TEALwatch
Power Quality Analysis

Facility:	**Memorial Hospital 1234 Mockingbird Lane Springfield, TX 12345**	Protected Equipment:	**Acme Phytoscan 4700**
TEAL Model #:	**PCDU-Phyto-U**	TEALWatch Serial #:	**00027**
TEAL Serial #:	**A-023456-1**	TEALwatch Site #:	**00010**
		TEALwatch Report #:	**00010A**
Primary Contact:	**Alfred Ganim**	Secondary Contact:	**Karl Strauss**
Company:	**Acme Medical Systems**	Company:	**Strauss Consulting**
Phone:	**(123) 456-7890**	Phone:	**(818) 888-3434**
Email:	**Aganim@Acmemed.Com**	Email:	**Kstrauss@Straussgroup.Com**

Facility Electrical System / Power Monitoring Notes

Intermittant system resets and lock-ups

Dates and Times of Interest

Date and Time	Event Description (Errors, Faults, Site Logs, Etc.)
1/19/05 10:47	System reboot (not in use)
1/21/05 7:45	Tube arc during air cals
1/22/05 15:18	Artifact on image during high power scan

Power Monitoring Information

Site Configuration:	☒ **Wye** ☐ **Delta**	Data Supplied via:	☐ **Direct Download** ☒ **Email** ☐ **Website Upload** ☐ **Disk**
Current Data:	☐ **Yes** ☒ **No**	Monitoring Comments:	**No Problems**
Trend Data Period:	**3 Days**	Voltage Events Logged:	**1 Week**
Received Data:	**11-Feb-05**	Report Generated:	**15-Feb-05**

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Category	Analysis	Recommendations
RMS Voltage Level	RMS Voltage levels are acceptable. Lower voltage on 1/21/05 but within system requirements.	No Corrective Actions Recommended
Voltage Waveform	Voltage waveform is sinusoidal with a minimum of visible harmonic distortion.	No Corrective Actions Recommended
Phase Imbalance	Voltage phase balance is less than 2%.	No Corrective Actions Recommended
Voltage Outages	Two voltage outages were captured.	Utility related outages may impact equipment availability and patient throughput. We recommend an Uninterruptible Power Source (UPS) to ride through short voltage outages.
Voltage Sags and/or Swells	Several dropouts and line related sags were recorded. Check for an emergency power suppy that might have switched during the monitored period.	Voltage sags and swells may cause equipment errors, lock-ups, or resets. In order to maximum equipment uptime at sites that experience frequent sags and swells, we recommend a UPS or power conditioner.
Voltage Transients	Low frequency ringing transients were recorded.	Consider a UPS or power conditioner to protect the system from low frequency transients, if unexplained or intermittant system problems can be correlated to these transients. Conventional TVSS devices do not provide protection from this type of transient.
Load Generated Events	Several apprent load generated disturbances were captured, and may indicate excessive source impedance.	Check the facility service and branch circuits to endsure they meet equipment requirements for conductor size, transformer size, and ratings.

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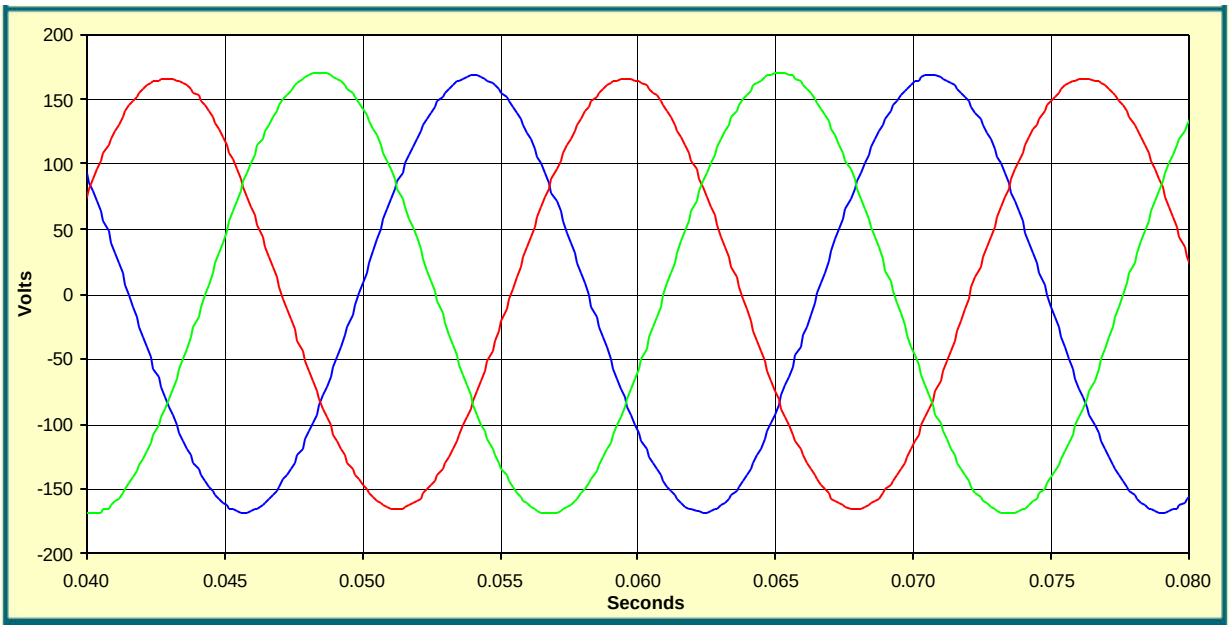
RMS Voltage Snapshot



Voltage waveforms are sinusoidal, with a minimum of harmonic distortion.

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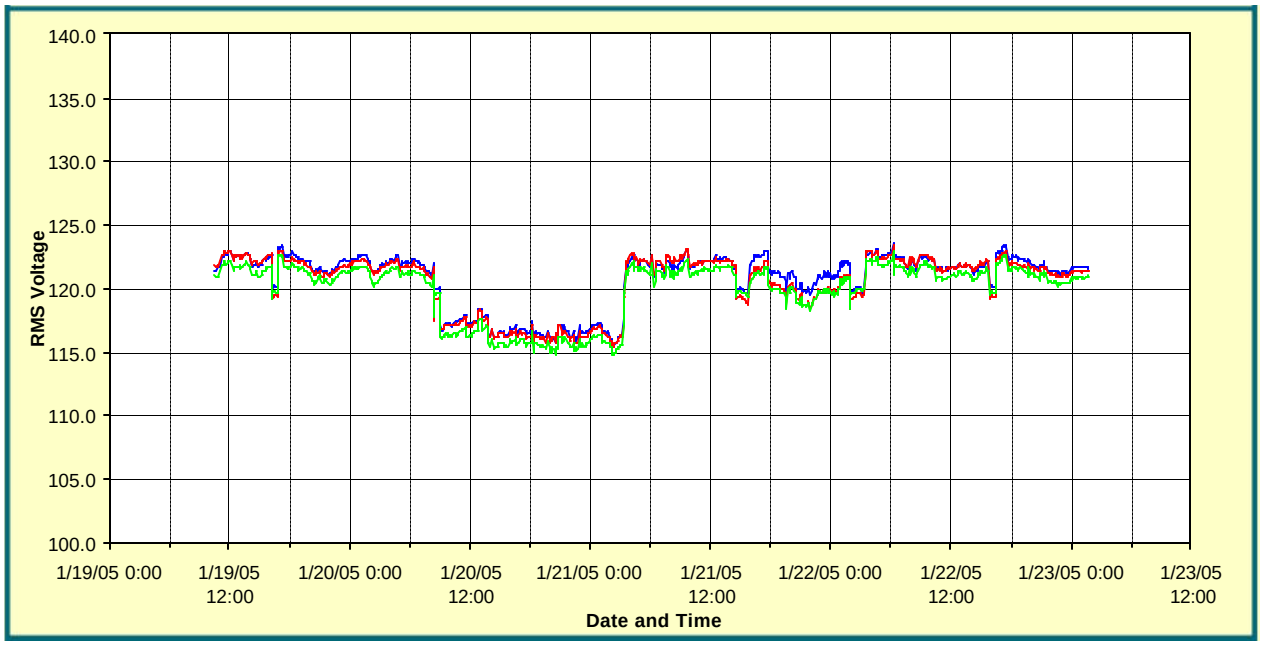
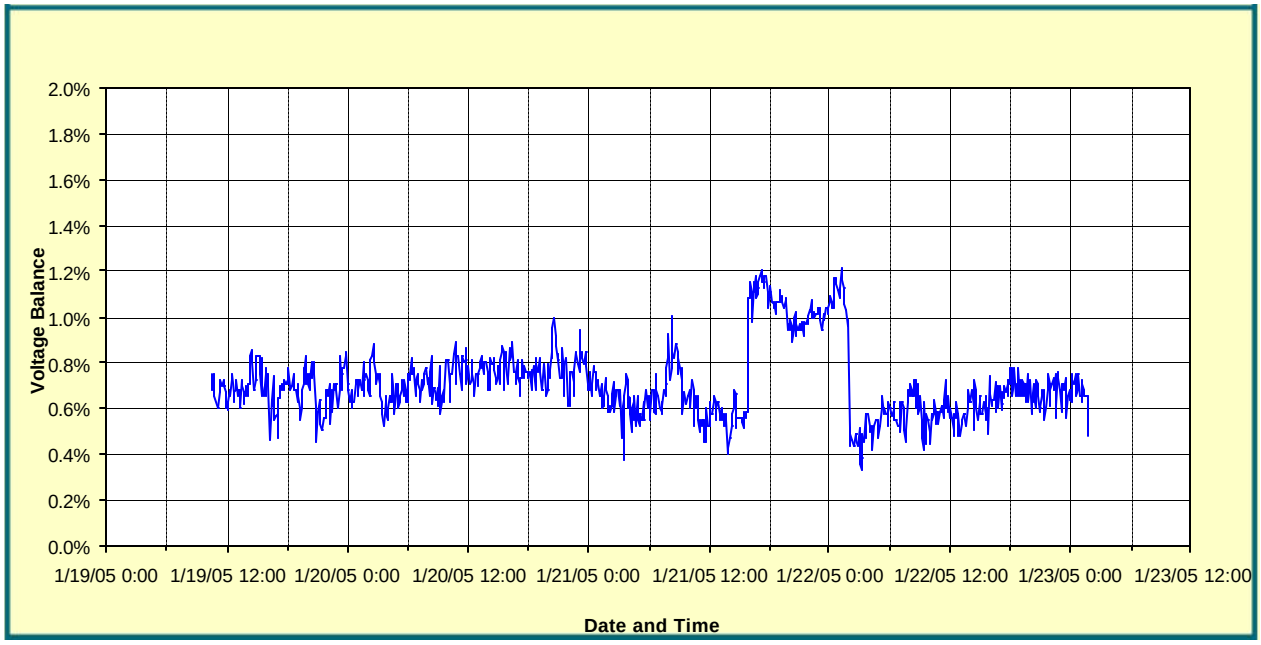
RMS Voltage Trend Data – Full Monitoring Period



RMS Voltages were acceptable throughout the monitored period.

Voltage Balance was less than 1% throughout the monitored period.



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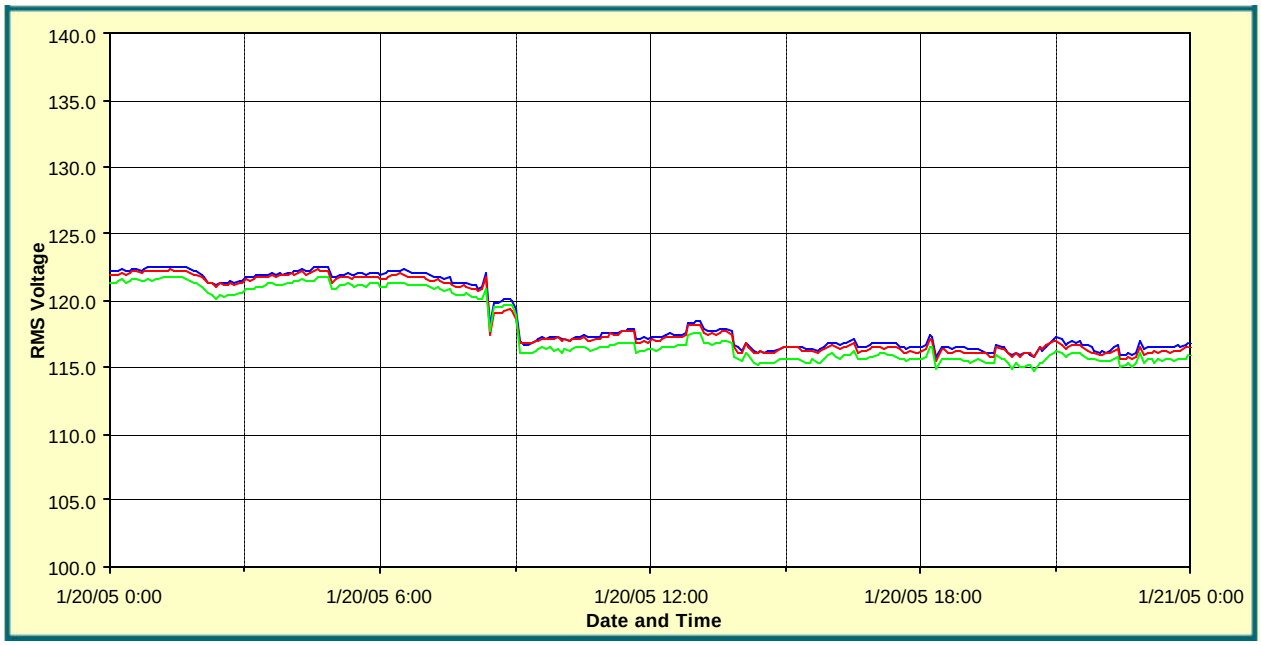
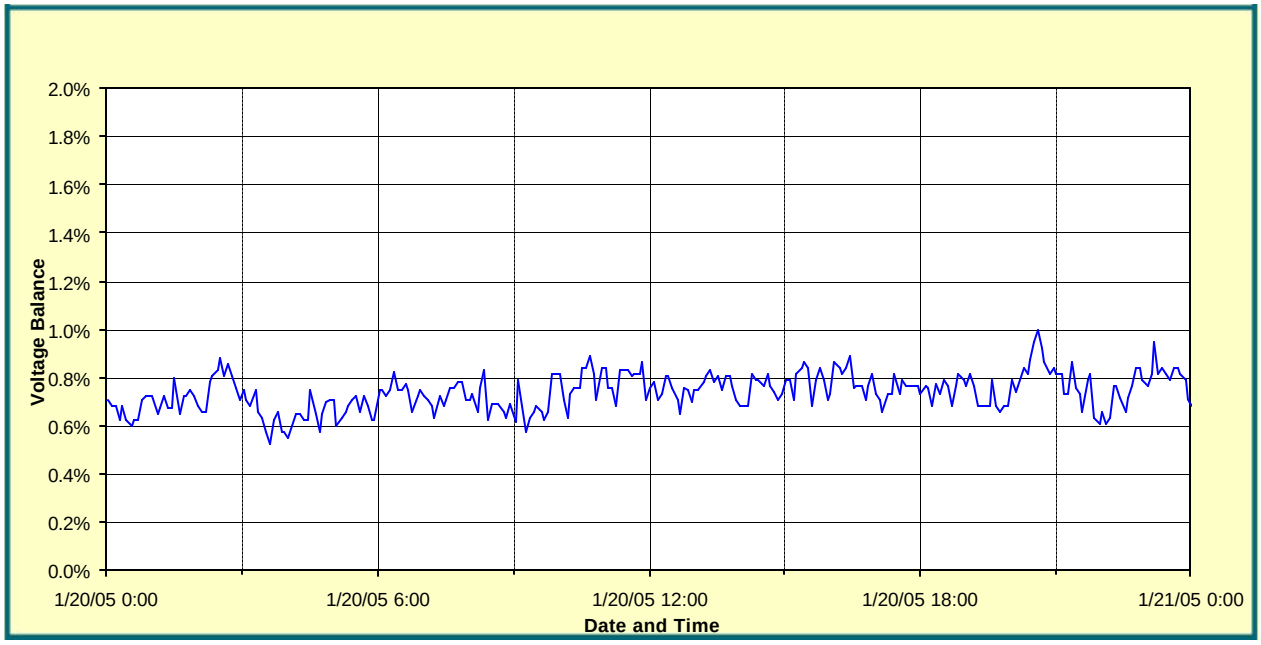
RMS Voltage Trend Data – 24 Hour Period



RMS Voltages were acceptable throughout the monitored period.

Voltage Balance was less than 1% throughout the monitored period.



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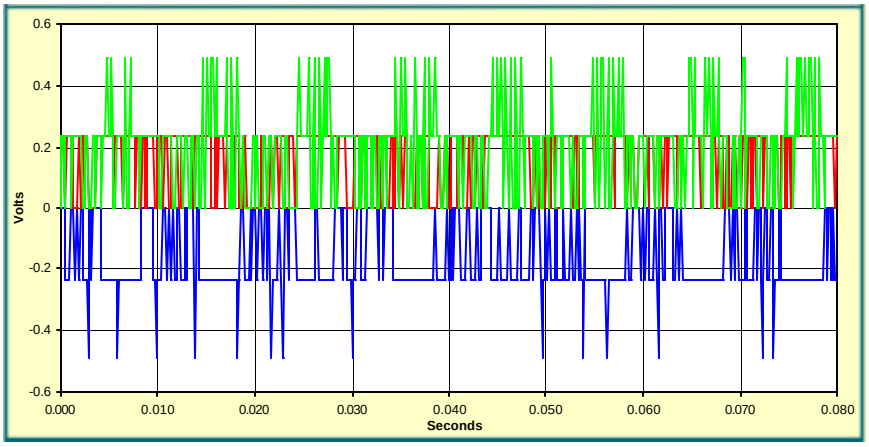
Voltage Outage Event Summary

Event	Date and Time	Type	Minimum	Maximum	Duration
4	1/19/05 10:28:23	Power Loss	0	0	1
5	1/19/05 10:57:46	Power Loss	0	0	1

Voltage Outage Events



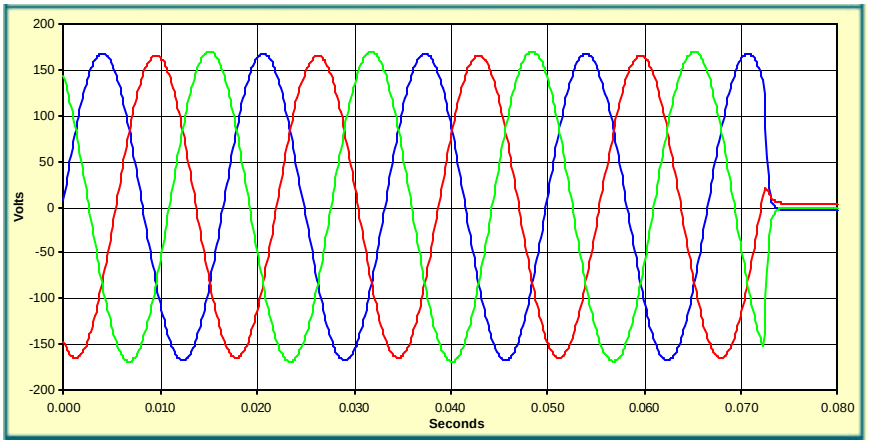
Event Number: 4

Date: mm/dd/yyyy

Time: 10:28:23 AM

Analysis

Voltage was not applied at the start of the monitored period.



Event Number: 5

Date: 1/19/2005

Time: 10:57:46 AM

Analysis

Loss of voltage, appears to be a local switch-off of power, and not a utility or facility-wide voltage failure.

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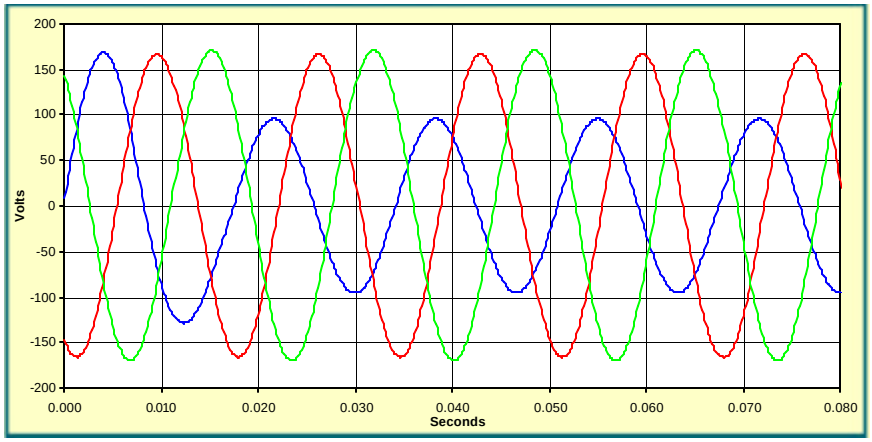
Voltage Sag and Swell Summary

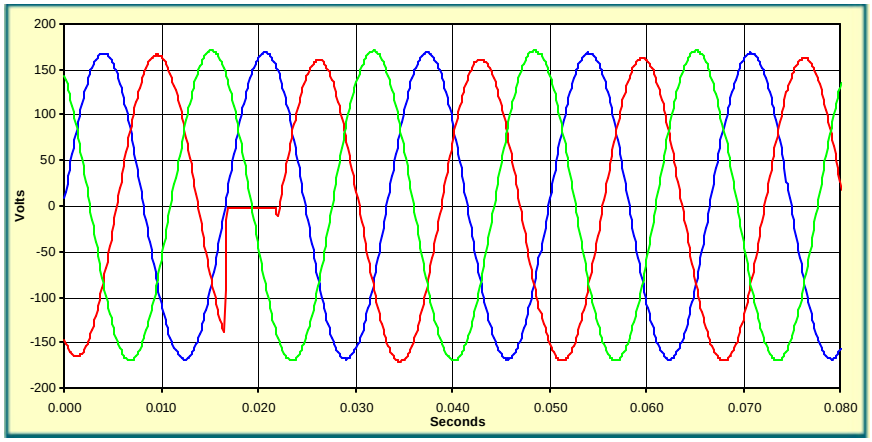
Event	Date and Time	Type	Minimum	Maximum	Duration
2	1/19/05 10:27:04	Voltage Sag	67.4	120.3	0.167
9	1/19/05 15:44:08	Voltage Sag	88.6	120	0.017
10	1/21/05 15:57:20	Voltage Sag	94	120.2	0.017
16	1/21/05 15:59:42	Voltage Sag	90.6	112.4	0.017

Voltage Sag and Swell Events



Event Number: 2
Date: 1/19/2005
Time: 10:27:04 AM
Duration: 0.167
Minimum: 67.4 VAC
Maximum: 120.3 VAC
Analysis

Severe voltage sag on Phase A only.



Event Number: 9
Date: 1/19/2005
Time: 3:44:08 PM
Duration: 0.017
Minimum: 88.6 VAC
Maximum: 120.0 VAC
Analysis

1/2 cycle drop-out on Phase B only.

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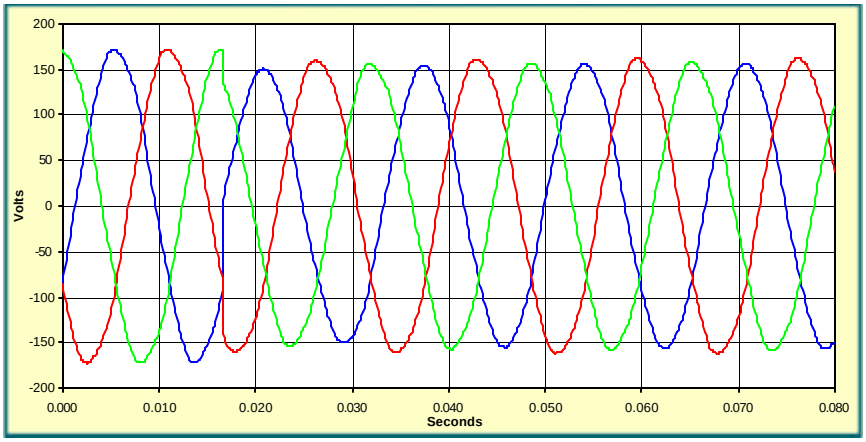
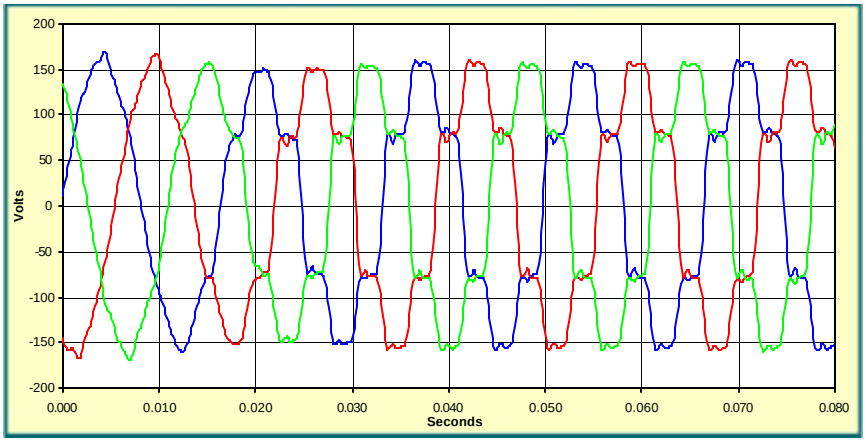
Voltage Sag and Swell Events



Event Number: 10
Date: 1/21/2005
Time: 3:57:20 PM
Duration: 0.017
Minimum: 94.0 VAC
Maximum: 120.3 VAC

Analysis

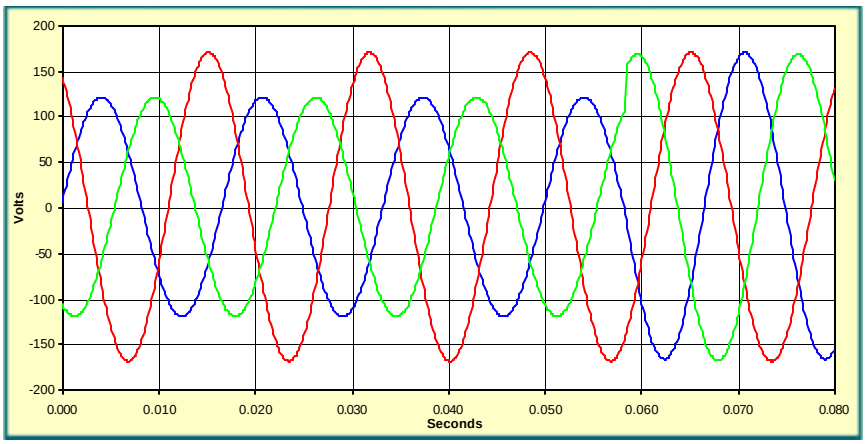
Small step in RMS voltage, probably a utility sag or large load switch-on.



Event Number: 16
Date: 1/21/2005
Time: 3:59:42 PM
Duration: 0.017
Minimum: 90.6 VAC
Maximum: 112.4 VAC

Analysis

Step change in voltage waveform and amplitude, probably related to load switch-on and VRDU output impedance.



Event Number: 2
Date: 1/19/2005
Time: 10:27:04 AM
Duration: 0.167
Minimum: 67.4 VAC
Maximum: 120.3 VAC

Analysis

End of event 2, sag ends and voltage is restored.

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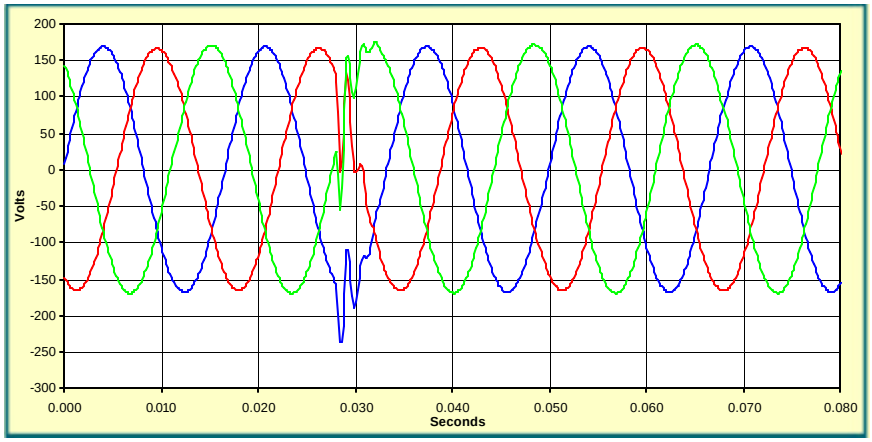
Voltage Transient and Sub-cycle Event Summary

Event	Date and Time	Type	Minimum	Maximum	Duration
1	1/19/05 10:26:53	Subcycle	-236.6	174.6	1
3	1/19/05 10:27:53	Subcycle	-236.8	174.6	1
7	1/19/05 15:44:05	Subcycle	-212.9	214.6	1
8	1/19/05 15:44:05	Subcycle	-197.5	197.8	1
11	1/21/05 15:58:07	Subcycle	-204.8	213.1	1
12	1/21/05 15:58:07	Subcycle	-198	200.9	1
13	1/21/05 15:59:23	Subcycle	-197.5	212.4	1
14	1/21/05 15:59:23	Subcycle	-199	202.4	1
15	1/21/05 15:59:40	Subcycle	-205.6	212.2	1
17	1/21/05 15:59:47	Subcycle	-200.4	213.4	1
18	1/21/05 15:59:47	Subcycle	-197.8	200.2	1
19	1/21/05 15:59:57	Subcycle	-208	210.2	1
20	1/21/05 15:59:57	Subcycle	-194.1	198.7	1

Voltage Transient and Sub-cycle Events



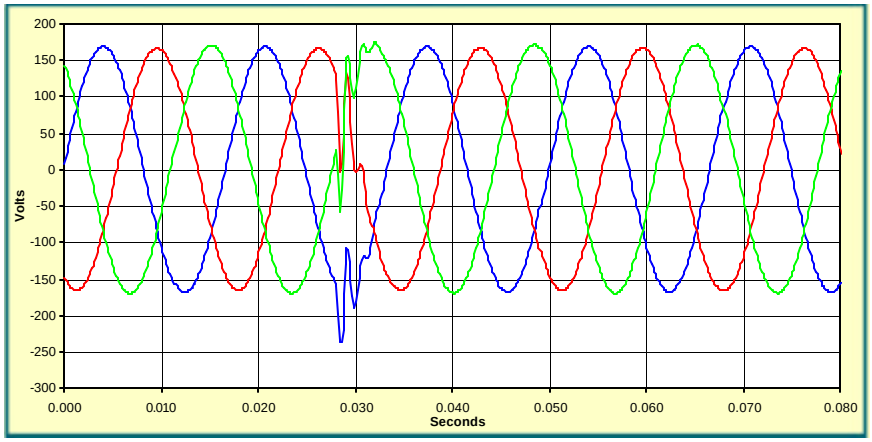
Event Number: 1

Date: 1/19/2005

Time: 10:26:53 AM

Analysis

Low frequency transient, possibly related to utility switching or power factor capacitor switching.



Event Number: 3

Date: 1/19/2005

Time: 10:27:53 AM

Analysis

Low frequency transient, possibly related to utility switching or power factor capacitor switching.

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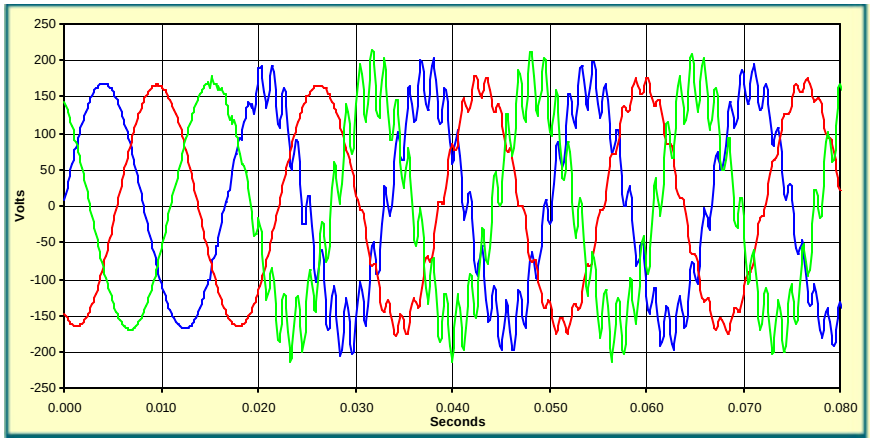
Voltage Transient and Sub-cycle Events



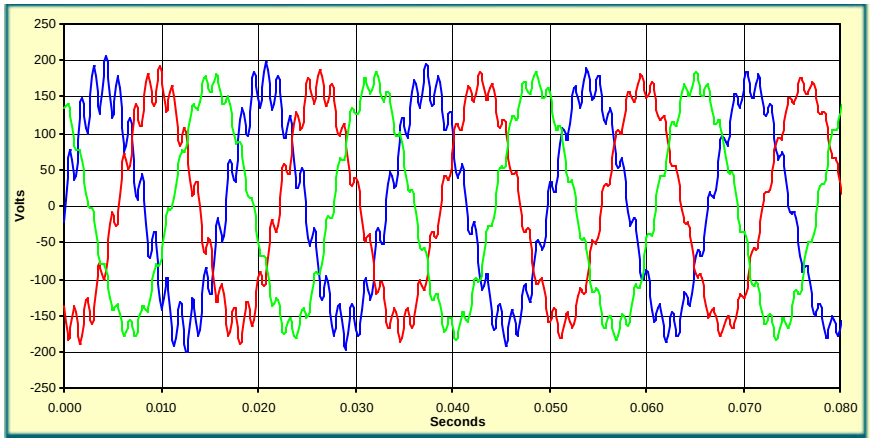
Event Number: 7

Date: 1/19/2005

Time: 3:44:00 PM

Analysis

Sudden change in voltage waveform / ringing - possibly related to power conditioner or resonant capacitors.



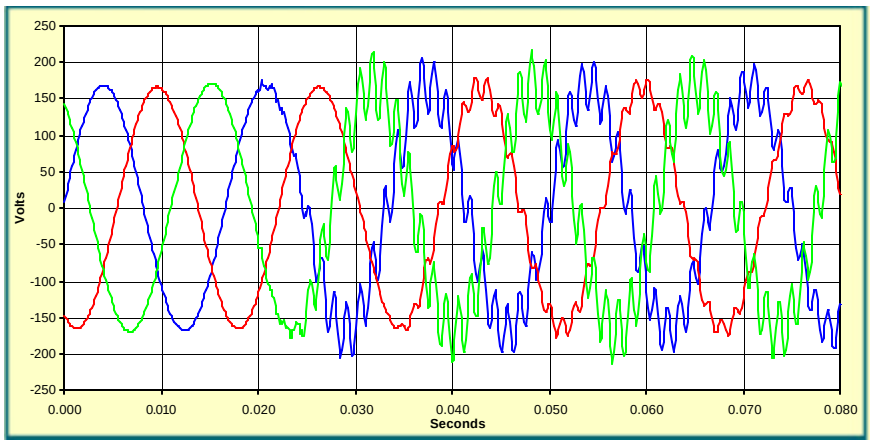
Event Number: 8

Date: 1/19/2005

Time: 3:44:05 PM

Analysis

Continued ringing waveform distortion.



Event Number: 11

Date: 1/21/2005

Time: 3:58:07 PM

Analysis

Sudden change in voltage waveform / ringing - possibly related to power conditioner or resonant capacitors.

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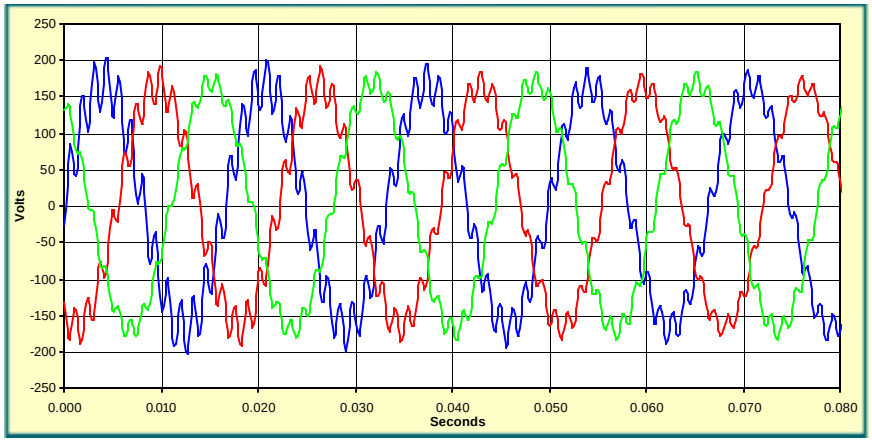
Voltage Transient and Sub-cycle Events



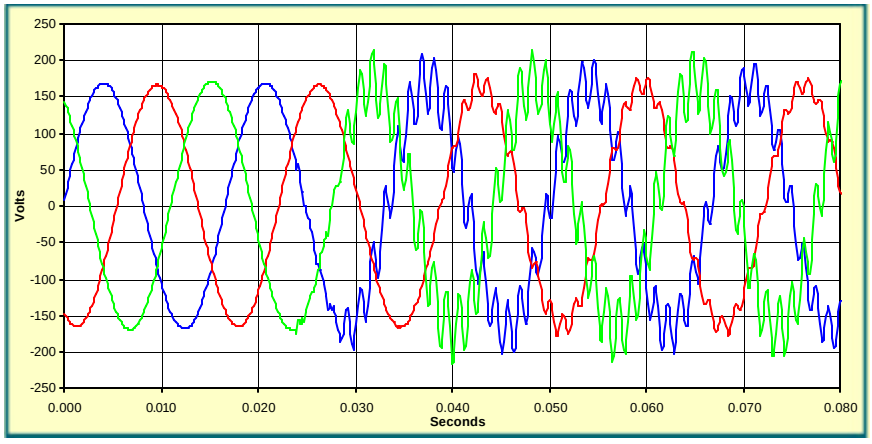
Event Number: 12

Date: 1/21/2005

Time: 3:58:07 PM

Analysis

Continued ringing waveform distortion.



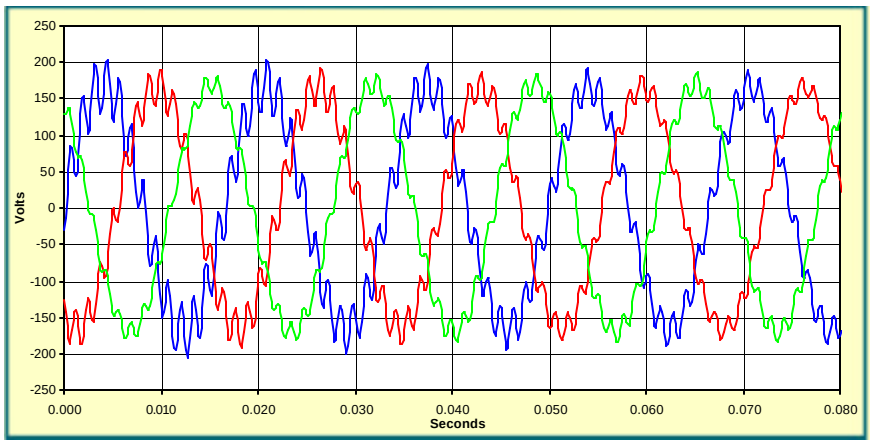
Event Number: 13

Date: 1/21/2005

Time: 3:59:23 PM

Analysis

Sudden change in voltage waveform / ringing - possibly related to power conditioner or resonant capacitors.



Event Number: 14

Date: 1/21/2005

Time: 3:59:23 PM

Analysis

Continued ringing waveform distortion.

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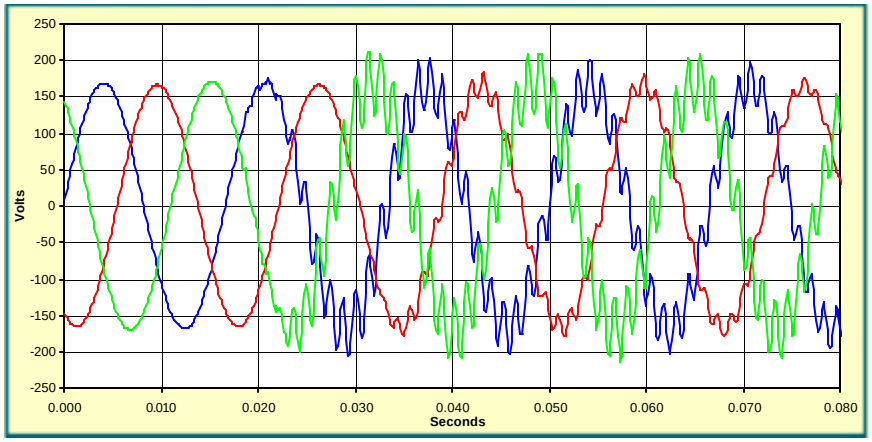
Voltage Transient and Sub-cycle Events



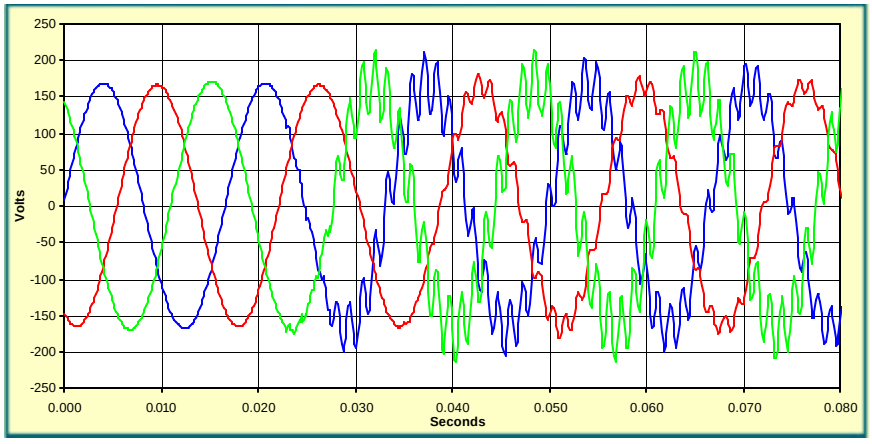
Event Number: 15

Date: 1/21/2005

Time: 3:59:40 PM

Analysis

Sudden change in voltage waveform / ringing - possibly related to power conditioner or resonant capacitors.



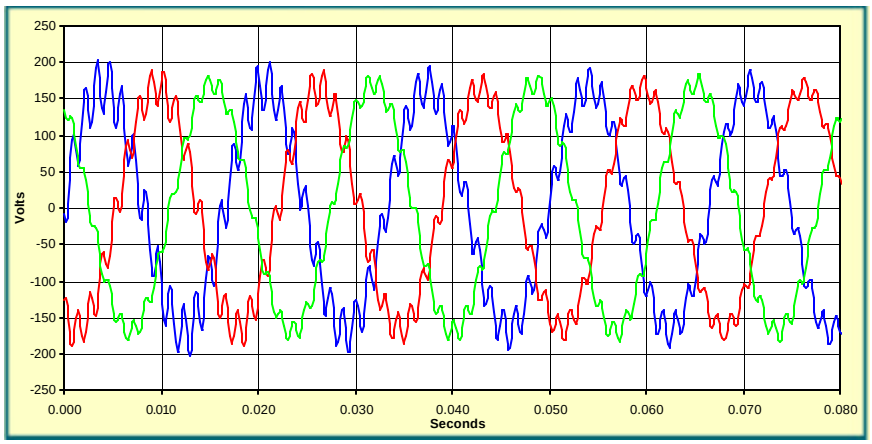
Event Number: 17

Date: 1/21/2005

Time: 3:59:47 PM

Analysis

Sudden change in voltage waveform / ringing - possibly related to power conditioner or resonant capacitors.



Event Number: 18

Date: 1/21/2005

Time: 3:59:47 PM

Analysis

Continued ringing waveform distortion.

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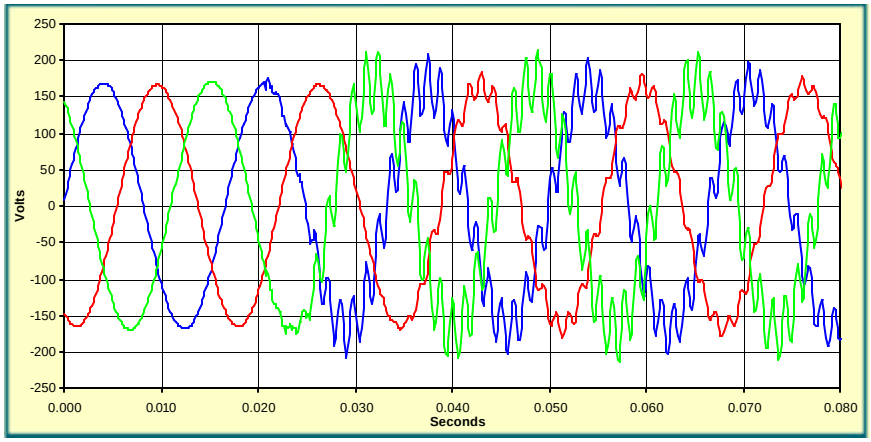
Voltage Transient and Sub-cycle Events



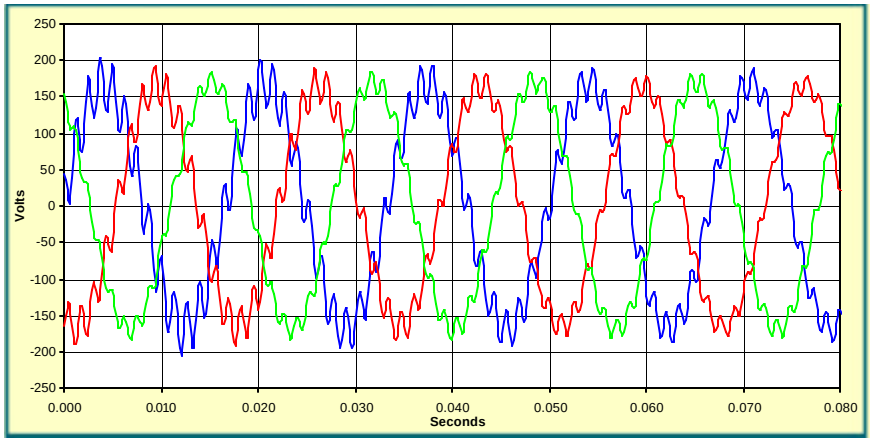
Event Number: 19

Date: 1/21/2005

Time: 3:59:57 PM

Analysis

Sudden change in voltage waveform / ringing - possibly related to power conditioner or resonant capacitors.



Event Number: 20

Date: 1/21/2005

Time: 3:59:57 PM

Analysis

Continued ringing waveform distortion.

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