The Five Pillars of ABB Motor Performance Management
In today’s increasingly competitive market, manufacturers face increased cost pressure from margin erosion, limited resources, and persistent efficiency improvement demands from stakeholders. Many executives have recognized that in order to survive they must focus on their core business and find partners to assume responsibility for processes not directly related to their core.

The Five Pillars of ABB Motor Performance Management

1 Condition Monitoring
2 Servicing
3 Managing Workshops
4 Clean Environment
5 Energy Savings

Pillar 1: Condition Monitoring
Condition monitoring, which leads to predictive maintenance, is often limited to vibration and temperature (thermographic) monitoring. Although these methods are valuable, electrical monitoring is often ignored. This omission precludes identification of the root cause of motor failures and ignores monitoring key aspects affecting motor performance (drive issues, phase fluctuations etc). In fact, we frequently see plants change motors without identifying the true root cause of the problem. This is an ineffective approach because if, for instance, there was a voltage imbalance or a drive problem, the motor that was changed will fail prematurely just as the previous one.

As the world’s largest manufacturer of motors as well as many of the products around the motor, ABB conducts much research and development on the impact various products and aspects have on motors. ABB uses its proprietary condition monitoring system, Argus™, to electrically monitor motors, thus providing a total condition monitoring program.

Pillar 2: Servicing
The servicing of motors through a well-designed preventive maintenance program is essential to optimal motor performance. One aspect of motor servicing is a well-managed lubrication program. The lubrication program must include a time-based route, identifying which lubricant to use with which

Motor Performance Management leverages electrical motor monitoring to capture fluctuations in motor efficiency and identify the true root cause of motor failure.
motor, and the amount to use (over-lubricating motors can be as harmful as not lubricating them). Based on our experience, most plants execute too many preventive maintenance (PM) activities that are ineffective at preventing and detecting failure. Furthermore, many plants have redundant PM activities which prevent plants from focusing on activities that effectively reduce cost and assure reliability.

To ensure optimal servicing of motors, ABB uses a proprietary system, the Comprehensive Motor Information System™ (C-MIS), to establish, execute and track the preventive maintenance program for motors. C-MIS can feed legacy Computerized Maintenance Management System if required to provide financial information.

**Pillar 3: Managing Workshops**

In today’s world, few industrial facilities maintain their own motor repair shops. Most motors are sent out for rewinding, overhauls and repairs. Management of repair shops is crucial; if not done properly, quality, availability and cost are adversely affected. ABB has owned and managed hundreds of motor repair shops around the world. We therefore have good benchmarks for how much each motor should cost to repair, overhaul and rewind. Quality repairs are ensured by supplying the vendors with specifications and standards, and by performing audits of their processes and facilities.

In fact, too often, organizations spend too much and are taken advantage of simply because they don’t know how much motor repair or rewinding should cost. As a result, many organizations are eroding their margins while knowledgeable organizations are winning market share. Other organizations are cost conscious, but attempt to improve through squeezing suppliers to reduce prices. In our experience, this tactic is rarely successful as suppliers simply reduce scope of work and as a result organizations accomplish less.

ABB realizes these issues and that’s why our objective when performing audits is improving the suppliers’ service, not identifying problems (although problem-finding is inherent in audits). Availability is increased by tracking turn-around times (also done with C-MIS) and ensuring that spares in inventory provide for this. Repair costs are related to specifications and standards (ABB maintains an extensive database of motor repair specification/standards), and long-term agreements which can also lead to cost benefits by leveraging volume and revenue predictability. Motor Performance Management’s on-site technicians and back-office contracts personnel have a well-defined process for working with motor repair shops, and successful relations are the norm.

**Pillar 4: Clean Environment**

Equipment performs better (and lasts longer) when operating in a clean environment. Motors are particularly vulnerable to contaminants; after all, they’re electro-mechanical, constantly rotating and almost always in use. While in most plants, particularly in heavy industry, it’s difficult to maintain a completely clean environment; incremental cleanliness improvements can be made.

We believe cleaning motors should be standard practice, as should be analysis of whether improving motor environments (by, for example, enclosing a motor) will provide a positive return on investment solely in reduced maintenance costs. One way Motor Performance Management helps ensure cleanliness is instilling ABB’s 5S program.

**Pillar 5: Energy Savings**

Properly maintaining motors quite often results in less energy consumption, but much more should be done. Ensuring that motors are properly sized to their duty pays big dividends, and if replacement of oversized motors is accomplished when the motor fails or its repair costs are no longer justifiable, little if any capital costs are incurred. More energy-efficient motors should also be considered when replacing motors. In any case, life cycle cost analysis should be performed.

In our experience, companies can reduce energy costs by 3-5% with better motor management. Motor Performance Management leverages ABB’s energy expertise to help achieve energy cost savings.

**Conclusion**

ABB’s Motor Performance Management reduces cost and improves motor performance by instilling effective motor condition monitoring; improved motor servicing; successful management of motor workshops; implementing a clean work environment; and achieving energy savings.
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