

II B. TECHNOLOGY DEVELOPMENT AND INNOVATION PROGRAMME

The programme has two components, viz. “Technology Development and Demonstration Programme” to support technology development efforts of industry-R&D system and “Technopreneur Promotion Programme (TePP)” to nurture the innovative spirit of individuals.

1. TECHNOLOGY DEVELOPMENT AND DEMONSTRATION PROGRAMME

1.1 Objectives

The programme aims at catalyzing and supporting activities relating to technology absorption, adaptation and demonstration including capital goods development, by involving industry and R&D organizations. The specific objectives of the programme are :

- ☞ supporting industry for technology development, demonstration and absorption of imported technology
- ☞ building indigenous capabilities for development and commercialization of contemporary products and processes of high impact.
- ☞ involvement of national research organizations in joint projects with industry
- ☞ technology evaluation in selected sectors.

1.2 Activities

The Department provides on a selective basis partial financial support to research, development, design and engineering (RDDE)

projects proposed by industry in the following areas:

- ☞ Development and demonstration of new or improved product and process technologies including those for specialised capital goods, for both domestic and export markets.
- ☞ Absorption and up-gradation of imported technology.

The partial financial support by DSIR in the above areas primarily covers prototype development and pilot plant work, test and evaluation of products from such R&D, user trials, etc. Bulk of the cost of the project is met from industry's resources.

The Department under this activity has so far supported about 155 R&D projects of Industrial units. These projects cover products and processes in various important industries such as metallurgy, electricals, electronics, instrumentation, mechanical engineering, earth moving and industrial machinery, chemicals and explosives etc.

During the year, 78 Technology Development & Demonstration projects supported under the scheme were reviewed for progress. Out of these 78 projects, 16 projects were completed successfully, 17 projects were nearing completion and 45 projects were under progress. Since inception of the scheme, 66 projects have so far been completed and over 40 technologies developed under the scheme have been commercialized or under commercialization.

The details of assistance provided under the scheme to various projects belonging to different sectors are given in Annexure 7. The

details of the industrial units and the relevant projects are listed in the following paragraphs:

CHEMICAL AND FERTILIZERS

Projects nearing Completion

☞ The project of *Canpex Chemicals Pvt. Ltd., Pune* for 'Setting up of Pilot Plant for Production of IT/day High Purity (72-80%) Calcium Cyanamide' has been supported by DSIR. Due to explosion in the factory, the Project Review Committee has recommended fore-closure of the project.

☞ The Project of *Castron Technologies Ltd., Dhanbad* in collaboration with Central Fuel Research Institute for 'Development of Indigenous Technology for Phenanthrene and 9:10 Phenanthrenequinone' has been supported by DSIR. The pilot plant is under erection and shall be soon operational. The Pilot Plant involves solvent extraction of Phenanthrene from Crude Anthracene and oxidation of Phenanthrene. The process of upgradation of Phenanthrene (60%) to around (70%) by chemical method has been developed in the lab and the pilot plant equipment is under erection. The product has very good market demand.

☞ The project of *IBP Co. Ltd., Gurgaon* (with the assistance of CMRI, Dhanbad) on 'Development of Heat Resistant Explosives' has been supported by DSIR. Field trial of Heat Resistant Explosive has been completed at 80° C and 100° C. Field trial of Heat Resistant Explosive at 120° C is in progress. After successful completion of trial at 120° C, the project will be completed.

☞ The Project of *NATCO Pharma Ltd., Hyderabad* for 'Development of Pilot Level Anaerobic Reactor to Pharmaceutical Waste' in collaboration with Indian Institute of Chemical Technology (IICT), Hyderabad,

has been supported by DSIR. The Lab work, the basic process design of the Pilot Plant and detailed engineering design have been completed. Pilot Plant at NATCO Pharma Ltd. has been assisted by IICT. The performance trials and test have been completed. The project is nearing completion.

☞ The project of *Solaris Chemtech Ltd. (Formerly BILT Chemicals Ltd.), Gurgaon* for 'Development of Technology for Tetra Bromo Bisphenol-A (TBBA) on a Pilot Plant level', supported by DSIR, has two parts (i) Development of Batch process at Ankleshwar, Gujarat and (ii) Continuous Process at Karwar, Karnataka. The batch process at the Pilot Plant at Ankleshwar based on the technology developed in-house has already been successfully completed. The Continuous Process at Pilot Plant at Karwar has been mostly completed and final tests are being conducted. The product TBBA is a fire retardant chemical and has considerable potential abroad and in the country.

☞ The Project undertaken of *TCM Ltd., Bangalore* for 'Development of Carbon-dioxide Route for the Manufacture of Barium Carbonate' based on the use of lecofines with Barytes in the continuous rotary kiln, has been supported by DSIR. The flue gases from the rotary kiln have been treated and the carbon dioxide obtained has been successfully employed for precipitation of Barium Sulphide to get Barium Carbonate. The quality of the product has been improved to 98.5%.

Projects under Progress

☞ The project of *Anirox Pigments Limited, Kolkata* (works at Dhanbad) is for 'Development of Stable Oil in Water Ink Emulsion, Based upon Water Reducible Nigrosine Dyes for Ink Jet Computer

Printers' with DSIR. The firm at present is engaged in the production of Nigrosine Dye which finds many applications, one of which is in ink industry. The project is progressing well.

☞ The project of *Anu's Laboratories Limited, Hyderabad* on 'Development of Process for manufacture of 1-Bromo-3-Chloro Propane (B.C.P.) & 1, 3-Dibromo Propane (D.B.P.) in Pilot Plant' has been supported by DSIR. The process developed at the lab scale involves the step of hydro bromination using hydrogen bromide gas. The company is in the process of installing pilot plant. 1-Bromo-3-Chloro Propane (B.C.P.) is a basic chemical used for manufacture of several intermediates for bulk drugs and other chemicals. 1, 3-Dibromo Propane (D.B.P.) is used for manufacture of other chemicals.

☞ The project of *Carbon Resources Pvt. Ltd., Giridih, Jharkhand* is for 'Development of Technology for state-of-the-art Coal Tar Pitch and Carbon Paste'. Coal Tar Pitch is used in steel plant, aluminium plants, refractories, etc. while carbon paste is used as an electrode in aluminum industries, ferro alloys and other alloys industries. The objective of the pilot plant is to generate the data for optimisation of parameters like resistivity, plasticity, conductivity, temperature, ratio, calcined petroleum coke and coal tar pitch, etc. for having better performance. The development of better quality product will ultimately reduce the resistivity of carbon electrode resulting in savings of electricity since the user industries are heavily dependent on electricity. Pilot plant has been installed and work is progressing well.

☞ The project of *Elkay Chemicals Pvt. Ltd., Pune* is for 'Development of Next Generation Amino Silicon based on hydrosilation technology'. The hydrosilation

process avoids import of silicones – a prohibited costly material. The formulations of amino silicones find applications in textile finishing, personal hygiene, etc. The company has developed a better route for the production of the product resulting in four products to be used for textiles, personal hygiene etc.

☞ The Project of *Engineers India Ltd., Gurgaon* in collaboration with Indian Institute of Chemical Technology (IICT), Hyderabad on "Development of Membrane Technology for Natural gas Separation" has been supported by DSIR. Efforts are on to setup a Pilot Plant at ONGC, Uran, assisted by IICT. The project is environment friendly and is in progress.

☞ The project of *Forest Research Institute (FRI), Dehradun* on 'Identification, Development and Utilisation of Natural Dyes from the Forest Plants of Uttranchal' has been supported by DSIR. The project is based on forest waste, which is available in plenty. Under the project, natural dyes are proposed to be extracted from 5 plant materials viz. *Populus deltoids*; *Pinus roxburghii*; *Eucalyptus hybrid*; *Cassia tora*; & *lantana camara*. FRI is in the process of procuring pilot plant and testing equipments for the project. Ministry of Environment & Forests (MoEF), New Delhi is also supporting the project with an equal financial support. Thus making total support of Rs. 50.32 lakhs. The applications includes natural dyes for textile manufacturers, dyers, paper and pulp industry etc.

☞ The project of *General Exports & Credits Ltd., New Delhi* in collaboration with *Dalmia Centre for Research & Development, Coimbatore* and *Indian Institute of Chemical Technology, Hyderabad* on 'Development of

Azadirachtin-A Technical from Neem Seeds Kernels and its Formulations' has been supported by DSIR. IICT, Hyderabad has been entrusted with the task of designing and engineering of the pilot plant. Due to demand shrinkage, the company has pruned the size of the pilot plant and is in the process of setting up of pilot plant.

- ☞ The Project of *Haryana Leather Chemicals Ltd., Jind, Haryana* on 'Development of Technology for Cross linked polyurethane Dispersions' has been supported by DSIR. The lab samples have been tested at CLRI. The design of the pilot plant is complete and is under installation. The project is in progress.
- ☞ The project of *Organic Coatings Limited, Mumbai* for (i) Water-based flexo inks used for absorbent stock (craft paper) and coated stock (art paper, etc.); and (ii) UV radiation curing inks used for coated stock and non-absorbent substrates such as PVC, Polyester, etc.' has been supported by DSIR. The flexo inks will be used in packaging materials, composite films, aluminum foils, plastic and paper labels, wall covers, envelopes decoration materials and other specialized papers. This part of the project is completed. The radiation curing inks are energy efficient as well as improve the life of specialty paper product such as currency notes, etc. Work on the part is in progress.
- ☞ The Project of *Pennwalt India Ltd., Mumbai* on 'Coating of Chemical Process Equipment with Fluoropolymer and other High Performance Powders' has been supported by DSIR. The company has undertaken the coating trials of the fluoropolymer compositions, which do not have any inflammable solvents. For such fluoropolymer coatings, which are based on inflammable solvents, the company has placed order for solvent Venting Oven. The oven is expected to arrive soon. The project

is in progress.

DRUGS AND PHARMACEUTICALS

Projects Completed

- ☞ The joint project of *Southern Petrochemical Industries Corporation Ltd., Chennai* and *Indian Institute of Chemical Technology, Hyderabad* on 'Development of Process for manufacture of Pyrazinamide' has been supported by DSIR. They have developed catalysts for methylpyrazine and cyanopyrazine. Pilot plant facility for the catalytic process for pyrazinamide has been established at Tuticorin. Pyrazinamide is an anti-tuberculosis drug widely used in India and other under-developed countries as an essential ingredient in all anti-tuberculosis formulations.

Projects nearing Completion

- ☞ The project of *Bharavi Laboratories Pvt. Ltd., Bangalore* on 'Development of Novel Resins for use in Solid Phase Organic Synthesis and Combinatorial Chemistry' has been supported by DSIR. The company has developed synthetic route for the preparation of isatoic anhydride resin and PEG grafted resins. The resins developed under the project would be useful for solid phase peptide synthesis.
- ☞ The project of *Gland Pharma Ltd., Hyderabad* on 'Pilot Scale Manufacture of Hyaluronic Acid Formulations' has been supported by DSIR. The company has installed the pilot plant for making Hyaluronic Acid from Rooster comb. The different grades of Hyaluronic Acid are claimed to be cheaper compared to the other products in the market. Hyaluronic Acid is used in rheumatology (osteoarthritis), cosmetics and ophthalmology.
- ☞ The project of *Lifecare Innovation Pvt. Ltd.,*

New Delhi on 'Scaleup Process Development of Liposomal Amphotericin B, Awareness Programme and Clinical Performance Trials' has been supported by DSIR. Amphotericin B is a macrolide polyene antibiotic produced by strain of *Streptomyces nodosus*. Amphotericin B shows a high order of *in vitro* activity against many species of fungi viz. *Histoplasma capsulatum*, *Cryptococcus immitis*, etc. Liposomal Amphotericin B is used for treatment of Kala-Azar.

- ☞ The joint project of *SPIC Ltd.*, (Pharmaceutical Division), Chennai and Central Electro-Chemical Research Institute (CECRI), Karaikudi on 'Development of Technology for 3-Chloromethyl- Δ^3 -Cephem Ester from Pen GK' has been supported by DSIR. The company is in the process of installing a pilot plant for five step chemical synthesis of 3-Chloromethyl- Δ^3 -Cephem ester which is an intermediate for cephalosporin, from "Pen GK". One of the steps in the process is electro-chlorination which has been developed by the collaborating agency namely Central Electro-Chemical Research Institute (CECRI), Karaikudi.

Projects under Progress

- ☞ The project of *M/s. Punjab Chemicals & Pharmaceuticals Ltd.*, Chandigarh on "Development of process for the manufacture of Ethyl 2-(2-aminothiazol-4-yl)-2-methoxyiminoacetate and 2-formylamino-4-thiazole acetic acid ethyl ester in Pilot Plant" has been supported by DSIR. It is proposed to develop process for manufacture of Ethyl 2-(2-aminothiazol-4-yl)-2-methoxyiminoacetate and 2-formylamino-4-thiazole acetic acid ethyl ester. These two are key raw materials for the manufacture of a large number of cephalosporins based antibiotics.

- ☞ The project of *M/s. SMS Pharmaceuticals Ltd., Hyderabad* on "Development of Active Pharmaceutical Ingredients (API), API Intermediates and Metal Acetylacetonates" has been supported by DSIR. The company intends to scale up processes for manufacture of Active Pharmaceutical Ingredients (API), API Intermediates and Metal Acetylacetonates. The API proposed to be developed are: Diltiazem Hydrochloride (API), Zolmitriptan (API) and Taxol C-13 side chain (API intermediate). The process makes use of heterogeneous catalyst developed by ICT, Hyderabad, which is recoverable and reusable. Diltiazem is used for hypertension and anti-angina. zolmitriptan is used for alleviating migraine. Metal Acetylacetonates are used as catalysts, glass coating agents, paints, ink etc

- ☞ The project on *TTK Healthcare Ltd., Bangalore* and *Sree Chitra Tirunal Institute for Medical Sciences and Technology, (SCTIMST), Trivandrum* on 'Development of an Improved Tilting Disc Heart Valve Prosthesis' has been supported by DSIR. The company in collaboration with SCTIMST, Thiruvananthapuram intends to develop an improved tilting disc heart valve prosthesis. The improvements in the valve will provide better performance characteristics (functional and durability); the new valve will be MRI compatible with improved thrombo resistance and with presence of radio-opaque marker for fluoroscopic visualization. The reduction in the production cost is expected to make the product more cost effective.

ELECTRICAL, ELECTRONICS AND COMMUNICATION

Projects Completed

- ☞ The project of *Aiswarya Telecom Pvt Ltd, Hyderabad* for 'Development of hand held

optical test equipment' has been supported by DSIR. The project has been successfully completed.

- ☞ The Project of *Ardee Business Services Pvt. Ltd., Vishakhapatnam* on 'RAMDARS-Coal dry Beneficial system' has been supported by DSIR. Pilot plant had undergone extensive testing at SCCL and WCL. World's first, patented, Coal Dry Beneficiation technology has been developed in India, which would facilitate increased acceptance of high ash Indian coal by thermal plants.
- ☞ The Project of *Autopal Industries Ltd., Jaipur* on 'Development of Metal Halide Lamps Including ARC Tube and Electronic Control Gear' has been supported by DSIR. Development of the ARC tube has been achieved under the project, first time in the country. The project is closed as firm has been facing labour unrest for a long period.
- ☞ The project of *Innovative Communication System Ltd., Hyderabad* for 'Development of Voice Enabled Web' has been supported by DSIR. Prototypes successfully developed and demonstrated with *ikisan.com* portal. Using this technology, even farmers without computers will be able to access the web portals by using simple telephones and listen to the contents of the web pages in local languages like Telugu, Hindi.
- ☞ The project of *Karnataka Hybrid Micro Devices Ltd., Bangalore* on 'Innovative Microelectronic Packaging Technology for Automobile under Hood Applications' has been supported by DSIR. The electronic circuitry and components used in automobiles like voltage controllers, circuit braking points for electronic ignition are currently being imported. Karnataka Hybrid Micro Devices Ltd. have indigenised the above electronic circuits by hybrid micro devices technology. The pilot plant has been set up by them and prototypes of the hybrid circuits were developed. These devices have been tested by Lucas-TVS satisfactorily.
- ☞ The project of *Punjab Agro Industries Corporation, Chandigarh* on 'Setting up a pilot plant for production of Cellulose Silica Lignin and Protein Rich Food for Human Consumption from Rice Straw' has been supported by DSIR. The project is closed as the industry partner withdrew from this project.
- ☞ The Project of *S M Creative Electronics Ltd., Gurgaon* on 'Development of Miniature DC/DC Converter for Line Cards' has been supported by DSIR. First phase of non miniature DC-DC converter has been successfully completed. Cost effective miniature DC-DC converter could not be developed due to strong patent position of MNCs. The project is closed.
- ☞ The Project of *Semiconductor Complex Ltd., Chandigarh* and *Bharati Telecom Ltd., New Delhi* on 'Development of Technology For Production of Single Chip Telephone ICs and Telephone Instruments Based on Single Chip Telephone ICs' has been supported by DSIR. The prototype, first of its kind integrating 3 chips into one single complex chip, has been successfully developed. This is a major development milestone in indigenous capability of chip design and fabrication.
- ☞ The Project of *Semiconductor Complex Ltd., Chandigarh* and *S M Electronics & Services Ltd., New Delhi (Now Known as SM Telesys Ltd)* on 'Development of Bilingual Pager based on ASIC' has been supported by DSIR. The project is closed as market for pagers is shrinking.
- ☞ The Project of *United Telecoms Ltd.,*

Bangalore on 'Design & Development of ADSL (Asymmetric Digital Subscriber Line)' has been supported by DSIR. The prototype has been successfully developed and commercialised. This is a major hardware development in Broadband communications.

☞ The project of *United telecom Ltd., Bangalore* for 'Development of ATM Access Multiplexer' has been supported by DSIR. The prototype has been successfully developed and commercialised. This is a major hardware development in Broadband communications.

☞ The project of *Webel Mediatronics Ltd., Kolkata* and *Jadavpur University, Kolkata* on 'Development of Computerised Braille Transcription Systems for automatic and speeded transcription of English and Indian language texts' had been supported by DSIR. The reading material for blind people is made in the Braille script. The printing of Braille transcription is currently done by Braille printers and the speed of the printing is slow. The printers are available only in English. There was a need to incorporate Indian languages in Braille and also make the process computer friendly. This project has made it possible to use Indian language texts for Braille transcription through a personal computer. The project activities have been completed and the products are under testing with NIVH, Dehradun.

Projects nearing Completion

☞ The joint project of *Ashok Leyland Ltd., Chennai* and *Electronics Research Development Centre of India, Thiruvananthapuram* for 'Development of Hybrid Electric Vehicle With Vector Controlled Induction Motor for Propulsion' has been supported by DSIR. Prototypes have been developed and the company exhibited the Hybrid Electric Vehicle in the Auto Expo 2002 in Delhi. The prototypes

are undergoing endurance test and certification. The technology has been patented and the metro bus developed is world's first Hybrid Electric large capacity (55 passengers) bus.

☞ The project of *Farcom Cable Systems (P) Ltd., Bangalore* and *Central Power Research Institute, Bangalore* on 'Development of Flame Retardant Low Smoke Material For Wires and Cables for Sheathing Applications' has been supported by DSIR. The Flame Retardant Low Smoke Material for cabling purposes is currently imported in the country. The Central Power Research Institute had a laboratory scale technology for making indigenous FRLS material. The process has been scaled up by Farcom Cable Systems (P) Ltd., Bangalore successfully. There is a large requirement of FRLS cables and wires in the construction industry, power stations, telephone exchanges etc..

☞ The project of *Mak Controls and Systems (P) Ltd., Coimbatore* on 'Design, Development and Trial and Testing of Mak World Tracker' has been supported by DSIR. Prototypes have been developed and the system is under demonstration in USA.

☞ The Project of *Semiconductor Complex Ltd., Chandigarh* and *Shree Pacetronix Ltd., Indore* on 'Design & Development of Indigenous Pacemaker Based on Single Chip and The Programming Unit' has been supported by DSIR. Prototypes (ASIC and Pacemaker) have been developed and the system is under testing. It is a major development in the area of sophisticated implanted medical devices.

☞ The Project of *Transasia Biomedicals Ltd., Mumbai* on 'Development of Fully Automatic High Speed Blood Chemistry Analyser, Model XL-100' has been supported by DSIR. Three prototypes have

been developed.

Projects under Progress

- ☞ The project of *Abacus Softech Ltd, New Delhi* for 'Development of upgraded digital voice logger with 32 channels, E-1 and FAX compatibility' has been supported by DSIR. This equipment meets the needs of security agencies.
- ☞ The project of *Aishwarya Telecom Pvt Ltd, Hyderabad* for 'The project development of Optical Test and Measuring Equipments (Optical Talk Set, Optical variable attenuator, Optical Power Meter – Type A' has been approved by DSIR. This project will facilitate availability of accurate, calibrated test instruments for field and operational people installing fibre.
- ☞ The project of *APTECH Ltd., Mumbai* in collaboration with *Indian Institute of Information Technology, Allahabad* for 'Development of Learning Content Management System with an Intelligent Authoring Tool' has been supported by DSIR.
- ☞ The project of *BEL Optronics Devices Limited, Pune* for 'Development of SUPERGEN Image Intensifier tube' has been supported by DSIR.
- ☞ The project of *Bharat Heavy Electricals Ltd., Electro Percelain Division, Bangalore* and *National Chemical laboratory, Pune* on 'Design and manufacture of prototype ceramic membrane filtration unit for production of safe domestic drinking water' has been supported by DSIR.
- ☞ The project on 'Development of ASIC Based Energy Meter' by *Bharat Heavy Electricals Ltd., Bangalore* and *Semiconductor Complex Ltd., Chandigarh* has been supported by DSIR. The metering of electricity for bulk industrial users with accurate kind of meters has been considered important. Until now the meters used in this area were of electro mechanical type with maintenance requirements and accuracy limitations. The aim of the above project is to manufacture indigenous meters based on the indigenous ASIC. The ASIC has been developed by Semiconductor Complex Ltd., Chandigarh. The meter fabricated could not meet the accuracy requirements of 0.5% due to technological limitations. In the meanwhile faster micro controllers have emerged making the digital signal processing faster and more accurate. The company is going ahead with the changed technology from the experience gained in the project.
- ☞ The project of *Central Electronics Ltd., Sahibabad* on 'Development of Digital Axle Counter' has been supported by DSIR. The 2 x 2 digital axle counter has been fabricated, tested and one prototype which has been installed between Delhi Mathura route, is functioning well. The prototype of 2 x 2 digital axle counter has been approved by RDSO and commercial order for 15 numbers have been placed by the Railways. The prototype of 2 x 3 digital axle counter is in progress.
- ☞ The project of *Coral Telecom Limited, Noida* for development of STM-1 based customer premises equipment (CPE) has been supported by DSIR. This is a broadband access terminal to be made as per TEC specifications.
- ☞ The project of *Goldstone Teleservices Ltd, Secunderabad* for 'Development of technology for manufacture of EHV Composite Insulator for application in 132 KV, 220 KV and 400 KV electrical power T&D lines' has been supported by DSIR. This project will deliver a new generation insulators to power transmission and

distribution utilities greatly minimizing the breakdowns due to insulator failure/replacement.

- ☞ The project of *MIC Electronics Ltd., Hyderabad* for 'Development of Fraud Management and Control Centre' has been supported by DSIR. The project is in progress.
- ☞ The project of *Pan India Electromech Pvt Ltd., Gurgaon* for 'Development of CASH' has been supported by DSIR. The project is in progress.
- ☞ The project of *NED Energy Limited, Hyderabad* for 'Development of High Energy Density Valve regulated Lead acid batteries' in collaboration with Indian Institute of Science, Bangalore has been supported by DSIR. The project is in progress.
- ☞ The project for 'Design, Development and Manufacturing of 5 ³/₄ and 6 ³/₄ digit multimeters' by *Rishabh Instruments (P) Ltd., Nasik* has been supported by DSIR. The company has been manufacturing high accuracy digital metering systems and is exporting its products to Europe. The company wanted to manufacture high-end digital multimeters for Indian as well as export market on their own during the project. The conceptualisation of the meters under development is completed and the first prototypes are under fabrication.
- ☞ The project on 'Development of RADAR Level Gauging Systems' by *S B Electro-Mechanicals (P) Ltd., Pune* was supported by DSIR. The company had expertise in manufacturing of level gauge systems. The system under development is computer friendly and based on radar principles giving simplicity of the operation and the accuracy requirements. The system for fixed roof tank has already been developed and the variant

for floating roof operation is currently under fabrication.

- ☞ The joint project of *SM Telesys Ltd (SMTL) and Atal Bihari Vajpayee Indian Institute of Information Technology and Management (ABV-IIITM)* for 'development of CTI (Computer Telephony Integration) based Call Centre Software' has been supported by DSIR. The software package will facilitate adoption of customer friendly marketing practices by small businessmen and professionals.
- ☞ The project on Development of optical pickup for CD mechanism by *Trident Industries Ltd., NOIDA* and *Central Scientific Instruments Organisation (CSIO), Chandigarh* has been supported by DSIR. The company was earlier supported by the Ministry of Information Technology for development of indigenous CD mechanism which was completed last year. The company proposed indigenous development of optical pick up for the mechanism already developed with the help of CSIO, Chandigarh. The mechanical and optical design of the device was completed. It is learnt that the company is facing problems due to labour unrest. Further progress of the project could be taken up after revival of the activities of the company.

MECHANICAL ENGINEERING

Projects Completed

- ☞ The project of *Ace Designers Pvt. Ltd., Bangalore* on 'Development of P.C. based CNC Machining system' has been supported by DSIR. The PC based CNC system has been fitted on the lathe machine and trials have been completed. The project has been completed successfully.

☞ The assisted project of *Bharat Earth Movers Ltd., Bangalore* to design and develop cast crank shaft for 450 KW engine. It involves identifying suitable material (SGI/ADI), design and development of foundry accessories and casting technique for a shaft of about 400 kgs, developing machining, heat-treatment and test schedules and techniques, assembly and test runs. Castings of the shafts (SGI & ADI) have been completed and subjected to endurance/fatigue tests. Assembly of the crank shafts in two engines and field trials were carried out. All the activities under the project have been satisfactorily completed and the final project report is also received.

☞ The objective of the project of *Mecpro Heavy Engineering Ltd., New Delhi* is to 'develop and demonstrate eco-friendly and efficient edible oil' refining process adopting twin bleaching system and deacidification and deodorization system resulting in better yields, low oil losses, excellent oil quality and low operating/maintenance cost. The performance and trials of the prototype equipments for both twin bleaching system and deodorization and deacidification system have been completed

Projects nearing Completion

☞ The project of *Atcom Technologies Ltd., Mumbai* proposed to 'develop higher capacity (200 gm) micro balance with one milligram accuracy' at lower cost. It involve design and development of mechanical sensor, components, magnetic circuit, force coil, analog-to-digital converter, needing mechanical CAD solutions, hybrid /ASIC development and EMI protection techniques. The prototypes have been developed and tested at NPL and at other agencies as per the specifications and suggestions of Project Review Committee. The project has been completed. The project

completion report is awaited.

☞ The project of *Atcom Technologies Ltd., Mumbai* aimed at 'design and development of different types and capacities of load cells' (bending beam shear, tension and compression) of international standards, which are now being imported. It involved software development, toolings, identification of materials, generation of technical specifications, design and fabrication of prototypes/components, testing and performance trials, etc. About 100 prototypes have been successfully developed and tested at NPL. Project report has been received and is under examination and approval.

☞ The proposal of *Steel Strip Wheel Ltd., Chandigarh* is to 'develop improved technology for the manufacture of automotive wheel discs for cars' by improving and smoothening the existing forming process, leading to reduction of input raw material, improvement of wheel life, reduced manufacturing cost and increase in productivity

Projects under Progress

☞ The project of *Bharat Pumps and Compressors Ltd., Allahabad* on 'Development of Twin Casing Fly Ash Slurry Pump' has been supported by DSIR. The design has been frozen.

☞ The project of *Klas Technology Ventures Ltd., Bangalore* proposes to 'design and develop seamless Aluminium cylinders for liquified gasses' for automotive, domestic, medical and defence applications. Advantages of Al cylinders include significant reduction in weight, reduced testing frequency, economic and easy handling and increased life. Computer modeling, fabrication of tools / jigs/ fixtures, establishing of welding process,

heat treatment, quality parameters, testing procedures etc are some of the activities to be undertaken. The prototype and the tooling are under fabrication. The project is expected to be completed in two years period since its approval in March 2003.

☞ The project of *M/s Mecpro Heavy Engineering Ltd., New Delhi* to “Design, development and demonstration of Technology for continuous Hydrogenation system in the Fatty Acids and Oleo Chemical Plant” has been supported by DSIR. The project aims at developing a new continuous hydrogenation process technology to improve upon the conventional process, its process efficiency, savings in energy and consumption of vehicle catalysts and reducing the wastes generating in the process besides improving product quality and productivity. It involves design developments of reactors, bubble cap column, plate and frame filter, vacuum system and its associated equipment and sub systems. The project was approved in March, 2004.

☞ The project of *P S G Industrial Institute, Coimbatore* on 'Development of Frequency Converter / Controller and High Frequency Submersible Motor Pump Sets For Irrigation' has been supported by DSIR. The motor for this pump has been specifically designed, fabricated and tested at full load. The pump and controller has been designed and developed. The trials and modifications are in progress. This project is likely to create a good demand in the agricultural sector.

☞ The Project of *Parag Fans and Cooling Systems Ltd., Dewas* on 'Development of Energy Efficient Fan System' has been supported by DSIR. The prototype fans of 1400 and 1600 mm sizes have been designed and fabricated using the FRP.

Both the fans have been tested on the conventional fan systems. The fabrication of 1400 mm fan system has been completed and tested in-house and at M/s Arvind Mills, Ahmedabad. The fabrication of 1600 mm fan is in progress.

☞ The project of *Priya Klay Pvt. Ltd., New Delhi* aims at developing a manufacturing system at par with international technologies for production of large diameters (600-1000 mm) and long stoneware / vitrified pipes of 1.5 to 2.5 meters. This involves design, prototype development and fabrication of pipe extruder, pipe trimming attachment, pipe handling units, pan mill and electric control panels. Specifications and engineering designs for extruder and the pan mill have been completed. The castings for shafts, gear box housing and other components have been fabricated. Sub-assembly design details for extruder and other equipments have been finalised.

METALLURGY

Projects under Progress

☞ The project of *Fluidtherm Technology Pvt. Ltd., Chennai* on 'Developing a Novel Heat Treatment Furnace' is for design and development of a versatile heat treatment/ carburising furnace which will combine the advantages of both batch sealed quench furnaces and continuous conveyor belt furnaces. The fabrication of the furnace has been completed and trials are expected shortly.

☞ The project of *National Aluminium Company Ltd., Bhubaneswar* on 'Recovery of Gallium from Sodium Aluminate Liquor' has been jointly supported by DSIR along DST, DRDO and NRDC. The project, based on the technology developed by

CECRI, Karaikudi, uses the mercury amalgamation route for recovering gallium. Designs of the plant have been completed and pollution clearance is awaited before starting civil works.

☞ The project of *Orient Software Pvt. Ltd., Bangalore* in collaboration with *Indian Institute of Science, Bangalore* on 'Development of system for aiding in the intelligent computer aided design for casting is to develop a unique software that would greatly facilitate the designers for designing components which are amenable for development using casting process.

☞ The project of *Sankar Sealing Systems (P) Ltd., Chennai* on 'Development and Indigenising of Asbestos Free Cylinder Head Gaskets for TATA Indica Diesel Cars' has utilised the technology, for manufacturing graphite sheets, developed by ARC-I, Hyderabad. For the project, the graphite sheets are being manufactured and supplied by ARC-I, Hyderabad, to Sankar Sealing Systems (P) Ltd., who in turn are developing the gaskets. The gaskets made from these sheets have passed most of the prescribed tests.

☞ The project of *Tamilnadu Zari Ltd., Kancheepuram* in association with NFTDC, Hyderabad on 'Establishment of a Technology Demonstration Facility for Super Fine Wire Drawing of Silver Alloy for ZARI Application' is to develop, for the first time in the world, drawing stands for 25 micron thick silver alloy wires for zari applications. The technology and the design of the stands has been provided by NFTDC. NFTDC has also fabricated the stand and has transferred the same to Tamilnadu Zari

for trials and for training of manpower.

MISCELLANEOUS

Projects Completed

☞ The project of *Central Building Research Institute, Roorkee* and *Central Power Research Institute, Bangalore* on 'Studies on Gainful Utilization of Marble Waste' had been supported by DSIR. The marble mining and cutting activity has been the main livelihood of southern Rajasthan. The marble miners and gang saw cutters have produced phenomenal quantity of marble dust as a waste material and the material has been posing a problem for the administration for its disposal. The Collectorate of Rajsamand, Rajasthan had approached Secretary, DSIR for an advise on the issue. Keeping the request in mind, the DSIR had funded the above studies to the laboratories indicated for gainful utilization of marble dust and for finding out the products like tiles, bricks, building blocks, distemper etc. which could be made out of the marble waste. The studies have been completed and the reports have been disseminated to the industry's association in Udaipur and the Rajasthan Government. Based on the studies, the Udaipur Chamber of Commerce & Industry have set up a demonstration centre at Udaipur in their own premises for demonstrating utilisation of marble waste.

☞ The project of *MATA Foundation, New Delhi* and *RRL Thiruvananthapuram* on 'Integrated Pilot Demonstration Plant for Spice Processing' had been supported by DSIR. The North-Eastern states are very rich in growth of spices, especially ginger. The ginger is grown in abundance in the North-Eastern states which does not have market due to transportation problems and poor connectivity of the region with the rest of the country. RRL, Thiruvananthapuram,

had developed a technology to extract ginger oil from raw ginger. MATA Foundation came forward with a joint project with RRL, Thiruvananthapuram for making ginger oil from the ginger grown in Manipur hills. The project has been completed and the ginger oil is being test-marketed by the MATA Foundation. The pilot plant could also be used for processing of other spices like turmeric, chilli, cinnamon and ilaichi etc.

Projects under Progress

☞ The project of *Bharat Heavy Electricals Ltd. (Ceramic Business Unit), Bangalore* and *National Chemical Laboratory, Pune* on 'Design and manufacture of prototype Ceramic Filtration Unit for production of safe domestic drinking water' has been supported by DSIR. The existing water filters available in market use various kinds of technologies like membrane filtration, UV technology etc. for purification of water. The proposal of using a ceramic water filter ensures removal of bacteria and viruses from the drinking water. NCL, Pune is to validate and test the membranes produced by BHEL. The final product will be fabricated by BHEL under NCL guidance. The work involving optimisation of the testing procedure and the process parameters for fabrication of support membrane has already been completed.

☞ The project of *Maharashtra State Seeds Corporation Ltd. (MSSCL), Akola* and *National Chemical Laboratory (NCL), Pune* on 'Development and Testing of Mini Dry HCL Gas Cotton Seed Delinting Plant' has been supported by DSIR. The existing processes for delinting cotton seeds both by HCL gas as well as concentrated sulfuric acid are polluting processes. To overcome the problem, MSSCL, Akola and NCL, Pune had jointly applied for the project based on the NCL process for producing HCL gas

pollution free. The fabrication of the plant is completed. The plant has already delinted cotton seeds for one season. The delinted seeds are under test marketing.

☞ The project of *MATA Foundation, New Delhi* and *CFTRI, Mysore* on 'Integrated pilot demonstration plant for fruit processing' has been supported by DSIR. North-Eastern states grow a variety of quality fruits namely oranges, pineapples, passion fruits etc. The fruits do not have adequate market because of poor connectivity and transportation problems. CFTRI, Mysore had an innovative technology of concentrating fruit juices by reverse osmosis process which has been scaled up in the project. The machinery has already been delivered on site and the erection and commissioning of the same is underway.

☞ The project of the *Rajasthan Government, Udaipur Chamber of Commerce & Industry, Udaipur* and *Central Road Research Institute, New Delhi* for construction of a 750 meter Demonstration Test Road Stretch using marble slurry dust (MSD) in Kotela Village of Rajsamand District under District Poverty Initiative Project (DPIP) has been supported by DSIR. The marble mining and cutting activity has been the main livelihood of southern Rajasthan. The marble miners and gangsaw cutters have produced phenomenal quantity of marble dust as a waste material posing a problem for the administration for its disposal. The Collectorate of Rajsamand, Rajasthan had approached Secretary, DSIR for an advice on the issue. Keeping the request in mind, the DSIR had earlier funded two studies for gainful utilisation of marble dust and also for finding out products like tiles, bricks, building blocks, distemper etc. which could be made out of the marble waste. During the discussion on the above studies, CRRRI and

UCCI gave a proposal along with the Rajasthan Government regarding utilisation of marble dust in road making. This is one of the way of bulk consumption of the marble dust without requiring it to be transported from the region. The basic road design protocol has been finalised by CRRI.

1.3 Customs Duty Exemption Certificate

In pursuance to Customs Notification No.50/96 Customs dated July 23, 1996 for Customs Duty Exemption on components, consumables, equipments etc. used in R&D projects supported by Government, 3 Customs Duty Exemption certificates for nearly Rs. 39 lakhs worth of components and consumables under one technology development projects supported under Technology Development and Demonstration Programme of DSIR have been issued.

2 TECHNOPRENEUR PROMOTION PROGRAMME (TePP)

“Technopreneur Promotion Programme (TePP)” is jointly operated by DSIR under its Technology Development and Innovation Program of TPDU and DST under its Home Grown Technology Programme (HGTP) of TIFAC, to tap the vast innovative potential of the citizens of India. Financial support is provided to individual innovators having original ideas to convert them into working models, prototypes etc. Five new projects were supported during the financial year 2003-04.

3 OTHERS

The DSIR participated in number of exhibitions to showcase the strengths and capabilities of

R&D projects supported under Technology Development and Innovation Programme.

- ☞ “Uttranchal International Trade Fair” at Dehradun from September 23-30, 2003.
- ☞ “Technology Innovation and IPR week” at Hyderabad from October 13-17, 2003.
- ☞ “Pride of India-Science Expo 2004” at Chandigarh from January 3-7, 2004.

The basic aim of these exhibitions was to diffuse and disseminate various information of DSIR activities among concerned scientific groups. A number of innovators supported under TePP Scheme also exhibited their achievements with the help of prototypes / models, charts, etc. during the exhibition held at Dehradun, Hyderabad and Chandigarh.

4 EXPECTED OUTPUTS AND BENEFITS

The completed technology development projects supported under PATSER Scheme have resulted in significant technological and commercial returns to the industries concerned such as cost reduction, higher quality, improved products and processes as well as foreign exchange savings, while building up the R&D capabilities of the industrial units. The on-going projects are expected to result in high commercial / societal impact and will lead to commercialisation and utilisation of ‘state of the art’ technologies. There have been useful interactions and linkages with other concerned Government departments, National Research Organisations and users during evaluation, approval and implementation of various projects supported under the scheme.