

IV. PUBLIC SECTOR ENTERPRISES

IV A. NATIONAL RESEARCH DEVELOPMENT CORPORATION

1. INTRODUCTION

The National Research Development Corporation (NRDC) is the principal organisation established by the Government to act as a link between scientific laboratories and industrial establishments for transferring technologies. It is a unique organisation in that it is the only public enterprise wholly dedicated to transfer of technologies from R&D laboratories to industry. What is more, its operations cover the entire spectrum of industrial technologies ranging from chemicals to metallurgy, mechanical engineering, electrical engineering, electronics, biotechnology and so on.

The year 2002-03 continued to be challenging for the Corporation. Nevertheless the overall performance of the Corporation has been satisfactory. The Corporation has earned lumpsum premia and royalties worth Rs. 308.89 lakhs from licensing and commercialisation of indigenous technologies as compared to earnings of worth Rs. 273.65 lakhs in the previous year. The gross profit of the Corporation was Rs. 12.62 lakhs as compared to Rs. 33.51 lakhs in the previous year.

2. PROFIT

Due to the sustained, hard and dedicated work of its executives and the staff, the Corporation continued to earn profits. However, introduction of the Voluntary Retirement Scheme for the employees of the Corporation on which an additional expenditure amounting to Rs.58.57 lakhs was incurred, has adversely affected the profitability of the Corporation. During the year the Corporation earned a gross profit of Rs. 12.62 lakhs against Rs. 33.51 lakhs in the previous year.

The gross income of the Corporation from all sources, including premia and royalties, but excluding Grants-in-Aid, was Rs.430.54 lakhs as compared to Rs. 407.58 in the previous year. The unsecured loan at the end of the year stood at Rs.75.22 lakhs as compared to Rs.93.55 lakhs at the end of 2001- 2002. The Department of Public Enterprises has given the 'VERY GOOD' rating to the Corporation for its MOU performance during the last year (2001-2002).

3. PROCESSES ASSIGNED AND LICENCE AGREEMENT CONCLUDED

To enlarge its pool of technologies, the Corporation continued its efforts to increase the inflow of the processes from various R&D laboratories and Universities. The Corporation entered into Memorandum of Understanding with several new organisations including AIIMS, New Delhi, NDRI, Karnal, CCSHAU, Hissar, NII, New Delhi, NBRI, Lucknow and SASMIRA, Mumbai for assignment of technologies developed by them.

As a result, 71 new processes were assigned to the Corporation for commercialisation as compared to 27 processes during the previous year. Some of the commercially important processes assigned to the Corporation during the year were:

- ☞ Herbal Beer & Herbal Lipstick
- ☞ Natural Dyes Textile Grade
- ☞ Nutan Kerosene Wick Stove

- ☞ Nutan Jyoti
- ☞ Nutan LPG Commercial Burner
- ☞ Nutan Deep Himveer Bukhari
- ☞ Long Shelf Life Paneer
- ☞ Malted Milk Food
- ☞ Mozzarella Cheese
- ☞ Enterotoxaemia Vaccine
- ☞ Sheep Pox Vaccine
- ☞ Technology for Inactivated Egg Drop Syndrome 76 Vaccine for layers
- ☞ Cold Process Technology for preparation of Urea Molasses Mineral Block (UMMB)
- ☞ Cocoon Deflossing machine
- ☞ Leaf Chopping Machine
- ☞ A process for In-vitro Enzyme Immunoassay for Qualitative Antibodies to HIV& HIV 2 in Human Serum or Plasma
- ☞ A newly formulated Herbal Ophthalmic Formulation for the Prevention of Cataract
- ☞ A novel 13 bp DNA marker specific for caprine genome
- ☞ Diagnosis of Streptococi-A strain
- ☞ Typhoid Detection Kit
- ☞ Production technology for high quality hybrid maize seed
- ☞ Natural dyes for wool and cotton
- ☞ Schizont cell culture vaccine against bovine tropical theileriosis
- ☞ An improved method for making Bacterins for parental use
- ☞ Production of fibres from PET Bottle Waste

for manufacture of nonwoven products

- ☞ A Process for the manufacture of bitter less Kinoo Juice

4. MAJOR TECHNOLOGIES LICENSED

The Corporation signed 29 licence agreements during the year as compared to 30 agreements signed in the previous year. Some of the major technologies licensed by the Corporation during the year were:

- ☞ Nutan Himveer Bukhari
- ☞ Instant Gel
- ☞ Cocolawn- a Readymade Lawn
- ☞ Resham Keet Oushadh
- ☞ Platinised Titanium Anodes
- ☞ Resorcinol
- ☞ Drivers' Reflexes Testing System

5. TECHNOLOGY DEVELOPMENT PROJECTS

The Corporation has been promoting and financing in collaboration with industry/R&D institutes, technology development projects for setting up pilot/semi commercial/demonstration plants. The Progress on the major technology development projects is given below

5.1 On-Going Projects

Thrombinase – a blood clot dissolving agent

Thrombinase, a novel blood clot dissolving agent has been isolated, identified and purified for the first time from a Bacillus species at the Vector Control Research Centre, Pondicherry. The Corporation in collaboration with Malladi Research Centre, Chennai have jointly carried out further development of Thrombinase at a cost of Rs.80 lakhs. The Corporation has paid a sum of Rs.18.94 lakhs each towards its share of grant and loan. The Corporation has also filed

patent applications for the process in India, USA, EPO (Germany, Switzerland, Liechtenstein, Belgium and UK). And patents in USA (US 5434059) & EPO (EP 0624642) have already been granted. The patent granted by European Patent Office has been assigned and registered in the name of the Corporation. The project has been successfully completed and the process know-how was licenced to M/s Malladi Pharmaceutical Drugs, Chennai on payment of Lumpsum Premium of Rs.60.00 lakhs and Recurring Royalty of 5% for 18 years.

Lithium-Lithium Ion Battery Project

The manufacture of Polymer Lithium Battery is a multi-agency-funded developmental project of M/s Twenty First Century Battery Limited, Chandigarh costing around Rs.27 crores based on the patented know-how of M/s. Telcordia Technology Inc., a subsidiary of Bellcore Laboratories, USA. The Polymer Lithium Batteries have many applications particularly in Cellphones, electric automobiles, photo voltaics, etc. Keeping in view the commercial potential of this battery technology, the Corporation has invested Rs.50 lakhs as equity in M/s. Twenty First Century Battery Limited, Chandigarh. The project has already been completed and the product under the brand name Xtra mile Plastic Lithium Ion has been formally launched in the market. The market response is positive and production ramp-up is being accelerated to keep pace with the changing market demands. However, there has been a cost overrun for which the Corporation has provided additional equity of Rs. 10 lakhs during the year 2003-04.

Setting up of a Technology Information Related Portal – Techknowhub.com

Internet, being a powerful medium for conducting business, is fast catching up the imagination of business community in India resulting in the mammoth development of dot coms. However, Internet lacks contents on technologies of Indian interest and relevance.

The Corporation being a premier Institute involved in technology transfer desires to move in and fill the gap by setting up a technology information related portal which shall provide complete information related to the technology development required by the small & medium entrepreneurs. This shall be the first international portal of its kind covering the following aspects of information needs of the industry, R&D Institutes, Universities, Researchers, and Industries.

- ☞ Indigenous & foreign technology
- ☞ Patent Data Base
- ☞ Certification/testing Organisations
- ☞ R&D Awards Information
- ☞ Quality Control
- ☞ Technology Funding Agencies
- ☞ Technical barriers to Trade
- ☞ R & D Institute/University
- ☞ Individual Experts
- ☞ Short term Training Programmes leading to technology transfer

The Corporation is setting up this Portal in joint collaboration with M/s Team Cube e-Services Pvt. Ltd., New Delhi. The Portal including NRDC intranet has been created with several databases and has been launched in-house for testing/ workability etc. modifications/ rectifications, based on the views of the users are in progress.

5.2 New Projects

Preparation of Status Report on Sports Technology in India

The performance of Indian Sports persons in the International area is a cause of great concern. The Corporation therefore, proposes to initiate

an action during 2003-2004 for formation of a Sports Technology Development Mission Programme (STDMP) in association with the Sports Authority of India (SAI) which is already engaged in promoting the activity of spotting and nurturing talented sports persons striving for excellence.

The objective of this programme is to bridge the technological gap by initiating R&D programmes in the country, and to indigenously develop modern equipment, accessories etc. required for practice and enhancement of performance of sports persons at an affordable price so that the required facilities could be made available around the country. In addition, by developing such technologies, a lot of foreign exchange could be saved and earned from export of such sports related products to other countries. Broadly the programme will cover the following areas:

- ☞ Identification of technological gaps in sports related Areas.
- ☞ Development and implementation of appropriate technologies for sports goods used in various sports.
- ☞ Development of new technologies for sports accessory materials
- ☞ Development of New Management techniques for enhancing sports persons performance.
- ☞ Upgrading and Development of new coaching methods.
- ☞ Diet control methods, health products & devices for performance enhancement of sports persons.
- ☞ Development of latest diagnostic devices and testing methods for testing drug abuse by sports persons.
- ☞ Identification of banned drugs and international methods of testing such drugs.

- ☞ Sports medicines such as rescheduling of menstruation cycles of sports women.
- ☞ Development of devices for physical fitness.

Technology Trade Facilitation Centre (TTFC)

The Corporation under the support from the Department of Scientific & Industrial Research, the Administrative Ministry of the Corporation has set up TTFC at the Corporation's registered office, during the financial year 2003-2004, to facilitate the exports of technology intensive products, services and projects. Under the scheme, the Corporation has provided exhibition space initially to 10 companies to show case their strength with the following broad objectives:

- ☞ Display of documentation on products, technologies, projects & services as provided by the companies.
- ☞ Arrange visits of foreign delegations, business associations to the centre.
- ☞ To provide assistance for patent filing, patent search on nominal cost basis.
- ☞ Follow up, feedback of enquires

Intellectual Property Rights Consultancy Services

In order to provide an effective tool for training on IPR for the benefit of industry ,R&D institutes, Government Departments, Educational Institutes, Patent Attorneys/Judiciary, Individuals etc., the Corporation has already marketed 275 Numbers of Interactive Multimedia IPR Training Package on CD. For the benefit of masses, the Corporation has also initiated action for IPR CD in Hindi.

The Corporation efforts to collaborate with Patent office Branch, New Delhi, under Department of Industrial Policy and Promotion,, Ministry of Commerce & Industry, for organising a Seminar to commemorate the

World Intellectual Property Day resulted in the organisation of the Seminar titled "Protection, Valuation & Commercialisation of Inventions" on 28th April, 2003. More than 250 participants from industry, R&D institutes, Government Departments, Educational Institutes, Patent Attorneys/Judiciary, Individuals etc., actively participated in the deliberations of the Seminar inaugurated by Shri Bachi Singh Rawat, Hon'ble Minister of State for Science & Technology.

The Corporation is guiding and assisting the industry and entrepreneurs to secure the Indian and foreign market by providing financial, technical and legal assistance for patenting not only the processes or manufacturing technologies but also the product itself under its National and Foreign Patent Protection Scheme (augmented by online International Patent Search facility). During the year 2002-03, the Corporation filed 51 no. of patent applications in India and one patent application abroad.

The Corporation continued to provide On-Line International Search Facility for Patents to its licencees, Universities, R&D Institutes and industry.

6. PROJECTS SUPPORTED BY DEPARTMENT OF SCIENTIFIC & INDUSTRIAL RESEARCH

DSIR has been supporting technology development projects under its "Programme Aimed at Technological Self Reliance (PATSER)" involving industry, research institutes and consultants. The Corporation has been identified as the agency to manage all matters connected with the intellectual property rights generated in these projects, as also to collect the royalty revenues accruing from the utilisation of the technology by the collaborating Company and also from third party licensing.

During the year 2002-2003, the Corporation has earned Lumpsum Premia and royalties worth

Rs. 102.60 lakhs from PATSER Projects.

In addition, under PATSER, the following major projects were undertaken during the yearR:

- ☞ Integrated Pilot Plant for spice processing unit
- ☞ Development of Novel Resins for use in Solid Phase Organic Synthesis and Combinatorial Chemistry
- ☞ Liposomal Amphotericin B
- ☞ Development of Process for manufacture of 1-Bromo-3-Chloropropane (B.C.P.) & 1-3-Dibromo Propane (D.B.P.) in Pilot Plant
- ☞ Detonating Cord for Shaped Charges
- ☞ Improved Industrial Natural Gas Burners
- ☞ Development of Technology on Slow and Controlled Release Fertilizer for application to Sugarcane, Banana, Paddy crops and Coconut seeding at pilot plant
- ☞ Controlled Release formulation of Nimesulide

7. MARKET SURVEYS

Market surveys are of considerable significance to the process of technology transfer. It makes the technology package more attractive to entrepreneurs. During the year, market survey reports were made through professional market survey agencies on the following technologies:

- ☞ Corrosion Resistant Coating
- ☞ Shellac based Can coating Lacquers for the packaging industry
- ☞ Aleuritic acid from Lac & preparation of isoambrettolide from Aleuritic Acid
- ☞ Rough Top Conveyor Belting
- ☞ Herbal Beer

- ☞ Herbal Lipstick
- ☞ Anti Corrosive Coating
- ☞ Animal Health Care
- ☞ Small Scale Biotech & Bioinformatic Companies
- ☞ Pet Recycle
- ☞ Cocolawn

8. INVENTION PROMOTION PROGRAMME

To promote and encourage the spirit of inventiveness amongst scientists, workers, students and inventors, the Corporation continued its programme of Awarding Prizes for the development of novel processes/products/inventions. The Corporation has also increased the maximum cash award amount from Rs. 1,00,000/- to Rs. 2,00,000/-. During the year 2002-03, the Corporation received 43 proposals for Prize Award. The Corporation announced cash awards amounting to Rs.2.55 lakhs (Rupees two lakhs fifty five thousand only) for the following inventions on the occasion of Technology Day i.e. 11th May 2002:

- ☞ SMA (Shape Memory Alloy) Actuated Stepper Drive Mechanism
- ☞ COCOLAWN – A Ready Made Lawn
- ☞ An Apparatus for Plant Tissue Culture
- ☞ Automatic Insect Removal Bins for Safe Storage of Grains and Seeds
- ☞ A Device for Production of Soft Coke and Process thereof
- ☞ Rock Bee Clip
- ☞ Micro Microscope

The Corporation also announced one WIPO Gold Medal, for the best invention to Dr. R.C. Naik and Dr. K.S. Ajayakumar of M/s. United

Phosphorous Ltd., Valsad (Gujarat) for their invention “Chemical Detectors for toxic Gases-Detector Strips, Short term Detector Tubes & Dosimeter Tubes” for the year 2002 sponsored by the World Intellectual Property Organisation (WIPO) a specialised agency of the United Nations.

9. DEVELOPMENT & PROMOTION OF RURAL TECHNOLOGY

The Corporation continued to pursue the programme of Development and Promotion of Technologies appropriate for rural areas. The programme is aimed at bringing the key elements of the innovation chain e.g. development on a carefully selected basis, of new and innovative technologies for use in rural areas, demonstrating them under actual field conditions and interest stimulation through publications and mass media etc during the year.

During the year 2002-03, the Corporation also submitted a proposal to the Ministry of Rural Development for funding the project of setting up National Rural & Household Technology Demonstration-cum-Training Centre at Delhi and for purchase of Scientists/ Technology Caravan for use in rural areas.

10. TECHNOLOGY AND PROJECT EXPORT

Our technologies are appropriate to the needs of many other developing countries. The Corporation, therefore, considers it an important part of its charter to seek out and seize opportunities in those countries for technology and project exports. The worldwide economic recession has affected the Corporation's efforts for export of technologies.

However, the Corporation could evince interest in its technologies in several African nations. During the year several delegations from other developing countries were received by the

Corporation. The corporation rendered its services to M/s Ethiopian Maize Agro Industrial Share Company (EMAISC), Addis Ababa for supply of Pharmaceutical books at a value of US \$ 3915.

10.1 Foreign Exchange Earnings

The foreign exchange earnings of the Corporation amounted to Rs. 1.86 lakhs in 2002-2003 as compared to Rs. 13.32 lakhs during the previous year.

11. PUBLICATIONS

An important activity of the Corporation is to disseminate information on new processes to industry, entrepreneurs and the general public for the promotion and commercialisation of technologies. One of the means of doing so is through publications of various types. During the year, the Corporation continued to bring out its regular magazines and publications viz Awishkar – (Monthly in Hindi) & Invention Intelligence – (Bi-monthly in English)

12. EXHIBITIONS AND PUBLICITY

Participation in exhibitions, seminars, workshops, entrepreneurship development programmes etc. are of vital importance for the creation of awareness about the role of the Corporation in technology transfer. With this end in view, the Corporation participated in exhibitions, seminars and get-togethers in India, organised by various agencies as detailed below:

- ☞ Innovative India, New Delhi, (May 11, 2002)
- ☞ Driving Knowledge Partnership, New Delhi, (July 9-10, 2002)
- ☞ Envirotech 2002, New Delhi, (September 12-15, 2002)

- ☞ Made in India, Kabul, Afghanistan, (September 16-29, 2002)
- ☞ Global Food Tech, Mumbai, (October 10-13, 2002)
- ☞ China Hi-Tech Fair 2002, Shenzhen, China, (October 12-17, 2002)
- ☞ IITF 2002, New Delhi, (November 14-27, 2002)
- ☞ Bangalore Food Tech 2002, Bangalore, (December 1-5, 2002)
- ☞ Science Congress, Bangalore, (January 3-7, 2003)
- ☞ CDC Global Partner, New Delhi, (January 15-16, 2003)
- ☞ NEARID 2002, Guwahati, (January 18-21, 2003)
- ☞ Biotech India 2003, New Delhi, (February 5-8, 2003)
- ☞ Technovation 2003, New Delhi, (February 5-8, 2003)

13. HUMAN RESOURCE DEVELOPMENT

The thrust for better utilisation of Human Resources and improvement in work practice continued during the year. In the drive to improve work culture and productivity, employees were exposed to need based training and development programmes. During the year 46 executives and 9 staff of the Corporation were deputed to various training programmes.

14. TECHNOLOGY ABSORPTION, ADAPTATION AND INNOVATION

While a major objective of the corporation is the development and commercialisation of indigenous technology, the Corporation itself does not carry out any R&D. However, it promotes and finances R&D on a selective basis

in both laboratories and industry. The details of the major development projects financed by the corporation during the year are given in the section of this report entitled “Technology Development Projects”. Hence the requirement to furnish information in respect of Technology Absorption, Adaptation and Innovation under Rule 2(B) of Companies (Disclosure of Particulars in the Report of Board of Directors) Rules, 1988, is not applicable to the Corporation.

15. IMPLEMENTATION OF OFFICIAL LANGUAGE

The Corporation continued making efforts to implement the provisions of the Official Language Act and Rules framed there under to ensure the continued use of Rajbhasha in its day to day working. Significant progress has been made in the field of correspondence, noting and drafting in Hindi. The Annual Report of the Corporation is being published in diglot form in

both Hindi & English since 1986-87. The Corporation also publishes a popular Science & Technology monthly magazine in Hindi, entitled ‘Awishkar’. To promote Rajbhasha “The Comprehensive Glossary of Administrative Terms (Eng.-Hindi)” was distributed among the employees. English-Hindi Dictionaries were also distributed among the officers and staff in this regard. To popularise the use of Hindi, the Corporation celebrated the “Rajbhasha Pakhwara” from 14th – 29th September 2002. During the “Pakhwara”, different types of competitions like Hindi essay writing, Hindi drafting & noting, Hindi typing, Slogan writing and Hindi poetry were organized. Certificate, cash award and mementos were given to the winners. The Corporation has also participated in many Hindi competitions organized by other Undertakings. To enrich Hindi vocabulary of the employees of the Corporation as well as visitors, an English word with its Hindi meaning is written daily on a writing board as “Today’s word” at the reception of the Corporation.