



MONITOR

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From President's Desk...

Information & Communication Technologies (ICT) in Condition Monitoring!!



Information & Communication Technology (ICT) pervade all domains in our daily life today, be it at office or at home or even on the move. Networking has certainly changed the way we handle the information and data. As the condition monitoring deals with a lot of data and information, it is time we look at adopting ICT for more effective maintenance in our industries. While condition monitoring systems in current practice have quite advanced to the extent of providing valuable information to maintenance engineers, they are not so effective in providing the information to the rest of the plant. ICT on the other hand permits this flow of information by providing access through networked systems. Condition Monitoring practice must now look beyond the data collectors, signal analysis and expert systems. Web and agent technologies can be employed effectively by integrating distributed systems and heterogeneous data for asset management. Networking, distributes systems and Object Linking and Embedding (OLE) have made rapid progress in recent years that are to be exploited fully. It is therefore high time now for us to exploit ICT in Condition Monitoring or else we would be lagging behind!

-- Dr V. Bhujanga Rao

Main Features of this Issue...

- Announcement of NCCM 2012
- Last date for PGDCM is extended
- Heavily Tracked Bushing Detected
- Poor Air Gap in 3000 HP Motors
- Product News
- Case History
- Terminology
- CMSI – Hyderabad Chapter
- CMSI Members in News
- Condition Monitoring Around The Globe
- New Members
- Reference Books

PGDCM Course

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www.andhrauniversity.info/sde

Announcement – NCCM 2012!!

Research & Development Establishment (Engineers)[R & DE(E)], Pune, has come forward to host next National Conference on Condition Monitoring (NCCM-2012). Further details will be intimated shortly.

Last Date for PGDCM is Extended up to 14-10-2011!!

The School of Distance Education (SDE), Andhra University (AU) in collaboration with Condition Monitoring Society of India (CMSI) is offering an exclusive one year PG Diploma on Condition Monitoring (PGDCM) in distance education mode. CMSI requests its members to encourage their eligible colleagues/friends to utilize this opportunity and enroll for the course.

Eligibility : BE / B.Tech. in any Discipline, AMIE or equivalent there to, or M.Sc (Applied Physics), or M.Sc (Electronics) or M.Sc (Instrumentation).

Course Fee : Rs.20,000/-

Cost of application : Rs. 100/-

Last date for submission of application : 14.10.2011

Last date for submission of application : 31.10.2011(With Fine).

Application can be downloaded from our website www.andhrauniversity.info/sde. Duly filled-in applications are to be sent to SDE, AU by enclosing a DD for Rs. 20,100/- (Course fee inclusive of cost of application) drawn in favor of Registrar, Andhra University payable at Visakhapatnam. Course details may be obtained by visiting our website.

Enroll as a member of our society & Advertise your products in News Letter 'MONITOR' and Website www.comsoi.org Check Website for details..

HEAVILY TRACKED BUSHING DETECTED IN HYDROGEN COOLED TURBO GENERATOR

A heavily tracked bushing was detected in 390MW, 20kV, hydrogen cooled turbo generator. During a partial discharge measurement using the TGA-B portable instrument, high levels of PD activity (over 3000mV position, well above the highest range, see Fig. 1) were detected on the C phase out side of the hydrogen environment.

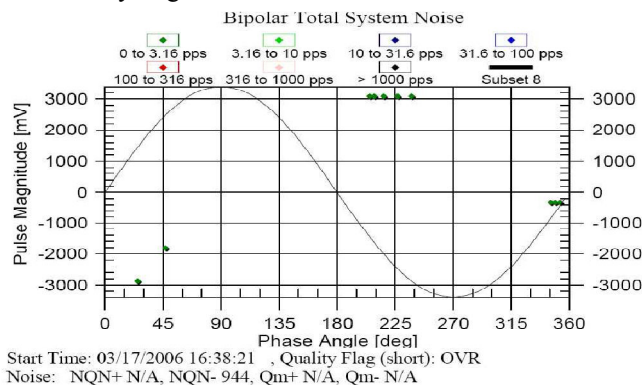


Fig. 1 High level system noise (OVR: out of range)

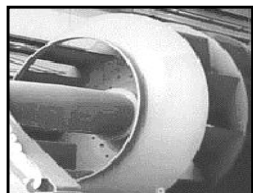
As consequence, the user briefly shut down the unit for a visual inspection to verify the mechanical connections in the main lead areas and to inspect the generator bushing for cracks or signs of tracking. The user found that the generator bushing of phase C was heavily tracked as shown in Fig.2. The plant had changed from a base to peak load operation, which may have accelerated the electrical tracking (due to condensation when the unit is off).



Fig. 2. Heavily tracked generator bushing

Web resource: <http://www.irispower.com>

POOR AIR GAP IN 3000HP MOTORS IDENTIFIED IN BOILER AIR FAN APPLICATION



Boiler Primary Air Fan motors in a utility plant Fig. 3 showed high vibration levels, which appeared to be electro-magnetically induced.



In February 2006, the CSMeter was used to perform broken bar and airgap eccentricity (AGE) tests.

Fig. 3. Air Fan Motor

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In February 2006, the CSMeter was used to perform broken bar and air gap eccentricity (AGE) tests. After about 2 minutes per motor the CSMeter came up with a diagnosis, on its LCD screen, that rotor windings on all four were healthy, but that the AGE was unacceptable on the three of them. This was confirmed by the current spectra, displayed by the CSMeter. Fig. 4 shows the spectrum of one of the motors, with an AGE severity of 13.89 dB (average difference between the RSPFC and RSFC sidebands).

A severity of less than 15dB indicates poor AGE. This finding provided guidance to the utility in question as to what type of inspections were required to determine the cause of this problem. The problem was finally corrected, and the vibration was reduced to acceptable levels.

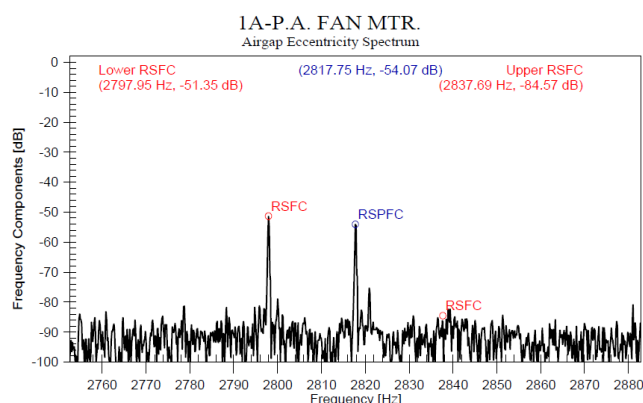


Fig. 4. Air Gap Eccentricity Spectrum

Web resource: <http://www.irispower.com>

Product News: Machine Talker's Wireless Vibration Sensor Product

Machine Talker, Inc. (OTCBB: MTKN), developer of wireless process control systems has introduced a new wireless product for reading and processing signals from vibration sensors. Dubbed the CBM6, the product facilitates Condition-Based Maintenance by monitoring up to 6 sensors at a remote location and linking results in to a wireless mesh network for access by a plant maintenance personnel. The product was shown at the annual conference of the Cooling Technology Institute (CTI) held in Houston on February 2008. At the Conference, Machine Talker's Chief Scientist Gerry Nadler presented a technical paper entitled "Wireless Vibration Monitoring for Condition Based Maintenance of Cooling Towers". In announcing the new product, Nadler noted, "A major initiative of the industry is ability to predict when machinery may fail so that repairs can be made before damage occurs. Acquiring vibration data from inside cooling towers is a perfect application for this product.

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Analyzing the vibration history of a machine and finding change is the principal means for pre directing failure. The health of machinery operating within cooling towers might be the most critical as they are used extensively in oil refineries, nuclear power plants, office buildings, hotels and industrial plants. Advance knowledge of a potential failure will save money and will extend equipments lifetime; not to mention the avoidance of a catastrophic event." Locating an intelligent CBM6 Machine Talker and its sensors right on the machinery is extremely cost-effective because no wiring is required. Studies indicate that wiring alone can be 90% of the cost of sensor installation with long runs of conduit required in industrial applications.

Web resource: <http://www.machinetalker.com>

Case History: Measurable returns from CM!!

An American petroleum company with two refineries on the West Coast of the United States embraced the concepts of condition monitoring early in its evolution. They saw measurable returns from the new approach. However, when they evaluated their maintenance activities and costs, they found they still had heavy expenditures, especially on their many pumps. They began to evaluate the incidence of failures and found that bearings or seals were failing in many of their pumps on an average of once every six months. The company then began to assess the causes of their high incidence of seal and bearing failure in pumps and found three general areas that required improvement: alignment, balance, and assembly.

The company addressed this problem by developing a new precision program with the full cooperation of upper management, operations, and maintenance, all of whom worked together to solve their machinery problems. By adopting precision standards for alignment, balance, and assembly, these refineries extended the mean time between failures from six months to more than six years.

The company in the preceding case history understood that the costs incurred by the excessive pump failures were more than those of just simple parts and labor. They also included the additional real costs of managers/supervisors and purchasing personnel's time, of stocking and maintaining inventory, and of the planners who scheduled the maintenance. What was not recognized, however, was the further effect that machinery failure has on production and/or productivity. The actual impact on production can vary greatly depending on industry, process, and equipment criticality. For example, in a refinery where there are redundant (backup) machines, a failure may have no effect on production. In the paper industry, however, there may only be one machine producing a particular type or grade of product. A failure may result in a complete halt in production. The cost savings resulting from precision maintenance practices in this case would be tremendous. The savings from reduced equipment downtime often far exceed the maintenance savings.

Web resource: <http://www.update-intl.com/Value2.htm>

Terminology: The Criticality Index

The Criticality Index is often used to determine the degree of condition monitoring on a given machine taking into account the machines purpose, redundancy (i.e. if the machine fails, is there a standby machine which can take over), cost of repair, downtime impacts, health, safety and environment issues and a number of other key factors.

CMSI Hyderabad Chapter EC Meeting Resolutions

The executive committee of Hyderabad Chapter met on 28th April at 6.30PM and declared new office bearers as below:

Chairman	: Dr.P.N.Reddy, Director, SNIST
Vice-Chairman	: Dr.P.Ravinder Reddy, Prof. & Head, MED, CBIT
Secretary	: Dr.A.Chennakeseva Reddy, Prof. & Head, MED, JNTUH
Jt. Secretary	: Dr.A.Purushotam, Prof. of MED, SNIST : Dr.P.Vekata Ramana, MGIT
Treasurer	: Sri.P.Manikandan, IARE
Jt. Treasurer	: Dr.K.Kishore, VCE
Executive Mem.	: Dr.P.A.Sastry, Dean, MVSR : Dr.S.Khadarvalli MJCET : Sri.Abrahamuddin, DCET, Vignan Jyothi : Dr.P.Mallesham, Principal, Sri Indu : Dr.Krishna Veni, EEE : Dr.S.Venkateswarlu, SNIST : Dr.N.Ramesh Kumar, BHEL (R&D)
Ex-Officio Mem.	: Dr.M. Anand Rao, Vice President,CMSI

Other important resolutions:

1. It is proposed to arrange awareness programs in each of the engineering colleges offering Mechanical and Electrical engineering courses. JNTU campus to identify guest speakers and also to draft the schedule of lectures for awareness program.
2. Formation of sub centers in various colleges and promoting enrollment of members (faculty and students).
3. Three day workshop on condition monitoring to be organized by Hyderabad local chapter.
4. National Conference on Condition monitoring to be proposed for Hyderabad.

Condition Monitoring Society of India(C M S I)

CMSI Members in News



Dr. V. Bhujanga Rao, Chief Controller (HR), DRDO, New Delhi, and Founder President, CMSI received the prestigious Technology Leadership Award 2010. Defence Minister A.K. Antony presented the award to Dr. Bhujanga Rao in recognition of his exemplary leadership in transforming NSTL into a premier underwater system lab of the DRDO at the DRDO awards function held at New Delhi.

CMSI congratulates him on this great achievement and wishes him all the best in future endeavors!!

CONDITION MONITORING AROUND THE GLOBE...

Courses, Conferences, workshops

COMADEM 2012, the 25th International Congress on Condition Monitoring and Diagnostic Engineering Management with **CMSI as a technical cosponsor of the event**, is being held in Huddersfield, UK during 18 - 20 June 2012. The congress will cover a wide range of subjects in the field of industrial asset management and will include a mix of key tone presentations, technical papers, poster sessions, themed master classes and exhibitions stands. Members of CMSI are requested to contribute technical papers in large numbers for the congress.

Submission of Abstracts: 1st October 2011

Papers Submission: 15th December 2011

Conference Dates: 18th - 20th June 2012

For Further details see website: <http://compeng.hud.ac.uk/comadem2012>

CMSI Welcomes New Members!!

Institutional Member:

SKF INDIA LTD, Mumbai

Life Members:

Dr. Manish Raj

Mr. Girish R Arlikatti

Mr. Dayananda Totar

Mr. Nataraj

Editorial Board :

Dr. V. Bhujanga Rao

Dr. M. Ananda Rao

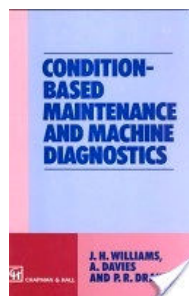
Sri. P.V.S.Ganesh Kumar

Sri. T. Venkata Ratnam

Reference Books

Condition Based Maintenance And Machine Diagnostics

By J. Hywel Williams, Alan Davies, Paul R. Drake



This text attempts to present the fundamental justification for condition-based maintenance together with enough analytical and practical guidance for its implementation. There are chapters on the two dominant techniques of vibration and debris analysis. Also basic diagnostic methods are given along with a presentation of systems approach to condition monitoring. A detailed case study shows the practical application of the techniques presented. Finally, future developments in the use of expert systems and AI techniques are highlighted.

Publisher : Kulwer academic publishers

ISBN : 0 412 46500 0

BOOK POST

If undelivered please return to:

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All feedback, comments and contributions to the news letter are most Welcome.

- Editor