Reducing Downtime Through Better Measurement

Every manufacturing operation depends on reliable equipment to maintain production schedules, product quality, and operational efficiency. Whether producing automotive components, industrial machinery, aerospace systems, pumps, packaging equipment, or consumer goods, keeping equipment operating consistently is essential for meeting production goals and controlling operating costs.

Even well-maintained equipment, however, experiences wear over time. Bearings, gears, couplings, and drive components gradually change as they accumulate hours of operation. Recognizing these changes early allows maintenance to be planned before they affect production.

Industry research shows that approximately 82% of manufacturers have experienced unplanned downtime, with the average event lasting about four hours and costing companies roughly $2 million. Nearly half of affected businesses reported delayed customer deliveries, while more than 70% indicated they could not accurately predict when critical equipment would require maintenance or replacement.

Beyond repair costs, unplanned downtime can reduce throughput, create production bottlenecks, increase labor expenses, generate scrap and rework, and impact overall equipment effectiveness (OEE). The earlier developing issues are identified, the more options engineers have to schedule maintenance, optimize performance, and avoid unnecessary disruptions.

Precision torque measurement is one approach to improving equipment reliability and process consistency. Himmelstein rotary torque sensors provide high-resolution measurements of torque, speed, and mechanical power that help engineers monitor operating trends, establish baselines, and view changes throughout the equipment lifecycle. Whether used in research and development, production testing, or condition monitoring, the resulting data supports more informed engineering decisions and helps identify developing mechanical issues before they affect productivity.

Many maintenance programs still rely on calendar intervals or accumulated operating hours to determine when equipment should be serviced. While these approaches are effective for some applications, they don't account for how individual machines are actually being used. Two identical pieces of equipment may experience vastly different loading conditions depending on the process, operating environment, or production schedule.

Torque data complements vibration, temperature, and other condition-monitoring methods by showing how mechanical loads change during operation. Together, these measurements provide a more complete picture of equipment health and help maintenance teams prioritize service based on actual operating conditions.

Because Himmelstein sensors provide both analog and digital outputs for torque, speed, and calculated mechanical power, the data can be integrated into existing data acquisition systems, PLCs, or automated test stands. This allows performance trends to be analyzed alongside other process variables, supporting root-cause analysis and continuous improvement initiatives.

Torque measurement provides value well beyond troubleshooting. During product development, it helps engineers characterize new designs and validate performance targets. In manufacturing, it supports quality verification and production testing. Once equipment is placed into service, the same measurements can be used to monitor machine health, evaluate maintenance effectiveness, and verify that repairs have restored normal operating conditions.

Using a common measurement approach throughout the equipment lifecycle creates consistency, improves traceability, and gives engineering teams greater confidence in the decisions they make.

While no measurement can prevent every equipment failure, accurate torque data provides engineers with earlier insight into changing operating conditions. When combined with other condition-monitoring techniques, precision torque measurement supports predictive maintenance, validates process improvements, and helps manufacturers improve equipment reliability while reducing unnecessary downtime.

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