

'I just dropped in to see...'

by Jack Poley

There was a song some decades ago that contained the lyric, "I just dropped in to see what condition my condition was in." This playfully redundant phrase has stayed with me through the years, possibly because of my career-long involvement in fluid analysis, one of the oldest but also one of the growing numbers of techniques and methods by which industry checks the pulse and health of its equipment

Condition monitoring or CM is the collective term that has evolved for these techniques and methods, and this column will attempt to provide insights and details involving all aspects of the CM world. Emphasis, will be on lubricants testing.

Following are some of the milestones in CM's developmental history:

- Visual observation of the machine, applied since the inception of equipment operation. Smoke, temperature, external fluid leakage, odors and physical performance are among the readily observed problems. Of course, the existence of such indicators would usually indicate that a problem had developed to a fairly advanced state, limiting the visual observation's preventive aspect.
- Visual inspection of the lubricant, applied since the inception of equipment operation. Smell, tactile feel and appearance are among the obvious properties readily noted. Where a dipstick is available, enough lubricant for visual inspection can be garnered by drawing the dipstick from its seated position. A blotter can be used to capture some of the lube, enabling further visual observations.

More refined approaches to blotter analysis, using chemicals, magnets and other treatments can reveal a variety of problems.

- 1948: "Oil Analysis," Denver & Rio Grande RR. The breakthrough development of the automated ultraviolet spectrometer allowed a lubricant to be analyzed for numerous metallic elements simultaneously, replacing "wet chemistry" techniques and providing an economical method for measuring and trending wear metals.
- 1960: Commercial Oil Analysis. Trucking and mining were the initial applications.
- 1960: Military Oil Analysis. The first effort involved jet aircraft at Pensacola Naval Air Station.
- 1965: Vibration Analysis. Plant and stationary equipment were most amenable to a technique that took advantage of "signature" vibration characteristics exhibited by specific problems in rotating equipment.
- 1975: Thermography developed. Hardware and software developments allowed the use of non-invasive infrared technology to determine temperatures at specific machine locations.
- 1988: STLE Condition Monitoring Technical Committee formed. The group provided a forum for presenting CM-related papers.
- 1994: STLE Condition Monitoring Education Course created. The course specifically focused on CM technology and applications.

Some of the CM techniques we will cover include:



- Fluid Analysis.
- Vibration.
- Thermography.
- Ultrasonics.
- Combinations of these techniques for enhanced CM synergy.

We might advance the following as shared characteristics of all CM platforms:

1. CM involves tests or measurements that either provide useful information to help gauge machinery condition or that confirm or deny a suspected problem. It is possible that a chronological series of tests, as opposed to a single result, might be necessary to achieve useful information, particularly where subtle indicators are involved.
2. A CM test or measurement can be performed without significant machine downtime, often with no downtime whatsoever. It can be argued that maximum uptime is the potentially greatest benefit of CM; the corollary is that the application of CM should not unduly interrupt a machine's production cycle.

Feedback of any constructive nature regarding this page is encouraged, whether an opposing view or a request for subject coverage. <<

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