POWER SHAVER
Energy Saving Systems®

GSA Contract Holder
Contract Number GS-07F-0422W

Timed Interval Sampling Monitoring & Verification Report

For

STIRLING BRIDGES
RESTAURANT & PUB

located at

5220 Manzanita Ave.
Carmichael, CA 95608

January 4, 2016

Prepared by:
John D. Knapp
President

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TIS Report

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Power Shaver, Energy Savings Systems®

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Executive Summary and Conclusions

During May of 2015, Stirling Bridges California Pub 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 and one (1) USES® Model XL-3Y-208V power conditioners were installed on the service entrance.

In accordance with the proposal offered to Stirling Bridges by Power Shaver, Energy Saving Systems® in April of 2015, 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 May 29, 2015 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 Stirling Bridges facility, installed on the service entrances for a total of 1 USES® XL 3-D 208V and 1 USES® XL 3-Y 208V units, 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 **1.747 kW and 4.311 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 Stirling Bridges facility to be between the verified, extrapolated **Real Power kWh of 15,303** and **Apparent Power kVAh of 37,764** per year.

The performance of the USES® Shunt Efficiency System at the Stirling Bridges California Pub facility has proven to be consistent with all of the estimated power quality improvements as outlined in Power Shaver's proposal to Stirling Bridges California Pub in April of 2015. The USES® System was estimated to reduce annual consumption by approximately **29,335 kWh per year and cost by $3,655**.

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 May 29, 2015. 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).

Power Shavers' Energy Saving Systems are truly "green" systems that reduce electric energy consumption. Installing the Power Shaver Energy Saving System® at the Stirling Bridges California Pub 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 22.3 tons per year** as well as your companies consumption of **Crude Oil by 17.26 barrels, Coal by 4.96 tons, Natural Gas by 97,368.62 cubic feet, Gasoline by 805.52 gallons or Diesel Fuel and Heating Oil by 721.70 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 Stirling Bridges California Pub 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 May 29, 2015 demonstrate that the USES® technology has provided substantial improvements in overall power quality. The following power quality improvements have been realized by Stirling Bridges California Pub:

- Real Power Demand Average (kW) – **Real Power demand was reduced by an average of 1.747 kW (3.87%)** at low load operational levels with 2 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 April 2015. During the Off-Peak TIS testing of May 29, 2015, the average real power demand reduction was 1,747 watts. These results are considered in the ROI and Savings calculations as representative of low circuit load conditions.

- Real Power Demand Instant (kW) – **Real Power demand was reduced instantly by 1.841 kW (4.08%)** at low load operational levels when the USES® System was activated.

- Apparent Power Average – Apparent power was reduced by an average of 4.311 kVA (8.82%) 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.

- Apparent Power Instant – Apparent power was reduced instantly by 4.737 kVA (9.69%) at low load operational levels when the USES® System was activated.

- Reactive Power – Reactive power was reduced by an average of 11.771 kvar (63.02%) at low load operational levels when the USES® System was activated.

- Power Factor –Power Factor improved from 92% to 99% (7.15%) and remained lagging when the USES® System was activated.

- Amperage – Amperage was reduced by approximately 11.5 amps (8.47%) per phase when the USES® System was activated.

- Voltage – Voltage improved by an average of 0.15 volts (.07%) per phase (VAB, VBC, VCA) when the USES® System was activated.

Savings and ROI Calculations

Evaluation of the USES® System installed at the Stirling Bridges California Pub 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 3.348 kWh. The total annual reduction of power consumed is 3.348 kWh x 8760 hours per year = 29,335 kWh per year.

Assuming the 2015 average cost of power of $0.1246/kWh will increase in 2016 to $0.1296/kWh and by $0.005/kWh each year thereafter, ROI savings are shown on the following pro-forma:

Year	COP	kWh/yr SVGS	SVGS/yr	
1	$0.125	29,335	$3,655.14	
2	$0.130	29,335	$3,801.82	
3	$0.135	29,335	$3,948.49	
4	$0.140	29,335	$4,095.17	
5	$0.145	29,335	$4,241.84	**Years 1-5**
6	$0.150	29,335	$4,388.52	**$19,742.46**
7	$0.155	29,335	$4,535.19	
8	$0.160	29,335	$4,681.87	
9	$0.165	29,335	$4,828.54	
10	$0.170	29,335	$4,975.22	**Years 6-10**
11	$0.175	29,335	$5,121.89	**$23,409.33**
12	$0.180	29,335	$5,268.57	
13	$0.185	29,335	$5,415.24	
14	$0.190	29,335	$5,561.92	
15	$0.195	29,335	$5,708.59	**Years 11-15**
Total		**440,025**	**$70,227.99**	**$27,076.21**

- **Actual ROI = 2.25 Years**
- **Year 1 savings = $3,655.14**
- **Purchase Cost, including installation costs = $8,250.00**
- **Total Savings over 15 years = $70,227.99 – $8,250.00 = $61,977.99**

USES® Power Quality Benefits

The installation of the USES® System at Stirling Bridges California Pub 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 and each USES® Model XL-3Y-208 power conditioner reduces reactive power by 5 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, 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 specified for this application, the USES® System will 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 2 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 May 29, 2015, 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:

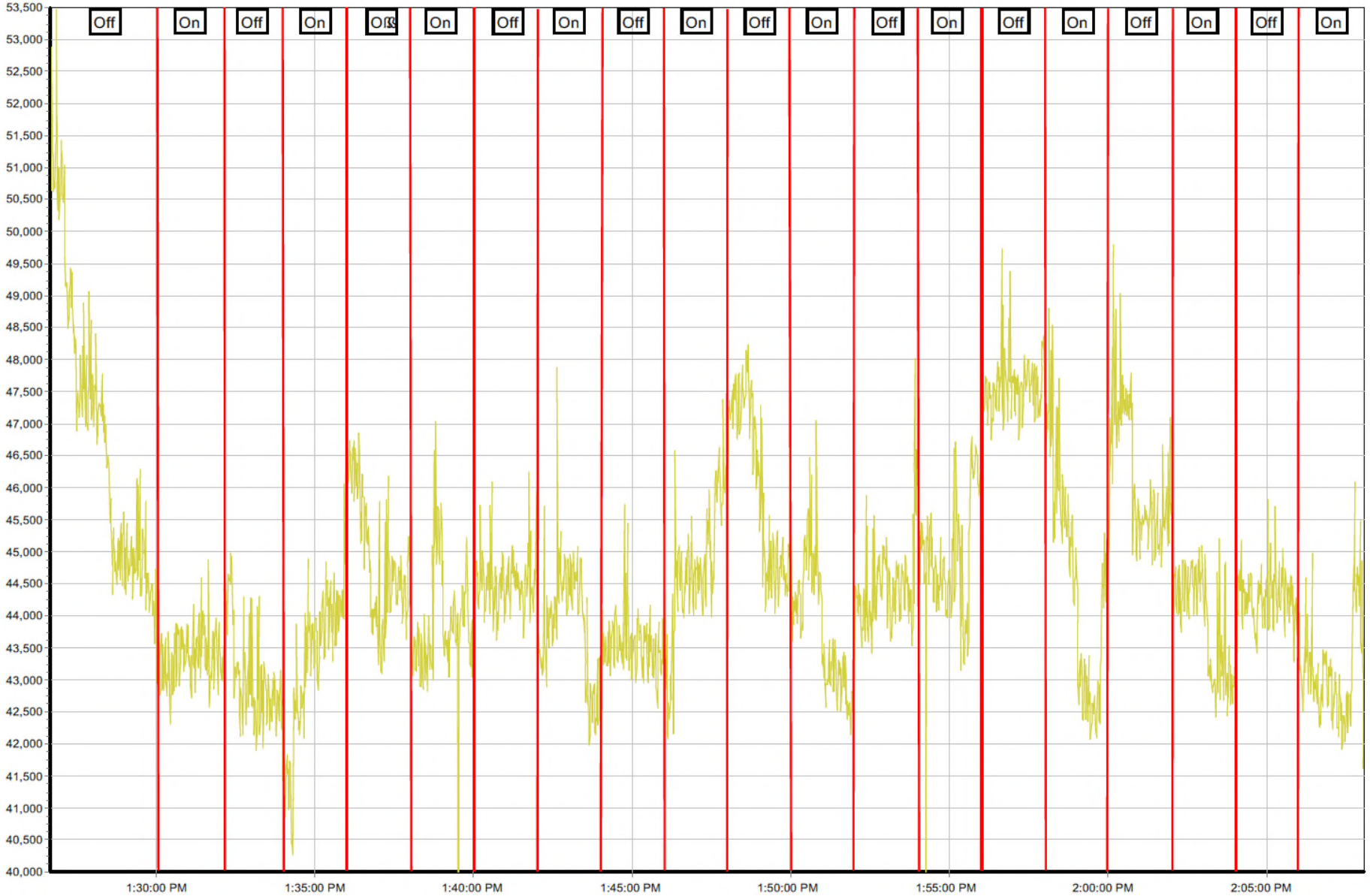
- Graph 1 – Real Power (Watts) – This graph shows real power in watts during the May 29, 2015 TIS testing.
- Graph 2 – Apparent Power (VA) – This graph shows apparent power during the May 29, 2015 TIS testing.
- Graph 3 – Reactive Power (var) – This graph shows reactive power during the May 29, 2015 TIS testing.
- Graph 4 – Power factor – This graph shows power factor as a decimal during the May 29, 2015 TIS testing.
- Graph 5 – Amperage (Amps) – This graph shows amperage in amps for 3 phases during the May 29, 2015 TIS testing.
- Graph 6 – Voltage (Volts) – This graph shows the voltage in volts for 3 phases during the May 29, 2015 TIS testing.

The following data tables are presented to show the average observed performance of the USES® System during the May 29, 2015 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 May 29, 2015 TIS testing.
- Table 2 – Apparent Power (VA) from the May 29, 2015 TIS testing.
- Table 3 – Reactive Power (var) from the May 29, 2015 TIS testing.
- Table 4 – Power Factor from the May 29, 2015 TIS testing.
- Table 5 – Amperage (Amps) 3 phases from the May 29, 2015 TIS testing.
- Table 6 – Voltage (Volts) 3 phases from the May 29, 2015 TIS testing.

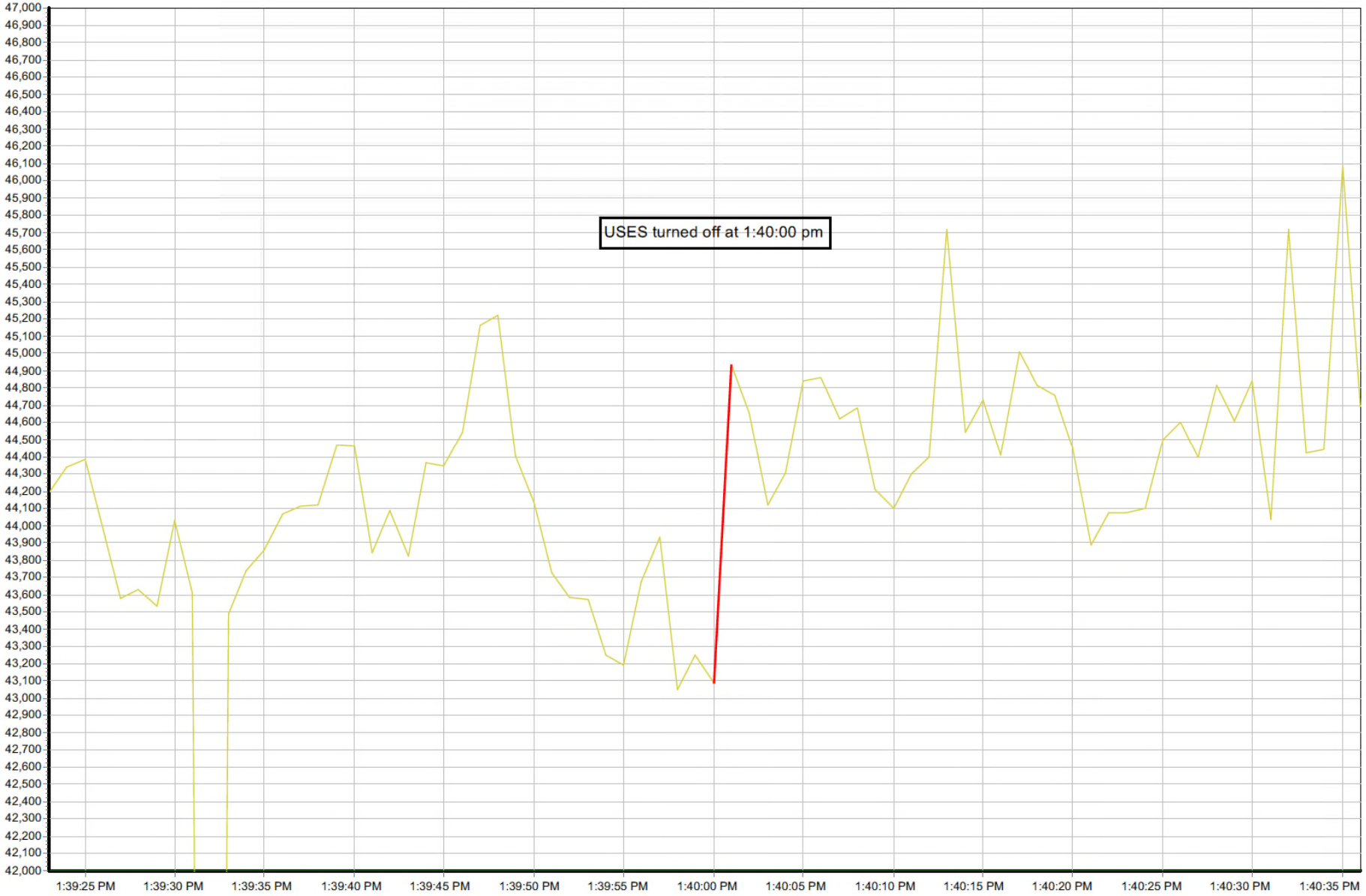
All Data Tables and Graphs, together with all raw data are included.

Graph 1



Graph 1 Above is the Real Power Demand in Watts during the TIS testing on May 29, 2015 between 1:26 pm and 2:08 pm with 1 USES® model XL-3D-208V and 1 USES® model XL-3Y-208V power conditioners operating. The real power demand is reduced by an average of **1,747.70 Watts.**

Graph 1.1



Graph 1.1 Above is the Real Power Demand instant change in watts during the TIS testing on May 29, 2015 at 1:40:00 pm with 1 USES® model XL-3D-208V and 1 USES® model XL-3Y-208V power conditioners being turned off. The real power demand is increased instantly by **1,841.45 Watts.**

Table 1

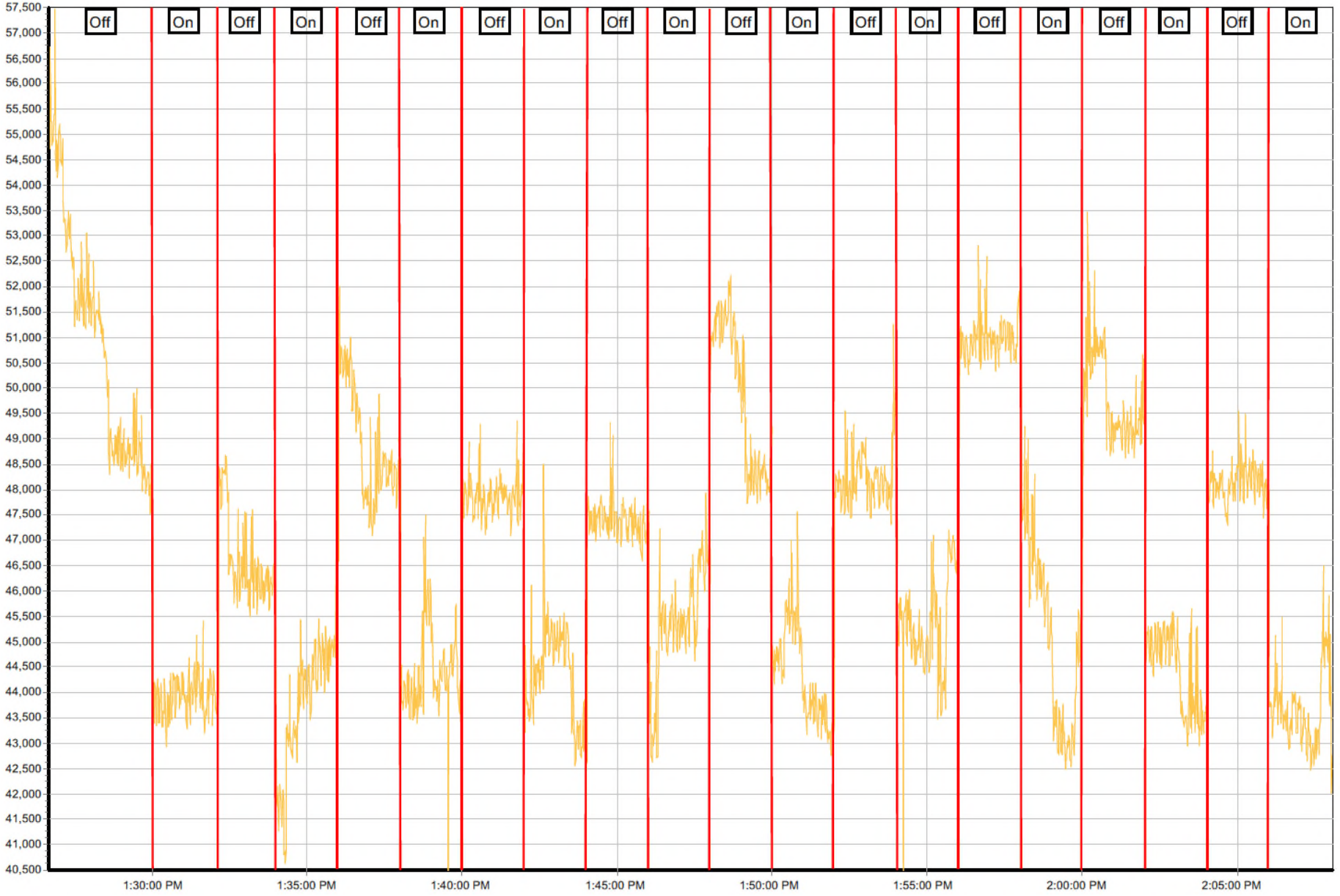
Real Power Demand (Watts)

Intervals						Full Interval		Instant	15 Sec	30 Sec	45 Sec	60 Sec
				System On	System Off	Difference	Difference	Change	Change	Change	Change	Change
Interval Time Frame		# USES	Status	Average	Average	Off to On	On to Off	At Transition	At Transition	At Transition	At Transition	At Transition
1:26:40 PM	1:30:01 PM		off		46925.22							
1:30:02 PM	1:32:08 PM		on	43369.91		3555.31		1707.04	1176.41	1895.22	915.30	1288.75
1:32:09 PM	1:33:59 PM		off		43087.66		-282.25	871.92	1395.63	-1411.48	-299.61	-1356.41
1:34:00 PM	1:36:00 PM		on	43281.71		-194.05		1276.00	1223.33	473.57	-1121.63	-559.20
1:36:01 PM	1:38:01 PM		off		44942.60		1660.89	968.66	518.28	344.22	-1199.17	-2296.89
1:38:02 PM	1:40:00 PM		on	43797.25		1145.35		1493.56	1039.25	1458.94	-211.45	141.69
1:40:01 PM	1:42:00 PM		off		44527.49		730.24	1841.45	1318.71	947.25	958.13	945.99
1:42:01 PM	1:44:01 PM		on	43851.20		676.29		1753.04	1219.79	947.83	-736.31	247.66
1:44:02 PM	1:46:01 PM		off		43546.64		-304.56	1630.37	1901.32	1308.52	2125.08	1348.27
1:46:02 PM	1:48:00 PM		on	44723.39		-1176.75		884.21	1585.07	-878.14	-1526.92	-1004.45
1:48:01 PM	1:50:00 PM		off		46055.34		1331.94	972.84	2207.37	1801.68	2099.51	-253.00
1:50:01 PM	1:52:00 PM		on	43774.45		2280.88		1152.50	950.48	258.50	409.33	2120.24
1:52:01 PM	1:54:01 PM		off		44488.95		714.50	1267.33	962.48	1031.93	2102.75	2409.37
1:54:03 PM	1:56:01 PM		on	44879.18		-390.23		1687.45	1499.46	1918.59	1819.60	2617.68
1:56:02 PM	1:58:01 PM		off		47585.65		2706.47	641.10	800.93	1072.88	1230.32	1238.43
1:58:03 PM	2:00:00 PM		on	44559.62		3026.03		672.08	1743.72	2389.66	2908.06	3619.85
2:00:01 PM	2:02:01 PM		off		46190.51		1630.90	707.02	1841.80	2372.16	2534.47	703.33
2:02:02 PM	2:04:01 PM		on	43882.61		2307.90		1727.19	1747.77	1188.49	992.27	1801.27
2:04:02 PM	2:06:01 PM		off		44277.13		394.52	431.61	1084.67	962.31	1225.40	1392.77
2:06:02 PM	2:08:04 PM		on	43112.45		1164.68		865.77	4.84	1176.89	564.64	850.32

Average - System Off				45162.72								
Average - System On				43923.18								
Difference				1239.54								
Transition Avg - Off to On						982.24		1542.40	1404.35	1671.30	2363.83	2289.56
Transition Avg - On to Off							953.63	1579.72	1624.92	1517.43	1886.26	1597.21
Average - All Transitions				1747.70	3.87%							

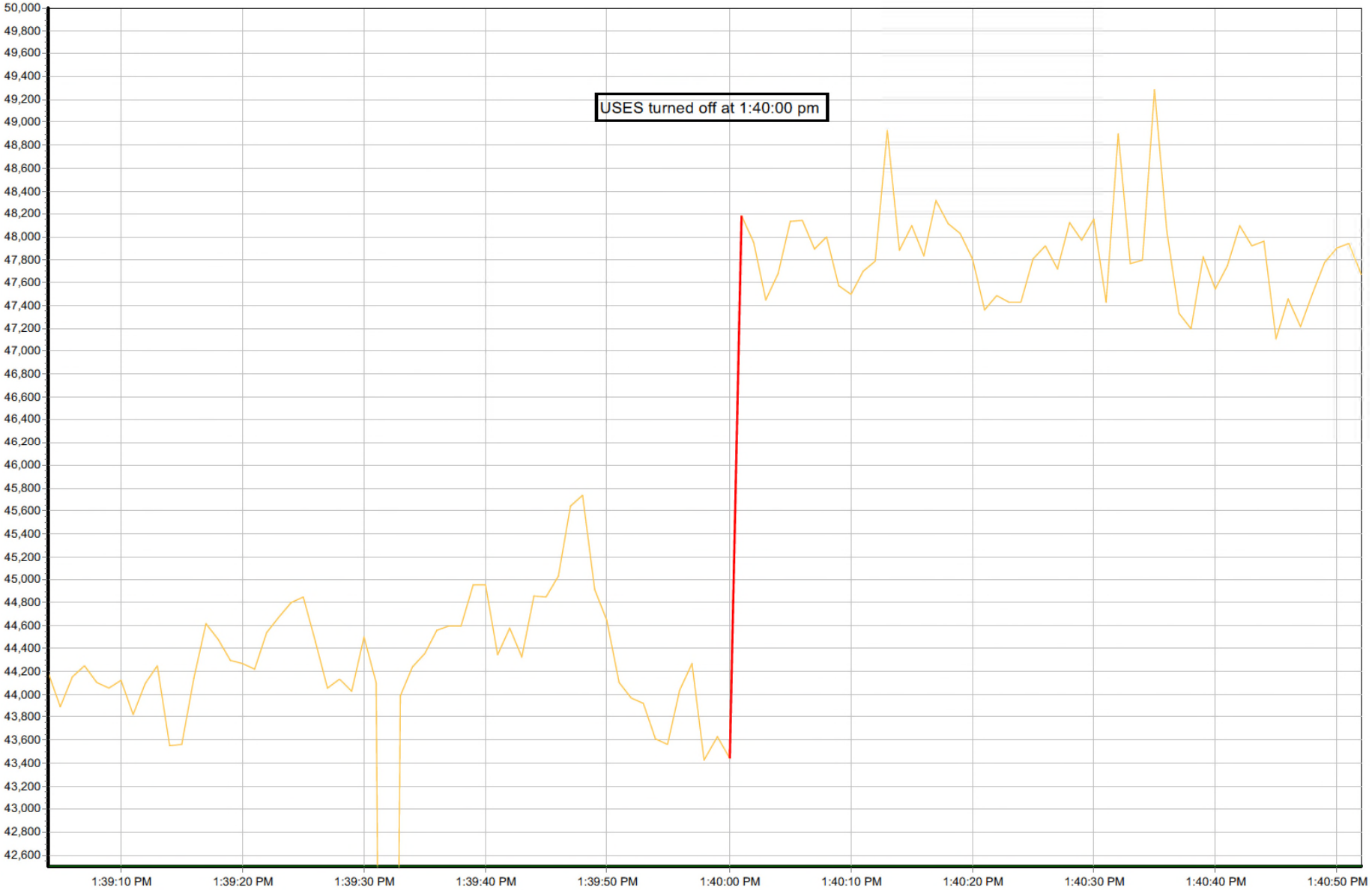
Table 1 Above is the analysis of the wattage data of 1 USES® model XL-3D-208V and 1 USES® model XL-3Y-208V units collected by the Amprobe DM-II Pro Multi-Meter and Data-Logger during the TIS testing on May 29, 2015. Each interval is 2 minutes in duration. The real power demand is reduced by an average of **1.747 kW.** 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. Because of load changes, full interval comparisons are not used to quantify reductions in real power demand.

Graph 2



Graph 2 Above is the Apparent Power in VA during the TIS testing on May 29, 2015 between 1:26 pm and 2:08 pm with 1 USES® model XL-3D-208V and 1 USES® model XL-3Y-208V power conditioners operating. The apparent power is reduced by an average of **4,311.86 VA.**

Graph 2.1



Graph 2.1 Above is the Apparent Power instant change in VA during the TIS testing on May 29, 2015 at 1:40:00 pm with 1 USES® model XL-3D-208V and 1 USES® model XL-3Y-208V power conditioners being turned off. The apparent power is increased instantly by **4,737.50 VA.**

Table 2

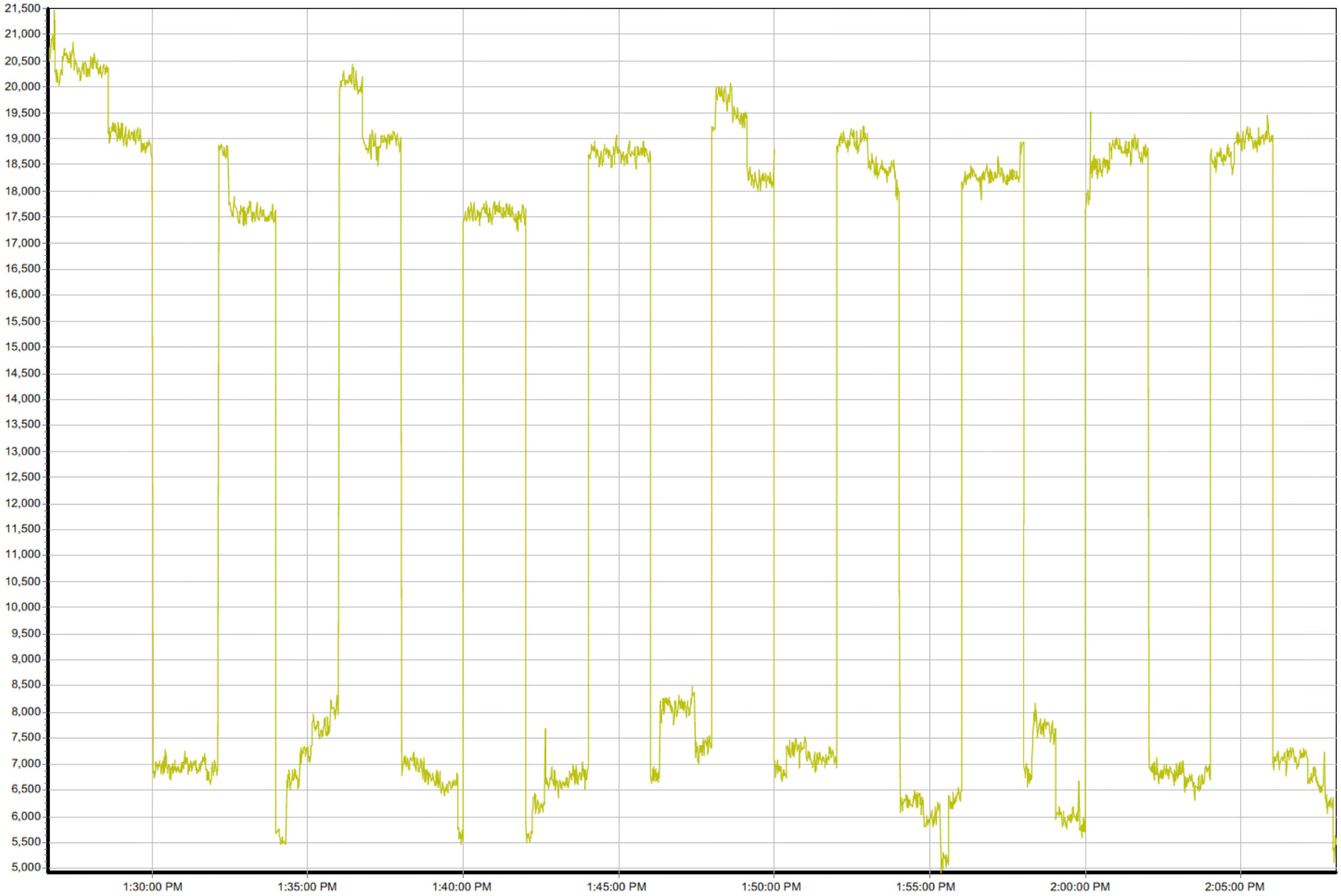
Apparent Power (VA)

Intervals						Full Interval		Instant	15 Sec	30 Sec	45 Sec	60 Sec
				System On	System Off	Difference	Difference	Change	Change	Change	Change	Change
Interval Time Frame		# USES	Status	Average	Average	Off to On	On to Off	At Transition	At Transition	At Transition	At Transition	At Transition
1:26:40 PM	1:30:01 PM	0	off		50949.39							
1:30:02 PM	1:32:08 PM	0	on	43922.23		7027.16		4866.99	4354.88	5055.01	4105.57	4452.22
1:32:09 PM	1:33:59 PM	0	off		46612.60		2690.37	4174.00	4575.59	1692.60	2608.64	1707.62
1:34:00 PM	1:36:00 PM	0	on	43864.41		2748.19		4385.61	4354.05	3432.17	1815.69	2332.99
1:36:01 PM	1:38:01 PM	0	off		48940.39		5075.98	4290.14	3986.49	3752.68	2447.53	915.87
1:38:02 PM	1:40:00 PM	0	on	44309.42		4630.97		4694.50	4265.23	4651.22	3036.43	3387.80
1:40:01 PM	1:42:00 PM	0	off		47871.12		3561.70	4737.50	4396.42	3989.89	4019.34	4052.67
1:42:01 PM	1:44:01 PM	0	on	44333.12		3538.00		4720.22	4121.58	3868.58	2158.35	3111.93
1:44:02 PM	1:46:01 PM	0	off		47399.52		3066.40	4886.10	5119.04	4655.98	5258.88	4667.93
1:46:02 PM	1:48:00 PM	0	on	45383.63		2015.89		4176.51	4857.98	2199.08	1633.91	2076.64
1:48:01 PM	1:50:00 PM	0	off		49821.58		4437.95	4200.78	5565.16	5208.86	5330.25	3176.69
1:50:01 PM	1:52:00 PM	0	on	44351.73		5469.85		4318.74	4182.07	3425.03	3550.26	5222.07
1:52:01 PM	1:54:01 PM	0	off		48252.61		3900.88	4573.75	4339.43	4439.97	5370.43	5656.15
1:54:03 PM	1:56:01 PM	0	on	45288.86		2963.75		4623.95	4397.20	4803.38	4753.29	5550.24
1:56:02 PM	1:58:01 PM	0	off		50989.81		5700.95	3568.04	3772.07	4002.59	4174.91	4132.84
1:58:03 PM	2:00:00 PM	0	on	45073.47		5916.34		3796.60	4788.21	5346.98	5867.60	6592.17
2:00:01 PM	2:02:01 PM	0	off		49812.93		4739.47	3634.49	5047.68	5474.06	5624.97	4152.68
2:02:02 PM	2:04:01 PM	0	on	44404.83		5408.10		4894.60	4957.54	4375.23	4202.41	4988.26
2:04:02 PM	2:06:01 PM	0	off		48128.86		3724.03	3745.32	4366.04	4245.59	4405.56	4659.81
2:06:02 PM	2:08:04 PM	0	on	43649.07		4479.79		4248.35	3394.61	4518.04	3964.26	4214.10

Average - System Off				48877.88								
Average - System On				44458.08								
Difference				4419.81								
Transition Avg - Off to On						4419.81		4472.61	4367.34	4167.47	3954.77	4192.84
Transition Avg - On to Off							4099.75	4201.12	4574.21	4471.20	4360.06	4356.97
Average - All Transitions				4311.86	8.82%							

Table 2 Above is the analysis of the Apparent Power data of 1 USES® model XL-3D-208V and 1 USES® model XL-3Y-208V units collected by the Amprobe DM-II Pro Multi-Meter and Data-Logger during the TIS testing on May 29, 2015. Each interval is 2 minutes in duration. The apparent power is reduced by an average of **4.311 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. Because of load changes, full interval comparisons are not used to quantify reductions in apparent power demand.

Graph 3



Graph 3 Above is the Reactive Power in var during the TIS testing on May 29, 2015 between 1:26 pm and 2:08 pm with 1 USES® model XL-3D-208V and 1 USES® model XL-3Y-208V power conditioners operating. The reactive power is reduced by an average of **11,771 var.**

Table 3

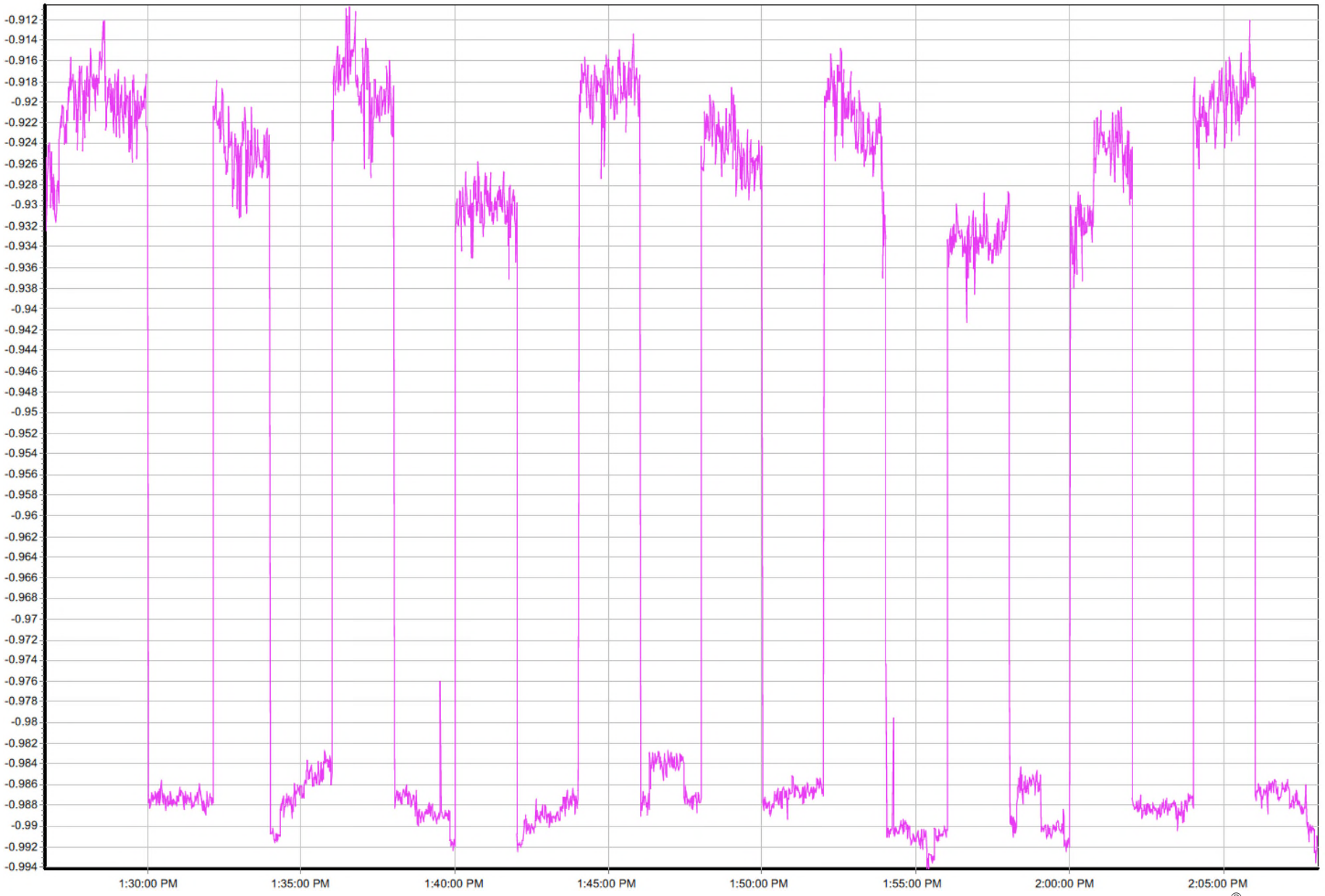
Reactive Power (VAR)

Intervals						Full Interval		Instant	15 Sec	30 Sec	45 Sec	60 Sec
				System On	System Off	Difference	Difference	Change	Change	Change	Change	Change
Interval Time Frame		# USES	Status	Average	Average	Off to On	On to Off	At Transition	At Transition	At Transition	At Transition	At Transition
1:26:40 PM	1:30:01 PM	0	off		19839.13							
1:30:02 PM	1:32:08 PM	0	on	6941.69		12897.44		11616.82	11690.54	11631.07	11745.52	11604.99
1:32:09 PM	1:33:59 PM	0	off		17778.74		10837.05	11989.37	11779.59	11018.05	10730.30	10926.53
1:34:00 PM	1:36:00 PM	0	on	7096.43		10682.31		11956.16	12110.37	10869.44	10607.96	10374.82
1:36:01 PM	1:38:01 PM	0	off		19369.77		12273.34	11758.51	12038.58	11852.03	12116.26	10812.39
1:38:02 PM	1:40:00 PM	0	on	6701.77		12668.00		11746.70	11869.73	11689.83	11917.23	11932.25
1:40:01 PM	1:42:00 PM	0	off		17575.20		10873.43	11869.81	12266.40	12100.45	12152.46	12271.85
1:42:01 PM	1:44:01 PM	0	on	6505.91		11069.29		11790.52	11286.98	11399.56	11095.76	10960.08
1:44:02 PM	1:46:01 PM	0	off		18717.36		12211.46	11717.78	11676.11	11882.89	11505.16	11821.33
1:46:02 PM	1:48:00 PM	0	on	7695.56		11021.80		11918.83	11851.64	10492.00	10913.04	10502.01
1:48:01 PM	1:50:00 PM	0	off		18999.94		11304.38	11887.27	12472.19	12519.33	12116.93	12158.71
1:50:01 PM	1:52:00 PM	0	on	7128.88		11871.07		11715.55	12127.91	11646.92	11496.69	11399.01
1:52:01 PM	1:54:01 PM	0	off		18676.28		11547.40	11925.64	12041.12	12133.62	11996.48	12004.30
1:54:03 PM	1:56:01 PM	0	on	6063.03		12613.25		11917.47	11620.58	11558.16	11905.30	11950.93
1:56:02 PM	1:58:01 PM	0	off		18316.79		12253.76	11696.72	11849.31	11784.46	11855.19	11715.97
1:58:03 PM	2:00:00 PM	0	on	6751.41		11565.38		11996.93	11556.23	11083.13	11140.99	11276.94
2:00:01 PM	2:02:01 PM	0	off		18639.41		11888.00	11916.50	12892.94	12710.25	12709.32	13314.08
2:02:02 PM	2:04:01 PM	0	on	6787.87		11851.53		11766.21	12039.65	11846.81	11984.16	11896.43
2:04:02 PM	2:06:01 PM	0	off		18863.83		12075.95	11997.05	12047.39	12027.51	11813.86	12072.73
2:06:02 PM	2:08:04 PM	0	on	6803.36		12060.46		12037.81	12013.83	11810.59	12120.66	11920.48

Average - System Off				18677.65								
Average - System On				6847.59								
Difference				11830.05								
Transition Avg - Off to On						11830.05		11846.30	11816.75	11402.75	11492.73	11381.79
Transition Avg - On to Off							11696.09	11862.07	12118.18	12003.18	11888.44	11899.77
Average - All Transitions				11771.20	63.02%							

Table 3 Above is the analysis of the Reactive Power data of 1 USES® model XL-3D-208V and 1 USES® model XL-3Y-208V units collected by the Amprobe DM-II Pro Multi-Meter and Data-Logger during the TIS testing on May 29, 2015. Each interval is 2 minutes in duration. The reactive power is reduced by an average of **11.771 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. Because of load changes, full interval comparisons are not used to quantify reductions in reactive power demand.

Graph 4



Graph 4 Above is the Power Factor in decimals during the TIS testing on May 29, 2015 between 1:26 pm and 2:08 pm with 1 USES® model XL-3D-208V and 1 USES® model XL-3Y-208V power conditioners operating. The power factor is increased from **92 % to 99 %.**

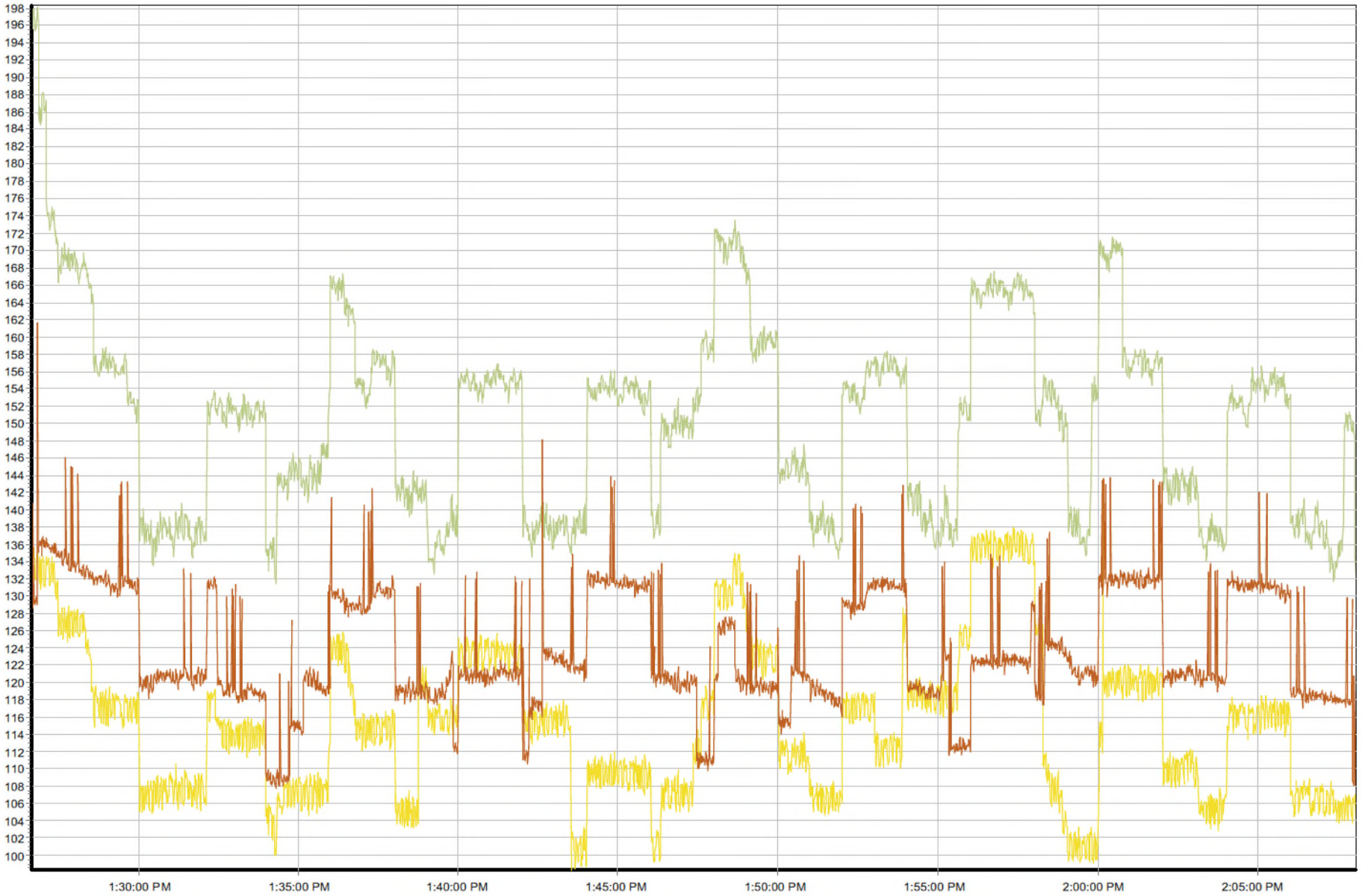
Table 4

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
1:26:40 PM	1:30:01 PM	0	off		0.92							
1:30:02 PM	1:32:08 PM	0	on	0.99		0.07		0.07	0.07	0.07	0.07	0.07
1:32:09 PM	1:33:59 PM	0	off		0.92		0.07	0.07	0.07	0.07	0.06	0.07
1:34:00 PM	1:36:00 PM	0	on	0.99		0.06		0.07	0.07	0.07	0.07	0.07
1:36:01 PM	1:38:01 PM	0	off		0.92		0.07	0.06	0.06	0.06	0.07	0.06
1:38:02 PM	1:40:00 PM	0	on	0.99		0.07		0.07	0.07	0.07	0.07	0.07
1:40:01 PM	1:42:00 PM	0	off		0.93		0.06	0.06	0.06	0.06	0.06	0.06
1:42:01 PM	1:44:01 PM	0	on	0.99		0.06		0.06	0.06	0.06	0.06	0.06
1:44:02 PM	1:46:01 PM	0	off		0.92		0.07	0.07	0.07	0.07	0.07	0.07
1:46:02 PM	1:48:00 PM	0	on	0.98		0.06		0.07	0.07	0.06	0.07	0.06
1:48:01 PM	1:50:00 PM	0	off		0.92		0.06	0.07	0.07	0.07	0.06	0.07
1:50:01 PM	1:52:00 PM	0	on	0.99		0.07		0.07	0.07	0.07	0.07	0.07
1:52:01 PM	1:54:01 PM	0	off		0.92		0.07	0.07	0.07	0.07	0.07	0.07
1:54:03 PM	1:56:01 PM	0	on	0.99		0.07		0.06	0.06	0.06	0.06	0.06
1:56:02 PM	1:58:01 PM	0	off		0.93		0.06	0.06	0.06	0.06	0.06	0.06
1:58:03 PM	2:00:00 PM	0	on	0.99		0.06		0.06	0.06	0.06	0.06	0.06
2:00:01 PM	2:02:01 PM	0	off		0.93		0.06	0.06	0.06	0.06	0.06	0.07
2:02:02 PM	2:04:01 PM	0	on	0.99		0.06		0.07	0.07	0.07	0.07	0.07
2:04:02 PM	2:06:01 PM	0	off		0.92		0.07	0.07	0.07	0.07	0.07	0.07
2:06:02 PM	2:08:04 PM	0	on	0.99		0.07		0.07	0.07	0.07	0.07	0.07
Average - System Off				0.92								
Average - System On				0.99								
Difference				0.07								
Transition Avg - Off to On						0.07		0.07	0.07	0.07	0.07	0.07
Transition Avg - On to Off							0.07	0.07	0.07	0.07	0.06	0.07
Average - All Transitions				0.07	7.15%							

Table 4 Above is the analysis of the Power Factor data of 1 USES® model XL-3D-208V and 1 USES® model XL-3Y-208V units collected by the Amprobe DM-II Pro Multi-Meter and Data-Logger during the TIS testing on May 29, 2015. Each interval is 2 minutes in duration. The power factor is increased from **92 % to 99 %.** 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. Because of load changes, full interval comparisons are not used to quantify increase in power factor.

Graph 5



Graph 5 Above is the Current in Amps per phase during the TIS testing on May 29, 2015 between 1:26 pm and 2:08 pm with 1 USES® model XL-3D-208V and 1 USES® model XL-3Y-208V power conditioners operating. The current is reduced by an average of **11.5 Amps per phase.**

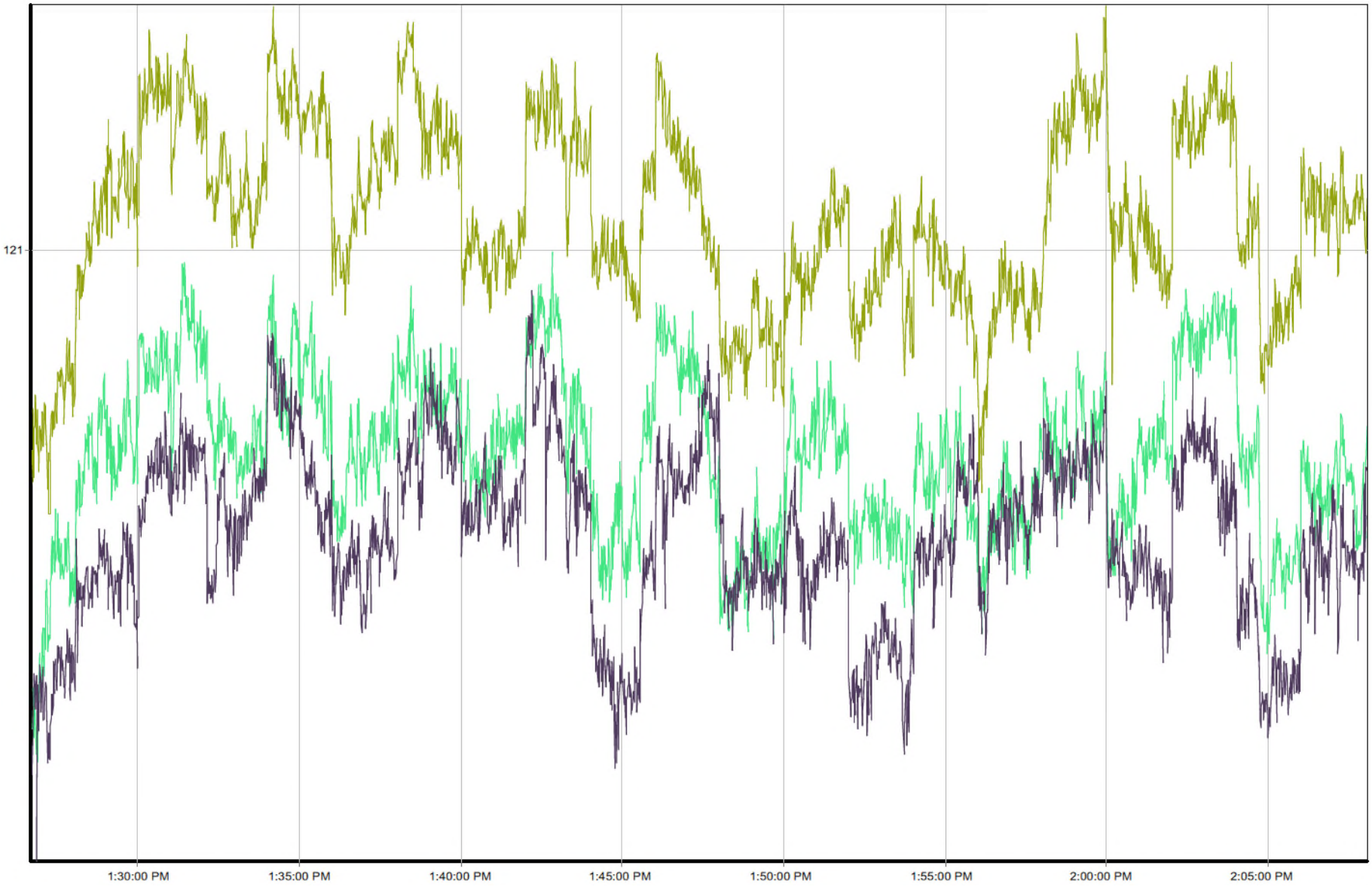
Table 5

RMS Current (Amps)

Intervals						Full Interval		Instant Change At Transition	15 Sec Change At Transition	30 Sec Change At Transition	45 Sec Change At Transition	60 Sec Change At Transition
Interval Time Frame		# USES	Status	System On Average	System Off Average	Difference Off to On	Difference On to Off					
1:26:40 PM	1:30:01 PM	0	off		141.35							
1:30:02 PM	1:32:08 PM	0	on	121.84		19.51		13.41	12.03	13.89	11.38	12.17
1:32:09 PM	1:33:59 PM	0	off		129.31		7.46	11.57	12.70	4.74	7.31	4.83
1:34:00 PM	1:36:00 PM	0	on	121.63		7.67		11.77	11.87	9.44	5.15	6.50
1:36:01 PM	1:38:01 PM	0	off		135.68		14.05	12.04	11.21	10.52	6.98	2.87
1:38:02 PM	1:40:00 PM	0	on	123.54		12.13		12.95	11.73	12.84	8.08	9.09
1:40:01 PM	1:42:00 PM	0	off		133.24		9.69	12.79	11.82	10.78	10.93	11.02
1:42:01 PM	1:44:01 PM	0	on	123.52		9.72		12.72	11.10	10.57	5.94	8.56
1:44:02 PM	1:46:01 PM	0	off		131.75		8.23	13.22	14.00	12.75	14.32	12.71
1:46:02 PM	1:48:00 PM	0	on	125.90		5.85		11.39	13.08	6.24	4.69	5.92
1:48:01 PM	1:50:00 PM	0	off		138.22		12.32	11.73	15.49	14.43	14.85	8.87
1:50:01 PM	1:52:00 PM	0	on	123.12		15.10		12.05	11.75	9.63	9.92	14.46
1:52:01 PM	1:54:01 PM	0	off		134.01		10.89	12.62	11.96	12.23	14.79	15.58
1:54:03 PM	1:56:01 PM	0	on	126.37		7.64		12.76	12.21	13.31	13.19	15.33
1:56:02 PM	1:58:01 PM	0	off		141.47		15.10	9.84	10.40	10.86	11.28	11.23
1:58:03 PM	2:00:00 PM	0	on	125.18		16.29		10.57	13.27	14.78	16.13	18.04
2:00:01 PM	2:02:01 PM	0	off		138.08		12.90	9.97	13.85	14.94	15.44	11.27
2:02:02 PM	2:04:01 PM	0	on	123.11		14.98		13.59	13.79	12.24	11.73	13.91
2:04:02 PM	2:06:01 PM	0	off		133.65		10.54	10.38	12.10	11.74	12.34	13.14
2:06:02 PM	2:08:04 PM	0	on	121.29		12.35		11.75	9.25	12.46	10.99	11.69
Average - System Off				135.68								
Average - System On				123.55								
Difference				12.13								
Transition Avg - Off to On						12.13		12.30	12.01	11.54	9.72	11.57
Transition Avg - On to Off							11.24	11.57	12.62	11.44	12.03	10.17
Average - All Transitions				11.50	8.47%							

Table 5 Above is the analysis of the Current data of 1 USES® model XL-3D-208V and 1 USES® model XL-3Y-208V units collected by the Amprobe DM-II Pro Multi-Meter and Data-Logger during the TIS testing on May 29, 2015. Each interval is 2 minutes in duration. The current is reduced by an average of **11.5 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. Because of load changes, full interval comparisons are not used to quantify reductions in amps.

Graph 6



Graph 6 Above is the Voltage in Volts per phase during the TIS testing on May 29, 2015 between 1:26 pm and 2:08 pm with 1 USES® model XL-3D-208V and 1 USES® model XL-3Y-208V power conditioners operating. The voltage is increased by an average of **0.15 Volts per phase.**

Table 6

RMS Voltage (Volts)

Intervals						Full Interval		Instant Change At Transition	15 Sec Change At Transition	30 Sec Change At Transition	45 Sec Change At Transition	60 Sec Change At Transition
Interval Time Frame		# USES	Status	System On Average	System Off Average	Difference Off to On	Difference On to Off					
1:26:40 PM	1:30:01 PM	0	off		120.68							
1:30:02 PM	1:32:08 PM	0	on	120.92		0.24		0.15	0.11	0.17	0.15	0.02
1:32:09 PM	1:33:59 PM	0	off		120.81		0.11	0.14	0.18	0.04	0.14	0.13
1:34:00 PM	1:36:00 PM	0	on	120.92		0.11		0.12	0.13	0.10	0.08	0.09
1:36:01 PM	1:38:01 PM	0	off		120.78		0.14	0.19	0.20	0.15	0.15	0.14
1:38:02 PM	1:40:00 PM	0	on	120.91		0.13		0.16	0.13	0.17	0.05	0.14
1:40:01 PM	1:42:00 PM	0	off		120.79		0.13	0.14	0.12	0.13	0.11	0.13
1:42:01 PM	1:44:01 PM	0	on	120.92		0.13		0.14	0.13	0.18	0.14	0.11
1:44:02 PM	1:46:01 PM	0	off		120.69		0.23	0.16	0.26	0.22	0.23	0.22
1:46:02 PM	1:48:00 PM	0	on	120.88		0.19		0.16	0.15	0.13	0.06	0.09
1:48:01 PM	1:50:00 PM	0	off		120.66		0.22	0.18	0.21	0.15	0.19	0.13
1:50:01 PM	1:52:00 PM	0	on	120.77		0.12		0.17	0.23	0.16	0.10	0.15
1:52:01 PM	1:54:01 PM	0	off		120.65		0.12	0.11	0.13	0.10	0.11	0.10
1:54:03 PM	1:56:01 PM	0	on	120.76		0.10		0.18	0.19	0.19	0.17	0.21
1:56:02 PM	1:58:01 PM	0	off		120.71		0.05	0.12	0.09	-0.03	-0.08	-0.08
1:58:03 PM	2:00:00 PM	0	on	120.88		0.17		0.10	0.07	0.08	0.11	0.12
2:00:01 PM	2:02:01 PM	0	off		120.75		0.13	0.14	0.23	0.18	0.24	0.15
2:02:02 PM	2:04:01 PM	0	on	120.92		0.18		0.19	0.16	0.22	0.19	0.23
2:04:02 PM	2:06:01 PM	0	off		120.66		0.27	0.11	0.17	0.13	0.32	0.34
2:06:02 PM	2:08:04 PM	0	on	120.77		0.11		0.15	0.12	0.12	0.09	0.15

Average - System Off	120.72	x 1.73	209.08									
Average - System On	120.87	x 1.73	209.34									
Difference			0.26									
Transition Avg - Off to On						0.15		0.15	0.14	0.15	0.12	0.13
Transition Avg - On to Off							0.16	0.14	0.18	0.14	0.19	0.17
Average - All Transitions per Phase			0.15	0.07%								

Table 6 Above is the analysis of the Voltage data of 1 USES® model XL-3D-208V and 1 USES® model XL-3Y-208V units collected by the Amprobe DM-II Pro Multi-Meter and Data-Logger during the TIS testing on May 29, 2015. Each interval is 2 minutes in duration. The voltage is increased by an average of **0.15 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. Because of load changes, full interval comparisons are not used to quantify increase in voltage.