Top 10 Ways to Use Predictive Prognostics
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Internet of Things (IoT)-enabled motion components provide up-to-date information on components’ condition and performance. With the right systems in place, that data can be quickly interpreted into insights and disseminated to decision-makers. Read on for the top 10 ways predictive prognostics can demystify your operations.

1. Collect multiple data types
Sensors are available to collect a variety of data on operation of motion components such as pneumatic actuators and vacuum systems. Data can include working conditions, stroke time, end of travel, temperature, and pressure.

2. Make data available remotely
Data from sensors need to be read and translated into insights that engineers and managers can use. Some sensor systems connect with a gateway that can collect and store the signals from multiple devices — and make them available via an internet connection for plant managers, operators, engineers, machine designers, service departments, maintenance managers, quality engineers, and reliability experts.

3. Minimize downtime
Predictive prognostics can give maintenance managers the data they need to shorten repair-related downtime. Using this data, managers can develop plans for repair or efficiency improvement before equipment reaches the point of failure. This approach prevents losses from shutdowns, saves on overtime costs, and avoids the expense of rush-ordered spare parts.

4. Schedule maintenance
Letting equipment operate to failure results in longer unplanned downtime than when maintenance is planned. However, the risk of planned maintenance is that time and money will be wasted fixing what is not broken. Sensors permit a hybrid approach: condition-based maintenance. When sensor data signal a specific pre-failure condition, personnel perform shorter planned maintenance. For example, a pneumatic cylinder may need new seals when pressure drops to 70% of nominal.

5. Monitor air use
Air leakage is one such pre-failure concern in pneumatic cylinder operations. Combining sensor data on air use and working pressure, predictive prognostics can track air leakage. IoT-enabled systems can alert engineers if air leakage changes, indicating an imminent seal failure.

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6. Monitor vacuum and supply pressure
In a similar way, sensors on vacuum cylinders can detect changes in vacuum levels and supply pressures over time. These data can illuminate components that are impacting energy efficiency, as well as let engineers predict failures.

7. Optimize efficiency
Engineers also use predictive prognostics to detect areas where efficiency could be optimized. Many cylinders in service report significant air leakage but are still reliably accomplishing their tasks. Sensor data in such a situation could let engineers install a downsized cylinder that uses less energy to perform the same job.

8. Improve machine design
Predictive prognostics also can help engineers make other improvements in the design of their machines. For instance, sensor data in one press application led engineers to realize improved performance and uptime by changing lubricants, adding a wiper, and changing other machine components.

9. Ensure product quality
Quality managers can use predictive prognostics to track part quality by recording how long pressure was applied on each part. For pressure bonding applications, dwell time can make the difference between a part that meets quality standards and one destined for rework. Sensor data can let systems immediately sort out inadequately bonded parts before they reach the next assembly station.

10. Track production
In addition to predicting quality, streamlining production lines, and scheduling maintenance activities, plant managers and engineers can use predictive prognostics to keep tabs on the production line. For instance, with visibility down to the cylinder level, plant managers at their desks can access pneumatic actuators’ cycle counts to track whether production schedules are on track.

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