



Brain implant reader

## HAS A NEW FACE

In our last issue we discussed the “big picture” when it comes to electrical power from wireless power transmission to the smart grid. The pace of these changes might seem drastic, but they are nothing compared to what is happening on the other end of the electrical spectrum. Nanotechnology along with biotechnology has grown exponentially in the last few years. Perhaps the most visible use of these techniques are the prosthetic devices being developed and implemented for our wounded veterans. The complexity of the mechanical components is extraordinary, but electrical interface with the body’s nervous system supplying the electrical signals to have it function is equally amazing. Even recent manufacturing developments were rudimentary devices being quite limited due to the fact that the wearer had to use a difficult system of pulleys and levers to manipulate the prosthetic.

Addition of motors did not relieve the problems because wearers had to knowingly run each motor individually. Today’s robotic prosthetics are now reaching levels equivalent to human functionality and, most importantly, prosthetic users can now operate their limbs by mere thought alone. new technology can drastically improve accuracy of BCIs electrical signal. As well, development of electrodes which are covered in carbon nanotubes has decreased the likelihood of development of scar-tissue problems in the brain. Researchers have now successfully grown human-nerve cells into a functioning electric circuit that could become an access or barrier interface between the brain and the electronics in a prosthetic limb.

However, merely restoring the function of a damaged limb, etc. is one thing, enhancing that function is becoming quite another. For example, there is development going using an implant in a wrist that uses magnetic sensory information to sense items before touching them. This is similar to how sharks sense their surroundings.,

Over 30,000 people worldwide have deep-brain electrical stimulation implants, an implant for a technique where electrodes generate scripted pulses of electricity to produce specific neural firing patterns. These implants mainly serve to treat Parkinson’s disease, but companies are petitioning for government approval to use such devices to treat other conditions such as epilepsy, Tourette’s syndrome, pain, and depression. Today’s deep-brain implants download updated information wirelessly through the patient’s skull.

The brain computer interfaces are enabling not just repair or correction of a problems or defects. Cochlear implants are among such BCIs and have helped over one hundred thousand people who were once totally deaf to now hear. For application with the blind, neuroelectric implants in the eye or visual cortex can help to provide vision.

Today hip and joint replacements are as common as new dentures. Will these enhancements/repairs become the same? What if a baseball pitcher decides he needs a better or more precise pitching motion than he has now? Would a chip, etc. that makes him better be considered in the same category of PEDs? Whether it is for stemming a medical problem or enhancing a biological asset, will we be seeing a new group of “enhanced humans”? Will these new electro-bio-mechanical techniques become a plastic surgery of sorts. It sounds a little freaky, but we are not talking 50 years down the road, we are talking now!

Unintended consequences. Once again technology is just flying past convention, ethics and the court house. In many instances we have gone from handicapped to handicapable and now to enhancedcapable. A question central to the debates around human enhancement is how to determine whether a particular technology is restoring human function or enhancing that function.

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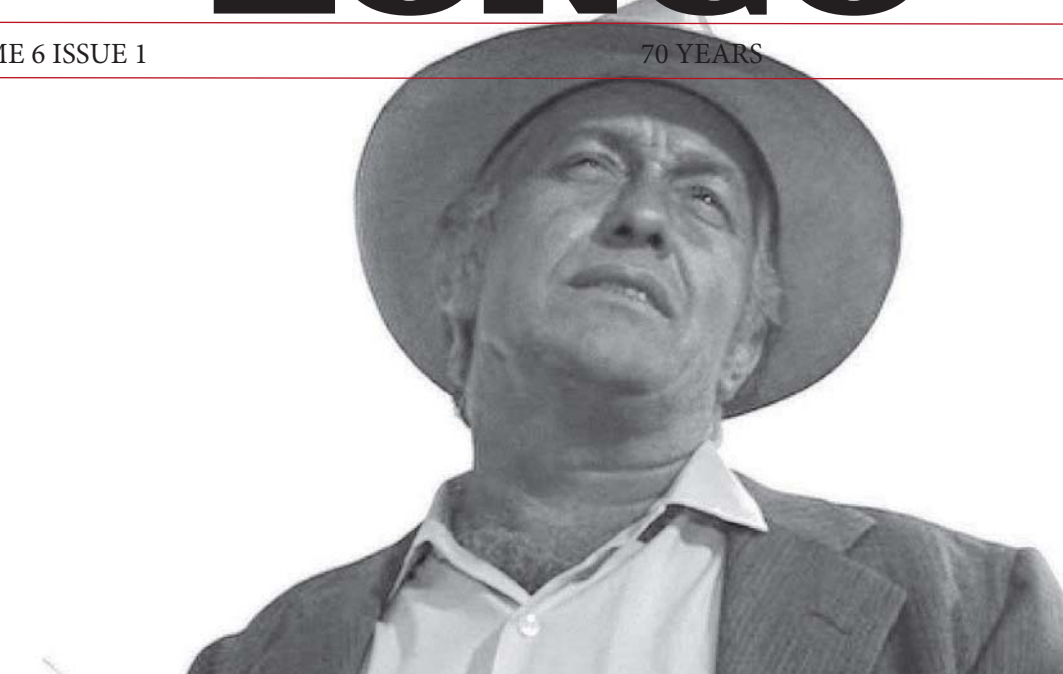
The Largest Independent Electrical-Mechanical Sales and Service Company in the Northeast

# THE LONGO LETTER

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70 YEARS

WINTER 2015



Strother Martin as the Captain in the movie Cool Hand Luke.

## What we have here is a failure...

of over communication. Email, voicemail, texts, apps, skype, go to meetings, phone calls, ad nauseum. Couldn’t live without it now. Fast, cryptic and essential. However, we were talking about the lack of face time, just sitting and talking with our customers without a timer in the background. Then someone pointed out that they actually have an app called “Face Time”! Argh.



Joseph M. Longo  
President

One on one you can have a conversation to discuss everything from the kids’ soccer games to details about a specific job. Not everything is intended for general public consumption, nor should it be.

A conversation, vs communication, can accomplish a lot from heading off a misunderstandings to learning how to work together better by understanding who we are. If you can see and understand body language, expressions and the tone of the conversation you can both come away ahead of the game. So this year myself and all the Longo sales

representatives will be taking time, when appropriate, to establish or re-establish contact with our customers by having a non-electronic conversation. Never know what might come up.

Another avenue of communication is taking action. To help our associates, particularly shop personnel, we are upgrading our facility.

Gradually over the years we accumulated stuff! Almost like ghosts in the shadows. Once we began to take a hard look at our shop and review how it functions we saw several ways to improve it. Old equipment, no longer used, was disposed of. Anything on the shop floor that was not an active job went into storage. A heavy dose of sweeping, cleaning, painting and new lighting made a big difference. Then with a somewhat clean canvas we reallocated space and work flow to be much more efficient. The impact of a fresh

work place and improved procedures has proven to be a real plus across the board.

Primed for an exciting 2015 we have been eager to see how the new budgets play out. With a fair number of changes in ownership and management, emergency repairs to planned replacements, it is a little bit all over the place.

That sort of plays into our “Line to Load” capabilities from fast and accurate PM analysis and NETA trained repair technicians to pull and replace. Now that we are all set, we are ready to really impress with our work.



Once the shop work is all complete we will look forward to showing it off, particularly to those of you who may have visited us in the past few years.

Service Through Knowledge™



[www.elongo.com](http://www.elongo.com)

We have been updating our website, so stop on by and see what is new and interesting!

How you can contact Longo...

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## SPORTS QUIZ

- Which of these franchises were originally named the Boston Redskins? a. Minnesota Vikings b. Green Bay Packers c. St. Louis Rams d. Washington Redskins
- Which two kicking brothers topped the 2000-point career mark collectively in the NFL careers first? a. Jan and Fran Stenerud b. Chris and Matt Bahr c. Bobby and Lou Groza d. Eddie and Rafael Septien
- Who was the first black head coach in the modern day NFL? a. Tom Flores b. James Harris c. Art Shell d. Barry Switzer
- What university did Super Bowl XLII MVP Eli Manning attend? a. Louisiana State University b. University of Mississippi c. University of Florida d. Florida State University
- What university did two-time Super Bowl MVP (XXXVI and XXXVIII) quarterback Tom Brady attend? a. University of Michigan b. University of Notre Dame c. Michigan State University d. Penn State University

1 d. 2. b. 3. c. 4. b. 5. c.





During, and for months after Sandy, this area, the Switchgear Lab of our Wharton Servicenter, was a chaotic mess. Our whole shop was over loaded. Switchgear units coming in, covered in who knows what, and the refurbished ones going back out. Only the incoming was stacking up faster than the outgoing. It was definitely tough on our technicians trying to maintain the pace of the repairs while keeping some sort of order to their work area. At the peak of the work flow, depending on what part of the 24 hour day, empty pizza boxes shared space with the dirty and broken switchgear waiting to be worked on.

Once the situation stabilized, we realized we needed a cleaner working environment that was good for the work and good for the technicians. Electrically we had everything we needed. The area also includes a lockable equipment/parts area to ensure equipment isn't borrowed when the lab would need it most. A work flow was established in the lab and we added a crane and better lighting to the whole area. Jobs coming in are better organized and the work area is clean and bright. The occasional search for missing parts no longer holds up jobs because there are no shadows for them to hide in.

There is a testing area, before and after repairs, a disassembly and reassembly area. Just outside the lab is a staging area for incoming switchgear so they do not clutter up the actual work area. The wide open entry to the lab (above) can be closed down with an overhead type closure to keep the lab's integrity should the activity in the main shop become a little too hectic.

If the work flow picks up unexpectedly we can tap into our cross trained technicians to handle the additional units. Having seen the overall effect in the lab, the main shop area in our Wharton Servicenter is undergoing a similar treatment with the same objectives.



During the height of the switchgear madness, thanks to Sandy, there was the need to balance speed and quality of our repairs. Both our Longo technicians and our support teams from across the country did one hell of a job.

## What goes on behind closed doors?



Given the right circumstances most of us could probably handle a particular job. Of course it depends on which side of the electrical or mechanical fence you are on. Equipment makes a difference too. Especially if you have to tell your customers, "I need to run back to the shop to get...(whatever)."

Over the years we have learned how to fit out our field service vans with damn well anything and everything the technicians could possibly need. Nothing worse than trying to do a job with the wrong tools. First of all it is just not safe, secondly something is bound to get broken, bent or just bugged up and end up useless. So the right tools in the right hands makes a big difference.

First each van is equipped with a host of safety items and equipment from simple first aid kits and hard hats to lockout tags and full face respirators. Then there are the array of drills, bars, come-alongs, jacks, pipe, cables, electrical testing components, etc. And lastly are the individual tools and equipment each technician prefers to have on hand. These can range from a particular type of shovel to a tap and die set. Overall fully equipped to most any electrical-mechanical situation.

Well trained, experienced and smart hands keep the jobs flowing smoothly and safely. Having run into "the result of unintended consequences" over the years our technicians work with confidence and a sense of anticipation. They are able to look through the job and see the various steps needed and the possibilities of something not going smoothly and not waiting until something happens to react.

Working hard is getting the job done right, safely, and on time. There are rabbits, there are tortoises and even some who run around like squirrels who lost their nuts. Technique aside, the work ethic is alive and well with our Field Service group.



## You can put lipstick on a...

Change is hard for some people to accept. The bigger the change and faster it comes at them, the more resistance there is. However sometimes there is no easy way, no gradual way to make a change to make it more palatable. Smart Meters are a case in point.

The automation of the grid is providing consumers with benefits they probably will never know about. For us in the northeast, outages are still a lingering fear. A damaged transformer, a downed line would send hundreds and thousands into the dark. People had to wait hours or days until the damage was found, then repaired and service gradually resumed. Now with the smart grid, operators can see the fault, isolate it and have unaffected consumers back up in seconds. Really amazing, but out of sight.

The Smart Meter seems to be the lynch pin in upgrading our grids. But, they are not invisible and they are not completely trusted by many. They have been installed in several areas around the country with varying degrees of acceptance and rejection. On the plus side they can and will provide valuable information on usage for utilities planning purposes. As an enticement to residents, the meters were supposed to provide a 30% reduction in their bills. Some complain their bills went up, a lot, not down. This may be where rates are determined by peak usage. In order to achieve those low rates consumers will be asked to have certain equipment (such as refrigerators or dish washers) in their house so it can be regulated and save power.

The privacy issue is another problem. While consumers applaud the utility providing help on reducing power usage, documenting their life style is unacceptable. The idea that the data would include how long you sit at your computer, what rooms you go in and out of and when is the problem.

Some smart meters have also caused fires, but it has been discovered that the cause is primarily poor installations. Putting these new units into old and often corroded sockets has created poor connections, shorts and fires.

Health issues are part of the picture as well. Electromagnetic impulses are thought to create brain tumors by weakening the immune system. Low sperm count and other problems are based on the impact of these pulses. It is similar to the cell phone/brain tumor issue that never seemed to be resolved one way or the other.

While the carrot approach of lower bills was not really working that well, the big stick came next. Those who refused to allow a smart meter to be installed were told that they would have their power cut off! Although there are no reports of this happening, it does raise the question of why the need to be so brutal about the whole thing.

A smarter and more realistic sales campaign will go a long way to assuage the consumers' concerns and ease the way for this important aspect of the new Smart Grid.



**Melting and fire starting smart meters raised concerns when they were introduced. Corroded or poorly cleaned recepticals seemed to be the culprit, not the meter itself.**



At one time any job outside of the tri-state area was something special. Today companies down through Maryland and Virginia call on Longo to handle motor, pump and control repairs.

Our most recent project was part of a major Virginia power plant outage. Two 1400 HP motors and a 53,450 GPM circulator pump. Having worked on many of these mega pumps there was nothing out of the ordinary. No surprises. Replaced bearings with customer supplied units, manufactured new top shaft, pump shaft, and new sand collar as well as new suction bell bearing, packing, and hardware. The motors did not require a rewind and were merely overhauled.

**The turn around time was 8 days from approval to completed repairs.**

One of the motors was completed first for the existing pump in Virginia and the second one competed and shipped just as the repaired pump was being completed. This was all done to fit into the customers' outage schedule and to have the motors and pump arrive in time for a smooth installation schedule.

One obvious item in the job is transporting the motors and pump up from Virginia to New Jersey and back again. By adapting one of our trucks to the size and shape of the equipment we eliminated one round trip.

Due the physical size of the pump, the decision was made to bring it all the way up to our Wharton, NJ facility vs. our Philadelphia area shop which normally handles our Mid-Atlantic customers.



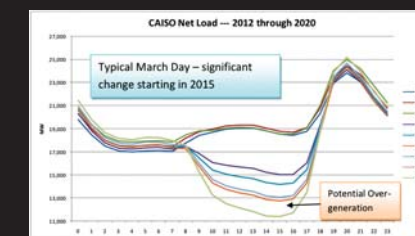
## It starts with the smart grid, but where does it end up?

sales, the growth of electric car ownership is and will continue to have an impact on electric power demand. However, there are predictions that while sales may increase, the development of new, more efficient batteries will mitigate the impact of the electric cars as far as the impact of recharging goes.

A lot of discussion has centered on monitoring the flow of power both in and outbound demand. With monitors on the transmission lines grid information will be instantaneous and that will be a big help to meet their target of maintaining consistency. To better understand the demand, and in some ways control it, the Smart Meter, as a replacement for the current meter, is seen as one solution. Either through its cable connection or wireless, the meter will supply information on real time usage. That would mean someone or some program would be able to adjust the power available to a specific customer to ensure the customer is working with the most efficient use of the power. Using the Smart Meter as an access point, the use of electrical appliances and tools in the household could be monitored and analyzed to determine patterns of use and of course adding this into the equation to determine demand. How much access the Smart Meter has and into what areas is a good subject for debate.

This all sounds interesting, but even those promoting this type of smart grid admit that the more data, the more monitoring and the more access points to information...the higher potential for hacking.

Moving forward, the smart grid will have to address the inconsistencies of power provided by many alternative sources such as wind, solar farms and even industrial/business/residential solar production. Although these new energy sources are growing, it will be a while until they actually supplant fossil fuel generated power. In the meantime, power companies have to learn to work with these power sources and their fluctuations, to be able to provide a consistent flow of power to their users.



In California they have "the duck", a graph of the incoming power and the demand. Obviously mid day with solar going gang busters along with wind the demand for fossil power is way down. Within a span of say two hours the renewables drop way off and the power plants have to make up the difference...quickly. While the growth of alternative energy is supposed to reduce the use of fossil fuels, the situation is perpetuating the life of the coal fired peaker generators. This is because they are still the best resource to quickly meet fluctuating demand. One area that may add some questions is the electric car. Based on current

Taking steps further down the road, it would seem that a fully programmed and monitored electrical system would be the prime candidate for artificial intelligence (AI). Anticipating all the incoming and demand would seem to be an ideal task for AI. Of course there is the debate over AI and whether it would be an asset controlling everyday electric power. It might be like having a conversation with HAL from 2001: A Space Odyssey. "Do you really need to use the coffee maker now?" or "The temperature of 58 degrees is perfect for my circuit boards, perhaps you should put on a sweater?"

It will be interesting as all these technologies converge and how the end result will be configured. If AI doesn't quite take over the planet to the detriment of us humans, there is always the Zombie Apocalypse to keep an eye on.