



MAINTENANCE "MATTERS"

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Thank You

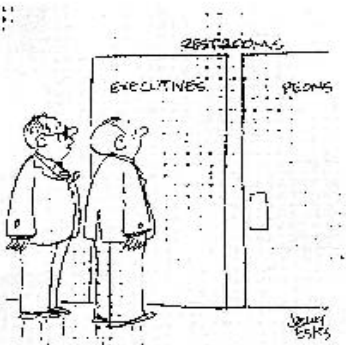
Thank you once again for the positive response we received from the first six issues of this newsletter. We would appreciate any comments and ideas to make this newsletter more informative and interesting. Please contact me at rsaxton@lloydelectric.net

OUR STRENGTH IS OUR PEOPLE

Wayne Elmore



Wayne is our CFO "The Bean Counter". The person responsible for all the necessary behind the scene paperwork and other office activities including financial that is required of a successful business. For the last 28 years he has been a key factor in Lloyd Electric's longevity and integrity



"I think someone needs a little sensitivity training"

Downtime Causes and solutions.

Maximizing machinery **Uptime** is the key to the financial success of most industrial operations.

Necessary **Acceptable Downtime** is required for some situations these include machine set-up and maintenance.

The infamous **Unscheduled Downtime** is caused by various situations. These include, among others; Machine failure or breakdown, material unavailability, operator absences and rework. Each cause must be investigated to get to the root of the problem.

Of all the acceptable downtime situations Maintenance is probably the most complex issue. A certain amount of maintenance downtime is essential to keep a machine running and to avoid unscheduled downtime and the possibility of catastrophic machine failure. To gain the required downtime it is essential that the people responsible for production are cognoscente of the need for preventative maintenance and understand the scheduling of machine downtime to do this is in their best interest and not a nuisance factor

If that necessary maintenance is done on a scheduled basis in a preventative manner machine time is maximized.

One aspect of proper maintenance entails the detailed tracking of the age of critical components and their useful lives. At some point, a machines age may make these costly occurrences inevitable and their replacement unavoidable.

Another reason for proper scheduled downtime is to monitor the integrity of rotating equipment on a regular basis. Mechanically this can be done using vibration analysis and ultrasonic acoustic detection. Electric motors and electrical connections can be monitored using infrared thermography and MCE technology among others.

The most disruptive and costly type of **Downtime** is that arising from sudden machine breakdown. This disruption usually effects not only the machine in question but the total plant operations.

It is a proven fact that proper predictive and preventive maintenance can and does reduce unscheduled downtime and eliminates most catastrophic failures. **Maintenance should no longer be considered a cost center but be heralded as a profit center if it is allowed to be done in a proper professional way**

MCE Testing with the PdMA technology



In previous newsletters I have covered most of the accepted first line PPM technologies. This time I am want cover the specific off-line testing of motors using the PdMA MCE technology. It tests the following parameters.

Resistance-to-Ground Measures the resistance of all conductors to ground. All readings are temperature corrected and standardized to ensure precise trending of insulation condition.

Capacitance-to-Ground. This parameter capitalizes on the natural capacitance of the motor and circuit to trend dirt and moisture build-up on the insulation. It is utilized, in combination with the resistance-to-ground measurements, to determine overall insulation conditions.



Phase Resistance. Extremely accurate phase-to-phase resistance values on the micro-ohm level are recorded to determine the quality of connections in the circuit and motor itself. An unbalance figure is then calculated for ease of interpretation and trending. Stator faults, both turn-to-turn and phase-to-phase, may be detected using these parameters.

Phase Induction. Phase-to-phase inductance parameters are collected and an imbalance calculated to determine, rotor, stator and air gap health. Higher or escalating imbalances indicate the presence of an anomaly. Additionally, these parameters can be beneficial in identifying faulty capacitors within the circuit.

Polarization Index (PI). The Polarization Index (PI) is recorded as a ratio and is calculated using ohmic readings at 10 minutes compared to the reading recorded at 1minute.

Rotor Influence Check (RIC). The collected parameters are sensitive enough to detect excessive porosity in cast rotors, cracked or broken rotor bars, and other defective conditions.

All These tests can be carried out on-site with the motor coupled but not energised. This is also a great Quality Control Tool when you have a motor overhauled or repaired. Ask your repair vender to provide you with a copy of the MCE report for your motor history records when he delivers the motor back to you.