

# Power Quality Analysis

## Why perform full-disclosure Power Analysis on your facility?

Is your transformer big enough? Is your service overloaded? Are you adding load to your service, MCC section, or a bus in your plant? By monitoring your service or buss, you have documented readings of the loading on your power system. Don't rely on spot checks taken with a hand-held meter.

Is the peak demand in your plant adding cost to your electric bill? Are you being penalized on your electric bill because of the power factor in your facility? By monitoring your facility power we can accurately document cost effective solutions that can actually pay for themselves by saving you money on your power bill.

Is your facility suffering expensive downtime due to power related issues? By monitoring your facility power we can accurately quantify voltage and current harmonics, voltage sags, voltage surges, as well as a number of other power quality related issues.

Do you have warranty issues or supplier issues that need to be documented to state your case? Do your ISO or QSO ratings depend on documentation of your power system?

## Features:

Buist Electric Testing provides "full-disclosure" analysis. What this means for you is that our power meter records everything the entire time that it is hooked up. This state-of-the-art equipment not only records values that are outside of given parameters, but all values for the entire time it is monitoring.

Our power meter can monitor from 15min. for short -term trouble analysis to long term studies that catch intermittent problems or provide insight into how your power usage changes from weekday to weekend or from week to week. Our reports are Microsoft Word documents that can be easily e-mailed. Our reports and graphs can be cut and pasted into your own reports **letting people know that you have "done your homework."**

# Sample Report

## Introduction

This is a summary of the power conditions at the Your Companies Power Quality site, as recorded at location Main Service. Data at this location was collected from 02/02/03 12:00:00 through 02/06/03 12:00:00.

This summary is composed of:

- The initial conditions section. This Section defines the power conditions at the above location.
- The Events section. This is a summary of the voltage events that occurred at this location during the monitor interval. Events are defined as changes in the monitored voltage. These changes may be subtle or severe. The power tolerance curve provides a graphical representation of the likelihood of an event to disrupt equipment operations.
- The Voltage Current and Frequency, (VIF), section. This section contains summaries for each of these parameters during the monitor interval.
- The Harmonics section. This contains the voltage and current harmonic, and harmonic distortion summaries acquired during the monitor interval.
- The Power section. This contains the VA, VARS., Watts, and Power factor acquired during the monitor interval. For multiphase locations, voltage and current imbalance are also included.

## Site and Location Information

### Site Information

|                             |                              |
|-----------------------------|------------------------------|
| Name                        | Your Companies Power Quality |
| Account Number              | IR000                        |
| Date and Time               | 01/24/03 13:31:51            |
| Phone Number                | 555-1212                     |
| Contact                     | Your Name                    |
| Memo                        | Main Service                 |
| Problem Description         | Hot Transformer Bushing      |
| Date First noticed          | 01/24/03                     |
| Problem Frequency           | Unknown                      |
| How problem exhibits itself | Other                        |
| Problem Cost                |                              |

### Location Information

|                 |                   |
|-----------------|-------------------|
| Name            | Main Service      |
| Power Type      | Three phase wye   |
| Feed Phase      | Unknown           |
| Phone           |                   |
| Date and Time   | 02/06/03 15:20:28 |
| Nominal Voltage | 480 Volts         |

Nominal Frequency                      60 Hz

## **Report Parameters**

This report was prepared on 2/6/2003 by John Paul of Buist Electric Testing Division. The following limits were used in analyzing the results.

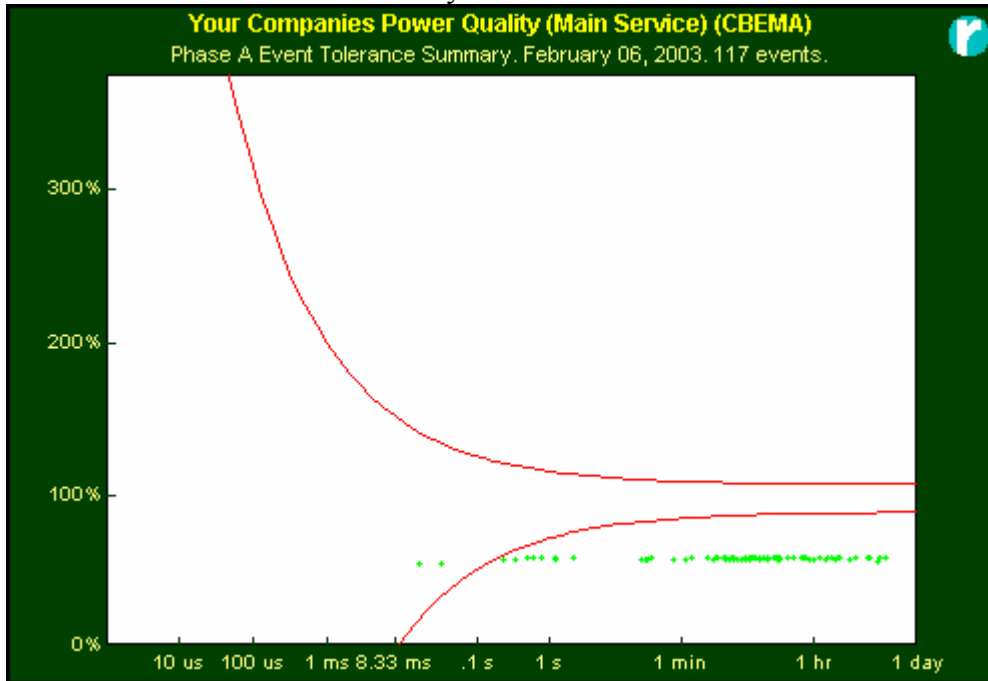
|                              |        |
|------------------------------|--------|
| Maximum Phase Voltage.       | 220 V  |
| Minimum Phase Voltage.       | 180 V  |
| Maximum Neutral Voltage.     | 3 V    |
| Maximum Impulse Voltage.     | 500 V  |
| Maximum. Waveshape Voltage.  | 10 V   |
| Maximum Frequency Deviation. | .02 Hz |
| Minimum Power Factor.        | .85    |
| Maximum Voltage T.H.D.       | 5 %    |
| Maximum Current T.H.D        | 20 %   |
| Maximum Voltage Imbalance.   | 2 %    |
| Maximum Current Imbalance.   | 5 %    |

Any values outside these limits are noted in the report. Values within the limits are considered to be within a safe operating range. These limits have been programmed by John Paul.

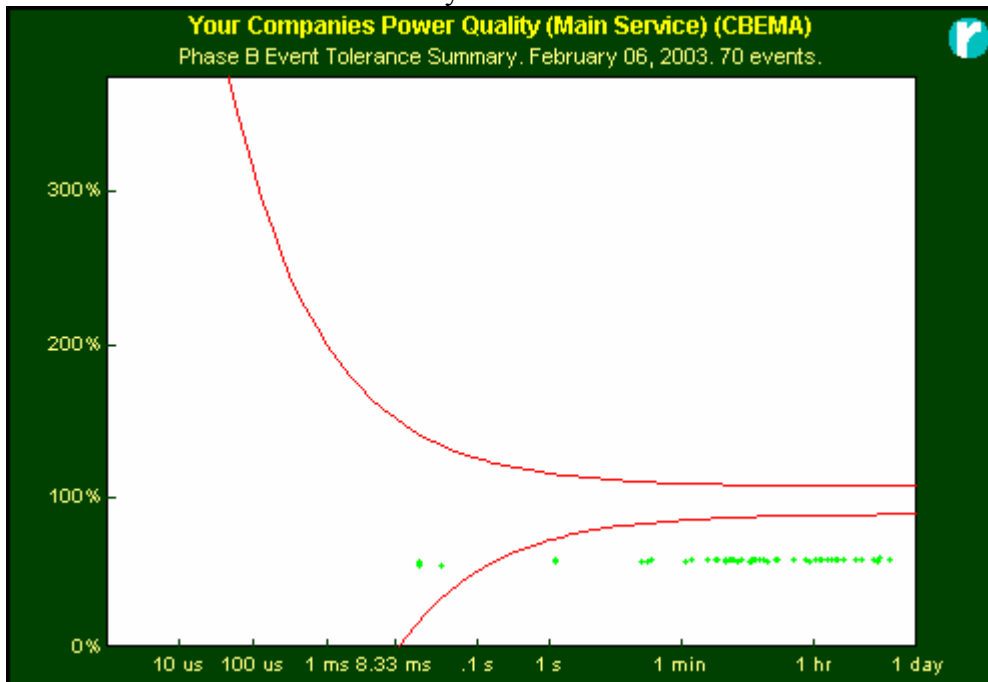
## Power Tolerance Envelope:

The power quality parameters are summarized in the Power Tolerance Envelope shown below. Each dot on these graphs represents an event. The area outside of these lines depict events which are often associated with equipment malfunction..

Phase A Event Tolerance Summary.

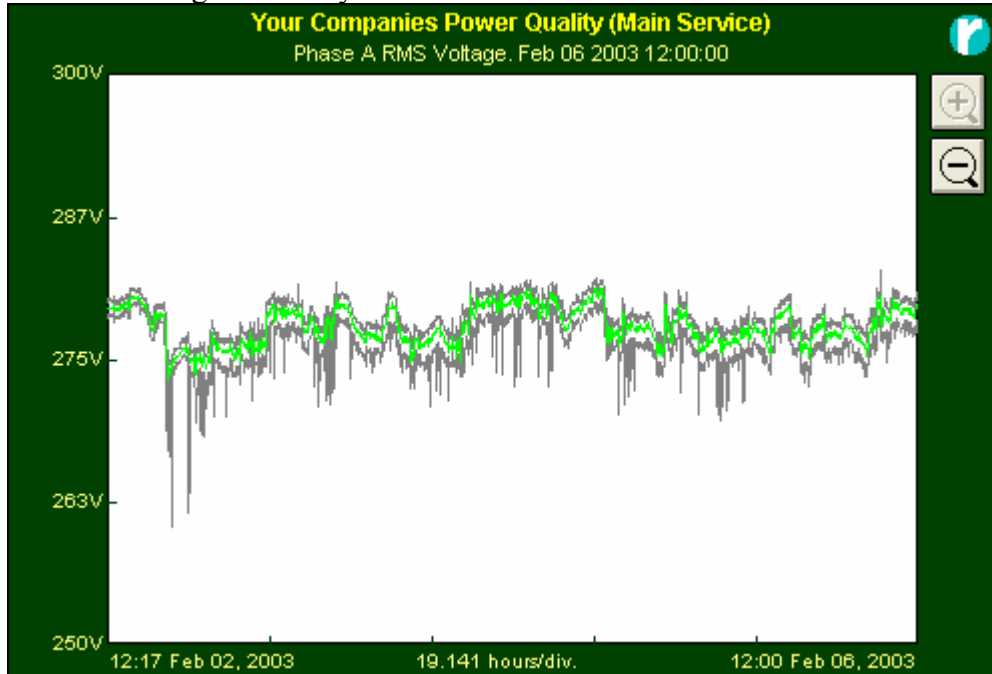


Phase B Event Tolerance Summary.



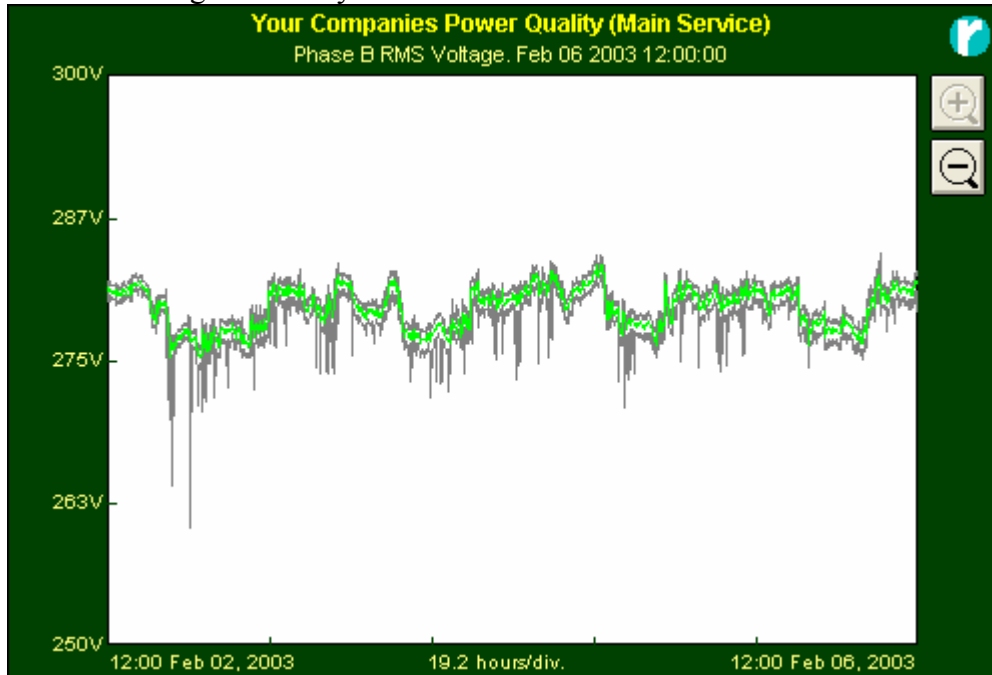
## RMS. Voltage Summaries for Your Companies Power Quality:Main Service.

### Phase A Voltage Summary.



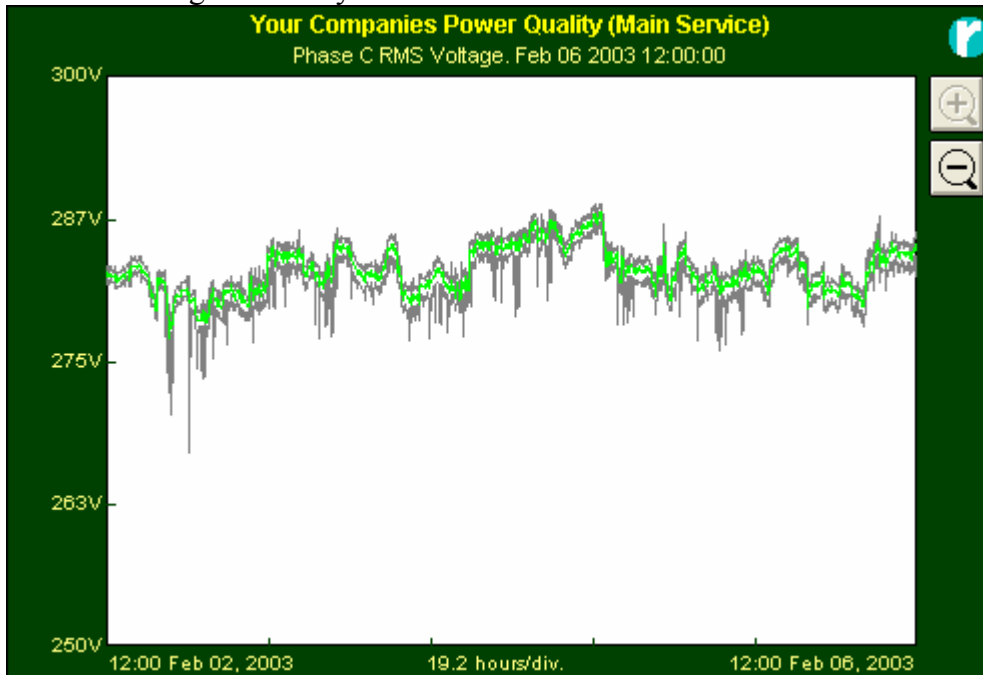
Min. 261.2V Feb 02 2003 19:48:00  
Avg. **278.4V**  
Max. 283.2V Feb 06 2003 07:33:00

### Phase B Voltage Summary.



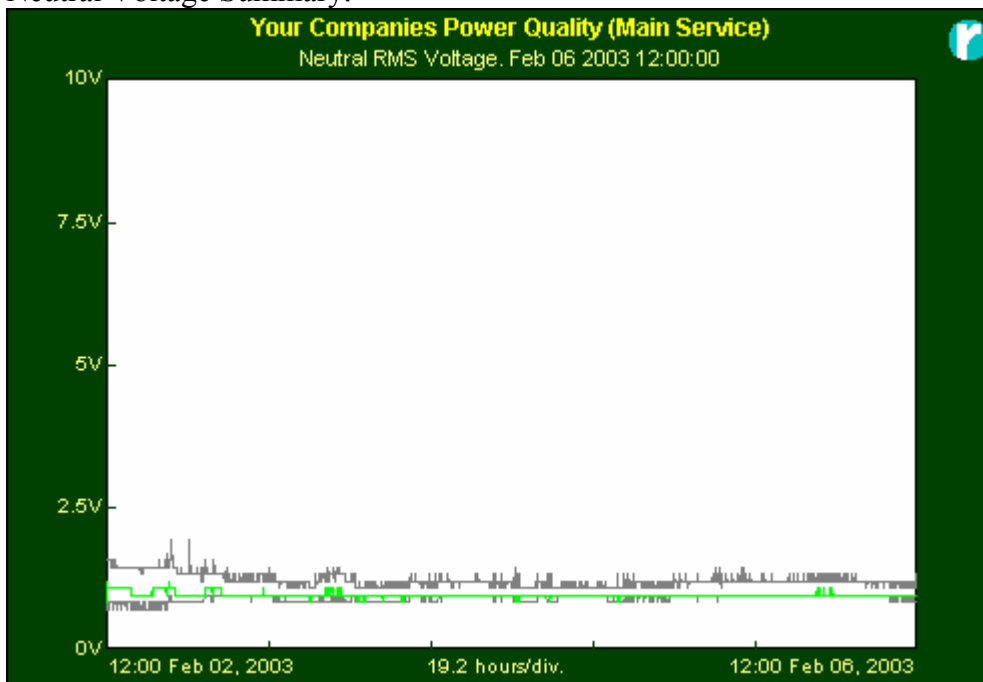
Min. 261.2V Feb 02 2003 21:54:00  
Avg. **280.1V**  
Max. 284.8V Feb 06 2003 07:33:00

### Phase C Voltage Summary.



Min. 267.8V Feb 02 2003 21:54:00  
Avg. **283.4V**  
Max. 289.2V Feb 04 2003 22:24:00

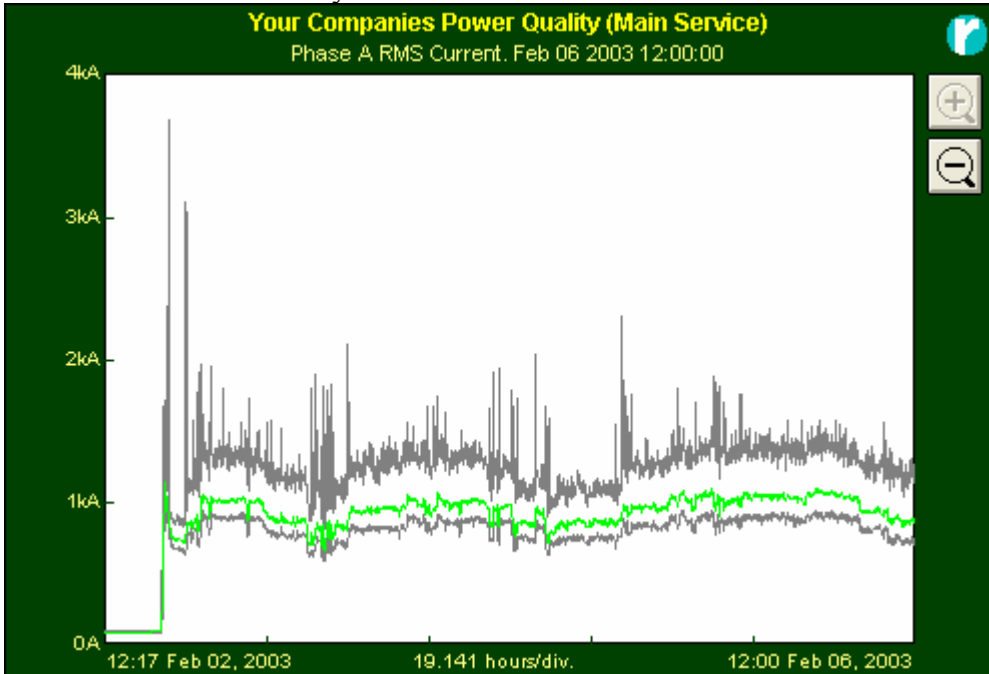
### Neutral Voltage Summary.



Min. 732.4mV Feb 02 2003 12:00:00  
Avg. **986.1mV**  
Max. 1.953V Feb 02 2003 19:48:00

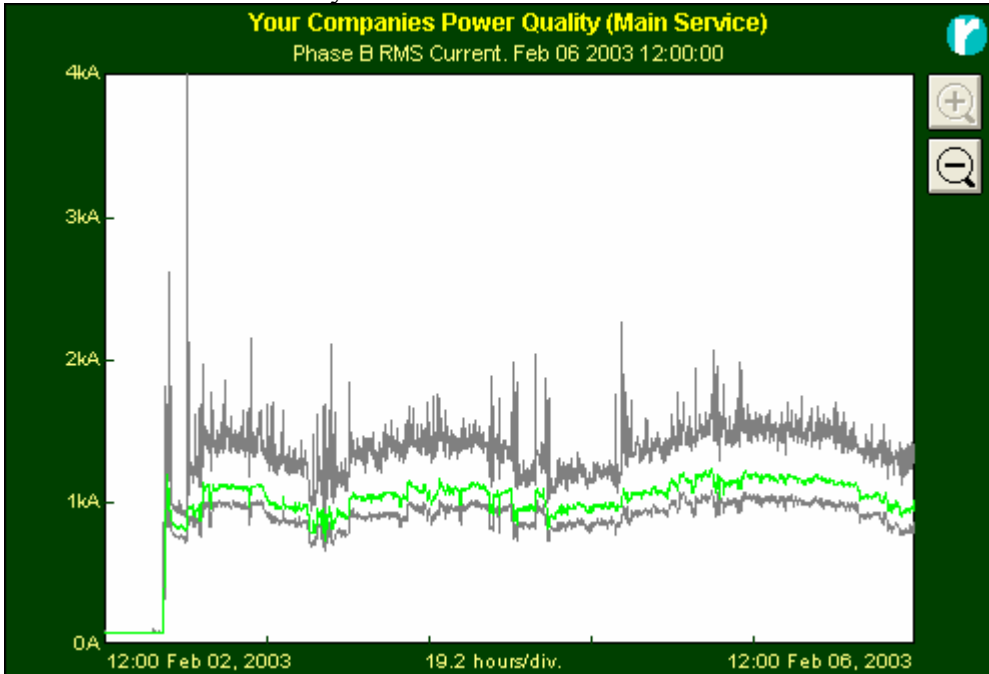
## RMS. Current Summaries for Your Companies Power Quality:Main Service.

### Phase A Current Summary.



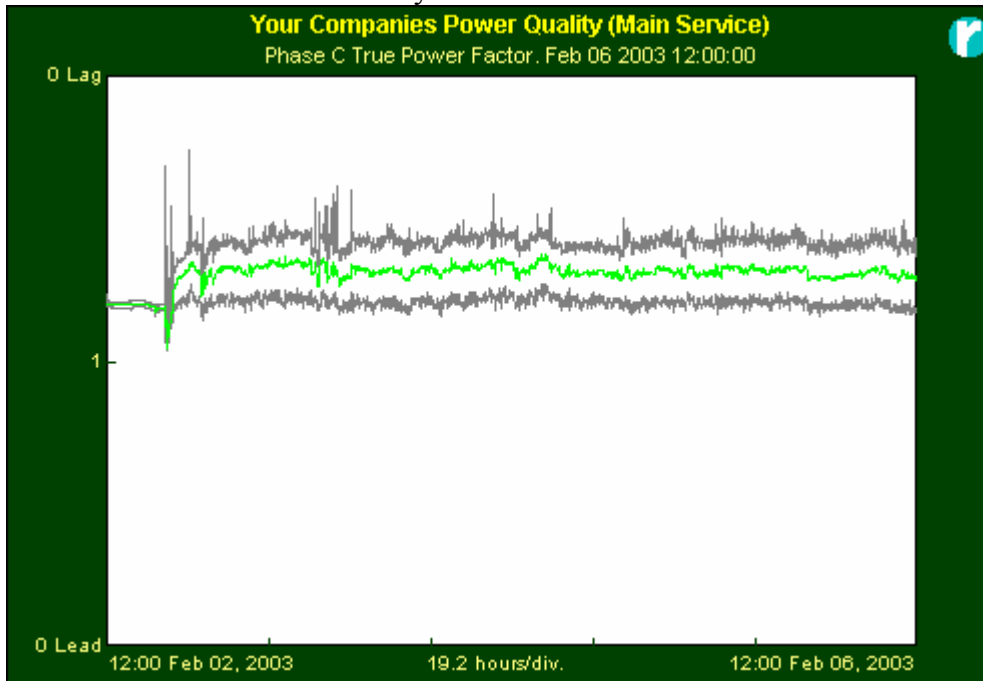
Min. 92.47A Feb 02 2003 17:06:00  
Avg. **886.6A**  
Max. 3.688kA Feb 02 2003 19:48:00

### Phase B Current Summary.



Min. 87.89A Feb 02 2003 17:48:00  
Avg. **981.7A**  
Max. 4.078kA Feb 02 2003 21:54:00

### Phase C Power Factor. Summary.

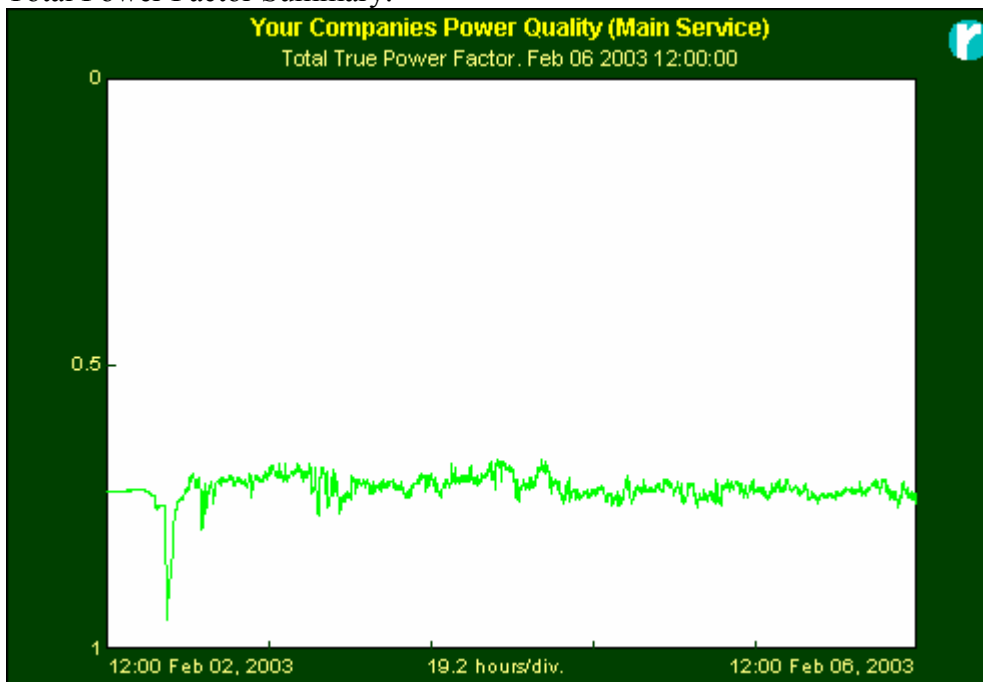


Min. 0.956 Lag Feb 02 2003 19:15:00

**Avg. 0.690 Lag**

Max. 0.253 Lag Feb 02 2003 21:51:00

### Total Power Factor Summary.



Min. 0.946 Feb 02 2003 19:15:00

**Avg. 0.717**

Max. 0.667 Feb 04 2003 15:33:00