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Pump and Motor Preventative Maintenance Program

Thank you for this opportunity to provide your facility with a proactive Preventative Maintenance Program.

As the demands on in-house manpower increase, "do more with less" mentality, we are finding pumps and motors failing at alarming rates. The root cause for the increase has been simply the lack of or contamination of lubricants. Thousands of dollars are spent to repair equipment, which if properly lubricated and maintained would provide years of service.

Metro Pumps will Provide the Following Services:

- Meet with you and/or your staff to determine your needs and goals
- Complete an equipment survey using existing machinery records and a plant walk through
- Identify critical and non-critical equipment for the facility
- Conduct a needs assessment for all equipment involved
- Determine immediate repairs required prior to the start of the preventative maintenance program
- Design a program that meets the OEM's recommendations for maintenance

The Following is an Example of the Work to be Performed to a Pump and Motor During a Preventative Maintenance Visit:

- Lock and tag out equipment
- Record equipment data
- Check all mounting and flange bolts to insure proper torque
- Check equipment base for soundness
- Visual inspection of pump grout for soundness
- Check for mechanical seal leaks
- Check condition of oil and grease seals
- Check packing for excessive leakage and adjust and/or replace
- Make sure all gauges are operational
- Remove coupling guard, check alignment and correct as required
- Lubricate coupling assembly as required
- Lubricate pump and motor
- Change oil on equipment as recommended by OEM
- Ensure all auxiliary equipment is functioning properly
- Put the unit into service, check bearing temperatures, listen and record any mechanical or hydraulic noise
- Make note on the field report of any findings that may require additional work



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Each preventative maintenance program is designed to meet the customer's requirements. We will work with you to ensure an economical solution to your maintenance issues.

Pump Maintenance Checklist

Description	Comment	Maintenance Frequency			
		Daily	Weekly	Monthly	Annually
Pump use and sequencing	Turn off or sequence unnecessary motors.	X			
Overall visual inspection	Complete overall visual inspection to be sure all equipment is operating and safety systems are in place.	X			
Check lubrication	Assure that all bearings are lubricated per the manufacturer's recommendation.			X	
Check packing	Check packing for wear and repack as necessary. Consider replacing packing with mechanical seals.			X	
Motor and pump alignment	Align the pump/motor coupling to allow for efficient torque transfer to the pump.				X
Check mountings	Check and secure all pump mountings.			X	
Check bearings	Inspect bearings and drive belts for wear. Adjust, repair, or replace as necessary.				X
Motor condition	Check the condition of the motor through temperature or vibration analysis to assure long life.				X



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Pump Maintenance

The importance of pumps to the daily operation of buildings and processes necessitates a proactive maintenance program, which incorporates a preventative and predictive maintenance schedule. Most pump maintenance activities center on checking packing and mechanical seals for leakage, performing maintenance activities on bearings, assuring proper alignment, and validating proper motor condition and function without consideration for pump efficiency. Improving efficiency will decrease both maintenance and operating costs.

Basic Measures to Improve Pump Efficiency

1. Shut down unnecessary pumps
2. Restore internal clearances if performance has changed
3. Trim or change impellers if head is higher than necessary
4. Control by throttle instead of running wide-open or bypassing flow
5. Replace oversized pumps
6. Use multiple pumps instead of one large one
7. Use a small booster pump
8. Change the speed of a pump for the most efficient match of horsepower requirements with output. This also may be achieved by the installation of a variable speed drive.

Most Likely Candidates for Pump Efficiency Measures

Large Horsepower Pumps (25 HP or greater)

(Listed in order of decreasing potential)

1. Excessive pump maintenance — this is often associated with one of the following:
 - o Oversized pumps that are heavily throttled
 - o Pumps in cavitation
 - o Badly worn pumps
 - o Pumps that are misapplied for the present operation
2. Any pump system with large flow or pressure variations. When normal flows or pressures are less than 75% of their maximum, energy is probably being wasted from excessive throttling, large bypass flows, or operation of unneeded pumps.
3. Bypassed flow, either from a control system or deadhead protection orifices, is wasted energy.
4. Throttled control valves. The pressure drop across a control valve represents wasted energy that is proportional to the pressure drop and flow.
5. Fixed throttle operation. Pumps throttled at a constant head and flow indicate excessive capacity.
6. Noisy pumps or valves. A noisy pump generally indicates cavitation from heavy throttling or insufficient net positive suction head available (NPSHa). Noisy control valves or bypass valves usually mean a higher pressure drop with a corresponding high energy loss.



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7. A multiple pump system. Energy is commonly lost from bypassing excess capacity, running unneeded pumps, maintaining excess pressure, or having a large flow differential between pumps.
8. Changes from design conditions. Changes in plant operating conditions (expansions, shutdowns, etc.) can cause pumps that were previously well applied to operate at reduced efficiency.
9. A piece of equipment requiring low-flow with high-pressure. This equipment may require operation of the entire pump system.
10. Pumps with known overcapacity. Overcapacity wastes energy because more flow is pumped at a higher pressure than required.



An equipment specialist will be in contact with you shortly to set up an appointment.