II-A. INDUSTRIAL R&D PROMOTION PROGRAMME

1. OBJECTIVES

The broad objectives of the Industrial Research & Development Promotion Programme 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 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 DSIR. A number of incentives and support measures are made available to in-house R&D units.

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. The in-house R&D units are also expected to maintain separate identifiable infrastructure and R&D accounts.

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 between 1200 to 1250; and was 1253 in December 2007. Of these, nearly 1180 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 November 2007. This Directory lists 1247 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.gov.in). The applications received are scrutinised for their completeness in the DSIR and are then circulated for comments to various other departments/agencies such as concerned administrative ministries, MSME, CSIR, ICAR, ICMR, ICAS, DBT, DCPC, DoT, DRDO, DIT and NRDC. The units seeking recognition are visited, if need be, by expert teams comprising of representatives of DSIR, as well as outside agencies, like, administrative ministries, CSIR, NRDC, DBT, ICAR, ICMR, DRDO, DIT, DoT, IITs 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, discussions with the chiefs of the R&D unit and executives of the firm are also held in DSIR in many cases. During the discussions 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 the 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 2007, the Screening Committee met 12 times and considered 138 applications for recognition; 92 R&D units were granted fresh recognition and 31 applications were rejected. Approval of balance R&D units is under process.

The pendency at the end of December 2007 was 60, including 15 applications received during the month of December, 2007. 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 2007, over 300 discussions/meetings were held with heads of in-house R&D units. Also, expert teams visited a number of in-house R&D units.

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 2007**,** 480 in-house R&D units were due for renewal of recognition beyond 31 March 2007; of which 425 applications were received. Based on the evaluation of the performance of the R&D units, renewal of recognition was granted to 420 R&D units.

Recognition granted to 5 companies could not be renewed because their R&D performance was not up to the mark. 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 110 units in Western Zone (Rajasthan and Gujarat), around 475 units in the Central Zone (Maharashtra, Madhya Pradesh and Orissa), around 392 units in the Southern Zone (Andhra Pradesh, Karnataka, Kerala and Tamil Nadu) and around 85 units in the Eastern Zone covering Bihar, West Bengal, Assam and other North-Eastern states and remaining in other places.

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 1253 recognised R&D units is of the order of Rs.6800 crores. The share of public and joint sector is about 20% and that of private sectors about 80%. 147 In-house R&D units spend over Rs.5 crore each on R&D**,** 303 in-house R&D units spent between Rs.1 crore to Rs.5 crore each per annum on R&D. The lists of these R&D units are given in **Annexure 3 and 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 microscopes, particle size analyzers, portable particle counting systems; vibration test equipment, calorimeter and wind tunnel for complete evaluation of automobile air-conditioning system, ultra filtration equipment, sonicator, spectro fluorimeter, protein purification set up, digital viscometer, 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 1253 in-house R&D units is around 65,000, out of which around 20,000 R&D personnel are employed in public sector in-house R&D units and around 45,000 R&D personnel are employed in the private sector in- house R&D units. Of the total 65,000 R&D personnel, around 3500 are Ph.D's, 21,000 Post Graduates, 21,000 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	521
Electrical & Electronics industries	275
Mechanical Engineering industries	184
Processing industries (Metallurgical, Refractories, Paper, Cement, Ceramics, Leather and others)	151
Agro and food processing industries and others	122

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 and commercialization of processes for manufacture of P-Ethoxy ethyl Benzoate; P-Iso propoxy ethyl benzoate; 4-Methoxy benzoic acid; 2-Ethoxy benzoic acid; PHBA solvent process; Ethyl benzoate; Ethyl paraben sodium; Benzyl paraben; Ortho anisic acid; Methyl-5-Chloro-Ortho methoxy benzoate; Gujsol-01 (mixture of parabens); 4-Methyl salicylic acid and Iso propyl myristate.

- Development and commercialization of the anti oxidants:

  a) Tris (2,4-di-tert. butylphenyl) phosphate (kinox-68)
  b) 1,3,5-Tris(3,5-di-tert.butyl-4-hydroxybenzyl)-1,3,5-Triazine-2,4,6 (1H, 3H, 5H)-trione (kinox-34),
  c) N'-Hexamethylene-bis(3-(3,5-di-teri. butyl-4hydroxyben-3ylphenyl) propionamide) (kinox-98)
  d)1,3,5-Trimethyl-2,4,6-tris(3,5-di-tert. butyl-4-ydroxybenzyl)benzene (kinox-30) and
  e) ntaerythrityl-tetrakis-[-3-(3,5-di tert-butyl -4 hydroxy phenyl) propionate (kinox-10 SnF) .

- Invented 5-Loxin, a novel anti-inflammatory & anti- arthritic product.

- Developed solid Catalyst – external donor system for polypropylene technology based on current generation supported titanium catalyst system which enables polymer production without removal of catalyst residues due to higher productivity; polymer with desired molecular weight distribution; polymer with controlled degree of stereo-regularity without requiring removal of undesirable polymeric fractions.

- Technology development for conversion of industrial waste to value added products:- Production of forskolin of drug grade; Production of policosanol; Technology development for manufacture of industrial diols: - 1,2 - Hexanediol; 1,2 - Octanediol and Technology development for manufacture of resveratrol by a facile synthetic route.

- Developed novel route of synthesis for commercial manufacture of Olanzapine - antipsychotic; Gabapentine- anti-convulsant; Isradipine – antihyper-tensive antiangial; Quinapril – antihypertensive; Meprobamate - anxiolytic and 2 – Carboxymethoxy -3 –thiophene-sulfonyl Chloride – pharma indicate. The product have been commercialized.

Computer Software

- Development of SHAKTI Artillery combat command & control system (ACCCS). SHAKTI is a subsystem for tactical command, control and communication intelligence system for Indian Defence forces. System is for automation of all operational procedures and data management of artillery with complete support for command and control levels of corps, division, regiment, battery and guns.

- Design, development & optimization of multimedia subsystem (wireless embedded software for mobile phones).The package has subsystem which have been developed; Stored multimedia player; DVD-H Applica-tions; Streaming media player; 2 Way real-time video telephony over a circuit switch

network; Voice over IP & video over IP; Image viewer; Image capture;Camcorder.

- Development of Remote multi-pass wire drawing simulator (RMWDS). Its main features are:- Numerical modeling of multi-pass wire drawing; Virtual wire drawing platform for various innovative ideas and analysis; An interface for use of the model by production personal; Platform for optimization of die schedule with respect to power consumption & quality of wire; Mass deployment of model using remote connection for multi-location production sites; Platform to analyse the effect of the different parameters on wire drawing process.

Drugs & Pharmaceuticals Industries

- Development of two new molecules antidiabetic (DPP IV inhibitor); anti-inflammatory (PDE4 inhibitor).

- Development of New Drug Delivery systems based on liposomes. Two products namely Fungisome gel (liposomal Amphotericin B Gel) and Psorisome Gel(Liposomal Dithranol Gel). Both these products are based on application of liposomal technology for controlled delivery of drugs encapsulated in the liposomes.

- Development of a scientific method for identifying optimum packaging for pharmaceutical formulations; effective counterfeiting solution to the pharmaceutical solid dosages through innovative packaging material.

- Development of five new drug processes which drastically reduced the price of the five anti cancer drugs. Gefitinib an anti cancer drug used mainly in non small cell lung cancer; Bortezomib a new drug for multiple myeloma – a newpolymorph of the drug developed; Amifostine is a radio protective drug given after the radiation therapy; Zoledronic acid is mainly used in bone cancer patients; Letrozole: is mainly used in the post menopausal breast cancer.

Electrical and Electronic Industries

- Development of technology for high-energy Permanent Magnet Machines (PMM) to meet the requirements of defence sector, space applications and power sector.

- Development of energy efficient electronically controlled new generation brushless DC motors (Voyager – railway carriage fan). Developed brushless DC railway carriage fans which are electronically controlled**.**

Electronics / Opto Electronics Industries

- Design, development and commercialization of Universal Temperature Controller, 4 Channel Sequential Timer with relay output , and 15 Channel Sequential Timer with Solid state output, HM-300-Hour Meter with RS232 Communication.

- Development of new technology using their in-house R&D for handling power distribution system of India. Development of cluster metering and associated technologies result in development of highly integrated end to end energy measurement /auditing/ management solutions to the utilities.

- Development of cutting –edge technologies for recordable optical media such as DVD-RW 4 X Digital Versatile Disc, Mini RW Disc (Cam-Recorder Application) and high –speed (8X) re-writable digital versatile disc (DVD+RW) (8X) Disc.

- Development of 8/16/32/40 Channel Dense Wavelength Division Multiplexing (DWDM) System: Dense Wave Division Multiplexing (DWDM) technology is the latest development in the Telecom Transport Systems in the Optical Domain.
- Development & commercialization of Curtain flame ignition system for ignition in sinter mix in sinter plants at Bokaro Steel Plant and Rourkela Steel Plant.

Infrastructure Development

- Geo-textile sand container mattresses (GSCM) lining for temporary river diversion channels. An innovative high performance cost & time efficient, environment friendly alternative method of lining diverted channels. Uses technically superior synthetic material. Successfully developed & implemented at Teesta Low Dam Hydroelectric Project Stage-IV site, Jalpaiguri, West Bengal.

Mechanical Engineering Industries

- Development of indigenous "Dual plate check valves".
- Development of innovative solutions to irritant judder and rattling phenomenon observed in multi-plate wet clutches in Motorcycles being manufactured in the country.
- Design and development of **"**Intelligent illuminated non contact handle bar switch for motor cycle" with novel features such as non contact mechanism, illumination in handle bar switch, self cancellation blinkers and body control unit for motorcycle. The newly designed control system include domain such as elector-magnetism, optics, and electronics and the system has been packaged in ergonomically styled switch consoles.
- Design, development& commercialization of "Integral receiver dryer condenser" (IRDC) also called "Subcool Condenser". The novel feature of the sub cool condenser is integration of receiver dryer and the condenser, thus to improve the performance of the A.C. system and at the same time to eliminate the need for separate packaging space in the engine cabin and associated cost of the pipe connectors mounting brackets and manufacturing operations in the car assembly line.
- Design, development and test of "dampolators" an innovative product which combines functions of both isolator and harmonic balancer providing benefits of both these parts in a single unit.

New Materials

- Development of three composites. The high temperature resistant laminates permaglass 22 CIN (PM1) can insulate continuously at a temperature of 500^0 C. Stable insulation can be attained in any heated area such as Dry Arc Electric Furnaces and Drying Ovens.
- Development of bake hardening (BH) steels with a higher initial yield strength and good formability properties. These steels have shown 40 to 50 % increased strength as compared to conventional grades such as low carbon EDD and extra low carbon Interstitial Free Steel. The increase in strength of this new steel led to decrease in the thickness (hence decrease in weight) with an improvement in dent resistance of the material.

Pollution Control & Environmental Protection

- Development and manufacture of Gas Monitoring devices for fumigation industry, Flammable gas detection devices for industrial & domestic segments,

Breath Alcohol Analyzer for Traffic police, railways, hospital and Gas Sensors.

Processing Industries

- Development of a process to reduce the hexavalent chromium to trace levels (less then 0.01 ppm) in concentrates by using an organic reductant known as Myrobalam in collaboration with Central Leather Research Institute, Chennai.

Agro and Food Processing Industries

- Development and promotion of technology & products for environment friendly management of tissue borers of sugarcane using indigenously synthesized sex pheromones and patented water trap. Developed bollworm resistant high yielding high quality Bt cotton hybrids utilizing modern tools of biotechnology combined with traditional breeding methods.

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, GC-FTIR system, FT-NMR spectrometer, inverted phase contrast fluorescence microscope, microsheen digital opacity reflectometer, colour image analysis system, laser based particle size analyzer, laser scanning microscope, dionex ion chromatography system, mass emissions analysis system, digital distortion analyser, dielectric loss analyser, X-ray fluorescence spectro-photometer system, portable particle counting system, ultra filteration equipment, probe sonicator, protein purification set up digital viscometer, stereo zoom microscope, Auto Titrator, UV-Vis dual beam spectro-photometer, trinocular phase contrast microscope, cryptometer, elisa system, mass emission analysis system, prototyping machine, electrophoresis unit, 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, fuel ratio analyser, ignition timing meter, paper permissibility meter.

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.

Few 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

21st National Conference on in-house R&D in Industry

DSIR organised the 21st National Conference on in-house R&D in Industry, in association with the Federation of Indian Chambers of

Commerce and Industry (FICCI) during 15-16, November 2007 in New Delhi. The theme of the Conference was "R&D Innovations: For Indian Growth Dynamics" The Conference had four technical sessions viz. "Creating Infrastructure for R&D Innovations"; **"**Innovative R&D: Some success stories"; "Innovative R&D: Inclusive Growth" and "Government Incentives for Innovative R&D ". Attended by over 500 delegates from industry, National laboratories, IITs and universities, Scientific and Industrial Research Organisations (SIROs), Consultancy organisations, Government Departments, the Conference was inaugurated by Dr. T. Ramasami, Secretary, DST and Dr S.K. Brahmachari, Secretary, DSIR who also presented the DSIR National Awards for Outstanding in-house R&D Achievements (2007) to nine industrial units. Dr. K.T. Chacko, Director, Indian Institute of Foreign Trade (IIFT) delivered the valedictory address on 16th November 2007.

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 DSIR. 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, 171 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 2007 is as follows:

- ***Chemical and Allied Industries***
  Laila Impex, Vijayawada (A.P)
- ***Agro & Food Processing Industries***
  Pest Control (India) Pvt. Ltd, Bangalore
- ***Pollution Control & Environmental Protection***
  United Phosphorous Ltd, Vapi (Gujarat)
- ***Mechanical Engineering Industries***
  Minda Industries Ltd, Gurgaon
- ***Electrical Industries***
  Crompton Greaves Ltd, Mumbai
- ***Electronics / Opto Electronics Industries***
  Ananth Technologies Ltd, Hyderabad
- ***Computer Software***
  Sasken Communication Technologies Ltd, Bangalore
- ***Technology Absorption of Imported Technologies***
  Reliance Industries Ltd, Surat
- ***Successful Commercialization of Technologies acquired from others***
  Tata Steel Ltd, Jamshedpur

3.12 Publications

Outstanding In-house R&D Achievements - 2007

The DSIR publication "Outstanding in-house R&D Achievements (2007)," covering the award winning achievements of 9 companies, was released during the inaugural session of the 21st National Conference on in-house R&D in Industry.

In-house R&D in Industry – An 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 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 1988. 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 2007, three issues of in-house R&D in Industry were brought out in April, July, October 2007. These have been widely disseminated to industry, SIROs, Government Departments and others.

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 21st National Conference on in-house R&D in Industry (November 2007). 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.

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 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 SIROs, which give procedural details and application proformae 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 (UGC). 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 2007 to December 2007, the Screening Committee met 8 times and recommended 27 cases for recognition as SIROs under 1988 Scheme of DSIR. These include 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 570 SIROs duly recognised by DSIR; of these, 198 are in the

area of natural and applied sciences, 200 are in the area of medical sciences, 38 are in the area of agricultural sciences, 108 are in the area of social sciences and 26 are universities/colleges. Of these 570 SIROs, the renewal of recognition beyond 31.3.2007 of 31 SIROs is under consideration for want of further information/ clarification. DSIR has brought out a directory of recognised SIROs in November 2007.

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

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 U/s 35 (2AA) of IT Act 1961 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, obtaining approvals from any regulatory authority under any Central, State or Provincial Act and filling an application for a patent under Patent Act, 1970), bio-technology, electronic equipment, automobiles and its components; computers, telecommunication equipment and manufacture of aircrafts and helicopters as approved by the Prescribed Authority (Secretary, DSIR)
- 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 approved upto 31.03.2007
- 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.

Information on some of these fiscal incentives is given in the following paragraph.

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

Secretary, DSIR, 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 2007, 5 certificates involving Rs.6797.7 lakhs on cost of plant and machinery were issued by DSIR. Details are given at **Annexure 6.**

5.2 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. 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 2007, request of one company has been under consideration.

5.3 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, DSIR 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 notification was valid upto 31st March, 2007 and this scheme was not extended further by the Government.

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 2007. So far, 45 R&D companies have been approved including 13 approved during the year 2007. Details are given at **Annexure -7.**

5.4 Customs Duty Exemption to Recognised SIROs

All SIROs 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 was set up in DSIR to examine the applications received from SIROs. The committee met periodically to examine the requests. The recommendations of the Committee were put up to the Head of the Industrial R&D Promotion Programme, for approval. As per the new notification No. 24 /2007 dated 1st March, 2007 the director or head of the institute / organization is empowered to sign the essentiality certificate.

5.5 Central Excise Duty Exemption to Recognised SIROs

All 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 1st March, 1997. A Committee was set up in DSIR to examine the applications received. The Committee met periodically and essentiality certificates were issued with the approval of Head of RDI Scheme. As per the new notification No.10/ 2007 dated 1st March, 2007 the director or head of the institute / organization is empowered to sign the essentiality certificate.

5.6 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 through a simple registration with the DSIR. 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 above Public Funded Research Institutions registered with DSIR are also eligible for Central Excise Duty Waiver on purchase of indigenously manufactured items for scientific research purposes.

Coinciding with the presentation of Union Budget for the year 2004, 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. Another significant change in the notification is that regional cancer centres (cancer institute) have been included in the list of institutions eligible for DSIR registration for importing goods for research purposes at a concessional rate of customs duty of 5%.

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 Screening Committee met 3 times during the year and considered 35 applications from various public funded research institutions.

During the year 2007, 28 registration certificates were issued to such public funded research institutions 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 five years. The registered institutions are advised to apply for renewal of registration well in advance of the date of expiry of the registration.

During the year 2007, 70 institutions were due for renewal of registration. The department received 66 renewal applications. These were processed on individual files and approval of Secretary was obtained and 60 renewal certificates were issued ;and 2 cases were rejected as these are now not falling under the definition of Public Funded Research Institutions. The remaining applications are under process.

5.7 Approval of In-house R&D Centres u/s 35(2AB) of I.T. Act 1961

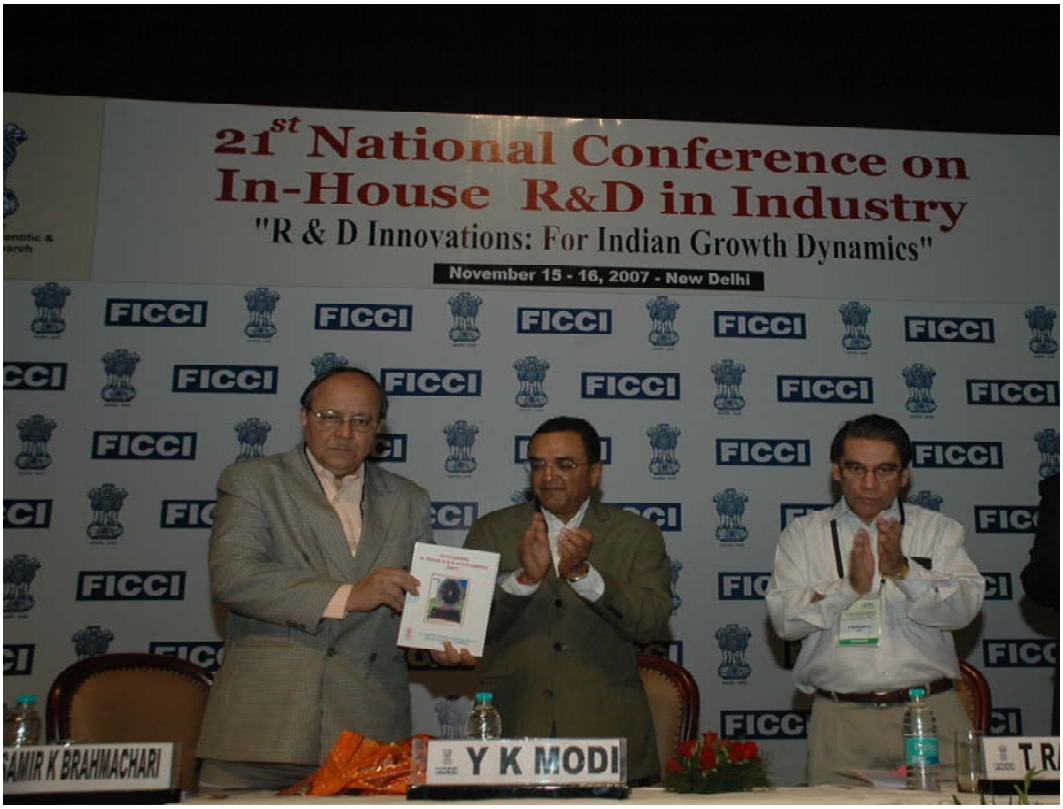
Finance Act 1997 introduced a sub-section (2AB) in Section 35 of the IT Act 1961. This sub-section was introduced in order to encourage research & development in drugs, pharmaceuticals, electronic equipment, computers, telecommunication equipment, and chemicals. The sub-section provided for weighted 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 and 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, 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 provision was further extended upto 31.03.2007 by the Finance Act 2005 and again upto 31.03.2012 by the Finance Act 2007. The sub-section was 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 2004, CBDT has notified automobile including automobile components as an article or thing eligible for the weighted deduction under the section 35(2AB) of IT Act.

During the year 2007, 43 new applications for approval in Form 3CM received by the Prescribed Authority. Secretary, DSIR is designated as the Prescribed Authority under section 35(2AB) of Income-tax Act, 1961. Fresh / renewal of approval were accorded to 82 companies by the prescribed authority. These approvals were communicated in Form 3CM, after 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 61 reports have been forwarded to DGIT(E) in Form 3CL as required under the IT Act. A list of companies approved under Section 35 (2AB) of IT Act, is furnished in **Annexure-8.**

An Award Winner Receiving the DSIR National R&D Award (2007)

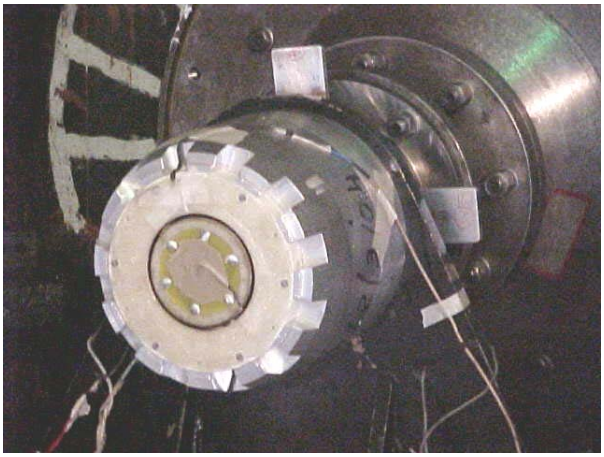


Prof. Samir K. Brahmachari, Secretary DSIR and Dr. T. Ramasami, Secretary, DST and Sh. Y.K. Modi, Ex President FICCI Releasing the DSIR Special Publication

Prof. Samir K. Brahmachari, Secretary, DSIR Inaugurating the 21st National R&D Conference

Dr. K.T. Chacko, Director Indian Institute of Foreign Trade, during the Valedictory Session

Recovery of Cyclohexane from waste RB bottom Stream in Polyethylene Manufacturing



12 channel rotary telemetry system mounted in the rig for spin test