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WISH YOU A HAPPY AND PROSPEROUS NEW YEAR 2006

EDITORIAL

Maintenance Department Needs a Coach!!

Let me ask this question why a cricket team needs a coach? Maintenance cost can be cut by 30-40% in any industry only if we employ right maintenance people with right training. Management can take pride in any plant by increasing the thirst for reliability by proper training and supporting over long term. Since money is also a motivator, let people be carefully recognized and rewarded for best equipment reliability practices. It is also sensible to base inspection frequency based on criticality of equipment in any plant operation. One can take even the help of special software. But we should not forget that experience plays a vital role. Why not hire a maintenance specialist for coaching the plant maintenance teams.

- Editor

Hey! Talk about my Bike! How can I relate different maintenance strategies to my bike maintenance

Student: *Sir, what are the different types of maintenance strategies? and how can I relate to my bike maintenance?*

Maintenance Engineer: See young man! There are different types of maintenance strategies like breakdown maintenance, periodic maintenance, Preventive maintenance/ predictive maintenance etc.

Student: *Sir, can you please elaborate?*

Maint. Engr: In breakdown maintenance, replacement of a defective part or machine itself takes place after the machine becomes in capable of further operation. This maintenance is recommended only when the plant or machinery has no effect on the operations of other machinery.

This maintenance is also called run-to failure maintenance.

- In periodic maintenance, maintenance procedures and activities carried out at regular intervals, e.g. every day, week, month, year, or 2 years etc. this is common strategy adopted by maintenance service providers.
- In preventive/predictive maintenance, activities are determined and planned from an assessment of machine condition by periodically checking its health parameters of the machine wring advanced computer analysis techniques. Maintenance activities designed to prevent/ predict the failure or breakdown of and machinery.

Student: *Sir, how can I relate these maintenance strategies to my bike maintenance?*

Maint Engr: For example, in breakdown maintenance, You have to change the tyres when they burst.

- You replace the engine when it seizes due to lack of oil.
- You can change the break shoes when they worn-out.
- You can replace the battery when self-motor is not working with it.

In periodic maintenance, you can

- Service the bike at regular intervals provided by your service agent as per nominated mileage (km).
-Change the engine oil for every 6months/ 2000km.
- Fill the 2T oil at every 500km.

In Preventive / Predictive maintenance, you can

- Measure the trend of the tyre tread, to establish the wear rate and predict the date that new tyres will be required.
- Measure the trend and brake disc pads to predict their replacement data.
- Measure and trend the wear and tear of piston rings and piston to predict their replacement data.

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Condition based maintenance – A Case Study

This study was made at Hallsta paper mill in Hallstavik, Sweden. The mill produces 785.000 tons of paper per year. The key performance indicators were selected as:

i. No. of machines included in CBM (condition based maintenance)
ii. No. of measuring points per inspector
iii. Pre warning time

Result:

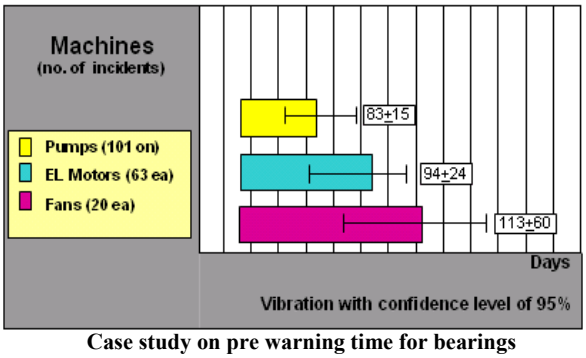
1) In total there are 8 inspectors that cover 16.000 measuring points at the mill. The applications consist of some 800 rolls and 4.000 auxiliary machines in the plant.

2) In total this makes an average of 2.000 points/ inspector.

3) In order to evaluate the pre warning time from the first detection of damage to the time when the component was changed the data base covering 6200 measuring points was analyzed. It consisted of 2300 machines and covered the period between 1993 and 1999. Some of the machines that were studied consisted of 74 fans, 1070 electrical motors, and 103 pumps.

The average pre-warning time from detection to corrective activity is 69 days and 95% were changed within the period of 59 to 78 days. The differences in pre warning time for the various applications can also be seen in the graph shown below. The pre-warning time on electrical motors, pumps and fans are similar for ships.

During this period there were no catastrophic failures on the equipment that was included in the program, so all incidents could be detected and



Case study on pre warning time for bearings

failures avoided.

The number of rotating machines can run close to 1000 units on a large ship so it is important to set up the program in a cost effective way where one person could handle the entire ship.

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Do U Know ?! It's Very Interesting !!

- *Thermography Scans prevents gear box failures.*
- *Oil Analysis contains critical information about the machine and its relationship with operating environment.*

Five Steps to Avoid Unnecessary Plant Shutdowns

1. Adopt Condition Based Maintenance

Operations and maintenance personnel should foresee and correct problems before equipment break down using latest sensor technology.

2. Monitor Power Quality

Monitor power quantity and quality to improve plant's bottom line.

3. Install Better Online Process Equipment

Continuous plant monitoring is always better than periodic checks.

4. Rationalise Your Alarm Systems

Regular inspection of all alarm systems enhances plant safety and reliability.

5. Move to Total Productivity Maintenance

Present high-speed machinery requires attention for an entirely different maintenance approach and one can even forget preventive maintenance and move to RCM. Make every sanction of the organisation as partners of total maintenance strategy and action plan.

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PRODUCT NEWS

Wilcoxon 788A Accelerometer

Wilcoxon Research introduced a new low-cost general-purpose accelerometer with a sensitivity of 100mV/g and a tight 10% tolerance.

The 788A sensor is said to combine the optimum combination of price and performance for condition-based monitoring and predictive maintenance programs. The single-axis sensor provides an acceleration range of 50g (at full scale), and is suitable for vibration monitoring of fans, motors, pumps, blowers, compressors, chillers, gearboxes and mixers, as well as other industrial applications.

The new device provides high frequency response measurements up to 10 kHz to identify faults and improper machine operation. Typical noise is 4µg at 100 Hz. The operating temperature is-50^0C to 120^0 C. additional features include shielding, ground isolation, and hermetic sealing against environmental contamination.

Engine Health Management (EHM) Software

The United States Air Force Air Logistics Center has selected Scientific Monitoring Inc. (SMI) to enhance its Engine Health Management (EHM) software across the USAF engine fleet.

The Air Logistics Center Propulsion Directorate (OC-ALC) is responsible for the worldwide management of more than 10 different aircraft engine families manufactured by multiple engine manufacturers. The software suite is comprehensive and provides the ability to detect and predict impending engine degradation/ failures, and will trend engine operational performance characteristics for all users and maintenance levels.

GE Energy Introduces New Vibration Transducer!

GE Energy has announced an important addition to its Bently Nevada® product line with the introduction of a new high-temperature casing-mounted vibration transducer intended for aero-derivative and industrial gas turbine applications.

Building on over 25 years of experience with seismic vibration measurements on gas turbine casings, the new High-Temperature Velocity and Acceleration Sensor (HTVAS) is designed for use on a wide variety of gas turbines, regardless of make, model or manufacturer. The transducer design separates its sensing element from its signal conditioning electronics, allowing it to be used in applications with surface temperatures of up to 900° F (482° C), as typically encountered on gas turbines. Use of a mineral-insulated hard-line cable between sensor and signal conditioner eliminates intermittent connector failures, a common source of problems, resulting in a more robust design.

The sensor returns both acceleration and integrated acceleration (velocity) measurements simultaneo-usly. Excessive casing vibration velocity is often used for machinery protection alarms, while the unfiltered acceleration signal is highly useful for machinery diagnostics.

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Benefits of Condition-Based Maintenance*

Maintenance costs	*reduced 50 to 80%*
Machinery breakdowns	*reduced 50 to 60%*
Spare parts inventories	*reduced 20 to 30%*
Total Machine downtime	*reduced 50 to 80%*
Overtime expenses	*reduced 20 to 50%*
Machine life	*reduced 20 to 40%*
Overall productivity	*reduced 20 to 30%*
Profit	*reduced 25 to 60%*

* Pat March, senior mechanical engineer at TVA (Tennessee Valley Authority) Engineering Laboratory, prepared this summary based on the results of a 1998 multi-industry survey conducted by TEC of firms that had used or were using condition-based maintenance techniques.

Boeing Selects Scientific Monitoring to Enhance Airplane Health Management

SCOTTDALE, Ariz (BUSINESS WIRE) – Oct. 17, 2005 – The Boeing Co. has selected Scientific Monitoring Inc.

(SMI) to provide analytical tools and software to further enhance the airplane data monitoring and decision support. Capabilities of the Airplane Health Management (AHM) team in Boeing Commercial Aviation Services. AHM will use advanced analytic tools and algorithms provided by SMI to improve reliability and maintenance.

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CMSI NEWS

Dr. V. Bhujanga Rao, President, CMSI receives Silver Medal at NSA – 2005 Symposium at NAL, Bangalore on 14th Dec '05 for his outstanding Contribution to Engineering Acoustics

Dr. M. Ananda Rao, Secretary, CMSI - The Man behind organizing the International Conference on Advances in Structural Dynamics and its Applications (ICASDA-2005) held at GITAM, Visakhapatnam

A COMPANY TO KNOW!!

Scientific Monitoring Inc. is a leader in Condition Based Maintenance (CBM) and monitoring solutions. The company provides software products and services for condition monitoring and decision support for turbines and other industrial equipment. SMI's distributed (or remote) monitoring technology can be applied to a wide range of industries such as aerospace, power generation, manufacturing, and ground/ sea transportation. SMI has been recognized for its technical excellence in NASA Achievement Award (2002). Tibbetts Award (2001), and a Small Business Administrator's Award for Excellence (2000). The Company is located in Scottsdale, Ariz.

Courtesy: *Web Source : www.scientificmonitoring.com*

MAINTENANCE TERMINOLOGY: Maintenance Costs

There are two types of maintenance costs i.e., direct cost and indirect cost. Direct cost is referred to budgeted costs, affecting the cash flow of an organization. Indirect maintenance cost is defined as loss-related as well as opportunity costs, affecting the profits of an organization.

All feed back, comments and contribution to the news letter are most Welcome.

- Editor

CMSI Welcomes New Members!!

Life Members:

Dr. K.V. LAKSHMIPATHI RAJU
Mr. K.P. GANDHI

Annual Members:

Mr. HEMANTH K. VEPAKOMMA
Smt. K. LAKSHMI TULASI
Mr. S. VEERESH

CBM Software Recommended

Dexter V 4.0 diagnostic and Predictive CBM Software automates the process of monitoring health for any equipment that can be instrumented with sensors. Intended to be part of an integrated condition-based maintenance program, software actively assists in production improvement, maintenance logistics, and real-time fault resolution. Key functions include monitoring and displaying performance of any plant equipment, customer built-in automatic diagnostics, continuous archiving of equipment performance histories, predicting equipment failures, before process disruption occurs, and managing and storing maintenance and operational knowledge.

(Control Engineering, January 9, 2006)
(Web source: www.macsea.com)

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If undelivered please return to:
Dr. V. Bhujanga Rao,
President, Condition Monitoring Society of India,
Naval Science & Technological Laboratory,
Visakhapatnam – 530 027, INDIA
Phone: 0891-2586196

To,