



MONITOR

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EDITORIAL

Hello! Folks...

NSTL is hosting under the aegis of CMSI, this year National Conference, NCCM-2006 during 15-16 Dec '06. Every effort is being made to make this annual meet a great success and rewarding experience. I request CMSI community to participate in this meet splendidly and give their best for the success of this annual meet. As you know CMSI is a no loss/no profit organization endeavoring to help to cut costs for the growth of Industry.

— President, CMSI

7 key trends for Condition Monitoring in the 21st Century

- The development of smart sensors, and other low-cost on-line monitoring systems that will permit the cost-effective continuous monitoring of key equipment items
- The increasing provision of built-in vibration sensors as standard features in large motors, pumps, turbines and other large equipment items
- Increasingly sophisticated condition monitoring software, with rapidly developing "expert" diagnosis capabilities
- The acceptance of Condition Monitoring within the "mainstream" of Operations and Maintenance, with Production operators increasingly utilising Condition Monitoring technologies as part of their day-to-day duties
- Increasing integration, and acceptance of common standards for interfacing Condition Monitoring software with CMMS and Process Control software
- An increasing focus on the business implications and applications of Condition Monitoring technologies, leading to the utilisation of Condition Monitoring technologies to improve equipment reliability and performance, rather than to merely predict component failure.
- A reduction in the cost-per-point of applying Condition Monitoring technologies - possibly leading to more widespread use of these technologies.

Call for Papers

Condition Monitoring Society of India is organizing a National Conference on Condition Monitoring (**NCCM-2006**) during December 15-16, 2006.

NCCM-2006 invites papers related to various disciplines on Condition Monitoring systems for presentation and publication in the proceedings of the conference, and a souvenir to be brought out during the conference. The papers relevant to diagnosis and rectification of machinery faults with case studies are expected to benefit the participants most.

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Abstract submission deadline: 30 September 2006.

Full Paper deadline: 07 November 2006.

**Hey Stop! Don't do surgery...
Why don't you go for CM?**

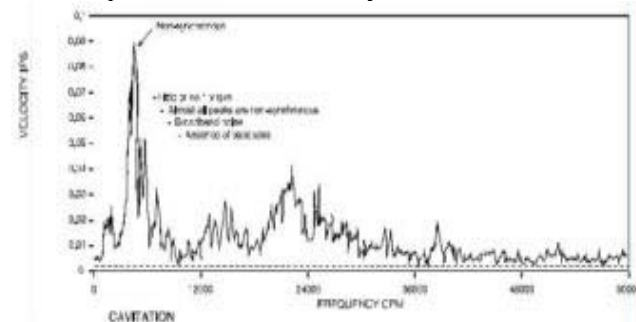


Editorial Board:

Dr. V.Bhuianda Rao. Dr. M. Ananda Rao. Mr. K.V.V.S.S. Murty. Mr. T. Venkata Ratnam

Cavitation – A Machinery Vibration Problem for centrifugal pumps

Cavitation is caused by a lack of Net Positive Suction Head (NPSH) in centrifugal pumps. It can also be induced by turbulent (non-laminar) flow conditions caused by sharp pipe bends immediately upstream of the pump suction. To prevent turbulence induced cavitation, it is recommended that a minimum of 6-10 pipe diameters of straight pipe be installed immediately upstream of the pump suction. The source of the cavitation induced vibration is the tiny implosion caused by pockets of steam condensing into considerably smaller droplets of water (or other liquid). Except for the volume of the tiny droplets, the space the steam occupied becomes a vacuum. This causes the liquid droplets to explode into a burst of steam followed by another condensation, implosion-explosion, etc. Though small in size, the continuous implosions and explosions impinge on the pump casing and impeller. These random impacts are usually located at the suction side of the pump, and the amplitudes of vibration do not usually exceed alert values unless resonance is involved (when peaks may reach 0.6-0.7 in/sec). Although the amplitudes are usually relatively small, cavitation is extremely destructive and causes erosion of the various components. It can also cause axial surging which, if excessive, will damage both bearings and seals. The spectra produced have a very wide frequency range and low amplitude. There are usually no sharp peaks, but instead, peaks that look like haystacks.



Cavitation produces very erratic and varied frequencies. With FFT analyzer, its effect on the vibration spectrum can be reduced by increasing the number of averages. Synchronous time averaging will also remove the cavitation-related portions from the spectrum.

The highest amplitudes are most often found in the suction area of the pump and are often highest in the axial direction. One frequency that does not usually show up in cases of cavitation alone is vane passing frequency or number of vanes x rpm.

Shaft Alignment Issues

Shaft misalignment is known to be responsible for up to 50 percent of breakdowns in rotating machinery. Such breakdowns increase machine downtime, lost productivity, and associated costs. Incorrect alignment further places a greater load on machine components, increasing wear and tear and putting additional stresses on supporting bearings.

Misalignment occurs when the center lines of rotation of two machinery shafts are not in line with one another. There are two types of misalignment (parallel and angular) and, in most cases, machine misalignment is caused by a combination of both.

Shaft misalignment adversely affects bearing performance. Misaligned shafts generate a frictional moment, which creates a reaction force in the shaft bearings of the driven and drive units. (As a safe guard, users should confirm that the degree of misalignment between the shafts is within the coupling manufacturer's tolerances and the machinery manufacturer's recommendations.)

In some bearings a 20 percent increase in load caused by misalignment will reduce the calculated bearing life by almost 50 percent. Proper shaft alignment can reward users with important advantages, including longer bearing life; minimal stress on couplings, reducing the risk of overheating and breakdowns; minimal wear of seals, lowering risk of contamination and lubricant leakage; lower energy consumption; minimal vibration and noise; and increased uptime.

Andhra Pradesh Honours – Stealth Man



Indian Express has brought out a special issue titled

“Celebrating the Best” on Andhra Pradesh highlighting the happenings in 2005-06 covering various aspects like Governance, Agriculture, Industry, Infrastructure, IT, S&T, BioTech, Tourism etc. In

a section entitled “Andhrapradesh Hounours” **only six individuals** from the State have been covered as extraordinary men of the period.

CMSI President shares the honour along with Dr. Ch. Chelamiah in Medicine and Dr. Lalji Singh, Director CCMB, Chief Minister and Two other celebrities.

CMSI congratulates its president for being one among the six who shared AP honours in 2005-06.

M/s. Mechanalysis (India) Limited (formally IRD Mechanalysis India Ltd.)

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Product News



RailBAM® – A new Bearing Acoustic Monitoring System

Derailment of trains caused by wheel bearing faults is a significant issue in the rail transport industry. A considerable number of derailments and train stoppages annually around the world are due to actual and potential overheated bearings.

Trains often consist of up to 320 wagons containing 2500+ bearings. The failure of just one bearing poses a significant safety risk.

Until recently inspection methods only included roll-by inspections and Hot Box Detector networks. Such "go/no go" tools are emergency alarms systems and therefore very costly. In contrast, Condition Monitoring approaches, well established in many industries, allow Predictive Maintenance of bearings, avoiding the above shortcomings. VIPAC Engineers & Scientists Ltd has developed RailBAM®, a new Bearing Acoustic Monitoring system. RailBAM® uses acoustics methods to implement Condition Monitoring for the roller bearings of underway rolling stock. RailBAM® detects and ranks axle-bearing faults and 'acoustic' wheel flats and provides advanced warning of failure.

Rockwell Expands Predictive Toolset

Rockwell automation has expanded its suite of predictive maintenance tools with the addition of the Allen-Bradley XM series of intelligent, distributed I/O modules, the XM-160 series of overall machinery protection modules. Deployed as either a stand-alone monitor or part of a broader network solution, the XM-160 series of a complete and cost effective solution for detecting system deterioration, providing maintenance departments with the intelligence necessary to correct issues before productivity is impacted. As the industry's first machine monitoring and protection system that successfully links maintenance tools to control architecture, the XM series can be deployed on an open-standard industrial bus, allowing plant engineering and maintenance to continuously and cost-effectively monitor and protect critical plant floor assets. The modules are designed to serve applications requiring real-time monitoring of vibration levels.

Rockwell Automation, Milwaukee, WI.

Extend the life of your lubricants and machinery!!

1. Prevent metal to metal contact at the operating temperature of the machinery by using proper lubricants which can provide the required viscosity and additives.
2. Store the lubricants to prevent contamination.
3. Filter the new lubricants and lubrication systems as per standard (ISO 14/11), or better, before they are being used.
4. Maintain the lubrication systems less than 100-parts per million of water.
5. Maintain lubricants temperature less than 150° F.
6. Use oil analysis to determine the condition of the lubricants and determine the wear and condition of the machinery.
7. Use the oil analysis to determine when the machinery needs repair and prevent the machinery from having catastrophic failures and change the lubricants.

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Do U Know!!!

If your machines are't telling you how they feel, you're probably wasting money on unplanned maintenance. Use diagnostics and analysis tools to keep equipment well and opening at peak performance.

CSI 9210 Machinery Health Transmitter

Emersion Process Management's CSI 9210 Machinery Health Transmitter can analyse sensor data for vibration, temperature, speed and motor flux data to determine machine health. It's been designed to assess the health of motor pump machine trains. Data are analysed inside the device and only results are published to the control system. CSI 9210 uses FOUNDATION field bus (FF) communications protocol making information available to an FF-complaint host system. It produces two main analysis results, machinery health values, and machinery alerts, with an onboard process system that evaluates the data to determine what problems may be developing in the machine train by comparing other process values associated with the pump system, like pressure, temperature, and flow rate.

Terminology

'Full Overhaul'- means a complete strip down to bare frames, then rebuilt with new roller bearings and seals. All parts checked for wear & tear and replace if necessary. Repaint of frames and parts if required.

'Partial Overhaul'- allows to choose the areas of the machine that require special attention, or even redesign, if past problems highlight a particular motion that gives trouble in production.

**CMSI Annual General Meet – 2006 at Hotel Dolphin
with Sri A.S.Rao, Executive Director, HPCL, Visakhapatnam as Chief Guest**



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

- Editor

CMSI Welcomes New Members!!

Life Members:

Sri A.V.S. CHARI
Sri G.SUBHASHBABU
Sri BRIJESH KUMAR
Sri A. SESHAGIRI RAO

Annual Members:

Sri M. P.SRIVASTAVA
Sri RAHUL PAHARIA
Sri M. SRINIVASA RAO
Sri K.SRINIVASA RAO
Sri G.V.R. REDDY
Sri P.K. GARU
Sri Ch.S.R.K. SARMA
Sri J. BHEEMA RAO
Sri D. RAMESH BABU

**Replica of CMSI Certificate for
Institutional Members**



For enrollment as a member of our society Visit our website

www.comsoi.org

If undelivered please return to:

To,

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