

fall  
1993

Volume 4  
Issue 3

# aef/fyi

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

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September 1993



Our 29th Year

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**Ask Dr. Science**  
*An Actual Expert answers all your questions.*

## Does Rewinding Your Old Transformers Make Sense?

R.E. Uptegraff Manufacturing of Scottsdale, Pennsylvania has been building transformers since 1932, and they've been rewinding, refurbishing, and retanking old transformers for almost that long.

The usual procedure involves, first, a "post-mortem" examination for the cause of the failure. The original design is then often modified to correct for weaknesses. Repaired units are subject to the same rigorous inspection and testing as new transformers, and are provided with the same warranty.

Larry Kirchner, Engineering Manager for Uptegraff, recently took a look at some reasons why rewinding a transformer can make an awful lot of sense.

**Cost.** Rewinding a transformer costs about 70% of purchasing a new unit, so

there's a savings of 30% right off the bat. On a big transformer, that 30% is big money.

**Guaranteed.** When Uptegraff rewinds a unit, it gets the same guarantee as a new unit, and its life expectancy is the same.

**Lower Losses, More kVA.** Modern winding designs and materials can result in lower core and winding losses. Since the tank and the cooling system were designed for the original, higher losses, unit kVA could be increased.

**No Redesigning Substations.** Since the tank dimensions remain the same, the substation will not have to be redesigned, resulting in additional savings.

**Environmentally Correct.** Environmental concerns are more important than ever,

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## The "Right" Heater Cable

Since we at A.E.F. Sales have been designing and selling heating cable systems for almost 30 years, we're often asked which kind of heater cable is best: self-regulating, constant-wattage, or M.I.?

The answer is: they're *all* swell.

Actually that's just part of the answer. The full answer is that each job has unique requirements that must be considered carefully to ascertain which type, or types,

of cable would be best. And since we sell all three major types of heater cable, we can afford to be real objective when we make a recommendation.

**Self-Regulating Cables.** Widely used for freeze protection, these cables adjust heat output in response to pipe temperature. Because of its infinite parallel path circuitry, it can be cut to any length in the field without affecting heat output. Colder

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**memo**  
from the desk of  
*Peter Fasolino*

*Everything happens to everybody sooner or later if there is time enough.*

G.B. Shaw

*A hen is only an egg's way of making another egg.*

Samuel Butler

*We have brought nothing into the world, and neither can we carry anything out.*

1st Timothy 6:7

*I never made a mistake in my life; at least never one that I couldn't explain away afterwards.*

Rudyard Kipling

*It is a foolish man who hears all he hears.*

Austin O'Malley

*He that would make his own liberty secure must guard even his enemy from oppression; for if he violates this duty he establishes a precedent that will reach to himself.*

Thomas Paine

*All generalizations are dangerous.*

Alexandre Dumas (fils)

At the beginning of June, Fred Eigenrauch and I attended a National Sales Meeting at Central Moloney's plant in Pine Bluff, Arkansas. In the atrium of the hotel where the meeting was held, two giant banners were hung. One said: "Central Moloney: If you haven't seen us lately, you haven't seen us." The second read: "If it isn't good for the customer, it isn't good for Central Moloney." For two and a half days, Fred and I learned that those banners weren't just catchy slogans.

Central Moloney's people showed us a willingness to work tirelessly for improvements in products and service. Millions of dollars have been invested over the last year or so, and more is in the planning stages. For example, in engineering, new hardware and software means that each transformer design is optimized by reviewing more than

100,000 possible configurations for each line item. Some of that design information is sent by fiber optic cables to the plant floor, where it directs numerically controlled machines cutting and punching steel for tanks. On the plant floor, new systems for painting, robotic welding, and core and coil drying are in place.

Just as impressive as the physical improvements are the attitude and enthusiasm of the men and women who build the transformers. During a tour of the plant, team members from each department explained to us what was being done, and what changes and improvements had been made. They care about their products and the customers who buy them. And they're excited about their work.

It all adds up to this: Central Moloney is a company we are proud to represent. Like all our principal companies, they are conscientious, they are leaders in their field, and their integrity in relations with employees, suppliers, and vendors sets the stage for fair relationships with our customers.

## The "Right" Heater Cable

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sections of pipe receive more heat output, while warmer sections receive less, so greater energy efficiency is achieved. In many cases multiple cables can be controlled with a single ambient-sensing thermostat.

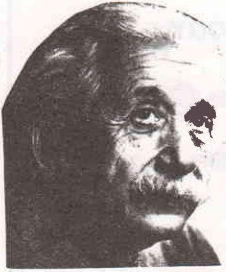
**Constant Wattage Cables.** These are also "off-the-shelf" heaters that can be cut to length in the field. As the name implies they supply a constant heat output, and always require some type of thermostatic control. They are useful for many process temperature maintenance applications, as well as freeze protection.

**M.I. Cables.** These are factory-fabricated Mineral Insulated cables with a

metal sheath of Incoloy 825. The high watt densities available (up to 70 watts per foot) reduce the amount of cable required for snow melting, maintenance of high process temperatures or freeze protection. The Incoloy sheath is corrosion-resistant, and can withstand temperatures of up to 1400 degrees F.

Of course there are many other questions to consider: What voltages are available? How quickly will the cable be needed in the field? Which cable will have the lowest installed cost? Do we get Columbus Day off?

Obviously we can't cover every possible variable in one brief article. But there's only one thing you really need to remember to get the best system for your requirements--*Call A.E.F.!*



# Ask Dr. Science

Guest Columnist

*Dr. Ralph Science is an internationally known author, lecturer, and Notary Public. He is also the host of the popular PBS series "I Know More Than You Do".*

DEAR DR. SCIENCE:

*What exactly is a joule, and where did the word "joule" come from? A.W.*

DEAR A.W.:

A joule is the amount of energy required to pass an electric current of 1 amp through a 1 ohm resistance. The term "joule" comes from the English physicist, James P. Joule. He is one of many electrical pioneers whose names have become part of our electrical terminology, including among others, James Watt, Francis Volt, Mary Louise Amp, and Bob Transformer.

DEAR DR. SCIENCE:

*Is there any way to know I've got a problem with my heat tracing system before there's a failure? I'm responsible for a system with dozens*

*of circuits all over the plant. I've got MI cables, self-limiting cables, and constant-wattage cables, some of them over 200 feet long. No matter how I try to stay on top of things, the first indication I get of a problem is when my phone rings, usually around 2 o'clock in the morning. And now they tell me my maintenance budget is being cut again. There's got to be a better way. D.V.*

DEAR D.V.:

There is a better way. CM Monitoring Systems from Nelson Electric automatically monitor heater cables 24 hours a day without periodic observation, costly maintenance, monitor wire, or those pesky end-of-circuit lights. These CM Systems continually monitor controller and heater function, continuity, current, and voltage to tolerances you set, and they work with every type of heater cable you've got.

Nelson also has systems that go beyond monitoring to total control. Nelson has been in the electrical heat trace business longer than any other manufacturer, so why not give your Nelson rep a call to see how he can make your job a little easier.

*EDITOR'S NOTE: The Nelson rep in your area for the last 29 years has been A.E.F. Sales Engineering.*

*Got a question? Need help? Write to Dr. Science, c/o A.E.F. Sales Engineering Co., PO Box 295, Mamaroneck, N.Y. 10543.*

*Idealism increases in direct proportion to one's distance from the problem.*

*John Galsworthy*

*In the small hours of the night giants seem less unlikely.*

*J.R.R. Tolkien*

*It would be a swell world if everybody was as pleasant as the fellow who's trying to skin you.*

*Frank McKinley Hubbard*

*We learn from history that we do not learn from history.*

*G.W.F. Hegel*

*Most Congressmen are very human, if nothing else.*

*W.C. Fields*

*If fifty million people say a foolish thing, it is still a foolish thing.*

*Anatole France*

*You can't ask a pint to hold a quart; if it's holding a pint it's already doing the best it can.*

*V.I.N.C.E.N.T.*

*Placebos work.*

*Dooms Madigan*

## Rewinding Makes Sense

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and are likely to become even more important in the future. Rewinding generates far less scrap than purchasing a new unit does.

**Cost.** OK, we mentioned cost already. But saving 30% is important, isn't it?

**Big Mistake.** Choosing the wrong people to rewind your transformer could be a big mistake. Since the object of rewinding is to take an old transformer and make it "new", it stands to reason that a company that's going to do the job right should be judged by the same standards as a vendor that manufactures new transformers. A quality manufacturer of new transformers has the engineering staff, manufacturing expertise, and the integrity

and reliability you need.

This, as you may have suspected, is where Uptegraff comes in. Uptegraff has been building transformers for over sixty years. Its seventy employees build conventional and special transformers and reactors ranging in size up to 15,000 kVA, with voltages up to 115,000 volts, grounded wye.

And while other transformer builders have been merged and acquired and downsized and synergized, Uptegraff has continued its traditional role of being a dependable supplier of special transformers and reactors for all kinds of applications. That means there's always someone you can talk to, who can understand your problem, and help solve it.

For more information to use in deciding whether to rewind, give A.E.F. Sales a call.

# EPSI Builds (and Ships) Gigantic Powerhouse

Electrical Power Systems, Inc., of Tulsa, Oklahoma recently built what may be the World's Largest Powerhouse. Consisting of five main rooms (plus computer rooms) and weighing in at 195,000 pounds, the house was 61 feet long, 24 feet wide, and 13 feet high.

The five main rooms contained switchgear, control, main analyzer, hazardous analyzer, and distributive control systems. The four computer rooms alone required some 21,000 feet of wiring. Other special requirements included a redundant air conditioning system, a UPS with battery back-up, and non-glare lighting.

Getting this behemoth from Tulsa to Algeria in one piece was quite a challenge; in fact, getting it out of the plant was a challenge in itself, since the house was too wide to fit through the plant doors. EPSI had to design special panels for the factory wall to let the Powerhouse out without having to widen the overhead door.

From there it was a trip on a special trailer with 64 individually computer-controlled wheels, through downtown Tulsa, to Tulsa's Port of Catoosa (yes, Tulsa really has a port), and onto the barge that would take it across the Atlantic to Algeria.

Do you have a big, special-requirement job that somebody says can't be done?

## 4 Things Worth Knowing

- *The First Step Is A Doozey.* The simplest known single-cell organism contains a hundred billion atoms, and performs thousands of different chemical reactions simultaneously. Evolution anyone?
- *You Want It When?* With cold weather just ahead don't forget A.E.F. has a whole lot of heater cable and controls in stock in Mamaroneck. You can have it on the jobsite tomorrow.
- *You Can't Get There From Here Anymore.* The last men on the moon were Astronauts Eugene Cernan and Harrison Schmitt. They made their trip in December, 1972.
- *Crash!* A power outage lasting a split-second (hundreds of milliseconds actually), might cause a fluorescent tube to flicker. An outage of less than 20 milliseconds is sufficient to crash a network. Better get a Best Fortress UPS from A.E.F. Sales right away!

### **BEST POWER TECHNOLOGY**

(Authorized Reseller)

Ferrups Single Phase UPS to 18kva

### **LORTEC POWER SYSTEMS**

On-Line UPS to 225kva

Specialty Inverters

### **RAPID POWER TECHNOLOGIES**

Power Conditioners to 1000kva

Voltage Regulators to 1000kva

Isolation Transformers to 750kva

### **GLEASON REEL CORPORATION**

Cable and Hose Reels

Festoon Systems and PowerTrak

Workstations and Tool Balancers

### **MYRON ZUCKER, INC.**

Low Voltage Capacitors to 600 volts

Harmonic Traps

### **R.E. UPTGRAFF MANUFACTURING**

Liquid-Filled Transformers to 15mva

Subsurface, Load Center, Station Type

Rebuilding and Rewinding Services

### **CENTRAL MOLONEY**

Single Phase Transformers: Pole Type,

Padmounted, Vault, and Stepdown

Components: Bushings-Switches-Accessories

### **NELSON ELECTRIC HEATER PRODUCTS**

MI Cable for Pipe Tracing and Snowmelting

Self-Regulating Cable for Pipe Tracing

Thermostats

Controls and Monitoring Panels

### **ELECTRICAL POWER SYSTEMS INC.**

Switchgear and Motor Control to 15KV

Powerhouses: Special Purpose Buildings for

Distribution and Control

### **NEHRING ELECTRICAL WORKS**

(for Utilities Only)

Bare Copper and Aluminum Cable

Aluminum Clad Cable

### **NORBERG INDUSTRIES**

Silver Sand Current Limiting Fuses

Type R Motor Starting Fuses

Type E General Purpose Fuses