



# Voltage Flicker in the Digital Age



## Background



Established in 1892, with more than 27,000 students Central Michigan University is one of the top universities in the nation. CMU boasts the oldest standing Professional Doctorate in Audiology program in the nation. The university relies on sophisticated technology to train future professional Audiologists as well as treat patients. This technology is very expensive and extremely sensitive to power disturbances.

New Energy Technologies (NET) is a full service power quality company based in Michigan. NET was built on 50 years of experience servicing commercial and industrial electrical systems. NET has successfully diagnosed, consulted and solved power quality problems for businesses of all sizes.



### The Situation



The main Audiology lab at Central Michigan University houses a multi-million dollar advanced diagnostics testing machine. The main controller board burned out twice in the first year with a \$24,000 replacement cost. Equally painful to the loss of the machine and the cost of the repair, was the lead time for replacement parts that had to be shipped from overseas (4-6 weeks).

Tom Erdman President of New Energy Technologies immediately provided a full power quality analysis for the Audiology Department at CMU. This analysis revealed regular and constant voltage flicker.

“I knew from my experience that CMU was suffering from internal power pollution,” said Erdman. “The readings confirmed my belief, the audiology lab suffered from voltage flicker and ground loops.”

Voltage flicker is a very common power quality problem that is especially problematic for sensitive electronic equipment. The voltage in most facilities will flicker multiple times each day. Voltage flicker is a sudden overshoot of voltage at regular intervals and is mostly associated with flickering lights. It is caused by large loads turning on and off. Once a harmless reality, voltage flicker can significantly shorten asset lifecycles for electronic, computerized and automated equipment.

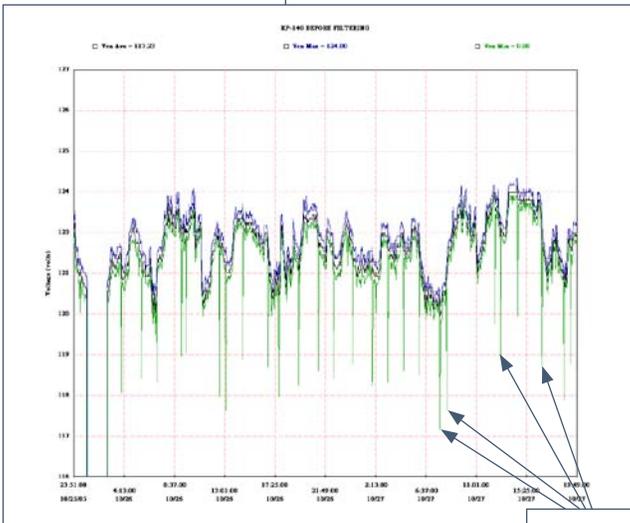


## The Situation

This scale is based on voltage magnitude with respect to time. While the nominal voltage is 120V, in reality the voltage is not constant. In this case the average voltage is 117.23V; the maximum voltage is 124V; and the minimum voltage is 0V which means a severe voltage drop occurred.

“This level of voltage flicker is extremely harmful to sensitive equipment, meaning anything computerized, digital or electronic,” said Erdman.

Before the advent of automated, electronic and computerized equipment voltage flicker was of little consequence. However, the trend of the past 30 years is to make equipment smaller, lighter and faster, this means smaller and more sensitive components such as microprocessors. Voltage flicker can cause interruptions to the business process and eat into profit.



*Constant voltage flicker is immediately visible in the readings.*

## The Solution

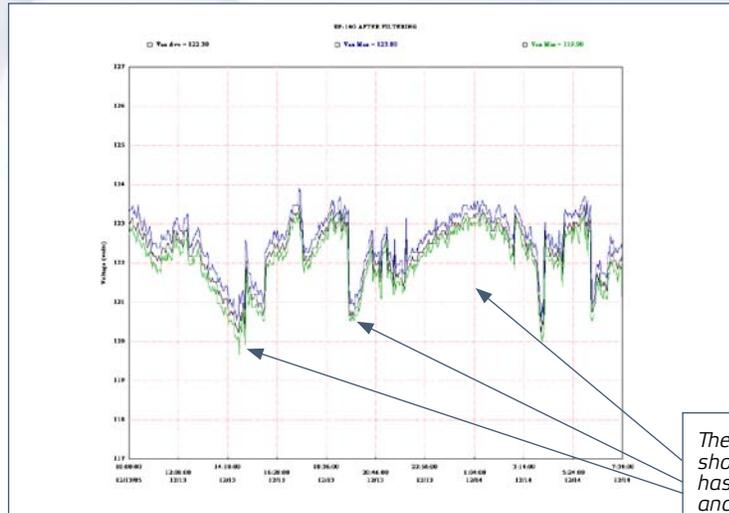


“I knew by analyzing the readings that Environmental Potentials’ waveform correction technology could solve this issue,” said Erdman. “I recommended they correct the waveform by installing an EP-2000, an EP-2500 and an EP-2700.”

Environmental Potentials’ patented waveform correctors remove voltage anomalies such as voltage flicker, by filtering the noise on the waveform at every angle.



## The Result



It has been more than four years since the first installation and the main controller board has not failed one time. The university has removed the legacy MOV design from their power quality standard and replaced it with EP's complete line of power quality products.

"I can't stress enough the importance of good power quality," said Erdman. "Modern equipment is extremely sensitive to even minor power disturbances.

The university has also begun retrofitting the 300-plus buildings under management with EP products as part of a university facilities specifications change.



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