Allied Converters, Inc.

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June 2, 2008

Hon. Jaclyn A. Brilling
Secretary to the Commission
New York State Department of Public Service
Three Empire State Plaza
Albany, New York 12223

Re: Case 07-M-0548- Proceeding on Motion of the Commission Regarding an Energy Efficiency Portfolio Standard.

Dear Secretary Brilling:

Enclosed, please find an original and five copies of the Reply Brief submitted by Allied Converters, pursuant to the case referenced above. This Reply Brief has also been submitted to all active parties in this case.

Sincerely,

Richard Ellenbogen
President

cc: EEPS email list-serve

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To all parties:

We are in receipt of the notice soliciting comments regarding efficiency based incentives for the utilities and have several comments, but would initially like to provide some background information.

First, I am an engineer. My agenda is to try to help the utilities to become more efficient, to reduce energy consumption and greenhouse gas emissions, and to help New York to remain a viable state in which to conduct business. The experiments, the results of which are documented in this paper, were conducted at our own expense.

Second, in the process of analyzing the power quality at our facility, we have isolated, measured and documented the sources of several inefficiencies on the utility network. This particularly relates to Con Ed, as they are our service provider but is true of many of the other utilities, as well. Many of the inefficiencies are related to effects caused by customer premise loads. However, the utilities have been knowingly earning a large profit from their existence. The costs of the inefficiencies have been shouldered by the customer base for many years with those costs buried within the distribution charges that appear every month on the utility bill. To offer a basis for comparison, as a manufacturer if we were to convert 33% of our raw material to deliverable product, we would have been out of business years ago. Yet our utilities have been doing this profitably for years.

While some form of incentive is certainly needed to induce the utilities to implement the needed efficiency measures, some of the incentive should be tied to how much they can reduce, or at least prevent the increase of their distribution tariffs and help their customer base. As New York has some of the highest energy costs in the country, this is needed if we are to remain a competitive environment for business and to keep it affordable for people to live here. Many would say that energy costs in New York are no longer affordable.

To pass through the lion's share of the spoils from achieving energy efficiency to the utilities is the equivalent of a "Heads I win, Tales you lose" scenario with the consumer on the short end of the deal. While the network has been inefficient, the customer has paid for those inefficiencies. The customers have not had the expertise to enact efficiency improvements, but the utilities could have enacted many of them prior to this if it hadn't been more profitable to ignore them. If we ultimately succeed in making the network more efficient, for the utilities to reap all of the financial benefits while passing little of the gains

back to the customer seems very unjust in light of past history. Furthermore, the process of making the network more efficient should be of great financial benefit to the utilities, in and of itself. A more efficient network should have fewer component failures and lower maintenance costs, bringing the shareholders a greater return on their investment without needing huge incentives.

In addition, we would also suggest that an independent review be done on the utility proposed programs as there is some question as to their accuracy. For example, in reviewing the details of the program released by Con Ed in May, we found errors in their efficiency calculations related to their residential lighting program. As this accounts for nearly 80% of their residential efficiency program and 18% of their entire program, it needs to be addressed in detail.

On page 39 of Con Ed's proposal is a table that documents wattage savings from the installation of Compact Fluorescent Bulbs (CFL's). For the 60 watt incandescent bulb, they have stated that the replacement CFL will only draw 13 watts and reduce load on the network related to that bulb by 78%. While this is partially correct, it is not the entire story. While it is true that Con Ed's revenue related to the bulb will drop by nearly 78%, the actual load on the utility network related to that bulb will only drop by 58%. There is almost a 20% discrepancy between the figure used in the efficiency proposal, and what will actually occur. The reasons are as follows:

While the incandescent bulb that is being replaced draws 60 watts, it does so with a power factor of 1. When the power factor equals one, the watts (real power) used equals the volt-amps delivered by the utility. The replacement CFL's operate with a power factor of less than .6 in many cases. Also, they claim to use only 13 watts, but on average use closer to 14 watts. As a result, while the real power consumption of the bulb is lowered to 14 watts, the load on the utility is only reduced to 25 volt-amps (VA). Real power divided by power factor equals volt-amps (VA), or the load on the utility network. Also, the average load from the 60 watt incandescent bulbs that we measured was only 55 watts. In their study, Con Ed is assuming that the CFL's operate with the same power factor as an incandescent bulb, which is incorrect. Waveforms documenting power draw for both types of bulbs from actual measurements appear below in Figure 1. The measured harmonic spectrum for both types of bulbs appears in figure 2.

As documented in figure 1, there is only a 58% decrease in load on the utility that resulted from using CFL's in our experiment, and not the 78% claimed by the utility. While we have not analyzed the CFL's being distributed by the utility, the bulbs that we used are the ones available at the large big box stores in our area and carried the Energy Star label. The average consumer, not being aware of the impact of Power Factor on CFL energy consumption, will opt for the least expensive bulb that will do the job. As such, those bulbs will represent the vast majority of CFL's used in the New York metropolitan area. The results that we measured will be representative of the results that can be expected for much of the Con Ed service area from switching to CFL's.

While it is true that there will be a residual power savings from reduced cooling load during the summer due to the lower thermal load of CFL's when compared with incandescent bulbs, it can be inferred from the values presented by Con Ed that these residual effects were not included in their calculations. Also, this situation would only affect the calculations during the summer months. Furthermore, lighting load is lower during the summer months as there is more ambient daylight.

We have not done any calculations as to the veracity of the claims made for the other portions of their program. However, if incorrect assumptions were also made on those parts of the efficiency program, as was done on the residential lighting program, the savings estimates will be similarly flawed. The only way to be sure is for some entity to do an independent analysis and for the utilities to release the calculations used to derive the savings estimates so that they can be reviewed and verified. If the programs are based on incorrect assumptions and are overstated from the outset, then cost estimates for the programs will be incorrect. It will also be far more difficult to assess the level of improvement and the utilities will not be able to achieve the prescribed targets. We must start with accurate assumptions regarding possible efficiency improvements if we are to achieve the reduced levels of energy consumption that are being demanded by this program and that are needed by society.

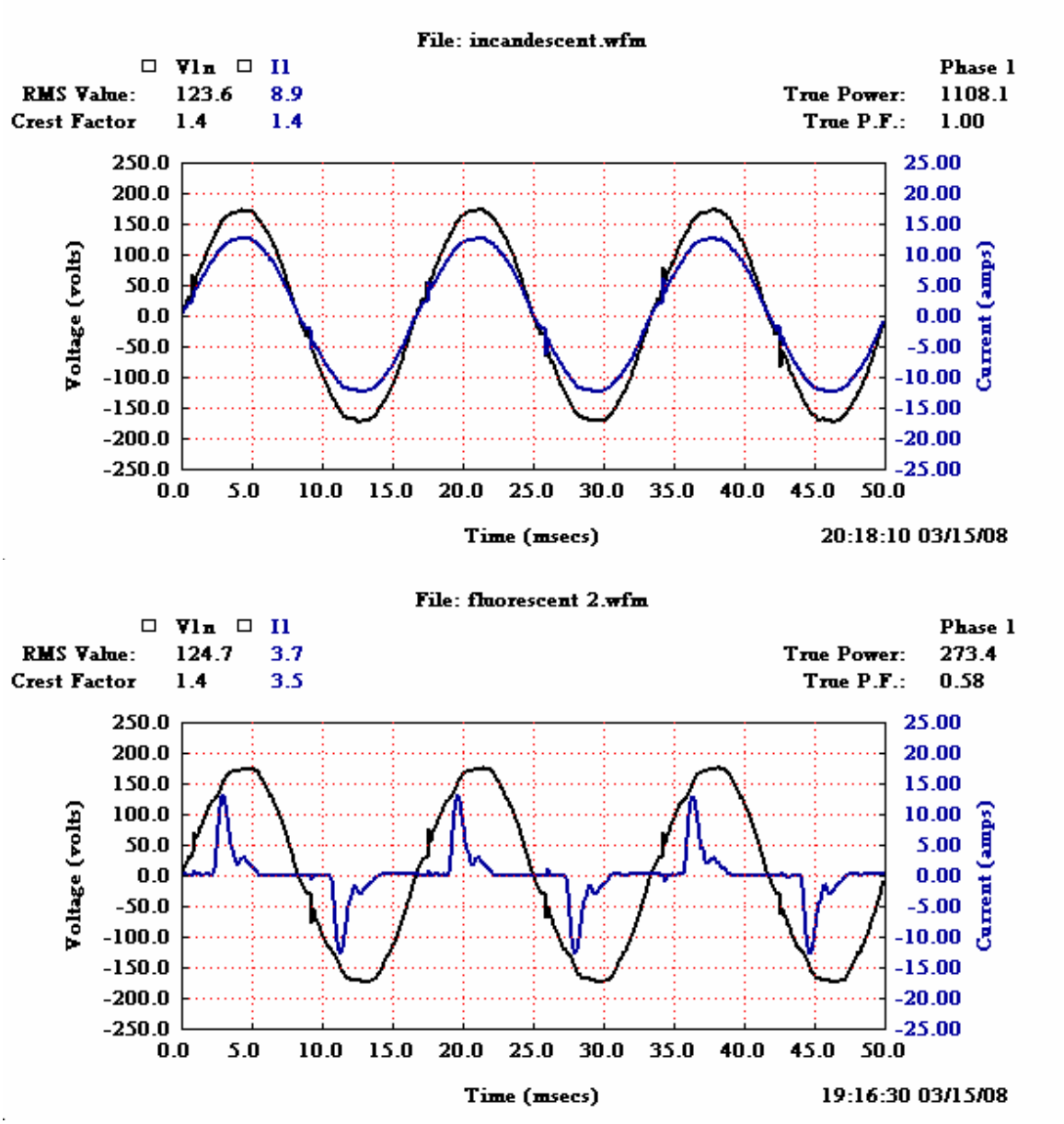

Figure 1. The top graph is the waveform for twenty “60 watt” bulbs. Their average power draw is 55 watts. The bottom graph is the waveform for twenty “60 watt” replacement CFLs. It shows a very distorted current waveform resulting in the measured power factor of .58. Note that real power is reduce by 75% (273 watts vs 1108 watts for the incandescent). However, the low power factor results in the CFLs drawing 470 VA from the utility, which is only a 58% decrease in load on the network, not the 78% claimed in the efficiency study.

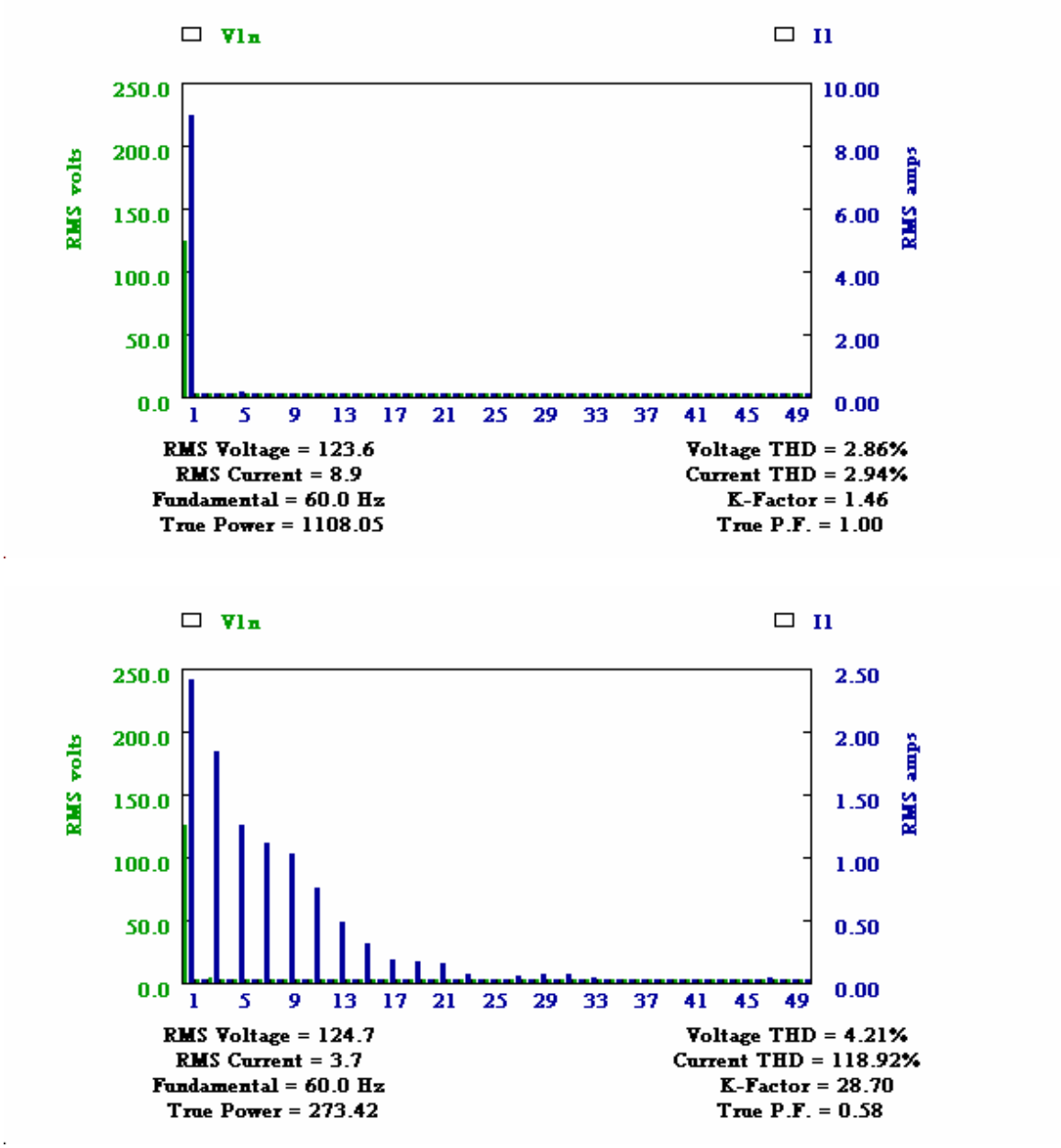

Figure 2. The top graph shows the harmonic spectrum of an incandescent bulb. Note that all of the voltage and current appears at the system frequency of 60 cycles (1st harmonic). The lower graph is the harmonic spectrum of the CFL. The CFL's are emitting significant amounts of current on all of the odd harmonics up to the 13th. Harmonics are multiples of the base system frequency, or 1st harmonic. (example: 3rd harmonic= 180 hz or cycles/second). These harmonics cause additional currents in all of the magnetic devices (motors and transformers) on the system resulting in excess thermal losses and additional heating in the devices. This accounts for the less than optimal efficiency that one would expect if they only looked at the real power consumption in Watts. Con Ed only used real power consumption (watts) in their calculations and did not include the effects of harmonics.