II C. TECHNOLOGY MANAGEMENT PROGRAMME

1. OBJECTIVES

The major objective of the Technology Management Programme is to provide technical inputs and support mechanisms for efficient transfer and management of technology.

In keeping with this, the division has networked with a number of organizations, research and academic institutes. This is helping in the promotion and effective utilization of emerging technology management methodologies, bringing about better industry-institute inter-linkages through a networking of industrial needs with academic and R&D inputs.

2. ACTIVITIES

The major activities undertaken are aimed towards :

- Providing assistance in efficient transfer of technology, through information in respect of foreign collaborations approved and analysis of such approvals as well as focused studies;
- Enhancing knowledge base in respect of technologies specific to the nation, including rural based technologies and region/sector specific technologies by undertaking analytical studies, technology status and development studies;
- Providing information to industry, Government departments, researchers through targeted research studies and policy research;
- Promoting industry-institute interaction by setting up resource centers on technology management in appropriate locations;
- Enhancing academic interest and contribution through active collaborations and memorandums of understanding with academic institutes;
- Initiating State level agencies and research organizations to take up activities in the realm of Technology Management;
- Information dissemination on Technology Management related information through newsletters, manuals, and other forms
- Promoting an understanding of technology management, its need and importance in the current competitive environment through development of course modules, awareness programmes, focused training, seminars and management development programmes, and guidance to trainers on specific technology management issues.

3. WORK COMPLETED / UNDERTAKEN DURING THE YEAR

During the year, in addition to the on-going work, some more need based programmes and activities have been taken up.

3.1 Compilation and analysis of data on approved foreign collaborations

The Division has been regularly bringing out an annual compilation of foreign collaborations approved during the year. These compilations provide information relating to the names and addresses of the Indian and foreign collaborators and the specific item of collaboration. The publication includes an analysis of the data compiled. Compilation for the year 2004 is in progress.

3.2 Analytical, Technology Status and Development Studies

Industry, policy makers, academic and research institutes need to be made aware of areas of their concern relating to technologies in which effective action can be taken to mitigate problems and enhance efficiency. Also, there are many region specific resources in different States in the country that have

spawned industries, which could benefit through further research and analysis in respect of value addition, technology upgradation and information dissemination. Identification of technology gaps in existing industries in respect of important products and processes is an important requirement that needs to be continually addressed.

There has thus been need for studies covering sector-specific status of technology in the country, international trends, gaps in technology, research facilities and other such information; in respect of specific identified products, processes. There are also a number of areas where there is need for indigenous development of technology and for value addition, including rural based technologies, in respect of which information collection and analysis is required. Some such areas have been identified on need basis and studies have been undertaken. The details are as under :

Study on 'Technological Interventions in manufacture of ethyl alcohol from grains in Maharashtra'

The study, entrusted to MITCON, Pune, has been completed. The objective is to study the technological aspects of manufacturing Ethyl Alcohol from grains, and its industrial potential in Maharashtra. In India, the fermentation route using sugar yielding materials and yeast has been utilized for production of alcohol. At industrial levels, molasses, a product of the sugar industry is used as a raw material to produce alcohol. Since sugar production takes place during only six months of the year, the infrastructure for alcohol production remains idle for about six months each year. Yield of alcohol is generally higher when grains are used. Further, problems relating to effluent treatment are much less. Grain based alcohol is also supposedly more suitable for production of potable liquor. In most of the industrially advanced countries, the preferred route for potable alcohol is from grains, whereas molasses based alcohol is used for industrial purposes. In India, only molasses based alcohol is produced and used for both potable and industrial purposes. More than 50% of the total sorghum production in the country (7.79 million metric tons in 2001-02) is in Maharashtra (3.99 million metric tons; 2.40 MMT kharif and 1.59 MMT rabi). The yield per hectare at 1256 kg is higher than the national average of 763 Kg/Ha. The report has brought out that sorghum grain based alcohol production is practicable, technically feasible and more environment friendly as compared to molasses based alcohol. The technology is also financially viable if the grain based alcohol is sold at a slightly higher rate, as compared to molasses based alcohol. In Maharashtra, the tendency of a farmer is to primarily produce a staple cereal grain like sorghum for his own consumption. In addition, the dry fodder becomes available to feed his cattle. The excess cereal beyond his own needs alone is sold in the market, mainly through the Agricultural Produce Market Committee (APMC). The prices of hybrid sorghum are less than those of the local sorghum, especially so in Latur, Amravati, Jalgaon and Beed.

The report recommends that a law may be enacted to make it imperative to use only grain based alcohol for potable purposes. This may be done in a phased manner over the years. In the meantime, distillers producing grain alcohol may be encouraged and given suitable incentives. It also recommends that alcohol from molasses may be used only for fuel blending and for industrial use.

Study on `Potential of Handloom and Spice Processing Industry with special focus on technology in the North East'

The main objective of the study, conducted by the NEITCO, Guwahati, was to find out the

interventions required for introduction of appropriate technology, equipment and upgradation of skills, which will enable the products produced in the region to get wider market acceptance at competitive prices; and thus develop and upgrade the socio-economic scenario of the region through generation of employment and income. The study involved survey of the existing units; identification of skills; technical, financial and economic status; present market coverage etc. The study has been completed.

The report has brought out that the handloom industry has a dominant role in the economic development of rural masses in a majority of the north eastern States. The region has the highest concentration of handlooms in the country. Around 53% of the looms and 50% of the weavers in the country belongs to this region. The concentration of domestic looms in these States is quite high. Handloom is dominant in the States of Arunachal Pradesh, Assam, Manipur, Nagaland and Tripura, whereas Meghlaya and Mizoram have very few units in the non-household sector. Different types of traditional items such as Mekhela-chaddars, dakhana, lychamphee, furnishings sarees and various muga silk fabrics for different products are produced in these looms. There is a great demand for fabrics woven in this region due to the vibrant colour combination and exclusive designs. Yarn requirement is met entirely by supplies coming from outside. Thus, one of the major problems faced by weavers in this region is a perennial short supply of yarn. Handloom weaving is mainly a household activity here. It is mostly confined to rural masses with poor economic conditions. Consequently, they are unable to build the basic infrastructure required for commercial production. On the other hand, the socio-economic condition of the weavers can be improved if their looms are upgraded to commercial ones. The major problems of the handloom sector in the region are: non-availability of raw materials, obsolete technology and lack of marketing policy.

Although, the North Eastern Region produces a sizeable quantity of spices like ginger, turmeric, chillies etc. commercial cultivation in an organized manner has not been taken up. Middlemen purchase the produce without giving much benefit to the growers. There is an increasing global demand for spices and the region can contribute substantially towards export. An analysis shows than an overall development in the sector needs an integrated approach involving farmers, processing units and marketing organizations. Suggestions include: improving present cultivation practices resulting in higher yield; improving harvesting and post harvest methods, storage systems, processing, packaging and transportation to avoid/minimise harvesting and post harvest losses; strengthening the marketing system by introduction of town level market and regularising the rural markets; development of a market information system and develop skilled manpower.

Study on Status and potential of Karaya Gum

The objective of the study, undertaken by UP Industrial Consultants (UPICO), Kanpur, is to assess the status and potential of karaya gum based industries in the country. The study would identify the actual availability of karaya gum plants in forest areas and possible utilization in different areas; identify technically feasible and commercially viable technologies to transform the raw material into value added products; as well as study the export potential of the gum as a raw material for various applications. The study is in progress.

Study on 'Technology Status on Isabgol based Industries' by Consultancy Development Centre (CDC), New Delhi.

The basic objective of the study, taken up by Consultancy Development Centre (CDC), New Delhi, is to find out the technology status of the industries based on isabgol by carrying out a market survey about its availability, its consumption level and future potential; as well as present the international scenario. The study would also attempt to explore the techno commercial viability of commercial scale production of isabgol and its various derivatives with the help of better process technology. The study is in progress

Studies on `Potential of MFP industries in select regions'

Status studies of minor forest produce (MFP) and industries based on non wood forest produce of select regions have been undertaken. That pertaining to the State of Gujarat has been taken up by Gujarat Industrial and Technical Consultancy Organization Ltd. (GITCO); that of Tamil Nadu by Industrial and Technical Consultancy Organization of Tamil Nadu Ltd. (ITCOT) and that of West Bengal by West Bengal Consultancy Organization Ltd., (WEBCON) Kolkata. Studies under progress include those relating to the States of Uttar Pradesh and Uttaranchal undertaken by UPICO, Kanpur and that of Andhra Pradesh by APITCO, Hyderabad. The broad objective of these studies is to carry out a survey of the respective States, assess the availability of MFP and also to assess the industries which are dependent on MFPs as raw materials for their industries. The studies would find out the status of technologies available in the country and suggest measures towards generation of value added products based on these raw materials. Select project profiles relevant to the specific regions would also be brought out.

3.3 Studies on technology and innovation management issues

Technological dynamism has become the order of the day and new approaches; tools and techniques are being developed in technology and innovation management areas. Studies - in such emerging areas for harnessing value from knowledge leading to further knowledge creation, on technology transfer issues and technology upgradation measures, and in other technology areas - have been taken up. Specific studies for the benefit of small and medium enterprises have also been taken up. Identified sectors that offer opportunity for growth have been among those selected for study. These study reports are widely disseminated and have benefited industrial units, R&D organizations, academic institutes, Government departments and others.

Study on 'Innovation in Infrastructure Sector in India'

This study, assigned to XLRI, Jamshedpur, has been completed. The gist is as under :

The broad objective of the study report is to study the innovation aspects of the infrastructure sectors, assess the extent of innovation achieved and contribution to the nation's development. The scope of work inter alia includes bringing out the status of technology in use in traditional infrastructure sectors such as power, telecommunications, roads, railways and others, identifying gaps, and bringing out suitable recommendations to mitigate shortcomings and improve the situation.

The progress made in the *power sector* in respect of hydro, thermal, nuclear and renewable energy sources was explained. Relevant details of the policies in place, measures taken to promote private sector participation in this sector, problems

associated with transmission and distribution of power were brought out. Major innovations in this sector include advances in technology such as combined cycle gas turbine, flexible ac transmission system, gas insulated substations and geothermal power plants. *Telecommunications* has advanced very rapidly and tele-density is currently of the order of 7.49 per hundred. Introduction of varied services; data services for closed user groups; global mobile personal communications by satellite; use of optical fibre and optical repeaters; switching and transmissions products; modems; intelligent network are some of the major advances in this sector. *Postal* services have also undergone major transformation over the years. The Golden Quadrilateral project and the North-South/East-West corridors development that together comprise the National Highway Development Project are important developments in the *roads sector*. Major innovations in this sector include those in respect of road construction equipment; new road construction materials like stabilized soil, lime concrete and cement flyash; low cost drainage structures and geo-synthetic pavement reinforcing fabrics. Electrification of routes, advanced signaling systems, telemedicine facility linking railway hospitals, compact brake units, anti collision devices, auxiliary warning system, accident relief trains, metro rails and an integrated management information system for passenger use are among the very many major advances in the *railways sector*. Innovations in *civil aviation* include use of air traffic control, airborne collision avoidance system, improved communication navigational and surveillance system, global positioning system, automatic dependent surveillance system, satellite communication to link airports and development of private sector aided airports. Private sector ports, the Sagarmala project and acquisition of coastal research vessels viz. M. V. Sagar Purvi and M. V. Sagar Paschimi are among major developments in the *ports and shipping sectors*. Advances in *social sectors* include those relating to education, health and welfare, housing, water supply and sanitation and culture, in all of which many major innovations have taken place.

Study titled 'Social Capital and Technology'

The above study taken up in association with T A Pai Management Institute (TAPMI), Manipal would undertake research and analysis on the manner in which technology has shaped and continues to shape social capital among professional groups such as those of lawyers or architects; community-based networks that support the activities of the community; religious based groups centred on common spiritual traditions; and literary and artistic groups. Both a qualitative as well as a statistical analysis is would be undertaken, as part of the project.

Study on `Status and prospects of Industry-Institute Collaborations in Emerging Technologies'

The basic objective of the above study taken up by Confederation of Indian Industry (CII), Gurgaon, is to study the status of emerging technologies in the field of nanotechnology; both nationally and globally. The objective is also to identify research institutes capable of providing technologies for further development and status of their current activities. In addition, the study would aim to identify the specific industries interested in taking up further work in respect of these technologies and suggest suitable modalities for industry institute collaboration.

3.4 Targeted research studies on specific issues in technology transfer, technology and innovation management

There is immense need for serious research and study of several aspects concerned with management of technology in different sectors that are important for the economic uplift of the nation. This is to develop an objective understanding of complex situations demanding a focused direction. Such research efforts not only result in comprehensive information and data collection of a specific nature but also enable analytical decision-making. With this in view, the Division has been making focused efforts at promoting an objective analysis of situations requiring study, analysis and research. During the year, some more need based research studies were undertaken.

Study on 'Influences of Integration of Technological Strategies with Business Strategies of Large Public Sector Organizations and their Small and Medium Scale Suppliers'

A study on 'Influences of Integration of Technological Strategies with Business Strategies of Large Public Sector Organizations and their Small and Medium Scale Suppliers' had been taken up in association with Birla Institute of Technology (BIT), Ranchi. The study is under finalization. A brief synopsis follows. The broad objective of the study report is to understand and assess the manner in which business and technology strategies are linked in a public sector organization, taking the case of Central Coalfields Limited (CCL), Ranchi; a unit of Coal India Limited (CIL). It was mentioned that the case study approach had been used. Secondary data collection had been done through archival records, company sources, print and electronic media, documented information and industry data bases. Primary data collection relied on questionnaires and in-depth structured interviews.

CIL contributes nearly 88% of the domestic coal production. CCL has 69 operating mines, 28 of which are underground and the rest are open cast; 7 washeries of which 4 are coking the rest non-coking; 6 workshops; command area of 2600 sq k.mts and spread over 5 major coalfields all within Jharkhand. Over the years, CCL has taken a number of initiatives towards adapting to technology changes by introducing suitable technology modifications and gearing its strategies for increasing the quality and quantity requirements of its customers. CCL depends on a number of ancillary units for supply of material and equipment, the terms of purchase of which are covered by a company-wide purchasing policy. Some of the constraints that have hindered development of a good vendor system have been brought out in the report. The problems faced by the small vendor have also been highlighted in the report. While having a number of systems in place for development of technology related skills, a well knit company wide technology management approach is lacking, the report brings out.

Another major constraint is that the financial resources required for the purpose of meeting technology change are enormous, consequent to the process of coal mining being highly capital intensive. Besides, CCL has been facing problems in respect of identifying indigenous compatible technology, leading to over dependence on its technology suppliers. The report brings out that the company's monopoly in its area of operation has perhaps resulted in some complacency. Adequate interaction with the venders resulting in quick updation of technological information is a major requirement.

Study on 'Women Representation in Corporate R&D'

A study on 'Women Representation in Corporate R&D' had been assigned to IIM Calcutta. The basic objective of the study is to examine the determinants of women leadership in R&D Departments of various corporate organizations. Socio-cultural factors and linkages between national cultures and organizational practices and processes are also to be analyzed.

In phase I of the project the micro level factors were studied with the help of a structured questionnaire that looked at several variables inclusive of: belief and practices, values grid, work-family interface, superior-subordinate relationship, time management and organizational role stress. The data was collected from a select sample of industry corporates that was fairly broad based and the respondents, both male and female, were on an average in their mid-career stage and were in the middle management levels. An attempt to identify the influence of social roles on the structural roles of organization was made by analyzing the data. The findings indicated that concerns relating to the family were central to decision making among both male and female professionals. Both categories of respondents accepted the importance of family support to achieve career goals. Women sacrificed their career progression on account of family commitments. Despite participation of male professionals in household chores, the women bore the major responsibility of caring for the family needs. The findings also indicated that the salary progression of women was lower as compared to their male colleagues. Phase II was later taken up to examine macro level factors to identify the linkages between organizational culture and leadership styles of male and female professionals. Again a questionnaire based approach was used to study organizational culture, security, strategic leadership styles, leadership effectiveness and background variables. The same industry corporates that had responded during Phase I were again contacted. It emerged that males were perceived to be more professional and have greater competence as compared to their female colleagues, more so in certain jobs. While straightforwardness appeared to be the personality trait of male professionals, modesty and politeness appeared to be the hallmark of female professionals. As regards leadership styles, both male and female professionals exhibited synergist leadership styles to help the organization successfully balance expansion and sustain growth. Also, women did appear to more successfully don the role of an integrator of systems and structures and their preferred leadership method was a collaborative style. Women expressed that the organizational climate should be supportive and should favour commitment whereas men gave greater weightage to transversality and responsibility. In respect of team leadership, there were more male team leaders as compared to women leading teams.

Phase III to evaluate explicit gender policies in organizations, identify specific issues with reference to high growth companies as against conservative industries, has now been taken up.

Technology audit of Handicraft Artisan Units in the Coastal Districts of Karnataka

This project, taken up in association with NITK- Science & Technology Entrepreneurs' Park, Karnataka, would cover the status of three industries; viz. jewellery, stone carving and sandalwood article manufacture. The project would analyze and assess the number of skilled persons associated with each of these industries; assess the skill levels they possess, the different designs being brought

out by them, the processes adopted by them etc. The study is in progress.

Project on IP Audit

This project taken up in association with Waterfalls Institute of Technology Transfer (WITT), New Delhi includes preparation of a Manual on IP Audit, and a workshop to enhance awareness of the relevant issues. The focus of the manual would *inter-alia* be on analysing practices adopted by industry to protect inventions and evaluating a strategy for utilizing inventions effectively. Aspects covered would include: study of the success rate for obtaining intellectual property rights, examining efforts taken in commercialising patented inventions through licensing or other measures, compliance with the requirements of various IPR related Acts and Rules, examining measures taken to enforce confidentiality for internal use, mechanisms for detecting infringements of IPRs and other related issues.

3.5 Case studies covering Technology Management aspects

There has been a need to take up case studies that bring out how technology has been managed in corporate and research organizational settings. The objective has broadly been to generate learning from best practices. It has been realized that manufacturing and research organizations operate in a unique environment specific to a nation's requirements. It hence becomes important to study and analyze the manner in which technology is managed in these enterprises in the Indian scenario for several reasons. One important reason is that such studies are important for pedagogic use. Academic institutes have ventured to teach specific modules in Technology Management have often to rely upon case situations based outside the country due to acute paucity of relevant case material based in the Indian situation. These case studies also provide useful information to consultants and executives from industry.

Case study of a paints manufacturing organization

The case study of paints manufacturing organization, assigned to School of Management, IIT Bombay, has been completed. The gist of the study follows: The company is a typical medium sized Indian manufacturing organization that embarked on its operations as far back as 1920. Currently, it is partnering one of the top ten coating companies of the world. The company has two areas of business; decorative paints and industrial paints, each of which caters to different types of customers. The variety thus extends from decorative paints applicable for walls, wood and metal to the second category covering automotive paints, industrial coatings, high performance coatings and powder coatings. It has five manufacturing units, and one under commissioning being equipped with modern manufacturing facilities.

The company has a clear and well defined vision and strong values. It has invested in technology over the years and has excellent facilities for developmental research, improving its manufacturing process and continuously innovating on its products. The company has rich cumulative experience and thus the expertise to innovate and develop products and services to satiate changing needs of customers. It has a strong widespread distribution network that is effectively aiding its marketing efforts. The company has, over the years, entered into technical collaboration with several international industry leaders. The company's R&D focus is on development of new products, import substitution, improvement of existing production process and curtailing environmental damages. It has

internalized values in its organizational culture conducive to fostering innovation. It believes that values, such as, customer orientation, transparency in decision making, performance linked reward system and team work facilitate synergy and interdependence between individual and corporate development.

Over the years, the company has effectively changed its strategy from a local one to an outward looking global one. The business strategy has leveraged the organization's intellectual capital to provide competitive advantage. The intellectual capital has effectively played three kinds of roles in the organization: triggering, supporting and leveraging. Thus the company has been able to dovetail its R&D projects that are non-routine, discontinuous and incremental in nature together with those involving higher levels of creativity. A networked structure with high levels of horizontal differentiation as against vertical differentiation has been cultivated in recent years in keeping with the changes in the external environment. Suitable incentive schemes are in place to motivate employees at all levels to promote technological innovation in the organization. The R&D projects taken up have enabled the company to: grow faster by developing new products or modifying products for new markets, improve efficiency across the production process, reduce material costs and reduce inventory.

Case study of a manufacturing organization in the Engineering Sector

The case study of manufacturing organization in the engineering sector assigned to IIT Bombay has been completed. Managing knowledge in an organization is a challenging task. The organization studied has devised an innovative methodology for doing so. The case study illustrates how the organization faced with challenges in the current competitive environment handles this task efficiently

The company was initially founded in 1969, to manufacture oil fired boilers and is currently a multidivisional engineering solutions company with a global presence in over 40 countries, manufacturing products to meet international standards. The two key segments in which the company operates are energy and environment. The core business of the company is in: boilers and heaters, cooling systems, water and waste solutions, captive power as well as environment solutions and chemicals. Growth in international business is being accelerated through improved product-market alignments, consolidating presence in existing markets through improved direct presence and strengthening its partner network. The company has joint ventures with major international technology giants as well as strategic alliances with several international technology leaders. The company is in continuous pursuit of means to add to customer value by offering quality products and services and integrating internal organizational beliefs to business processes. It is promoting entrepreneurial skill among its employees to develop new ideas into projects for motivation and morale boosting. In delivering value to the customer, the company relies on its major strengths: extensive and varied experience with industrial processes, close familiarity with a range of fuels, expertise in application R&D and its trained and dedicated manpower. The R&D of the company is customer driven and application oriented, enabling it to customize appropriate solutions for different industry segments. The organization structure of the company is predominantly functional and is based on the industry sector. An open work culture has been promoted in the organization. Clients and suppliers are taken into confidence during the technology development phases. Every employee is motivated to suggest ideas for

improving business activity. Management is involved in creating a challenging and vibrant work culture where every employee can contribute and make a difference; suitable reward schemes are in place too. There are systems in the company for regular technology scanning enabling identification of new opportunities, acquisition of new product or process technology and suggesting new applications for a new product.

While there is no formal R&D project management system in place, all R&D projects are scrutinized appropriately at identified points on the project life cycle. The company does use secrecy agreements to bind the R&D project team members. The company aims to extend its growth by: providing total solutions to enhance the existing business portfolio and at the same time identify diversification into new business areas through technology scanning. Thus, by promoting an effective technology management culture, the organization has been able to gain a valuable competitive edge and stay ahead of competitors.

3.6 Collaborative work with Academic Institutes on Technology Management

Interaction with academic institutes, especially those concerned with technical and management education, has always been one of the focal areas of attention in the Division. Further, there is a need to give the necessary thrust to formal education in technology management aspects. There is a major requirement for a base of teaching tools that are of specific relevance to the Indian situation and the Division has made explicit efforts to fill this gap through its collaborative activities with different academic institutes across the country. Measures to develop sufficient teaching material based in the Indian setting and to enable appropriate understanding of the issues concerned is a continuous thrust of these collaborative activities. Also, recognizing that the Indian industry and research institutions operate in a unique manner that needs to be researched upon extensively and documented in order to enable teaching, further research and analysis suited specifically to their requirements, appropriate steps have been taken.

Collaboration with IIMs

The Division has collaborated extensively with several IIMs in its efforts to propagate an understanding of technology management related issues. Activities, inclusive of management development programmes, projects on technology and innovation management and focused research studies on several emerging aspects undertaken in association with IIM Ahmedabad, IIM Calcutta and IIM Indore are under progress.

Collaboration with IITs

Activities that had been taken up in the second phase of work taken up in association with School of Management, IIT Bombay and have been completed have generated an appreciable response. These include: organization of management development programmes, bringing out of newsletters, development of a portal and organization of a national seminar – each on specific aspects in the subject. The case studies and research study taken up during this phase are under finalization. Outputs generated during the first phase were much appreciated by the many users from industry, academic institutes, Government departments, consultancy and research organizations.

During the year, an electronic newsletter being developed in collaboration with IIT Madras has been launched. The objective of the Newsletter is to enhance technological

creativity and interest in technology development among various target groups. The newsletter features information on various technologies, case studies, and technology morphologies; and provide basic foundation in various aspects of technology management. It has generated a very positive response.

Collaboration with PSG Institute of Management, Coimbatore (PSGIM)

Activities undertaken in association with the PSG Institute of Management during the second phase have been completed. Those undertaken include counseling and training for development of human resources for implementation of technology management programmes, studies focused on specific industry related issues and information dissemination on aspects related to the field.

3.7 Collaborations with State level, research and other agencies on Technology Management

Interaction with Madhya Pradesh Council of Science & Technology

The Division had entered into the first phase of its collaboration with the Madhya Pradesh Council of Science & Technology in the form of a memorandum of understanding. Several activities aimed at fostering an understanding of technology management issues had been undertaken. Those that have been completed include newsletters targeted towards information dissemination and training programmes in Indore and Bhopal on specific aspects of technology management. Other activities that are under progress include case studies of special interest to the region.

Interaction with Karnataka Council for Technological Upgradation (KCTU)

Collaborative activities undertaken in association with the Karnataka Council for Technological Upgradation Bangalore, a joint venture organization between the Central and Karnataka State Government, were continued. Cluster level case studies, focused training programmes, information dissemination of technology management aspects specific to the region and bringing out of newsletters are among the activities taken up during phase I. The outputs generated and the training programmes conducted, including those for training of trainers, have been found to be extremely useful.

3.8 Industry-Institute networking

Center for Technology Management at Coimbatore

A Centre for Technology Management has been established at PSG Institute of Management, Coimbatore. The objective of the Centre is mainly to act as a resource base for Technology Management related activities for furthering knowledge in this field. The Centre provides information on an on-going basis in respect of local-specific technology related issues. An industry focus has been selected for the purpose so that close linkages between industry, technical, management and research organizations can be forged effectively. Activities taken up include: counseling and training; studies focusing on targeted industry related issues; services and guidance to SMEs; providing forums for interaction between different interest groups; publications on different TM aspects for increased knowledge sharing and others. The programme has completed its second phase.

Technology Management Center at Bhopal

Under a Memorandum of Understanding (MOU) with the Madhya Pradesh Council for Science and Technology Bhopal, a number of activities related to technology management have been initiated and a Technology Management Center has been started. The programme is currently in its first phase. The activities include specific region need-based study reports, bringing out of a periodic publication, the organization of training programmes and workshops on specific Technology Management related issues and awareness generation programmes.

3.9 Information dissemination

Newsletters

During the year, the Division has been bringing out newsletters on specific technology management aspects in association with IIT Bombay, PSGIM Coimbatore, KCTU Bangalore and MAPCOST Bhopal. In addition, a web based electronic newsletter has been launched in collaboration with IIT Madras.

Other publications for information dissemination

Portals and other interactive media are under development in association with ASCI Hyderabad, IIT Bombay and other organizations.

3.10 Training / Interaction meets / Seminars / Management Development Programmes

During the year, the following programmes have been organized :

- A Management Development Programme for the benefit of industry professionals on 'Technology Marketing and Management' was organized in association with IIM Calcutta.
- Courses and programmes on technology management aspects were organized by the Center for Technology Management at Madhya Pradesh Council for Science & Technology, Bhopal in different parts of the State.
- Workshops, courses and management development programmes on technology and innovation management issues were organized at Mumbai by School of Management at IIT Bombay as part of an on going collaborative project with the Division.
- Seminars on several aspects of innovation were organized by the Karnataka Council for Technological Upgradation under a collaborative arrangement with the Division in different pats of Karnataka.
- A National Seminar on 'Technology Management for Innovation and Entrepreneurship' was organized at Bhilai in association with Rungta College of Engineering & Technology, Bhilai.
- A Seminar on Technology and Innovation Management was organized in association with Maratha Chambers of Commerce and Industry and ICFAI in Pune.
- A Workshop on IP Litigation was organized in association with Intellectual Property Management Division, CSIR and CII in New Delhi.