



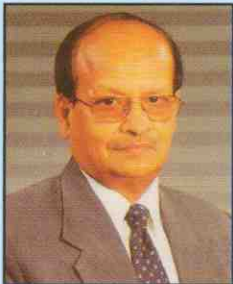
TSI NEWSLETTER

#9

A Quarterly Newsletter from Tribology Society of India

OCT. 2001

Message From President



Dear TSI Members,

Thank you for your overwhelming response to the ICIT-2001, which was scheduled to be organized from 27th to 30th Nov 2001 by TATA Steel at Jamshedpur. The response was really great and almost 100 technical papers have been received

from India and abroad for presentation in this conference. However, we have been concerned about the poor response of delegates and keynote speakers from abroad for this conference. This has been caused due to corporate restrictions imposed on international travel by many countries in the wake of the September 11 attack on the World Trade Centre in the USA. In view of this, a large number of foreign delegates and guests who were to deliver lectures, keynote addresses and theme lectures, have expressed their regrets to attend the conference. Under such a situation, we have no other options than to postpone this conference to a later date. This has been done to facilitate participation from a wider cross-section of tribologists from world over. Therefore, the conference will now be held from April 8 to 11, 2002 at the same venue. The education course on "Advances in Lubricating Greases" has been held as per the earlier schedule, and the other two education courses have been postponed to be held during the conference as per the new schedule. A detailed circular in this regard will be sent to you all soon.

I sincerely regret the inconvenience caused due to this postponement. However, I assure you all that the conference is only being postponed and not cancelled.

Looking forward to your continuous support for TSI in furthering its objectives.

With best wishes to you all,

Yours sincerely
Dr. A. K. Bhatnagar

Eminent Tribologists

Shri C. Mishra, TATA Steel, Jamshedpur

Shri C. Mishra is presently the Head of Mechanical Technology Division at Tata Steel, Jamshedpur. After obtaining B.Tech. degree in Mechanical Engineering, he did 12 months, research work at IIT, Kharagpur in Tribology and Lubrication Engineering. At various stages of his career he also took short term courses in Polymer Technology, Material Science, Physical Metallurgy, Computer Programming, Machine Dynamics and Tribology. He has put in about 35 years service in Tata Steel. His areas of interest have been related to Tribology in hydraulics, conveyer belts, wire rope, rubber and polymer products, surface engineering etc. He took special interest in mechanical maintenance of steel plant equipment. He has created a Tribology Work Bench, a unique system that helps to solve the maintenance problems through analytical and condition monitoring based approaches. This has resulted in significant improvement in equipment reliability and reduction in maintenance cost. He has also created a condition monitoring centre in Tata Steel which has state-of-the-art techniques of vibration analysis, thermography, ultrasonic testing, wear debris analysis, spot hardness technique, shock pulse analysis, particulate count etc. and softwares like Oil View and Motor View for condition monitoring of plant equipment. He has introduced in Tata Steel the process of optimization technique in maintenance practices for cost effective maintenance.



Shri Mishra has published several papers in Tata Search and other national and international journals. Four of his papers have received awards. He has organized many national and international seminars in Jamshedpur. He is the Organising Secretary of the International Conference on Industrial Tribology being organized by TATA Steel under the aegis of Tribology Society of India (TSI) at Jamshedpur during 8th to 11th April 2002.

Shri C. Mishra is the recipient of Visveshvarayya Gold Medal, an award instituted by Institution of Engineers (India), in the year 1992.

3rd International Conference on Industrial Tribology Postponed to April 8th - 11th, 2002.

TRIBOLOGY : A MULTI - DISCIPLINARY APPROACH

Tribology is a fascinating research subject as many times the results of the research through experiments in tribo-testing machines are seen quickly. Many maintenance engineers will also vouch for exciting findings when they apply simple tribological tools in situations like oil condition monitoring. But can we say so with confidence when it comes to the application of tribology to areas such as design where, the direct benefits may be rarely seen or related to tribology? Nevertheless, it is very crucial for the designer to remain focused on tribology to reap the benefits in terms of reliable designs and also to avoid tribological problems at design stage before they occur in real life application. Can we really argue a case for tribology in a seemingly unconnected area such as controlling global warming? Let us stretch our minds: CO₂ emission targets to be met by automobiles under Kyoto Protocol, for example, can be helped, inter-alia, by application of tribological research such as low rolling resistance tyres, low viscosity friction modified lubricants and low friction engine designs etc.

This brings us to the point: How can the designers and the application engineers become tribology conscious? The answer lies in the recognition of the fundamental framework of tribology as an interdisciplinary science. How many of us, the tribologists, have knowledge and experience of multidisciplinary research? We have all along emphasized, since Jost's report in 1966, the need of tribology. But finally it is the demand which causes growth. This demand for tribology can be created by individuals, but only in small measures; the societies like TSI can certainly make a better impact by encouraging multidisciplinary groups to work in the field of tribology.

This issue of the TSI Newsletter features a technical update 'Nano-Tribology' - which truly is interdisciplinary. Eminent Tribologist featured in this issue belongs to the group of application engineers who are creating the demand for tribology in the country from which will emanate the need for tribological research - thus creating a self-sustaining mechanism for growth of tribology.

Two of our local chapters, Bhopal and Pune, have been quite active these days. We also hope that other local chapters will carry out their chartered activities on which we should be able to reflect in future issues of TSI newsletter.

The second World Tribology Conference was held in Vienna during 3rd - 7th Sept 2001. The lone Indian participant, Shri N. M. Dube's observation about strong Japanese presence in the conference is noteworthy because their commitment to research in tribology in recent times is well known. These international conferences are the windows to peep in, to capture the latest happenings in the research and to further build on. We sincerely hope that our industry, especially the corporate sector, will encourage participants in such events. This year, we really missed ICIT-2001 in the wake of the Sep 11, 2001 events in U.S. Nevertheless, it is heartening to note that ICIT-2001 will now take place on 8-11 April 2002 at Jamshedpur and we look forward for exciting times together.

In this second issue of re-launched TSI Newsletter, we are reproducing a letter from one of readers. It is a welcome sign. Please believe me: If there are listeners, story tellers will always be around.

Dr. G. K. Sharma

Members Column

Letters to the Editor

Dear Sir,

I have just received our Society's maiden newsletter. To say the least, I am very much impressed by the contents. This is what I aspired for a long time. Thanks for bringing out a nice issue against all odds. Hope you would continue bringing out more issues like this with the same missionary zeal, which has been seen in the pages of this newsletter.

The article on Dr. K. S. Ramayya is informative and makes interesting reading. I hope you would bring out more tributes like this in the future issues also.

There are some spelling mistakes in this issue. Hope they would not find a place in the future issues.

Once again, I thank you for bringing out the excellent newsletter.

With regards,
Anandan. N

Achievements

Dr. C. M. Reddy receives Young Engineers Award.

Dr.C. M. Reddy, Associate Professor at CBIT Gandipet, Hyderabad has been awarded the "Young Engineer of the Year - 1999". The award is jointly instituted by the Institution of Engineers (India), AP State Chapter and Govt. of Andhra Pradesh.

Indian Journal of tribology

Tribology Society of India is planning to launch its quarterly journal "Indian Journal of Tribology" during the ICIT at Jamshedpur. This will be distributed to all life members as part of the benefit for being a member of this society.

Technical Update

Nano Tribology

Professor S. K. Biswas, Indian Institute of Science, Bangalore.

Historically a unique problem has troubled tribologists for generations; predictions and designs are based on continuum and scale independent phenomenon. While tribological interactions often occur in very small scales and volumes, our observations are related to large-scale dimensions and volumes. For example, the junction growth model of Tabor is really a very small volume phenomenon at the asperity level involving molecular level interactions. As the phenomenon and the related small volume deformations were impossible to be observed directly, the model which is supposed to provide a phenomenological view of adhesive wear and friction was based on continuum plasticity theory. The situation has changed dramatically in the last ten years. With a virtual revolution in electronics and materials technology, we are able to make reliable measurements down to nano and pico metric levels. This advance coupled with the giant strides in non-continuum modeling at the molecular level has opened up a new world of phenomenon, properties and mechanics.

This enables fresh look at old problems such as lubrication and hardness while it brings in new approaches to design of materials and components for tribological applications. The problems of nano wear in magnetic storage disc has now been handled successfully using the tools of nano tribology. To look into the immediate future, the problems of ultra thin tribological coatings and designer molecules for specific applications look solvable within the framework of nano tribology. One of the most interesting aspects of nano tribology is that the traditional separation between science and engineering has disappeared. Today, for example, to understand boundary lubrication mechanism we use a whole host of techniques such as Four Ball Tester, Infrared and Raman Spectroscopy, Atomic Force and Scanning Tunneling Microscopy, TOF-SIMS, Small Angle X-ray as well as more conventional techniques of NMR and light scattering, all coupled and linked together by abinitio and molecular dynamic calculations. The techniques and instruments are no longer confined to academic research laboratories but have started to be used increasingly by industrial R&D and production organizations. Another major development, which has become possible via nano tribology is the design of new smart materials and their fabrication.

It is now possible to alter surface properties not only using conventional surface engineering techniques but also by atom-by-atom manipulation of the zone of interest and specific application. The latter is of special relevance to a new generation of machines known as MEMS and NEMS. The scale of the devices is often hundreds of micrometers and the problems of stick slip, adhesion and lubrication at the nano scale have now appeared as major challenges to nano tribology. Here we are not just investigating tribological phenomenon at a nano scale but looking for nano tribological solutions, which can make these machines efficient and functional.

Nano tribology in short has brought the scale of interest, familiar in physics and chemistry, to the level of engineering phenomena in this new framework are being investigated while new solutions are being found.

Local Chapter Activities

Bhopal Chapter

The Annual General Body Meeting (AGM) of TST Bhopal Chapter was held on August 10, 2001 in the Conference Hall of the Regional Research Laboratory, Bhopal (RRL).

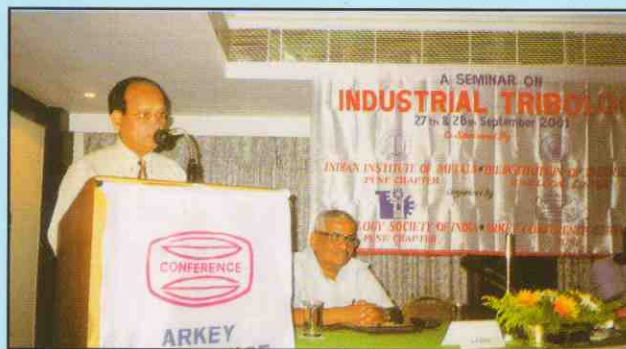
Dr. A. H. Yegneswaran, President, TSI Bhopal Chapter, while welcoming the participants expressed his satisfaction to note that as per the recommendations of the last AGM, the local chapters of national societies presently operating from RRL, Bhopal, i.e., IIM, MRSI & TSI have clubbed their activities for better response from members. This has enabled the societies to reach out to a wider cross section of professionals. It has also resulted in widening the activities of the TSI, Bhopal Chapter through establishing wider contact with academic institutions and industries personnel who are not members of the society. He opined that the number of members need to be increased and efforts should be made in this direction. Dr. Yegneswaran also expressed satisfaction on the activities carried out by the local chapter.

Dr. Rupa Dasgupta, Secretary of the local chapter, welcomed Dr. N. Ramakrishnan, Director, Regional Research Laboratory, Bhopal who made it convenient to attend the AGM in spite of his busy schedule. She welcomed the members of the AGM, especially the new members of the chapter for showing interest in the activities of the chapter.

Dr. Rupa Dasgupta elaborated upon the activities of the local chapter since the last AGM.

Pune Chapter

Two-Day Seminar on Industrial Tribology held on 27th and 28th September, 2001



Dr A.K. Bhatnagar, President TSI delivering the inaugural address in the seminar

Second National Seminar on Industrial Tribology was jointly organised by TSI Pune Chapter and Arkey Conference Service Cell, Pune. It was co-sponsored by Indian Institute of Metals, Pune Chapter and The Institution of Engineers, Pune local Centre.

Dr. A. K. Bhatnagar, President TSI and Director, IndianOil R and D Centre, Faridabad, inaugurated a well-attended seminar. He delivered an excellent thought provoking keynote speech in which he outlined the development of science of tribology over the last 150 years. He also highlighted the recent advances made in the areas of lubricants, bearing materials and surface engineering, and thermal treatment. He further elaborated the substantial contribution made by IndianOil

