



Contract Holder  
Contract Number GS-07F-0422W

# Timed Interval Sampling Monitoring & Verification Report

*For*

DAILY REPUBLIC

*located at*

1250 Texas Street  
Fairfield, CA 94533

August 18, 2011

Prepared by:  
John D. Knapp  
President

A DIVISION OF JDK INDUSTRIES, INC.

**PowerShaver.com**



OFFICE (916) 988-POWER TOLL FREE (888) 9-POWER-5 7904 Excelsior Ave, Orangevale, CA 95662

## Table of Contents

Cover Page .....	1
Table of Contents .....	2
Title Page .....	3
Executive Summary .....	4
Summary of Power Quality Improvements .....	6
Savings and Return on Investment (ROI) Calculations .....	8
USES® Power Quality Benefits .....	9
Timed Interval Sampling (TIS) Techniques .....	11
Graphs and Data Tables .....	13
Installation Configuration .....	39
Test Configuration .....	40
Acceptance of Timed Interval Sampling .....	41

# Power Conditioning and Energy Savings

## TIS Report

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*For*

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*located at*

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*Prepared by:*

**Power Shaver, Energy Savings Systems**

**John D. Knapp, CEO/President  
(888) 9-POWER-5  
[john@powershaver.com](mailto:john@powershaver.com)**

## Executive Summary and Conclusions

During June of 2011, the Daily Republic purchased and installed a Power Shaver Energy Saving System, manufactured by USES<sup>®</sup> MFG INC. The purpose of the Power Shaver System is to reduce the overall demand and consumption of power and improve overall power quality. A total of four (4) USES<sup>®</sup> Model CMES-3D-240V and five (5) USES<sup>®</sup> Model CMES-3D-460V power conditioners were installed at the service entrance and on the Press of the Daily Republic printing facility. These circuits supply power to several operational processes within the facility.

In accordance with the proposal offered to the Daily Republic by Power Shaver, Energy Saving Systems of March 17, 2011, the Power Shaver Energy Saving 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 Power Shaver System performance, and the results of the TIS testing from July 21, 2011 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 Power Shaver Energy Saving System at the Daily Republic facility has significantly improved power quality and resulted in a substantial decrease in electrical demand according to the conservative Amprobe DM II. The Power Shaver Energy Saving System reduced the demand for electricity at average load by approximately **4.763 kW and 13.666 kVA** without the press and **9.998 kW and 49.999 kVA** with the press running.

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 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 the Daily Republic facility to be approximately **83,000 kWh per year**; Between the verified, extrapolated Real Power kWh of 63,618 and Apparent Power of 229,207 kVA per year **for a cost reduction of \$15,189.00 and ROI of approximately 2.89 years.**

The performance of the Power Shaver Energy Saving System at the Daily Republic facility has proven to be consistent with all of the estimated power quality improvements as outlined in Power Shaver's proposal to the Daily Republic in March of 2011. The Power Shaver Energy Saving System was estimated to reduce annual consumption by approximately **79,781 kWh per year and cost by \$14,600.**

The data tables and graphs presented in this report clearly show the beneficial results provided by the Power Shaver 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 Power Shaver Energy Saving System was activated and de-activated. All of the data tables presented in this report are from the TIS testing and evaluation conducted on July 21, 2011. Additional power quality improvements

also realized by the installation of the Power Shaver Energy Saving System are discussed later in this report.

The resultant power demand reductions during the TIS testing were used to calculate the net annual effect of the Power Shaver system in terms of actual savings and return on investment (ROI). Power Shaver expects that the Billing Assessments to follow will verify at least the expected results presented in our proposal dated March 17<sup>th</sup> 2011.

Power Shaver does want to acknowledge the time and effort of the Daily Republic staff for their patience and accommodations during our unusually lengthy installation and adjustment period. Due to the age and design of a couple of the newspapers control systems, it became necessary for Power Shaver to investigate and remedy some operational situations to ensure reliable operation as well as the expected power quality increases and energy reductions that were proposed to the Daily Republic.

Power Shavers' Energy Saving Systems are truly "green" systems that reduce electric energy consumption. Installing the Power Shaver Energy Saving System at the Daily Republic facility will beneficially impact the environment by reducing the consumption of our precious natural resources. According to the U.S. Energy Information Administration, the proposed reduction of electricity demand provided by the Power Shaver System, will reduce your companies consumption of **Crude Oil by 52.18 barrels, Coal by 15.01 tons, Natural Gas by 294,412.69 cubic feet, Gasoline by 2,435.64 gallons or Diesel Fuel and Heating Oil by 2,182.19 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 the Daily Republics' 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](mailto:john@powershaver.com).

# Summary of Power Quality Improvements

## 4 USES<sup>®</sup> CMES 240V Power Conditioners without press

Analysis of the average load TIS testing results from July 21, 2011 demonstrate that the USES<sup>®</sup> technology has provided substantial improvements in overall power quality. The following power quality improvements have been realized by the Daily Republic:

- Real Power Demand Average (kW) – **Real Power demand was reduced by an average 4.763.13 kW (5.2%)** at average load operational levels with 4 USES<sup>®</sup> CMES 240V Power Conditioners activated. Each USES<sup>®</sup> 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 March 17, 2011. During the On-Peak TIS testing of July 21, 2011, the average real power demand reduction was 4,763 watts. The results are used in the ROI and Savings calculations because they are representative of average load conditions.
- Real Power Demand Instant (kW) – **Real Power demand was reduced instantly by 5.194 kW (5.6%)** at average load operational levels with 4 USES<sup>®</sup> 240V Power Conditioners activated.
- Apparent Power Average – Apparent power was reduced from 106.645 KVA to 91.231 KVA when the Power Shaver System was activated. The average apparent power reduction was 15.406 KVA (14.5%).
- Apparent Power Instant – The instant Apparent power reduction was 14.644 kVA (16.8%) at average load operational levels with 4 USES<sup>®</sup> 240V Power Conditioners activated.
- Reactive Power – Under average load, the Reactive power was reduced from 53.265 KVAR to 19.987 KVAR when the Power Shaver System was activated. The average reactive power reduction was 33.278 KVAR (62%).
- Power Factor – Under average load, the Power Factor improved from 87% to 97% (11.6%) and remained lagging when the Power Shaver System was activated.
- Amperage – Under average load, the circuit Amperage was reduced by about 34.5 amps (13.5%) on each phase when the Power Shaver System was activated.
- Voltage – Voltage improved by an average of 1 volt (.38%) per phase (VAB, VBC, VCA) when the Power Shaver System was activated.

# Summary of Power Quality Improvements

## 4 USES<sup>®</sup> CMES 240V and 5 USES<sup>®</sup> CMES 460V Power Conditioners with press

Analysis of the average load TIS testing results from July 21, 2011 demonstrate that the USES<sup>®</sup> technology has provided substantial improvements in overall power quality. The following power quality improvements have been realized by the Daily Republic:

- Real Power Demand Average (kW) – **Real Power demand was reduced by an average 9.998 kW (4.1%)** at average load operational levels with 4 USES<sup>®</sup> CMES 240V and 5 USES<sup>®</sup> CMES 460V Power Conditioners activated. Each USES<sup>®</sup> 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 March 17, 2011. During the On-Peak TIS testing of July 21, 2011, the average real power demand reduction was 9,998.13 watts. The results are used in the ROI and Savings calculations because they are representative of average load conditions.
- Real Power Demand Instant (kW) – **Real Power demand was reduced instantly by 10.6 kW (4.4%)** at average load operational levels with 4 USES<sup>®</sup> CMES 240V and 5 USES<sup>®</sup> CMES 460V Power Conditioners activated.
- Apparent Power Average – Apparent power was reduced from 300.764 KVA to 259.999 KVA when the Power Shaver System was activated. The average apparent power reduction was 40.764 KVA (13.5%).
- Apparent Power Instant – The instant Apparent power reduction was 55 kVA (19.5%) at average load operational levels with 4 USES<sup>®</sup> CMES 240V and 5 USES<sup>®</sup> CMES 460V Power Conditioners activated.
- Reactive Power – Under average load, the Reactive power was reduced from 180.473 KVAR to 102.597 KVAR when the Power Shaver System was activated. The average reactive power reduction was 77.876 KVAR (43%).
- Power Factor – Under average load, the Power Factor improved from 80% to 92% (15%) and remained lagging when the Power Shaver System was activated.
- Amperage – Under average load, the circuit Amperage was reduced by about 71.28 amps (9.5%) on each phase when the Power Shaver System was activated.
- Voltage – Voltage improved by an average of 3.18 volts (1.33%) per phase (VAB, VBC, VCA) when the Power Shaver System was activated.

## Savings and ROI Calculations

Evaluation of the Power Shaver System installed at the Daily Republic Newspaper facility shows a range of demand reductions at average load when the Power Shaver System is activated. During the TIS testing period, when the facility was operational, the average extrapolated billed demand reduction was estimated to be 83,000 kWh. The total annual reduction of power consumed is 9.474 kWh x 8,760 hours per year = 83,000 kWh per year.

Assuming the 2010 average cost of power of \$0.183/kWh will increase in 2012 to \$0.193/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	\$0.183	83,000	\$15,189	
2	\$0.193	83,000	\$16,019	
3	\$0.203	83,000	\$16,849	
4	\$0.213	83,000	\$17,679	
5	\$0.223	83,000	\$18,509	<b>Years 1-5</b>
6	\$0.233	83,000	\$19,339	<b>\$84,245</b>
7	\$0.243	83,000	\$20,169	
8	\$0.253	83,000	\$20,999	
9	\$0.263	83,000	\$21,829	
10	\$0.273	83,000	\$22,659	<b>Years 6-10</b>
11	\$0.283	83,000	\$23,489	<b>\$104,995</b>
12	\$0.293	83,000	\$24,319	
13	\$0.303	83,000	\$25,149	
14	\$0.313	83,000	\$25,979	
15	\$0.323	83,000	\$26,809	<b>Years 11-15</b>
<b>Total</b>		<b>1,245,000</b>	<b>\$314,985</b>	<b>\$125,745</b>

- **Actual ROI = 2.89 Years**
- **Year 1 savings = \$15,189.00**
- **Purchase Cost, including installation costs = \$43,900.00**
- **Total Savings over 15 years = \$314,985.00 – \$43,900.00 = \$271,085**



## USES<sup>®</sup> Power Quality Benefits

The installation of the USES<sup>®</sup> System at the Daily Republic Newspaper 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<sup>®</sup> System is presented below:

**Real Power Demand** - The USES<sup>®</sup> 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<sup>®</sup> 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<sup>®</sup> System reduces both real power demand and apparent power demand, the power factor is improved and approaches unity, or 100%. Because the USES<sup>®</sup> 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<sup>®</sup> System reduces the reactive power on the circuit in a manner which does not create RLC resonance. Each USES<sup>®</sup> Model CMES-3D-240 power conditioner reduces reactive power by 6-9 KVAR and each USES<sup>®</sup> Model CMES-3D-460 power conditioner reduces reactive power by 20-25 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<sup>®</sup> System reduces the Harmful Harmonic Distortion (HHD) of the amperage and voltage on the circuit by passing all power generated within the USES<sup>®</sup> System through 60 Hz band-pass Filters. Because the USES<sup>®</sup> 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 HHD 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<sup>®</sup> 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<sup>®</sup> 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<sup>®</sup> 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<sup>®</sup> “Wye” units were specified for this application, the USES<sup>®</sup> 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<sup>®</sup> 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<sup>®</sup> 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<sup>®</sup> System has on the circuit when activated and deactivated. Power Shaver used an Amprobe DM-II Pro<sup>®</sup> 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<sup>®</sup> System performance was made through analysis of the data recorded from the TIS testing. The Amprobe DM-II Pro<sup>®</sup> 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<sup>®</sup> System was activated and deactivated for intervals of 5 and 10 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<sup>®</sup> 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<sup>®</sup> 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<sup>®</sup> 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<sup>®</sup> System on to the first one-second with the USES<sup>®</sup> 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<sup>®</sup> System.

This report shows all differences in electrical performance with the USES<sup>®</sup> 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<sup>®</sup> Power Multi-meter and Data Logger recordings collected on July 21, 2011, we have prepared a series of graphs and data tables to show the effect of the USES<sup>®</sup> System. The following graphs are presented below, showing all changes to power quality when the USES<sup>®</sup> System is activated or de-activated:

- Graph 1 – Real Power (watts) – This graph shows real power in watts during the July 21, 2011 TIS testing.
- Graph 2 – Apparent Power (VA) – This graph shows apparent power during the July 21, 2011 TIS testing.
- Graph 3 – Reactive Power (VAR) – This graph shows reactive power during the July 21, 2011 TIS testing.
- Graph 4 – Power factor – This graph shows power factor as a decimal during the July 21, 2011 TIS testing.
- Graph 5 – Amperage (Amps) – This graph shows amperage in amps for 3 phases during the July 21, 2011 TIS testing.
- Graph 6 – Voltage (Volts) – This graph shows the voltage in volts for 3 phases during the July 21, 2011 TIS testing.

The following data tables are presented to show the average observed performance of the USES<sup>®</sup> System during the July 21, 2011 TIS testing. Please note that during the testing, each USES<sup>®</sup> unit was tested individually to ensure performance and evaluate circuit improvements with 4 CMES 240V and 4 CMES 240V along with 5 CMES 460V units cumulatively.

- Table 1 – Real Power (Watts) from the July 21, 2011 TIS testing.
- Table 2 – Apparent Power (VA) from the July 21, 2011 TIS testing.
- Table 3 – Reactive Power (VAR) from the July 21, 2011 TIS testing.
- Table 4 – Power Factor from the July 21, 2011 TIS testing.
- Table 5 – Amperage (Amps) 3 phases from the July 21, 2011 TIS testing.
- Table 6 – Voltage (Volts) 3 phases from the July 21, 2011 TIS testing.

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

# Graph 1A

The Daily Republic - Real Power  
7/21/2011 2:30:59 PM - 7/21/2011 4:11:00 PM



**Graph 1A** Above shows the Real Power Demand in watts during the TIS testing on July 21, 2011 between 2:31 pm and 4:11 pm. With 4 USES<sup>®</sup> model CMES 240V power conditioners operating, the real power demand is reduced an average of **4,763.13 watts**.

Power Shaver, Energy Savings Systems

Daily Republic

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**Table 1A**

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
2:30:59 PM	2:41:01 PM		on	84463.90								
2:41:02 PM	2:51:01 PM		off		84791.93		328.03	2330.58	3818.43	-6187.28	-6871.87	-9045.99
2:51:03 PM	3:01:00 PM		on	84875.11		-83.18		2744.32	772.94	-383.22	1431.09	447.44
3:01:01 PM	3:11:00 PM		off		92699.74		7824.64	2697.44	5706.44	1934.66	1945.78	786.07
3:11:03 PM	3:20:59 PM		on	86400.10		6299.64		3449.07	2230.81	1727.66	1187.56	444.24
3:21:00 PM	3:30:59 PM		off		90493.94		4093.83	3354.55	2155.67	4247.96	10091.92	9211.77
3:31:01 PM	3:41:00 PM		on	79867.07		10626.87		5194.75	3542.64	-5218.84	-7451.94	-4243.97
3:41:01 PM	3:51:00 PM		off		96989.10		17122.03	438.31	9287.98	7637.33	-10226.27	-11316.20
3:51:02 PM	4:01:00 PM		on	101626.87		-4637.77		2474.28	54.29	-740.64	2807.74	8914.82
4:01:02 PM	4:10:59 PM		off		93218.64		-8408.22	2993.33	3264.68	8322.62	16666.41	9760.06
Average - System Off				91638.67								
Average - System On				87446.61								
Difference				4192.06								
Transition Avg - Off to On						8463.26		3465.61	2182.13	1727.66	1808.80	3268.83
Transition Avg - On to Off							7342.13	2362.84	4846.64	5535.64	9568.04	6585.97
Average - All Transitions				4763.13								

**Table 1A** Above shows analysis of the wattage data of 4 USES<sup>®</sup> model CMES 240V power conditioners collected by the Amprobe DM-II Pro Multi-Meter and Data-Logger during the TIS testing on July 21, 2011. Each interval is 10 minutes in duration. The real power demand is reduced an average of **4.763 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<sup>®</sup> system occurred during the averaging period. Because of a cyclical load change every 6-10 minutes, full interval comparisons are not used to quantify reductions in real power demand.



# Graph 1B

The Daily Republic - Real Power  
7/21/2011 5:39:59 PM - 7/21/2011 6:09:29 PM



**Graph 1B** Above shows the Real Power Demand in watts during the TIS testing on July 21, 2011 between 5:40 pm and 6:09 pm. With 4 USES<sup>®</sup> model CMES 240V and 5 USES<sup>®</sup> model CMES 460V power conditioners operating, the real power demand is reduced an average of **9,998.25 Watts**.



**Table 1B**

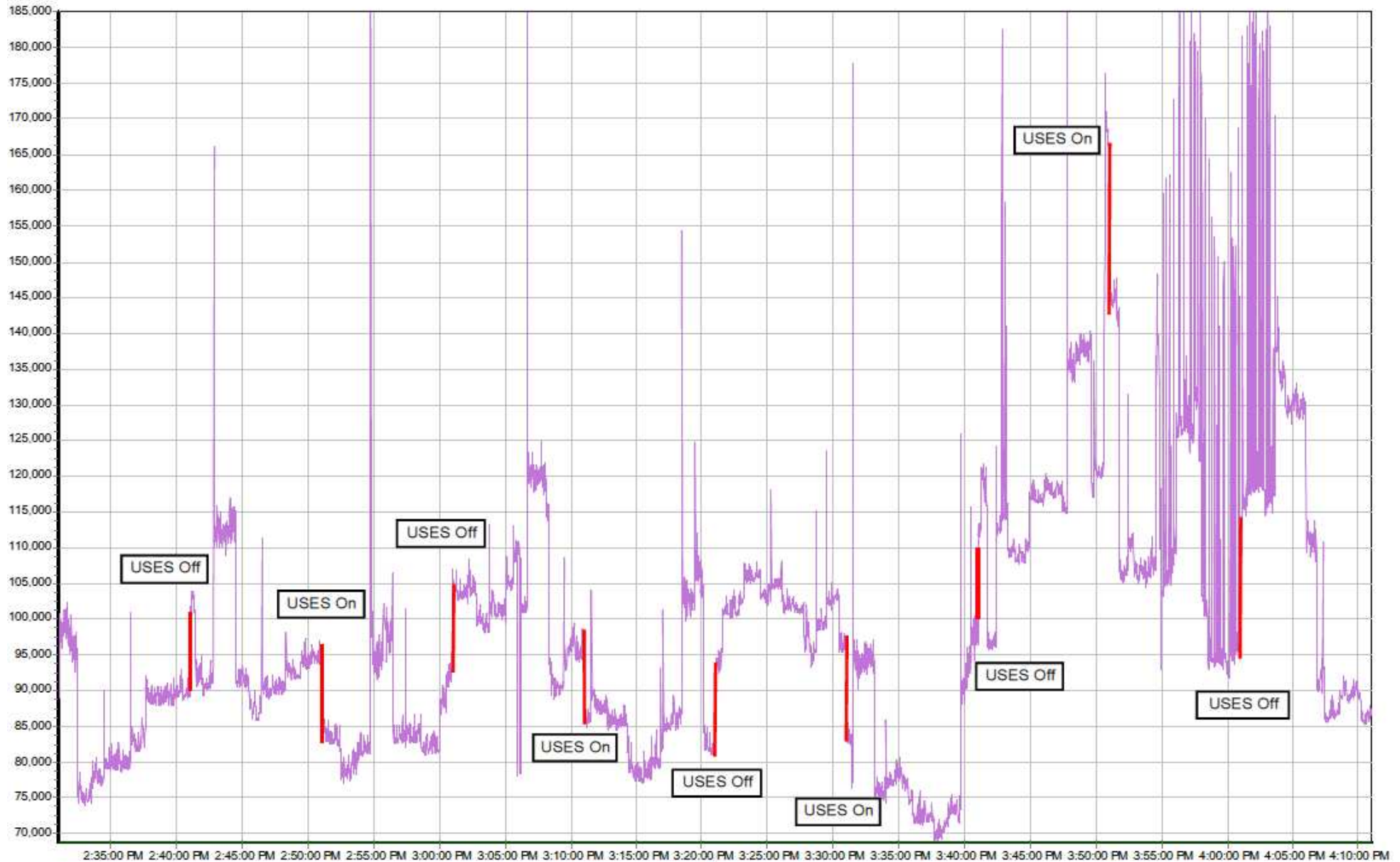
Real Power Demand (Watts)												
Intervals						Full Interval		Instant	15 Sec	30 Sec	45 Sec	60 Sec
				System On	System Off	Difference	Difference	Change	Change	Change	Change	Change
Interval Time Frame		# USES	Status	Average	Average	Off to On	On to Off	At Transition	At Transition	At Transition	At Transition	At Transition
5:39:59 PM	5:45:00 PM		on	254483.26								
5:45:04 PM	5:50:00 PM		off		254593.97		110.71	6030.06	7117.64	5153.51	12299.03	12232.12
5:50:04 PM	5:55:00 PM		on	243316.42		11277.56		5496.38	7449.66	7466.89	6935.63	10882.35
5:55:04 PM	6:00:01 PM		off		246011.14		2694.73	10659.07	20208.57	18095.12	18992.57	23759.92
6:00:05 PM	6:05:01 PM		on	221645.87		24365.28		6608.50	6595.09	5827.76	6651.15	8617.22
6:05:05 PM	6:09:00 PM		off		221149.02		-496.85	6377.53	3854.61	1502.86	652.98	-14739.24
6:09:04 PM	6:09:28 PM		on	230491.95		-9342.94		5410.64	7211.02	0.00	0.00	0.00
Average - System Off				240584.71								
Average - System On				237484.37								
Difference				3100.34								
Transition Avg - Off to On						17821.42		5838.51	7085.26	6647.33	6793.39	9749.78
Transition Avg - On to Off							2694.73	7688.89	10393.61	11624.32	15645.80	17996.02
Average - All Transitions				9998.25								

**Table 1B** Above shows analysis of the wattage data of 4 USES<sup>®</sup> model CMES 240V and 5 USES<sup>®</sup> model CMES 460V power conditioners collected by the Amprobe DM-II Pro Multi-Meter and Data-Logger during the TIS testing on July 21, 2011. Each interval is 5 minutes in duration. The real power demand is reduced an average of **9.998 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<sup>®</sup> system occurred during the averaging period. Because of a cyclical load change every 6-10 minutes, full interval comparisons are not used to quantify reductions in real power demand.

## Graph 2A

The Daily Republic - Apparent Power

7/21/2011 2:30:59 PM - 7/21/2011 4:11:00 PM



**Graph 2A** Above shows the Apparent Power in VA during the TIS testing on July 21, 2011 between 2:31 pm and 4:11 pm. With 4 USES<sup>®</sup> model CMES 240V power conditioners operating, the apparent power is reduced an average of **13.666 KVA**.

**Table 2A**

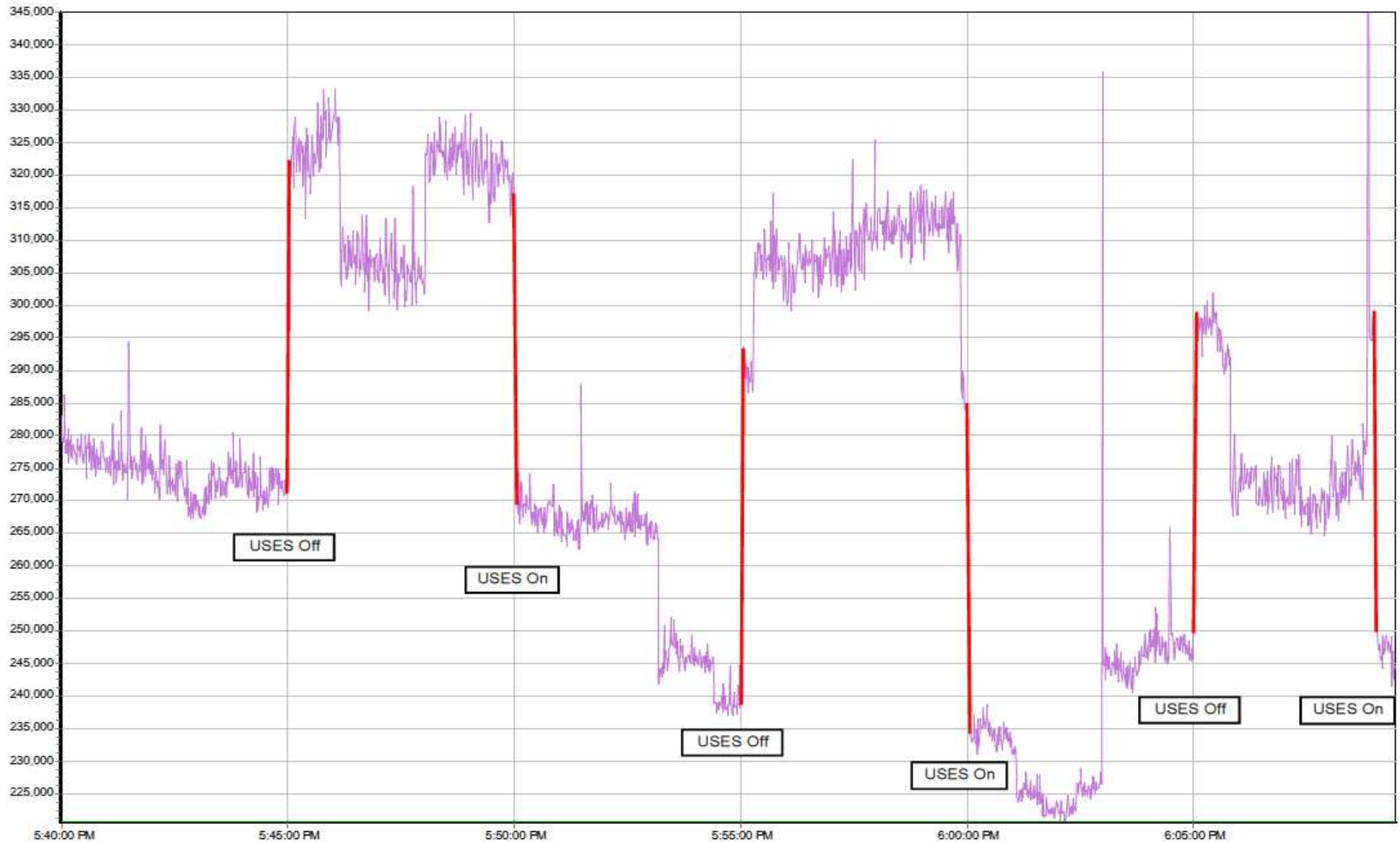
Apparent Power (VA)												
Intervals						Full Interval		Instant	15 Sec	30 Sec	45 Sec	60 Sec
Interval Time Frame		# USES	Status	System On Average	System Off Average	Difference Off to On	Difference On to Off	Change At Transition	Change At Transition	Change At Transition	Change At Transition	Change At Transition
2:30:59 PM	2:41:01 PM		on	85393.77								
2:41:02 PM	2:51:01 PM		off		95520.34		10126.57	12256.23	13323.16	2429.68	2109.62	15.40
2:51:03 PM	3:01:00 PM		on	85741.19		9779.16		12738.41	10795.17	9679.32	11436.94	10511.17
3:01:01 PM	3:11:00 PM		off		103413.65		17672.46	11940.44	14183.93	11142.53	11128.83	10190.23
3:11:03 PM	3:20:59 PM		on	87373.06		16040.58		12768.61	11610.14	11093.23	10329.45	9570.44
3:21:00 PM	3:30:59 PM		off		101487.10		14114.03	12892.87	12007.01	13956.31	20640.04	19750.87
3:31:01 PM	3:41:00 PM		on	80729.39		20757.71		14644.64	12982.75	2628.64	471.20	3688.98
3:41:01 PM	3:51:00 PM		off		120770.99		40041.60	12272.38	21926.34	19836.66	-2343.93	-3084.38
3:51:02 PM	4:01:00 PM		on	116955.48		3815.51		23731.23	22230.04	21203.40	24389.98	60217.10
4:01:02 PM	4:10:59 PM		off		112034.40		-4921.08	5263.83	6260.54	9851.66	65644.94	26673.01
Average - System Off				106645.29								
Average - System On				91238.58								
Difference				15406.72								
Transition Avg - Off to On						12598.24		15970.72	14404.53	11151.15	15385.46	7923.53
Transition Avg - On to Off							20488.67	10925.15	13540.20	11443.37	11292.83	18871.37
Average - All Transitions				13666.27								

**Table 2A** Above shows analysis of the Apparent Power data of 4 USES<sup>®</sup> model CMES 240V power conditioners collected by the Amprobe DM-II Pro Multi-Meter and Data-Logger during the TIS testing on July 21, 2011 between 2:31 pm and 4:11 pm. The test data shows an apparent power reduction of about **13.666 KVA**. Shaded cells are not included in the average performance calculations because load changes unrelated to the performance of the USES<sup>®</sup> system occurred during the averaging period.

## Graph 2B

The Daily Republic - Apparent Power

7/21/2011 5:39:59 PM - 7/21/2011 6:09:29 PM



**Graph 2B** Above shows the Apparent Power in VA during the TIS testing on July 21, 2011 between 5:40 pm and 6:09 pm. With 4 USES<sup>®</sup> model CMES 240V and 5 USES<sup>®</sup> model CMES 460V power conditioners operating, the apparent power is reduced an average of **49.997 KVA**.

**Table 2B**

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	At Transition
5:39:59 PM	5:45:00 PM	on	274309.64									
5:45:04 PM	5:50:00 PM	off		316556.85		42247.21	50009.78	51324.75	47674.87	56344.15	56140.87	
5:50:04 PM	5:55:00 PM	on	283205.08		33351.77		48536.12	49419.15	49277.25	48684.37	53207.31	
5:55:04 PM	6:00:01 PM	off		307859.34		24654.27	54977.50	67879.25	66176.41	66528.63	71258.41	
6:00:05 PM	6:05:01 PM	on	235742.11		72117.23		50709.04	49864.90	50146.25	50637.86	53126.20	
6:05:05 PM	6:09:00 PM	off		277875.92		42133.81	49513.01	46784.08	45929.14	42185.14	25367.23	
6:09:04 PM	6:09:28 PM	on	246740.56		31135.36		49314.11	50715.31	0.00	0.00	0.00	
Average - System Off				300764.04								
Average - System On				259999.35								
Difference				40764.69								
Transition Avg - Off to On						45534.79		49519.76	49999.79	49711.75	49661.12	53166.76
Transition Avg - On to Off							36345.09	51500.10	55329.36	53260.14	55019.31	50922.17
Average - All Transitions				49997.51								

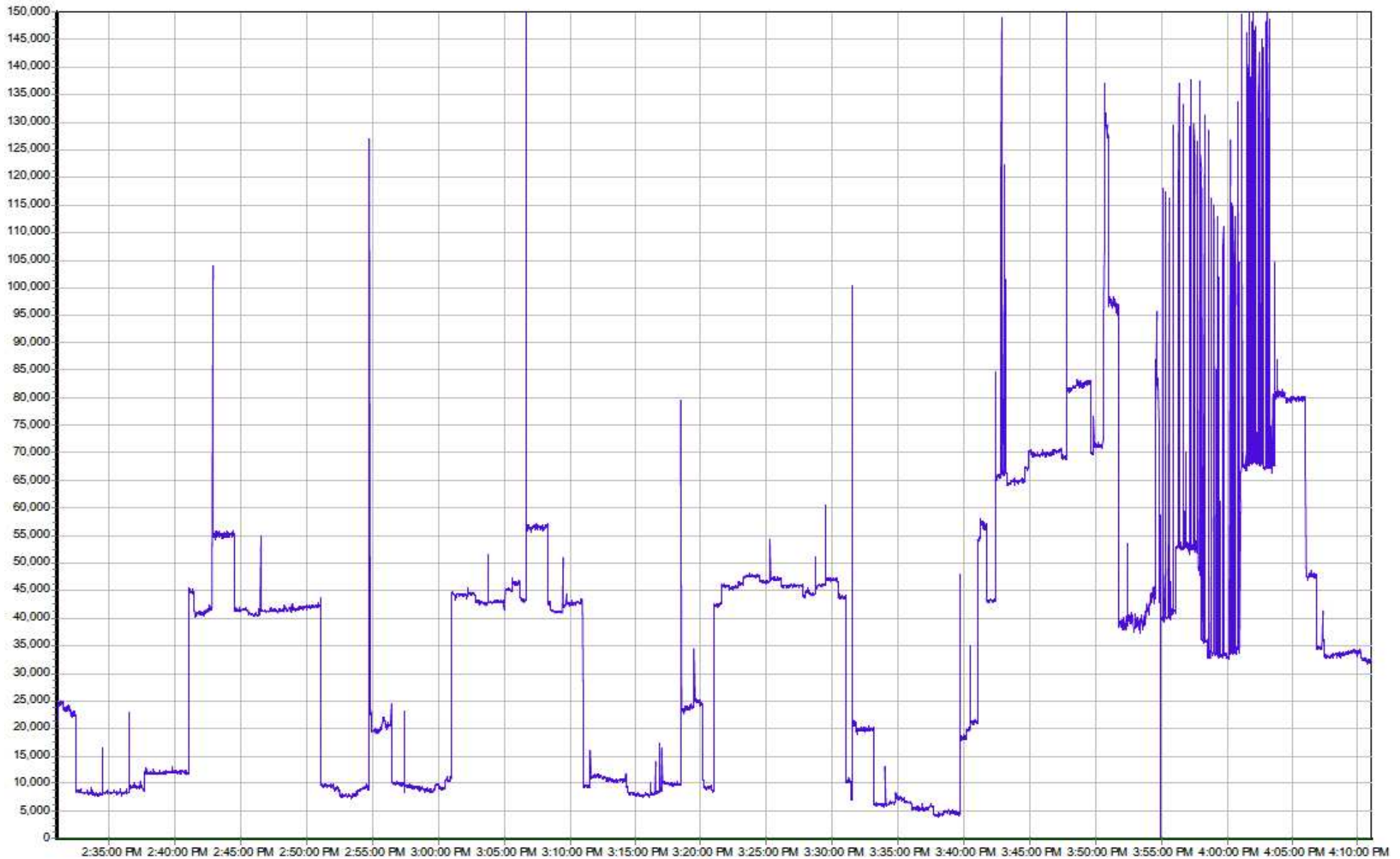
**Table 2B** Above shows analysis of the Apparent Power data of 4 USES<sup>®</sup> model CMES 240V and 5 USES<sup>®</sup> model CMES 460V power conditioners collected by the Amprobe DM-II Pro Multi-Meter and Data-Logger during the TIS testing on July 21, 2011 between 5:40 pm and 6:09 pm. The test data shows an apparent power reduction of about **49.997 KVA**. Shaded cells are not included in the average performance calculations because load changes unrelated to the performance of the USES<sup>®</sup> system occurred during the averaging period.



## Graph 3A

### The Daily Republic - Reactive Power

7/21/2011 2:30:59 PM - 7/21/2011 4:11:00 PM



**Graph 3A** Above shows the Reactive Power in KVAR during the TIS testing on July 21, 2011 between 2:31 pm and 4:11 pm. With 4 USES<sup>®</sup> model CMES 240V power conditioners operating, the reactive power is reduced an average of **31.616 KVAR**.

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**Table 3A**

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
2:30:59 PM	2:41:01 PM		on	11893.41								
2:41:02 PM	2:51:01 PM		off		43930.98		32037.57	33704.76	33096.12	28761.52	29420.90	29077.78
2:51:03 PM	3:01:00 PM		on	11260.20		32670.78		34043.96	34178.16	34483.10	34070.44	34538.93
3:01:01 PM	3:11:00 PM		off		45734.89		34474.69	33237.02	32046.10	32984.07	32928.27	33183.11
3:11:03 PM	3:20:59 PM		on	12142.72		33592.17		33170.51	33643.08	33488.19	31572.99	31403.59
3:21:00 PM	3:30:59 PM		off		45933.41		33790.70	33295.55	33696.51	33885.57	37139.34	36908.01
3:31:01 PM	3:41:00 PM		on	10250.58		35682.84		32881.29	32699.48	22679.12	22792.52	23182.72
3:41:01 PM	3:51:00 PM		off		71297.35		61046.78	33246.24	37191.45	35853.92	22140.26	22658.18
3:51:02 PM	4:01:00 PM		on	54391.03		16906.32		30449.92	30883.04	30231.83	31060.70	87522.62
4:01:02 PM	4:10:59 PM		off		59432.58		5041.54	4911.87	6242.73	5280.51	76856.07	30494.35
Average - System Off				53265.84								
Average - System On				19987.59								
Difference				33278.26								
Transition Avg - Off to On						29713.03		32636.42	32850.94	30220.56	29874.16	29708.41
Transition Avg - On to Off							33278.26	33370.89	34007.55	32871.27	30407.19	30464.29
Average - All Transitions				31616.91								

**Table 3A** Above shows analysis of the Reactive Power data of 4 USES® model CMES 240V power conditioners collected by the Amprobe DM-II Pro Multi-Meter and Data-Logger during the TIS testing on July 21, 2011 between 2:31 pm and 4:11 pm. The test data shows a reactive power reduction of about **31.616 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 3B

The Daily Republic - Reactive Power

7/21/2011 5:39:59 PM - 7/21/2011 6:09:29 PM



**Graph 3B** Above shows the Reactive Power in KVAR during the TIS testing on July 21, 2011 between 5:40 pm and 6:09 pm. With 4 USES<sup>®</sup> model CMES 240V and 5 USES<sup>®</sup> model CMES 460V power conditioners operating, the reactive power is reduced an average of **88.979 KVAR**.



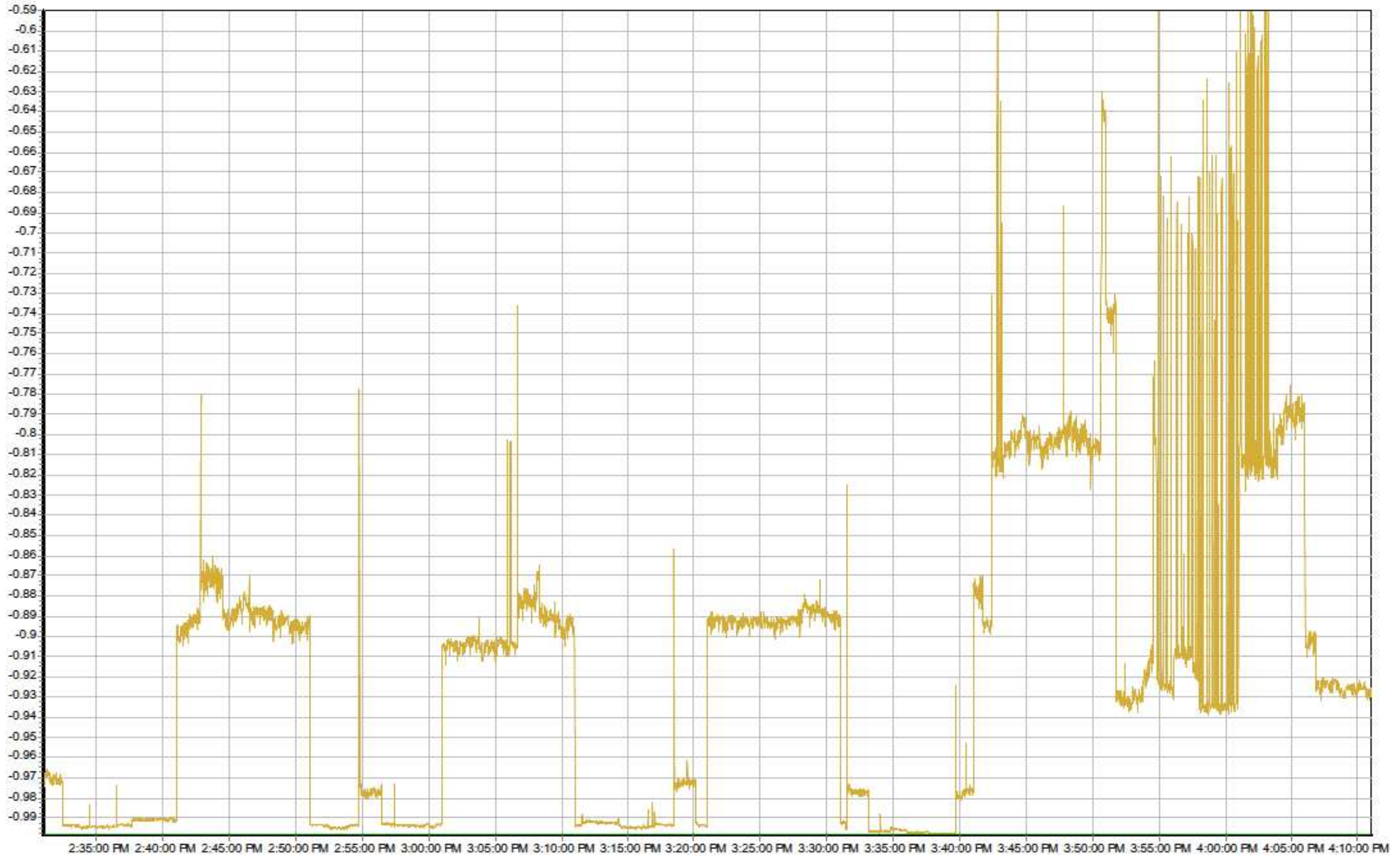
**Table 3B**

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
5:39:59 PM	5:45:00 PM		on	102379.91								
5:45:04 PM	5:50:00 PM		off		188118.28		85738.37	90570.60	91311.79	87830.46	92747.01	92494.76
5:50:04 PM	5:55:00 PM		on	139799.18		48319.10		89791.03	87275.71	86856.08	86588.68	88891.49
5:55:04 PM	6:00:01 PM		off		185073.05		45273.87	93748.94	102508.14	102468.60	101875.55	103416.75
6:00:05 PM	6:05:01 PM		on	80157.02		104916.03		93320.59	90873.55	93839.61	92988.99	94889.92
6:05:05 PM	6:09:00 PM		off		168230.64		88073.63	89932.04	88747.62	90431.90	85351.17	77822.23
6:09:04 PM	6:09:28 PM		on	88054.45		80176.20		91473.41	90682.83	0.00	0.00	0.00
Average - System Off				180473.99								
Average - System On				102597.64								
Difference				77876.35								
Transition Avg - Off to On						77803.78		91528.34	89610.70	90347.85	89788.84	91890.71
Transition Avg - On to Off							73028.62	91417.19	94189.18	93576.99	93324.58	91244.58
Average - All Transitions				88979.28								

**Table 3B** Above shows analysis of the Reactive Power data of 4 USES® model CMES 240V and 5 USES® model CMES 460V power conditioners collected by the Amprobe DM-II Pro Multi-Meter and Data-Logger during the TIS testing on July 21, 2011 between 5:40 pm and 6:09 pm. The test data shows a reactive power reduction of about **88.979 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 4A

The Daily Republic - Power Factor  
7/21/2011 2:30:59 PM - 7/21/2011 4:11:00 PM



**Graph 4A** Above shows the Power Factor in decimals during the TIS testing on July 21, 2011 between 2:31 pm and 4:11 pm. With 4 USES<sup>®</sup> model CMES 240V power conditioners operating, the power factor is increased from **87% to 97%**.

**Table 4A**

## Power Factor

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
2:30:59 PM	2:41:01 PM		on	0.99								
2:41:02 PM	2:51:01 PM		off		0.89		0.10	0.10	0.09	0.09	0.10	0.10
2:51:03 PM	3:01:00 PM		on	0.99		0.10		0.10	0.10	0.10	0.10	0.10
3:01:01 PM	3:11:00 PM		off		0.90		0.09	0.08	0.08	0.09	0.08	0.09
3:11:03 PM	3:20:59 PM		on	0.99		0.09		0.09	0.09	0.09	0.09	0.09
3:21:00 PM	3:30:59 PM		off		0.89		0.10	0.10	0.10	0.10	0.10	0.10
3:31:01 PM	3:41:00 PM		on	0.99		0.10		0.09	0.09	0.08	0.08	0.08
3:41:01 PM	3:51:00 PM		off		0.81		0.19	0.11	0.10	0.10	0.08	0.09
3:51:02 PM	4:01:00 PM		on	0.88		0.07		0.09	0.10	0.10	0.09	0.28
4:01:02 PM	4:10:59 PM		off		0.85		0.03	0.02	0.02	0.00	0.22	0.09
Average - System Off				0.87								
Average - System On				0.97								
Difference				0.10								
Transition Avg - Off to On						0.09		0.09	0.10	0.09	0.09	0.09
Transition Avg - On to Off							0.10	0.10	0.09	0.10	0.09	0.09
Average - All Transitions				0.09								

**Table 4A** Above shows analysis of the Power Factor data of 4 USES® model CMES 240V power conditioners collected by the Amprobe DM-II Pro Multi-Meter and Data-Logger during the TIS testing on July 21, 2011 between 2:31 pm and 4:11 pm. The test data shows the power factor is increased from **87% to 97%**. 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 4B

The Daily Republic - Power Factor

7/21/2011 5:39:59 PM - 7/21/2011 6:09:29 PM



**Graph 4B** Above shows the Power Factor in decimals during the TIS testing on July 21, 2011 between 5:40 pm and 6:09 pm. With 4 USES<sup>®</sup> model CMES 240V and 5 USES<sup>®</sup> model CMES 460V power conditioners operating, the power factor is increased from **80% to 92%.**

**Table 4B****Power Factor**

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	At Transition
5:39:59 PM	5:45:00 PM	on	0.93									
5:45:04 PM	5:50:00 PM	off		0.80		0.13	0.13	0.13	0.13	0.12	0.12	0.12
5:50:04 PM	5:55:00 PM	on	0.87		0.06		0.12	0.12	0.12	0.12	0.12	0.12
5:55:04 PM	6:00:01 PM	off		0.80		0.07	0.14	0.14	0.14	0.15	0.14	0.14
6:00:05 PM	6:05:01 PM	on	0.94		0.14		0.14	0.14	0.14	0.14	0.14	0.14
6:05:05 PM	6:09:00 PM	off		0.80		0.15	0.13	0.13	0.13	0.14	0.13	0.14
6:09:04 PM	6:09:28 PM	on	0.93		0.14		0.14	0.13	0.00	0.00	0.00	0.00
Average - System Off				0.80								
Average - System On				0.92								
Difference				0.12								
Transition Avg - Off to On						0.11		0.13	0.13	0.13	0.13	0.13
Transition Avg - On to Off							0.11	0.13	0.13	0.14	0.13	0.13
Average - All Transitions				0.13								

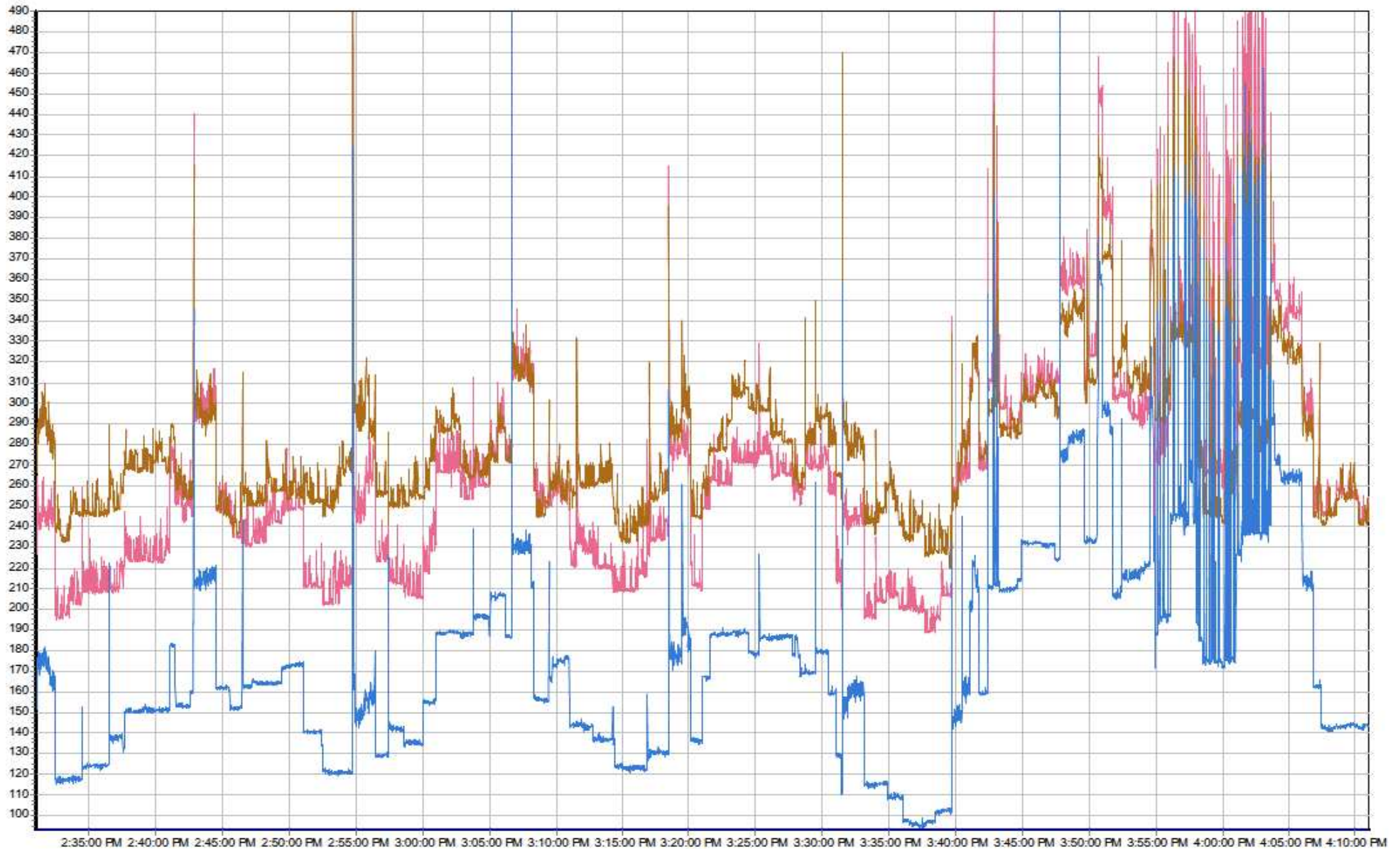
**Table 4B** Above shows analysis of the Power Factor data of 4 USES<sup>®</sup> model CMES 240V and 5 USES<sup>®</sup> model CMES 460V power conditioners collected by the Amprobe DM-II Pro Multi-Meter and Data-Logger during the TIS testing on July 21, 2011 between 5:40 pm and 6:09 pm. The test data shows the power factor is increased from **80% to 92%**. Shaded cells are not included in the average performance calculations because load changes unrelated to the performance of the USES<sup>®</sup> system occurred during the averaging period.



## Graph 5A

The Daily Republic - RMS Current

7/21/2011 2:30:59 PM - 7/21/2011 4:11:00 PM



**Graph 5A** Above shows the Current in Amps per phase during the TIS testing on July 21, 2011 between 2:31 pm and 4:11 pm. With 4 USES<sup>®</sup> model CMES 240V power conditioners operating, the current is reduced an average of **34.75 Amps per phase**.

**Table 5A**

RMS Current (Amps)												
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
2:30:59 PM	2:41:01 PM		on	207.60								
2:41:02 PM	2:51:01 PM		off		230.48		22.88	28.57	31.56	7.01	6.71	0.82
2:51:03 PM	3:01:00 PM		on	209.30		21.18		29.19	24.31	21.39	26.14	23.01
3:01:01 PM	3:11:00 PM		off		249.13		39.83	27.11	34.76	25.08	25.85	23.18
3:11:03 PM	3:20:59 PM		on	211.83		37.30		29.41	26.94	25.42	23.59	21.53
3:21:00 PM	3:30:59 PM		off		245.34		33.51	29.79	27.71	32.26	48.19	45.93
3:31:01 PM	3:41:00 PM		on	197.79		47.55		34.92	30.03	6.83	1.83	10.22
3:41:01 PM	3:51:00 PM		off		290.82		93.03	29.47	52.03	47.01	-4.56	-6.81
3:51:02 PM	4:01:00 PM		on	289.40		1.42		55.19	50.59	48.92	55.53	129.01
4:01:02 PM	4:10:59 PM		off		270.95		-18.45	14.40	15.28	22.70	161.63	65.47
Average - System Off				257.35								
Average - System On				223.19								
Difference				34.16								
Transition Avg - Off to On						35.34		37.18	32.97	31.91	35.09	18.25
Transition Avg - On to Off							47.31	28.74	36.52	31.76	37.02	44.86
Average - All Transitions				34.75								

**Table 5A** Above shows analysis of the Current data of 4 USES<sup>®</sup> model CMES 240V power conditioners collected by the Amprobe DM-II Pro Multi-Meter and Data-Logger during the TIS testing on July 21, 2011 between 2:31 pm and 4:11 pm. The test data shows the current is reduced an average of **34.75 Amps per phase**. Shaded cells are not included in the average performance calculations because load changes unrelated to the performance of the USES<sup>®</sup> system occurred during the averaging period.

## Graph 5B

The Daily Republic - RMS Current  
7/21/2011 5:39:59 PM - 7/21/2011 6:09:29 PM



**Graph 5B** Above shows the Current in Amps per phase during the TIS testing on July 21, 2011 between 5:40 pm and 6:09 pm. With 4 USES<sup>®</sup> model CMES 240V and 5 USES<sup>®</sup> model CMES 460V power conditioners operating, the current is reduced an average of **90.24 Amps per phase.**



**Table 5B**

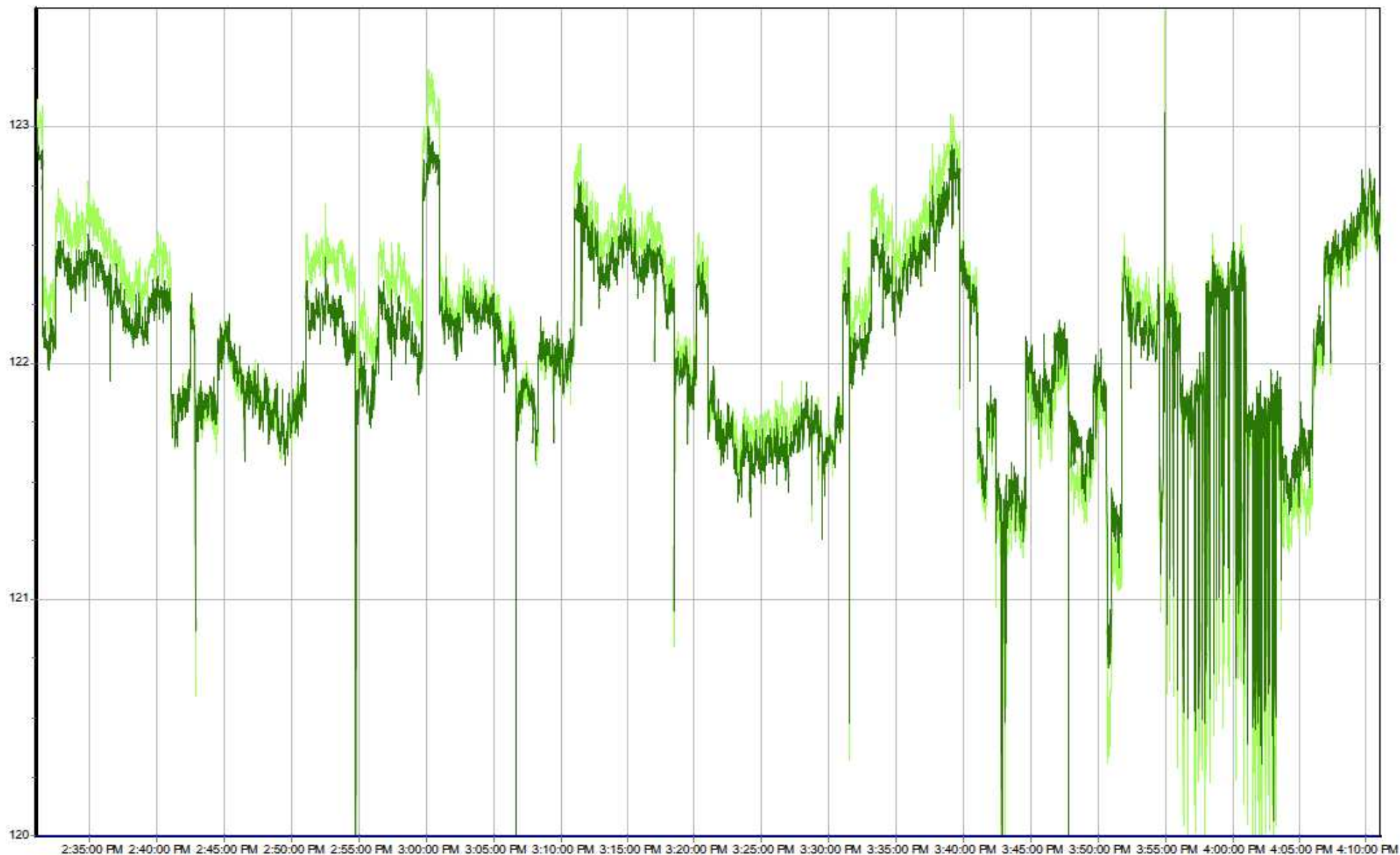
RMS Current (Amps)												
Intervals						Full Interval		Instant	15 Sec	30 Sec	45 Sec	60 Sec
				System On	System Off	Difference	Difference	Change	Change	Change	Change	Change
Interval Time Frame	# USES	Status	Average	Average	Off to On	On to Off	At Transition	At Transition	At Transition	At Transition	At Transition	At Transition
5:39:59 PM	5:45:00 PM		on	725.25								
5:45:04 PM	5:50:00 PM		off		794.68	69.44	87.10	95.03	86.34	104.48	103.84	
5:50:04 PM	5:55:00 PM		on	724.00		70.68	89.52	91.34	90.99	90.74	106.08	
5:55:04 PM	6:00:01 PM		off		767.30	43.30	97.48	130.22	126.00	125.24	137.04	
6:00:05 PM	6:05:01 PM		on	628.69		138.62	86.89	85.12	87.67	77.83	88.62	
6:05:05 PM	6:09:00 PM		off		696.19	67.50	91.04	85.09	83.63	72.32	32.38	
6:09:04 PM	6:09:28 PM		on	647.85		48.34	92.43	95.22	0.00	0.00	0.00	
Average - System Off				752.73								
Average - System On				681.45								
Difference				71.28								
Transition Avg - Off to On						85.88		89.62	90.56	89.33	84.29	97.35
Transition Avg - On to Off							60.08	91.87	103.44	98.66	100.68	91.09
Average - All Transitions				90.24								

**Table 5B** Above shows analysis of the Current data of 4 USES<sup>®</sup> model CMES 240V and 5 USES<sup>®</sup> model CMES 460V power conditioners collected by the Amprobe DM-II Pro Multi-Meter and Data-Logger during the TIS testing on July 21, 2011 between 5:40 pm and 6:09 pm. The test data shows the current is reduced an average of **90.24 Amps per phase**. Shaded cells are not included in the average performance calculations because load changes unrelated to the performance of the USES<sup>®</sup> system occurred during the averaging period.

## Graph 6A.1

The Daily Republic - RMS Voltage

7/21/2011 2:30:59 PM - 7/21/2011 4:11:00 PM



**Graph 6A.1** Above shows the Voltage in Volts for phases 1 and 2 during the TIS testing on July 21, 2011 between 2:31 pm and 4:11 pm. With 4 USES® model CMES 240V power conditioners operating, the voltage is increased an average of **.67 Volts per phase.**

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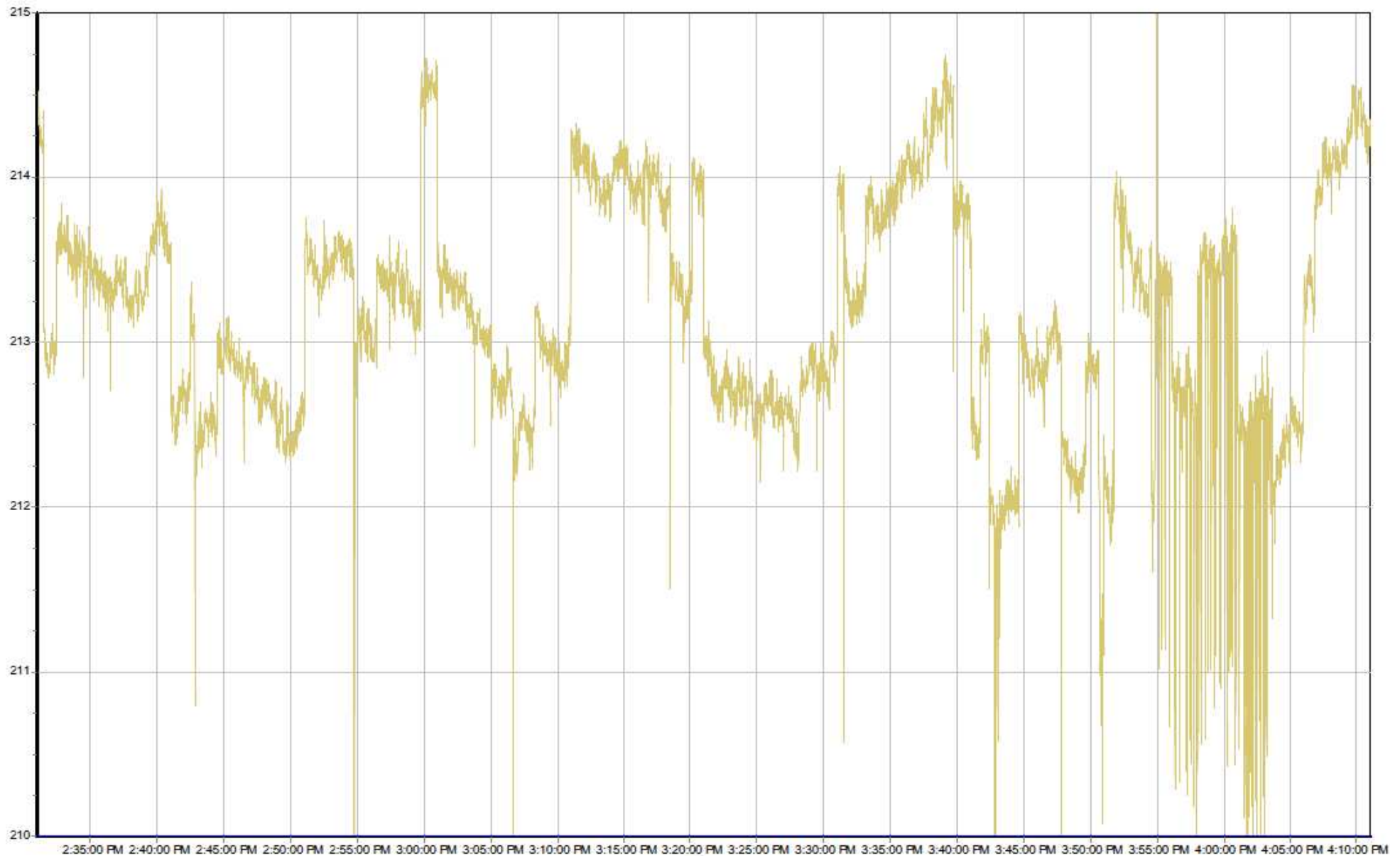
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## Graph 6A.2

The Daily Republic - RMS Voltage

7/21/2011 2:30:59 PM - 7/21/2011 4:11:00 PM



**Graph 6A.2** Above shows the Voltage in Volts for phase 3 during the TIS testing on July 21, 2011 2:31 pm and 4:11 pm. With 4 USES<sup>®</sup> model CMES 240V power conditioners operating, the voltage is increased an average of **.67 Volts per phase.**

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**Table 6A**

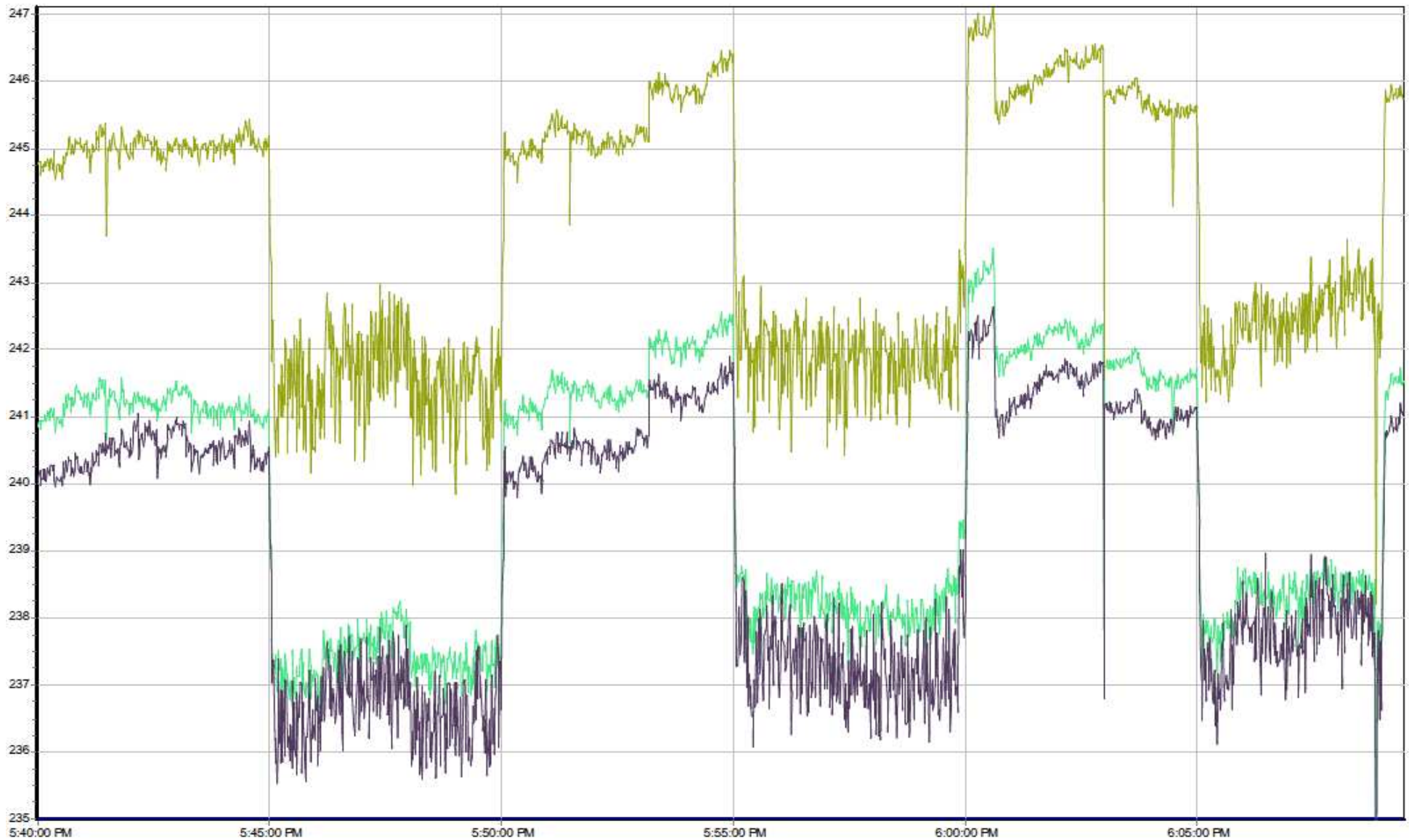
RMS Voltage (Volts)												
Intervals						Full Interval		Instant	15 Sec	30 Sec	45 Sec	60 Sec
Interval Time Frame		# USES	Status	System On Average	System Off Average	Difference Off to On	Difference On to Off	Change At Transition	Change At Transition	Change At Transition	Change At Transition	Change At Transition
2:30:59 PM	2:41:01 PM		on	152.76								
2:41:02 PM	2:51:01 PM		off		152.13		0.62	0.63	0.65	0.76	0.64	0.59
2:51:03 PM	3:01:00 PM		on	152.71		0.57		0.63	0.50	0.53	0.61	0.56
3:01:01 PM	3:11:00 PM		off		152.37		0.34	0.81	1.00	0.86	0.88	0.97
3:11:03 PM	3:20:59 PM		on	152.90		0.53		0.90	0.81	0.79	0.80	0.74
3:21:00 PM	3:30:59 PM		off		152.03		0.87	0.72	0.56	0.59	0.68	0.82
3:31:01 PM	3:41:00 PM		on	152.94		0.91		0.78	0.83	0.40	0.38	0.40
3:41:01 PM	3:51:00 PM		off		151.90		1.04	0.76	0.77	0.82	0.45	0.38
3:51:02 PM	4:01:00 PM		on	152.28		0.38		0.72	0.68	0.52	0.51	1.97
4:01:02 PM	4:10:59 PM		off		152.34		-0.06	0.04	0.11	0.11	1.80	0.54
Average - System Off												
Average - System On												
Difference												
Transition Avg - Off to On						0.60		0.76	0.70	0.56	0.58	0.57
Transition Avg - On to Off							0.72	0.73	0.74	0.76	0.66	0.66
Average - All Transitions												

**Table 6A** Above shows analysis of the Voltage data of 4 USES<sup>®</sup> model CMES 240V power conditioners collected by the Amprobe DM-II Pro Multi-Meter and Data-Logger during the TIS testing on July 21, 2011 between 2:31 pm and 4:11 pm. The test data shows the voltage is increased by **.67 Volts per phase**. Shaded cells are not included in the average performance calculations because load changes unrelated to the performance of the USES<sup>®</sup> system occurred during the averaging period.

## Graph 6B

The Daily Republic - RMS Voltage

7/21/2011 5:39:59 PM - 7/21/2011 6:09:29 PM



**Graph 6B** Above shows the Voltage in Volts per phase during the TIS testing on July 21, 2011 between 5:40 pm and 6:09 pm. With 4 USES<sup>®</sup> model CMES 240V and 5 USES<sup>®</sup> model CMES 460V power conditioners operating, the voltage is increased an average of **3.53 Volts per phase.**

**Table 6B**

RMS Voltage (Volts)												
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
5:39:59 PM	5:45:00 PM		on	242.22								
5:45:04 PM	5:50:00 PM		off		238.55		3.67	3.32	4.07	4.27	4.00	4.04
5:50:04 PM	5:55:00 PM		on	240.87		2.32		3.91	3.52	3.65	3.63	4.15
5:55:04 PM	6:00:01 PM		off		239.14		1.73	3.83	4.15	4.58	4.17	4.09
6:00:05 PM	6:05:01 PM		on	243.12		3.98		3.56	3.45	3.79	2.13	2.47
6:05:05 PM	6:09:00 PM		off		239.47		3.65	3.49	3.80	3.82	3.24	2.73
6:09:04 PM	6:09:28 PM		on	242.74		3.26		3.35	3.36	0.00	0.00	0.00
Average - System Off				239.05								
Average - System On				242.23								
Difference				3.18								
Transition Avg - Off to On						3.19		3.61	3.44	3.72	2.88	3.31
Transition Avg - On to Off							3.01	3.55	4.01	4.22	3.80	3.62
Average - All Transitions				3.53								

**Table 6B** Above shows analysis of the Voltage data of 4 USES<sup>®</sup> model CMES 240V and 5 USES<sup>®</sup> model CMES 460V power conditioners collected by the Amprobe DM-II Pro Multi-Meter and Data-Logger during the TIS testing on July 21, 2011 between 5:40 pm and 6:09 pm. The test data shows the voltage is increased by **3.53 Volts per phase**. Shaded cells are not included in the average performance calculations because load changes unrelated to the performance of the USES<sup>®</sup> system occurred during the averaging period.



## Installation Configuration



The photographs above show the installation of the USES<sup>®</sup> Shunt Efficiency System by Power Shaver, Energy Saving Systems at the Daily Republic Newspaper facility.

## Test Configuration



The photographs above show the configuration for the Timed Interval Sampling. The Current Transformers for the Amprobe DM II Pro meter are placed around the incoming Buss bars for the main service entrances.



# Acceptance of TIS Report

Having read the Power Shaver System Evaluation for the Daily Republic Newspaper facility, dated August 18, 2011, 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 March 17<sup>th</sup> 2011.

**DAILY REPUBLIC**

**1250 Texas Street  
Fairfield, CA 94533**

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Name

Title

Date