



MONITOR

A Publication of Condition Monitoring Society of India

Regd. No. 45061/2003

Volume 8, No. 1

April 2011

From President's Desk...



CM of Power Cables catching up very fast!!

We are entering an exciting new era in the cable industry where there will be significant advances in cable condition monitoring to improve reliability of electricity supply, reduce investments and maintenance costs, and extend the life of new and existing cables.

We can make our power cables 'Smart' by inclusion of an optical fibre within the cable or attach the optical fibre directly to the cable. A single optical fibre has the ability to act as a distributed temperature sensor (DTS) with potentially many thousands of individual measurement points. Current DTS technology allows fibre lengths of up to 30 km in length with sampling every two meters. Optical fibre sensors for power asset monitoring have significant advantages because they are totally immune to EMC interference and can also be used in hazardous areas.

Many systems for long distance temperature monitoring have been successfully proven in critical applications like fire detection in road and rail tunnels and special hazard buildings, power cable and transmission line monitoring, in oil & gas exploration for permanent monitoring and for industrial induction furnace surveillance. The future sure looks 'smart' for CM of power cables!!

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PGDCM Course

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www.andhrauniversity.info/sde

Post Graduate Diploma in Condition Monitoring (PGDCM):

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. The course is designed for the benefit of both maintenance practitioners and engineers intending to learn about condition monitoring. The course covers fundamentals on principles of vibration based condition monitoring, thermography, oil & wear debris analysis. Upon completion of the course, attendees will have an understanding of the capabilities of the technologies along with the practical hands on experience. Faculties for the course are drawn from AU and experts of CMSI.

Admission Information

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).
Duration	: One Year
Course Fee	: Rs.20,000/-
Cost of application	: Rs. 100/-
Last date for submission of application	: 31.05.2011.
Last date for submission of application	: 30.06.2011(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..

International Conference on Condition Monitoring (ICCM-2011): Some Highlights!!

CMSI's first ever International Conference on Condition Monitoring (ICCM-2011) was jointly organized by Mechanical Engg. Department of GITAM University (GU), Condition Monitoring Society of India (CMSI), Visakhapatnam and Condition Monitoring and Diagnostic Engineering Management (COMADEM), UK during 24 – 25 February 2011 at Mother Theresa Auditorium, GU, Visakhapatnam.



The conference was planned with the objective of providing a platform for interaction among experts from industries, educational institutions and scientific laboratories on condition monitoring and also to spread the message of effectively implementing condition monitoring practices in the industry for enhanced productivity and increased availability.

Prof. D. Prasada Rao, Principal, GU, was the chairman for this conference and Prof. S. Kamaluddin, Head of the Dept. (Mechanical Engg.), was the convener. The conference was inaugurated by the Chief Guest, Vice Admiral B. Kannan, AVSM, VSM, Indian Navy, New Delhi, Dr. Jerome Antoni, University of Technology of Compiègne, France, Prof. K. P. J. Reddy, Dept. of Aerospace Engg., IISc, Bangalore were the Guests of honour. Dr. MVVS Murthi, President, and Prof. G. Subrahmanyam, Vice Chancellor, GU graced the occasion.



Dr. V. Bhujanga Rao, Director, NSTL and President, CMSI and Prof. M. Ananda Rao, General Secretary, CMSI addressed the gathering. The other dignitaries on the dais emphasized on the need of adopting condition monitoring techniques in industries as it saves a lot of money on maintenance and increases efficiency.



In his inaugural address, Vice Admiral Kannan said condition monitoring was a maintenance strategy based on prediction and diagnosis of machine condition through periodic measurements of vibration, temperature, oil condition and other parameters. The development of electronic instrumentation and the digital technology in signal processing in the last two decades have brought new reliable techniques to monitor and analyze signals of running machinery and to intervene with timely maintenance activities, he added.

The keynote addresses and invited talks were delivered by Prof. Jerome Antoni from University of Tech. Compiègne, France, Prof. Rajiv Tiwari, Professor, IIT, Guwahati, Prof. V. Ramamurthi, a retired professor of IIT Madras, Mr. MP Srivastava, Essar, Gujarat, Prof. N. Tandon, Professor, IIT, Delhi, Dr. Mark Richardson, President, Vibrant technology, USA, Dr. Suri, SpectraQuest, USA, Mr. B K Das, Tata Steel, Jamshedpur, Dr. Bhaskar Sarma, Sampooran Rotor Dynamics and Mr. Rana Dutta, Electro Steel, Kolkata.

A number of participants representing various sectors of the industry, the services, academic institutions, and students actively participated in the deliberations and presented papers on various topics such as 'Maintenance management', 'vibration monitoring', 'materials and structural health monitoring', 'infrared thermography', 'condition monitoring and diagnosis', 'motor current signature analysis methods and technologies', 'oil/wear debris analysis', 'ferrography', 'online/real time condition monitoring', 'expert systems', 'neural networks', 'case studies in condition monitoring', 'maintenance management' and 'Rotor Dynamics'.

It is heartening to note that practicing maintenance engineers had come forward and narrated their experiences in the conference through their papers. Engineers from industry such as Vizag Steel (VSP), Tata Steel (Jamshedpur), and Cero Rubber (Durgapur) participated. Similarly R&D scientists from DRDO and CSIR also presented their case studies. Consultants such as ACME, Sampooran Rotor Dynamics also narrated their view points. The sessions were highly interactive and were chaired by eminent academicians, industrial and Naval experts.

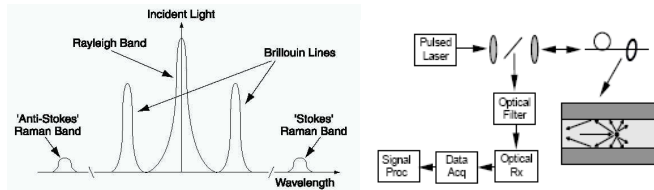
A cultural programme was organized in the evening on 24 Feb 2011 which enthralled the audience. An exhibition was also organized during the conference showcasing the technologies and tools available for condition monitoring. The conference was well attended and widely appreciated. During the valedictory function on 25 Feb 2010 evening, Chief guest Sri MK Surana, General Manager, HPCL opined that the deliberations of the conference would help the maintenance practices in the industry a great deal for achieving better productivity.



Distributed Temperature Sensing (DTS)

In conventional temperature measurements, a sensor, such as a thermocouple or platinum resistance probe, is needed for each point of interest. For applications where large areas or long distances are involved, conventional systems therefore become over-complicated, bulky, unreliable, and costly to maintain. An effective alternative solution is a distributed sensing system.

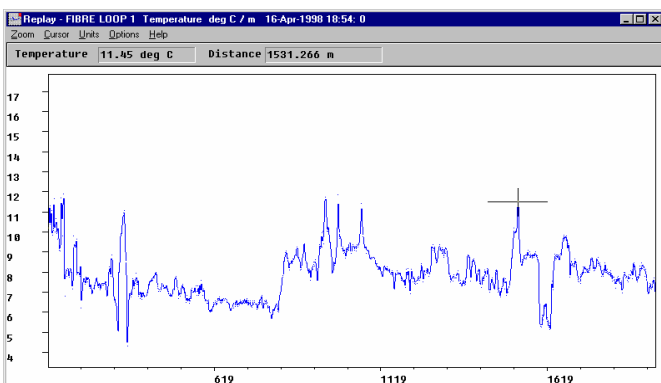
The expression "distributed sensing" is used to describe a technique whereby one sensor can give data spatially distributed over many thousands of individual measurement points. A single optical fibre has the ability to act as a Distributed Temperature Sensor (DTS) with potentially many thousands of individual measurement points. Current distributed temperature sensing technology allows fibre lengths of up to 30 km in length with sampling every 2 meters to be used in this way. Optical fibre sensors for power asset monitoring have significant advantages because they are totally immune to EMC interference and can also be used in hazardous areas.



A DTS system is essentially a combination of two technologies, optical fibers and analysis of a complex physical effect. Temperature measurements are achieved by analysing the Raman back-scatter signals reflected back from laser pulses travelling down an optical fibre. The position of each measurement point is determined by its time-of-flight from laser emission and the temperature is related to back-scatter intensity. Complex electro-optical devices are required to detect the very small change in the optical signal.

The laser pulse is transmitted into the fibre via optical directional couplers which allows the returning back-scatter signals to be filtered into a highly sensitive dual-channel receiver where the Raman signals are detected and converted into a digitised format specifying temperature and position. The function of the signal processor is to provide a user-controllable level of signal averaging to obtain the desired level of temperature resolution.

The resultant temperature profile, shown below, enables cable owners to determine the size, location, and potential impact on rating performance by any hot spots caused by localized environmental conditions.



Just as a doctor has to interpret the results from an ECG machine, the interpretation of the results from the DTS equipment needs some special cable engineering skills. However, by combining the use of appropriate cable rating software, it is possible to establish a predictive rating assessment. Such a situation in a real time mode will enable system operators to maximise the cable capacity without any danger of overload and deterioration of the circuit.

DTS validates design configurations while allowing optimal use of cable circuits and the elimination of the risk of damaging the cable unknowingly.

Source: Extract from '**Cable Condition monitoring**', By Hilary Marazzato, Ken Barber, Mark Jansen, and Graeme Barnewall

Workshop by CMSI - Jamshedpur Chapter

Condition Monitoring Society of India – Jamshedpur Chapter organized one day workshop on "Condition Monitoring Practices in Steel & Allied Industries" on 28th January 2011 in Institution of Engineers Building at Jamshedpur.

Workshop was inaugurated by Dr. Vijay Sharma, Executive Director & Chief Executive (Steel Business), and Usha Martin. Around 70 Engineers participated from various steel & allied Industries.



The topics covered during the workshop were 'Present practices and emerging trends of condition monitoring in steel and allied industries' by Prof. A. R. Mohanty, Professor of Mech Engg, IIT, Kharagpur, 'Vibration analysis, concept and case studies' by Mr. Saptiman Panda, SKF India Ltd., 'Thermography, concept and case studies' by Mr. A.K. Paul, Tata Steel, 'Condition monitoring in Electrical systems' by Mr. Rajesh Vyas, Tata Steel, 'Lubricant analysis, concept and case studies' by Mr. S K Roy, Balmer Lawrie & Co. Ltd., and 'NDT for steel and allied industries' by Mr. Dibyendu Dey, Reliability Consultant.

The workshop concluded with a panel discussion and certificates were distributed to all the participants by Mr. B.K. Das, Chief of Mechanical Maintenance, Tata Steel and Chairman of CMSI, Jamshedpur Chapter.



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Condition Monitoring Society of India(C M S I)

CMSI Members in News

Dr. V. Bhujanga Rao, Director, NSTL, and President, CMSI, Visakhapatnam has been appointed as Chief Controller (HR), Defence Research & Development Organization, New Delhi, with effect from 08th April, 2011.

CMSI congratulates him on his appointment and wishes him all the best in new assignment.

CMSI Welcomes New Members!!

Institutional Member:

**GMR Institute of Technology,
Rajam**

Life Members:

Dr. P. Srinivasa Pai
Mr. K. Venkateswara Rao
Mr. Ch. Suryanarayana
Mr. Rajendra S. Sukthankar
Cdr. G. L. Sharma
Cmde. U. C. Talwelkar
Mr. Hemanth M. Bari
Cdr. S. Gopikrishna
Mr. Kamal Mukharjee
Mr. Amit Kumar Mehta
Mr. Arvind Kumar Sinha
Mr. Thota Srinivas
Mr. S. Jagadeesh Kumar
Mr. Tapan Kumar Goswami
Mr. Korabu Tulasi Balaram Padal
Mr. Tangella Bhavani Shanker
RAdm. A.V. Subhedar
Lt. Cdr. Nikhil S Deshmukh

Editorial Board :

Dr. V. Bhujanga Rao
Dr. M. Ananda Rao
Sri. P.V.S.Ganesh Kumar
Sri. T. Venkata Ratnam

CMSI Newly Elected Executive Body

Annual General Body Meeting (AGM) of Condition Monitoring Society of India (CMSI) was held on 24-02-11 at Hotel Green Park, Visakhapatnam at 1930 Hrs. Election of new executive body was conducted during AGM and the following members are unanimously elected with effect from 01-04-2011.

President	:	Dr. V. Bhujanga Rao
Vice Presidents	:	i. Prof. M. Ananda Rao ii. Sri. KVVSS Murty
General Secretary	:	Sri. PVS Ganesh Kumar
Jt. Secretaries	:	i. Prof. MRS Satyanarayana ii. Dr. Edwin Vijay Kumar
Treasurer	:	Prof. K. Ramji

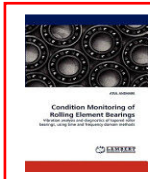
Executive Committee Members:

Sri. G.U. Narasimhulu	Prof. K.V. Ramana
Sri. R.K. Biswas	Sri. P. Kanakeswara Rao
Sri. T. Venkata Ratnam	Sri. A.K. Paul
Sri. G.R.P. Singh	Sri. Krishna Dutt
Prof. V.S.R.K. Prasad	

CMSI Wishes All the Best to all the newly elected executive body members!!

Reference Books

Condition Monitoring of Rolling Element Bearings By Atul Andhare



This book is focused on vibration based condition monitoring of tapered roller bearings. It presents results of experiments performed towards diagnosis of defects in tapered roller bearings using vibration analysis. A MATLAB based computer interface, which was developed for vibration signal processing and diagnostics, is also discussed in the book.

This interface made use of all the time and frequency domain vibration data to diagnose defects in bearings. This book will be useful for the practicing engineers and students working on condition monitoring.

Publisher : **Lambert Academic Publishing 2010**
ISBN : **3838357949, 9783838357942**

BOOK POST

If undelivered please return to:

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Naval Science & Technological Laboratory,
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All feed back, comments and contributions to the news letter are most Welcome.

- Editors