



MONITOR

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From President's Desk...



Motor Maintenance: Improve the bottom line: Motor is one piece of equipment, which finds its presence in every industry, process plant, mobile platforms, agriculture pump sets, etc. To talk of numbers, a steel plant will have nearly 25000 motors in one plant! The number of agricultural motors runs into few lakhs in Andhra Pradesh only. We think that organizing and setting a budget for a motor PM programme is usually difficult. A wrong machine to get economy of cutting costs! But I believe the other way. We have to choose best P M techniques for motors. They could be temperature, listening sounds, infrared scanning, vibration analyzer, stethoscopy, mounting checks, oil checks, motor current monitoring, excessive end play, etc. Differences in readings obtained year to year indicate bearing wear. Proper tools, trained men and accurate records is what is required to get economy of costs in the maintenance of motor at viable scale.

Most common causes of thrust bearing failures!!

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Thrust bearing failure of a premature engine occurs often soon after an engine rebuild. One of the most common causes of thrust bearing failures is the transmission torque convertor. When the overrunning clutch in a torque convertor becomes either seized or will not lock up in one direction, the stator does not provide its normal function of directing the transmission fluid to create the proper torque multiplication required to drive the vehicle. When this happens, a large amount of the energy created is exhausted through the center of the torque convertor, creating excessive forward pressure. It is this pressure which causes the engine thrust bearing damage.

Improper installation of the torque convertor in the transmission front pump can also lead to bearing failure, as well as transmission failure.

Vehicles with standard transmissions may also experience this type of engine failure due to high clutch pressures, usually related to performance clutches with high spring pressures being installed. Riding the clutch can also cause thrust bearing failure on new engines. One should also ensure the clutch has adequate free play. Symptoms of damage caused by excessive external pressure on the crankshaft vary on engines due to their design differences.

Small block engines usually suffer catastrophic damage from excessive external pressures. In most cases the thrust bearing shows signs of heavy rubbing on the thrust bearing. The most severe damage is on the other mains bearings, with the highest wear being on the center bearing, usually concentrated on the lower half of the bearing. The intermediate main bearings will have about half the wear of the center bearing, with the front and rear bearing showing little sign of problem.

Big block engines, due to the rigidity of their crankshaft, will usually only destroy the thrust face of the thrust bearing, causing little damage to the other mains. Engines with a center thrust bearing usually, as well as rubbing the thrust surface, will show signs of wear on the opposite sides of the crankshaft on the two intermediate bearings.

It is found that in some cases of thrust bearing failure on small block engines that do not seem have an apparent cause. Upon checking the inner part of the bearing that seats in the block, signs of scraping on the bearing were noticed. This is the result of the installer trying to install the bearing in the rear location instead of the center, where the thrust bearing is located in this type of engine.

Main Features of this Issue

- Common causes of thrust bearing failures
- Glimpses of NCCM-2009
- CM Around the Globe
- CMSI Members in News
- New Members
- Reference Books

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NATIONAL CONFERENCE ON CONDITION MONITORING (NCCM – 2009) - SOME HIGHLIGHTS

The Second National Conference on Condition Monitoring (NCCM 2009) was organized by Naval Science and Technological Laboratory (NSTL) and Condition Monitoring Society of India (CMSI) under the aegis of Defence Research and Development Organisation (DRDO) during 04–05 December 2009 at Visakhapatnam.

The conference was planned with the objective of bringing together practitioners and experts of Condition Monitoring and spread the message of effectively implementing Condition Monitoring practices in the industry for enhanced productivity and increased availability.

Dr. V. Bhujanga Rao, Director NSTL and Founder President of CMSI was the Chairman for this conference and Prof. (Dr.) M. Ananda Rao was the Co-chairman with Shri PVS Ganesh Kumar, Additional Director, as the Convener. The Conference was inaugurated by Shri Ajeya Kallam, Chairman, Visakhapatnam Port Trust, Visakhapatnam. Shri B. Subrahmanyam, Vice Chancellor, GITAM University, Visakhapatnam and Shri B V A Rao, Advisor to Chancellor, VIT University, Vellore were the Guests of Honor.

The Chief Guest of the inaugural Shri Ajeya Kallam, IAS, said lot of research is being carried out to develop new techniques of condition based monitoring of machines to reduce disadvantages of preventive maintenance.

On this occasion, CMSI felicitated Prof. B. Satyanarayana, Vice Chancellor, Andhra University, Visakhapatnam. Prof. Satyanarayana has been constantly guiding and encouraging the activities of the society since its inception. While thanking CMSI for felicitating him, Prof. Satyanarayana brought to the notice of audience that PG Diploma in Condition Monitoring (PGDCM) in distance education mode is about to be started by AU in association with CMSI shortly.

The keynote address was delivered by Prof. Dr. BVA Rao, a pioneer of Condition Monitoring in India, and Director (International Relations), VIT. He delivered a talk on “Some Random Thoughts & Allied Areas in Condition Monitoring & Condition Based Maintenance”.

Invited talks were delivered by Dr. V. Ramamurti, Retired Professor, IIT, Chennai, Sri B.K. Patnaik, Associate Director, IIPM, Dr. K V Bhaskar Sarma, SRDC, Bengaluru, Dr. Suneet Tuli, IIT, Delhi, Dr. Rajiv Tiwari, IIT, Guwahati and Dr. Edwin Vijay Kumar, AGM, Vizag Steel Plant, Visakhapatnam. These lectures were of immense benefit to the participants and helped to enrich their knowledge base.

A number of participants representing various sectors of the industry and the services, academic institutions, and students actively participated in the deliberations and presented papers on various themes such as ‘Vibration based Condition Monitoring’, ‘Oil and Motor Current based Condition Monitoring’, ‘Thermography and Acoustic Emission based Condition Monitoring’, ‘Automation in Condition Monitoring’, and ‘Reliability Centered Maintenance’.

In particular, 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 Viskahapatnam Steel Plant, Hindustan Petroleum Corporation Limited, National Thermal Power Corporation, SAIL, Visakhapatnam Port Trust, Electrosteel castings, IFFCO and Academicians from Andhra University and GITAM University are actively associated with the conference.

Similarly R&D scientists from DRDO, BARC and CMERI, Durgapur also presented their case studies. Consultants such as ACME, Sampoorana 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 before the Conference dinner to the appreciation of 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, and helped in spreading the utility of Condition Monitoring practices for achieving better productivity in industry.

The proceedings of the conference are available for members in our website www.comsoi.org.

What is Rotor Runout ?

Vibration measurement of rotating components is well known and largely understood due to online vibration monitoring systems. One major component of such systems is the ability to measure shaft vibration using non-contact probes such as eddy-current shaft proximity probes. These probes measure the distance between the probe tip and the shaft surface. One important aspect to be aware of when using this type of probe is a phenomenon known as Runout.

Runout is the combination of the inherent vibration measurement of a rotating object together with any error caused by the measurement system. Runout may consist of two components:

Mechanical Runout - An error in measuring the position of the shaft centerline with a displacement probe that is caused by out-of-roundness and surface imperfections.

Electrical Runout - An error signal that occurs in eddy current displacement measurements when shaft surface conductivity varies.

Terminology: Baseline Spectrum

A vibration spectrum of a machine that is considered in good condition. Baseline spectrum may be an average of spectra recorded from several machines of the same type. The baseline spectrum is also sometimes called a reference spectrum, and is used as a basis for comparison to spectra recorded as the machine continues to operate.

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GLIMPSES OF NCCM-2009

04-05 December 2009



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Condition Monitoring Society of India(C M S I)

CMSI Members in News



1. Stanley L Ehrlich Gold Medal for outstanding work in Engineering Bio-acoustics was awarded to Dr. V. Bhujanga Rao, President, CMSI and Director, NSTL by Acoustical Society of America (Madras Regional Chapter) on 26 Nov 2009 at the National Symposium on Acoustics held at RCI, Hyderabad.

2. President CMSI and Director NSTL, Dr. V. Bhujanga Rao was presented the National Design Award by the National Design and Research Forum, under the aegis of the Institution of Engineers India, for his outstanding work in Engineering Design.

3. Dr. V. Bhujanga Rao, President, CMSI and Director, NSTL receives the Silicon Trophy from Shri AK Antony, Hon'ble Raksha Mantri, in the presence of Dr. VK Saraswat, SA to RM on 23 Feb 2010.

4. Shri M. Mohana Krishna, Scientist F, received the "Scientist of the Year" Award from Hon'ble Defence Minister, Shri. AK Antony, on 23 Feb 2010, for his excellent contributions in the design and development of 'first of kind' Infra Red Signature Suppression

CMSI Welcomes New Members!!

Institutional Members:

M/s Electro Steel Casting Ltd.,
Kolkata

M/s. AIMIL Ltd., Instrumentation
& Technologies, Secunderabad.

Life Members:

Sri. S. Kumara Swamy
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Sri T. Venkata Ratnam



Sri PVS Ganesh Kumar, Scientist 'F', NSTL, Visakhapatnam was elected as General Secretary, Acoustical Society of India (ASI). CMSI wishes him best of luck in his future endeavors.

CONDITION MONITORING AROUND THE GLOBE...

Courses, Conferences, Workshops

International Conference on Condition Monitoring and Diagnosis (CMD2010)

Date: September 6 -11, 2010

Venue: Tokyo, Japan

Web: <http://www.cmd2010.org>

Reference Books

Electrical Motor Diagnostics: 2nd Edition (2008): By Dr. Howard W. Penrose, PhD, CMRP

Developed for electricians, mechanics, students, academia, and reliability/maintenance managers, Electrical Motor Diagnostics provides the information, case studies, and materials necessary to interpret motor circuit analysis, motor current signature analysis, electrical signature analysis, and other standard testing technologies for AC/DC electric motors, transformers, machine tool motors, synchronous motors, and generators including pass/fail values.

ISBN 978-0-9712450-7-5, \$149.95

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Naval Science & Technological Laboratory,

Visakhapatnam – 530 027, INDIA, Phone: 0891-2586100

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

- Editor