



LONGO
Electrical-Mechanical, Inc.

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THE LONGO LETTER

September 1999



by
Joseph J. Longo
President



LONGO . . . Your Integrated Supplier

It's becoming more difficult to write this column since there is so much happening here. The broad spectrum of equipment and services we now provide makes that so. Consider with me the electrical-mechanical system in *your* facility. The power companies provide the power and, from there, you are on your own (almost).

Longo is supportive in your entire system from that point onward—the lines, switches, transformers, relays, instruments, overcurrent devices, motor control centers, motors, and most of the driven equipment. Included are fans, blowers, pumps, gearing and related hardware. Services offered are testing, maintenance, repair, and sales.

All this happened because our valued customers encouraged us to expand from *just motors*. Doing all of this is easier said than done, and requires a staff having broad experience. We have, through good planning, recruiting, and *luck*, been able to accomplish this. It is a great group of learned and dedicated team players that make it possible, especially when we need to be able to do so 24 hours a day, 7 days a week.

Our website has been upgraded and will be maintained with relevant technical

information to keep you up to speed on a variety of issues. Visit us at our web site:

www.longo-ind.com

Relationships with noted manufacturers are very strong and they encourage us to expand. A unique arrangement with Cutler-Hammer makes available to you just about their entire line. Recall that they acquired the Westinghouse power apparatus group, and all of that is now included in our offerings.

Reliance Electric has been one of our long-standing vendors. Now, we can supply Reliance parts, a significant addition.

Fairbanks-Morse, another flagship name, has appointed Longo as an Authorized Fairbanks-Morse Submersible Motor Repair Facility for the Metropolitan New York and New Jersey areas. This is most timely, since we now have in-house capability to load test these pumps to verify their performance and print a curve to assure users of the performance. *We have taken the lead again!*

Reports are being automated to facilitate timely preparation and delivery. Today, people want information about their



Pump performance testing & documentation
...an integral part of a quality rebuild.

work and they want it now! We are working very hard on getting to that objective, which will further the value provided. . . . something you have become accustomed to when dealing with Longo.

The brief photo case history of a turn-key job—replacing a 7000 kva transformer on a very short time line (on pages 2 and 3)—gives you an idea of the present scope of our activities. Page 4

addresses the maintaining of efficiency when rewinding *your* electric motors.

There are a number of vital things that can be done to assure you that your motor, after rewinding, is performing at the same efficiency or better. The Longo regimen, albeit rigorous and time-consuming, provides that assurance. **All rewinds are not equal!** Savings between vendors by as much as 20-25% may *not* be a bargain. Recall the famous saying: *"There is no free lunch."*

When you assess all of this, you come to only one conclusion:

LONGO . . . from-line-to-load!

Transformer Replacement 7000 KVA 69,000/5000 V ... a turnkey job for **LONGO**



Old unit being staged for removal



Old unit being removed



Loading old unit



Testing the breaker



Project manager reviews details



*LONGO project manager gives a thumbs-up
... a job well done!*

Turnkey projects encompass a wide variety of assignments. The Longo team has broad experience in handling most of them.

From changing a 7000 KVA 69/5KV transformer with a very tight time line at a manufacturing plant to designing systems for water pumping or air flow. Converting inefficient eddy-current drives to cost-effective modern energy-efficient drives is another viable opportunity.

As utility deregulation grows, monitoring, maintaining, and making the most of our electrical power systems is more critical than ever. Power quality is an issue we have taken for granted in the past, but with the proliferation of computers and additional electronics, the need to monitor our power quality is an increasing concern. We have the know-how and equipment to measure each element related to power quality including harmonics, voltage variations, et al.

Engineers having broadly diverse experiences have joined the Longo team to allow us to better service your needs. Their backgrounds include power engineering design for IBM; power apparatus design, application and installation for GPU; and pumping system design, application, and servicing of variable frequency drives and controls for a major design firm.

These additions, together with the vast experiences of our already-in-place team, facilitate our ability to provide a vast array of services from the incoming lines (utility) through and to the driven equipment.

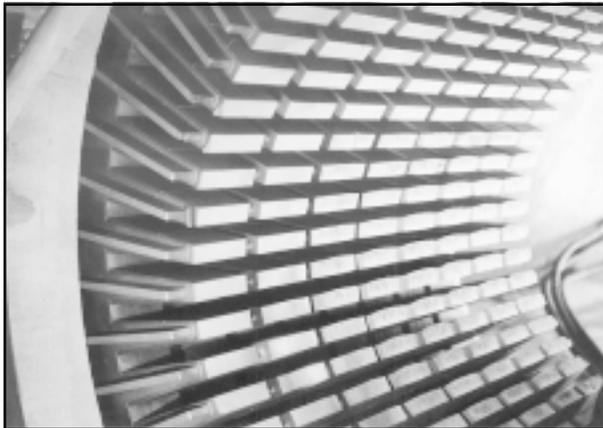
LONGO ... *The Source!*

LONGO ... *Your Resource!*

Maintaining Motor Efficiency During the Rewind Process



Of the five categories of motor losses, there are three types that may be directly affected by repair methods. These are the stator copper (I^2R) losses, core iron losses, and bearing friction. The stator winding losses and core losses are the main source of increased losses, respectively, for rewind motors. Bearing friction losses have been found to be the primary cause of increased losses for motor repairs not involving a rewind. The two types of losses that would normally not be affected by repairs are rotor cage losses and “stray load” losses. The rotor cage, actually a winding consisting of bars and end rings, is rarely altered during rebuilding. Stray load losses is a term for those losses that cannot otherwise be accounted for.



The primary reason for potentially higher stator copper losses is an increase in the resistance of the winding. The root causes for this increase can be the use of a smaller cross-sectional area of wire, increasing the number of turns in the coils, and/or increasing the distance that coils extend from the stator core. The proper way for a rebuilder to address stator winding losses is to put back into the motor the exact size of winding that was removed. At Longo, we use computer programs developed by our engineering staff to verify data on every rewind. Changes, if any, must be approved by a staff professional engineer.

Stator core losses may be changed due to the winding removal process. Most often the failed windings are “pyrolyzed” to facilitate removal, that is, heated to the

point where insulation physically breaks down. This process breaks down the chemical bonds that act to glue the winding wires to each other and to the core. Breaking these bonds allows the coils to be removed without physically damaging or distorting the stator core iron. The core itself is made up of laminated steel disks that are insulated from each other by a very thin coating of what is termed “core plate.” The plating process enables the core to handle alternating current magnetization without overheating. Should the pyrolyzing process become too hot, it can damage the core plate insulation—even destroy it. Therefore, damage to the core or its insulation results in increased losses.

We use quality controls that can prevent, or, at least identify, core degradation. Our ovens have tight temperature control set at the minimum temperature needed to pyrolyze a winding. Core quality is measured prior to and following winding removal by means of a core loss test. This test magnetizes the core to a specific value, then measurements are made of the core temperature and watts loss. Core quality and core loss are maintained if the temperature and wattage are the same before and after pyrolyzing. The pass-fail criteria for these core tests was developed by our engineers, from statistical analysis of over 1000 core tests performed in Longo facilities.

The value of a core test is evident in the accompanying photograph, taken during an actual core test. The area with the bright glow had no physical evidence of a fault when viewed with the naked eye. Our goals in rewinding include maintaining efficiency, improving it where possible, and increasing reliability of the motor as a whole.

An efficiency change of 3 percent on a 50 hp motor could add \$42.08 per month if operated one-half of the time at an 8-1/2 cent per kilowatt-hour electric rate. That is \$505 per year. . . . Wow!

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SPORTS QUIZ

1. What NHL Original six team has won the fewest Stanley Cups?
2. Who holds the National League record for the most saves in one season?
3. What uniform number did Mike Piazza wear as a rookie in spring training with the Dodgers in 1992?
4. What NFL stadium has the largest capacity?

ANSWERS:

1. The Blackhawks, who have won three (1934, 1938, 1961)
2. Randy Myers had 53 saves for the Cubs in 1993
3. Piazza wore #60
4. The Pontiac Silverdome (80,365)

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