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The Quarterly
Newsletter
from
A.E.F. Sales
Engineering
Company

P.O. Box 295, Mamaroneck, N.Y. 10543 (914)698-0432 Fax (914)698-7279

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Our 32nd Year

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Hot Water

Sometimes you really want to be in hot water. Find out how.

Harmonics 101

What you don't know can hurt you, and cost you money to boot. We're here to help.

Sad Story

There's alot of stuff money can buy, and some big things it can't.

Return of Bernadette

Black and white and read all over, A.E.F.'s Answer Cow is back.

How To Get Into Hot Water

How to get into hot water?!? You may think you can get into hot water well enough on your own, thank you. But we're talking real, literal hot water here. Some of what you're going to hear may surprise you, but every word is true. So read on.

The Problem. You know how when you go to the kitchen sink, and turn on the hot water, you've got to let it run for a minute to let the water in the pipe run out, so you can get water that's still heated? Not a big problem, right? But what if you're on the sixth floor of a hotel, or the-fifteenth floor of an office building. You'd be a long time waiting, wouldn't you? Well, not really, cause large buildings that require a

ready supply of hot water, have a system to deliver hot water, almost instantly.

Surprisingly enough, most buildings today still provide hot water with a system that looks like it was designed by the Federal Government. Water is heated in a central boiler, but to maintain ready hot water to each tap then requires an elaborate system

-Most buildings still use a system that looks like it was designed by the Federal Government-

of return piping, recirculation pumps, and valves to maintain proper pressure at the outlets. You would imagine all this extra equipment would cost a bunch of money to

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Sine Up for Harmonics 101

EDITOR'S NOTE: AC electrical power is delivered in sinusoidal form, that is, it follows a sine wave through each cycle. 'Dirty Power' refers to power that for various reasons, has that sine wave chopped up or distorted. It can cause all sorts of problems, from failures of computers and electronic equipment, to excessive utility bills. There are two classes of villains in the dirty power problem. Some are Transient: voltage spikes, sags, and surges. However, harmonics are considered a Steady-State cause of poor power quality since they repeat EVERY CYCLE, five million times a day. In response to numerous requests from our readers, we are pleased to present the following article dealing with the subject of Harmonics.

We all know dirty power causes problems. Today were going to be talking about

Harmonics, boldly answering the basic questions most people were afraid to ask.

What Are Harmonics? Harmonics are multiples of the fundamental frequency of an electrical power system. In a 60 hz system, the 5th harmonic is five times that, or 300 hz. (See Fig. 1 on page 2.) To see what this does to the sine wave, look at Figure 2. Not a pretty picture, is it?

What Causes Them? Harmonics are caused by devices that draw non-sinusoidal currents when a sinusoidal voltage is applied. Adjustable speed drives, 6-pulse converters, and UPSs all cause harmonics. And these devices have become a growing percentage of the load in most industrial power systems.

What Problems Do They Cause? Harmonic

Continued on page 2

memo from the desk of

Peter Fasolino

Where ever your life casts you, make you the world a bit better or more beautiful because you have lived in it.

Edward Bok

The chief danger in life is that you may take too many precautions.

Alfred Adler

We entreat you not to accept the undeserved kindness of God and miss its purpose.

2 Corinthians 6:1

The child of a frog is a frog.

Japanese Proverb

We're all different. And we're all a little strange.

Big Lu from New York

It is strange that men should take up crime when there are so many legal ways to be dishonest.

Laurence J. Peter

I'm proud to pay taxes in the United States; the only thing is, I could be just as proud for half the money.

Arthur Godfrey

No matter how strong you are, and how fast, sometimes it just isn't enough.

Superman

Like any company, A.E.F. Sales is only as good as the people who work for it. And over the last thirty-two years, we've had some very good people on our team.

For the last twenty-nine years, a key member of the A.E.F. Sales team has been Ed Chociey. Ed marked his anniversary here on March 1st by working as hard as ever-- so hard that he did not realize the milestone had arrived until he got my singing voicemail message in the morning. When we spoke in real time later that day, Ed reminisced about the time which has gone by and marveled -- as we all do -- at how fast it goes. Congratulations, Ed! And best wishes for many more happy, cordial, and productive years.

Harmonics 101 *from page 1*

currents flowing in a power system cause lots of problems. Excessive utility bills, blown fuses and tripped breakers where there's no apparent fault, insulation breakdown, malfunctioning electronic controls and computers. One of the biggest problems is overheating equipment. A 10 degree C rise in the operating temperature of transformers and motors can cut their life by 50%. If you've got harmonic currents, they're costing you money.

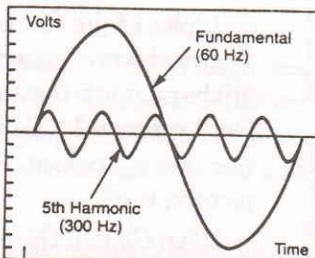


Figure 1.
Fundamental (60 Hz)
and 5th Harmonic

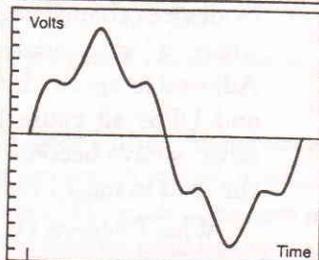


Figure 2.
Fundamental (60 Hz)
and 5th Harmonic
Combined Effect

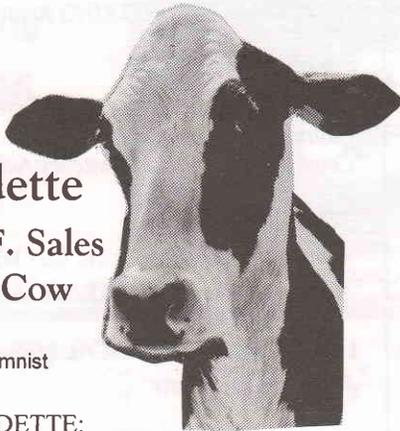
The newest member of the A.E.F. Sales team is now at work, behind the scenes, at our office in Malone, New York, about seven miles shy of the Canadian border. My brother's son, Chris, has come on board recently as a part time quotation specialist. Many of our customers have been receiving faxed quotes on heater products generated by Chris from bills of material put together by salesmen in the field. When an order is placed, a faxed acknowledgment is sent to the customer with the scheduled ship date and shipping point. Often, the elapsed time from quote to acknowledgment is only a matter of hours, with most shipments from stock being made in one day.

This new system -- as everything we do at A.E.F. Sales -- is aimed at improving the service we can offer our customers. We've got more plans in store for the coming months. And if you've got an idea as to how we can be a better supplier, please let us know. We'll be glad to hear from you.

Good News. Remember, harmonics are a steady-state phenomenon. So, unlike that noise your transmission's been making when you drive (but never makes for the mechanic), they're Always There. So even an instantaneous reading of the load will tell you if you have a problem. Ask your Myron Zucker representative (A.E.F. Sales!) about a getting low cost, hand-held Harmonimeter. Then you'll know for sure.

More Good News. Once you've identified the harmonics problem, how do you solve it? That involves Myron Zucker once again. If you want to trap a mouse, you'd use a mouse trap, right? So if you want to trap harmonics, use a harmonics trap. Really. A Caltrap from Myron Zucker corrects the problem at the source. The trap is actually an inductor-capacitor, which provides a low impedance path for the harmonic currents. Essentially, the harmonic current is trapped between the source and the trap, forever! Neat, huh? Zucker manufactures Caltraps from 10 to 100 KVAR.

Want to find out more? You have two choices. You can call your friendly A.E.F. representative for more information. Or you can sign up for Harmonics 102 next semester.



Bernadette The A.E.F. Sales Answer Cow

Guest Columnist

DEAR BERNADETTE:

I recently bought several submersible transformers, made by R.E. Uptegraff, from a company called A.E.F. Sales Engineering. They turned out to be real good folks to work with. (Both A.E.F. and Uptegraff, I mean.) When I had questions, they had answers, or they got the answers. When I had special problems that needed thinking, and not stock answers, they took the time to see things from my viewpoint, and really went the extra mile to help me out. They treated me the way I like to be treated.

But here's my problem. I'd like to do more business with those folks, but I don't see any transformer requirements in the pipeline. What I was wondering is, does A.E.F. Sales sell other stuff besides transformers? L.A.B.

DEAR L.A.B. One of the big differences I've noticed between cows and people is that, for the

most part, cows seem to catch on a bit quicker. (*Vive la difference!*) Now, if you will just grab the bottom right hand corner of this page with the thumb and forefinger of your right hand, and then fold it to your left, you should find yourself looking at page 4. Once on page 4 you will see that the publishers have thoughtfully provided a summarized listing of all the companies they represent, and the products manufactured by each.

I'm sure if you just take a minute to read through it, you'll find other types of equipment that you need that you can indeed purchase from those friendly folks over at A.E.F. Sales.

DEAR BERNADETTE:

I heard that there were some changes in the 1996 NEC with regard to Heat Tracing. What were those changes, and how do I make sure I'm in compliance? R.S.

DEAR R.S. There were two significant changes to Article 427, to wit: 1) Ground fault protection of equipment shall be provided for each branch circuit supplying electric heating equipment; and 2) Electric heating equipment shall have a grounded metal covering. (Applies to heating cables and panels.) For details in your specific situation, I'd call in A.E.F. Sales. They've been doing this for 32 years so they know what's what. Heat On!

*Questions? Anxiety? Bernadette can help.
Write to her c/o A.E.F. Sales Engineering Co.,
P.O. Box 295, Mamaroneck, N.Y. 10543*

*Only the pure in heart
can make good soup.*

Ludwig von Beethoven

*Happiness is a virtue.
You cannot be wicked
and happy; triumphant,
perhaps, but not happy.*

King Arthur

*You can't run away
from trouble. Ain't no
place that far.*

Uncle Remus

Marcel Marceau

*It used to be that death
was the worst thing
that could happen to
you, but medical
technology has now
allowed doctors to
create a situation that's
even worse.*

William Knaus, M.D.

*The kiss of the sun for
pardon, the song of the
birds for mirth; you are
nearer to God in a
garden than anywhere
else on earth.*

Dorothy F. Gurney

*As you wander on
through life, no matter
what your goal, keep
your eye upon the
doughnut, and not
upon the hole.*

*From the Wall of the
Mayflower Donut Shop*

Hot Water *from page 1*

purchase and install, and you'd be right. You might also imagine that operating and maintenance costs to keep the recirculation pumps running constantly would be high also, and you'd be right again. Energy costs to heat and re-heat the same water over and over add up too. Up until a few years ago, there wasn't any real alternative, so people went on happily (more or less) buying, installing, and maintaining all that extra gear. But now there is an alternative that takes advantage of newer technology, and it makes so much sense, and can save so much money, that frankly we find it a little hard to believe that so many folks are still going the Rube Goldberg route.

The Answer? The answer is Nelson Electric's Type LT Hot Water Heating

System. Here's how it goes: The water is heated ONCE in the central boiler, and then it begins its ONE-WAY journey to the various taps, kept at temperature along the way by using Nelson's famous, fabulous, self-regulating heater cable. The LT cable replaces heat loss at the proper rate throughout the supply piping to maintain desired water temperature at every hot water tap. The cable adjusts its own power output based on actual pipe temperature, so not a single watt is wasted. And the installation couldn't be simpler: Nelson's systems require No Spiralling, unlike some competitors we could mention.

Like to know more about all this? Would you be terribly surprised if we told you you could get all the information you want, and maybe even a Free Brochure, by just calling A.E.F. Sales?

'Stop All Work'

George C. Boldt came to America in the 1860's. His family was poor, but he was a man of tremendous energy, who dreamed big, and then worked to make his dreams come true. He became one of the wealthiest Americans of his era, eventually owning many hotels, including the original Waldorf-Astoria in New York.

But as successful as he was in business, the center of his life was his wife, Louise. As the century came to an end, he decided to build her her own castle, on their own private island in New York's Thousand Islands. Inspired by the castles of Europe, no expense was spared. Six stories high with 120 rooms and an indoor swimming pool, everything was to be first class. Fireplaces were brought from Italy, tapestries from France, fine furniture from the world over. Three hundred workers, including artists and craftsmen from Europe were at work, making the dream come true. By 1904 it was almost finished.

Then suddenly, unexpectedly, Louise Boldt died. Her devastated husband sent a simple telegram: 'Stop all work.' Three hundred men put their tools down and left the island, never to return. Everything was left where it lay, furniture never uncrated. Boldt never returned to his island.

Nothing was touched till 1977, when it was taken over by New York State. Now every summer thousands of tourists wander the island where George Boldt's dream died.

4 Things Worth Knowing

- **Nice Guys Finish 67th.** Charles Lindbergh's flight from New York to Paris in 1924 made him world-famous. It also made him the 67th man to fly non-stop across the Atlantic. Lindbergh had been preceded by a two-man flight in 1919 and two dirigible crossings, one in 1919 that carried 31 men, and another earlier in 1924 with 33 men aboard.
- **Best Thing About Lortec.** That's a tough one since there are so many great things to choose from. But some of our users say it's our installation options. Every Lortec proposal includes a variety of installation and test options. Most UPS companies just send you a packing crate and an invoice.
- **Heads Up, Dudes.** That big fluffy cloud up there could weigh as much as 100,000 Tons. Amazing that they just float up there exactly the way buildings don't. (Ain't you glad it comes down in drops?)
- **Forever and Ever.** Conex Cable's Aluminum Clad Steel Wire (AS) is built to last just about forever. A special, patented process is used to apply a thick, uniform coating of EC grade aluminum that provides superior corrosion resistance and superior conductivity.

A.E.F. SALES ENGINEERING Represents:

CENTRAL MOLONEY

Single Phase Transformers: Pole Type
Padmounted, Vault, and Stepdown
Components: Bushings-Switches-Accessories

CONEX CABLE

Aluminum Clad Shield Wire, Guy Wire
Messenger Wire, and ACSR/AS (AW)

LEWTEX TECHNOLOGICAL MFG.

Fibreglass Crossarms

LORTEC POWER SYSTEMS

On-Line UPS to 300kva
Specialty Inverters, Battery Trackers

NELSON ELECTRIC HEATER PRODUCTS

MI Cable for Pipe Tracing and Snowmelting
Self-Regulating Cable for Pipe Tracing
Thermostats and Controls
Control and Monitoring Panels
Ricwel SECT and Stereo Impedance Heating

NEHRING ELECTRICAL WORKS

Bare Copper and Aluminum-Cable
Aluminum Clad Cable

NORBERG INDUSTRIES, INC.

Silver Sand Current Limiting Fuses
Type E General Purpose Fuses
Type R Motor Starting Fuses

PYRAMID INDUSTRIES, INC.

Plowable Duct, Locatable Duct, Inner Duct
Aerial Duct, Cable Blowing Equipment

RAPID POWER TECHNOLOGIES

Power Conditioners, Voltage Regulators
and Isolation Transformers to 1000kva

R.E. UPTGRAFF MANUFACTURING

Liquid-Filled Transformers to 15mva
Subsurface, Load Center, Station Type
Rebuilding and Rewinding Services

MYRON ZUCKER, INC.

Low Voltage Capacitors to 600 voltss
Harmonic Traps