

V. PUBLIC SECTOR ENTERPRISES

V A. NATIONAL RESEARCH DEVELOPMENT CORPORATION

1. INTRODUCTION

The National Research Development Corporation (NRDC) is a premier organisation, under the Ministry of Science & Technology, engaged in the development, promotion and commercialisation of the R&D results/ technologies emanating from Research Institutes/ Universities/ Industries, etc. The Corporation provides comprehensive technology transfer services and acts as a catalyst for transforming innovative research into marketable industrial products. NRDC is a unique organisation in that, it is the only public enterprise wholly dedicated to transfer of technologies from R&D laboratories to industry. During the past five decades of its existence, the Corporation has developed strong links and network with various R&D organisations in the country as well as abroad for transfer of technologies. Its operations cover the entire spectrum of industrial technologies ranging from chemicals to metallurgy, mechanical engineering, electrical engineering, electronics, biotechnology and so on.

The Corporation continued to maintain its good overall performance in all areas of its operations during the year 2003-2004. During the year, the Corporation's income from its principal source of revenue i.e. Lumpsum Premia and Royalty on the licensing of technologies to industry was Rs 339.94 lakhs, as compared to Rs. 308.89 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. During the year the Corporation earned a gross profit of Rs. 19.35 lakhs against Rs. 12.62 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.439.93 lakhs as compared to Rs. 430.54 lakhs in the previous year. The unsecured loan at the end of the year stood at Rs.58.19 lakhs as compared to Rs.75.22 lakhs at the end of the previous year. However, the Government Loan has been fully repaid during the year 2004-05.

3. PROCESSES ASSIGNED AND LICENCE AGREEMENTS CONCLUDED

The Corporation with its objective of building up of a large depository of technologies, 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 the following organisations for assignment of technologies developed by them:-

- Central Salt & Marine Chemicals Research Institute, Bhavnagar
- National Metallurgical Laboratory, Jamshedpur
- All India Council of Technical Education (AICTE), New Delhi
- Madhu Silica Pvt. Ltd., Bhavnagar
- CSK Himachal Pradesh Krishi Vishva Vidyalaya, Palampur
- IIT, Kharagpur and
- TARSONS Ltd., Kolkata

As a result, 45 new processes were assigned to the Corporation for commercialisation. Some of the commercially important processes assigned to the Corporation during the year are:

- Design for Domestic RO and ED units, solar operated RO unit, medium size RO unit and animal powered RO unit.

- Device for remote sensing of brine density in salt works
- Brine purification resins
- Bacteriological agar
- Integrated process for manufacture of industrial grade-I salt, potash, bromine and magnesia.
- Integrated process for manufacture of liquid fertilizer and phycocolloid from seaweed.
- Improvement in or relating to the manufacture of heat, light and storage stable azadirachtin based products with insect control properties
- Development of heat, light and storage stable reduced azadirachtins and products based on them with pest control properties
- Field spot test to detect Urea in Synthetic Milk
- Rapid Field Diagnostic test for Haemorrhagic Septicaemia (HS)
- Abrasive Silica & Highly Abrasive Silica
- Precipitated Silica (Thickening grade)
- Silica Agglomerates
- Chalk Agglomerates
- Flame Gun Technology
- Emulsifiable Concentrate and Powder from Citrus Wastes
- Plant Tissue Culture Apparatus (PTCA)
- Development of Mosquito Larvicide based on Rabdosia species and its constituents.

4. MAJOR TECHNOLOGIES LICENSED

The Corporation signed 26 licence agreements during the year, as compared to 29 agreements signed in the previous year. Some of the major technologies licensed by the Corporation during the year were for:

- Improved Handloom
- Fibre Reinforced concrete manhole covers for heavy duty
- Herbal Beer from Plant Resources

- Synergist for Pyrethrum
- Herbal Lipstick
- Resham Keet Oushad
- Phyto Exdysone (Sampoorna)
- Nutan Deep Kerosene Wick Lamp-II
- Silver Impregnated Contacts
- Material Transfer and Evaluation Agreement for Development of Mosquito Larvicide based on Rabdosia species and its constituents.
- A newly formulated Herbal ophthalmic formulation for the prevention of cataract.
- Retractable anchoring and locking device

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 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 Ltd., 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. 60 lakhs as equity in M/s. Twenty First Century Battery Ltd., Chandigarh. The project has already been completed and the product under the brand name Xtra mile Plastic Lithium Ion battery has been launched in the market on a trial basis.

5.2 Setting up of a Technology Information Related Portal

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 is in the process of setting up of the technology information related Portal (Techknowhub.com) in joint collaboration with M/s Team Cube e-Services Pvt. Ltd., New Delhi. The Portal will provide complete information related to the technology development operates required by small & medium entrepreneurs, industry, R&D Institutes, Universities, Researchers, etc. The portal will cover mainly :

- Lab & Commercial scale technologies
- Patent attorneys, Patent Database
- Plant and Machinery
- R&D Institutes/ University and Testing Organisations
- R&D Awards Information.
- Individual Experts
- Short term Training Programmes leading to technology transfer.
- Indigenous & foreign technology Certification/ testing Organisations
- Quality Control
- Technology Funding Agencies
- Technical barriers to Trade

The Corporation procured the necessary hardware, server for working on the portal. The Corporation has developed the database for technologies, R&D Institutes etc. Beta version of the portal has been demonstrated and amendments are underway.

5.3 Development of database of technologies developed by R&D organizations

The National Science & Technology Management Information Systems (NSTMIS), under the Department of Science & Technology (DST), intends to study and develop the database on various technologies developed by the Research Institutes. DST has approved the proposal of NRDC with project cost of approximately Rs.20 lakhs to be shared equally by DST and the Corporation. The database would have the following objectives:

- To disseminate information of technologies developed from a single source
- To bring the information of various technologies to the large number of small & medium scale entrepreneurs/ industry who have limited resources.
- To avoid repetition of research work.

At present information on technologies is not available from a consolidated single source. This technology database would help both the technology generators as well as technology seekers for accessing the information. Moreover, it is very essential for the Indian SMEs to utilise the latest technologies available in their areas of operation to compete globally in the new WTO regime.

6. TECHNOLOGY TRADE FACILITATION CENTRE (TTFC)

The Corporation under the support from DSIR, 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 with the following broad objectives:

- To display documentation on products, technologies, projects & services provided by the companies.
- To attract visits of foreign delegations, business associations to the centre.
- To provide assistance for patent search, patent filing on nominal cost basis.
- To generate business opportunities from the enquires.

7. 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 around 307 No. of Interactive Multimedia IPR Training Package on CD. During the year 2004-05 the Corporation has updated/ amended the CD to be in line with the latest amendments in the Patents Act. Considering the good response from the various organisations, the Corporation is in the process of translating the package into Hindi to reach the grass root innovators or inventors for the benefit of masses. The CD is expected to be released shortly.

The Corporation continued to provide On-line International Search Facility for Patents to its licencees, Universities, R&D Institutes and industry. The Corporation is also guiding and assisting the industry and entrepreneurs to secure Indian & foreign markets 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 2003-04, the Corporation filed

61 nos. of patent applications in India and one patent application abroad.

8. PROJECTS SUPPORTED BY DSIR

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 from third party licensing.

The following major projects were undertaken during the year under PATSER :

- M/s Coral Telecom Ltd., Solan (H.P.)
- M/s MIC Electronics Ltd., Hyderabad
- M/s Klash Technologies
- M/s TTK Health Care Ltd., Chennai
- M/s Pan India Electromech Pvt. Ltd., New Delhi
- M/s Haryana Leather Chemicals Ltd., Faridabad
- M/s NED Energy Ltd., Hyderabad
- M/s Aishwarya Telecom Pvt. Ltd., Hyderabad
- M/s Karnataka Hybrid Micro Devices Ltd., Bangalore

9. 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 on the following items were conducted through professional market survey agencies for the following technologies:

- Milk based products consisting of Long life Paneer, Malted milk food, Lassi, Infant Formulation, Low fat spread, Mozzarella Cheese, Ultra filtered Shrikhand, Acido Whey
- Milk based Dry Mixes consisting of Khoa powder, Gulab Jamun mix powder, Rasogolla mix powder, Instant Kheer mix, Instant Kulfi Mix.

10. 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. During the year 2003-2004, the Corporation announced cash awards amounting to Rs.5.10 lakhs (Rupees five lakhs ten thousand only) for the following inventions on the occasion of Technology Day i.e. 11th May 2003 :

- Fresh Flavour Ginger Oil
- Multi Purpose Food Processor
- Maleic Anhydride Grafted Polymers
- Development of M Type Dispenser
- Opto-Electronic Apparatus for Static & Dynamic Measurements
- Tractor Mounted Multipurpose Deep Trencher
- A Remarkable Technology from Old Used Automotive Tyres
- A Device for Recovery of Finest Cleans from Accumulated Slurry

The Corporation also announced two WIPO Gold Medals, one for best invention to Shri C.P. Sadashivaiah of M/s Shiva Industries, Tumkur (Karnataka) for his invention Tractor Mounted Multipurpose Deep Trencher and the other for best woman inventor to Ms. Rama Anand of M/s R.A. Innovations, New Delhi for her invention Manufacturing Furniture

from Old used Automotive Tyres for the year 2003 sponsored by the World Intellectual Property Organisation (WIPO) a specialised agency of the United Nations.

11. PROMOTION OF RURAL AND HOUSEHOLD TECHNOLOGY

The Corporation continued to pursue the programme of Development and Promotion of Rural & Household 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.

The methodology adopted by the Corporation is to demonstrate the utility of the rural technologies and ensure their faster dissemination through the network of RTDT Centres set up in association with NGO's in various parts of the country. The Corporation has so far set up 57 RTDT Centres in different parts of the country. During the year the Corporation has reviewed the performance/working of the existing RTDT Centers set up by the Corporation, through an independent agency and strengthened two RTDT Centers by providing them Sutli Making Machine and Leaf Cup Making Machine.

12. 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 and the Corporation signed the following major agreements for services/technology transfer :

- M/s Livie Biopesticides Ltd. U.K. for the technology Synergist for Pyrethrum developed by IARI, New Delhi at a premia of US\$ 15,000.
- Material Transfer and License Agreement with M/s Livie Biopesticides Ltd., UK for the technology Mosquito Larvicide from Rabdosia and its species developed by IARI, New Delhi at US\$ 5000.
- M/s. Fawes Pharmaceuticals Pvt. Ltd. Ethiopia for Consultancy for Liquid Oral Formulations at a total fee of US\$ 10,000 and received US\$ 2000 and remaining amount received during the financial year 2004-05.

12.1 FOREIGN EXCHANGE EARNINGS

The foreign exchange earnings of the Corporation amounted to Rs. 10.10 lakhs in 2003-2004 as compared to Rs. 1.87 lakhs during the previous year.

13. 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). The

Corporation has also brought out the following publications:

- Catalogue of Technological Opportunities from India through NRDC (English)
- Catalogue of Technological Opportunities from India through NRDC (French)
- Taking Ayurveda and Unani from Laboratory to Industry

14. 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, (11th May, 2003)
- Symposium de development du Bendje, (26-30th May, 2003)
- Infra Medica 2003, (28-30th August, 2003)
- Uttaranchal International Trade Fair, Dehradun, (23-30th September, 2003)
- A Century of Innovation & the Future of Aviation, New Delhi, 11th October, 2003
- Food & Hospitality Fair, Mumbai, (16-18th October, 2003)
- Made in India Show, China, (16-19th October, 2003)
- India International Trade Fair, New Delhi, (14-29th November, 2003)
- Infracom, New Delhi, December, 2003
- Science Congress, Punjab University, Chandigarh, (3-7th January, 2004)
- National Consultancy Congress, New Delhi, (15-16th January, 2004)
- Palwal Expo, Palwal, (6-8th January, 2004)
- India Build, New Delhi, (19-21st February, 2004)

- Jaipur International Trade Fair, Jaipur, (21-28th February, 2004)
- Workshop cum Exhibition on IPR & NRDC Technologies, Bhopal, (12-13th February, 2004)

15. HUMAN RESOURCE DEVELOPMENT

Training and development of all levels of employees was given due priority by the Corporation to increase effectiveness. Special emphasis was given to organisation building and shaping right attitudes, team building and work culture besides preparing employees to understand the trends in fast changing technology/switching over to latest technology for achieving higher results in productivity and profitability. During the year 28 executives and 8 staff of the Corporation were deputed to various training programmes to further develop their skills in various areas of management, communication, vigilance and advancement of technology.

The thrust for better utilisation of Human Resources and improvement in work practice continued during the year.

16. 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.

17. IMPLEMENTATION OF OFFICIAL LANGUAGE

The Corporation continued to make intensive efforts to fulfil the targets prescribed by Govt. of India in the Official Language Act and Rules framed therein with regard to increase the use of Hindi Rajbhasha in office during the year 2003-04. Employees were motivated to use their working knowledge of Hindi in day to day official work. 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 14 - 29 September 2003. During the "Pakhwara" different types of competitions like Hindi essay writing, Hindi drafting & noting, Hindi typing and Hindi poetry were organized. Certificate, cash award and mementoes were given to the winners. 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.