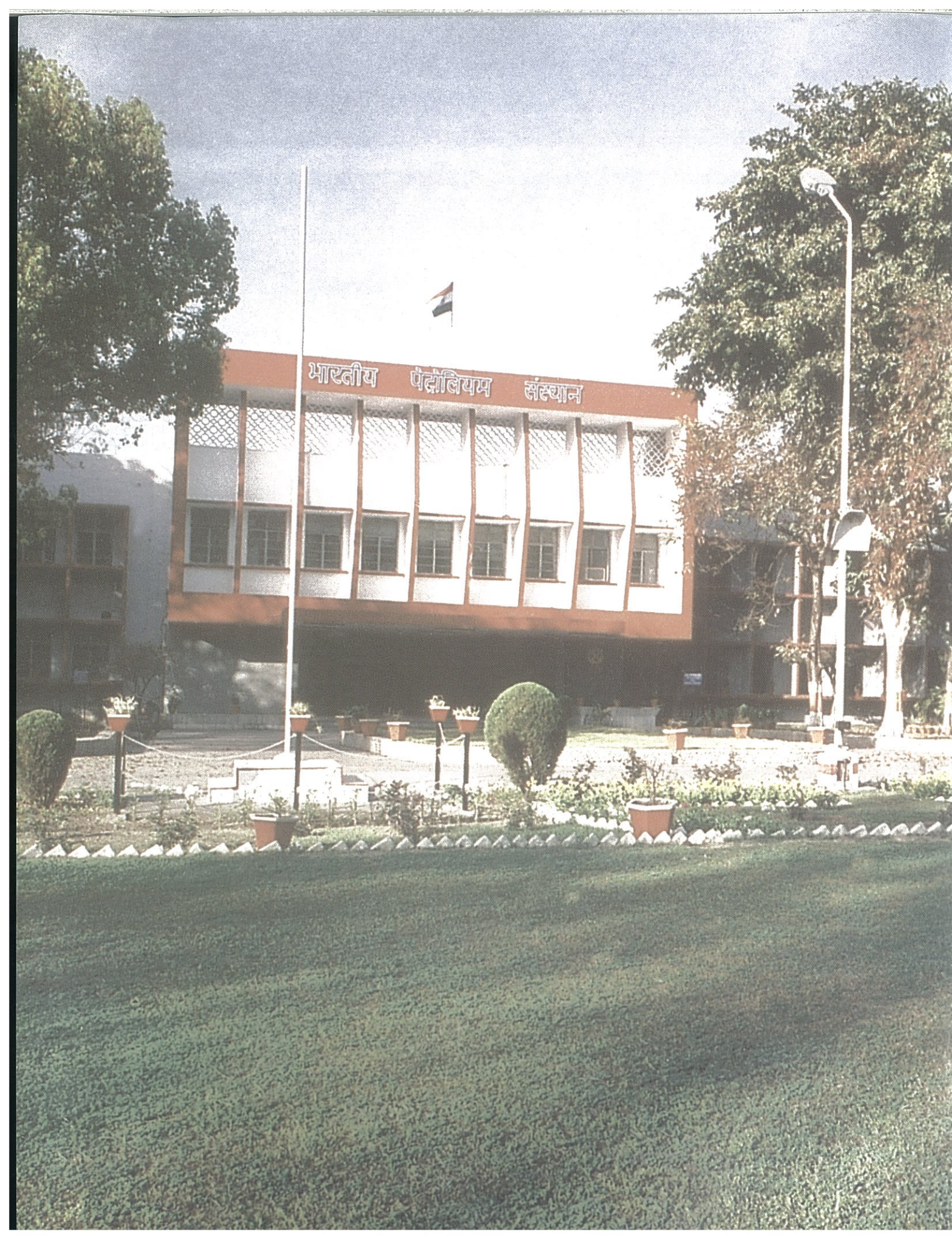
Highlights of Achievements
1996-97

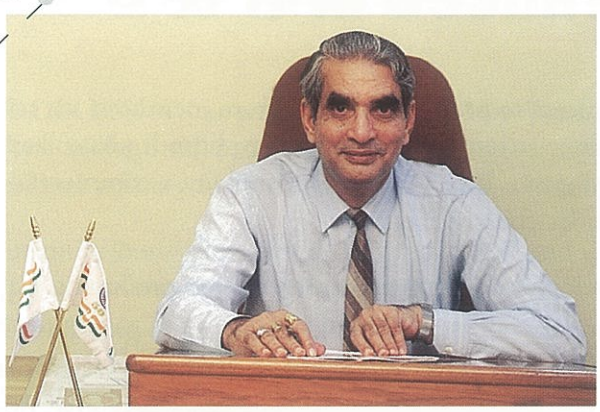
IIP

INDIAN INSTITUTE OF PETROLEUM
DEHRADUN


भारतीय पेट्रोलियम संस्थान


State-of-the-art technologies
Quality R & D organization
Pursuit for globalization


CATALYSIS
PETROLEUM REFINING
PETROLEUM PRODUCTS APPLICATION
IIP
MAJOR AREAS OF RESEARCH
INDUSTRIAL & DOMESTIC COMBUSTION
BIOTECHNOLOGY
CHEMICAL SCIENCES
TYPES OF RESEARCH
APPLIED
INDUSTRY SUPPORTIVE
BASIC



FOREWORD

While continuously pursuing to fulfil its mandate, the Indian Institute of Petroleum (IIP), Dehradun, has also been making all-out efforts to deliver the fruits of research to the industry and market place. Bagging of the 'CSIR Award for Business Development and Technology Marketing for the year 1996,' and the ever-increasing extra-budgetary resources (EBR), are a testimony of our efforts and success in this endeavour. We believe in combining business acumen with R & D talent. This is in line with our continuous efforts for becoming a self-sufficient and profit-centred organization in the coming years.

To provide further focus on our future goals, a long-term Business Plan has been drawn up in which IIP's R&D potential, re-structuring, human resource management as well as financial & other inputs required to achieve the targets, are included. We have acquired the World Bank loan of about Rs. 15 crores for the modernization of our laboratories as envisaged in our Business Plan. Our institute is also in the process of qualifying for the international standards of quality:'ISO 9001'.

In this year, while successfully transferring several technologies at national level, we have increased our efforts to make IIP global. Entering into an agreement with the Unitel Technologies Inc. (UTI), USA for setting up mini-refineries in India is one step in this direction. We are also in the midst of active negotiations for tie-ups with a number of multinational organizations in the hydrocarbon sector for global marketing of our technologies and collaborative research.

IIP's efforts for excellence and innovation in the area of petroleum refining have led to the development of a process for conversion of NGL / light naphtha into LPG and high octane gasoline. As an environmentally-conscious organization, we have also developed a catalytic converter which can reduce harmful emissions from four-stroke engines effectively, and also technology for use of CNG and other alternative fuels in three-wheelers.

In the area of chemicals, intermediates and additives, our endeavour for generation of innovative processes and products has resulted in getting several sponsored projects for technology transfer to national and international industries in private sector. Notable among these concern secondary alcohols, adipic acid and EP additives. Science of catalysis is one of our core activities of research. On this important subject we are now hosting the 13th Biennial Silver Jubilee Symposium of the Catalysis Society of India.

Ever devoted to the service of the nation, IIP was also successful in solving the national controversy on the claim of Mr. Ramar Pillai regarding the so-called 'Herbal Petrol.'

While reviewing the above highlights of success of this year, I am confident that with the background of our success stories of the past, and with a dedicated and talented team of scientists, the institute will be able to meet the challenges in the years to come with much confidence and will have a brilliant future.

(Dr. T S R Prasada Rao)
Director

Advances in R & D

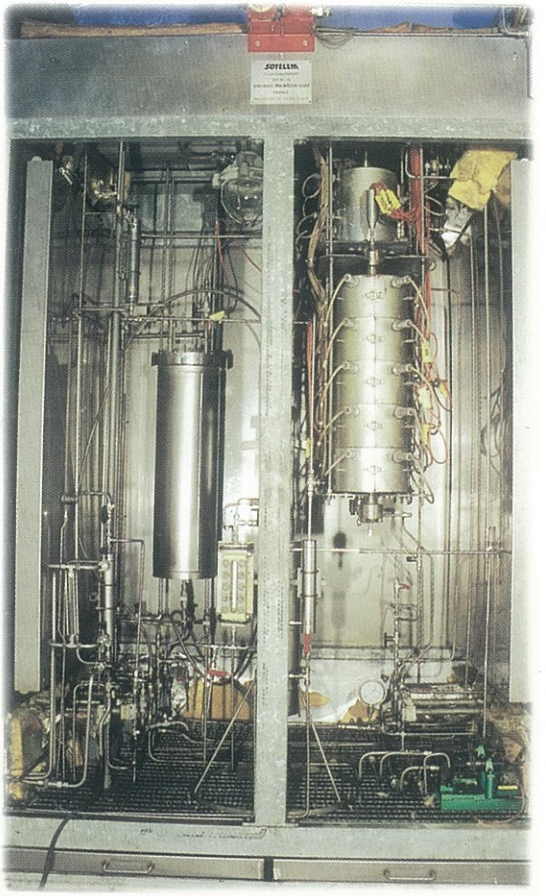
Extrudates of Hydrotreating Catalyst

Extraction Column for Lube Studies

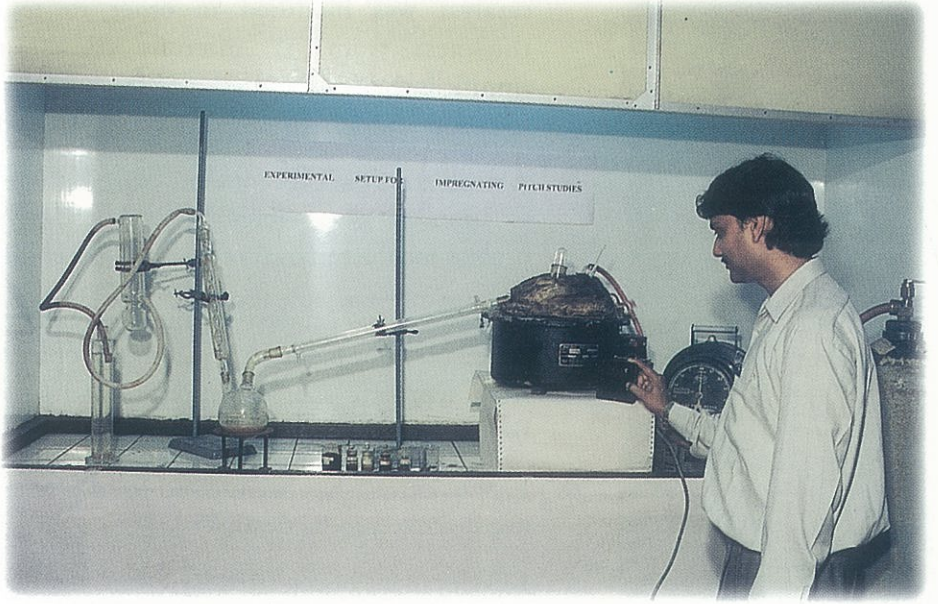
- A process to produce menthol from menthone via selective hydrogenation of menthone in liquid phase has been developed. Based on this technology a commercial plant is under construction.
- Developed an innovative process for producing C_{10}-C_{18} secondary alcohols by oxidation of n-paraffins. Novel catalyst gave 90% selectivity at 40% conversion per pass in comparison to current processes which give 80-90% selectivity at 15-22% conversion.
- A new process for producing NMP has been developed. The distinguishing feature of this process is that Gamma Butyrolactone (GBL) is reacted with ammonia at low pressure to produce NMP. Based on this technology a 2500 T/A commercial plant is at process design stage.
- Catalyst formulations have been developed for VGO/residue cracking and also for hydrodesulphurization of diesel oil.
- NMP based lube extraction technology has been accepted by the industry and a grass-root unit of 350,000 T/A capacity is under construction.
- Hybrid type approach for lube base stock production in an existing lube refinery established.
- Ashless phospho -sulphurized hydroxy esters of fatty acids as antiwear and antifriction additives developed.
- A new combustion improver to enhance cetane number of diesel fuels has been synthesized.
- Mannich bases and poly alkenyl poly amines as multifunctional dispersants, sludge inhibitors and solubilizers for long life automotive lubricants developed.
- Soaker visbreaking technology has been upgraded to minimize back mixing and to improve the flow and temperature profiles.
- Techno-economic studies of a developed process called NTGG (Naphtha to Gas and Gasoline) for production of LPG and high-octane gasoline from NGL/light naphtha indicated its commercial viability.

Advances in R & D ...

- PROBLEN — a software package for prediction of physico-chemical properties of blends of distillates and residual refinery fuels was developed and commercialized.
- Formulations developed for CCR and skewed Pt-Re reforming catalyst have shown excellent performance at pilot plant level.
- Indigenous catalytic converters for 2-wheelers having 4-stroke engine and also for passenger cars were developed. For 2-wheelers, the conversion efficiency achieved was - CO : 77-82% and HC : 70-91% while for passenger cars it was - CO : 57%, HC : 80% and NOx : 52%.
- A rear-engine three-wheeler was converted to operate on either CNG or gasoline with a separate oil pump lubrication system.
- Lubricants for deep-drawing of aluminium were developed and subsequently the field trials have been successfully completed.
- IIP technology for impregnating pitch is being scaled up by putting up a pilot plant of 900 T/A pitch capacity by a user industry.



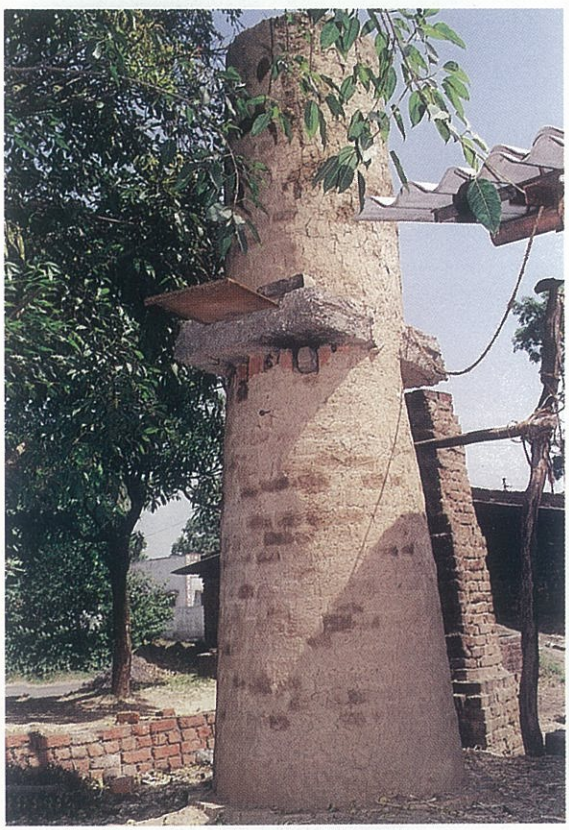
Pilot Unit for Diesel Hydrodesulphurization



Laboratory Set-Up for Impregnating Pitch

Applied Research

Bed Sweetening Pre-Treating Unit



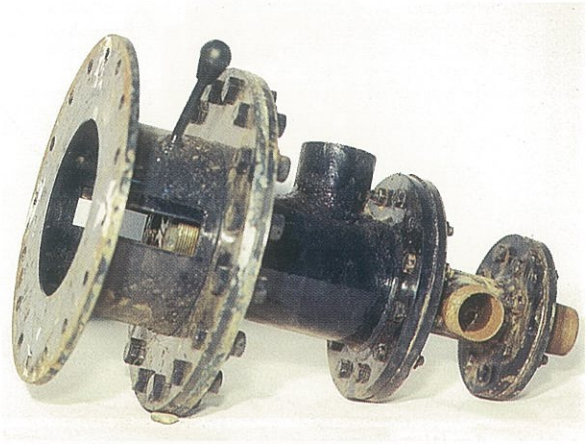
Modified Jaggery Plant

- Catalysts have been developed for sweetening of LPG, light naphtha, FCC gasoline, ATF & kerosene. These catalysts have been thoroughly characterized and gave excellent performance.
- Corrosion inhibitor for protection of gas turbine engine parts has been developed.
- Improvements in the existing jaggery (*gur*) making plants have been made. This modified version ensures reduction in smoke along with lesser fuel (bagasse) consumption, and an extended plant life. This will be of immense use in rural areas.
- A commercial toluene chlorination plant producing benzyl and benzal chlorides was revamped. After revamping the capacity increased by 3.2 times and selectivity by 4%.
- Process design data for revamping of soaker visbreaker unit located abroad has been generated.
- Process flow sheet for aromatic recovery unit at a refinery was simulated on the ASPEN simulator.
- A case-study to understand the effect of integration of NTGG process with NGC fractionation unit at ONGC Hazira Plant has shown that the production of LPG can be doubled.
- The technique to wash-coat the monoliths of auto-exhaust catalyst was modified in order to reduce wash-coat thickness from 37 microns to 20 microns with significantly improved average strength. This also helped in reduction of back pressure across the converter.
- A simulation package for semi-batch bubble column reactor to simulate gas sweetening, and a catalyst regeneration process for the removal of H_2S have been developed.
- An indigenous catalyst formulation has been successfully tested on pilot plant for the removal of hydrogen sulphide from synthetic sour gas mixture and scale-up data have been collected.
- Phenol extract has been found to be a potential source for needle coke production.
- Development of eco-friendly lubricants / base fluids based on synthetic esters & esters from non-traditional vegetable oils was pursued.

Applied Research ...

- Field studies on 30 scooters for 10,000 km each were carried out to evaluate 15 lubricant formulations for deposits, fuel/oil consumption and exhaust emissions at different stages.
- Mass emissions of CO, HC, NOx and smoke were measured on gasoline and diesel engines with & without catalytic converter.
- The requirement of multifunctional additives (MFA) for Indian gasoline was established. This included evaluation of carburettor deposits, intake valve cleanliness, optimum additive dosages, fuel economy and exhaust emissions.
- Studies on diesel fuel-quality requirements to meet future emission standards are under way.
- For use of LPG as fuel in IC engines, the kit developed by IIP and an imported kit were evaluated on an engine and a vehicle for performance and emissions.
- Indigenously developed friction/wear reducer, lubricity and multifunctional additives were evaluated for their performance.
- Modifications in a kerosene-operated 2-stroke engine for genset application were made for optimum performance with reduced engine deposits. The modified engine has also been put to commercial use.
- One prototype model of an industrial natural gas burner (nozzle-mix type) has been designed and fabricated.
- An incinerator for acid sludge was developed.
- Technical management of demonstration programme on 450 buses of various State Transport Undertakings running on diesenol (diesel-alcohol) with IIP's dual-fuel kit is in progress.
- Development of test methods for assessment of anti-scoring characteristics of auto gear oil and for performance evaluation of metal cutting oil using Amsler disc machine was pursued.
- Studies for the development of an adsorption process using ion exchange resins for clean-up of degraded sulpholane have been carried out.
- Process know-how on solvent deoiling for wax manufacture and solvent dewaxing for production of wax-free oils / LOBS has been upgraded.

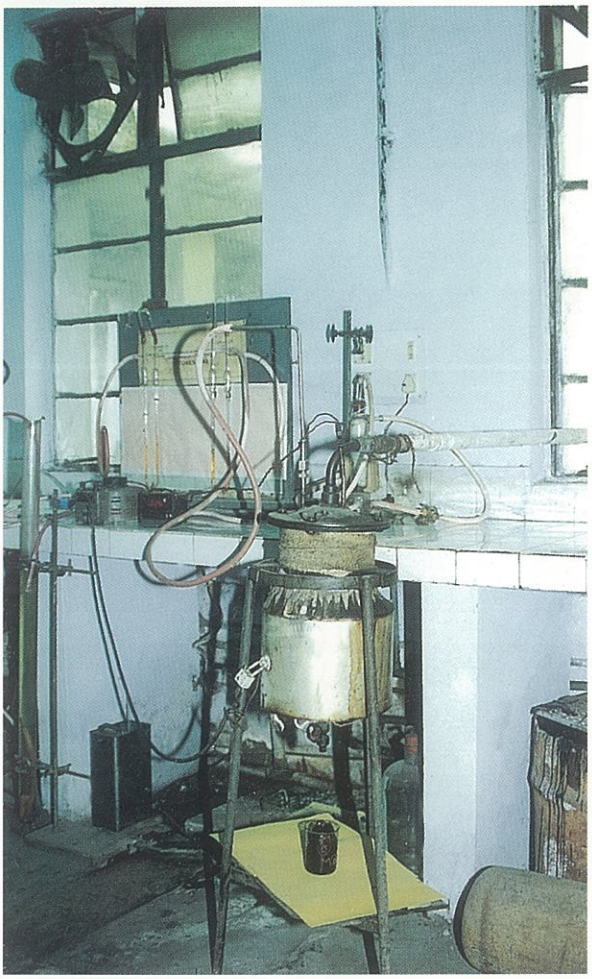
Fleet of Scooters for Evaluation of Lubricant Formulations



Prototype of Industrial Natural Gas Burner

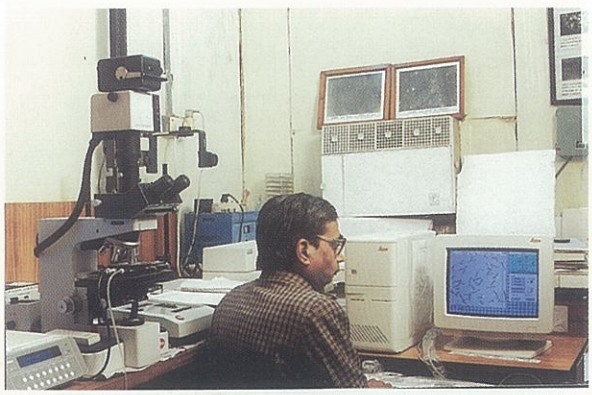
Wax Deoiling Pilot Plant

Basic Research



Air Blowing Assembly for Bitumen Studies

- Developed an eco-friendly synthetic method for oxidation of thiols to disulphides, and sulphides to sulphones/sulphoxide.
- Developed novel method for conversion of α-di ketones to α-hydroxy ketones using ammonium formate.
- Studies on ring opening/metathesis polymerization of norbornylene and its derivatives using ruthenium based catalyst were carried out.
- Relationship between composition of waxes and their physical properties established.
- Studies on optimum operation of dewaxing/deoiling units in lube refineries including the effect of dewaxing aids on crystal morphology and slurry filterability have been completed.
- Multidimensional modelling studies were undertaken by coupling chemical kinetics to fluid motion for understanding the chemistry of early flame development in a CNG - operated engine.
- Studies on the oxidation chemistry of compositionally - controlled paving bitumens were completed.
- Hydrodesulphurization and hydrodeoxygenation activities of the SiO_2 -TiO_2 supported molybdenum and tungsten catalysts compared favourably with standard catalysts.



Optical Microscope with Image Analyser

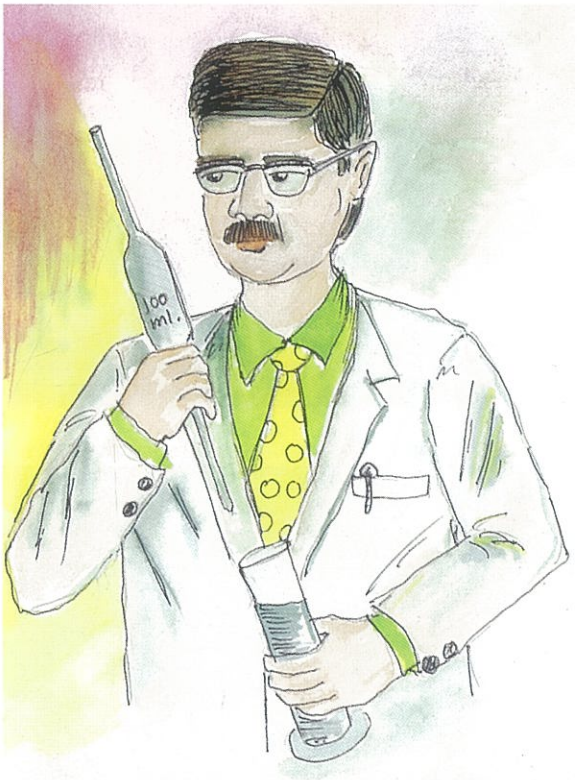
- Role of lubricants on fatigue and crack initiation in rolling/sliding contacts has been studied.
- Scientific methodology for running-in of automotive engines being developed.
- Structural parameters of chemisorbed films formed on iron surfaces by sulphurized & phospho-sulphurized esters of oleic acid and hydroxy oleic acid in relation to friction- and wear-reducing characteristics under tribo-chemical conditions studied.

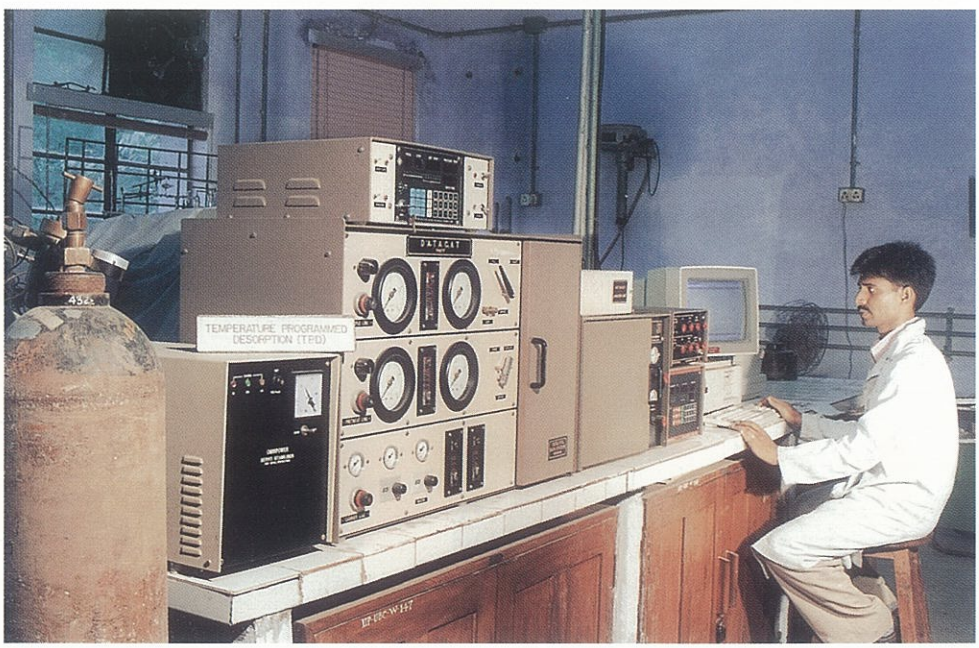
Basic Research ...

- Relationship between structural parameters, dispersant and antioxidant properties of mannich bases from alkyl phenols and aromatic amines determined.

- Studies on ZSM-5 with varying Si/Al ratios have shown that acid sites characterized by ΔH greater than 90 kJ/mol correlate with catalytic activity.

- Deactivation patterns of acid sites and their acid strength present in ZSM-5 catalysts were studied using micro-calorimetric ammonia adsorption technique. The change in pore size distribution provided an evidence for molecular traffic control (MTC) mechanism.



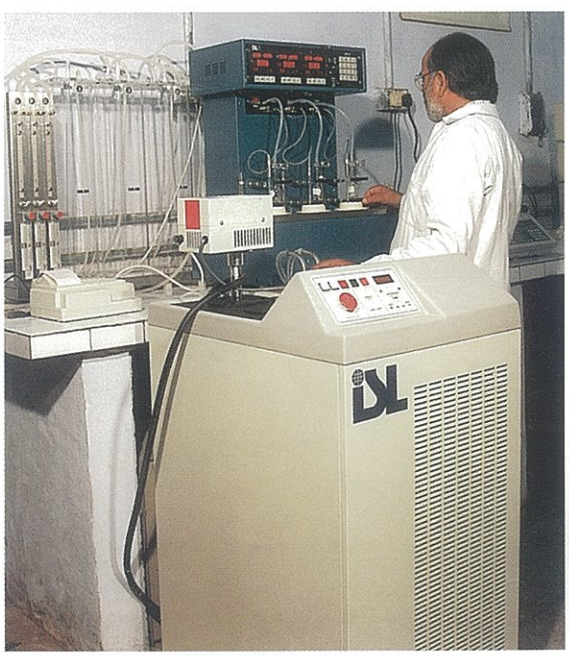


Temperature-Programmed Desorption Unit

Service to the Industry

Model Pipeline

Amsler Disc Machine for Performance Evaluation of Industrial Lubricants



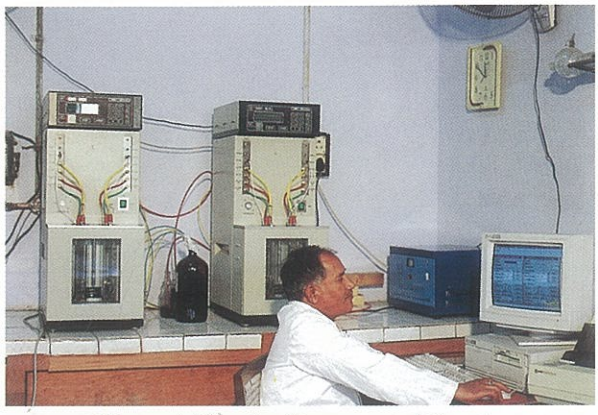
Cold Filter Plugging Point Apparatus

The institute also provides technical services to the hydrocarbon and related industry through which, in 1996-97, an earning of Rs. 266.7 lakhs was acquired. Some of the major services carried out are :

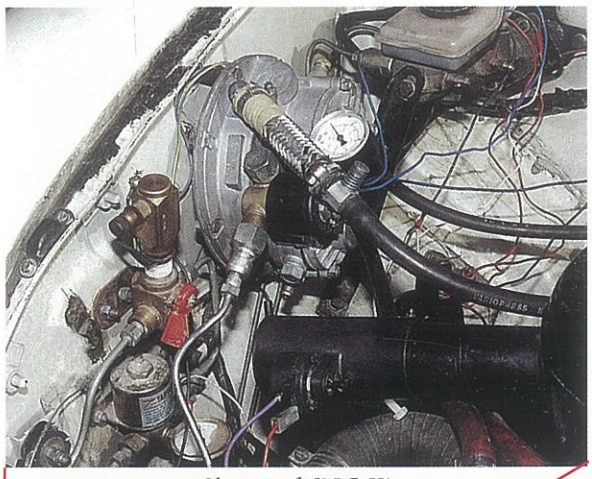
- Investigations on a change-over from sulpholane to NMP solvent in the hexane unit
- Performance and emission improvements in the Eicher engine through mathematical simulation modelling
- Feasibility of the utilization of kerosene cut from the Hazira NGL
- Characterization of pyrolysis gasoline from gas cracker
- Identification of colour-forming component in detergent alkylates
- Performance evaluation of RG-484 reforming catalyst in pilot plant
- Studies to produce isophthalic acid from m-xylene
- Evaluation of pipeline corrosion inhibitor
- State-of-the-art report on the use of alternative fuels for motor vehicles to control vehicular emissions in the metropolitan cities
- Performance evaluation of industrial lubricants and engine oil filters
- Evaluation of LPG-saving device
- Certification of engine oils as per BIS standards
- Four-ball wear and E.P. tests on gear oil and cutting oil formulations
- Emission measurement of Eicher engines
- Detailed evaluation of Bombay High, Panna & Mukta crude oils
- Morphological behaviour of crude oils
- Analysis of naphtha samples (imported and of BH origin) for fuel quality

Service to the Industry ...

- Characterization of gasoline samples for their stability behaviour
- Short assays for pricing of the crude oils produced by joint-venture companies
- Evaluation of NGL for value-addition
- Survey of the quality of gasoline & diesel fuels from the Indian market
- Techno-market study to assess the prospects of setting up a petrochemical industry
- Tenth regeneration of reforming catalyst RG-451 and start-up of a reformer plant
- Pre-commissioning and start-up of pyrolysis gasoline hydrogenation unit
- Pre-commissioning & check-up of 300,000 T/A capacity pretreater and reformer
- Evaluation of a CNG kit on Ambassador car for road-worthiness as per Motor Vehicles Act

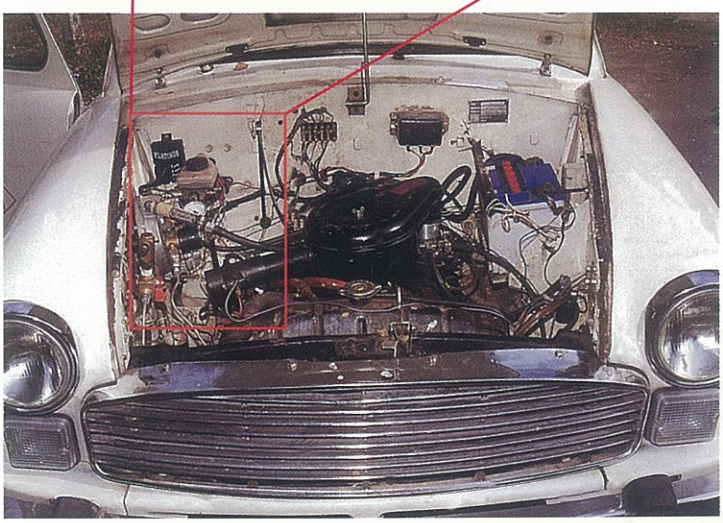


Kinematic Viscosity Measurement Apparatus



Close-up of CNG Kit

Vacuum Distillation Assembly



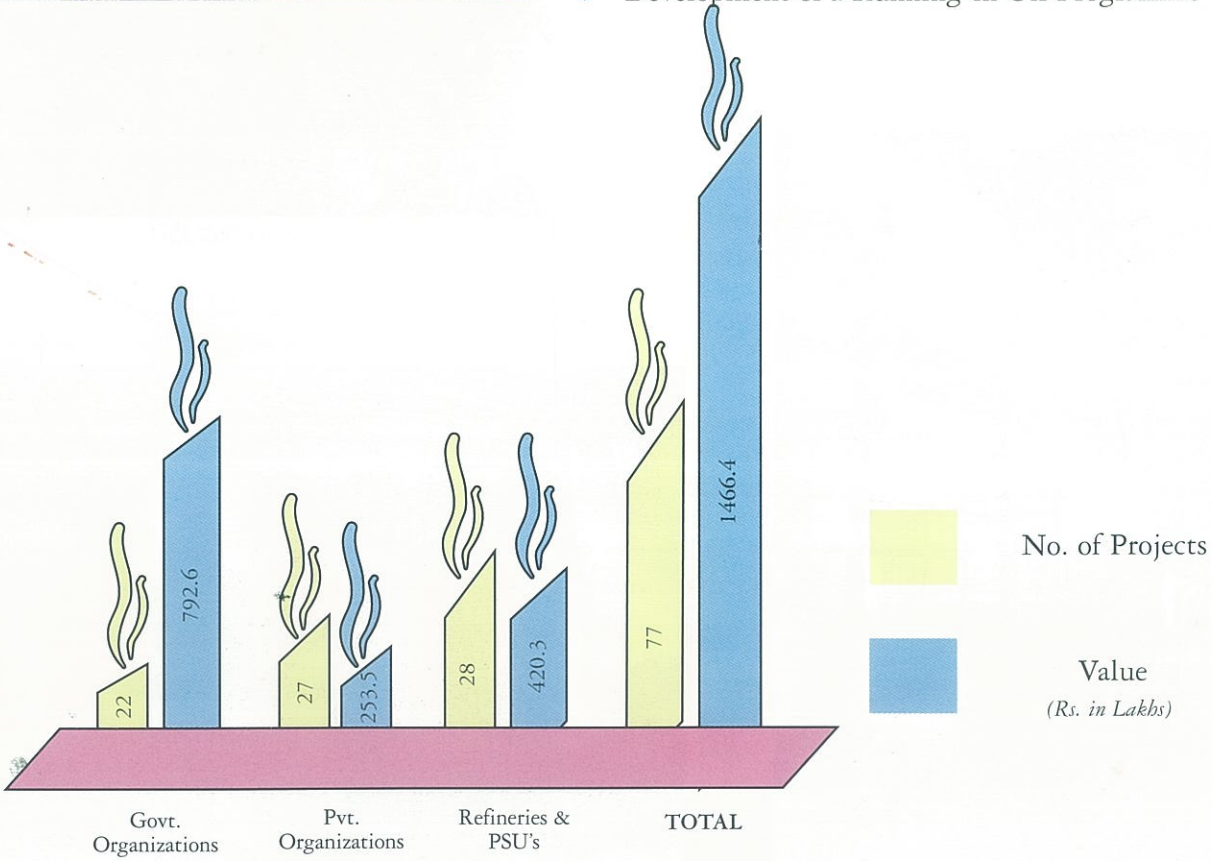
CNG Kit Mounted on a Passenger Car

Sponsored Research

Sponsorship of projects by various Government organizations, refineries, public sector undertakings and private organizations continues to be on a constant increase. The value of such research projects completed during the year was Rs. 222.9 lakhs, while that of those initiated in the period was Rs. 220.6 lakhs. At the close of the year the total value of on-going sponsored projects was Rs. 1466.4 lakhs. This is a pointer to the credibility that the institute has acquired with the industry over the years.

Major Projects Initiated During the Year

- Sulpholane Degradation and Corrosion/Fouling Problems in the Aromatic Extraction Unit
- Preparation of Pre-Feasibility Report on Production of FGH/SBP Solvents from NGL
- Preparation of Detailed Project Report on Establishment of National Lubricant Facility
- Two-Stroke Vehicle Field Studies
- Performance Evaluation of 2T Lubricants Through Field Trials on 10 Scooters
- Two-Stroke Engine Oil Field Trials
- Role of Lubricants on Fatigue Crack Initiation in Rolling/Sliding Contacts
- Development of a Running-in Oil Programme

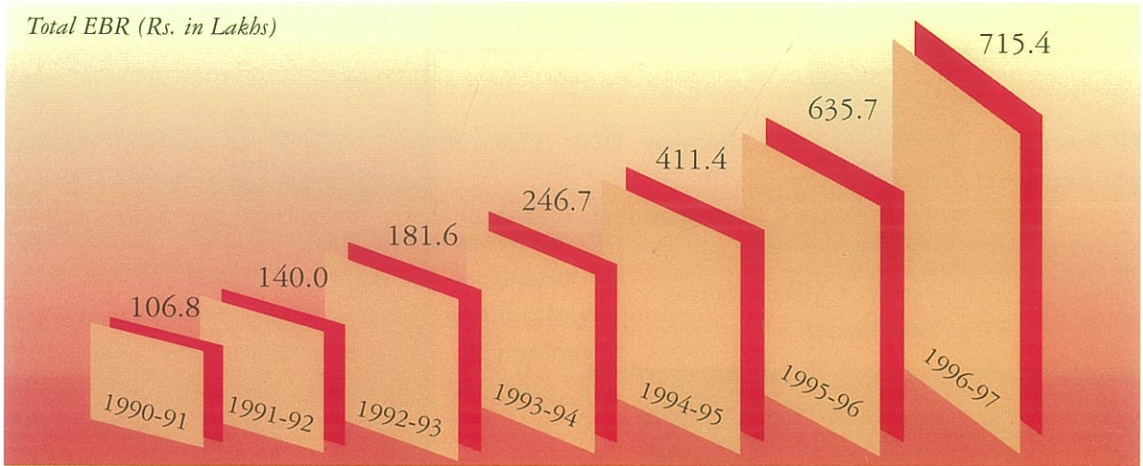


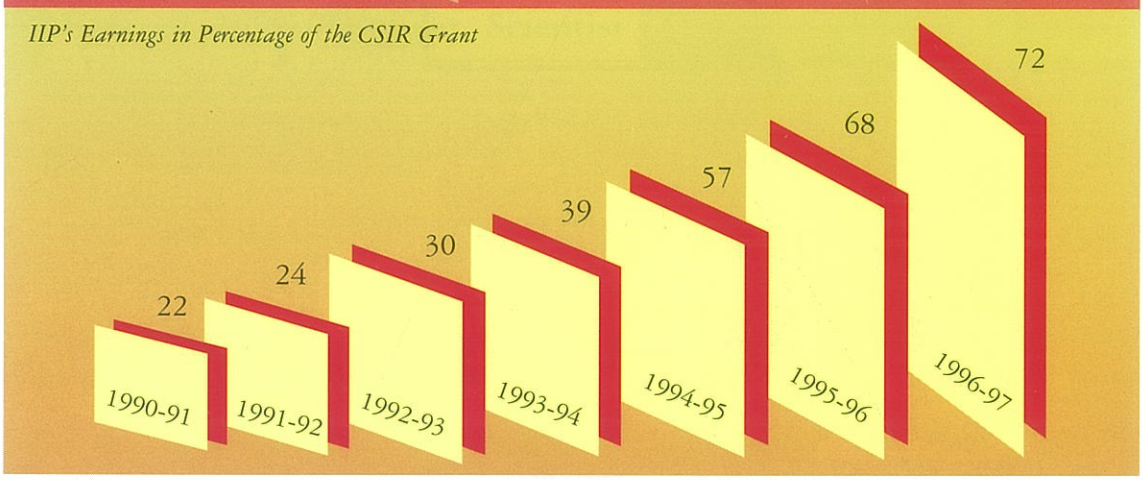
VALUE & NO. OF ON-GOING PROJECTS AS ON 31.03.97

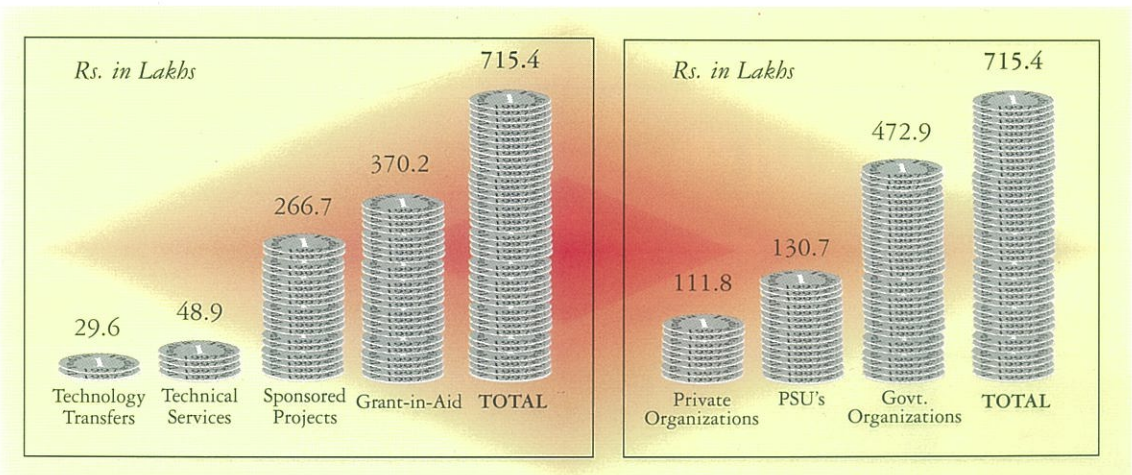
Tapping Business Resources

IIP's earnings from extra-budgetary resources (EBR) have maintained their upward swing for the last six years, going up by seven times from Rs 106.8 lakhs in 1990-91 to Rs. 715.4 lakhs during 1996-97.

MARKS OF GROWTH



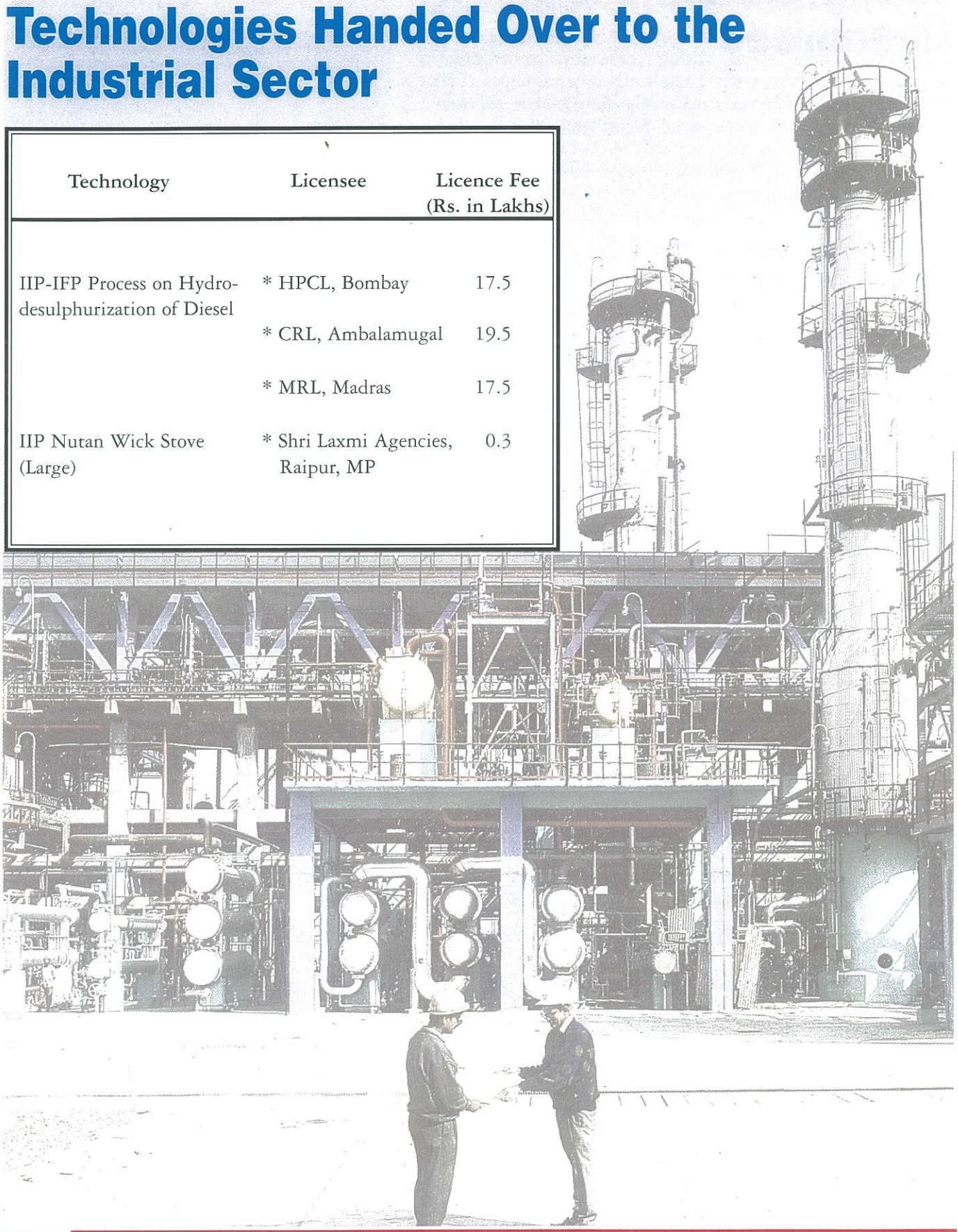




EBR BREAK-UP : 1996-97

Technologies Handed Over to the Industrial Sector

Technology	Licensee	Licence Fee (Rs. in Lakhs)
IIP-IFP Process on Hydro-desulphurization of Diesel	* HPCL, Bombay	17.5
	* CRL, Ambalamugal	19.5
	* MRL, Madras	17.5
IIP Nutan Wick Stove (Large)	* Shri Laxmi Agencies, Raipur, MP	0.3



Feathers in the Cap

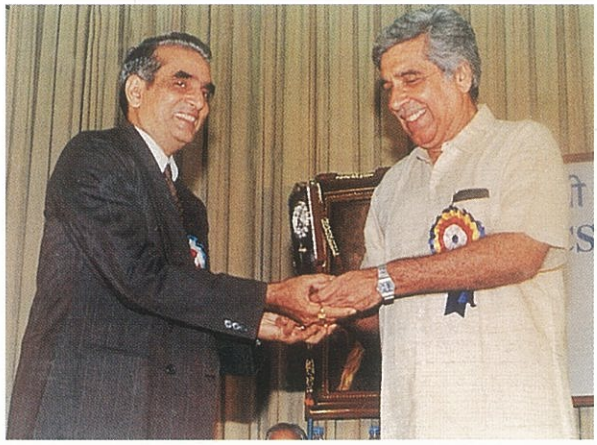
CSIR Business Development and Technology Marketing Award, 1996

This is an honour bagged by the institute in recognition of its efforts under the helmsmanship of Dr T S R Prasada Rao, Director, towards changing of its focus from mere research and development activities to answering the need of the market forces as well.

Plaque of CSIR Technology Award received by IIP

Kamal Kumari National Award for Science and Technology, 1995 *(Declared in 1996)*

Dr T S R Prasada Rao, Director, was selected for this award by the Kamal Kumari Foundation of Assam for his outstanding contributions in the field of catalysis and catalytic processes which have deeply influenced the technological requirements of the fertilizer, petroleum refining and petrochemical industries.



Prof. Y. K. Alagh, Minister of State for Power and Science & Technology, giving away the CSIR Technology Award to Dr. T S R Prasada Rao

Catalysis Society of India Eminent Scientist Award, 1996 *(Declared in February 1997)*

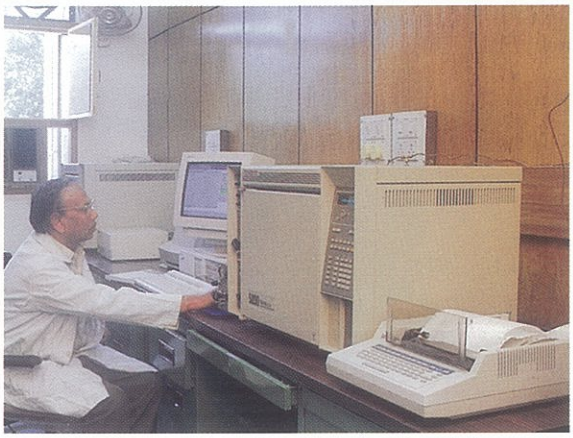
This illustrious award also went to Dr T S R Prasada Rao for his 30-year-long yeoman contributions to the business, science and technology of catalysis. This is the highest possible official honour to any catalysis scientist in India.

Shri Om Prakash Bhasin Award for Excellence in Science and Technology, 1997

Dr T S R Prasada Rao was selected for this award in view of his exemplary services to science and technology for the last three decades.

Dr. T S R Prasada Rao receiving the Kamal Kumari Award from Hon'ble Loknath Mishra, Governor of Assam

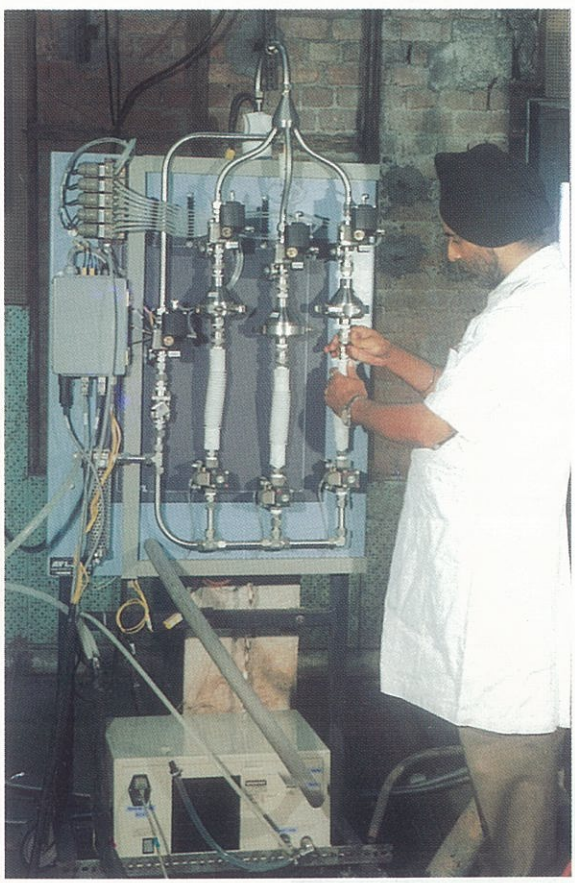
Enhancing the Facilities



Prefractionator with Multi Dimensional Gas Chromatograph & Oxygenate Analyser

Prefractionator with Multi Dimensional Gas Chromatograph & Oxygenate Analyser *(Hewlett - Packard 5890 Series II)*

The instrument has facilities for estimation of oxygenated compounds (alcohols and ethers) in fuels added for improving octane number and for low lead phase down programmes. The system also provides for back flushing heart cutting and on-line GC trapping with packed/wide-bore analytical column for characterization of complex hydrocarbon mixtures.



Dilution Tunnel

Dilution Tunnel *(AVL Make, SPC-472)*

This unit facilitates on-line sampling of engine exhaust for measurement of particulate emissions.

Direct Filter Injector Gas Chromatograph *(Perkin-Elmer Auto Xh-GC, Turbo-41)*

This instrument has facilities for the analysis of soluble organic fraction of particulate matter originated from both fuels and lubricants in an engine exhaust. The injection system has been modified to directly feed particulate sample as collected on filter paper.

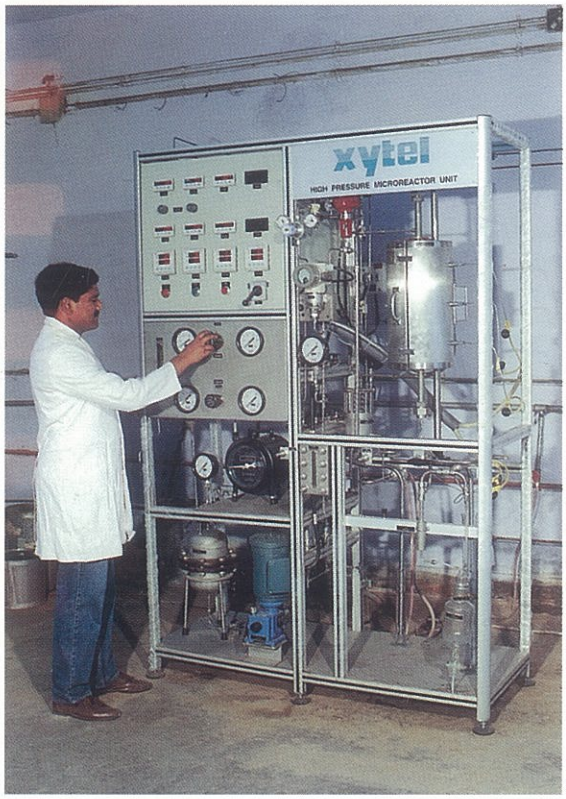
Process Design Software *(Aspen Plus)*

With the procurement of this particular software, it is expected that the process design capabilities, which are very vital to the scientific activities of the institute, will be enhanced to a great extent.

Enhancing the Facilities ...

High Pressure Micro Reactor Unit *(Xytel-India)*

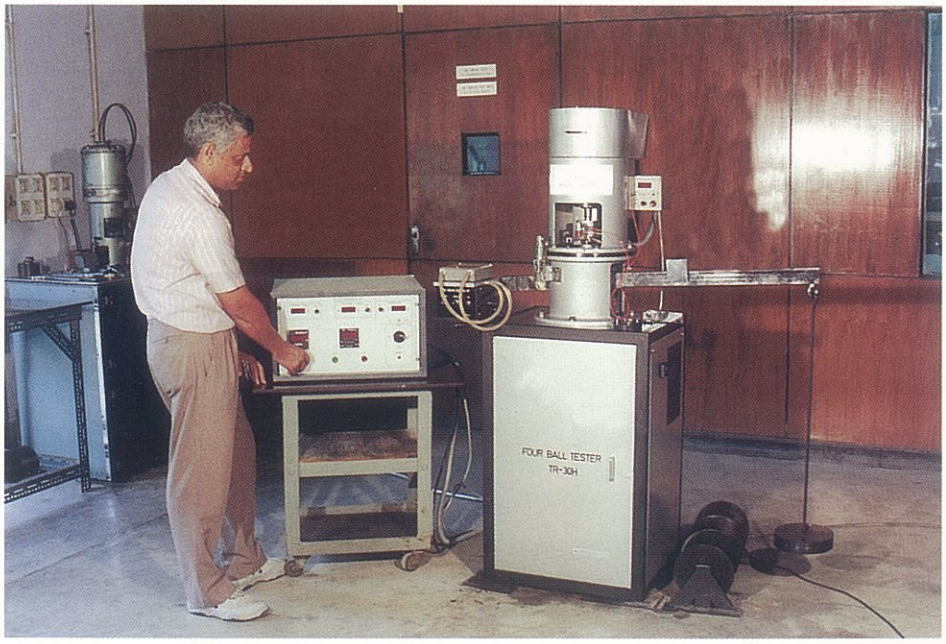
The unit is slated for catalytic process development and is meant for studying light naphtha catalytic reactions, viz., production of LPG, aromatics and isomerization of light naphtha. This unit can function upto the operating pressure of 100 kg/cm^2 and a maximum temperature of 600°C while its furnace can withstand temperatures upto 1200°C.



High Pressure Micro Reactor Unit

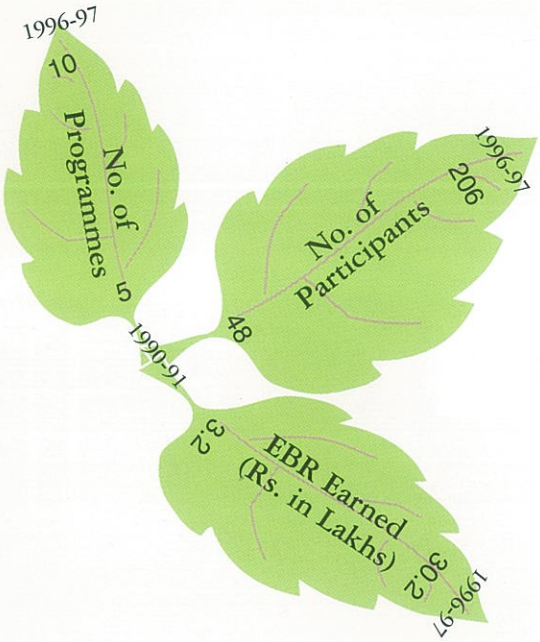
Rolling Contact Fatigue Four-Ball Machine *(Ducom - TR-30H)*

This facility is for studying the effect of lubricant on fatigue life of machine components.



Rolling Contact Fatigue Four-Ball Machine

Human Resource Development : Honing People's Skills



Training Programmes:Then & Now

Training Programmes for Petroleum Personnel

In fulfilment of the mandate of the institute, ten training programmes on various topics relating to refining technology and analytical techniques in respect of petroleum and petrochemicals, application of fuels and lubricants, and measurement of automotive emissions were conducted for two hundred and six participants from the oil industry and State Transport Departments. These included advanced programmes on petroleum-related subjects for the senior executives from the oil industry. The total EBR earned out of the sponsored programmes was Rs. 30.2 lakhs.

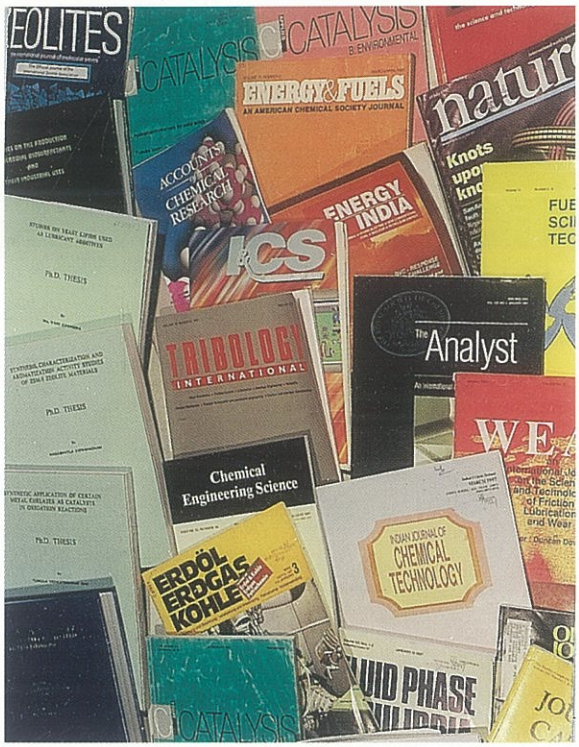
Training in Management & Related Issues

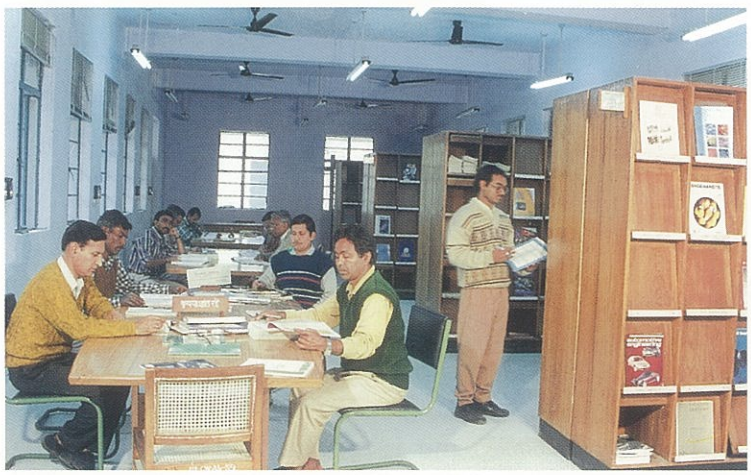
Besides technical training programmes for the industry, four training programmes especially on HRD factor for the IIP staff were also conducted. Two of them touched upon the subject of management, specifically on 'Management of Strategic Change' and were conducted by Prof R S Ganapathy of the Academy of Management Excellence, Madras. These were aimed at providing necessary mental and physical preparation for the 'Implementation of the IIP Business Plan'. Another programme conducted by Dr Rakesh Chopra of M/s Century Health Limited, New Delhi, dealt with 'Winning Strategies for Success'. A training programme on 'Internet - Online Patent Search' was also organized at Doon Valley Integrated Systems, Dehradun.

A Training Course for Senior Executives in Progress

Patents, Publications & Academic Achievements

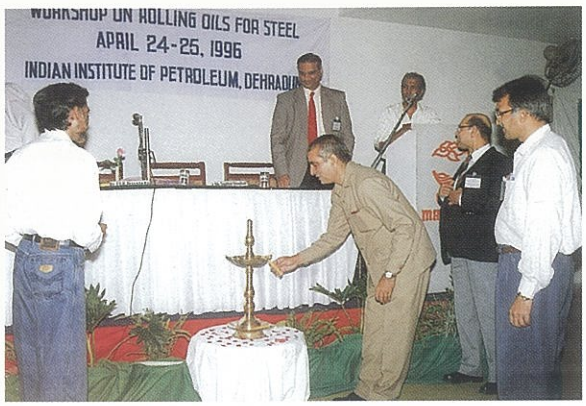
- Three patents were filed during the year. Ten more applications for patents have been submitted.
- Thirty-nine papers were published in various national and international journals and seventy-eight papers were presented in different national and international conferences.
- A revised edition of the 'Hand Book on Crude Oils' (1996 edition) was brought out by the institute. It contains information on about one hundred crude oils.
- During the year, four scientists of the institute were conferred upon the degree of Ph.D. /D.Phil., while another four research scholars/scientists submitted their theses to various universities for its award.





A View of the Library Annexe of the Institute

Conferences & Meets



Dr. T S R Prasada Rao inaugurating the 'Workshop on Rolling Oils for Steel'

Dr. K R Sarma, Director, CSIO, Chandigarh, inaugurating the 'Symposium on Recent Advances in Chromatography of Petroleum Hydrocarbons'

National Workshop on Deposit Rating of Engine Components
April 23-24, 1996

IIP hosted this workshop to bring together technical personnel from different sectors, viz., oil industry, OEMS, and R & D institutions, to share their knowledge-base and discuss different practical aspects of rating of engine components. The workshop was attended by 40 delegates from 20 different organizations.

Workshop on Rolling Oils for Steel
April 24-25, 1996

In this workshop over 50 participants from steel industry, oil companies, R & D institutions and academic organizations interacted on a common platform. It provided opportunity for disseminating the existing knowledge and understanding the future requirements of the steel industry.

Symposium on Recent Advances in Chromatography of Petroleum Hydrocarbons
May 22-24, 1996

This national symposium was organized to take stock of the level of sophistication that has been attained in the field of chromatography in India. About 80 experts from the petroleum industry, academic institutions and various research and development organizations attended the symposium. It featured lectures of eminent scientists in the field along with 30 technical presentations from various organizations. An impressive exhibition of analytical instruments put up by instrument manufacturers was an added attractive feature of the symposium.

III Meet of the Heads of the CSIR Libraries/ Information Centres
May 30 - June 1, 1996

This meet was inaugurated by Dr R A Mashelkar, Director General, CSIR. Its theme was *"The role of CSIR Libraries/Information Centres in the context of* ***CSIR Vision*** *2001"* and it concentrated upon changing the system of the CSIR libraries in the wake of changing times.

Conferences & Meets ...

Annual R & D Review Meet
June 10-17, 1996

The meet was organized with the idea to look back at the R & D work done in the past year, the 'delta' progress achieved, and to assess the efforts and abilities of the institute as well as its shortcomings. About 275 scientists & technical personnel took part in it. Presentations, representing all the sectors of R & D in the institute, were made. The Business Plan of the IIP was also discussed in it.

Mini Refinery Conference
December 5, 1996

Consequent upon the IIP- Unitel Technologies Inc, USA tie-up on mini-refineries, a one-day conference was organized by the IIP at New Delhi. The conference was attended by potential clients from oil industry and several business houses. Dr T S R Prasada Rao, Director, IIP, stressed upon the need to set up mini-refineries especially in those remote parts of the country, where crudes are available in small quantities and which lack transportation facilities.

Seminar on Deposit Rating of Diesel Engine Components
January 16-17, 1997

This seminar was held to facilitate strong interaction among the participants from oil industry, automobile industry and the scientists of the institute.

Inauguration of the 'III Meet of the Heads of CSIR Libraries/Information Centres'

Conference on Mini Refinery

Bilateral Scientific Exchange Visits

Our Voyages

As many as twenty-nine of the IIP scientists / engineers were deputed under various programmes to the following countries -- the USA, Germany, Egypt, Austria, Japan, the Czech Republic, France, Switzerland, Sweden, Malaysia, Singapore, the UK, Kuwait, China, the Slovak Republic, Yugoslavia and Thailand.

Their Response

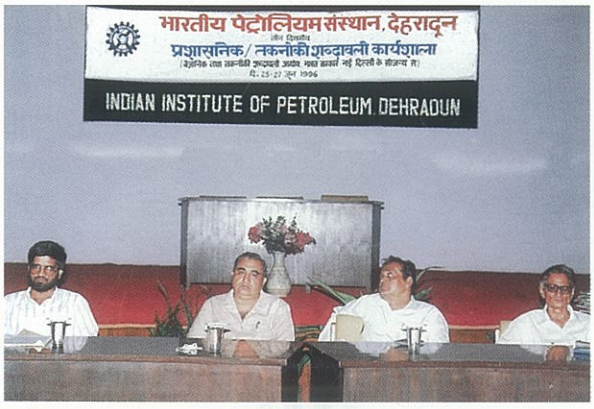
Twenty-two scientists from foreign countries, viz., Ukraine, the USA, Egypt, Hungary, the Czech Republic, Japan, Myanmar & Bangladesh graced IIP's corridors this year. Three foreign delegations from countries like Japan, Myanmar and the USA also visited us in this period to search for opportunities of collaboration with the institute.

A Foreign Delegation visiting IIP Laboratories

Rajbhasha Activities

Administrative & Technical Terminology Workshop
June 25-27, 1996

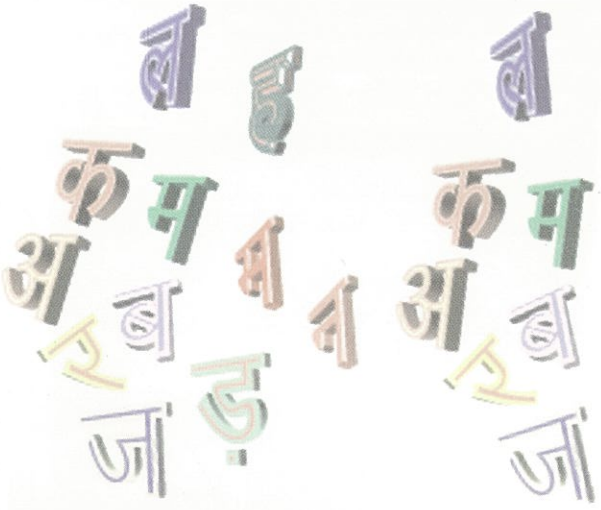
The Rajbhasha Section of the institute organized this workshop under the auspices of the Commission for Scientific & Technical Terminology (CSTT), New Delhi. About 200 administrative and technical personnel interacted with 10 experts on various aspects like word-construction, usage and over-all implementation of Hindi in both administrative and S & T areas.



Terminology Workshop in Progress

Hindi Diwas Celebrations
September 16, 1996

Speaking on this occasion, Padmashri Dr Shyam Singh 'Shashi', a famous litterateur, called upon all to learn all the languages. The importance of Hindi in science & technology was also highlighted. Winners of various competitions held on the occasion of Hindi Diwas were presented awards and mementos.



Pursuit of Hindi in Science & Technology

Recognizing the institute's efforts for promoting the use of Hindi in S & T, the CSIR adjudged the IIP as the Second Best Laboratory for the 'Award for Scientific Work in Hindi' during the year 1996-97.

Padmashri Dr. Shyam Singh 'Shashi' inaugurating the Hindi Diwas Celebrations

Down the Memory Lane

April 17

Inauguration of IIP Foundation Day Celebrations

1996

September 27

Mr. G V Ramakrishna delivering CSIR Foundation Day Lecture

1996

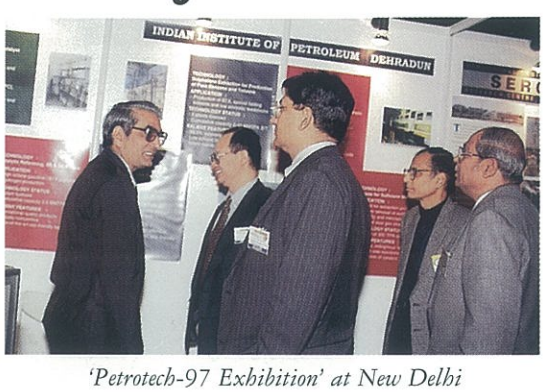
November 15

Members of Parliamentary Committee with the Director, Dr. T S R Prasada Rao

1996

April 17, 1996	IIP Foundation Day Lecture by Prof R Kumar, Chairman, CSIR Technical Advisory Board (Chemical Sciences)
May 8-9, 1996	Catalytic Reforming Activity Committee Meeting
May 30, 1996	Inauguration of 33 KV Indoor Power Substation by Dr R A Mashelkar, DG, CSIR
June 5, 1996	World Environment Day Celebrations
September 27, 1996	CSIR Foundation Day Lecture by Mr. G V Ramakrishna, Chairman, Research Council of IIP, and Chairman, Disinvestment Commission
October 1-14, 1996	Shanti Swaroop Bhatnagar Memorial Tournament (Outdoor - Zonal)
November 15, 1996	Visit of the Parliamentary Committee on Science & Technology to witness the demonstration on the so-claimed 'Herbal Petrol' by Mr. Ramar Pillai
January 9-12, 1997	Participation of IIP in the 'Petrotech-97 Exhibition' at Pragati Maidan, New Delhi

January 9-12



'Petrotech-97 Exhibition' at New Delhi

1997

Community & Culture

The campus of IIP, as always, has been a witness to a plethora of festivities like the ***IIP Mela, Cultural Evenings, Vinayaka Chaturthi, Durga Mata's Annual Bhandara, Holi, Shivaratri, Shri Krishna Janmashtami, Navaratri, environment protection activities*** etc., as they are considered to be a part and parcel of social life. The community also had the privilege of finding amidst it the holy and august presence of **HH 1008 Shankaracharya Shri Shri Jayendra Saraswati Swamigal of Kanchi Kamakoti Peetham** who gave his blessings to all those present.

HH 1008 Shankaracharya Shri Shri Jayendra Saraswati Swamigal blessing the IIP Community

❖ In order to create awareness amongst the people about the need for conservation of petroleum products, their efficient and economic use, and to educate them about fuel-saving devices developed by the institute, several programmes were organized under the **Oil Conservation Fortnight** between February 1-15, 1997. They included a 'Walk for Oil Conservation' in which students and teachers from various schools of the city, employees of IIP and other citizens of Dehradun took part. Painting and slogan competitions for school children, talks, video films, distribution of literature on the subject and demonstration of aforesaid heating and lighting appliances also featured in it.

A view of Durga Mata's Annual Bhandara

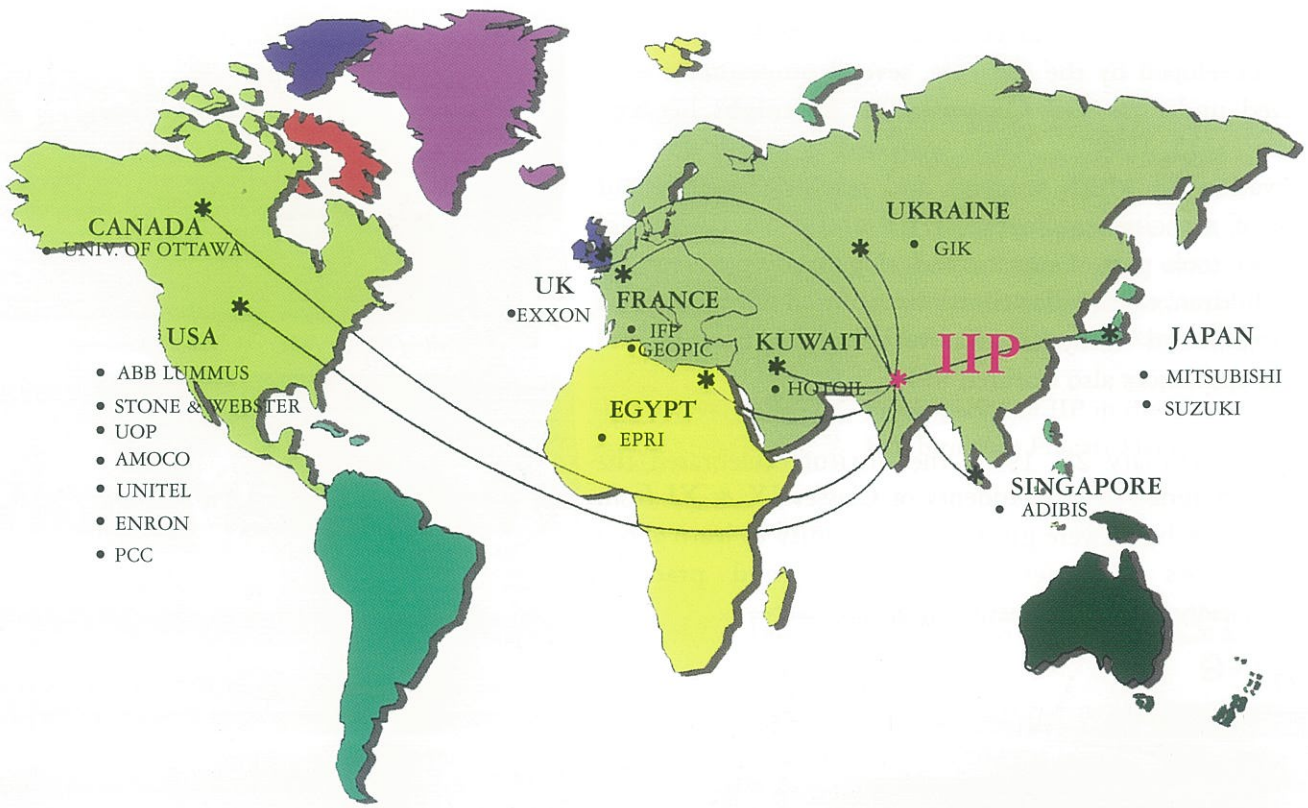
❖ On February 28, 1997, the institute celebrated the **National Science Day.** Students of Classes IX & XI from various local schools were given an opportunity to learn about the institute's activities through talks and practical demonstrations by senior scientists.

Cultural Show on Independence Day Eve by the IIP Youth Club

Practical Demonstration to Students on National Science Day

'Walk for Oil Conservation' being flagged off

IIP's Global Linkages



IIP Technologies Licensed in the Country

IIP's Quality Policy

Indian Institute of Petroleum is committed to develop into an internationally reputed R&D centre of excellence for providing globally competitive technologies and services for Hydrocarbon and related industries. This will be achieved through total quality management and by anticipating and exceeding the expectations of customers through innovation, team work and commitment.

Objectives

- Develop innovative and frontier technologies and products
- Maintain high level of scientific, technological, marketing and managerial competence
- Excellence through team work, motivation and dedication
- Provide customer satisfaction through meeting commitments on quality, cost and delivery schedule as per the contract

INDIAN INSTITUTE OF PETROLEUM

(Council of Scientific and Industrial Research)

P.O.- I.I.P., DEHRADUN (U.P.)-248 005, INDIA

Telex : 0585-217 Fax : 91-135-621986

Phones : 0135 - 660113 to 660116 Gram : PETRINST, Dehradun

E-Mail : iipddn@del2.vsnl.net.in

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