

XI NATIONAL CONFERENCE ON INDUSTRIAL

TRIBOLOGY

1995

January 22-25, 1995

at

SCOPE COMPLEX

CORE 2

LODHI ROAD

NEW DELHI

Organised by



INDIAN OIL CORPORATION LTD
R&D CENTRE, FARIDABAD



Under the aegis of

TRIBOLOGY SOCIETY OF INDIA

FINAL ANNOUNCEMENT

&

CALL FOR REGISTRATION

XI NATIONAL CONFERENCE ON INDUSTRIAL TRIBOLOGY - 95

NATIONAL STEERING COMMITTEE

Shri B.K. Bakshi , Former Chairman, IOC, Bombay.	Chairman
Dr A.K. Bhatnagar , Executive Director, IOC (R&D), Faridabad.	Chairman, Organising Committee
Dr. D.V. Singh , Director, CRRI, New Delhi.	Member
Dr. T.C. Rao , Director, RRL, Bhopal.	Member
Dr. T.S.R. Prasad Rao , Director, IIP, Dehradun.	Member
Dr. V. Ramaswamy , Executive Director, SAIL, Salem.	Member
Shri K. Kumar , Director, Maruti Udyog Ltd., Gurgaon.	Member
Shri J.K. Das , Executive Director, PCRA, New Delhi.	Member
Shri U.K. Dikshit , Executive Director, Indian Oil Corporation, New Delhi.	Member
Shri M.N. Lambah , Executive Director, IOC (M), Bombay.	Member
Shri A.M. Uplenchwar , GM, IOC (R&D), Faridabad.	Member
Shri N.K. Puri , GM, HPCL, Bombay.	Member
Shri J.P.L.N. Shastry , GM, BHEL, Hyderabad	Member
Shri R.P. Sharma , Ashok Leyland Ltd., Hosur, Tamil Nadu.	Member
Dr. S.R. Mediratta , GM, RDCIS, SAIL, Ranchi.	Member
Dr. A.S. Sharma , GM, Lubrizol India Ltd., Bombay.	Member
Shri N.R. Bhoopatkar , GM, IOC (M), Bombay.	Member
Shri J.C. Seth , GM, IOC (M), New Delhi.	Member
Dr. G.S. Vasudev , CTSM, BPCL, Bombay.	Member
Shri A.K. Mehta , CRM, IOC (R & D), Faridabad.	Convenor & Secretary, Organising Committee.

SESSION ORGANISERS

KEYNOTE / PLENARY :	Dr D.V. Singh , Director, CRRI, New Delhi.
LUBRICATION BASICS :	Dr R. Sinhasan , Professor, University of Roorkee, Roorkee.
TRIBOLOGY OF MATERIALS :	Dr S.K. Biswas , Professor, IISc., Bangalore.
AUTOMOTIVE LUBRICATION :	Shri Sudhir Singhal , Deputy Director, IIP, Dehradun.
MAINTENANCE TRIBOLOGY AND CONDITION MONITORING :	Dr. Har Prasad , Lab Manager, BHEL, Hyderabad.
TRIBOTESTING AND ANALYTICAL TECHNIQUES :	Shri A.K. Mehta , CRM, IOC (R & D), Faridabad.
INDUSTRIAL LUBRICANTS, GREASES AND SPECIALITY LUBRICANTS :	Dr J. Bhatia , ED, Balmer Lawrie & Co Ltd., Bombay.
TRIBOLOGY IN METAL WORKING :	Shri Sudhakar Jha , DGM (RT), RDCIS, SAIL, Ranchi.
SPECIAL TOPICS IN TRIBOLOGY :	Dr. A. Sethuramaiah , Professor, IIT, New Delhi.

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SCOPE OF THE CONFERENCE

A World Conference in Industrial Tribology was organised in India in 1972. Since then, the tribologists of the country have not looked back and have been regularly organising a biennial National Conference on Industrial Tribology in the country to provide a national forum for exchanging ideas and sharing of experiences related to various aspects of Tribology. To further enhance and co-ordinate the national activities in the field of tribology, the "**Tribology Society of India**" came into existence in 1989 with registered office at BHEL, Hyderabad. Since then, the biennial conferences are being organised by different organisations under the aegis of the tribology Society of India.

The XI National Conference on Industrial Tribology is being organised by **Indian Oil Corporation Ltd. R & D Centre** at the **Scope complex, Lodhi Estate, New Delhi** from the **22nd to 25th January, 1995**.

The XI National Conference on Industrial Tribology will have "**Energy and Material Conservation through Tribological Measures**" as its main theme. This theme will be expressed in form of invited lectures followed by a panel discussion. Various important aspects relating to current research in various areas of Tribology will be brought out in terms of over eighty technical papers sent by various institutions active in the field of Tribology in the country and abroad.

The areas covered are grouped in the following eight categories:

- (1) Lubrication Basics
- (2) Tribology of Materials
- (3) Automotive Lubrication
- (4) Maintenance Tribology & Condition Monitoring
- (5) Tribotesting and Analytical Techniques
- (6) Industrial Lubricants, Greases and Specialities
- (7) Tribology in Metal Working
- (8) Special Topics in Tribology

A panel discussion will be held during the concluding session where the directions in future research in Tribology in the country will be discussed. The session will be an open house session with eminent tribologists answering queries in this regard and discussing them.

ABOUT THE ORGANISERS

Tribology Society of India

Introduction:

'Tribology Society of India' is a Professional, non-profit making body consisting of members from various Academic Institutions, Industry (Petroleum, Steel, Engineering) and Research Organisations in the country. Although the society in its present name and form was constituted in the year 1989, the tribologists of the country had been meeting together and organising National and International seminars every alternate year in the field of Industrial Tribology since the year 1972. It is also an affiliated member of the International Tribology Council, U.K.

The society has the following broad Objectives:

- (a) To promote advancement of the Science of Tribology. (Science and technology of Friction, Wear and Lubrication).
- (b) To provide a common forum for Industrialists, Technologists, Scientists and others to meet and to foster the advancement of Science of Tribology.

- (c) To organize and conduct activities of interest to the Members, such as holding of meetings, arranging of lectures, etc.
- (d) To disseminate scientific and technical information of interest to the Members through publication of periodicals, reports, etc. and proceedings of Conferences.
- (e) To collaborate with other bodies in India and abroad, pursuing similar aims and objectives in the areas related to Tribology.

Membership Fees

The following are the membership fees for various categories of memberships available:

	ADMISSION FEES	ANNUAL FEES
(A) INSTITUTIONAL MEMBERS	Rs. 10,000/-	—
(B) LIFE MEMBERS	Rs. 500/-	—
(C) ORDINARY MEMBERS	Rs 20/-	Rs. 40/-

About the organisers

The Research & Development Centre of India Oil Corporation Limited was established in 1972 with the primary objective of developing indigenous technologies in the areas of lubricant of formulations and refinery processes in the first phase of its activities spanning a period of a decade. Indigenisation of over 95 per cent of lubricating oils and greases for a wide range of applications was achieved. Further advances have been made with greater emphases on the development of energy efficient and environment friendly lubricants. Biodegradable products will form a part of this range in future.

Conservation of petroleum products was accorded a high priority following the oil crises of the 70's. Research and development programmes initiated in this area included the development of fuel efficient household appliances for cooking and lighting utilisation of alternate fuels in petrol and diesel driven vehicles evaluation of fuel-saving devices and additives development of fuel efficient and long drain automotive engine, oils railroad oils etc.

Tribology is a vital aspect to be considered during the development of lubricating oils and greases. Through the applications of standard procedures, or methods developed in-house, tribological parameters are evaluated before a product is passed on for final performance test or field trial.

Significant progress has been made in the area of refinery process development, while full capability has been established in FCC catalyst-evaluation and condition monitoring work on distillation, Merox and hydrocracking is progressing at a fast pace. Studies on the rheological properties of different crudes and petroleum products are carried out regularly to solve problems encountered in pipeline transportation of petroleum.

Material health assessment and material failure analysis of refinery equipment and marketing and pipeline installation form a major area of research being pursued.

The first R & D organisation in the Indian Petroleum Industry to obtain the ISO-9001 certification. Indian Oil R & D Centre is guided by the following organisational mission to achieve still higher levels of excellence.

R & D Mission

1. Provide leadership to corporate business through Research & Development.
2. Develop environmentally safe petroleum products and processes.
3. Ensure Commitment to petroleum and energy conservation and customer's trust and satisfaction.
4. Foster a culture of participation, creativity and quality in work.
5. Be a centre of excellence in Petroleum Technology.

CONFERENCE VENUE DETAILS

SCOPE Complex, located in one of Delhi's prime areas on Lodhi Road is flanked by Jawaharlal Nehru Stadium on one side and central government offices on the other. It is well connected from Palam Airport, New Delhi railway station, inter state bus terminus (ISBT), and Hazrat Nizamuddin Railway Station. The approximate distances from these three places will be 16, 9, 14 & 3 kms respectively. Pre-paid taxi and auto services are available from all these four places.

Convention Centre

The conference Venue is the SCOPE Auditorium, Mirza Ghalib Hall, Kalidas Hall, and Tagore Hall located at the SCOPE convention centre situated in the ground floor of Core 2 of SCOPE Complex.

Conference Information Cell

An information center providing computerised information regarding every aspect of Conference for the convenience of delegates will be operated from 22nd-25th January, 1995 from 8.00 a.m. to 8.00 p.m. at SCOPE Complex convention center. Contact phone number of this is 4360101/Extn. XI NCIT-95 Conference Venue.

REGISTRATION

Registration Fees

Category	TSI Members	Non Members
Industry Delegates	Rs 1600	Rs 2000
Academic Institution Delegates	Rs 800	Rs 1000
Bonafide Students	Rs 200	Rs 250
Foreign Delegates	US \$ 200	US \$ 250
Accompanying Family Members (a) Indian	Rs 400	Rs 400
(b) Foreign	US \$ 30	US \$ 30

Cheques/Demand Draft to be drawn in favour of "Tribology Society of India, NCIT-95" payable at Faridabad/ Delhi

Advance Registration

It is desirable that delegates get themselves registered in advance by sending their details in the attached advance registration form. This would help them in avoiding crowd at the registration counter at the venue. Also this will help us in planning & serving you better.

Pre-Registration

There will be a counter for advance registration on 22nd January, 1995 from 1.00 p.m. to 6.00 p.m. The venue will be convention center of SCOPE Complex.

Spot Registration

For the convenience of those delegates who are arriving on 23rd January, 1995 there will be a spot registration desk at the convention centre of SCOPE Complex being operated from 8.00 A.M. onwards.

Registration for Accompanying Spouse

Accompanying spouse may register by remitting Rs. 400/- (US \$ 30 for foreign delegates) towards registration fee.

XI NATIONAL CONFERENCE ON INDUSTRIAL TRIBOLOGY - 95

PROGRAMME DETAILS

SUNDAY, January 22, 1995

1.00 p.m.

6.00 p.m.

REGISTRATION

(Foyer, Scope Convention Centre)

5.00 p.m.

6.00 p.m.

High Tea

(Dining Hall, Scope Convention Centre)

MONDAY, January 23, 1995

08.30 am

09.15 am

AUTHOR'S BRIEFING & BREAKFAST

Authors & Session Organisers Only)

(Dining Hall, Scope Convention Centre)

08.30 onwards

05.00 pm

REGISTRATION

(Foyer, Scope Convention Centre)

09.30 am

10.45 am

10.45 am.

11.00 am

INAUGURAL SESSION

(Main Auditorium, Scope Convention Centre)

INAUGURATION OF EXHIBITION

11.00 am

11.25 am

TEA

(Dining Hall, Scope Convention Centre)

11.30 am

01.00 pm

PLENARY SESSION I (Theme Session)

(Main Auditorium, Scope Convention Hall)

**The case of the Automobile Industry - Friction,
Lubrication and Wear - FLAW.**

S.G. Shah, A.I.A.M., Bombay.

**Loss of Material by Wear - an essay on our under-
standing of Sliding Wear of Metals.**

S.K. Biswas, I.I.Sc., Bangalore.

Energy and Materials Conservation through Tribology.
R.P. Tyagi, TISCO, Jamshedpur.

01.00 pm

LUNCH - Hosted by M/s. Exxon Chemicals Eastern Incorporated, New Delhi.
(Dining Hall, Scope Convention Centre)

01.55 pm

MONDAY, January 23, 1995

TECHNICAL SESSION (LB I)

02.00 pm

LUBRICATION BASICS I

03.30 pm

(Kalidasa Chambers, Scope Convention Centre)

Elastohydrodynamic Lubrication: Its Relevance to Engineering Design and Applications.

M.K. Ghosh, B.H.U., Varanasi.

Analysis of Submerged Elliptical Bearings considering Surface Roughness.

J. Ramesh, B.C. Majumdar and N.S.Rao, I.I.T., Kharagpur.

The Effect of Axial Geometrical Variations on Sliding Element Bearing Characteristics.

Hassan A. El-Gamal, Alexandria University, Egypt.

Steady-State Characteristics of Isotropically rough Journal Bearings with Non-Newtonian Lubricants.

S.K. Guha, NERIST, Nirjuli, Itanagar.

The Influence of the Cavitation Zone in Prediction of Power loss in a Journal Bearing.

K. Mistry, S. Biswas and K. Athre, I.I.T., Delhi.

TECHNICAL SESSION (TM I)

02.00 pm

TRIBOLOGY OF MATERIALS I

03.30 pm

(Mirza Ghalib Chambers, Scope Convention Centre)

The Energy Pulse-A New Wear Criterion and its Relevance to Wear in Gear Teeth and Automotive Engine Valve Trains.

M.A. Plint, Plint and Partners Ltd., Wokingham, England.

Role of Counterface Topography in Tribo Performance of Polymers / Composites.

U.S. Tiwari and J. Bijwe, I.I.T., Delhi.

MONDAY, January 23, 1995
TECHNICAL SESSION (TAT I)

02.00 pm

03.30 pm

ZrO₂ - Graphite Enhanced Al₂O₃ Composite Ceramic - Tribological behaviour.

A. Srivastav, A.K. Singh, S. Jain, V.C. Srivastava and B.D. Gupta, KNIT, Sultanpur.

Experimental Investigation of Nylon and its Composite for Machine Components.

S.C. Sharma and K.L. Awasthy, I.I.T., Delhi.

Microstructure and Wear of Aluminium Alloy Matrix Composites.

S. Das, A.K. Jha, B.K. Prasad, O.P. Modi and A.H. Yegneswaran, R.R.L., Bhopal.

TRIBOTESTING AND ANALYTICAL TECHNIQUES I

(Main Auditorium, Scope Convention Centre)

Machines and Methodologies for Testing Extreme Pressure and Anti-Wear Properties of Lubricants.

George Plint, Plint and Partners Ltd., Wokingham, England.

Improving the Correlation Between Field and Test Machine Conditions by Using Dynamic Test Programmes or the Development of CV Joint Greases.

J. Ebrecht, Optimol Instruments Pruftechnik GmbH, Munich, Germany.

Non-Invasive Tribological Testing of Lubricants (Oils) over wide range of temperature.

K.K. Sugandhi and A.S. Zadgaonkar, Govt. Engg. College, Raipur.

Laboratory Test Method for Performance Evaluation of Energy Efficient Industrial and Automotive Gear Oils.

V. Martin, A.V. Suresh Babu, S.S.V. Ramakumar, R.T. Mookken and A.K. Mehta, IOC R & D Centre, Faridabad.

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MONDAY, January 23, 1995

TECHNICAL SESSION (MCM I)

02.00 pm

MAINTENANCE TRIBOLOGY AND CONDITION MONITORING I

(Tagore Chamber, Scope Convention Centre)

03.30 pm

A New Approach to Maintaining Industrial Equipment.
James C. Fitch, Diagnostics Inc. U.S.A.

Recent Development in Conditioning System Automatic Data Manager System for Gas Turbine / Load Compressor.

S.H.A. Jafri, ONGC, Dehradun.

Maintenance Audit of Scooters - A General Study.

A.D. Telang, H.B. Khurasia and C.K. Chugh, MACT, Bhopal.

03.30 pm

HIGH TEA - Hosted by M/s. Gulf Oil India Ltd., Bombay

03.55 pm

(Dining Hall, Scope Convention Centre)

TECHNICAL SESSION II (LBII)

04.00 pm

LUBRICATION BASICS II

05.30 pm

(Kalidasa Chambers, Scope Convention Centre)

Hydrostatic Bearings - A Review.

R. Sinhasan and P.L. Sah, University of Roorkee, Roorkee.

Dynamic Performance of Porous Metal Journal Bearings in Turbulent Regime.

Anjani Kumar and N.S. Rao, R.I.T., Jamshedpur.

Effects of Mass Transfer of Additives in Finite Journal Bearing Using Micropolar Lubricant.

C.C.Narayanan, R. Narayanan and K. Prabhakaran Nair, REC, Calicut.

Whirl Instability of Turbulent Porous Metal Journal Bearing in Conical Whirl Mode.

Anjani Kumar and N.S. Rao, R.I.T., Jamshedpur.

Tilting Pad Journal Bearings for Rotating Machinery - An Overview.

D. Sudheerkumar Reddy, S. Swarnamani and B.S. Prabhu, I.I.T., Madras.

MONDAY, January 23, 1995

TECHNICAL SESSION II (TM II)

04.00 pm

05.30 pm

TRIBOLOGY OF MATERIALS II

(Mirza Ghalib Chamber, Scope Convention Centre)

Finite Element Analysis of Thermomechanical Effect in Layered Media Due to Frictional Heating.

M.K. Ghosh, B.H.U., Varanasi.

Surface Temperature at the Dry Sliding Contacts: the Effect of Surface Roughness.

D. Guha and S.K. Roychowdhury, I.I.T., Kharagpur.

Study of Tribological Characteristics of Some Metals at Cryogenic Temperature.

S.K. Ghosh, Jadavpur University, Calcutta.

A New Generation of Hard and Wear Resistant Coatings by Closed Field Unbalanced Magnetron Sputtering.

B. Raghuram Singh, T. Nedumaran and K. Balasubramanian, Tribology India, Madras.

Mathematical Modelling of Tribological Characteristics of Plasma Sprayed Fine Ceramics

S. Gowri, K. Kamban, K. Narayanasamy, and R. Krishnamurthy, Karnataka Regional Engineering College, Srinivasnagar.

TECHNICAL SESSION II (TAT II)

04.00 pm

05.30 pm

TRIBOTESTING AND ANALYTICAL TECHNIQUES II

(Tagore Chambers, Scope Convention Centre)

On the Prediction of the Anti-Wear Performance of an Engine Oil.

F. Jarnias, and J. du Parquet, TOTAL Raffinage Distribution S A, Harfleur, France.

A Method of Investigation of Friction Between Metallic Surfaces in Vacuum and Lubricants.

A. Prancs, Riga Technical University, Latvia.

MONDAY, January 23, 1995
TECHNICAL SESSION II

04.00 pm

05.30 pm

06:00 pm

06:30 pm

07:00 pm

Characterisation and Rapid Estimation of Sulphonate Additives Used in Lubricants by Liquid Chromatography.

S.Murali, S. Mahanti and P.R. Nambiar, Balmer Lawrie & Co., Calcutta.

A Tribological Study of Some Novel Mo-S Complexes as EP Additives.

V.K. Verma, R. Singh, A. Bhattacharya and A.K. Tripathi, B.H.U., Varanasi.

Wear Monitoring in Rolling Contact Fatigue testing of Bearing steel.

P. Kamath, K. Gopinath and S. Swarnamani, I.I.T., Madras.

MAINTENANCE TRIBOLOGY & CONDITION MONITORING (MCMII)

(Main Auditorium, Scope Convention Centre)

Failure of Rolling-Element Bearings of the Alternators - A Design Consideration.

Har Prashad and M. Raghvender, BHEL Corporate R & D Hyderabad.

A CCD Based Ferrogram Scanning Apparatus.

Margaret Cheiky-Zelina, Predictive Technology, Cleveland, U.S.A.

Monitoring Coal Mill Gear Boxes Through Wear Debris Analysis: A Case Study.

Barun Chakrabarti, Nagapati Hedge, A.K. Mittal and A. Palit, NTPC R & D Centre, Noida.

Condition Based Maintenance Through Wear Particle Analysis in SAIL Plants.

A.K. Mishra, T.D. Chatterjee and S.R. Mediratta, RDCIS, SAIL, Ranchi.

Breakdown Characteristics of Lubricating Film in Roller bearings Under the Application of Voltage.

S. Biswas and S.K. Bhawe, BHEL Corporate R & D, Hyderabad.

General Body Meeting of the Tribology Society of India (For Members of the Tribology Society of India)
 (Main Auditorium, Scope Convention Centre)

Banquet Dinner Hosted by M/s Tribotech Technologies Pvt Ltd, New Delhi at The Kautilya Hall, Hotel Samrat, New Delhi.

TUESDAY, January 24, 1995

08.30 am

09.15 am

AUTHOR'S BRIEFING & BREAKFAST

Authors & Session Organisers Only
(Dining Hall, Scope Convention Centre)

08.00 am

05.00 pm

REGISTRATION

(Foyer, Scope Convention Centre)

09.30 am

11.00 pm

PLENARY SESSION II

(Main Auditorium, Scope Convention Hall)

Mechanical Signature Analysis for Condition Monitoring and Diagnostics.

B.C. Nakra, I.I.T., Delhi.

Automobile Industry - Creating a Competitive Edge Through Tribological Measures.

S.G. Awasthi, DCM Daewoo Motors Ltd., New Delhi.

The World Industrial Lubricants Market - Facts and Trends.

Manfred Fuchs, Fuchs Petrolube A G, Germany.

State of Art and Latest Trend in Condition Monitoring.

S.K. Bhawe, BHEL Corporate R & D, Hyderabad.

11.00 am

11.25 am

Tea

(Dining Hall, Scope Convention Centre)

TECHNICAL SESSION III (ILG I)

11.30 am

01.00 pm

INDUSTRIAL LUBRICANTS, GREASES & SPECIALITY LUBRICANTS I

(Kalidasa Chamber, Scope Convention Hall)

Water Soluble Polymer Base Functional Fluids-Hydraulic Oils.

M.C. Dwivedi, IIT, Bombay.

Laboratory Studies on Pumpability of Greases for Centralized Lubrication Systems.

Ajay Kumar, E. Sayanna, A.S. Verma, V.P.

Deshmukh and A.K. Mehta, IOC R&D Centre, Faridabad.

High Performance Lubricating Greases for Chassis Wheel Bearing Applications.

Anoop Kumar, B.D. Mittal, K.P. Naithani, M.M. Rai & A.K. Bhatnagar, IOC R & D Centre, Faridabad.

Effect of Oxidation Inhibitors on life of Turbine Oil

Fakira Singh, IOC, Bombay.

Selection of Lubricant for Reliable Operation of Antifriction Bearings.

C. Mishra, TATA Steel, Jamshedpur.

TUESDAY, January 24, 1995

TECHNICAL SESSION III (MCM III)

11.30 am

01.00 pm

MAINTENANCE TRIBOLOGY AND CONDITION MONITORING III

(Main Auditorium, Scope Convention Centre)

Rotrode Filter Spectroscopy- A New Method for Multi Element Analysis of Particles in Used oil Samples.

M. Lukas, D.P. Anderson, Spectro Incorporated, Littleton, USA.

Condition Monitoring of Typical Faults of Hydraulic systems in HEMM.

O.P. Gandhi, I.I.T., Delhi.

Techno-Economic Considerations While Selecting Bearings for Large Vertical Motors - A Case Study.

P.N. Kapoor, BHEL, Hardwar.

Condition Monitoring of Antifriction bearings using Shock Pulse Method.

P. Kanakesh, SPM Instrument India Ltd., Hyderabad.

TECHNICAL SESSION III (TMW I)

11.30 am

01.00 pm

TRIBOLOGY IN METAL WORKING I

(Mirza Ghalib Chamber, Scope Convention Centre)

Interface Shear Factor - A New Analytical Approach in Tribology.

R.N. Bosu and S.N. Prasad, Neo Consultants, Faridabad.

Investigation on Strip Cleanliness Behaviour of Semi-Synthetic High Performance Oils for Cold Rolling of Steel.

S. Mahanti, N. Maiti and S. Barman, Balmer Lawrie & Co., Calcutta.

TUESDAY, January 24, 1995
TECHNICAL SESSION III (AL)

11.30 am

01.00 pm

01.00 pm

01.55 pm

Lubricant Behaviour under Plastic Impact.

R.K. Banerjee, C.R. Jagga and A. Sethuramiah, I.I.T., Delhi.

Tribological Aspects of Production of Surface Clean Cold Rolled Products at BSL, Bokaro.

A.C. Tiwari, M. Ranjan, S. Jha, R.C. Mishra, V.N. Singh and R. Khanna, SAIL, Ranchi.

Roll Lubrication Technology for Structurals and Rail Rolling.

D.S. Gupta, K. Prakash, R. Topno, R.C. Thakur, B. Roy, J. Singh, Ramakant Singh and S. Jha, RDCIS, SAIL, Ranchi.

AUTOMOTIVE LUBRICATION

(Tagore Chamber, Scope Convention Centre)

A Statistical Method for Establishing Wear Control Benefits with a Properly Balanced Multigrade Rail road Diesel Engine Oil.

S.K. Mazumdar, P. Arikkat, A.M. Rao and S.P. Srivastava, IOC R & D Centre, Faridabad.

Simulation of Bore Polish.

A.K. Gondal, F.A. Davis and T.S. Eyre, I.I.P., Dehradun.

Lubrication and Wear Characteristics of Piston Rings and Cylinder liner of I.C. Engines During Running-in and after.

N. Raman, I.I.Sc, Bangalore.

Some Aspects of lean Oil-Fuel ratio on Two-stroke gasoline engine.

R.L. Mendiratta and Sudhir Singhal, I.I.P. Dehradun.

Effect of Base Oil Composition on the Antiwear Performance of Additive Pairs-A Model Tribological Study.

S.S.V. Ramakumar, Ajay Kumar, A.M. Rao, S.P. Srivastava A.K. Bhatnagar IOC R & D Centre, Faridabad.

LUNCH - Hosted by M/s. Savita Chemical, Bombay
(Dining Hall, Scope Convention Centre)

TUESDAY, January 24, 1995
TECHNICAL SESSION IV (ILG II)

02:00 pm

3:30 pm

**INDUSTRIAL LUBRICANTS, GREASES AND
SPECIALITY LUBRICANTS II**

(Kalidasa Chamber, Scope Convention Centre)

**Microfine Dispersion of Soluble Organomolybdenum
Compound and its Effect on the Performance of Bo-
rated Sulphonate.**

A.A. Gupta, K.K. Swami, Shanti Prakash, A.V. Suresh Babu,
M.C. Jain, M.M. Rai and A.K. Bhatnagar, IOC R & D
Centre, Faridabad.

**Trialkyl Borate-Esters as Antiwear Agents for
Lubricants.**

R.P.S. Bisht, P.K. Goel and V.K. Bhatia, I.I.P., Dehradun.

**Moly Friction Modifier for Solid-Solid Interface
Lubrication.**

R.B. Choudhary, R.P.S. Bisht and P.C. Nautiyal, I.I.P.,
Dehradun.

**Effect of Sulfurised Jojoba oil, its Synthetic Analogue
and a Commercial EP Additive on the performance of
Oil Soluble Molybdenum Containing Friction
Modifiers.**

A.K. Gupta, H.C. Bhatia, D.K. Tuli, V. Martin, M.M. Rai
and A.K. Bhatnagar, IOC R & D Centre, Faridabad.

**Development of a Chemically Bonded Solid Lubricant
Compounded with a Novel Inorganic Abrasion Resis-
tant Filler.**

S. Barman, S. Mahanti and P.R. Nambiar, Balmer Lawrie &
Co., Calcutta.

TUESDAY, January 24, 1995

TECHNICAL SESSION IV (MCM IV)

02.00 pm

MAINTENANCE TRIBOLOGY AND CONDITION MONITORING IV

(Main Auditorium, Scope Convention Centre)

03.30 pm

Condition Monitoring of Turboexpanders and a Case Study on Experience of Oil whirl Problem.

N.R. Subba Rao, K.K. Desai and V.K. Nagpaul, ONGC, Bombay.

Load Distribution and Regimes of Lubrication in Roller Bearings.

S. Biswas and S.K. Bhawe, BHEL Corporate R & D, Hyderabad.

Acoustic Emission in Condition Monitoring of Deep-Hole Drilling.

M. Pugazhendi and R. Krishnamurthy, I.I.T., Madras.

Oil use and its Maintenance in Hydro Turbine Governor and Bearings

M.P. Shrivastava and Nand Kishore, BHEL, Bhopal.

TECHNICAL SESSION IV (TMW II)

02.00 pm

TRIBOLOGY IN METAL WORKING II

(Mirza Ghalib Chamber, Scope Convention Centre)

03.30 pm

New Self Emulsifiable Esters in Metal Working Fluids.
Ronald Hoogendoorn, Unichema International, Gouda, The Netherlands

A Study of Tribological Properties of Aqueous Oil Systems.

V.K. Jain, B.M. Shukla and D.S. Shukla, I.I.P., Dehradun.

Soluble Oil Emulsion With Improved Bioresistance -A Case study.

Faiz Waris, Subhash Chand, Sivasurian, K.C. Jayaprakash, S.P. Srivastava and A.K. Bhatnagar, IOC R & D Centre, Faridabad.

TUESDAY, January 24, 1995
TECHNICAL SESSION IV (STT)

02.00 pm

03.30 pm

3.30 pm

3.55 pm

4.00 pm

5.30 pm

6.30 pm

8.30 pm

8.30 pm

Wednesday, 25th January, 1995

09.30 am

05.00 pm

Influence of Tin Coating on the Life of High Speed Steel Tools.

A.K. Roy, M. Singh, A.K. Mukherjee, T.D. Chatterjee, S. Jha and S.R. Mediratta, RDCIS, SAIL, Ranchi.

Determination of Working Gap Width During Lapping of Planes.

Adam Barylski, Technical University of Gdansk, Poland.

SPECIAL TOPICS IN TRIBOLOGY

(Tagore Chamber, Scope Convention Centre)

Magnetic Flux Density Distribution on the Track Surface of Rolling Element Bearings - An Investigation.
 Har Prashad, BHEL Corporate R & D, Hyderabad.

A New Eco Friendly Textile Loom lubricant.

D. Saxena, R. T. Mookken, V. Kalra, J. Zacharia, S.P. Srivastava and A.K. Bhatnagar, IOC R & D Centre, Faridabad.

HIGH TEA - Hosted by M/s. Castrol India Ltd. Bombay
 (Dining Hall, Scope Convention Centre)

Panel Discussion /Valedictory Session
 (Main Auditorium, Scope Convention Centre)

Cultural Programme

"INDIAN DANCE CREATION" BY ANAND SHANKAR CENTRE FOR PERFORMING ARTS, CALCUTTA.

(Air Force Auditorium, Subroto Park, New Delhi)

Banquet Dinner Hosted by M/s. Indo Mobil (P) Ltd., New Delhi.

(Dining Hall, Air Force Auditorium Subroto Park, New Delhi)

SIGHT SEEING TRIP AROUND DELHI.

CONFERENCE PROCEEDINGS

The papers being presented in this conference are being published in a bound volume by M/s. Tata McGraw Hill Publishing Company (P) Ltd., New Delhi. All registered delegates will receive one copy of the proceeding free of cost at the time of registration.

CULTURAL PROGRAMME

A Scintillating dance programme by Shri Anand Shankar son of the legendary dancers Uday Shankar and Amala Shankar and his troupe from ANAND SHANKAR CENTRE FOR PERFORMING ARTS, Calcutta will constitute a pleasurable cultural evening on 24/01/95 at 7.00 PM at Air Force Auditorium, Subroto Park, New Delhi. Delegates are requested to collect their invitation cards for this programme at the registration desk.

BANQUET DINNER

M/s. Tribolotech Technologies (Pvt) Ltd., New Delhi will be hosting a banquet dinner at Hotel Samrat, New Delhi on 23rd January, 1995 at 7.00 pm.

M/s. Indo Mobil Ltd. New Delhi will be hosting a banquet dinner at the Air Force Auditorium, New Delhi on 24th January, 1995 after the cultural programme. All delegates are requested to collect the invitation card for the above at the time of registration.

SOCIAL EVENTS

DELHI TOUR: A short excursion trip covering important monuments of Delhi is being planned on 25/01/95 from 9.30 AM to 5.00 PM. Details of the trip will be available at the registration counter. All those interested will have to enroll their names at the time of registration.

MAILING ADDRESS:

All Correspondence should be sent to

Shri A.K Mehta,

Organising Secretary, (NCIT-95),

Indian Oil Corporation Ltd.,

Research & Development Centre,

Sector - 13,

Faridabad - 121 007

INDIA

Tel: 0129 286216 (D), 0129 285611-16, (EPABX) Extension - 232

Fax: 0129 - 286221, Telex: 0343-257

IMPORTANT CONTACT NUMBERS:

Shri A.K. Mehta

(for Conference enquiry)

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Shri S.P Dubey

(for Conference enquiry)

Phone: 0129 - 285611- 16 (Ext. 220) 0129 - 295672 (R)

Shri R K Dua

(for Accomodation)

Phone : 0129 - 285611- 16 (Ext. 223) 011 - 5883349 (R)

Wed

09.30 a

05.00 p

XI NATIONAL CONFERENCE ON INDUSTRIAL TRIBOLOGY-1995
JANUARY 22-25, 1995
New Delhi, INDIA
ADVANCE REGISTRATION FORM

To,
 The Organising Secretary,
 NCIT-95
 Indian Oil Corporation Ltd.
 Sector-13
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Please register the following persons as delegates to NCIT-95
 Name (s) of delegates and designation

1. _____
 2. _____

Kindly also book accommodation for me at.....

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Demand Draft/Cheque No. _____ Date _____ drawn on _____

in favour of Tribology Society of India-NCIT'95 for Rs. _____ is enclosed.

Signature

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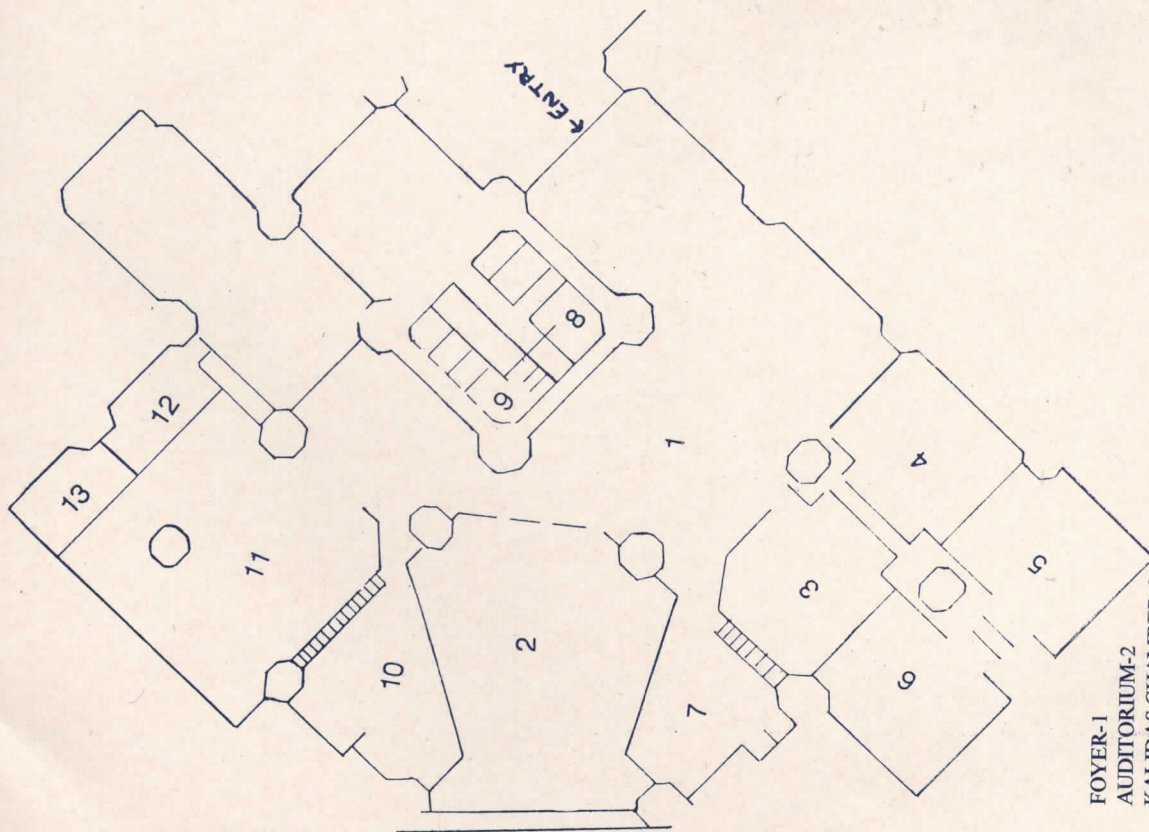
Name and Designation

(This form may be photocopied and used if more than two delegates are to be registered)

Registration Fees

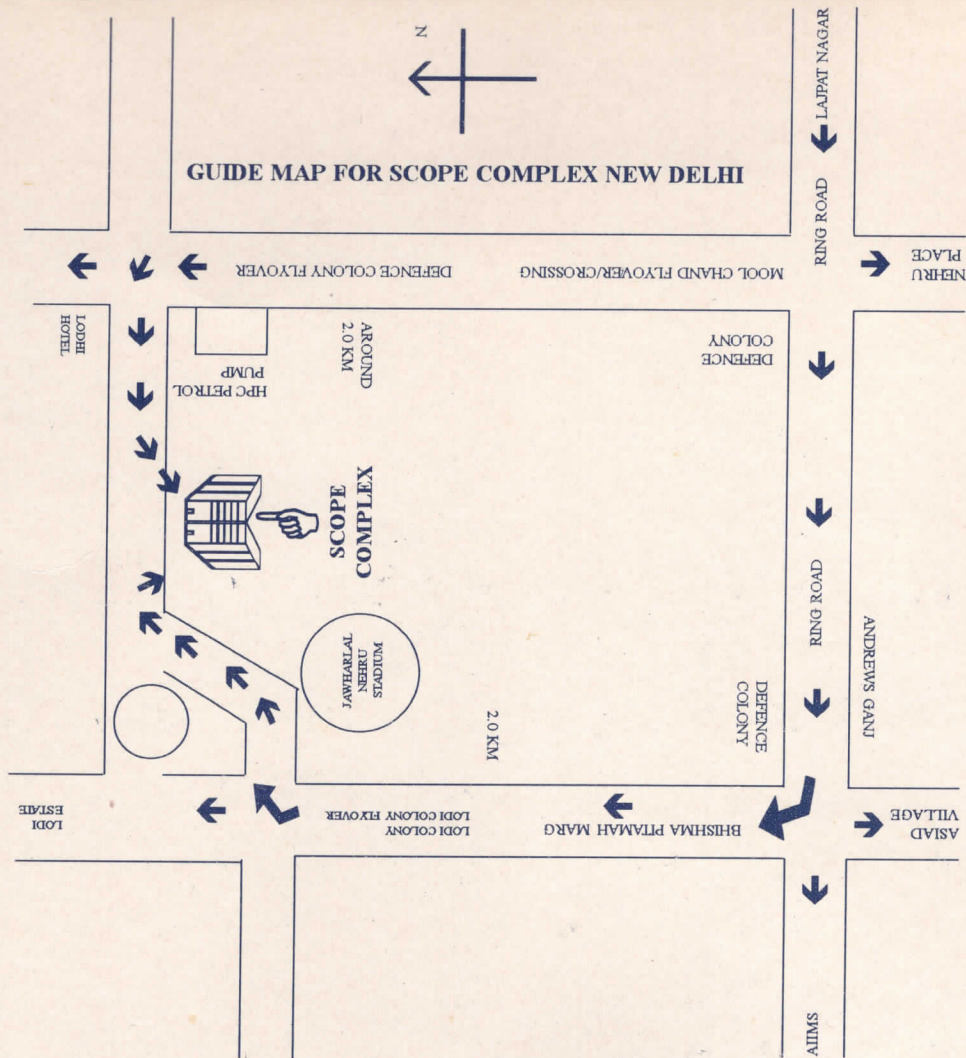
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- FOYER-1
- AUDITORIUM-2
- KALIDAS CHAMBER-3
- MIRZA GHALIB CHAMBER-4
- BHABA CHAMBER-5
- TAGORE CHAMBER-6
- FAZAL CHAMBER-7
- LADIES TOILET-8
- GENTS TOILET-9
- GENERAL TOILET-10
- RESTAURANT-11
- KITCHEN-12

**Floor Plan of Scope Convention Centre,
Core 2, Lodhi Road, New Delhi.**



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