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Web Hunter: The pillars of predictive maintenance

by Executive Editor Russ Kratowicz

Get a grip on predictive maintenance with these useful Web resources, hand picked by Executive Editor Russ Kratowicz in his monthly Web Hunter column. We search the Web so you don't have to.

Everyone with any sense already embraces the idea that maintenance operations need to be determined by the condition and reliability of the equipment being maintained. Watch closely, listen carefully, touch gently and trust that the hardware will tell you when it wants your attention. The trick is having the proper enhancements for your eyes, ears and fingers to help you record, quantify and document the hardware's current health. What you do with the data after that is the hard part.

Don't despair. Help is at hand right online. That's why I'd like to invite you on a romp through that endless morass we call the Web to pick up just a few of the countless practical, zero-cost, noncommercial, registration-free pearls of wisdom that can help move you even farther away from getting bogged down in reactive maintenance. Remember, we search the Web so you don't have to.

Wisdom of the masses

Reading the collected works of one author only gives you an insight into one person's views. When you seek best practices, it might be better to broaden your input. A good way to do this is through an online forum, which allows you to read comments and advice about a range of topics within a particular forum's scope. One such example is found at www.vibinst.org/forum/default.asp, a service of the Vibration Institute, Willowbrook, Ill. In addition to vibration, the topics covered include certification, diagnostics, instrumentation, reliability, maintenance management, mechanical fault analysis and, of course, this month's topic, predictive maintenance.

How hot is it?

That's a good question that's often best answered by means of thermography, one of the pillars of predictive maintenance. Before those answers can be given, however, there are some procedural questions you ought to be able to answer before the thermographic readings begin to make any sense in the real world. If you're the plant's resident thermographic hotshot, then you should be able to ace the three quizzes you'll find at www.snellinfrared.com/iriq. This is where John Snell and Associates, Inc., Montpelier, Vt., has posted three 10-question quizzes covering thermographic theory and application. The specific questions change periodically, so I guess you'll need to keep returning to defend your title as the corporate IR guru.

Reading can stop the shakes

Another pillar of predictive maintenance is vibration analysis. It's a technology that requires converting a time-domain signal into a frequency-domain signal, a mind-bending exercise in higher math that can't be performed easily with a pencil and paper. Instead, we grab raw data and let computers do the heavy lifting, which frees the human to do the high-value work, interpreting the resulting spectrum. Acquiring the ability to perform such analysis

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requires training, and a good place to start learning is online. To get you started, check out “A Brief Tutorial on Machine Vibration” by Victor Wowk, P.E., of Machine Dynamics, Inc., Rio Rancho, N.M. To do so, your studious mouse will need to attend classes at www.machinedyn.com, where its homework is to click on “Books and Articles.” The payoff is a link to a free 10-page booklet about the basics of vibration analysis. The three books featured on that page have a cost, so start with the freebie.

If that brief exploration whets your interest, you can go after the complete textbook posted by DLI Engineering Corp., Bainbridge Island, Wash. Flip open the dust jacket at www.dliengineering.com and click on “Vibration Reference” in the lower left. When the new page loads, click on the entry called “Introduction to Machine Vibration Online Text Book.” At that point, you only need to click on the word “next” in the upper right to view each page in sequence, and there are a lot of pages to view. You can save a bit of time by skipping the basic material. To do this, click on “Introduction to Vibration” in the left column. From there, use the “next link” as before.

A good, slippery coating

Oil analysis is yet another important facet of the world of predictive maintenance. As you might be aware, Noria Corp. in Tulsa, Okla., is a major player in that arena, and maintains several Web sites that focus on the topic. As an example of the content available to you, consider “The Buck Stops Here,” an article by Drew D. Troyer. In it, he notes the frustration some in the maintenance function feel because of an inability to get funding for tribology and oil analysis technologies. Troyer’s main point is that the requester must present the proposal in terms that management understands, which means in terms of money. The article offers some guidelines for expressing maintenance needs in ways that will have a better chance of being taken seriously on Mahogany Row. But the concept would probably work just as well for any of the technologies you need. Go to www.practicingoilanalysis.com and click on “Past Issues” on the left, scroll down to the January/February 2000 issue and look for the article.

Another Noria site, www.lube-tips.com, has a large collection of lubricant tips, many of which are submitted by end users. The material isn’t sorted or categorized, so it can be time-consuming to find that pearl of wisdom that solves a specific problem in your plant. You can start searching the posted arcana by clicking on “Archives.” Enjoy.

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The big picture

A good niche Web site explores a single topic in depth, provides everything you want to know readily at hand, and avoids posting extraneous, distracting material that rightly deserves to be ignored. That’s why the asset care Web site operated by Sandy Dunn from Assetivity Pty Ltd., Como, Western Australia, has earned at least one previous mention in this column. As you’d expect, part of it covers predictive maintenance in the form of 114 articles about RCM and PdM. To see the goods, fly south to www.plant-maintenance.com and click on “Articles.” Ignore the drop-down menu that appears when your cursor covers the word - simply click on it. The PdM articles are listed under the Management heading. Absorbing the content here should keep you busy for quite a while.

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Maintenance cost gold mine

Some Web sites devote themselves entirely to the art and science of predictive maintenance. You've just got to love a Web site that calls itself www.downtimecentral.com, which has, as its mission, the goal of exposing the true cost of manufacturing downtime through process mapping of production cost. That simple-sounding task covers more maintenance-related territory than you'd think. Consequently, the food for thought that the Business Industrial Network, St. Louis, posts on the site is far-reaching. It features a heavy use of the three-letter acronym TDC, which stands for true downtime cost. Toggle the small triangle to the left of "True Downtime Cost" to reveal a second triangle to the left of "Sub-Categories A-Z." Click that one and you're presented with links to a string of multi-page topics. After you've explored this part, repeat the process for the content behind "Resources." It might be link-rich, but several of the exterior links didn't work when I explored the site. I sent an e-mail to the webmaster in hopes that all could be made right by the time you arrive.

Basic definitions

It's always wise to research the literature and define your terms before embarking on a discussion of any topic about which you don't want to appear clueless. This magazine, and several others, bemoans the apparent brain drain going on in the industrial maintenance community. The younger people being targeted to get into the business might be clueless about the benefits of asset reliability. Who knows. But they're computer-savvy and probably do their research on the Web, the world's hard drive. No doubt, some start by using Wikipedia, that free online encyclopedia. The idea behind any kind of wiki is that users out in cyberspace can edit the content. After a while, a given entry reflects the aggregate wisdom of the active users who each know a little about a given subject. The whole is more than the sum of the parts. but I digress.

The upcoming generation, upon whom we must rely to keep American industry humming, will be disappointed if they go to Wikipedia to learn about predictive maintenance. That Web site needs your input. Open the page called http://en.wikipedia.org/wiki/Predictive_maintenance and see for yourself. The explanation is sparse, totally lacking in the rich content we all know should be reflective of industrial maintenance. It's not in our collective best interest to allow such paucity of content to continue. I urge you to make your additions and edits as you see fit. While you're at it, you might want to investigate Plant Services online energy wiki at our Web site.

Hot tips

Another source of information about predictive maintenance is available in the form of a Web log, more commonly known as a blog. In this medium, some author posts commentary or opinion piece, usually only a few hundred words, which is designed to provoke a response or two from the huddled masses in cyberspace. Readers on either side of the author's argument can then post a response, which leads to the posting of a chain of responses from other readers, which constitutes group communication, a good thing. Almost as good as best practices, a collection of user-donated maintenance tips might be useful for improving anybody's maintenance department. Research this month uncovered a collection of blog-like maintenance tips brought to you by Netexpress Inc., Fort Myers, Fla. The Maintenance Talk Web site archives stretch back to February, 2005. If you're interested in checking it out, send your desk rodent to <http://maintenancetalk.com/blog.php/tipsblog>. Then, scroll down below the calendar page on the left and enter the phrase "predictive maintenance" in the search function. This returns a lot of uncategorized entries, some of which are commercial, some

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from your colleagues. The latter are labeled simply as predictive maintenance tips. One can't identify the subject matter before opening an entry and it's not obvious how to respond to an entry. All in all, this probably isn't the most user-friendly site in the world.