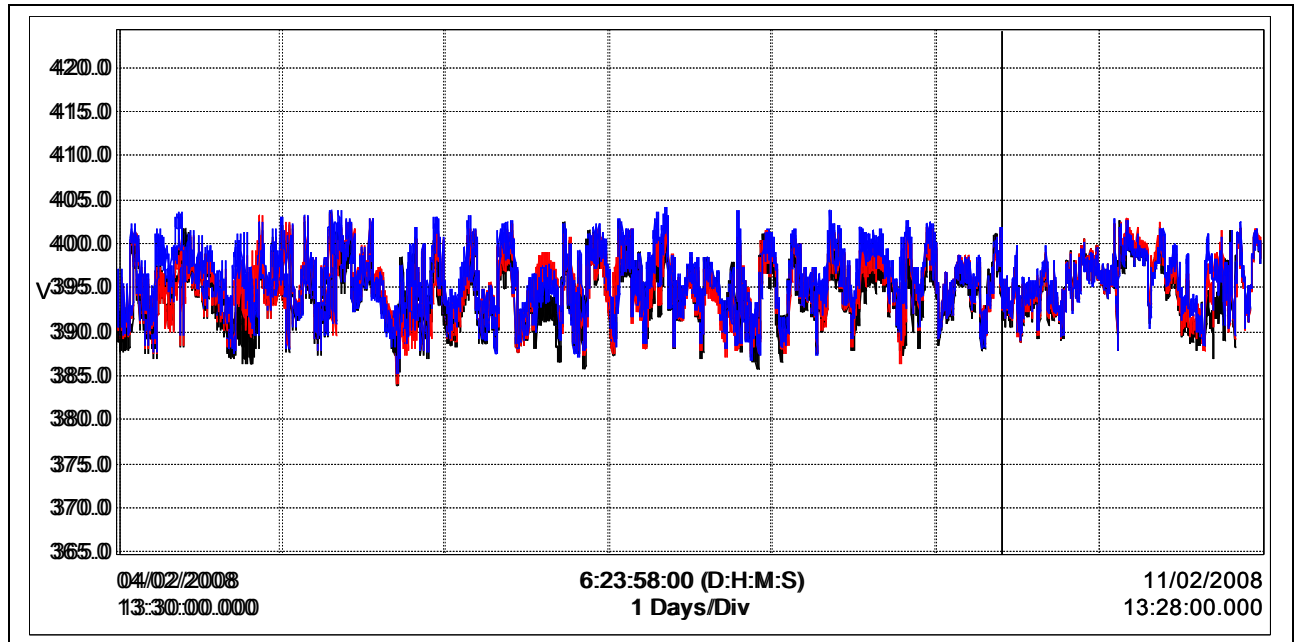


Chart 3

Name	Date	Hour	Average	Min	Max	Units
Urms Linea	104/02/08	13:30:00.00	394.56	383.90	403.70	Volt
Urms Linea	204/02/08	13:30:00.00	395.10	384.10	403.40	Volt
Urms Linea	304/02/08	13:30:00.00	395.71	385.20	404.10	Volt

Chart 3 above shows to the characteristic of the voltages phases - phase of the substation, the behavior of the voltages does not differ with respect to shown in the chart of the neutral phase voltage. The analysis indicates that the minimum registered value of this parameter was of 383,9 volt registered in the 1st phase, the maximum value registered during the period is 404,10 volt and it was registered in the 3rd phase. It cannot be visualized considerable losses in the low tension network, according to the previous graph the voltages stay on an average of 380 volts, which is a value more than acceptable for the equipment operation.

Lineal RMS Electric Current Behavior

Channel Name: Arms Line1
Current Ratio: 1.000

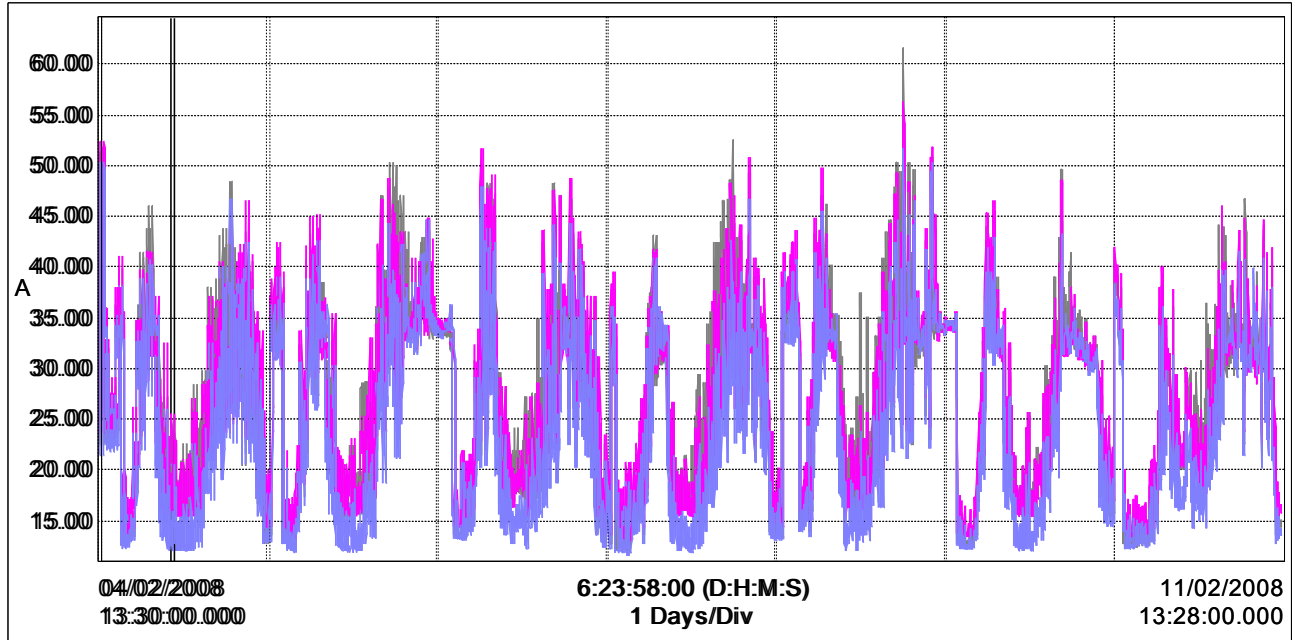


Chart 4

Name	Date	Hour	Average	Min	Max	Units
Arms Linea	104/02/08	13:30:00.00	26.959	11.800	61.600	A
Arms Linea	204/02/08	13:30:00.00	27.016	12.800	56.300	A
Arms Linea	304/02/08	13:30:00.00	24.282	11.600	51.700	A

The data shown at the above chart (Chart 4) proves a low consumption of energy during the period of test, which is reflected in the current consumptions. The maximum registered value borders the 61,6 A in the 1st phase, the minimum registered value is 11,6 A registered in the 3rd phase, the system during the monitoring registered a consumption average of 27,016 A.

In general the loads connected to this substation are balanced according to the values indicated in the data listed above, this since they don't exist greater difference comparing the minimum and maximum values.

Behavior of the registered demand power

Channel Name: W Line1
 Voltage Ratio: 1.000
 Current Ratio: 1.000

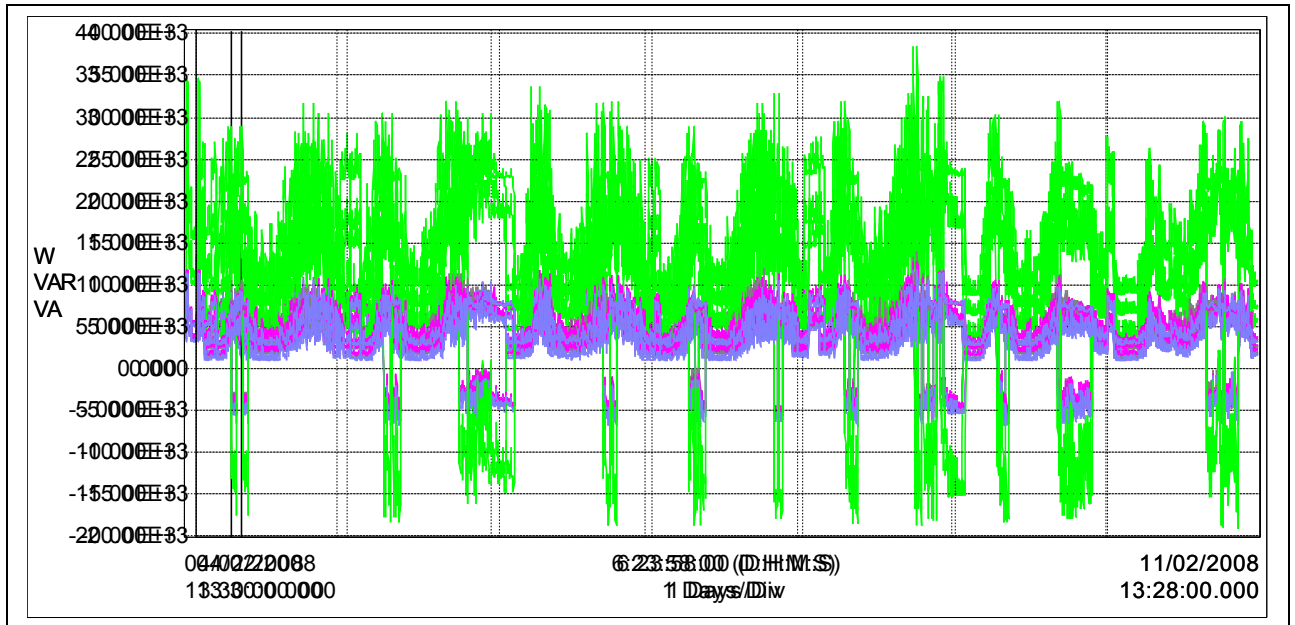


Chart 5

Name	Date	Hour	Average	Min	Max	Units
W Linea 1	04/02/08	13:30:00.00	4.7402E+3	2.1409E+3	10.660E+3	W
W Linea 2	04/02/08	13:30:00.00	4.6843E+3	2.2996E+3	10.202E+3	W
W Linea 3	04/02/08	13:30:00.00	3.9208E+3	1.5552E+3	10.110E+3	W
W Neutral	04/02/08	13:30:00.00	13.345E+3	5.9956E+3	30.107E+3	W
VAR Linea 1	04/02/08	13:30:00.00	2.2719E+3	-6.4065E+3	9.1498E+3	VAR
VAR Linea 2	04/02/08	13:30:00.00	2.4502E+3	-6.1426E+3	8.6928E+3	VAR
VAR Linea 3	04/02/08	13:30:00.00	1.6782E+3	-7.0308E+3	8.1441E+3	VAR
VAR Neutral	04/02/08	13:30:00.00	6.4004E+3	-19.209E+3	25.987E+3	VAR
VA Linea 1	04/02/08	13:30:00.00	6.1598E+3	2.7191E+3	14.016E+3	VA
VA Linea 2	04/02/08	13:30:00.00	6.1612E+3	2.9547E+3	12.780E+3	VA
VA Linea 3	04/02/08	13:30:00.00	5.5550E+3	2.6842E+3	11.760+3	VA
VA Neutral	04/02/08	13:30:00.00	17.876E+3	8.3580E+3	38.556E+3	VA

The power demands reflects the current consumption commented previously, in Chart 5 it can be observed that this sector had a maximum power demand of 30 KW and 5,9 W minimum approx.

Power Factor Beauvoir

Channel Name: PF Line1

Voltage Ratio: 1.000

Current Ratio: 1.000

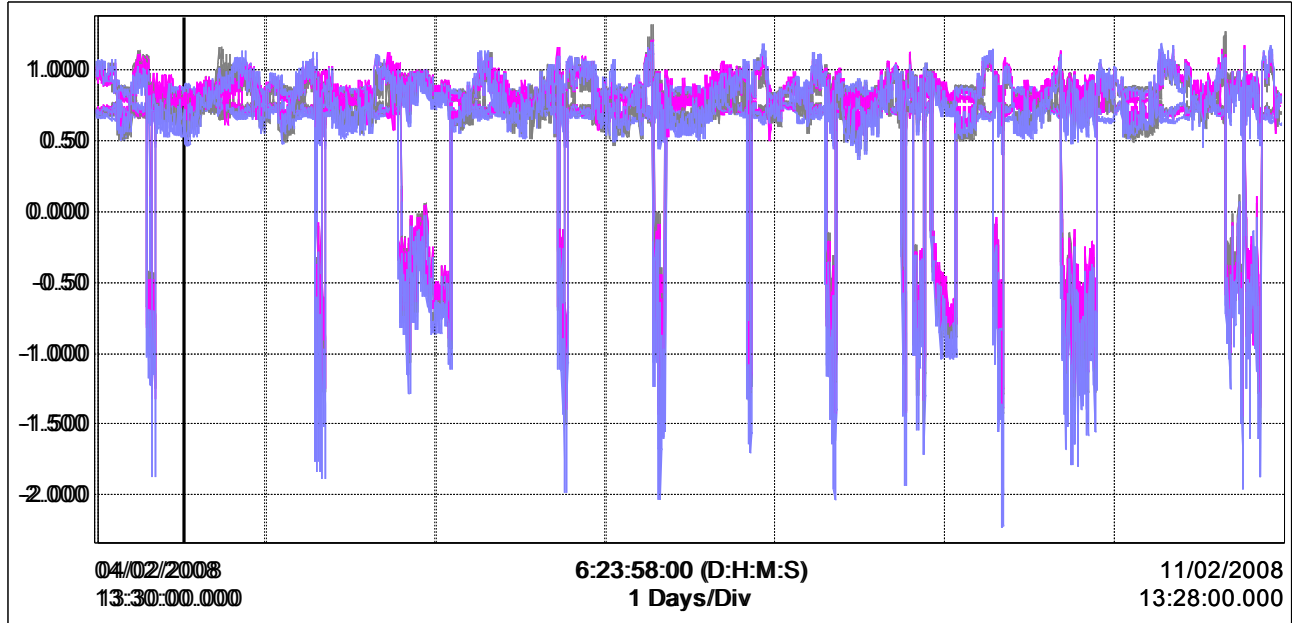


Chart 6

Name	Date	Hour	Average	Min	Max	Units
PF Linea 1	04/02/08	13:30:00.00	0.772	0.551	0.990	
PF Linea 2	04/02/08	13:30:00.00	0.761	0.562	0.990	
PF Linea 3	04/02/08	13:30:00.00	0.696	0.398	0.997	

The power factor at this sector is below the demanded by the Chilean electrical norm (minimum of 0.93) and although in certain moments this value is the ideal, the average of this parameter is low.

Illustration 6 shows the behavior of the power factor, it can be clearly appraised that the optimal values are registered in isolated events, showing at the rest of the monitoring a very uniform behavior and below the demanded rank.

The final recommendation is to improve the power factor at the monitored facilities, by means of the existing methods like condensers banks in average and low tension.

Responsible engineer
Claudio Bustos Carrasco
Sistel Ltda.

San Vicente de Tagua-Tagua 29 de Febrero de 2008