



INFRAMARK

CUSTOMER FIRST NEWSLETTER

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PUMP AND MOTOR PREVENTATIVE MAINTENANCE

CENTRIFUGAL PUMPS AND ELECTRIC MOTORS

We know that human preventative maintenance; taking care of our bodies, eating right, exercising and seeing a doctor should help us live longer and healthier lives. It is no different for the equipment in our water and wastewater facilities. Two key components in those facilities are pumps and motors.

We use centrifugal pumps which are mechanical devices designed to move fluids by the means of rotational energy called impellers. They are a much larger version of those pumps used in home aquariums to keep the water oxygenated and to trap debris in the aquarium filters. Centrifugal pumps have no drive seal, so there is no leakage in the pump and they can pump hazardous liquids. We also use positive displacement pumps, submersible pumps and suction pumps. For this article, we will focus on centrifugal pumps and their maintenance.

Along with a variety of pumps, we also use many electrical motors in the facilities. To keep them running efficiently and to prolong their active life, Inframark has a detailed Preventative Maintenance (PM) program for both pumps and motors. We check for noise, vibration and other anomalies to maintain optimum performance and life span.

PREVENTATIVE MAINTENANCE - PUMPS

There are three measurable efficiencies in a pump; mechanical, volumetric and hydraulic. While mechanical and volumetric losses are important components of total efficiency, hydraulic efficiency is the largest factor. Some, but not all, of the factors that decreases the efficiency of a centrifugal pump are:

- Heat generated due to packing
- Rubbing between wear rings and maintaining proper impeller clearances
- Over lubricated bearings
- Foreign particles or dirt that can hinder piping passages
- Corroded internal pump passages that cause fluid turbulence
- A throttled discharge valve

PM intervals depend on the specified manufacturer's recommendations and run times, but we typically perform PM's monthly, every two months and quarterly. During the maintenance process, we lubricate, check for vibrations, examine the seal and impeller condition and do an oil analysis. While the average life of a pump is about 10 years, with a good PM program, a pump can last 15+ years.

There are at least 6 to 12 pumps in the average water and wastewater facility. A PM program can result in cost savings to a district. Depending on the pump size, the cost to replace a pump can run from hundreds to thousands of dollars. An effective PM program not only increases a pump's service life, but also increases its efficiency and reduces unplanned maintenance and downtime.

PREVENTATIVE MAINTENANCE - MOTORS

Both AC and DC motors are used in our plants for a variety of functions and it is imperative that they work at their highest efficiency. Some of the issues that can impact motor performance are:

- Proper motor ventilation to limit high temperature that can damage motor insulation and bearing grease
- Proper humidity and condensation
- Loose connections
- Voltage and current imbalance that can cause vibrations, torque pulsations and overheating
- Under and over voltage
- Regular maintenance of bearings
- Proper bearing lubrication
- Cleanliness

Our regular motor PM program checks for noise in the bearings, vibrations and grease or oil leaks. Our PM checklist includes cleaning and wiping down the motor, proper lubrication, examining the coupling/pulleys and checking the alignment. Motors must be kept clean, free of dust, debris and oil. Removing dirt on a regular basis to keep the motor from overheating is critical to optimum performance and extended life.

Besides our PM program, we also do Predictive Maintenance which includes oil and vibration analysis along with Infrared Thermography. The difference between Preventive Maintenance and Predictive Maintenance is that Preventative Maintenance is time based and Predictive Maintenance is condition based.

The average motor life in a water or wastewater facility is about 10 years. A strong PM program can extend the life of a motor. A PM program is like exercise and a good diet. If it is done regularly, we can avoid larger issues down the road.

On behalf of the Texas MUD Leadership Team

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