Timed Interval Sampling Monitoring & Verification Report

For

TACO BELL

located at

**2365 Sunset Blvd.
Rocklin, CA 95765**

4-4-2013

**Prepared by:
John D. Knapp
President**

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Power Conditioning and Energy Savings

TIS Report

April 4, 2013

For

located at

2365 Sunset Blvd.
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Prepared by:

Power Shaver, Energy Savings Systems®

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Executive Summary and Conclusions

During January of 2013, the Rocklin, Sunset Blvd., Taco Bell purchased and installed a USES® Shunt Efficiency System, manufactured by USES® MFG INC. The purpose of the USES® System is to reduce the overall demand and consumption of power and improve overall power quality. A total of one (1) USES® Model XL-3D-208V power conditioner was installed on the Rocklin, Sunset Blvd., Taco Bell facilities service entrance.

In accordance with the proposal offered to the Rocklin, Sunset Blvd., Taco Bell by Power Shaver, Energy Saving Systems® in January of 2013, the USES® System was evaluated to determine the average power conditioning results, power demand reductions and resultant monetary savings and return on investment (ROI). Power Shaver used Timed Interval Sampling (TIS) methods to determine the USES® System performance, and the results of the TIS testing from March 22, 2013 are presented herein.   TIS analytical techniques conform to the International Performance Monitoring and Verification Protocols (IPMVP) as established by the U. S. Department of Energy as a mechanism to evaluate the performance of Energy Conservation Measures.

The installation of the USES® Shunt Efficiency System at the Rocklin, Sunset Blvd., Taco Bell facility has significantly improved power quality and resulted in a substantial decrease in electrical demand according to the conservative Amprobe DM II. The USES® System reduced the demand for electricity at low load by an average of **3.497 kW and 3.902 kVA.**

 Due to the fact that utility customers are billed for Demand and Energy between the Real and Apparent Power powers, based on their Power Factor, power condition and power quality and the fact that our NIST certified and calibrated data logger Amprobe DM II Pro is very conservative to utility Revenue meters as to what it determines to be and measures as usable power, Power Shaver conservatively estimates the actual reduction in billed kWh to Rocklin, Pleasant Grove, Taco Bell facility to be between the verified, extrapolated **Real Power kWh of 24,892.45** and **Apparent Power KVAH of 27,406.59** per year.

The performance of the USES® Shunt Efficiency System at the Rocklin, Sunset Blvd., Taco Bell facility has proven to be consistent with all of the estimated power quality improvements as outlined in Power Shaver's proposal to the Rocklin, Sunset Blvd., Taco Bell in January of 2013. The USES® System was estimated to reduce annual consumption by approximately **22,447 kWh per year and cost by $2,716.09**.

The data tables and graphs presented in this report clearly show the beneficial results provided by the USES® System. All power quality data was averaged to take into account short term load variations and to determine the average levels of power quality when the USES® System was activated and de-activated. All of the data tables presented in this report are from the TIS testing and evaluation conducted on March 22, 2013. Additional power quality improvements also realized by the installation of the USES® System are discussed later in this report.

The resultant power demand reductions during the TIS testing were used in an attempt to conservatively calculate the net annual effect of the USES® system in terms of actual savings and return on investment (ROI). The verified demand reductions and power quality improvements in this low demand period of the year are proven to be in line with those proposed to Yum! Brands. Inc. When the summer period demands increase and efficiency decreases we would expect to see greater performance from the USES® system.

Power Shavers' Energy Saving Systems are truly "green" systems that reduce electric energy consumption. Installing the Power Shaver Energy Saving System® at the Rocklin, Sunset Blvd., Taco Bell facility will beneficially impact the environment by reducing the consumption of our precious natural resources. According to the U.S. Environmental Protection Agency and the U.S. Energy Information Administration, the proposed reduction of electricity demand provided by the Power Shaver System, will reduce **emissions of Greenhouse Gases by 19.4 tons per year** as well as your companies consumption of **Crude Oil by 14.64 barrels, Coal by 4.21 tons, Natural Gas by 82,622.92 cubic feet, Gasoline by 683.53 gallons or Diesel Fuel and Heating Oil by 612.40 gallons per year**, depending on which resource your power company depends on. There is also a significant reduction in water consumption associated with each of the above quantities reduced as it is a necessary part of all fuel processing. Power Shaver is proud to partner with you to reduce your operational cost and help sustain our environment for future generations.

Power Shaver is glad to be part of Rocklin, Sunset Blvd., Taco Bell facilities energy savings program and looks forward to assisting with any additional needs in the future. For any questions or comments on this report, please contact John D. Knapp, CEO/President of Power Shaver, Energy Savings Systems® at (888) 9-POWER-5, or via email at john@powershaver.com.

Summary of Power Quality Improvements

Analysis of the low load TIS testing results from March 22, 2013 demonstrate that the USES® technology has provided substantial improvements in overall power quality. The following power quality improvements have been realized by the Rocklin, Sunset Blvd., Taco Bell:

➢ Real Power Demand Average (kW) – **Real Power demand was reduced by an average of 3.497 kW (11.09%)** at low load operational levels with 1 USES® Power Conditioners activated. Each USES® unit was individually tested and found to be operational and contributing to the overall power quality improvements as presented in the Power Shaver proposal of January 2013. During the Off-Peak TIS testing of March 22, 2013, the average real power demand reduction was 3,496.97 watts. These results are considered in the ROI and Savings calculations as representative of low circuit load conditions.

➢ Apparent Power Average – Apparent power was reduced by an average of 3.902 KVA (12.08%) at low load operational levels when the USES® System was activated. These results are considered in the ROI and Savings calculations as representative of low circuit load conditions.

➢ Reactive Power – Reactive power was reduced by an average of 7.275 KVAR (105%) at low load operational levels when the USES® System was activated.

➢ Power Factor –Power Factor improved from 98% to 100% (2.04%) and remained lagging when the USES® System was activated.

➢ Amperage – Amperage was reduced by approximately 8.87 amps (9.75%) pre phase when the USES® System was activated.

➢ Voltage – Voltage improved by an average of 0.21 volts (0.10%) per phase (VAB, VBC, VCA) when the USES® System was activated.

Savings and ROI Calculations

Evaluation of the USES® System installed at the Rocklin, Sunset Blvd., Taco Bell facility shows a range of demand reductions at low load when the USES® System is activated. During the TIS testing period, when the facility was operational, the average extrapolated billed energy reduction was estimated to be 2.8416 kWh. The total annual reduction of power consumed is 2.8416 kWh x 8760 hours per year = 24,892.45 kWh per year.

Assuming the 2013 average cost of power of 0.121¢/kWh will increase in 2014 to 0.131¢/kWh and by $0.01/kWh each year thereafter, ROI savings are shown on the following pro-forma:

Year	COP	kWh/yr SVGS	SVGS/yr		
1	$0.121	24,892	$3,011.99		
2	$0.131	24,892	$3,260.91		
3	$0.141	24,892	$3,509.84		
4	$0.151	24,892	$3,758.76		
5	$0.161	24,892	$4,007.68	**Years 1-5**	
6	$0.171	24,892	$4,256.61	**$17,549.18**	
7	$0.181	24,892	$4,505.53		
8	$0.191	24,892	$4,754.46		
9	$0.201	24,892	$5,003.38		
10	$0.211	24,892	$5,252.31	**Years 6-10**	
11	$0.221	24,892	$5,501.23	**$23,772.29**	
12	$0.231	24,892	$5,750.16		
13	$0.241	24,892	$5,999.08		
14	$0.251	24,892	$6,248.00		
15	$0.261	24,892	$6,496.93	**Years 11-15**	
Total		**373,387**	**$71,316.87**	**$29,995.40**	

➤ **Actual ROI = 18.5 Months**
➤ **Year 1 savings = $3,011.99.**
➤ **Purchase Cost, including installation costs = $4,650.00.**
➤ **Total Savings over 15 years = $71,316.87 – $4,650.00 = $66,666.87.**

USES® Power Quality Benefits

The installation of the USES® System at the Rocklin, Sunset Blvd., Taco Bell facility has resulted in measurable and verifiable power quality improvements, as well as other benefits which cannot be measured. A discussion of the power quality improvements resulting from the USES® System is presented below:

Real Power Demand - The USES® System reduces real power demand in two principal ways: Through amperage reductions on the circuit, which reduce "Copper Losses", and through the reduction of Total Harmonic Distortion (THD) in the amperage and voltage supplied to operating loads, which improves motor efficiency. The amount of real power demand reduction associated with the USES® System exceeds that of comparable power factor correction capacitor (PFCC) equipment because of the reduced THD in addition to the improvement in power factor.

Power Factor – Power Factor is the ratio of real power to apparent power. Because the USES® System reduces both real power demand and apparent power demand, the power factor is improved and approaches unity, or 100%. Because the USES® System does not create RLC resonance, any leading Power Factor will have no effect on the performance or reliability of the equipment.

Reactive Power, Apparent Power and Amperage – The USES® System reduces the reactive power on the circuit in a manner which does not create RLC resonance. Each USES® Model XL-3D-208 power conditioner reduces reactive power by 9 KVAR. A reduction in reactive power results in a corresponding decrease in the apparent power on the circuit. This, in turn, results in a decrease in the amount of amperage on the circuit, which results in a decrease in real power demand as a result of reduced "Copper Losses" on the circuit. Copper losses manifest themselves as heat in motors and conductors and can reduce the useful life of motors, transformers and sensitive electronic equipment. The reduction in reactive power on the circuit also acts to "stiffen" the circuit by reducing overall circuit impedance. A "stiff" circuit will reduce the creation of voltage total harmonic distortion as a result of current harmonics.

Voltage Improvement - By improving voltage across each of the three phases (VAB, VBC, and VCA), circuit amperage is further reduced and motors will run cooler and last longer. Increased voltage will also lessen the likelihood of equipment tripping off due to utility voltage sags. Fluctuations in voltage are dampened by the coupling of the three phases of power supplied, which will lessen any likelihood of equipment tripping problems associated with voltage fluctuations.

Harmonics – The USES® System reduces the Harmful Harmonic Distortion of the amperage and voltage on the circuit by passing all power generated within the USES® System through 60 Hz band-pass Filters. Because the USES® System is connected to the electrical circuit in parallel, some HD will continue to pass on to the operational loads. However, because a significant portion of the power supplied to the load is "choked" to 60 Hz, total HD supplied to the load is reduced. This action significantly reduces the THD in the voltage and current provided to the operating motors, thus increasing motor efficiency. This also drastically reduces the amount of NON POWER CURRENT or harmonic current, which the utility meter charges for as kWh. Problems associated with circuit

harmonics include:

> Excessive Neutral Currents, where voltage harmonics result in additional current on the circuit neutral conductor, resulting in additional heat, possible overloading and the need to install additional neutral conductors.

> Overheated transformers, where harmonics generated on the secondary side of a delta-wye transformer will circulate on the primary side of the transformer. Some types of transformer losses, such as skin losses and eddy currents will increase by the square of the harmonic order.

> Overheated solenoid coils and lighting ballasts.

> Positive, negative and zero sequence voltages on motors and generators, where certain harmonic frequencies will try to rotate the motor forward or backward, or simply heat up the motor.

> Incorrect reading power meters, especially disc type watt-hour meters and averaging type current meters.

> Failure of electronic equipment, including nuisance tripping and overload.

> Nuisance tripping of circuit protection devices including false tripping of relays and failure of UPS devices to properly transfer.

> Blown fuses and overheated power factor correction capacitors due to the cumulative effects of harmonic THD and RLC resonance.

Spike and Surge Protection - Inherent in the USES® System, but not measured, is the ability to provide superior spike and surge suppression capabilities. A surge is any voltage increase lasting 3 or more nanoseconds. A spike is any voltage increase lasting less than 3 nanoseconds. The USES® device detects any surges or spikes traveling along one of the active phases and shunts it to the other two phases. From there, the transformer/choke sets within the USES® device attenuate the surge/spike through the action of the "chokes", which use capacitors and inductors to resist the change in voltage and associated change in current, and flatten out the waveform. The surge/spike is recycled as usable power for the circuit. Because USES® "Wye" units were not specified for this application, the USES® System will not protect the circuit against ground fault transients or lightning strikes which can enter the circuit through the neutral conductor.

Timed Interval Sampling (TIS) Techniques

Timed Interval Sampling (TIS) techniques are used to determine actual performance of the USES® System. In order to ensure the accuracy, transparency and repeatability of the TIS evaluation, Power Shaver, Energy Saving Systems® has developed TIS methods which adhere to the International Performance Measurement & Verification Protocols (IPMVP). The IPMVP, endorsed by the U.S. Department of Energy, provides an overview of the best practice techniques available for verifying the results of energy savings projects.

Timed Interval Sampling is a statistical method of energy measurement with regard to electrical consumption, measured as average wattage demand reductions over a short span of time. It is used in facilities with dynamic electrical loads where energy use is a function of manufacturing, environmental loads, and related equipment. TIS techniques are utilized to minimize the high degree of variables present when measuring energy consumption. These variables often include: weather conditions, facility operational techniques, and load variations.

When the USES® System is being evaluated, it is alternately activated and deactivated at timed intervals such as 5, 10 or 15 minutes, to compare the average demand of real power by the loads in the facility under equal conditions. All samples are recorded and averaged in each respective operating condition (on vs. off), in order to demonstrate the effects that the USES® System has on the circuit when activated and deactivated. Power Shaver used an Amprobe DM-II Pro® Multi-meter and Data Logger to perform TIS metering and recording. This "True RMS" meter meets the standards of the National Institute of Standards and Technology and the IPMVP.

Evaluation of the USES® System performance was made through analysis of the data recorded from the TIS testing. The Amprobe DM-II Pro® Multi-meter was connected at a point at or near the main service breaker serving the entire facility in order to measure overall circuit power quality and average energy savings. The USES® System was activated and deactivated for intervals of 5 minutes during the test period to measure the changes in overall power quality in each operating condition. A separate test of the cumulative effect of the USES® power conditioners was also conducted to confirm that each of the units is operating properly. The differences between conditioned and unconditioned power quality was determined and averaged to demonstrate the overall effect that the USES® System has on the circuit.

➢ All recorded data was evaluated and averaged in the following manner to determine the overall average performance of the USES® System: The average power quality for each full interval was calculated and compared to the next interval before and after each transition from on to off, and off to on.

➢ Each instantaneous change in power quality was determined by comparing the last one-second with the USES® System on to the first one-second with the USES® System off, and vice-versa.

➤ The average power quality was calculated before and 15-seconds after each transition from on to off, and off to on.

➤ The average power quality was calculated before and 30-seconds after each transition from on to off, and off to on.

➤ The average power quality was calculated before and 45-seconds after each transition from on to off, and off to on.

➤ The average power quality was calculated before and 60-seconds after each transition from on to off, and off to on.

➤ All representative transitional changes are averaged to derive the overall average performance of the USES® System.

This report shows all differences in electrical performance with the USES® System activated and deactivated including:

➤ Real Power demand reductions (Watts)
➤ Voltage improvements across each phase (Volts)
➤ Amperage reductions across each phase (Amps)
➤ Reactive Power reductions (VAR)
➤ Apparent Power reductions (VA)
➤ Power Factor improvement (%)

Graphs and Data Tables

Through evaluation of the Amprobe DM-II Pro® Power Multi-meter and Data Logger recordings collected on March 22, 2013, we have prepared a series of graphs and data tables to show the effect of the USES® System. The following graphs are presented below, showing all changes to power quality and condition when the USES® System is activated or de-activated:

➢ Graph 1 – Real Power (watts) – This graph shows real power in watts during the March 22, 2013 TIS testing.
➢ Graph 2 – Apparent Power (VA) – This graph shows apparent power during the March 22, 2013 TIS testing.
➢ Graph 3 – Reactive Power (VAR) – This graph shows reactive power during the March 22, 2013 TIS testing.
➢ Graph 4 – Power factor – This graph shows power factor as a decimal during the March 22, 2013 TIS testing.
➢ Graph 5 – Amperage (Amps) – This graph shows amperage in amps for 3 phases during the March 22, 2013 TIS testing.
➢ Graph 6 – Voltage (Volts) – This graph shows the voltage in volts for 3 phases during the March 22, 2013 TIS testing.

The following data tables are presented to show the average observed performance of the USES® System during the March 22, 2013 TIS testing. Please note that during the testing, each USES® unit was tested individually to ensure performance and evaluate circuit improvements.

➢ Table 1 – Real Power (Watts) from the March 22, 2013 TIS testing.
➢ Table 2 – Apparent Power (VA) from the March 22, 2013 TIS testing.
➢ Table 3 – Reactive Power (VAR) from the March 22, 2013 TIS testing.
➢ Table 4 – Power Factor from the March 22, 2013 TIS testing.
➢ Table 5 – Amperage (Amps) 3 phases from the March 22, 2013 TIS testing.
➢ Table 6 – Voltage (Volts) 3 phases from the March 22, 2013 TIS testing.

All Data Tables and Graphs, together with all raw data are included.

Graph 1
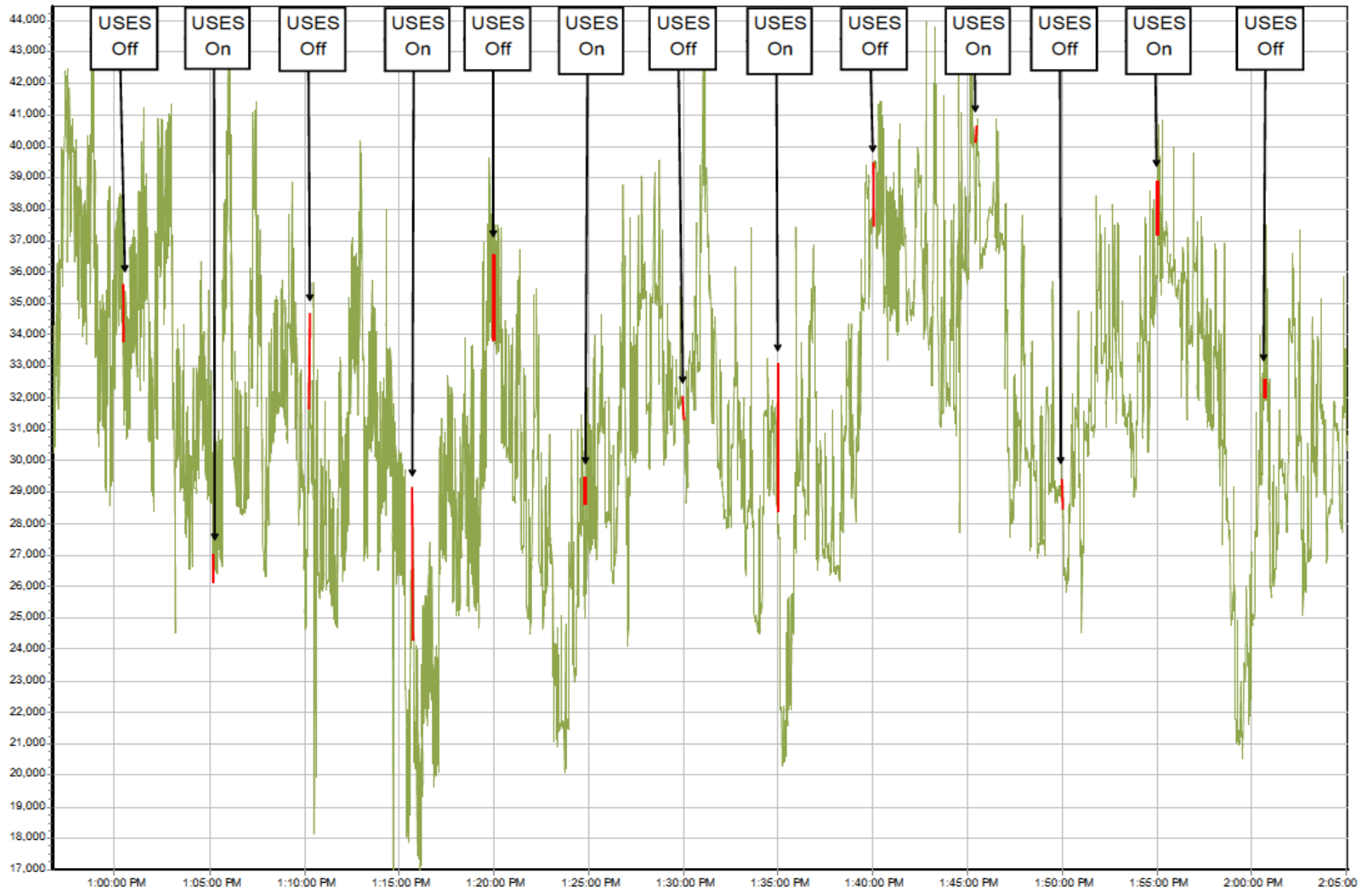
Graph 1 Above is the Real Power Demand in watts during the TIS testing on March 22, 2013 between 12:56 pm and 2:05 pm. With 1 USES® model XL-3D-208V power conditioner operating, the real power demand is reduced an average of **3,496.97 watts.**
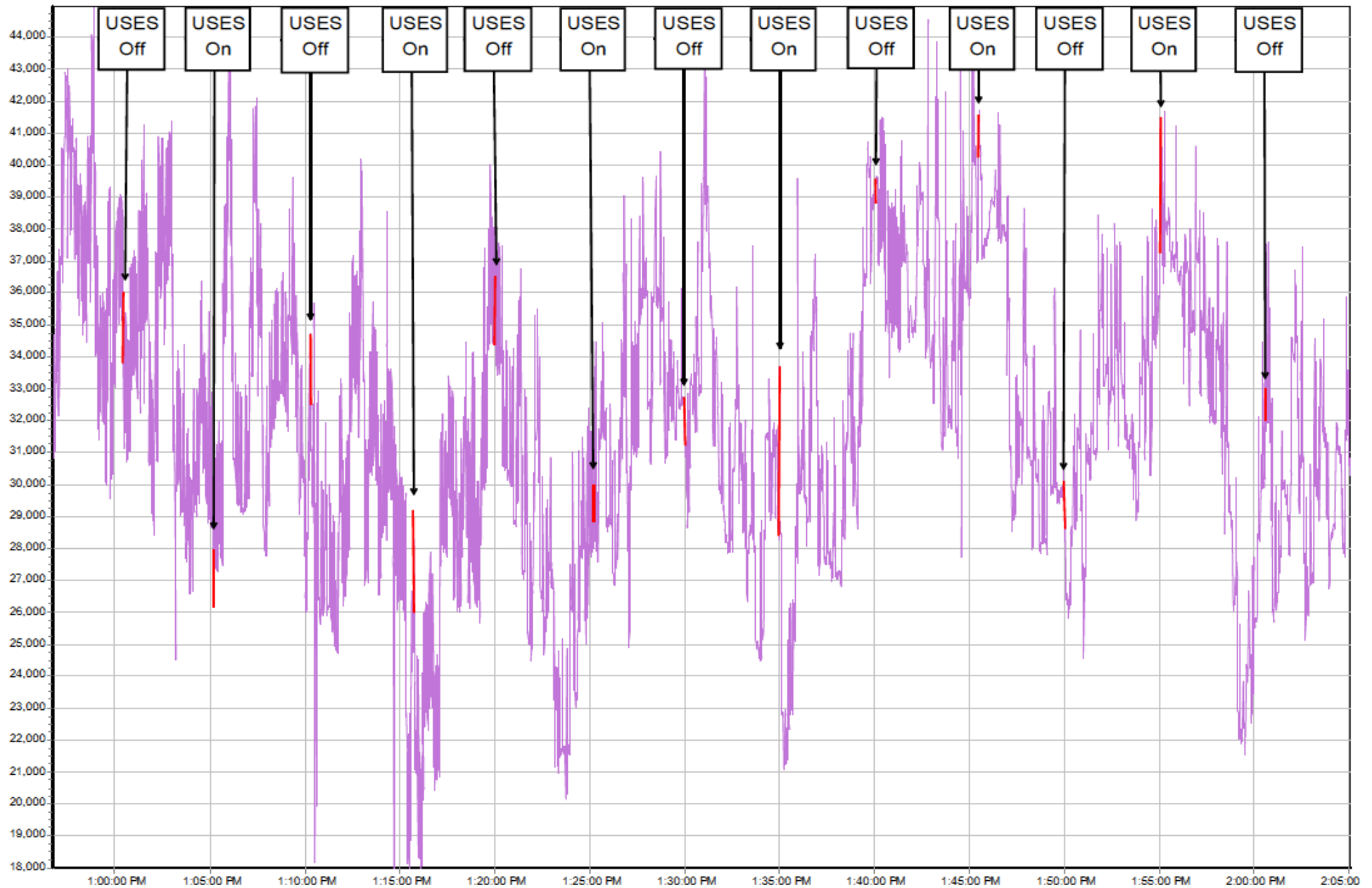
Table 1

Real Power Demand (Watts)

Interval Time Frame		# USES	Status	System On Average	System Off Average	Difference Off to On	Difference On to Off	Instant Change At Transition	15 Sec Change At Transition	30 Sec Change At Transition	45 Sec Change At Transition	60 Sec Change At Transition
12:56:44 PM	1:00:27 PM		off		36532.52							
1:00:28 PM	1:05:12 PM		on	32958.34		3574.17		1653.32	1012.74	1794.75	2734.95	-3108.06
1:05:13 PM	1:10:16 PM		off		31650.63		-1307.71	835.84	4791.05	7953.85	13517.26	6686.33
1:10:17 PM	1:15:42 PM		on	29272.56		2378.08		-3183.18	2476.90	5629.73	5086.12	5349.36
1:15:43 PM	1:20:01 PM		off		27397.19		-1875.36	-3667.04	-11698.92	-5704.06	-7225.42	-6770.46
1:20:02 PM	1:24:59 PM		on	27874.08		-476.88		-2581.64	343.77	3067.09	3740.62	-419.03
1:25:00 PM	1:29:59 PM		off		31569.75		3695.67	829.35	-1109.32	2550.43	2326.49	-600.73
1:30:00 PM	1:34:58 PM		on	31047.54		522.21		762.48	975.21	-942.06	-1921.91	-7222.86
1:34:59 PM	1:40:01 PM		off		29644.37		-1403.17	4560.74	-7977.69	-6494.47	-2883.73	494.45
1:40:02 PM	1:45:27 PM		on	36193.01		-6548.64		-2002.78	-43.57	767.77	4261.33	-1151.49
1:45:28 PM	1:49:59 PM		off		32683.75		-3509.25	476.49	-3946.02	-3141.00	-2161.73	-2644.01
1:50:00 PM	1:55:00 PM		on	31927.71		756.04		713.79	2445.35	-1604.61	-2068.44	4816.25
1:55:01 PM	2:00:36 PM		off		31270.97		-656.74	1299.30	-1572.91	-460.77	-1715.98	-2004.24
2:00:37 PM	2:05:02 PM		on	30063.67		1207.30		494.39	3755.41	3214.48	4520.46	2500.32

Average - System Off	31535.60	
Average - System On	31333.84	
Difference	201.75	

	Difference Off to On	Difference On to Off	Instant Change	15 Sec Change	30 Sec Change	45 Sec Change	60 Sec Change
Transition Avg - Off to On	-360.32		1653.32	1978.33	2692.11	4068.70	4221.98
Transition Avg - On to Off		-842.76	1299.30	4791.05	5252.14	2326.49	6686.33
Average - All Transitions	3496.97						

Table 1 Above is the analysis of the wattage data of 1 USES® model XL-3D-208V power conditioner collected by the Amprobe DM-II Pro Multi-Meter and Data-Logger during the TIS testing on March 22, 2013. Each interval is 5 minutes in duration. The real power demand is reduced an average of **3.497 kW.** At the completion of the test period, each unit was tested individually. Shaded cells are not included in the average performance calculations because load changes unrelated to the performance of the USES® system occurred during the averaging period.

Graph 2

Graph 2 Above is the Apparent Power in VA during the TIS testing on March 22, 2013 between 12:56 pm and 2:05 pm with 1 USES® model XL-3D-208V power conditioner operating. The apparent power is reduced an average of **3,902.15 VA.**
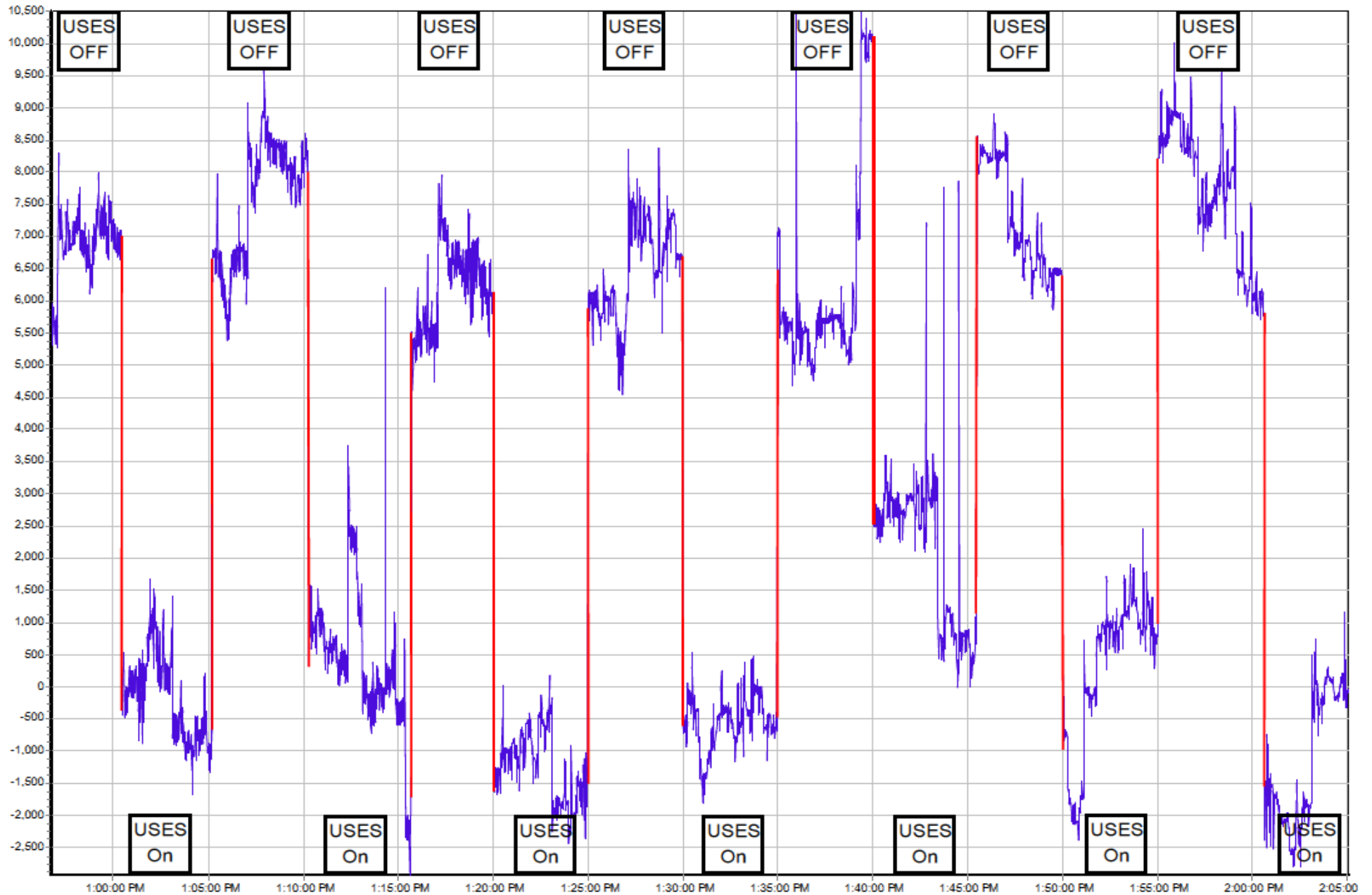
Table 2

Apparent Power (VA)

Interval Time Frame		# USES	Status	System On Average	System Off Average	Difference Off to On	Difference On to Off	Instant Change At Transition	15 Sec Change At Transition	30 Sec Change At Transition	45 Sec Change At Transition	60 Sec Change At Transition
12:56:44 PM	1:00:27 PM		off		37186.15							
1:00:28 PM	1:05:12 PM		on	32965.41		4220.75		2341.07	1700.89	2483.48	3422.89	-2418.46
1:05:13 PM	1:10:16 PM		off		32579.75		-385.65	1635.05	5793.90	8601.29	13935.31	7303.73
1:10:17 PM	1:15:42 PM		on	29295.49		3284.26		-2170.31	3477.54	6599.51	6077.03	6356.79
1:15:43 PM	1:20:01 PM		off		28115.64		-1179.85	-3122.82	-10860.74	-5188.90	-6490.77	-6150.63
1:20:02 PM	1:24:59 PM		on	27908.23		207.41		-2066.24	870.40	3600.29	4275.57	105.24
1:25:00 PM	1:29:59 PM		off		32247.46		4339.23	1367.79	-471.72	3056.68	2830.14	11.41
1:30:00 PM	1:34:58 PM		on	31053.96		1193.50		1437.39	1656.26	-262.04	-1242.19	-6565.63
1:34:59 PM	1:40:01 PM		off		30328.84		-725.12	5187.62	-7177.18	-5788.01	-2254.00	999.49
1:40:02 PM	1:45:27 PM		on	36271.55		-5942.72		-750.90	1198.46	1999.55	5443.35	94.80
1:45:28 PM	1:49:59 PM		off		33484.77		-2786.78	1349.72	-3035.62	-2249.01	-1316.04	-1778.49
1:50:00 PM	1:55:00 PM		on	31950.67		1534.10		1382.12	3116.99	-985.31	-1454.27	5457.40
1:55:01 PM	2:00:36 PM		off		32214.49		263.82	2149.20	-565.61	611.82	-620.69	-920.07
2:00:37 PM	2:05:02 PM		on	30102.73		2111.77		973.28	4218.85	3622.21	4969.26	2942.28

Average - System Off				32308.16								
Average - System On				31364.01								
Difference				944.15								
Transition Avg - Off to On						944.15		1720.19	2561.50	3661.01	4837.62	4918.82
Transition Avg - On to Off							-79.06	2337.88	5793.90	3056.68	2830.14	7303.73
Average - All Transitions				3902.15								

Table 2 Above is the analysis of the Apparent Power data of 1 USES® model XL-3D-208V power conditioner collected by the Amprobe DM-II Pro Multi-Meter and Data-Logger during the TIS testing on March 22, 2013 between 12:56 pm and 2:05 pm. The test data shows an apparent power reduction of about **3.902 KVA.** Shaded cells are not included in the average performance calculations because load changes unrelated to the performance of the USES® system occurred during the averaging period.

Graph 3

Graph 3 Above is the Reactive Power in VAR during the TIS testing on March 22, 2013 between 12:56 pm and 2:05 pm with 1 USES® model XL-3D-208V power conditioner operating. The reactive power is reduced an average of **7,275.02 VAR.**
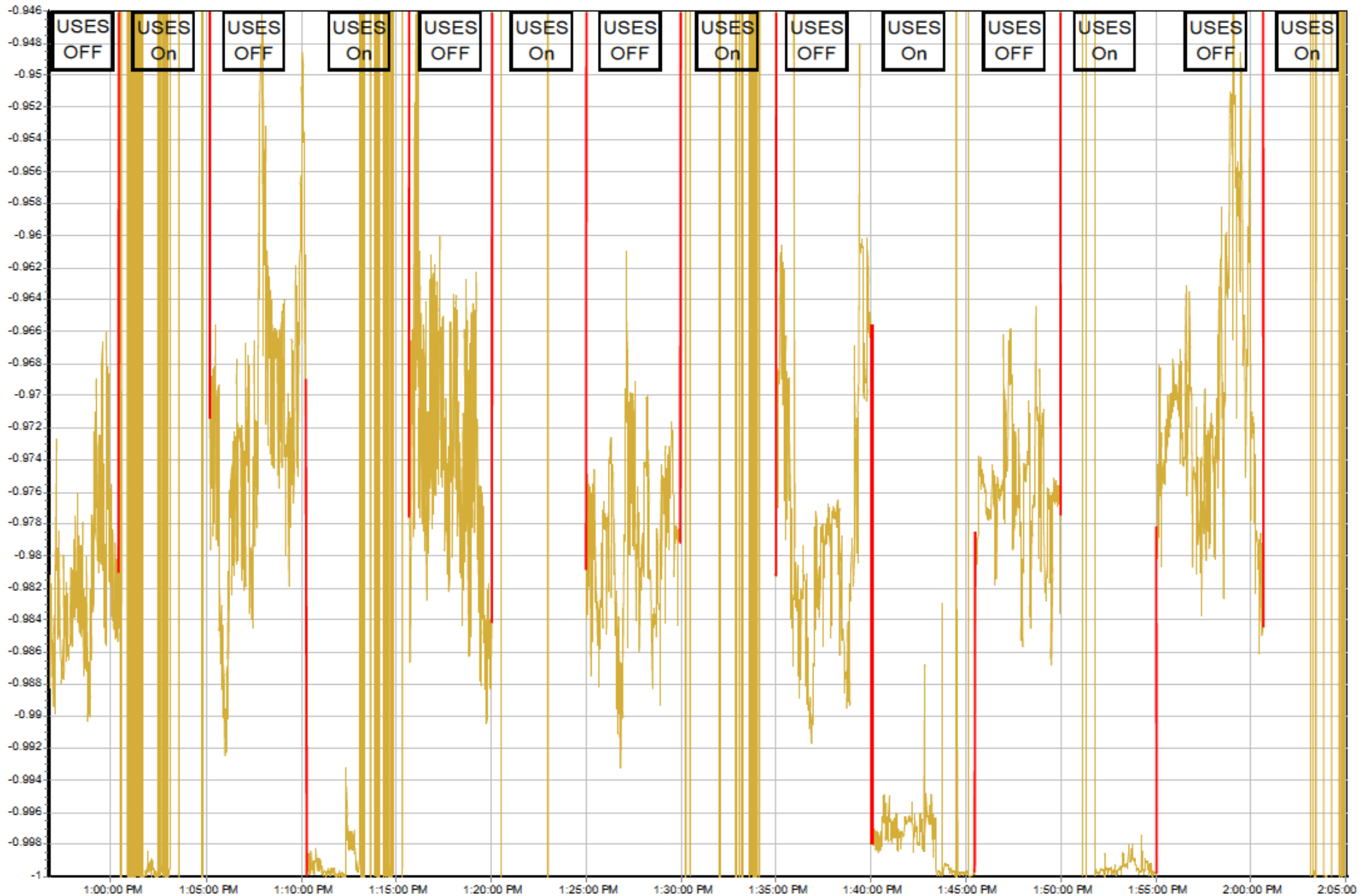
Table 3

Reactive Power (VAR)												
Intervals					Full Interval		Instant Change	15 Sec Change	30 Sec Change	45 Sec Change	60 Sec Change	
Interval Time Frame		# USES	Status	System On Average	System Off Average	Difference Off to On	Difference On to Off	At Transition	At Transition	At Transition	At Transition	At Transition
12:56:44 PM	1:00:27 PM		off		6883.01							
1:00:28 PM	1:05:12 PM		on	-148.35		7031.36		7377.12	7339.10	6777.86	6691.76	7042.03
1:05:13 PM	1:10:16 PM		off		7606.67		7755.02	7309.48	8633.23	7378.11	6489.49	7099.02
1:10:17 PM	1:15:42 PM		on	401.33		7205.34		7736.50	7167.32	6540.55	6946.76	7457.72
1:15:43 PM	1:20:01 PM		off		6234.27		5832.94	7181.13	7288.20	6825.06	7566.36	7163.79
1:20:02 PM	1:24:59 PM		on	-1223.24		7457.50		7730.67	7397.27	7165.48	7101.53	7473.25
1:25:00 PM	1:29:59 PM		off		6524.68		7747.92	7294.56	7574.74	7288.98	7254.02	7511.09
1:30:00 PM	1:34:58 PM		on	-524.47		7049.15		7286.52	6812.71	6329.98	6992.65	8024.96
1:34:59 PM	1:40:01 PM		off		6287.73		6812.20	6924.12	6238.85	6072.71	6168.46	5891.38
1:40:02 PM	1:45:27 PM		on	2100.47		4187.26		7525.29	7445.77	7334.24	6898.00	7469.27
1:45:28 PM	1:49:59 PM		off		7257.28		5156.81	7332.16	7027.23	7033.20	6922.47	6964.60
1:50:00 PM	1:55:00 PM		on	309.95		6947.33		7344.10	7214.01	8388.66	8481.73	7837.90
1:55:01 PM	2:00:36 PM		off		7680.30		7370.35	7232.38	7625.36	8035.41	7976.69	7895.38
2:00:37 PM	2:05:02 PM		on	-1136.03		8816.33		7338.02	7539.32	8325.35	7742.54	7911.38

Average - System Off					6924.85							
Average - System On					-31.48							
Difference					6956.32							
Transition Avg - Off to On						6956.32		7476.89	7273.64	7266.02	7265.00	7602.36
Transition Avg - On to Off							6779.21	7212.31	7397.94	7105.58	7062.92	7087.54
Average - All Transitions				7275.02								

Table 3 Above is the analysis of the Reactive Power data of 1 USES® model XL-3D-208V power conditioner collected by the Amprobe DM-II Pro Multi-Meter and Data-Logger during the TIS testing on March 22, 2013 between 12:56 pm and 2:05 pm. The test data shows a reactive power reduction of about **7.275 KVAR.** Shaded cells are not included in the average performance calculations because load changes unrelated to the performance of the USES® system occurred during the averaging period.

Graph 4

Graph 4 Above is the Power Factor in decimals during the TIS testing on March 22, 2013 between 12:56 pm and 2:05 pm with 1 USES® model XL-3D-208V power conditioner operating. The power factor is increased from **98 % to 100 %.**

Table 4

Power Factor												
Intervals						Full Interval		Instant Change	15 Sec Change	30 Sec Change	45 Sec Change	60 Sec Change
Interval Time Frame		# USES	Status	System On Average	System Off Average	Difference Off to On	Difference On to Off	At Transition	At Transition	At Transition	At Transition	At Transition
12:56:44 PM	1:00:27 PM		off		0.98							
1:00:28 PM	1:05:12 PM		on	1.00		0.02		0.02	0.02	0.02	0.02	0.02
1:05:13 PM	1:10:16 PM		off		0.97		0.03	0.03	0.03	0.02	0.01	0.02
1:10:17 PM	1:15:42 PM		on	1.00		0.03		0.03	0.03	0.03	0.03	0.03
1:15:43 PM	1:20:01 PM		off		0.97		0.03	0.02	0.05	0.02	0.03	0.03
1:20:02 PM	1:24:59 PM		on	1.00		0.03		0.02	0.02	0.02	0.02	0.02
1:25:00 PM	1:29:59 PM		off		0.98		0.02	0.02	0.02	0.02	0.02	0.02
1:30:00 PM	1:34:58 PM		on	1.00		0.02		0.02	0.02	0.02	0.02	0.02
1:34:59 PM	1:40:01 PM		off		0.98		0.02	0.02	0.04	0.03	0.02	0.02
1:40:02 PM	1:45:27 PM		on	1.00		0.02		0.03	0.03	0.03	0.03	0.03
1:45:28 PM	1:49:59 PM		off		0.98		0.02	0.02	0.03	0.02	0.02	0.02
1:50:00 PM	1:55:00 PM		on	1.00		0.02		0.02	0.02	0.02	0.02	0.02
1:55:01 PM	2:00:36 PM		off		0.97		0.03	0.02	0.03	0.03	0.03	0.03
2:00:37 PM	2:05:02 PM		on	1.00		0.03		0.02	0.02	0.02	0.02	0.02

|										
Average - System Off		0.98								
Average - System On		1.00								
Difference		0.02								
Transition Avg - Off to On			0.02		0.02	0.02	0.02	0.02	0.02
Transition Avg - On to Off				0.03	0.02	0.03	0.02	0.02	0.02
Average - All Transitions		0.02								

Table 4 Above is the analysis of the Power Factor data of 1 USES® model XL-3D-208V power conditioner collected by the Amprobe DM-II Pro Multi-Meter and Data-Logger during the TIS testing on March 22, 2013 between 12:56 pm and 2:05 pm. The test data shows the power factor is increased from **98 % to 100 %.** Shaded cells are not included in the average performance calculations because load changes unrelated to the performance of the USES® system occurred during the averaging period.
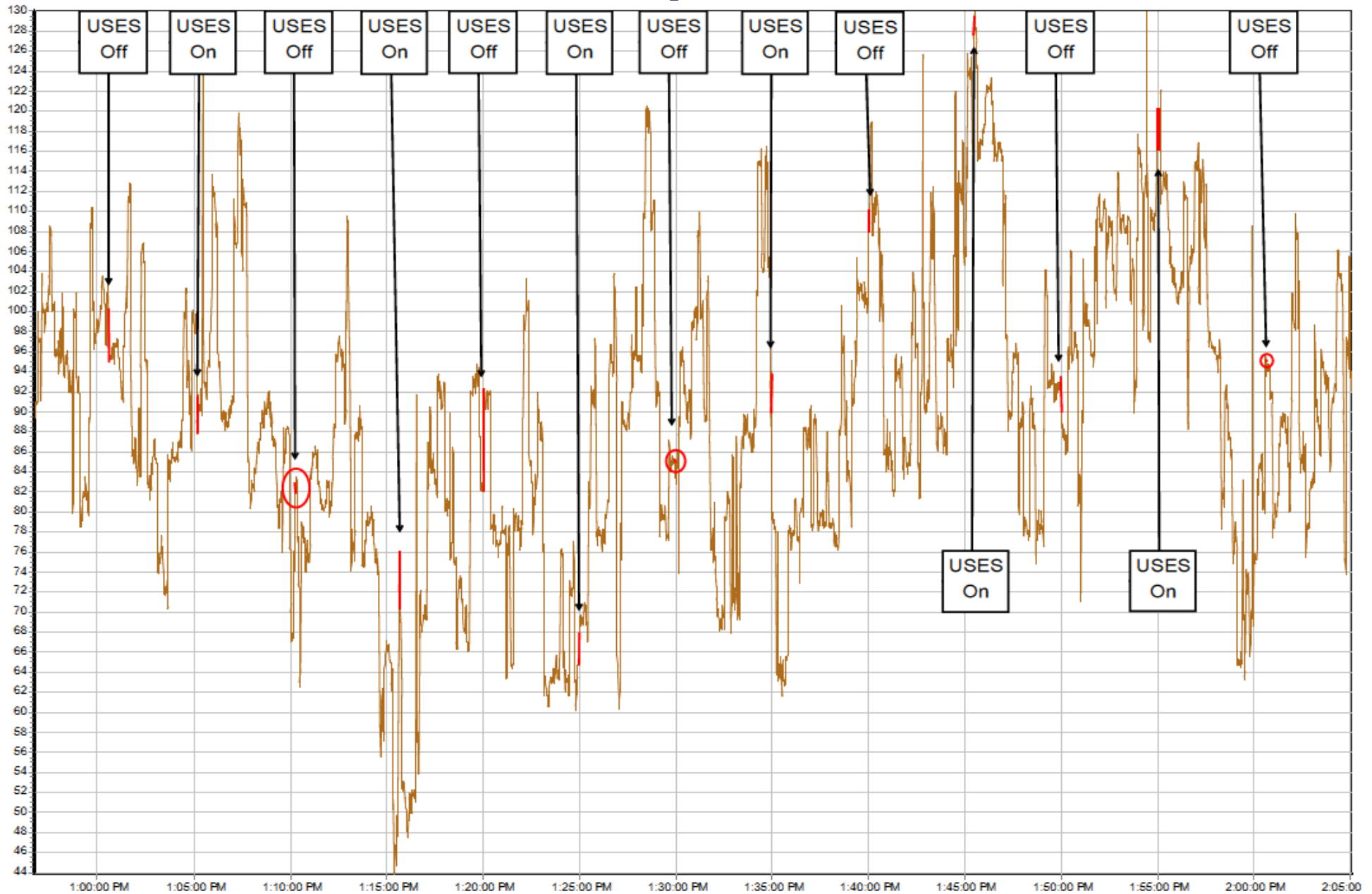
Graph 5
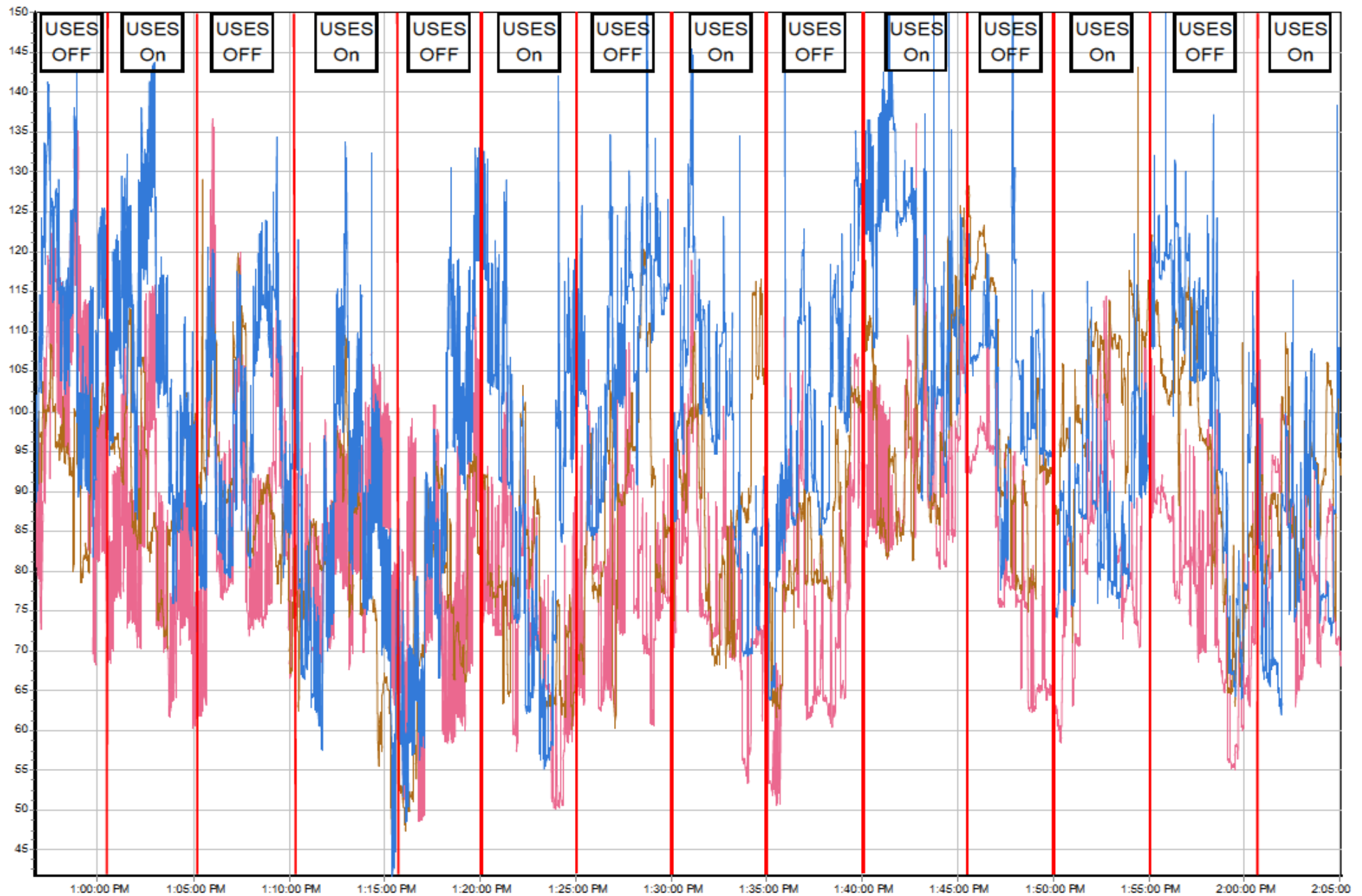
Graph 5 Above is the Current in Amps per phase during the TIS testing on March 22, 2013 between 12:56 pm and 2:05 pm with 1 USES® model XL-3D-208V power conditioner operating. The current is reduced an average of **8.87 Amps per phase.**

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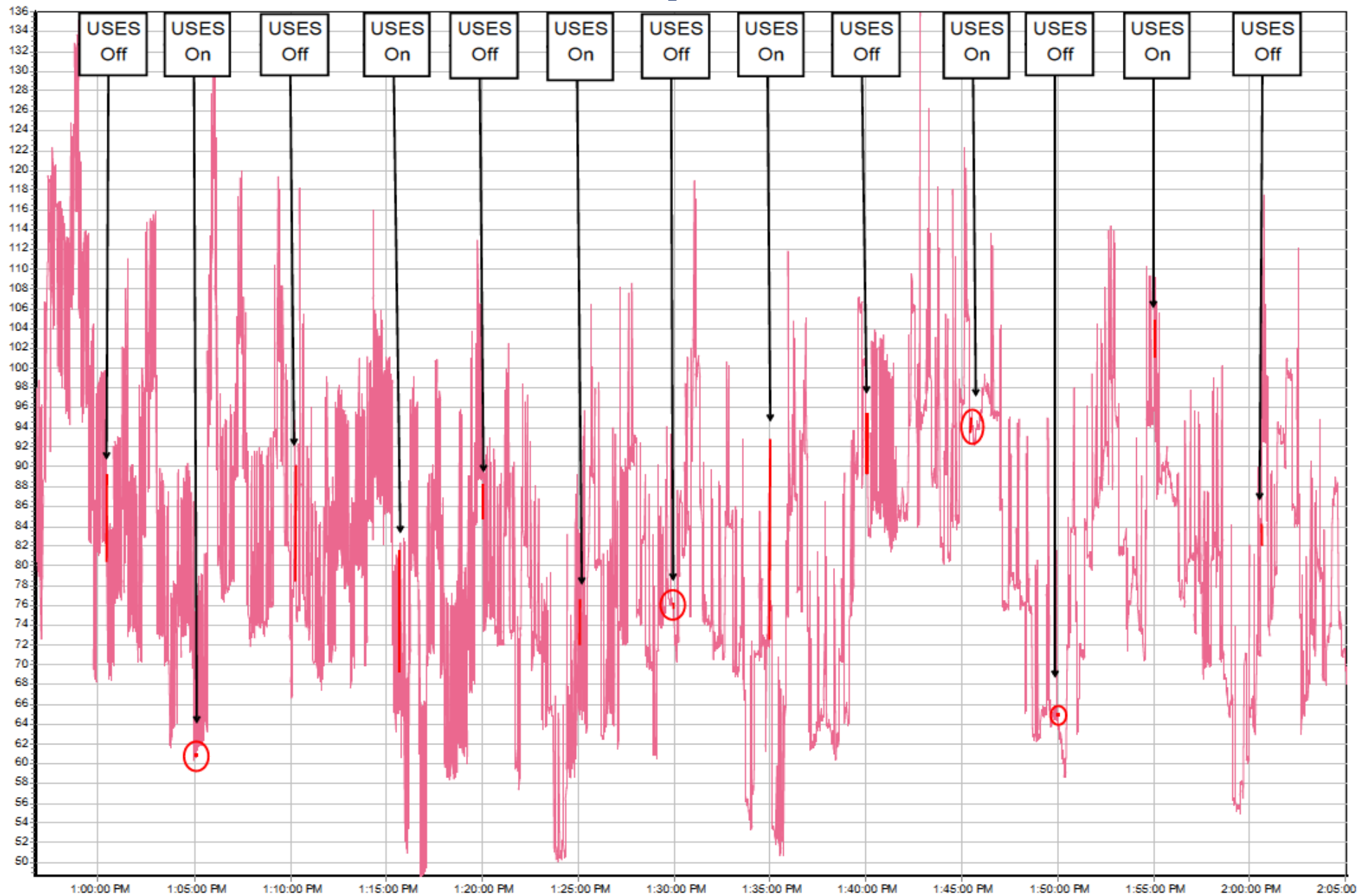
Graph 5.1

Graph 5.1 Above is the Current in Amps for phase 1 during the TIS testing on March 22, 2013 between 12:56 pm and 2:05 pm with 1 USES® model XL-3D-208V power conditioner operating. The current is reduced an average of **8.87 Amps per phase.**
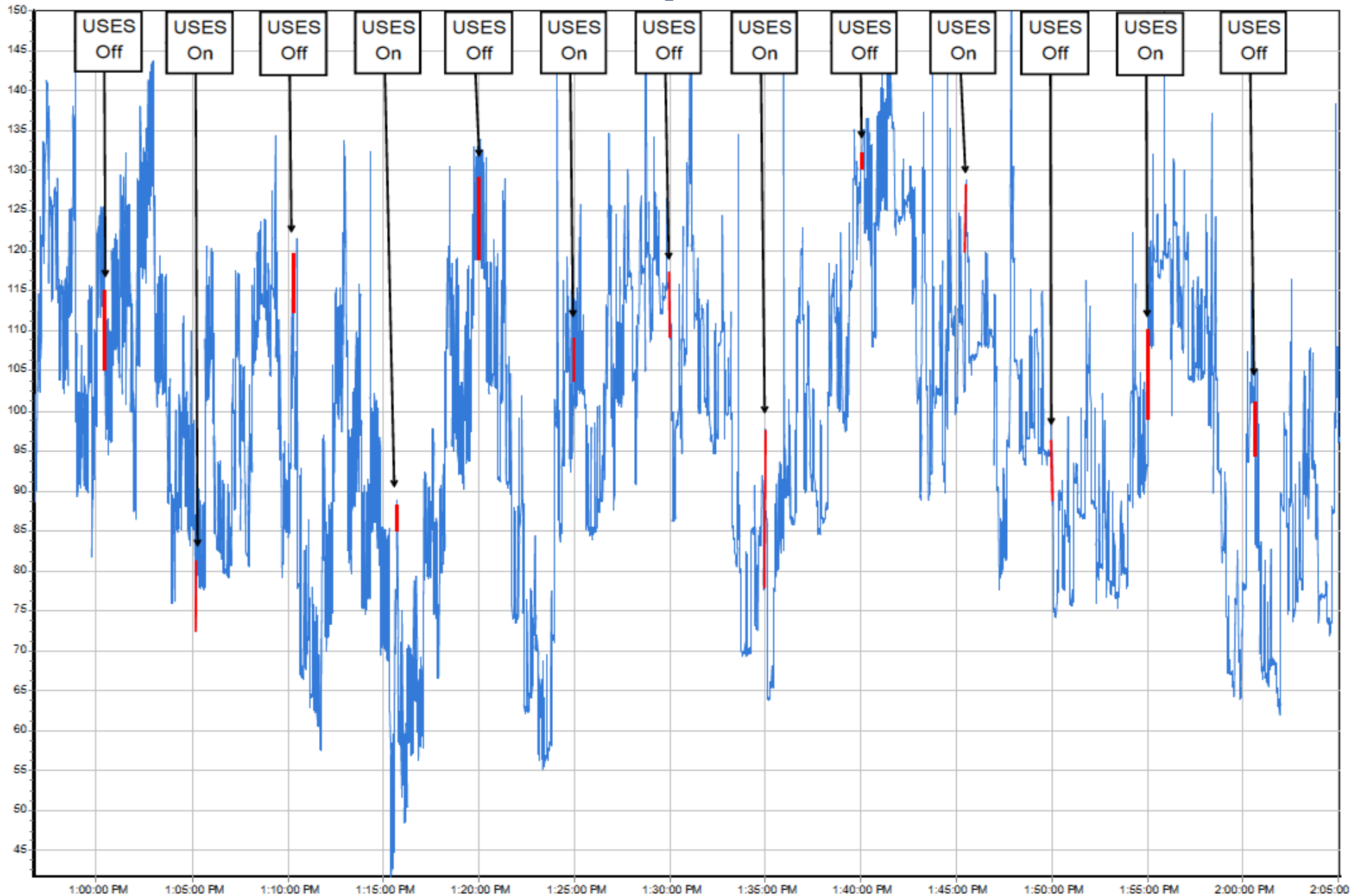
Graph 5.2

Graph 5.2 Above is the Current in Amps for phase 2 during the TIS testing on March 22, 2013 between 12:56 pm and 2:05 pm with 1 USES® model XL-3D-208V power conditioner operating. The current is reduced an average of **8.87 Amps per phase.**

Graph 5.3

Graph 5.3 Above is the Current in Amps for phase 3 during the TIS testing on March 22, 2013 between 12:56 pm and 2:05 pm with 1 USES® model XL-3D-208V power conditioner operating. The current is reduced an average of **8.87 Amps per phase.**

Table 5

RMS Current (Amps)

Interval Time Frame		# USES	Status	System On Average	System Off Average	Difference Off to On	Difference On to Off	Instant Change At Transition	15 Sec Change At Transition	30 Sec Change At Transition	45 Sec Change At Transition	60 Sec Change At Transition
						Full Interval		**Instant Change**	**15 Sec Change**	**30 Sec Change**	**45 Sec Change**	**60 Sec Change**
12:56:44 PM	1:00:27 PM		off		104.15							
1:00:28 PM	1:05:12 PM		on	92.43		11.72		6.59	4.94	6.94	9.61	-6.44
1:05:13 PM	1:10:16 PM		off		91.52		-0.91	4.49	16.12	23.26	38.27	20.97
1:10:17 PM	1:15:42 PM		on	82.09		9.44		-5.93	10.34	19.10	17.65	17.90
1:15:43 PM	1:20:01 PM		off		79.01		-3.08	-7.40	-30.36	-14.87	-18.45	-17.60
1:20:02 PM	1:24:59 PM		on	78.75		0.25		-5.67	2.60	10.47	12.34	0.48
1:25:00 PM	1:29:59 PM		off		90.94		12.19	3.97	-1.18	9.44	7.96	0.26
1:30:00 PM	1:34:58 PM		on	87.71		3.24		3.67	4.64	-0.55	-2.81	-17.60
1:34:59 PM	1:40:01 PM		off		85.54		-2.17	14.40	-19.23	-15.86	-5.98	3.02
1:40:02 PM	1:45:27 PM		on	102.42		-16.88		-1.73	3.60	6.18	16.14	0.90
1:45:28 PM	1:49:59 PM		off		94.52		-7.90	3.90	-9.02	-6.79	-4.04	-5.37
1:50:00 PM	1:55:00 PM		on	90.67		3.86		3.67	8.54	-3.77	-3.81	15.00
1:55:01 PM	2:00:36 PM		off		90.96		0.29	6.10	-1.83	1.42	-2.20	-3.05
2:00:37 PM	2:05:02 PM		on	84.78		6.18		2.92	11.60	10.91	13.94	9.11

|												
Average - System Off				90.95								
Average - System On				88.41								
Difference				2.54								
Transition Avg - Off to On						2.54		4.64	7.28	8.62	13.01	12.05
Transition Avg - On to Off							-0.26	6.57	16.12	9.44	7.96	3.02
Average - All Transitions				8.87								

Table 5 Above is the analysis of the Current data of 1 USES® model XL-3D-208V power conditioner collected by the Amprobe DM-II Pro Multi-Meter and Data-Logger during the TIS testing on March 22, 2013 between 12:56 pm and 2:05 pm. The test data shows the current is reduced an average of **8.87 Amps per phase.** Shaded cells are not included in the average performance calculations because load changes unrelated to the performance of the USES® system occurred during the averaging period.
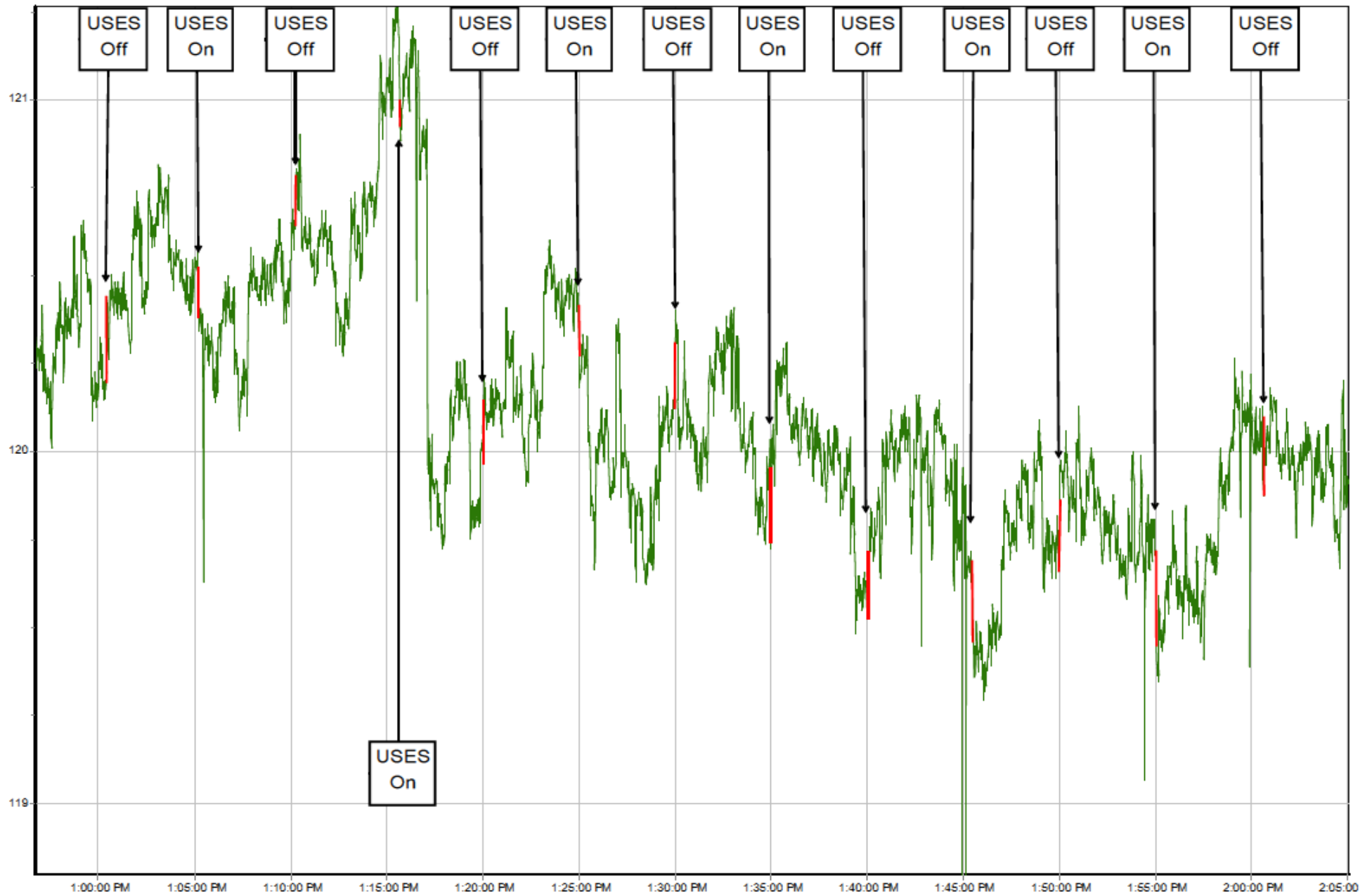
Graph 6
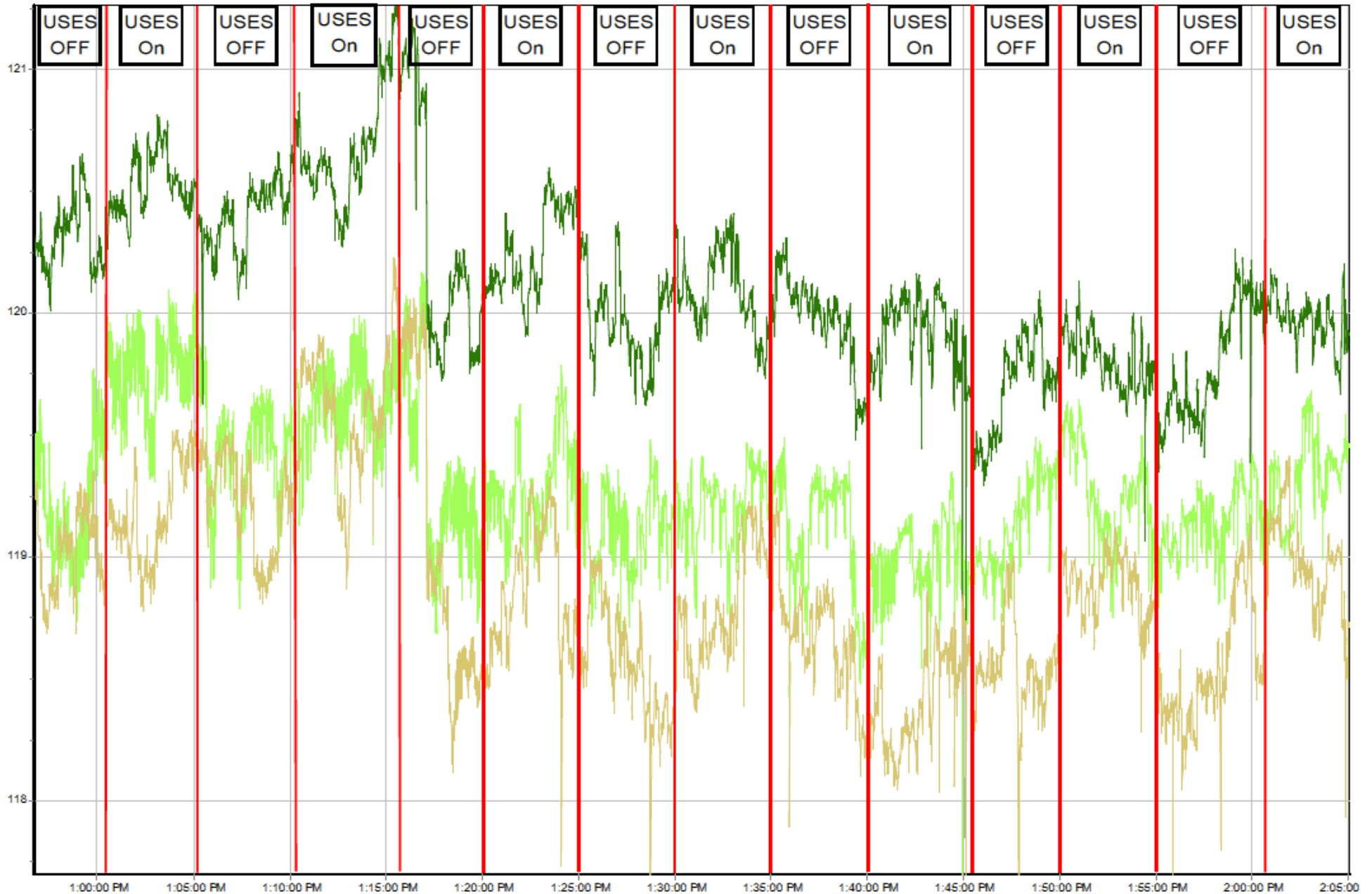
Graph 6 Above is the Voltage in Volts per phase during the TIS testing on March 22, 2013 between 12:56 pm and 2:05 pm with 1 USES® model XL-3D-208V power conditioner operating. The voltage is increased an average of **0.21 Volts per phase.**

Graph 6.1
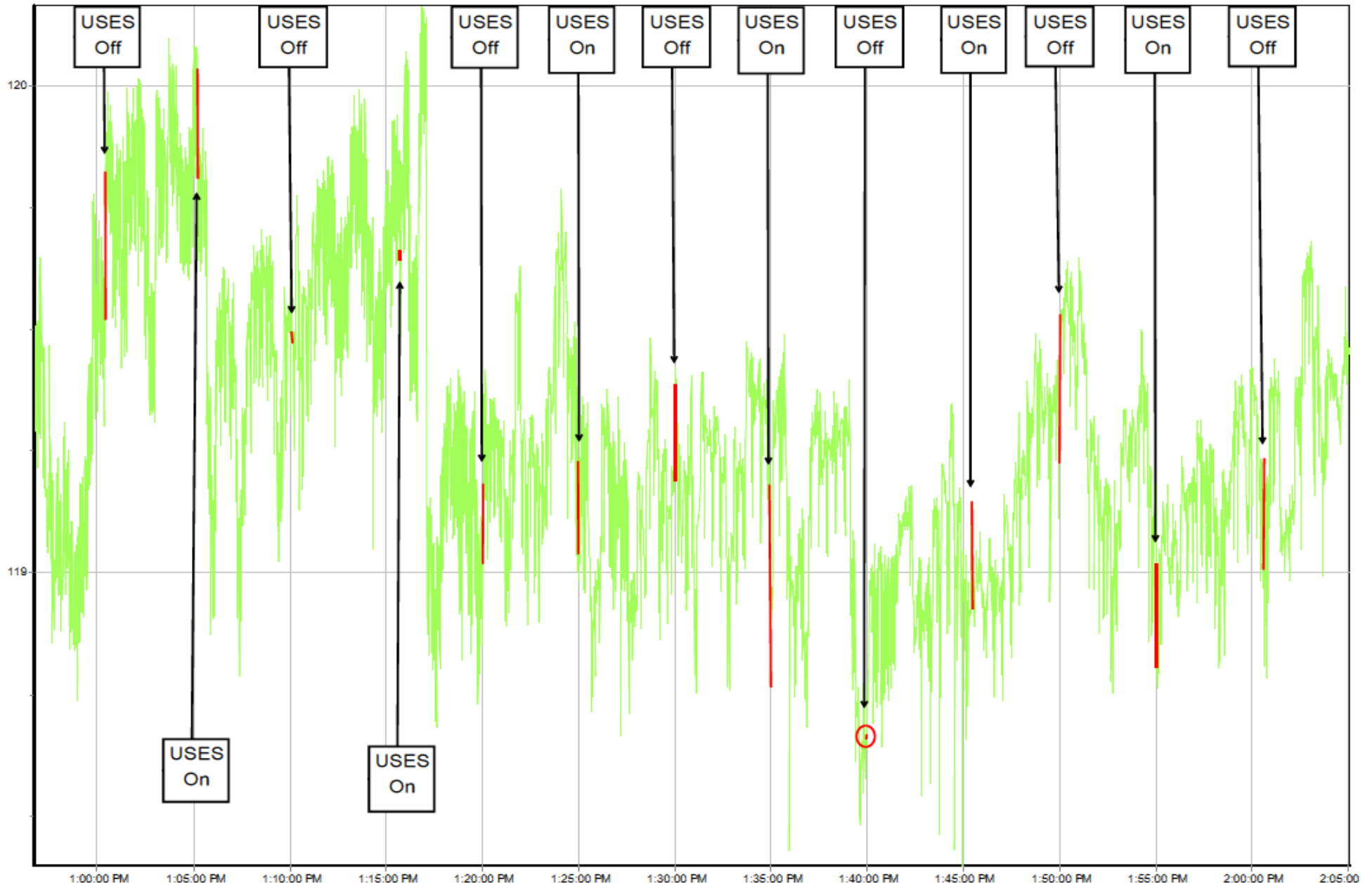
Graph 6.1 Above is the Voltage in Volts for phase 1 during the TIS testing on March 22, 2013 between 12:56 pm and 2:05 pm with 1 USES® model XL-3D-208V power conditioner operating. The voltage is increased an average of **0.21 Volts per phase.**

Graph 6.2

Graph 6.2 Above is the Voltage in Volts for phase 2 during the TIS testing on March 22, 2013 between 12:56 pm and 2:05 pm with 1 USES® model XL-3D-208V power conditioner operating. The voltage is increased an average of **0.21 Volts per phase.**
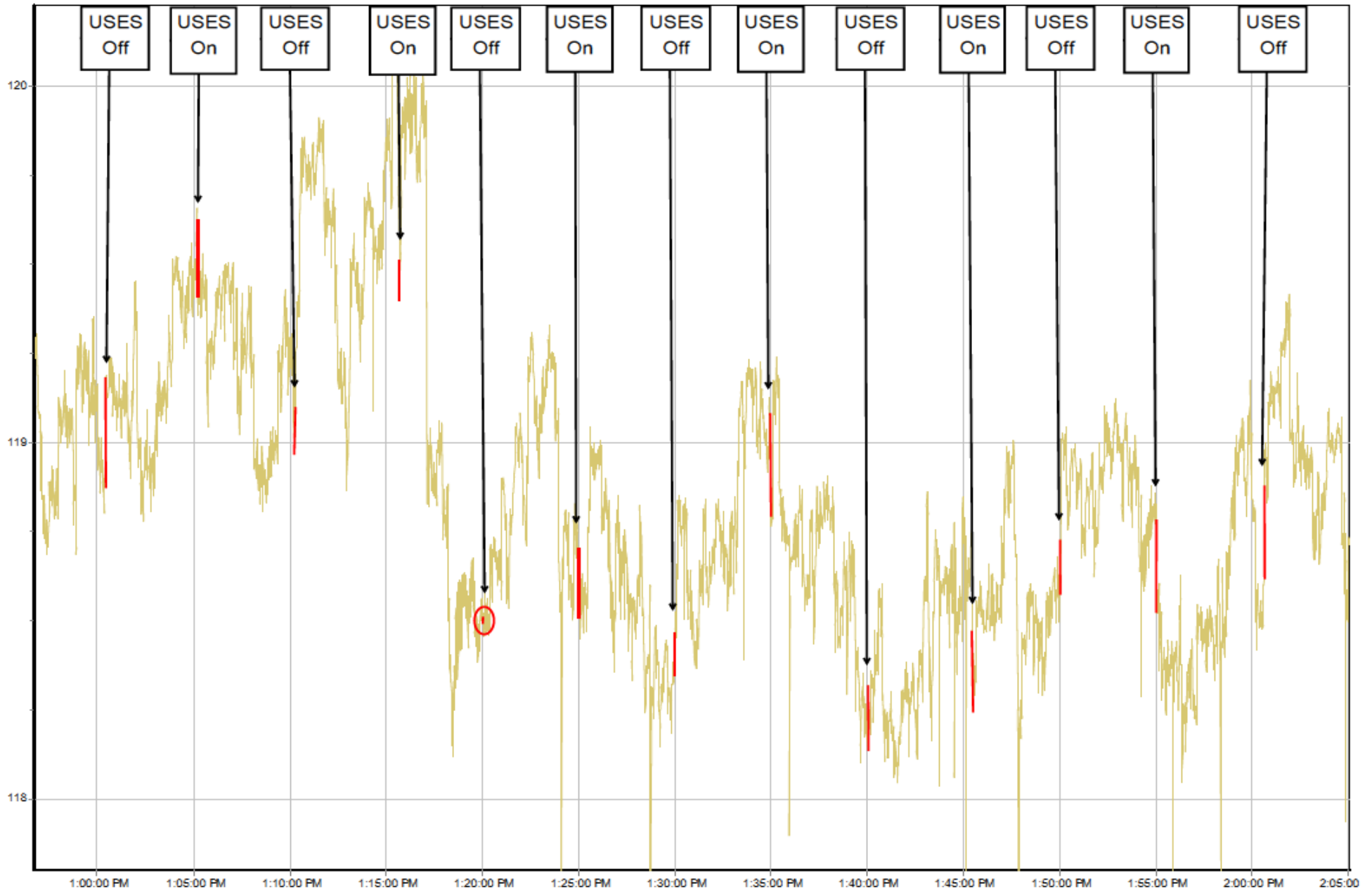
Graph 6.3

Graph 6.3 Above is the Voltage in Volts for phase 3 during the TIS testing on March 22, 2013 between 12:56 pm and 2:05 pm with 1 USES® model XL-3D-208V power conditioner operating. The voltage is increased an average of **0.21 Volts per phase.**

Table 6

RMS Voltage (Volts)

Interval Time Frame		# USES	Status	System On Average	System Off Average	Difference Off to On	Difference On to Off	Instant Change At Transition	15 Sec Change At Transition	30 Sec Change At Transition	45 Sec Change At Transition	60 Sec Change At Transition
12:56:44 PM	1:00:27 PM		off		119.52							
1:00:28 PM	1:05:12 PM		on	119.84		0.32		0.28	0.23	0.26	0.27	0.16
1:05:13 PM	1:10:16 PM		off		119.70		0.14	0.17	0.37	0.41	0.47	0.36
1:10:17 PM	1:15:42 PM		on	119.98		0.28		0.07	0.23	0.32	0.27	0.27
1:15:43 PM	1:20:01 PM		off		119.56		0.42	0.08	-0.30	-0.11	-0.22	-0.12
1:20:02 PM	1:24:59 PM		on	119.48		-0.08		0.10	0.15	0.21	0.19	0.10
1:25:00 PM	1:29:59 PM		off		119.22		0.25	0.16	0.06	0.18	0.24	0.16
1:30:00 PM	1:34:58 PM		on	119.37		0.15		0.16	0.12	0.17	0.07	-0.05
1:34:59 PM	1:40:01 PM		off		119.24		0.13	0.28	-0.13	-0.05	-0.04	0.12
1:40:02 PM	1:45:27 PM		on	119.11		-0.14		0.13	0.18	0.29	0.29	0.13
1:45:28 PM	1:49:59 PM		off		119.13		-0.02	0.22	0.14	0.12	0.14	0.11
1:50:00 PM	1:55:00 PM		on	119.32		0.20		0.22	0.34	0.22	0.30	0.42
1:55:01 PM	2:00:36 PM		off		119.16		0.16	0.22	0.16	0.15	0.15	0.11
2:00:37 PM	2:05:02 PM		on	119.43		0.26		0.22	0.33	0.27	0.33	0.27

Average - System Off	119.36	x 1.73	206.85	
Average - System On	119.50	x 1.73	207.10	
Difference			0.25	

	Difference Off to On	Difference On to Off	Instant	15 Sec	30 Sec	45 Sec	60 Sec
Transition Avg - Off to On	0.14		0.17	0.23	0.25	0.24	0.23
Transition Avg - On to Off		0.18	0.19	0.18	0.21	0.25	0.17
Average - All Transitions	0.21						

Table 6 Above is the analysis of the Voltage data of 1 USES® model XL-3D-208V power conditioner collected by the Amprobe DM-II Pro Multi-Meter and Data-Logger during the TIS testing on March 22, 2013 between 12:56 pm and 2:05 pm. The test data shows the voltage is increased by **0.21 Volts per phase.** Shaded cells are not included in the average performance calculations because load changes unrelated to the performance of the USES® system occurred during the averaging period.

Installation Configuration

The photographs above show the installation of the USES® Shunt Efficiency System by Power Shaver, Energy Saving Systems® at the Rocklin, Sunset Blvd., Taco Bell facility located at 2365 Sunset Blvd., Rocklin, CA 95765.

Acceptance of TIS Report

Having read the USES® System Evaluation for the Rocklin, Sunset Blvd., Taco Bell facility, dated April 4, 2013, I hereby accept the results and agree that Power Shaver, Energy Saving Systems® has sufficiently validated the guarantees as provided in the Purchase Agreement dated January 2013.

2365 Sunset Blvd.
Rocklin, CA 95765

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Authorized Taco Bell Representative   Title   Date