



Motor Management Survey Form

None of your data will be shared with any other firm, for any reason. Survey results are confidential but may be part of a compiled set of findings without any reference to the companies that responded. Use of the material and information provided is at the risk of the person submitting the information who agrees to hold SBD, it's employees, and all associates harmless for any reason.

For your free evaluation of your Motor Management Program, please fill out this cover sheet and the attached questionnaire then email or fax it to the contact information below. Your score for each topic will be provided.

NAME: _____

Company: _____

Industry: _____

Address: _____

City/State/Zip: _____

Country: _____

Phone: _____ **Fax:** _____

Email: _____

Comments: _____

Fax To: 860 577-8537

Email To: Info@motordoc.net

Electrical Maintenance

1. Drawings (Check all that apply)
 - a. Do updated as-built drawings exist and are they available? _____
 - b. Are all relevant equipment instruction manuals available? _____
 - c. Is there a process in place that ensures the manuals and drawings are maintained in a current condition? _____

2. Maintenance (Check all that apply)
 - a. Is there a documented program and does it have a valid basis (ie: RCM)? _____
 - b. Is the program being vigorously followed? _____
 - c. Is there a procedure in place that updates the program based on changes to plant equipment or processes (ie: MER)? _____
 - d. Does the program identify critical equipment? _____
 - e. Are there adequate work control procedures that prevent mistakes when work is done on critical systems and equipment? _____
 - f. Does system design provide redundancy so all critical equipment can be maintained without a shutdown? _____
 - g. Does the program ensure that maintenance test results are trended and used to update and improve the maintenance program? _____
 - h. Is there a program in place that ensures periodic evaluation of possible equipment replacement considering maintenance data trends, availability of replacement parts and unplanned shutdown costs? _____

3. Training Program (Check all that apply)
 - a. Is there a formal technical training program in place? _____
 - b. Do training records exist? _____
 - c. Is there a process in place that ensures training records are maintained in an up-to-date condition? _____
 - d. Is there a process in place that identifies and arranges for needed training? _____
 - e. Is there a process in place that ensures the training program is periodically reviewed to identify needed changes? _____
 - f. Is there a process in place that ensures personnel have the proper test/monitoring equipment and that it's periodically calibrated? _____

4. Arc Flash and PPE (Check all that apply)
 - a. Has an arc-flash study been performed and are specific PPE requirements posted at each panel, switchgear, etc? _____
 - b. Is there a process in place to ensure studies and PPE requirements are updated when system or utility supply changes are made? _____

5. Load and Power Quality (Check all that apply)
 - a. Is there a load monitoring program in place? _____
 - b. Is there a power quality monitoring program in place? _____
 - c. Is there a process in place that takes appropriate action when overloads or power quality problems develop? _____

6. Root-Cause-Analysis (Check all that apply)
 - a. Is there a program in place that ensures equipment failures, unplanned outages and unusual events are investigated to determine root-cause? _____
 - b. Is there a process in place that ensures root-cause information is used to effectively improve operations, facility design, maintenance procedures, and personnel training programs to avoid or minimize future unplanned outages? _____

7. Electrical-Safe Work Procedures (Check all that apply)
 - a. Are electrical work procedures included in the safety manual? _____
 - b. Is there a formal and active program for updating the safety manual? _____
 - c. Are accidents and near-misses documented and is there a process in place that ensures actions will be taken to update procedures or take other corrective actions? _____
 - d. Are workers trained on safety manual procedures? _____
 - e. Do workers comply with manual procedures? _____
 - f. Is there a periodic audit of workers to confirm compliance with safety manual procedures? _____

8. Do electrical maintenance personnel have an emergency repair plan that identifies or lists the critical equipment?
 - a. Yes _____
 - b. No _____

Motor and Driven Equipment Selection

1. Which statement describes your company's approach to electric motor repair versus replacement? (Select one)
 - a. Motors are repaired versus replaced based upon the urgency of the reactive failure. _____
 - b. It is usually left up to the maintenance person to decide on action. _____
 - c. A repair versus replace decision is made before a motor is repaired using a tool such as MotorMaster Plus. _____
 - d. A review of motors over a specific size is performed, as well as motors in critical machines. The review covers condition, the load and life-cycle cost analysis. Where it makes economical and reliability sense, operating motors are replaced prior to failure. When a motor fails, maintenance reviews the pre-made decisions. _____

2. When the company makes purchasing decisions about electric motors and driven equipment what does it consider? (Check all that apply)
 - a. Purchase price _____
 - b. Availability _____
 - c. Operating efficiency _____
 - d. Motor design _____
 - e. Estimated operating costs _____
 - f. Installation costs _____
 - g. Supplier support and backup _____

3. What financial analysis method does your company use to select equipment? (Select one)
 - a. Life cycle costing based on cash flow _____
 - b. Simple payback analysis _____
 - c. Compare purchase price _____

4. How are motors sized? (Select one)
 - a. The operating speed and frame size _____
 - b. Motors are sized to operate near 100% of their rated load considering starting requirements _____
 - c. Motors are sized to operate newar their optimum efficiency point considering starting requirements _____

5. Does your company select premium efficient motors when possible?
 - a. Yes _____
 - b. No _____

6. Does your company take into account speed changes when replacing motors with different models or brands, especially on centrifugal loads such as pumps, fans or compressors?
 - a. Yes _____
 - b. No _____

Commissioning

1. Which statement best describes your company's commissioning program: (Select one)
 - a. Attitudes vary depending on the personalities involved. _____
 - b. Operations apply pressure to get the plant operational. New and repaired equipment is made available as soon as possible. _____
 - c. Executives, operations and maintenance are all aware that commissioning will determine the equipment life, reliability, product quality and throughput. Commissioning is performed by appropriate reliability and maintenance staff and equipment is checked to ensure that it meets the design and manufacturers' specifications and the results are documented. _____

2. Which of the following tests does your company normally perform during plant or equipment commissioning? (Select all that apply)
 - a. Check that machine alignment is within specification using appropriate calibrated equipment. _____
 - b. Check that both the motor and the driven equipment are properly shimmed, bolted down and soft foot is mitigated. _____
 - c. Check that vibration levels are within the standards or specifications of the equipment. _____
 - d. Use motor diagnostics to ensure that motor load is appropriate for the application. _____
 - e. Use motor diagnostics to ensure that the electrical and mechanical condition of the equipment is acceptable. _____
 - f. All settings and controls are operating as designed, including variable frequency drive settings, and that such settings are logged for later reference. _____
 - g. Confirm whether or not the bearings are greaseable and that lubrication systems are functioning (oil or grease). _____
 - h. Check that the operating environment is suitable. _____

3. Which of the following statements best describes your company's approach to machine setup: (Select one)
 - a. It does not matter as long as the machine runs _____
 - b. Rely upon manufacturers, vendors or contractors to set up _____
 - c. Competent company personnel ensure machines are set up properly _____
 - d. There is a commissioning audit with checklists and procedures to ensure each machine is set up according to manufacturers and corporate instructions _____

4. Which of the following methods best describe your company's practice of commissioning V-belt drives? (Select one)
 - a. There are no V-belts on any equipment _____
 - b. It varies from person to person _____
 - c. Sheave alignment is checked and belts are tensioned with a belt tensioning device _____
 - d. Sheave alignment and belt tension are checked to ensure that they are within the machine requirement (not belt limits) using alignment and tensioning tools. The tension is checked after 24 hours of operation. A label is placed on the equipment showing the proper belt tension limits. _____

5. How is commissioning data recorded at the company? (Select one)

a. No records are kept _____

b. Basic notes are recorded on the machine maintenance logbook or CMMS system

c. _____
Comprehensive forms are completed for future reference and include all measurements and findings _____

Operations and Maintenance

1. When are machine components typically replaced in your company? (Select one)
 - a. When components fail _____
 - b. When scheduled as part of our planned preventive maintenance program _____
 - c. According to a schedule that is determined by condition monitoring and some preventive replacement based upon a program such as RCM _____
 - d. When the condition-based monitoring program warns there is a risk of failure in critical equipment _____

2. What areas of training and evaluation have the average maintenance personnel completed within the past five years at your company (Select all that apply)
 - a. None _____
 - b. Company orientation _____
 - c. Basic bearing fitting course _____
 - d. Bearing failure analysis course _____
 - e. Machine set up and alignment course _____
 - f. Machine monitoring and condition assessment _____
 - g. Maintenance record keeping _____

3. What does your company generally do with failed bearings? (Select one)
 - a. Replace the bearings as quickly as possible to get machines running and dispose of the failed bearings as part of clean up _____
 - b. Check that the bearing type is the one specified for the application before replacing it _____
 - c. Inspect the failed bearings for obvious signs of failure _____
 - d. Trained personnel (internal or external) examine failed bearings from critical equipment to determine the cause of failure. Record the analysis and, if necessary, perform root cause analysis and rectify problems. _____

4. Which of the following best describes your company's approach to alignment? (Select one)
 - a. We use flexible couplings so alignment is not critical _____
 - b. Most of our machinery is aligned before installation it is just bolted down _____
 - c. Each technician has his/her own approach and handles alignment in their preferred way _____
 - d. Straight edge and feeler gages _____
 - e. Good alignment is fundamental to machine reliability. Laser or dial indicator methods are used by trained personnel. _____

5. Which of the following best describes the lubrication of machinery at the company (Select one)
 - a. Lubrication is not a high priority at our plant _____
 - b. Each production area looks after the lubrication of their own machinery according to their own schedule _____
 - c. Lubrication is given a high priority, it is conducted based on a schedule determined as part of the maintenance program process, such as RCM _____

6. Which of the following equipment is available to the company maintenance technicians?
(Select all that apply)
- a. Bearing pullers _____
 - b. Bearing mounting kits appropriate for the type of bearings used _____
 - c. Motor circuit analysis _____
 - d. Electrical signature analysis _____
 - e. Vibration analysis _____
 - f. Laser alignment equipment _____
 - g. Other condition-based monitoring technologies _____
7. Which of the following activities form part of the company's condition-based maintenance program? (Select all that apply)
- a. Inspection of machines for abnormal conditions, vibration, temperature, noise or smell _____
 - b. Oil and/or grease analysis _____
 - c. Infrared thermography _____
 - d. Vibration analysis _____
 - e. Electrical motor diagnostics _____
 - f. Other technologies _____

Electric Motor Repair

1. What best describes the company's electric motor repair or replace policy? (Select all that apply)
 - a. No policy exists _____
 - b. The policy includes a motor break even chart. Motors below a specific size are usually replaced and not repaired _____
 - c. The policy includes a financial evaluation of each option _____
 - d. The policy includes an assessment prior to failure to check if in the event of a failure that repair or replacement is the best option _____

2. Does the company have a motor repair specification that is shared with the motor repair vendor(s)? (Select all that apply)
 - a. No _____
 - b. It specifies a schedule of relevant standards _____
 - c. Requirements for root-cause reporting _____
 - d. Requirements for winding removal _____
 - e. Requirements for rewind and overhaul _____
 - f. Requirements for mechanical repair and overhaul _____
 - g. Condition verification testing requirements _____

3. Is the repair vendor capable of performing reliable repairs? (Select all that apply)
 - a. Not sure _____
 - b. Has a recognized quality control program (ISO/EASA) _____
 - c. Follows regular calibration intervals of testing equipment and properly sized testing and handling equipment _____
 - d. Controlled winding removal processes, including temperature control and suppression and verification of core losses _____
 - e. Capabilities to repair to at least the original manufacturer's specifications _____
 - f. Power supplies appropriate to the operation of the equipment that the company will send to the vendor _____
 - g. Well trained staff, a clean work environment and well kept repair records _____

4. Does the company receive a complete report for each repaired motor? (Select all that apply)
 - a. No _____
 - b. Condition of the motor on arrival _____
 - c. Detailed description of the work performed _____
 - d. Schedule of the materials replaced _____
 - e. Condition of the motor on return _____
 - f. Test data per the specification _____

Plant Inventory and Records

1. Does the company maintain motor inventory and maintenance history for both in-service and spare motors?
 - a. Yes _____
 - b. No _____

2. What information is tracked on motor records? (Select all that apply)
 - a. Nameplate data _____
 - b. Location of the motor _____
 - c. Loading, efficiency and operating hours _____
 - d. Starting requirements _____
 - e. Scheduled maintenance records _____
 - f. Service history, including age and number of repairs/rewinds _____

3. Does the company maintain plant inventory and maintenance history for all critical machinery?
 - a. Yes _____
 - b. No _____

4. What information is kept on company equipment inventory records? (Select all that apply)
 - a. Commissioning data and supplier contact _____
 - b. Bearing information _____
 - c. Rotor bars and stator slot information _____
 - d. Lubrication requirements _____
 - e. Scheduled maintenance history _____
 - f. Service history _____
 - g. Condition monitoring history _____

5. Are company inventories and manuals regularly updated, available to all staff and used by the maintenance staff?
 - a. Yes _____
 - b. No _____

6. The motor storage policy includes the following: (Select all that apply)
 - a. There is not policy _____
 - b. Motors are stored in an environment that is above dew point and away from heavy traffic and machinery that would cause excessive vibration _____
 - c. Heaters are used where appropriate _____
 - d. Motors are covered and dessicant is used _____
 - e. Motor shafts are turned at least quarterly _____
 - f. Motors are stored Visual and condition based tests are periodically performed on stored motors _____
 - g. A process is in place where warranty time does not start until the motor is put into service _____

Utility Management

1. Which statement best describes the level of awareness of utility use and cost throughout your company? (Select all that apply)
 - a. The company accountant knows the use and cost _____
 - b. Management is regularly updated on utility use and cost and relate these to production figures _____
 - c. Each production supervisor knows the utility use and cost for his/her area _____
 - d. Every employee knows the utility use and cost for his/her production area _____
 - e. Every employee knows the utility use and cost for his/her area and has input into energy saving opportunities _____

2. Which statement best describes the level of support and commitment your top management has to optimizing utility use? (Select one)
 - a. Top management is not interested but occasionally complain about high costs _____
 - b. Top management is willing to listen but rarely takes action _____
 - c. Top management is openly enthusiastic about utility management and is willing to invest in financially attractive opportunities _____

3. Which statement best describes the availability of resources (time and money) for utility management in the company? (Select one)
 - a. No extra time or money is allocated for utility management _____
 - b. Time is allocated to discuss utility management at meetings and employees have time to ensure efficient utility use _____
 - c. Management takes time to hear employee recommendations on improved utility management and sometimes these ideas are acted upon _____
 - d. A utility manager is assigned and has management support to co-opt employee assistance when required. There is a budget available for evaluation of suitable projects _____

4. Which of the following statements best describes how utility management projects are evaluated in the company? (Select one)
 - a. There is no formal evaluation process, but management will pursue if they like it _____
 - b. Projects have to meet a simple payback hurdle _____
 - c. Projects are evaluated using cash flow techniques. If a project shows an acceptable return on investment and look at all financial options to assist it to proceed _____