

Definition

Condition-based maintenance programs perform equipment maintenance only when condition monitoring technologies have provided sufficient evidence that the condition of the fluid and/or the equipment merits action. Maintenance is not performed according to set intervals of time or usage – maintenance is done when technology has proven there is a problem to address and clear direction for correcting it has been established.

Example 1: The oil drain interval for a diesel engine is typically 10,000 miles although some may operate sufficiently for more than 10,000 miles – others for less. A condition-based maintenance strategy would rely on trends in oil analysis to optimize the drain interval. When wear, contamination and/or fluid degradation results approach levels that could result in engine damage, a recommendation to change the oil would be made.

Example 2: Diesel engine re-builds are typically done at around 750,000 miles. But a condition-based strategy would use oil analysis to monitor both type and rate of wear occurring and use this data to drive the decision as to when to re-build.

Benefits of Condition-Based Maintenance

Maintenance department operating costs are significantly reduced.

- Extending maintenance and oil drain intervals reduces wrench time and oil consumption.
- Performing the appropriate maintenance on the appropriate unit at the appropriate time increases component life and improves overall fleet management.
- Trending data provides early knowledge of possible failure, allows for planned maintenance and drastically reduces unexpected downtime – changing from a “reactive” maintenance strategy – fix it when it breaks – to a “proactive” maintenance strategy identifies small problems before they become catastrophic failures.
- Provides guiding evidence for more accurate root cause analysis.

Moving From Interval-Based to Condition-Based Maintenance

Clearly define maintenance program objectives and tools for measuring progress.

- Determine goals and select the appropriate testing to accomplish them. If the goal is to extend drains, tests for monitoring wear, contamination and fluid degradation are essential.
- Work with lubricant suppliers and OEMs to determine an appropriate course of action.
- To properly monitor equipment health, complement oil analysis with additional diagnostics such as thermography, vibration analysis, SPM (Shock Pulse Method), ultrasonic leak protection and regularly download engine ECM (Electronic Computer Module) data.
- Track trends in fluid test results and equipment diagnostics to affect change in daily maintenance practices.