

II A. INDUSTRIAL R&D PROMOTION PROGRAMME

1. OBJECTIVES

The activity pertaining to Industrial R&D Promotion programme is an important component scheme of plan scheme "Technology Promotion, Development and Utilisation (TPDU)".

The objectives are to:

- ☞ bring in-house R&D into sharper focus;
- ☞ strengthen R&D infrastructure in industry and Scientific and Industrial Research Organisations (SIROs);
- ☞ promote R&D initiatives of the industry and SIROs;
- ☞ ensure that the contributions made by the in-house R&D centres and SIROs dovetail adequately in the overall context of technological and industrial development.

2. AREAS OF COVERAGE

The specific areas covered under the component scheme Research & Development by Industry are :

- ☞ In-house R&D in Industry
 - ☞ Scientific and Industrial Research Organisations (SIROs)
 - ☞ Fiscal Incentives for Scientific Research
- Activities and achievements in each of above areas are presented below:

3. IN-HOUSE R&D IN INDUSTRY

3.1 Recognition of In-house R&D Units

A strong S&T infrastructure has been created in

the country. This covers a chain of national laboratories, specialised R&D centres, various academic institutions and training centres, which continuously provide expertise, technically trained manpower and technological support to the industry. Various policy measures have been introduced from time to time, to meet the changing industrial and technological requirements of the industry. The Government has been giving special attention to promotion and support to industrial research in industry. Several tax incentives have also been provided which encourage and make it financially attractive for industrial units to establish their own in-house R&D units.

A scheme for granting recognition to in-house R&D units in industry is operated by the Department of Scientific & Industrial Research. The incentives and support measures presently available to in-house R&D units include:

- ☞ Income-tax relief on R&D expenditure as per Income-tax Act;
- ☞ Weighted tax deduction for sponsored research programs in approved national laboratories, universities and IITs;
- ☞ Weighted tax deduction u/s 35(2AB) of IT Act, 1961 on in-house R&D expenditure in chemicals, drugs, pharmaceutical (including clinical drug trials), bio-technology, electronic equipment, computers, telecommunication equipment and manufacture of aircrafts and helicopters;
- ☞ Accelerated depreciation allowance under Rule 5(2) of IT Rules, on new plant and machinery set up based on technology obtained from any institution recognised by,

DSIR;

- ☞ Customs duty exemption on goods imported by recognised in-house R&D units for use in Government funded R&D projects, under notification 50/96 - Customs;
- ☞ Customs duty exemption on specified goods (comprising of analytical and specialty equipment) imported by recognised in-house R&D units, for use in pharmaceutical and biotechnology sector under notification no. 26/2003 – Customs dated 1st March 2003;
- ☞ Excise duty waiver for 3 years on goods designed and developed by a wholly Indian owned company and duly patented in any two countries from amongst India, USA, Japan and any country of the European Union;
- ☞ 10 years tax holiday to commercial R&D companies approved by the Prescribed Authority u/s 80-IB(8A);
- ☞ Financial support for R&D projects;
- ☞ National Awards for outstanding in-house R&D achievements and commercialisation of results of public funded R&D, besides other indirect benefits.

The in-house R&D units qualifying for recognition are expected to be engaged in research and development activities related to the line of business of the firm, such as, development of new technologies, design and engineering, process / product / design improvements, developing new methods of analysis and testing; research for increased efficiency in use of resources, such as, capital equipment, materials and energy; pollution control, effluent treatment and recycling of waste products.

The R&D activities are expected to be separate from routine activities of the firm, such as, production and quality control. The in-house R&D units should have staff exclusively

engaged in R&D and headed by a full-time R&D manager who would have direct access to the chief executive or to the board of directors depending upon the size of the unit.

Number of in-house R&D units recognised by DSIR increased steadily from about 100 in 1973 to about 275 by 1975, to over 700 by 1980, around 925 by 1985, over 1100 in 1990 over 1200 in 1995 and thereafter is hovering around 1200; and was 1180 in December 2003. Of these, nearly 1100 are in the private sector and the remaining units are in public/joint sector. A revised and updated 'Directory of Recognised in-house R&D Units' was brought out during October 2003. This Directory lists 1159 recognised in-house R&D units, giving registration number, name and mailing address of the company, location of the in-house R&D unit(s) and validity of DSIR recognition. The data on these R&D units has been computerised and updated.

For the purpose of recognition, the R&D units have to apply to DSIR as per a prescribed proforma. The proforma and other details about the scheme are provided to the interested companies on request. The proforma and details of the scheme are also available at DSIR website (<http://www.dsir.nic.in>). The applications, after initial scrutiny in the DSIR, are circulated for comments to various other departments/agencies including concerned administrative ministries,. The units seeking recognition are also visited, if need be, by expert teams comprising of representatives of DSIR, as well as outside agencies, including administrative ministries and local educational and Research Institutions before they are taken up for consideration. In order to obtain first hand information on R&D activities of the applicant firms, discussion with the chiefs of the R&D units and executives of the firm are also held in DSIR in many cases. During the discussion outside experts are invited and their comments are sought. The applications along

with comments from outside agencies, visit reports, and the Department's own evaluation are considered by an Inter-Departmental Screening Committee constituted by Secretary, DSIR. The Committee meets every month to consider the applications and makes recommendations to the Secretary, DSIR based on its evaluation of R&D infrastructure and R&D activities of the applicant firms.

During the year 2003, the Screening Committee met 12 times and considered 115 applications for recognition; 83 R&D units were granted fresh recognition and 32 applications were rejected.

The pendency at the end of December 2003 was 28. A statement giving month-wise receipt, disposal and pendency of applications for recognition of in-house R&D units is given at *Annexure 1*.

During the year 2003, over 350 discussions / meetings were held with heads of in-house R&D units. Also, a number of in-house R&D units, were visited by expert teams

3.2 Renewal of Recognition

Recognition to R&D units is granted for a period ranging from 1 to 3 years. The R&D units are advised to apply for renewal of recognition well in advance (3 months prior to the date of expiry of the recognition). Applications received for renewal of recognition are circulated to CSIR, NRDC and/or the concerned administrative department of Government of India for comments. The applications are examined in DSIR taking into account the inputs received from other agencies for taking suitable decision on their renewal. During the year 2003, 521 in-house R&D units were due for renewal of recognition beyond 31 March 2003; of which 451 applications were received. Based on the evaluation of the performance of the R&D units, renewal of recognition was granted to 444 R&D units. Recognition granted to 6 companies could not

be renewed because their R&D performance was not up to the mark and one application is pending for want of additional information. A statement showing month-wise receipt, disposal and pendency of the cases of renewal of recognition of the R&D units is given at *Annexure 2*.

3.3 Zonal Distribution of In-house R&D Units

The in-house R&D units are distributed throughout the country. There are around 185 units in the Northern Zone (Delhi, Haryana, Punjab, Uttar Pradesh, Jammu & Kashmir), around 105 units in Western Zone (Rajasthan and Gujarat), around 450 units in the Central Zone (Maharashtra, Madhya Pradesh and Orissa), around 350 units in the Southern Zone (Andhra Pradesh, Karnataka, Kerala and Tamil Nadu) and around 90 units in the Eastern Zone covering Bihar, West Bengal, Assam and other north eastern states.

3.4 R&D Expenditure

The expenditure incurred by in-house R&D units in industry has steadily increased. During 1980-81 it was of the order of Rs. 300 crores. In 1985-86, it was of the order of Rs. 500 crores. It is estimated that the present R&D expenditure of the 1180 recognised R&D units is of the order of Rs. 3200 crores. The share of public and joint sector is about 20% and that of private sectors about 80%. 117 in-house R&D units spend over Rs. 5 crore each on R&D, 217 in-house R&D units spent between Rs. 1 crore to Rs. 5 crore each per annum on R&D. The list of these R&D units is given in *Annexure 3* and *Annexure 4* respectively.

3.5 R&D Infrastructure

The in-house R&D centres have created impressive infrastructural facilities for R&D including sophisticated testing facilities, laboratory equipment and pilot plant facilities. Analytical facilities such as HPLCs, IR

spectrophotometers, UV-Vis spectrophotometers, NMR spectrometers, electron microscope, particle size analyzer, high temperature test and evaluation facilities, CAD-CAM facilities, rapid prototype building machines, greenhouse and tissue culture laboratory facilities are available with many in-house R&D units.

3.6 R&D Manpower

There has been a steady increase in R&D manpower employed by the in-house R&D units. By 1975-76, about 12,000 R&D personnel were employed by recognised in-house units, and by 1981-82, the figure was over 30,000. The present estimated manpower for the 1180 in-house R&D units is around 50,000, out of which around 17,500 R&D personnel are employed in public sector in-house R&D units and around 32,500 R&D personnel are employed in the private sector in-house R&D units. Of the total 50,000 R&D personnel, around 2700 are PhD's, 16,500 Post Graduates, 14,000 graduates and the rest are technicians and support staff.

3.7 Sectorwise Break-Up of In-house R&D Units

A broad sector-wise break-up of the recognised in-house R&D units is as below:

| | |
|---|-----|
| Chemical and Allied industries | 485 |
| Electrical and Electronic industries | 280 |
| Mechanical Engineering industries | 180 |
| Processing industries (Metallurgical, Refractories, Paper, Cement, Ceramics, Leather & others) | 150 |
| Agro and Food processing industries and others | 85 |

3.8 Achievements of In-house R&D Units

Some of the R&D achievements reported by the recognised in-house R&D units are listed below:

Chemical and Allied Industries

- ☞ Development of production processes for Bis- (2,2,6,6-tetramethyl-4 piperidinyl) sebacate (hilite-77), adipic dihydrazide (Hichem ADH - a high purity nitrogen containing compound of hydrazine group which is used as chain extender and cross linker), 2,2-azobis (2-amidinopropane) dihydrochloride (Polyazo-AZPH a water soluble Azo-initiator), and, a range of Kinox™ antioxidants viz. Pentaerythrityl-tetrakis - [3-(3,5 - ditert - butyl -4-hydroxy phenyl) propionate] (Kinox-10) and Octadecyl - 3-(3,5 - ditert - butyl-4-hydroxy phenyl) propionate, (Kinox-76)
- ☞ Commercialisation and improvement of technology for the manufacture of tetrakis (2,4-di-tertbutylpheynyl) (I,I-bipheynyl)-4,4'-diylbisphosphonite (or di-phosphonite).
- ☞ Development and commercialization of new vaccines such as tissue culture anti-rabies vaccine; vaccines for foot and mouth disease (FMD), sheep pox and black quarter.
- ☞ Development of prototype hepatitis-B vaccine from high titre plasma; inactivated polio vaccine from sabin strains, hyper sensitivity devoid anti snake venom serum, assay system from endotoxin detection.
- ☞ Development of products such as interleukin, interferon alpha, anticancer products, dermatology products and products for orthopaedic application.
- ☞ Development of recombinant human interferon alpha-2b for therapeutic use, from genetically engineered methylotropic yeast pichia pastories, giving yield of 0.2 g/l.
- ☞ Development of herbal non-toxic immunomodulatory drug for cancer support therapy; herbal liver protective capsules, herbal cough suppressant and herbal drug for osteo

and rheumatoid arthritis.

- ☞ Development and commercialization of bulk drugs such as cephatexin, cefaclor and cefdinir.
- ☞ Development of process technology for anti cancer drug 'Imatinib Mesylate' (Innovator-Novartis) for treatment of chronic myeloid leukaemia, to reduce cost of the product.
- ☞ Development of process for 2-phenyl thio-5propionyl phenyl acetic acid, zaltoprofen, famotidine (an anti-ulcer drug), benzbramarone (an uricosuric drug), zolpidem tartrate a hypnotic drug;
- ☞ Development of homoeopathic and ayurvedic medicines such as alfalfa, malt, denton, syrup, orthomuv ointment, herbokool
- ☞ Development of enzymatic method (immobilized) for the manufacture of mycophenolate mofetil (an immuno-suppressant) by reacting mycophenolic acid with 2-morpholino ethanol, in water free organic solvent and its subsequent purification.
- ☞ Development and commercialization of Xylanase enzyme using submerged fermentation.
- ☞ Development and commercialization of processes for the manufacture of mancozeb (75% water dispersible granule) a fungicide and Glyphosate technical by IDA.
- ☞ Development of catalyst for degassing which accelerates the decomposition of polysulphides.
- ☞ Commercialisation of technology for the "Biological wastes water treatment using jet loop aeration system in dairy industry".
- ☞ Commercialisation of technology acquired from IIT, Bombay for "Supercritical Fluid Extraction System for manufacture of value

added herbal products"

- ☞ Development of hydroxyl ethyl starch from maize starch with life saving medicinal properties.
- ☞ Development of vaccines to control poultry disease such as Bronchi-F, Bronchi-C infectious coryza, BursaB2K & fowl cholera

Electrical and Electronic Industries

- ☞ Development and commercialization of diamond laser processing systems such as those of mapping, cutting, polishing etc.
- ☞ Development of several software including surveillance system for air navigation, warfare simulator both at operations and tactics stage, operator training simulators for power plants, e-governance, IT implementation in agricultural market yards, and aeronautical information management systems for airports.
- ☞ Development of a Network Management System (NMS) for air force satellite communication network.
- ☞ Development of set top boxes for satellite cable and terrestrial applications, 16x16 analog video-audio routers for broadcast applications, high performance video-audio distribution amplifier and controlling and monitoring system for transmitters of low power and very low power ratings.
- ☞ Development of T/R (Transmit receiver) module for space application.
- ☞ Development of several products including micro controller based digital axle counter, circular weaving machine controller, g-locator, FDR milling unit for mirage aircraft and deskmate.
- ☞ Development of microprocessor based SPV dusk-dawn system.

- ☞ Development of CorDECT – a “Wireless in local loop” system and optima fibre access system.
- ☞ Development of GPS based time synchroniser for synchronization of power stations.
- ☞ Development and commercialization of cell phone, jammers, KU band, USAT antenna, radio proximity fuse, radio altimeter.
- ☞ Development and commercialization of low cost portable alternative to PCs. “Simputer”
- ☞ Development of Raw Milk Reception Dock System (RMRD) SNF Tester (Solid not fat analyzer) “Data Processor electronic Milk tester” “Society Accounts Management system” and “PC Based Milk Collection Stations”.
- ☞ Development of an “On-line property prediction system for hot rolled coils”.
- ☞ Development of PC based exhaust gas analysers for petrol engines and smoke analysers for diesel engines.
- ☞ Development of single phase neutral missing static energy meter for theft control, SALEM IP class 0.5 static energy meter with temper detection devices with polycarbonate body to Euro standards; 3 phase static energy meter with neutral missing features with magnetic temper protection as per CBIP requirement.
- ☞ Development of weft straightening system and weft accumulator.
- ☞ Development of a high-end feature phone “Millennium Clip Max” - having ‘Surface Mount Technology’, Caller ID facility, IC design based speaker phone, 9 single touch memories and a hidden store key to avoid inadvertent deletion of stored numbers.

- ☞ Development of C-DOT optical booster amplifier
- ☞ Development of “Voice Compression System (VCS) for 120 channels by adopting CELP coding.
- ☞ Design and development of deuterium lamp for use in spectrophotometers and various other specialized photometric equipment designed for use in the ultraviolet waveband.
- ☞ Design and development of “Klen Glass” laser window for MIG-27 air crafts.

Mechanical Engineering Industries

- ☞ Development of "Scorpio" an all terrain vehicle as per Euro II norms.
- ☞ Development of a 'Track Friendly Bogie' using computer aided design techniques supported by software for virtual prototyping, finite element analysis and dynamic simulation.
- ☞ Design, development and commercialization of sophisticated stretch farming machine for the production of dual counter original skins for advanced missile programme.
- ☞ Development of technology for introduction of vent air purification system, azeotropic distillation and low temperature miscella separation in the solvent extraction plant for reduction of hexane consumption from the existing level of 11.11 ltrs/ton, to 0.1 ltrs/ton, besides improving the quality of oil which can now be processed as edible grade oil instead of non edible grade.
- ☞ Development of wireless radio control system for dozer applications.
- ☞ Design, development and commercialisation of vertical machining centre VMC-400S.

- ☞ Development and commercialisation of diesel engine with balancing shaft, improved tractor hydraulics and constant mesh transmission for tractors.
- ☞ Development of multi radius cylindrical blades and nozzle; zero leakage throtter valve glands.
- ☞ Development of fuel injection system for automobile vehicles to meet Euro-2 Emission norms.
- ☞ Development of "Corrugated inner liner for industrial gas turbines" using Nickel based super alloy IN617 (ASTM-B-166).
- ☞ Development of a high speed web offset printing machine "Orient 35000 iph"
- ☞ Development and commercial-isation of bomb shell bodies for 81mm, 120mm and 130 mm guns.
- ☞ Design, development and commercialization of zero till seed-cum-ferti drill
- ☞ Development of a vacuum brazed aluminium plate fin type compact heat exchanger for light combat aircraft.
- ☞ Development of a small and efficient screen compressor (micro rotary)

Processing Industries

- ☞ Development of an innovative / novel extrusion technology for the production of vitrified ceramic products, for producing various profiles, shapes, special pieces, slabs, tiles etc.
- ☞ Commercialisation of technology for the production of water soluble metal complexes used for high temperature colouring of vitreous glass-ceramic tiles.
- ☞ Development of a technology for phosphate rich organic manure from rock phosphate

where high grade rock phosphate in fine size is composted along with natural organic matter.

- ☞ Development of a process to control the violent reaction that naturally would occur when MK grade ilmenite is reacted with sulphuric acid.
- ☞ Process development for removal of nickel from copper refining effluent; and prevention of copper cathodes from tarnishing.
- ☞ Development of process for the manufacture of high absorption value silica with absorption capacity of 500% for soap industry, low bulking silica for salt and tensile silica for rubber and plastics industry.
- ☞ Development of process for production of eco-friendly green tyres by using naturally occurring precipitated silica in place of carbon black and, vegetable oil in place of aromatic oils.
- ☞ Process development of sodium ascorbate and ascorbic acid.

Agro and Food Processing Industries

- ☞ Development of hybrids for pickling cucumber, tomato, hot pepper, baby corn, sweet corn, okra, water melon, egg plant etc; and hybrids of watermelon, sweet pepper, okra, onion etc., for export.
- ☞ Development of downy mildew resistant hybrids of pearl millet for summer season; sorghum hybrid suitable for rain fed rabi cultivation, early maturity hybrid of maize for North India, cotton hybrid with high fibre quality index.
- ☞ Development of technology for solving problems in banana plantations, such as, high mortality during establishment stage, low multiplication rate, virus infestation,

poor quality fruit, low yields, excessive water requirement, non-uniform growth of plant etc.

- ☞ Development of technology for in-vitro propagation of banana in the lab under aseptic conditions.
- ☞ Design, development and commercialisation of super critical fluids extraction technology for various herbal extracts and formulations thereof such as neem, curcuma longa, ashwagandha etc., flowers such as cardamom, nutmeg etc., and fragrances such as bakul, champaka, nagchampaka etc.
- ☞ Development of Zero-discharge composting technology for conversion of press mud and distillery spent wash into organic manure on the principles of aerobic solid-state fermentation.
- ☞ Commercialization of KALISENA which is an aspergillus niger based bio-fungicide - cum - biofertiliser formulation.

3.9 Imports Made by In-house R&D Units

The recognised in-house R&D units have imported a variety of equipment, raw materials and samples for their R&D activities. These include: NMR, GLC, IR Spectro Photometer, HPTLC, high speed centrifugal counter current and droplet counter current chromatographs; GC-FTIR system, FT-NMR spectrometer, inverted phase contrast fluorescence microscope, microsheen digital opacity reflectometer, colour image analysis system, laser based particle size analyzer, digital distortion analyser, dielectric loss analyser, X-ray spectrophotometer, ASIC development system, CAD system; stereo zoom microscope, Auto Titrator, UV-Vis dual beam spectrophotometer, trinocular phase contrast microscope, cryptometer, computer for colour matching, CO sensor and filter, total organic

carbon analyser, rapid prototyping machine, EDM, microprocessor double ended inertia dynamometer, logic analyser, fibre optics evaluation kit, intelligent universal programmer, reference standards for chemical raw material testing purpose, microwave accelerated acid digestion system, pump for ultra filtration system and auto hardness tester.

3.10 Other Benefits Availed by the Recognised R&D Units

The Department provides assistance to recognised in-house R&D units in a number of ways, such as cases of industrial R&D units requiring allotment of special controlled materials for R&D, permission to export of specialised products reserved for small scale industries by medium scale industries for test marketing in other countries and disposal of imported R&D equipment/instruments and pilot plant produce are examined for making suitable recommendations to concerned agencies.

A number of cases regarding locational clearance with respect to expansion of R&D have been dealt with. A number of applications regarding disposal of R&D equipment and also, pilot plant produce; and permission for allotment for controlled materials required for R&D were examined and the decisions of the Department conveyed.

3.11 Conference, Awards and Publications

17th National Conference on in-house R&D in Industry

Department of Scientific & Industrial Research (DSIR) organised the 17th National Conference on in-house R&D in Industry, in association with the Federation of Indian Chambers of Commerce and Industry (FICCI) during 10-11 November 2003 in New Delhi. The theme of the Conference was "India's Emergence as a Global Research, Design & Development Platform". The Conference had three technical sessions viz.

“Globalisation of R&D : Indian Opportunities”; “Setting up and Operation of R&D Centres in India : Experience of Multinational Companies”; “Design & Engineering : Future Prospects”. Attended by over 400 delegates from industry, national laboratories, IITs and universities, Scientific and Industrial Research Organisations (SIROs), consultancy organisations, Government departments, the Conference was inaugurated by Shri Bachi Singh Rawat, Minister of State for S&T on 10 November 2003 in FICCI Golden Jubilee Auditorium. The Minister presented the DSIR National Awards for Outstanding in-house R&D Achievements (2003) to 8 industrial units. Dr. Ashok Ganguly, Chairman, ICICI OneSource Ltd., Mumbai delivered the valedictory address on 11 November, 2003.

National Awards for Outstanding In-house R&D Achievements

In order to provide recognition to the efforts of industry towards innovative research and technological development, the National Awards for R&D Efforts in Industry were instituted in 1987 by the Department of Scientific & Industrial Research. These awards are in the form of silver shields and are presented along with citations at the inaugural session of the annual National Conference on in-house R&D in Industry. So far, 139 companies have won the DSIR National R&D Awards for Outstanding in-house R&D Achievements. The list of the award winners in the year 2003 is as follows :

☞ Chemical and Allied Industries

High Polymer Labs Ltd., New Delhi

☞ Drugs & Pharmaceuticals Industries

Natco Pharma Ltd., Hyderabad

☞ Biotech Industries

Shantha Biotechnics Pvt. Ltd., Hyderabad

☞ Electronic / Opto Electronic Industries

Sahajanand Laser Technology, Ahmedabad

☞ Computer Software

Electronics Corporation of India Ltd., Hyderabad

☞ Mechanical Engineering Industries

Mahindra & Mahindra Ltd., Mumbai

☞ Processing Industries

Boss Profiles Ltd., Chennai

☞ Technology Exports

Midas Communication Technologies Pvt. Ltd., Chennai

Outstanding in-house R&D Achievements - 2003

The DSIR publication “Outstanding in-house R&D Achievements (2003),” covering the award winning achievements of 8 companies was released during the inaugural session of the 17th National Conference on in-house R&D in Industry on 10 November 2003.

In-house R&D in Industry – Information Update

As the number of in-house R&D Centres has increased while the activities of DSIR have also diversified significantly with respect to in-house R&D units, it was felt appropriate to devise a quick communication system between DSIR and in-house R&D units. Accordingly, the DSIR started bringing out a quarterly Information Update on in-house R&D in industry on a regular basis since April 1998.

The information Update intended to provide a fast communication link between DSIR, in-house R&D units and SIROs and serve to disseminate useful and important information relevant to R&D in Industry. During 2003-04, four issues of in-house R&D in Industry were brought out in April, July, October 2003 and January 2004. These have been widely disseminated to industry, SIROs Government Departments, missions abroad and others and are well received.

Research and Development in Industry : An Overview

A publication entitled “*Research and Development in Industry : An Overview*” was brought out on the occasion of the 17th National Conference on in-house R&D in Industry (November 2003). The publication gives details of resources devoted to scientific and technological activities, international comparison of S&T indicators, fiscal incentives and support measures available for research in India, promotional schemes for R&D operated by DSIR and other Government Departments and important achievements of the in-house R&D units.

4. SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANISATIONS

4.1 Recognition of Scientific and Industrial Research Organisations (SIROs)

The DSIR had launched a scheme of granting recognition to Scientific and Industrial Research Organisations (SIROs) in 1988. SIROs recognised by DSIR are eligible for Customs Duty Exemption and Excise Duty Waiver in terms of notification Nos. 51/96-Customs dated 23.7.1996 and 10/97-Central Excise dated 1.3.1997 respectively.

The DSIR has brought out Guidelines for Recognition of Scientific and Industrial

Research Organisations (SIROs), which give procedural details and application proforma for seeking recognition under the SIRO Scheme. Functional SIROs having broad based governing council, research advisory committee, research personnel, infrastructural facilities for research, well defined, time bound research programmes and clearly stated objectives of undertaking scientific research, are considered eligible for recognition by DSIR. The investments of surplus funds not needed for immediate research should be in accordance with the Income-tax Act, 1961.

Applications for seeking recognition under the SIRO scheme are considered in DSIR by an Inter- Departmental Screening Committee with members from Council of Scientific and Industrial Research (CSIR), Indian Council of Medical Research (ICMR), Indian Council of Agricultural Research (ICAR), Indian Council of Social Sciences Research (ICSSR) and University Grants Commission. The recommendations of the Screening Committee are put up for approval of Secretary, DSIR. The recognition is effective from the date of approval of Secretary. Retrospective approval is not granted.

During the period January 2003 to December 2003, the Screening Committee met 3 times and recommended 26 cases for recognition as Scientific and Industrial Research Organisations under 1988 Scheme of DSIR. These include 26 cases in the natural and applied sciences, agricultural, medical sciences and social sciences. List of these SIROs is furnished at Annexure 5.

Recognition granted to SIROs is for duration ranging from 1 to 3 years. The SIROs are advised to apply for renewal of recognition well in advance (3 months prior to the date of expiry of recognition). Such applications received for renewal of recognition are examined by Research Review Groups by involving representatives from ICAR, ICMR, CSIR and

ICSSR depending on the area. Based on the evaluation made by the Research Review Groups, renewal of recognition is granted to SIROs.

At present there are 555 SIROs duly recognised by DSIR; of these, 192 are in the area of natural and applied sciences, 156 are in the area of medical sciences, 35 are in the area of agricultural sciences, 107 are in the area of social sciences and 16 are universities/colleges. Of these 555 SIROs, the renewal of recognition beyond 31.3.2003 of 49 SIROs is under consideration for want of further information/clarification. DSIR has brought out a directory of recognised Scientific & Industrial Research Organisations in November 2003.

The SIROs have employed qualified scientists and researchers and have also established good infrastructural facilities for research. They have developed new processes, procedures, techniques and technologies and also filed several patents. They have also organised seminars/ symposiums/ workshops and published research papers / reports / books.

5 FISCAL INCENTIVES FOR SCIENTIFIC RESEARCH

5.1 Introduction

Government has evolved, from time to time, fiscal incentives and support measures to encourage R&D in industry and increased utilisation of locally available R&D options for industrial development. New incentives to encourage investments in R&D by industry are announced in the Union Budget.

Fiscal incentives and support measures presently available include:

- ☞ Income-tax relief on R&D expenditure;
- ☞ weighted tax deduction for sponsored research;

- ☞ weighted tax deduction on in-house R&D expenditure;
- ☞ customs duty exemption on capital equipment, spares, accessories and consumables imported for R&D by approved institutions/SIROs;
- ☞ customs duty exemption on specified goods (comprising of analytical and specialty equipment) for use in pharmaceutical and biotechnology sector;
- ☞ excise duty waiver on indigenous items purchased by approved institutions/ SIROs for R&D;
- ☞ ten year tax holiday for commercial R&D companies;
- ☞ excise duty waiver for 3 years on goods produced based on indigenously developed technologies and duly patented in any two of the countries out of India, European Union (one country), USA and Japan;
- ☞ accelerated depreciation allowance on plant and machinery set-up based on indigenous technology;
- ☞ customs duty exemption on imports for R&D projects supported by Government.

5.2 Depreciation Allowance on Plant and Machinery Setup Based on Indigenous Technology

Secretary, Department of Scientific & Industrial Research, Ministry of Science and Technology, is the Prescribed Authority to certify expenditures where higher rate of depreciation is to be allowed for the plant and machinery using indigenous know-how as per provisions of rule 5(2) of IT Rules. Guidelines have been issued for making applications for obtaining the aforesaid certificate. All such applications received are examined in the department, and discussions and visits by experts to verify the

claim are made to the plants by expert teams. Based on a detailed examination, certificates in deserving cases are issued for eligible expenditure.

During the year 2003, 4 certificates involving Rs. 1547.82 lakhs on cost of plant and machinery were issued by DSIR. Details are given at Annexure 6.

5.3 Reference Under Section 35(3) of Income-Tax Act, 1961 Regarding Scientific Research

In the implementation of various incentive schemes for the promotion of research and development, the Income-tax Act, inter-alia, provides that expenditure made on capital equipment and related to research activities are allowed to be written off 100% in the year in which the expenditure are incurred. The Government has provided that if a question arises under section 35 of Income-tax Act, 1961 as to whether and, if so, to what extent any activity constitutes or constituted or any asset is or was being used for scientific research the Central Board of Direct Taxes would refer the question to the Prescribed Authority. Director General Income-tax (Exemptions) in concurrence with Secretary, DSIR is the Prescribed Authority for deciding such cases. However, w.e.f assessment year starting 1-4-2000, the Prescribed Authority for such reference pertaining to sub-sections 35(1)(ii) and 35(1)(iii) is Central Government. On receipt of the reference in DSIR, the department collects information/background regarding the description of the activity claimed as scientific research, date of commencement of the relevant projects, date of completion of research work as also the results obtained from the specific project. After obtaining all these details, the matter is examined in DSIR. In case where it is considered necessary, a team of technical experts is constituted for on the spot appreciation of the research work done at the premises of the company. After receiving the

technical assessment report from the visiting team, a discussion is also normally held so that the point of view of the Company is taken into account before arriving at a decision. After completing the processing of the case in the above fashion, the case file is placed before the Secretary, DSIR for giving a decision. The Secretary, DSIR gives his decision by setting out a reasoned order duly signed by him, which is communicated, to Director General (Income-tax Exemptions).

During the year, recommendations of Secretary were sent to DG (ITE) in one case namely Deccanet Designs Private Ltd., Bangalore.

5.4 Approval of Commercial R&D Companies

In order to promote research and development activities in the commercial research and development companies, the Finance Act, 2000 provided for a ten-year tax exemption from income-tax under section 80-IB(8A) of the Income-tax Act, 1961, to approved companies, whose main objective is scientific and industrial research. Secretary, Department of Scientific & Industrial Research is the Prescribed Authority vide Gazette notification no. S.O.85 (E) dated 31 January, 2001, issued by Department of Revenue, Ministry of Finance for granting approval under section 80IB(8A) of the IT Act.

The approval to commercial R&D companies is given initially for a period of 3 years, which can be extended up to 10 years based on evaluation of its performance. The tax exemption is available to a company, which is accorded approval by the Prescribed Authority at any time after the 31st day of March 2000 but before the 1st day of April 2004.

So far, 16 R&D companies have been approved (including 6 approved during the last year; and the requests of 4 more companies are under consideration.

5.5 Excise Duty Waiver for Patented Products

The notification no. 13/99 dated 28 February, 1999, introduced the provision of exemption of all goods falling under the Schedule to the Central Excise Tariff 1985 (5 of 1986) from the whole of the duty of excise leviable thereon provided such goods are manufactured by a wholly Indian owned company, such goods are designed and developed by such Indian company, national laboratories, public funded research institutions and universities, the goods so designed and developed are patented by such Indian company in any two countries from amongst India, USA, Japan and any one country of the European Union, for a period of 3 years from the date of issuance of certificate to the effect by DSIR.

During the year 2003, two requests received from the industrial R&D units, are under consideration.

5.6 Customs Duty Exemption to Recognised SIROs

All Scientific and Industrial Research Organisations recognised by DSIR are eligible for Customs Duty Exemption on the import of scientific equipment, instruments, spares, accessories as well as consumables for research and development activities and programmes.

The procedure for issuing the essentiality certificates to SIROs for obtaining the customs duty exemptions has been formalised. A Committee has been set up in DSIR to examine the applications received from SIROs. The committee meets periodically to examine the requests. The recommendations of the Committee are put up to the Head of the RDI Scheme, for approval.

During the year 2003, around 622 essentiality certificates were issued for claiming customs duty exemption on import of scientific

equipment, accessories and components, including consumable items. The value of imports covered by the certificates was nearly Rs. 35 crores.

5.7 Excise Duty Exemption to Recognised SIROs

All Scientific and Industrial Research Organisations (SIROs) recognised by DSIR are eligible for Excise Duty Exemption on purchase of scientific and technical instruments, apparatus, equipment (including computers); accessories and spare parts thereof and consumables; computer software, Compact Disc-Read Only Memory (CD-ROM), recorded magnetic tapes, micro films, microfiches; and prototypes for research and development activities and programmes.

This provision was introduced by Ministry of Finance (Department of Revenue) vide notification No. 10/97-Central Excise dated 1 March 1997. A Committee has been set up in DSIR to examine the applications received. The Committee normally meets periodically and essentiality certificates are issued with the approval of Head of RDI Scheme.

During the year 2003, 87 essentiality certificates for a total amount of Rs. 127 lakhs were issued for claiming Excise Duty Exemptions.

5.8 Registration of Public Funded Research Institutions, Universities, Etc.

Public funded research institutions, universities, IITs, IISc., Bangalore; Regional Engineering Colleges, (other than a hospital) are eligible for availing customs duty exemption on import of equipment, spares and accessories and consumables for research purposes. The pass book scheme which was hitherto operated by the Department of Science and Technology and the Ministry of Human Resources Development is superseded by a simple registration with the

Department of Scientific and Industrial Research. The ceiling on the value of goods imported for R&D is also removed and the head of the public funded research institutions/organisations duly registered with DSIR can certify the R&D goods for duty free import as per the notification No. 51/96-Customs dated 23 July 1996. As per the Government notification No. 10/97-Central Excise dated 1.3.1997, the Public Funded Research Institutions, universities, IITs, IISc, Bangalore, Regional Engineering Colleges, registered with DSIR are also eligible for Central Excise Duty Waiver on purchase of indigenously manufactured items for scientific research purposes.

The registration of above institutions is recommended by an inter-departmental Screening Committee constituted by the department for considering the requests from various institutions. The Committee met 2 times during the year and considered 26 applications from various public funded research institutions.

Coinciding with the presentation of union budget for the year 2003-04, Ministry of Finance amended the notification No. 51/96-customs vide notification No. 28/2003-Customs dt. 1.3.2003. As per the amendment, departments & laboratories of central government and state governments (other than a hospital) are not required to register with DSIR for availing the customs duty exemption. They can clear the consignments by producing a certificate from the Head of the institution certifying that the said goods are required for research purposes only. With this change, some laboratories & institutions directly under central or state governments and already registered with DSIR, need not seek renewal or revalidation to their registration. Therefore the number of institutions registered with DSIR has come down to 570 at present. Another significant change in the notification is that regional cancer centres (cancer institute) have been included in the list of institutions eligible for registration DSIR for importing goods for research purposes

at a concessional rate of customs duty of 5%.

During the year 2003, 24 registration certificates were issued to such public funded research institutions universities, IITs, IISc, Bangalore, Regional Engineering Colleges for availing customs duty exemption on import of scientific equipment, spares and accessories, consumable items and Central Excise Duty exemption on indigenous purchases for Scientific Research Purposes.

The registration to public funded research and other institutions mentioned in the notification is granted for maximum period of 5 years. The institutions are advised to apply for renewal of registration well in advance of the date of expiry of the registration. During the year 2003, 39 institutions were due for renewal of registration. The department received 25 renewal applications. These were processed on individual files and approval of Secretary was obtained and 15 renewal letters were issued. Registration to 10 institutions could not be renewed as it was found that some of the institutions were not fulfilling the criteria as per the notifications or their research performance was not satisfactory.

5.9 Approval of In-house R&D Centres under Section 35(2AB) of I.T. Act 1961

Finance Bill 1997 introduced a sub-section (2AB) in Section 35 of the IT Act 1961. This sub-section was introduced in order to encourage research & development in drugs, pharmaceuticals, electronic equipment, computers, telecommunication equipment, and chemicals. The sub-section provided for weighted tax deduction of a sum equal to one and one-fourth times of any expenditure incurred on scientific research (not being expenditure in the nature of cost of any land building). The weighted tax deduction was further raised to 150% by the Finance Act, 2000. The in-house Research and Development

Facilities of the companies engaged in the business of manufacture or production of the above said items should be approved by the 'Prescribed Authority' i.e. Secretary, DSIR. Also, the company should enter into an agreement with the Prescribed Authority for co-operation in such research and development facility and for audit of the accounts maintained for that facility. Through a separate notification no. 11112 (F.No.225 / 192 / 99 / ITA.II) dated 27 October 1999, manufacture of aircrafts and helicopters was included in the list eligible under this section.

The provision was introduced for expenditure on R&D incurred up to 31st March 2000. The Ministry of Finance, Department of Revenue, Central Board of Direct Taxes, notified the provision vide Notification No. S.O.259 (E) dated 27 March 1998. Finance Bill 1999 introduced in Lok Sabha on 27 February 1999 extended this provision till 31 March 2005. The

sub-section was further amended by the Finance Bill 2001, to include expenditure on in-house R&D by units engaged in the business of biotechnology, as well as cover expenditure on clinical trials, filing of patents under Indian Patent Act (1970) and obtaining regulatory approvals, for weighted tax deduction @ 150% under section 35(2AB) of Income-tax Act.

During the year 2003, 28 applications were received from eligible companies. Secretary, DSIR who is designated as the Prescribed Authority under section 35(2AB) of Income-tax Act, 1961, approved in-house R&D centres of 22 companies and approval was communicated in Form 3CM, Agreements of cooperation for research & development were signed with these companies on behalf of the Secretary, DSIR. Further, the detailed R&D expenditures of the approved companies have also been examined by DSIR and 32 reports have been sent to DG, ITE in Form 3CL as required under the IT Act.