

**REPORT OF THE
REVIEW COMMITTEE
ON
HOME GROWN TECHNOLOGY
PROGRAMME**



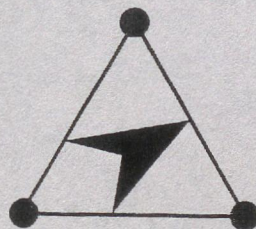
**Technology Information, Forecasting and Assessment Council (TIFAC)
Department of Science and Technology, Govt. of India**

February 2012

**REPORT OF THE
REVIEW COMMITTEE
ON
HOME GROWN TECHNOLOGY
PROGRAMME**

From:-

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TIFAC

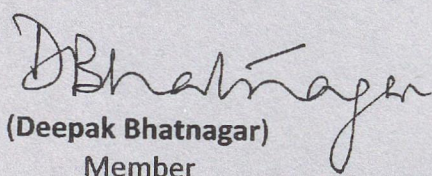
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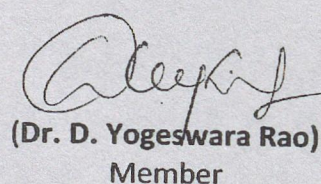
FOREWORD

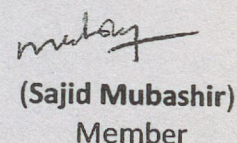
We are presenting this Review Report on Home Grown Technology (HGT) Programme implemented by Technology Information, Forecasting and Assessment Council (TIFAC) during 1992-2005. The main focus of the Programme was to address the shift in the technology scenario in the wake of economic liberalization and support a few bench-scale indigenous technologies, in a complementary and supplementary manner, to demonstrate the technological capabilities and to facilitate their reach to market. In the process, it aimed to foster and enhance closer linkages between industry and R&D institutions. TIFAC provided Technology Development Assistance (TDA) on returnable basis to 76 projects (out of 79) under this novel initiative to R&D institutes, industries (mostly SMEs) and other agencies.

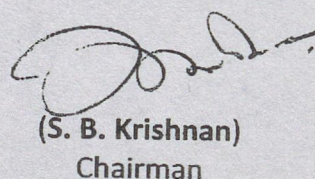
Relevant data collection from a number of files and their compilation and presentation before the Committee was an onerous task. This task was well performed by the Secretariat to the Committee lead by Dr. Shishir Kumar Goel, Scientist "D" and In-charge, HGT Monitoring Cell, TIFAC. We record with appreciation the work done by him and by his team members.

The Committee had been uniformly lucky as all the members contributed meaningfully in all the meetings thereby making the Committee's task easier to accomplish. We hope that the Committee's various observations and recommendations in this Report will not only help TIFAC to take appropriate decisions but also pave way for conceptualizing a similar programme with novel support mechanisms for the benefit of developing competing and competitive indigenous technologies.


(Deepak Bhatnagar)
Member


(Dr. D. Yogeswara Rao)
Member


(Sajid Mubashir)
Member


(S. B. Krishnan)
Chairman

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Executive Summary

TIFAC started HGT Programme to support few bench-scale indigenous technologies, in a complementary and supplementary manner, to demonstrate the technological capabilities available in the country and to facilitate their reach to market to meet the challenges in the era of economic liberalization.

The Programme was implemented during 1992-2005. TIFAC played a role of catalyst with technology returns being the prime focus. The return of funds/benefits from successful projects was advised without imposing severe commercial conditions in a flexible manner. Risk sharing was an important component of the Programme to encourage both industries and R&D institutions to take up such projects and in case of commercial failure the writing off of the funds was advised. Such mechanisms didn't exist at that time and the financial institutions/commercial banks were reluctant to fund such early stage developments. As per TIFAC objectives mass repetition of successful projects for greater societal benefits was also envisioned.

The Technology Development Assistance (TDA) was provided to public funded institutions, industries (primarily SMEs) and NGOs through 79 projects on flexible terms in various sectors and disbursement of a sum of **Rs. 35.81 crore** was made. A sum of **Rs. 20.38 crore** (about 57% of the principal disbursement) has been recovered till 31st December 2011.

Secretary, DST constituted a Committee under the Chairmanship of Shri S. B. Krishnan, former Member-Secretary, Technology Development Board in December 2010, to review the HGT Programme. The Committee held five meetings, studied the related material and made following observations and recommendations.

- The HGT Programme was the first of its kind for supporting the technology development in the R&D domain and was a pilot programme and a precursor for other programmes that had come up in the later years.
- HGT was conceived to fulfill a sub segment of complete technology development cycle, from the lab to pilot scale where it is difficult for any industrial concern to make significant investments. TIFAC's role was to share the risk.
- 71% projects had industry involvement and 30% of them were start-up companies. 80% of the projects achieved objectives and 27% projects had good impact on the recipient in terms of technology capability.
- Programme performance was impressive, when viewed from the modest financial inputs it had. It was largely successful in translating the laboratory-level innovations into technologies at pilot scale and the recoveries appear to be very impressive.
- A sample study of 15 successful projects (who fully returned the financial assistance) reported a turnover of Rs. 788 crore during 1998-2011. Contribution to exchequer through taxes amounted to Rs. 80 crore which was more than the entire Programme outlay. This also resulted in significant employment generation.

- A review of the Programme by an independent outside agency would have been of immense help to effect any midcourse corrections. Similarly, an in-house critical review might have also provided valuable insights.
- The Programme lacked well defined and documented projects handling procedures and there was no sunset clause to ensure its closure in public domain.
- The present economic scenario justifies interventions like HGT Programme, to generate new knowledge, in the context of the objectives of TIFAC. It should, therefore, consider mounting a new programme with the present learning. Such a new scheme might include collaborations and networking with other organizations, financial institutions and banks.

- Commercial failures are inherent in such projects due to varied reasons and HGT was no exception. This need not be construed as the failure of the Programme.
- Technology failures under such Programmes had to be looked at more benignly and one need not necessarily resort to legal course in all cases. Alternate dispute resolution and out of court settlement including one time settlement, recovery from the sale proceeds and conversion of loan into grants could be explored effectively.
- Closure of the unsuccessful projects should be made easier and simpler. Otherwise people may be discouraged to take up new challenges contrary to the scheme objectives.
- Scientific agencies are different from banks and other financial institutions as their primary objective to promote and nurture innovations in the country differed from their objective to earn profits. Routing S&T funds through them, therefore, require careful consideration.
- HGT experience of funding Public Institutions was not encouraging and most of their projects failed at the commercial level and returns were poor. Routing of funds through industries and professional and stringent monitoring would have yielded better results.
- Simultaneous funding of more than two projects to one institution needed careful examination and diversity of experts in Monitoring Committees with defined actions should have been encouraged. Recovery from such institutions in unsuccessful cases might not be worth as the transaction will only occur within government without any tangible results.
- HGT had projects ranging from larger developmental component to larger commercial component. The adoption of similar clauses in agreements for repayment was inappropriate and created difficulties. Agreements should, therefore, be carefully finalized avoiding inherent contradictions with termination clause and well defined foreclosure procedure.
- Programme lacked standard procedures to record success criteria, projects closure and submission of completion reports necessary for proper documentation. Post funding monitoring was inadequate.
- One Time Settlement (OTS) offers could not be accepted for want of a prescribed procedure that needed to be considered and accepted on a case to case basis by developing an appropriate decision making and enforcing mechanism.
- Several repayment reschedulement were not agreed due to non-availability of prescribed procedure and in place of accommodating genuine requests, legal recovery actions were initiated which appear to give an impression that those who take risks were penalized.
- TIFAC failed to timely empanel legal firms/ experts for proper advice and legal actions and subsequent follow up which could have saved several cases from becoming time barred. The dependence on a single legal firm for a very long duration requires reconsideration.

completion of the initial project for greater societal benefits was also envisioned in the Program, which was well within the objectives of TIFAC.

- 1.5 HGT Programme provided partial financial assistance to several public funded institutions, industries (primarily SMEs) and NGOs during 1992-2005. In the case of publicly funded institutions, the repayment was linked to sharing of monies earned from transfer of developed know-how in a predefined ratio, whereas easier repayment schedules with a small surcharge envisaged for industries. The focus was to provide an initial push for up-scaling the lab scale technology to pilot scale and towards first time marketing/ commercialization of the know-how.
- 1.6 TIFAC supported 79 projects under HGT Programme in various sectors including health /veterinary care, new/improved chemical processes, bio-technology, eco-friendly technologies, and products from natural materials.
- 1.7 Under the HGT Programme, TIFAC had disbursed a sum of Rs. 35.81 crore; this includes Rs. 8.36 crore to public funded institutions and Rs. 27.45 crore to industry. A sum of Rs. 20.38 crore (about 57% of the principal disbursement) has been recovered (Rs. 1.81 crore (22 %) from public funded institutions and Rs. 18.57 crore (68 %) from industry) till 31st December 2011.

2 Approval and Monitoring Mechanisms

- 2.1 To start with, the focus was on the generation and implementation of suitable proposals, under the overall guidance of a High Level Core Group (HLCG) with Director General, CSIR as its Chairman. Reputed scientists and technologists and Secretary, DST were part of this group. This group was helped by a Small Group constituted by HLCG under the Chairmanship of Dr. V. Siddhartha to generate and screen good proposals for HLCG's final consideration. The Executive Director, TIFAC, and other subject experts were members of Small Group. This mechanism was subsequently substituted by HGT Apex Board, constituted under the Chairmanship of Dr. V. Siddhartha. The last meeting of the HGT Apex Board that reviewed the complete Programme was held in August 2005. A separate Monitoring Committee was set up for each project to review and monitor the progress.

Report of the Review Committee on
Home Grown Technology Programme of
Technology Information, Forecasting and Assessment Council

1 Introduction

- 1.1 Technology Information, Forecasting and Assessment Council (TIFAC) was constituted in 1988 as a registered society under the Department of Science and Technology (DST), Government of India. It was constituted in the wake of India's economic liberalization that moderately started in mid-eighties getting full momentum post-1992, to meet the challenges of free market forces, technology acquisition and denials, and business competitiveness. In pursuit of its objectives several initiatives were taken by TIFAC. These include:
- △ technology assessment and forecasting studies in key areas of national economy;
 - △ keeping technology watch on global trends and formulation of preferred options for India;
 - △ setting up systems for information collection, analysis and implementation; and
 - △ promotion of key technologies.
- 1.2 Home Grown Technology (HGT) Programme was one such initiative, started in 1992. The main focus of the Programme was to address the shift in the technology scenario in the wake of economic liberalization and support few bench-scale indigenous technologies, in a complementary and supplementary manner, to demonstrate the technological capabilities and to facilitate their reach to market. In the process, it aimed to foster and enhance closer linkages between industry and R&D institutions as well as Academia.
- 1.3 A High Level Core Group (HLCG) was constituted by Secretary, DST under the Chairmanship of Director General, Council of Scientific and Industrial Research (CSIR), to guide, steer and monitor the HGT Programme. The HLCG observed, in its first meeting held in December 1992 that TIFAC should play a role of catalyst in supporting development of technologies with technology returns being the prime focus. Wherever possible return of funds/benefits from commercialization should be worked out, but severe commercial conditions for providing the financial assistance should not be imposed. Accordingly, TIFAC was advised to work out flexible mechanisms of supporting the projects. In case the efforts for commercialization did not yield desired results or led to a failure, the funds could be written off on a case to case basis.
- 1.4 Risk sharing at development stage was an important component of the Programme to encourage both industries and R&D institutions to take up such projects. At that time, such mechanisms didn't exist. The financial institutions/commercial banks were reluctant to fund such early stage developments. Therefore, the initiative by TIFAC was a welcome step and filled a gap for funding technology development. Mass repetition after successful

3 Review Committee

3.1 The Chairman, Executive Committee, TIFAC and Secretary, DST constituted a Committee in December 2010, to review the Home Grown Technology (HGT) Programme of TIFAC (Annexure-I). The Review Committee comprised the following:

Shri S. B. Krishnan
(Former Secretary, Technology Development Board &
Former JS&FA, DST) Chairman

Shri Deepak Bhatnagar
(Former Adviser & Scientist-G, TIFAC and Head CITT, IIFT, New Delhi) Member

Shri R. K. Gupta, IRS
(Former Registrar-TIFAC & Commissioner, Income Tax, New Delhi) Member

Dr. D. Yogeswara Rao
(Former Chief Scientist IICT, Hyderabad & currently Adviser O/o PSA,) Member

Shri Sajid Mubashir
Director, TIFAC, New Delhi Member

Dr. S. K. Goel, Scientist-D and Officer-in-charge of Monitoring Cell, TIFAC rendered administrative support to the Review Committee.

3.2 The terms of reference of the Review Committee were:

- ▲ To study the HGT project guidelines within the provision of bye-laws/rules of TIFAC
- ▲ To advise TIFAC and Council best way of resolving the issues concerning the repayment of Technology Development Assistance
- ▲ To advise the Council of remedial actions in such cases where recovery of funding is currently constrained; and
- ▲ To advise and recommend best course of future actions with respect to extending technology development assistance from TIFAC.

3.3 The Review Committee held its meetings in TIFAC on 24th January 2011, 26th July 2011, 20th October 2011, 20th December 2011 and on 1st February 2012. The meetings were attended by all the members except by Shri R.K. Gupta who did not attend the last three meetings as he opted out of the Committee due to his pre-occupation.

3.4 The Committee had examined the Programme in detail. In addition to studying, TIFAC bye-laws, HGT funding guidelines as well as other related information including the context in which the Programme was initiated, general philosophy, modalities to be adopted etc. , the Committee examined 50 projects not closed so far. The Committee was ably assisted by Dr. S. K. Goel, Shri Arghya Sardar, Mrs

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Nirmala Kaushik, Shri Anil Kumar Rai and Ms. Reena Rana with substantial details and significant data on each project.

- 3.5 The Committee's report is presented in two subsequent sections. Section - 4 deals with general assessment as well as observations of the programme and recommendations and Section - 5 deals with specific recommendations for resolving the issues concerning the repayment as well as remedial action for the remaining 50 projects, not yet closed.

4 Assessment, Observations and Recommendations by the Review Committee

4.1 Achievements of the Program:

- 4.1.1 The HGT Programme was the first of its kind for supporting the technology development in the R&D domain. In a sense it was a pilot programme and a precursor for other programmes that had come up in the later years. It was also launched at a time when the economic reforms were introduced and the country was debating the implications of WTO and India joining the organization. Nation was also looking for a reassurance that National Innovation System in the country had the capability to build technologies in the civilian sector and compete in the international arena.
- 4.1.2 HGT was conceived to fulfill a sub segment of complete technology development cycle, from the lab to pilot scale where it is difficult for any industrial concern to make significant investments. Financial institutions were not funding such developments. Further, Innovative technology transfer by scientific institutions in public domain to industrial concerns was not matured. Risk taking, in such innovative technology development was inevitable and TIFAC's role was to share the risk.
- 4.1.3 In its existence of over 12 years, HGT Programme had developed and supported 79 projects (including two study projects), encompassing diverse areas on innovative technologies with an outlay of Rs. 35.81 crore. Of these, 80% of them were reported to have achieved the project objectives. About 27% projects had good impact on the recipient in terms of technology capability. 71% projects had industry involvement and about 30% of them were start-up companies.
- 4.1.4 On any performance yardstick the performance of the HGT was impressive, particularly when viewed from the modest financial inputs it had. It was largely successful in translating the laboratory-level innovations into technologies at pilot scale. It is heartening to note that TIFAC, having had no prior experience in managing such programmes, the recoveries compared to the funds released appear to be very impressive. Since, the financial and intellectual investments were moderate to small in quantum; a proportionate impact could only be expected.

4.1.5 A sample study of 15 successful projects (who had fully returned the financial assistance) has reported a turnover of Rs.788 crore based on the developments supported under the Programme during 1998-2011. Their contribution to the exchequer by way of taxes amounted to Rs. 80 crore which was clearly more than the entire outlay of HGT Programme. This has also resulted in significant employment generation.

4.1.6 Several technologies developed with TIFAC assistance did not see commercial success. The reasons were attributed to environmental issues, changing national and international scenario, commercial viability, poor marketing techniques, and cheaper imports from neighboring country and so on. Failures are inherent in such technology development and up-gradation projects and in eventual commercialization, whether it is in India or elsewhere and HGT was no exception. This need not be construed as the failure of the Programme.

4.2 Recovery of Technology Development Assistance (TDA):

4.2.1 TIFAC had invested a sum of Rs. 35.81 crore in the Programme; this included support of Rs. 8.36 crore to public funded institutions and Rs. 27.45 crore to industries. A sum of Rs. 20.38 crore (about 57 % of the principal disbursement) had been recovered (Rs. 1.81 crore (22 % of the total recovery) from public funded institutions and Rs. 18.57 crore (68 % of the total recovery) from industry) till 31st December 2011.

4.2.2 Innovative technologies might not fare well if these were introduced ahead of the market preparedness and would call for larger level of marketing efforts and brand building exercise. As HGT projects were not funded to that extent, such outcomes could not be expected of the Programme.

4.2.3 Technology failures in Programmes like HGT had to be looked at more benignly. One need not necessarily resort to legal course in all cases as it would result in time and cost involvement. Alternate dispute resolution and out of court settlement including one time settlement could be explored effectively. If the technology had not succeeded or had become obsolescent, the assistance given under the HGT Programme could have been treated differently. Even transfer of assets acquired under the Programme had to be examined whether it would be worthy of transfer. Similarly, the product / process could not be established in the market though the project might have been successful, it could be examined for one time settlement keeping in view the investment made by the industry, the time and possibility of its recovery, and the ability to pay. Closure of the projects should be made easier and simpler if the newly developed technology/knowhow was not commercialized within a specified period despite sincere efforts. Otherwise people may be discouraged to take up new challenges which may be contrary to the larger objectives of the nation.

- 4.2.4 In some of the projects the recovery had not been in time. It was to be expected as the technologies developed did not succeed at the commercial level. Ideally such assistance to industry could have been treated as grants-in-aid. The other alternative was that the recoveries could have been linked to the sale proceeds from that product or process.
- 4.2.5 Scientific agencies providing financial assistance to technology development and commercialization efforts should not compare themselves with banks and other financial institutions as their primary objective to promote and nurture innovations in the country was different compared to the objective of the financial institutions, which was to earn profits. The role was different and the objectives were different. This was inherent in the schemes as the Government had given adequate space to operate these schemes with certain amount of freedom with a view to promote and nurture technology innovations. If this aspect was not realized then most of these S&T organizations might become more like the asset management companies, whose focus remained just on the recovery of funds without any assessment of impact made by their investment.
- 4.2.6 Routing funds earmarked for technology development through financial institutions require careful consideration as it might be contrary to the approach that led to the formation of Technology Development Board (TDB) and initiation of schemes like Drug Development Programme under Department of Science and Technology.

4.3 *Shortcomings in Program Administration:*

- 4.3.1 The HGT experience of providing TDA to Publicly Funded Institutions was not encouraging. Most of the technologies developed by these institutions had no takers or failed at the commercial level. Thus no revenues were generated in transferring the technologies and no monies were returned to TIFAC. The Committee opined that in future while extending support to these institutes, a more professional approach and rigor along with more stringent monitoring system should be adopted. It was felt that the TDA to public funded institutions would have yielded much better results if the same was routed through interested industries. This would have ensured better coordination and closer interaction between the institution and industry and it would have ensured transplantation of the knowledge/information and expertise from the institution to the industry. This is an important learning from the Programme.
- 4.3.2 The Committee observed that a number of projects were supported to a single institution at a time. Efforts should have been made to uniformly generate and support projects across the country at diverse institutes. The Committee felt that funding of more than two projects at a time to a single institution needed careful examination. Perhaps one can await the outcome of the earlier project before a third project was considered for funding assistance. Further, diversity of experts in Monitoring Committees should

also have been encouraged to ensure different perspectives on the progress of the project. The record notes of the proceedings of the Monitoring Committee should have been spelt out clearly the actions. With regard to the returns from these institutions, the Committee felt that the expenditure of efforts, time and money to recover dues from such public funded institutions in unsuccessful cases might not be worth as the transaction will only occur within the organizations that were publicly funded, without achieving any tangible results. Therefore the Committee recommends closure of these projects.

- 4.3.3 HGT had mix categories of projects. While some had a larger developmental component, the others had a larger commercial component. The adoption of similar clauses in agreement for repayment is inappropriate and has created difficulties. Agreements/contractual documents should, therefore, be carefully crafted on a case to case basis. The agreements lacked termination clause and well defined foreclosure procedure.
- 4.3.4 There are also inherent contradictions in the TIFAC agreement. For example, in some of the earlier cases, the return of TIFAC assistance is linked to successful commercialization of technology and in others it is linked to the completion of the project as declared by the Monitoring Committee. Monitoring Committees in many cases did not meet after completion of the project and thus not pronounced the completion of the project. Completion reports were also not obtained by TIFAC. The inherent contradictions have complicated where co-funding has been done with other financial institutions/banks. The Committee recommends that proper documentation of the knowledge generated in the projects was necessary and every project must ensure a completion report.
- 4.3.5 Technical success may not always lead to commercial success. Success criteria should have been defined early. In quite a few cases Monitoring Committee did not categorically state if the project was a success or a failure. This had further complicated matters in several cases. The post funding monitoring of the projects by Monitoring Committees should also have been done to understand real difficulties faced by the firm in commercialization of technologies on a regular basis.
- 4.3.6 Most of the projects were initially supported at publicly funded R&D institutions. In later years, TIFAC expanded the scheme to fund industries (mostly SMEs with few exceptions) directly and the agreements were modified with emphasis on returns and recovery of TDA assistance. In the process the scheme had lost the objective and TIFAC started behaving like a financial institution which was not the objective of the Programme.
- 4.3.7 Absence of clear Programme guidelines and defining the scope of operational area had led to supporting of wide ranging projects from Research & Development to scale-up to manufacturing to Commercialization. Further the agreements remained by and large same for

these wide ranging projects. This approach of 'one shoe fits all' did more damage to the scheme.

- 4.3.8 The Project Monitoring Committees (PMCs) could have been more forth right in their assessment of progress. Quite often the PMCs reviewed the projects as R&D projects and recommended the extensions in some cases more than the implementation period. In several cases the PMCs were not even convened at completion of project. It led to confusion as there was no final word from the PMC.

4.4 Shortcomings in Funds Recovery:

- 4.4.1 One Time Settlement (OTS) offers could not be accepted for want of a prescribed procedure. OTS needed to be considered and accepted on a case to case basis by developing an appropriate decision making mechanism. Once OTS was agreed between the parties, it should be sealed through a legally binding agreement without which it was not valid.
- 4.4.2 Various requests for the rescheduling of installments have been summarily rejected due to non-availability of prescribed procedure. This might not be correct as the main purpose of HGT funding was to develop and commercialize innovation based technologies. Failures can not be avoided in such an exercise and the rescheduling requests could have been considered on a case to case basis. In several cases in place of accommodating genuine requests, legal recovery actions have been initiated which appear to give an impression that those who take risks are penalized.

4.5 Other Shortcomings:

- 4.5.1 TIFAC should have empaneled a panel of legal firms/ experts for proper advice for timely legal actions and subsequent follow up, thereby, avoiding several difficulties and saved several cases from becoming time barred. The Committee felt that dependence on a single legal firm for a very long duration requires reconsideration.
- 4.5.2 A review of the Programme by an independent outside agency would have been of immense help to effect any midcourse corrections. Similarly, an in-house critical review might have also provided valuable insights.
- 4.5.3 The Committee feels that any programme should have a sunset clause howsoever good the programme might be. Closure of a programme should be in public domain. Procedures should be spelt out how the files opened under the programme would be closed and on going projects under the programme would be handled till they are closed. Transfer of the closed files to the Records Section would also facilitate the dealing officers.

4.6 *Recommendations for Future Innovation Support Programs:*

4.6.1 The present economic scenario justifies the abiding need to promote technology generation and commercialization through such interventions, and generating new knowledge, particularly in the context of the objectives of TIFAC, as TIFAC would be constrained to do technology forecasting and assessment without hands-on experience in such and similar programmes. TIFAC should therefore consider mounting a new programme with the learnings from HGT. Such a Programme might include collaborations with other organizations and networking with financial institutions and commercial banks.

5. **Specific Recommendations on Projects (50 cases, not closed so far)**

Sl. No	Project Title	Implementing Agency	Released TDA (Rs. Lakh)	Recovered TDA (Rs. Lakh)
1	CO based chemicals	IICT, Hyderabad	75	20
<p><u>Project Context</u> The project was supported to indigenously develop and commercialize new cost effective processes based on single step carbonization using catalysts to produce industrially important chemical intermediates of improved quality such as Phenyl Acetic Acid (PAA), Dimethyl Malonate, Diethyl malonate, Ibuprofen, Phosgene and Carbonates (like carbaryl, carbofuran and propoxur) etc.</p> <p><u>Status</u> The process know-how for the PAA, Dimethyl Melonate, Diethyl Melonate and Ibuprofen were developed. PAA know how transferred to Rashtriya Chemicals and Fertilizers Ltd. (RCF), Mumbai against payment of Rs. 34 lakh, out of which Rs. 20 lakh repaid to TIFAC in terms of MoU.</p> <p><u>Recommendations</u> IICT had partially succeeded in developing the technologies. It faced variety of technical hurdles and therefore could not fully exploit the newer developments. Future transfer of these technologies did not appear good, as the technologies were old and had become almost obsolescent. The Committee recommended to obtain updated information regarding the revenues earned from sale of these technologies from IICT and after ensuring recoveries in terms of the MoU, the file might be closed.</p>				

2	Development of technology for the manufacture of Hydro Fluoro Carbon-134A (HFC-134A) (Bench Scale)	IICT, Hyderabad	75	20
<p><u>Project Context :</u> As signatory to Montreal Protocol, India was required to phase out use and production of CFCs. These chemicals were used in refrigeration and air conditioning industry. IICT took up the task of developing a bench scale (80-100 gm/hr) process to manufacture HFC-134 A. Since it was a strategic requirement TIFAC assisted the technology development with TDA support.</p> <p><u>Status</u> IICT successfully developed the bench scale process at 80-100 gm/hr at 8 atmospheric pressure and collected the necessary data to set up a pilot scale of 5 kg/hr.</p> <p>A sum of Rs. 20 lakh was refunded by IICT to TIFAC out of the contributions received from M/s Navin Florine International Ltd., Mumbai and M/s SRF Limited, New Delhi, who joined hands with IICT to set up a pilot plant at Hyderabad.</p> <p><u>Recommendations :</u> Please see recommendation at project 3.</p>				
3	Development of technology for the manufacture of Hydro Fluoro Carbon-134A (HFC-134A) (Pilot Scale)	IICT, Hyderabad	100	Nil
<p><u>Project Context :</u> To set up a pilot plant for production of HFC 134A and collect necessary design data for setting up a manufacturing unit. Both the industrial partners indicated at project 2 had actively participated in setting up the pilot plant.</p> <p><u>Status:</u> A pilot plant was successfully erected and operations of different sections independently were demonstrated. Needful data to set up a commercial plant was also collected.</p> <p><u>Recommendations :</u> It is understood that a dispute arose between the partners with regard to deliverables and hence the agreed technology license fee was not paid to IICT. Subsequently, M/s SRF Ltd., had set up a commercial unit for production of HFC 134A and the other company had set up a unit for production of HCFC 133A, an intermediate for HFC 134A..</p> <p>The Committee observed that the institute had not initiated any legal proceedings against the companies for recovery of monies. The case was almost time barred. The Committee noted that the efforts of IICT and TIFAC had led to development of a critical technology at crucial time without resorting to imports and thus nation</p>				

	gained immensely in this critical area. In the process IICT too had gained substantial expertise in fluorination chemistry which led to development of several other technologies for strategic sectors (defence & space). These gains might be viewed positively and file may be closed after obtaining the updated information regarding the revenues earned from this know-how and ensuring the recoveries in terms of the MoU.			
4	Development of technology for the manufacture of Acephate (Tech.)	IICT, Hyderabad	25	Nil
	<p><u>Project Context :</u> Acephate (chemical name N-[methoxy(methylthi)phosphinoyl]) is an organo-phosphorous insecticide. The project was to develop an improved and BIS specifications complaint process technology at pilot scale.</p> <p><u>Status:</u> The project was successfully completed and process technology was developed. There was no incentive for the manufacturers to shift to new process technology in the absence of strict enforcement of BIS standards. The problems were further compounded by imports of cheaper and inferior quality product from China. IICT, could not transfer the technology to any of the domestic industries.</p> <p><u>Recommendations :</u> The Committee felt that although the institute was successful in developing an improved process technology for Acephate, it could not transfer the technology due to external factors. Such situations are very common in the technology transfer business. Since the technology was developed about 10 years ago, its chances of transfer are bleak due to obsolescent. The Committee therefore recommends the closure of the file after obtaining updated information regarding revenues earned from the technology, possibility of its transfer in near future, and making sure recoveries, if any in terms of the MoU.</p>			
5	Development of technology for the manufacturing of insecticide Esfenvalerate	IICT, Hyderabad	25	10
	<p><u>Project Context :</u> Fenvalerate, a third generation synthetic pyrethroid, and chiral compound) was an insecticide. The compound was a mixture of isomers. Later, it was discovered that only one isomer designated as SS and known as Esfenvalerate [chemical name S-(R*, R*) - Cyano((3-phenoxyphenylmethyl-4-chloro-2-(1-methyl ethyl)-benzeneacetate)] was found to be mainly responsible for the insecticidal activity. The technology to manufacture Esfenvalerate was proprietary to Sumitomo and DuPont and was not available to Indian companies.</p> <p>The present project was to develop Esfenvalerate technology at pilot scale.</p> <p><u>Status:</u> The project was successfully implemented and the know how was transferred to 3 industries, namely, M/s Sudershan Chemicals Industries Ltd., Pune, M/s Searle</p>			

India Ltd. and M/s Isagro Mumbai. These companies, however, didn't set up commercial plants due to availability of 20 % cheaper product from China.

Recommendations :

The Committee felt that the technology was successfully developed and transferred to 3 parties. A sum of Rs. 10 lakh was refunded to TIFAC. Due to external factors the institute could not maximize its returns on the technology. However, the institute had fulfilled its obligations as per the MoU. The Committee recommends the closure of the file after obtaining the updated information on the revenues received and ensuring the sharing of the revenues as per the MoU.

6	Development of continuous process for the manufacture of Sebacic Acid from Castor Oil	IICT, Hyderabad	13.5	Nil
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Project Context :

Sebacic acid was an important chemical and finds several applications. The project was to develop a continuous process technology for Sebacic acid based on castor oil.

Status:

The institute could develop a 30 liter capacity reactor to produce product @ 22 gm/hr on continuous basis. The institute faced several technical hurdles in developing the process. A preliminary material balance and cost calculations carried out for the developed process indicated the process to be economically unviable. Based on the Monitoring Committee advice the project was fore closed.

Recommendations :

As per the MoU, the institute was to share part of the revenue earned from the technology transfer. Since the technology was not developed, the technology transfer as well as sharing of revenues did not arise. The Committee therefore recommended closing the case.

7	Preparation of irreversible temperature sensitive paints/labels for pharmaceutical industry	IICT, Hyderabad	42.5	Nil
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Project Context :

The main focus of the project is to develop temperature sensitive labels to be used in pharmaceutical packaging applications.

Status:

Despite its best efforts, the institute had failed to develop the technology. The limited number of labels produced at lab scale were very costly and didn't generate confidence for further work. The Monitoring Committee had also recognized the need for multi-disciplinary approach in developing such technologies and recommended consortium approach for development of such technologies in future.

	<p><u>Recommendations :</u> As per the MoU the institute was to share part of the revenue earned from the technology transfer. Since the technology was not generated, the question of technology transfer as well as sharing the revenues did not arise. The Committee recommended closure of the case.</p>			
8	Development of technology for the manufacture of mono-nitro-toluene with high selectivity for para isomer	IICT, Hyderabad	60	Nil
	<p><u>Project Context :</u> The project involves development of a process technology for nitration of toluenes with high para selectivity employing reusable solid acid catalyst at pilot scale. The present process is based on a patented laboratory process developed by the laboratory.</p> <p><u>Status:</u> Although IICT successfully developed and demonstrated the new process @ 2 kg/hr scale, it took considerably longer time for development. The scenario in the meantime completely changed with availability of cheaper material from China, rendering the process uneconomical.</p> <p><u>Recommendations :</u> The Committee felt that whilst the institute had developed the process, the availability of cheaper material from china rendered the process technology uneconomical. The chances of the technology being transferred were rather dim unless the institute improves the process parameters further. The Committee therefore recommended closure of the case after ascertaining the revenues earned by IICT from the project so far and after ensuring recoveries in terms of the agreement.</p>			
9	Development of technology for the manufacture of Vitamin-A or Vitamin A Acetate based on synthetic route	IICT, Hyderabad	10	10
	<p><u>Project Context :</u> TIFAC supported IICT to develop a suitable process to manufacture Vitamin A through synthetic route, first at the lab scale and then upscale the same to a pilot scale.</p> <p><u>Status:</u> IICT successfully developed the lab scale know how to produce Vitamin A. Glaxo India Limited initially showed interest in the technology. But later backed out. Pilot plant studies were not taken up.</p> <p><u>Recommendations :</u> The Committee noted that IICT returned TIFAC assistance of Rs. 10 lakh provided for this purpose. Since the project was abandoned and IICT had returned the TDA support, the Committee recommended that the project might be closed.</p>			

10	Pre-bleaching of kraft pulp using xylanase and ancillary enzymes	IIT, Delhi	21	Nil
<p><u>Project Context :</u> Conventional methods available to reduce the use of bleaching agents in the pulp and paper industry were not conducive and new solutions were required to reduce environmental hazards from liquid effluents of these industries. With a view to reducing the liquid effluents while retaining the same brightness, TIFAC supported above project at IIT Delhi to develop a technology for pre-bleaching of the Kraft pulp using Xylanase and ancillary enzymes.</p> <p><u>Status:</u> IIT developed and optimized the process to produce Xylanase only at the 150 Liter fermentor scale at its pilot plant facility and failed to produce the required quantity of the enzyme for industrial trial as envisaged.</p> <p><u>Recommendations :</u> The Committee felt that IIT Delhi could not develop the technology to the desired level due to several technical hurdles. And hence, it could not transfer the knowhow. Since technology transfer did not take place, the question of repayment of monies did not arise. As the chances of technology transfer at the current level were not encouraging, the Committee recommended closure of the file.</p>				
11	Development of technology for the manufacture of Coir-CNSL board as wood substitute	CBRI, Roorkee	6.30	Nil
<p><u>Project Context :</u> TIFAC provided TDA to CBRI to set up a fully mechanized pilot plant capable of producing Coir-CNSL boards of standard sizes.</p> <p><u>Status:</u> CBRI developed smaller size boards of 5'x4' and 2'x2' manually and could not develop the standard sizes which required higher capacity hot press costing over Rs. 40 lakh. The project was short closed due to the inability of the lab to develop the complete technology.</p> <p><u>Recommendations :</u> The Committee noted that the project was short closed and the technology development remained inconclusive. Since the technology transfer did not take place, the repayments which were linked to transfer of the technology could not be realized. The Committee therefore suggested closure of the project.</p>				

12	Membrane cell process for the production of caustic soda and chlorine (chlor-alkali)	CECRI, Karaikudi	35.5	Nil
<p>Project Context : TIFAC provided TDA to CECRI to upscale its lab level know how of membrane cell technology for producing chlor-alkali to a pilot scale of 0.75 TPD capacity. The development required installation of 10 cells for the electrolysis of brine solution.</p> <p>Status: CECRI could only develop 6 cells for the electrolysis of brine and failed to develop another 4 cells due to unavailability of adequate rectifiers with them.</p> <p>Recommendations : CECRI failed to successfully upscale the technology and could not transfer the technology. The repayments which were linked to transfer of technology could not be realized. The Committee therefore recommended closure of the project and suggested to recover an unspent balance of Rs. 1.96 lakh from CECRI as per utilization certificate submitted by them</p>				
13	Up-gradation and commercialization of 64 bit Parallel Computer (Flosolver)	NAL, Bangalore	66	Nil
<p>Project Context : TIFAC provided TDA to NAL to up-grade 64 bit parallel computer (Flosolver) including Graphic User Interface to enhance its commercial prospects.</p> <p>Status: NAL successfully developed the product. But the lab could not commercialize the product as there were hardly any Indian hardware manufacturers. The laboratory's efforts to transfer the technology did not bear fruit.</p> <p>Recommendations : The Committee observed that since the technology could not be commercialized, the question of repayment did not arise. Technology advancements in the field had been very rapid and there was no possibility of reaping commercial benefits from the project. The Committee recommended that the file might be closed.</p>				
14	Environment friendly coke-less cupola	NML, Jamshedpur	45	8.25
<p>Project Context : TIFAC provided TDA to NML to develop a 2T/hr capacity improved natural gas based coke-less cupola with lesser emissions. The development envisaged to replace coke burning in the foundries in the Taj Trapezium Zone.</p> <p>Status: The technology was successfully developed by NML and the operations of the 2T/hr capacity gas based coke-less cupola was demonstrated in the premises of Agra Loh Udyog, Agra in May 1998. Some minor difficulties during the trial runs were</p>				

	<p>adequately resolved and the technology was transferred to M/s Tata Korf Engineering Services Limited for further commercialization and TIFAC received a repayment of Rs. 8.25 lakh from NML till date. However, wider commercial exploitation of the technology could not be ensured</p> <p><u>Recommendations :</u> The Committee felt that the technology was developed over 10 years back and despite its initial transfer to M/s Tata Korf Engineering Services Limited, further propagation of the technology could not be ensured. NML had informed TIFAC in May 2011 that it had not earned any further revenues from the sale of this technology and as and when any more revenues were generated the same will be shared with TIFAC in terms of the MoU. In view of the above the Committee recommended closure of the file.</p>				
15	Development of prototype plasma pyrolysis reactor for safe disposal of medical waste	FCIPT, Gandhinagar	IPR,	18	Nil
	<p><u>Project Context :</u> The project aimed at development of a plasma pyrolysis (burning at around 1400° K in oxygen starved environment) based reactor for safe disposal of hospital waste and demonstrate its operation at select hospitals.</p> <p><u>Status:</u> The technology was successfully developed @ 15 kg/hr scale with a cost of around 22 lakh, disposal cost of around Rs. 20 /kg without any residues and Rs. 14 /kg with energy recovery and energy consumption of around 1.6 kW/kg. The emissions of harmful gases were found to be well within the CPCB prescribed limits and scrubbing and quenching of CO, CO₂, H₂O and NO_x restricted their recombination reactions. On TIFAC recommendation above technology based solutions have also been included in Indian Gazette for safe disposal of hospital waste of category 1 and 2. The inclusion of category 6 and 7 is also being pursued by FCIPT. The technology was transferred to M/s Bhagwati Spherocast Limited, Ahmedabad on non exclusive basis @ a lumpsum cost of Rs. 20 lakh payable to FCIPT in 4 equal half yearly installments in 1999 and in 2005 to M/s Bhagwati Pyrotech Pvt. Ltd., Ahmadabad, a new company formed by the same promoters on exclusive basis. TIFAC did not have information about the receipt of payments..</p> <p><u>Recommendations :</u> The Committee observed that the technology was developed and transferred to an industry by FCIPT at a specific price and it was included in Indian Gazette as a technical solution for the safe disposal of hospital waste. The Committee advised TIFAC to pursue for recovery of money as per the MOU at the earliest. If necessary the good offices of the Chairman TIFAC Governing Council might be used in collecting the dues.</p>				

16	Development of biofertilizers technology for field application	BAIF Development Research Foundation, Pune	39.755 00	Nil
<p><u>Project Context :</u> TIFAC provided TDA to BAIF Development Research Foundation, Pune to set up a pilot plant (200 tons/batch capacity) for Biofertilizers production using large scale fermentation techniques. The development of good quality biofertilizers, however, required identification of specific strains of microorganisms, good quality carrier materials, improved shelf life and large scale production.</p> <p><u>Status:</u> The organization initially set up a Biofertilizers production pilot plant (200 tons/batch capacity) using large scale fermentation techniques at BAIF, Whagoli facility. The lignite was used as a carrier material and the product was tested for following crops and tree species:</p> <ul style="list-style-type: none"> • Rhizobium for leguminous crops like groundnut, soybean, pigeon pea, green gram, black gram and multipurpose tree species • Azotobacter for cereals and millets • Azospirillum for cash crops like sugarcane • Phosphate Solubilizing Bacteria for application in a variety of crops grown in deep soils. <p>The manufactured biofertilizers was supplied to Rashtriya Chemicals and Fertilizers Ltd to meet their occasional need and BAIF for its captive use in different field locations. However the organization could not address the automatic packaging to avoid contamination due to higher moisture content (30%). Later BAIF had sold its facility at Whagoli to an MNC under intimation to TIFAC. Thus the technology could not be completely developed and could not be transferred.</p> <p><u>Recommendations :</u> The Committee felt that despite the best efforts of the organization, it could not successfully develop the technology. Since the technology was not transferred to a third party the question of repayment did not arise as per the clause in MoU. The Committee recommended closure of the file as the possibility of the transfer of the technology was not good.</p>				
17	Development of diagnostics for important diseases in India	BAIF Development Research Foundation, Pune	79.824 50	50.2694
<p><u>Project Context :</u> TIFAC provided TDA to BAIF Development Research Foundation, Pune to develop economical and user friendly ELISA technology based Rapid Diagnostic Kits for monitoring Brucellosis and New Castle Disease in Cattle and Infectious Bursal Disease in Poultry and scale up the development at pilot plant level.</p>				

	<p><u>Status:</u> Three ELISA technology based Rapid Diagnostic Kits for monitoring Brucellosis and New Castle Disease in Cattle and Infectious Bursal Disease in Poultry were successfully developed.</p> <p>The facilities of BAIF Laboratory Limited, where the project was implemented was sold to M/s Hoechst Roussel Vet. Pvt. Ltd. in 1999 along with the project related assets. TIFAC was to receive a lumpsum payment of Rs. 50 lakh plus 5% royalty on the ex-factory sale value of the products for 5 years for transfer of technology on exclusive basis. TIFAC received Rs. 50 lakh as lumpsum and a royalty of Rs. 26924/- . The company informed that there was no further production of the product and hence royalty was not payable.</p> <p><u>Recommendations :</u> The Committee felt that the project was successfully completed and the technology was transferred. While transferring the technology TIFAC adopted staggered payment and it did not yield dividends, as expected. It received only Rs, 50.269 lakh. The Committee recommended the closure of the file.</p>			
18	Development of high performance synthetic thickener for substitution of kerosene in pigment printing of textiles	ATIRA, Ahmedabad	15	3.40795
	<p><u>Project Context :</u> The project was aimed at development of synthetic polymer based product as thickening agent for printing pigment colours on textiles in place of kerosene, a pollutant. ATIRA was the agency which took up the responsibility to develop the alternative with TDA from TIFAC.</p> <p><u>Status:</u> ATIRA developed the product and filed patents in India, Bangladesh and Sri Lanka with the help of Patent Facilitation Cell (PFC) of TIFAC.</p> <p>The technology was transferred to M/s Gunjan Paints Ltd., Ahmedabad, which had set up a commercial unit with TDB assistance. The company could not stabilize the production due to teething technical problems and could not obtain consistent quality product. As a result the company could not launch the product fully. Some quantities of the product were made and the same was sold. A sum of Rs. 40,795 was received as royalty by TIFAC as part of its share. Due to technical problems the company could not reap commercial benefits from the technology. In the mean time several competitive products were introduced into market from external companies cutting into the markets of the company. Since the company had to invest substantial sums in further R&D and plant modification to achieve improved product quality, it requested for waiver off the recovery of royalty of Rs. 5.125 lakh payable by it to both TIFAC and ATIRA.</p>			

	<p>Recommendations : The Committee noted as per the MoU the organization had paid TIFAC share. ATIRA was agreeing to share any monies that it would receive from the client with TIFAC as per the MoU. The Committee therefore felt that there was no need to keep the file alive and suggested its closure.</p>			
19	Recovery of cobalt from industrial waste having significant cobalt content	M/s. Hindustan Zinc Limited (HZL), Udaipur (Money given to company) Technology developed jointly by BARC and Hindustan Zinc Limited	40	0.77175
<p>Project Context : Cobalt is a strategic material and finds extensive applications. Its production in India was limited and the demands were mainly met through imports.</p> <p>The process to extract cobalt from beta cake (residues with 1-1.5 % cobalt generated during the hydrometallurgical processing of zinc concentrate) was developed jointly by Central Research and Development Laboratory (CRDL) of Hindustan Zinc Limited (HZL) and Bhabha Atomic Research Center (BARC) and a demonstration plant was set up at CRDL in 1990. The recovery from this process was low (40%) and there was high cobalt loss (20 %) during iron removal stage. Problems related to formation of some hard crude mass in various sections of mixer, settler units due to presence of suspended particles and soluble silica in the feed solution were also there.</p> <p>In the present project HZL along with BARC took up the task of improving the overall recovery (60 %) and purity (more than 99 % from earlier 98.5 %) of cobalt from above process by incorporating suitable modifications. Augmentation of the production capacity to 60 kgs/day and development and scaling up of cobalt recovery processes from other industrial wastes were also envisaged.</p> <p>Status: Due to complexities of the problems, the project implementation took much longer period and its scope to produce cobalt metal powder was not taken up due to limited availability of beta cake. Development of processes for cobalt recovery from other industrial wastes was also not taken up and the company availed TIFAC assistance partially.</p> <p>However, cobalt recovery of 66 % with more than 99 % purity was achieved and the project was declared successful in July 2000. The commercialization was, however, not taken up due to drop in the cobalt prices in international market rendering the plant operations unviable. TIFAC only received an amount of Rs. 77175/- towards the royalty @ 5 % of the sale value of 1715 kg of cobalt produced from the above plant during December 2001 to January 2002 and there had been no development after that and the plant is lying idle.</p>				

In 2001 TIFAC suggested HZL to transfer the technology to NRDC and other interested parties and failing with the assets might be auctioned to recover the monies. None of these were accomplished. Government in the meantime had sold the HZL to Vedanta Group. The officials of the Vedanta group visited TIFAC in December 2010 and were advised to get the plant and machinery related to the project valued by a government approved valuer and return the amount corresponding to the TIFAC share in the project. There had been no response from them till date.

Recommendations :

The Committee recommended that TIFAC should obtain the balance sheets of the company and examine whether its dues have been shown as liabilities or not as all the assets and liabilities are transferred in toto during a takeover. TIFAC may thereafter send a reminder to recover its dues in terms of MoU and take legal advice.

20	High energy rare earth permanent magnets	Non-ferrous Technology Development Centre (NFTDC), Hyderabad (Money given to NFTDC) and Defence Metallurgical Research Laboratory (DMRL), Hyderabad developed the lab scale know how	83.08	24.16716
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Project Context :

NFTDC and DMRL proposed to jointly develop, scale up and commercialize Samarium-Cobalt (SmCo_5) and Neodymium-Iron-Boron (Nd-Fe-B) Rare earth magnets. These materials find applications in strategic sectors and in miniaturization of electric and electronic devices.

Status:

The agencies developed the Nd-Fe-B technology (having optimum properties) and field tested with public sector and private companies. The know how was transferred to MIDHANI in mid 1996 for commercial exploitation. While MIDHANI was trying to streamline the large scale production technology for the near-net shaped magnets required by customers, the availability of the Chinese magnets in Indian markets at a cost lower than the raw material cost for MIDHANI seriously jolted the marketing prospects for Indian technology. An amount of Rs. 24,16,716/- out of released assistance was returned by NFTDC in 1998.

TIFAC followed up with NFTDC and DMRL till the beginning of 2004 and there was no response from them.

	<p><u>Recommendations :</u> The Committee noted the facts and recommended that TIFAC should write to NFTDC and find out the details of any technology transfer fee earned by them. After recovery of proportionate amount out of this fee as per the MoU the case file may be closed. If timely reply is not given the information might be sought through RTI to ascertain the position.</p>			
21	Commercialization of technology for CF lamination of Particle Boards	M/s Prerna Boards Pvt. Ltd., Secundrabad (Money given to company) IICT, Hyderabad was to provide technology	54	Nil
<p><u>Project Context</u> IICT developed a lab scale CF Lamination Process. M/s Prerna Boards Pvt. Ltd., Secundrabad showed interest in upgrading their products, namely, waste wood dust based particle boards using this process. The laminated boards were envisaged to be used as refrigerator tops, table tops, sewing machine tops, door panel inserts, partition panels and ceiling tiles etc. The company availed TIFAC assistance to set up a semi-automatic plant of an installed capacity of 2370 MTA for this purpose.</p> <p><u>Status</u> Know how had teething problems and didn't work at the plant scale. An alternative single component polyurethane paint technology suggested by the institute did not find merit with the company. The company did not start commercial production and suffered closure. HGT Apex Board in its last meeting observed that "there might be deficiency of service on the part of R&D institute and suggested not to pursue legal action against the company". On the advice of Dr. Kota Harinarayan Committee, the chief promoter was located in August 2010. He had informed that the company's assets including land, building, plant and machinery were taken over and auctioned by the Bank of India to recover their dues and equity investment by APIDC-VCF in the company was written off due to project failure. TIFAC didn't receive any returns from the project despite having an ownership on the plant and machinery with bank on pari-passu basis. Legal advice was to write off the assistance as recovery action cannot be initiated on account of case becoming time barred.</p> <p><u>Recommendations</u> The failure of company to manufacture the product due to technology deficiency was noted. Therefore, the recoveries were to be made from the sale proceeds of the assets by sharing them in the investment ratios with Bank of India. The law of limitation is not relevant in this case as the bank has already disposed off company's assets to recover its dues. The company and bank should have informed TIFAC about this action. TIFAC may write to bank and find out the details of amount recovered by disposing off the assets and claim TIFAC share as per the terms of agreement. After recovering its share, the case may be closed.</p>				

22	Manufacture of Red-mud Fly Ash Polymer R. Wood Door Shutters	M/s Dual Build Tech (P) Ltd., Chennai (Money given to company) RRL, Bhopal was to provide technology	30	15
<p><u>Project Context :</u> M/s Dual Build Tech Ltd., Chennai set up a pilot plant at Pondicherry to manufacture Red-mud Fly Ash Polymer R. Wood Door Shutters based on a know how jointly developed by RRL Bhopal and BMTPC. A production capacity of 12 to 15 door shutters per day was successfully achieved.</p> <p><u>Status</u> Although, the product was approved by CPWD and TADC for the intended use, the user feedback was not good as the product was costlier, heavier compared to wood shutters and suffered from problems of poor surface finish warping and buckling during use of nails and screws. The technology suppliers could not solve the problems. No further production took place. The project was a commercial failure. TIFAC decided to recover only the principal amount from the company. HGT Apex Board in its last meeting observed that "there might be deficiency of service from the part of R&D institutes and it is advisable not to pursue legal action against the company". In the meantime the OTS agreed by TIFAC was also endorsed by TEC Sub-Committee headed by Dr. Kota Harinarayan. The company is using project related assets for other purpose and has repaid an amount of Rs. 12.40 lakh so far. Although the company had made several requests to waive off the remaining outstanding dues, it was not agreed to.</p> <p><u>Recommendations :</u> The Committee noted the deficiencies of the technology and the TIFAC's gesture to recover only the principal amount. However, no contractual agreement was signed for OTS. The company repaid Rs. 12.40 lakh so far. The Committee further noted that the company's request for waiver of balance was not agreed to. The Committee felt, in case of action as per agreement, TIFAC would have recovered a much lesser amount from the sharing of the sale proceeds of the assets. The recoveries were possible, since the company was able to use the facilities for other products. The Committee felt that TIFAC might negotiate with the party to recover maximum possible dues from the outstanding amount of Rs. 2.6 lakh and the remaining dues (if any thereafter) may be written off and the case file might be closed.</p>				

23	Manufacturing process for ceramic crucibles for carbon & sulfur analysis	M/s Advanced Ceramics Pvt. Ltd., Hyderabad (Money given to company) ARC-I, Hyderabad was to provide technology and help the company in up scaling to acquire the capability for commercial manufacturing of the product	20	9.86420
<p><u>Project Context :</u> Ceramic crucibles were used in steel industry for carbon and sulphur analysis in molten metal. Leco, USA had a monopoly in the world market. The company set up a pilot plant to manufacture such crucibles to meet local demand based on a technology developed by ARC-I, Hyderabad.</p> <p><u>Status:</u> The company could initially produce ceramic crucibles of quality comparable with Leco, USA at the lab scale. It had set up a facility to produce 7,20,000 crucibles per annum. The project was declared technically successful by the Monitoring Committee. The original repayment schedule was modified by TIFAC twice due to company's financial problems. The company could not adhere to the revised payment schedule. HGT Apex Board in its last meeting suggested that "in case of this project TIFAC administrative action should take into account long term interest. Mere legal action may not be correct option due to larger time and cost involvement. The relative merits of various options including one time settlement, converting repayment into revenue etc. should be considered".</p> <p>Subsequently the company faced several technical problems related to the quality of crucibles and reported that the lab scale quality, could not be achieved at the pilot plant level. These were related to:</p> <ul style="list-style-type: none"> • Reaction of crucible body with high sulphur and low carbon samples and cracking producing dust leading to frequent filter choking • Higher transportation cost due to lesser strength • Cracking of crucibles in those samples where Tin (Sn) was used in place of Tungsten (W) accelerators <p>Leco crucibles didn't have above problems and ARC-I failed to rectify the same. The company, therefore, failed to exploit the market and suffered net losses over the years.</p>				

TEC Sub-Committee headed by Dr. Kota Harinarayan considered the case and observed that the technology developed under the project was not commercially viable. It recommended a One Time Settlement (OTS) at the depreciated value of the assets by 31st March 2009, failing which, transfer of assets to ARC-I was suggested. Above recommendations were accepted by TEC and implementation was to be carried out after taking legal advice.

The company repaid a sum of Rs. 9.86420 so far. In July 2011, it had requested TIFAC to accept its One Time Settlement (OTS) proposal to repay only Rs. 10.13580 lakh of principal outstanding in ten half yearly installments backed by post dated cheques or take over its assets for the recovery of its remaining dues in terms of the deed of hypothecation.

Recommendations :

The Committee noted the facts related to the case and observed that the company is resuming its activities and is having an inclination to settle its dues with TIFAC. The company may, therefore, be invited for discussions for a negotiated OTS settlement.

24	Eco-friendly lac dye from shellac wash water effluent.	<p>M/s Tajna Shellac Pvt. Ltd., Khunti, Ranchi (Money given to company)</p> <p>M/s Alps Industries Ltd., Ghaziabad was to give technology (But it failed)</p> <p>The know-how developed by Indian Institute of Natural Resins and Gums (INRG), Ranchi earlier known as Indian Lac Research Institute (ILRI) was then used</p>	40	40
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Project Context :

A significant quantity (about 2 %) of lac dye (a natural product) is washed away in to effluents in lac processing units. M/s Tajna Shellac Pvt. Ltd. had proposed to setup a pilot plant for the extraction of lac dye from effluents of its unit located at Khunti near Ranchi based on a technical know-how developed by Institute of Natural Resins and Gums (INRG), Ranchi earlier known as Indian Lac Research Institute (ILRI).

Status:

The company set up the unit. HGT Apex Board in its last meeting noted the successful completion of the project and suggested that "TIFAC may conduct a

study on the impact of these projects in terms of the turnover, employment generation and other direct and indirect benefits".

M/s Alps Industries Limited didn't honour its buy back arrangement with the company. The unit did not earn profits despite sincere efforts. The unit operated occasionally. The company repaid the principle amount of Rs. 40 lakh from the earnings of its other business. The company made several requests to TIFAC to waive off the surcharge of Rs. 8.0 lakh stating among others poor crop conditions and naxalite interventions in the supply of the seed lac from nearby jungles. The requests were not agreed to. Dr. Kota Harinarayan Committee considered the case and did not agree to waiver of surcharge.

Recommendations :

The Committee noted the facts related to the case and observed that the project had not registered commercial success despite sincere efforts. The local conditions related to the regular supply of raw material i.e. seed lac had deteriorated over the years due to crop failures and naxalite problems. Even then the company had repaid principal amount worth Rs. 40 lakh from its other business. The company's efforts in project implementation in the given circumstances are praise worthy and further recovery of surcharge and additional interests may not be pursued with them and the case file may be closed.

25	Extraction of flavouring compounds from Hops using liquid CO ₂ under high pressure	M/s Aromatrix Flora Pvt. Ltd., New Delhi (Money given to company)	50	43.75
		Foundation of Innovation and Technology Transfer (FIIT), IIT Delhi licensed the technology		

Project Context :

Hops are flowers that contain alpha acid and essential oils which give bitterness, aroma and colour to Beer. Hops are used primarily in two forms, viz., pellets and extracts by the breweries world over. Indian breweries imported the same from Germany, USA and China. M/s Aromatrix Flora Pvt. Ltd. had set up the only unit for the pelletization of Hops flowers primarily grown in Lahul and Spiti (Himachal Pradesh) due to very specific climatic conditions required for their cultivation. The company proposed to set up a processing plant to extract the essential oils from the Hops pellets using liquid CO₂ under high pressure, a 10 liters capacity technology developed by IIT Delhi, at a relatively low price with TIFAC assistance.

Status:

A plant of 0.75 tons/day capacity was successfully set up by the company. The company is repaying TIFAC assistance as scheduled and is aiming for further scaling up its operations with the assistance of Technology Development Board (TDB) and

	Ministry of Food Processing Industries.			
	<p><u>Recommendations :</u> The Committee noted the facts related to the case and observed that full fledged commercialization has been successfully achieved in the present case and the repayments of TIFAC assistance have been made timely by the company.</p>			
26	Manufacturing plant for heat pipe based heat sinks	M/s Capri Cables Pvt. Ltd., Hyderabad (Money given to company) ARC-I, Hyderabad was to provide technology	22	14
	<p><u>Project Context :</u> Heat pipes are devices capable of quickly transforming heat from one point to another with almost no loss and find application in power electronic devices like diodes, thyristors and field effect transistors etc. The company had set up a small pilot plant to manufacture such devices of various specifications at the Technology Incubation Center of ARC-I, Hyderabad. The company took up the task of up-scaling the production capacity of above plant to 40000 units per annum with TIFAC assistance to meet the market requirement.</p> <p><u>Status:</u> The Company implemented the project but it couldn't avail full TIFAC assistance as originally approved due to its inability to comply with the Monitoring Committee recommendation to further improve thermal design and optimize material consumption to reduce cost. The company initially faced difficulties in marketing the products and thus made no repayments to TIFAC. The company's marketing efforts led to orders from Medha Servo Devices. BHEL is also likely to place an order. The company's efforts in commercializing the technology were also praised by Dr. Kota Harinarayan Committee. TIFAC had reduced the repayment amount to Rs. 26.4 lakh from Rs. 36 lakh due to lesser TDA availed by the company and revised the repayment schedule. The company had repaid Rs. 14 lakh so far.</p> <p><u>Recommendations :</u> The Committee noted the facts related to the case and observed that commercial success has been achieved by the company after initial difficulties and repayments of TIFAC assistance are being made as per the revised schedule.</p>			

27	Pilot scale manufacture of bioreactors	M/s Spectrochem Instruments Pvt. Ltd., Hyderabad (Money given to company) Know-how developed in house	50	48
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Project Context :

M/s Spectrochem Instruments Pvt. Ltd., Hyderabad, a company promoted by an ex-DRDO scientist took up the challenge of developing and marketing micro controller based glass bioreactors of 2L, 5L and 15L capacities with TIFAC assistance.

Status:

The company implemented the project and acquired the capability to manufacture micro controller based 50 glass bioreactors (of 2L, 5L and 15L capacities) per annum as envisaged. The products were comparable with international products and were sold under the trade name 'Biotron'. The company applied for patenting the reactive control logic developed and used by it for these bioreactors and the product was also displayed in Vigyan Rail. The market success, however, was eluded due to slow growth of biotechnology industry in the country that compelled closure of biotech teaching at several institutions. The company, however, continued its efforts and further customized the product as per the user requirements at lower costs. The company was facing cash flow problems due to insufficient orders. The company also puts in a lot of efforts in R&D activities to come out with other novel products to ensure its survival which also enhances their cash flow problems. The repayment schedule was revised two times by TIFAC on company's request. HGT Apex Board in its last meeting observed that "TIFAC may conduct a study on the impact of these projects in terms of the turnover from these projects, employment generation and other direct and indirect benefits". The company had made a written request in September 2011 to reschedule the repayment of 9th installment of Rs. 6.0 lakh from present 24th September 2011 to 24th December 2011 on account of reduced sale of bioreactors.

Recommendations :

The Committee noted the facts related to the case and observed that the company had achieved limited success in commercializing the product. Even then the company had cleared maximum dues of TIFAC. The company's balance sheets for the years 2009-10 and 2010-11 (provisional) also show a net loss. Therefore, the company's request for postponement of the last but one installment by 3 months appeared to be genuine. The Committee recommended TIFAC to favorably consider the request.

28	Manufacture of Unsaturated Polyester Resin (Vinyl Ester)	M/s Vetrofibre Reinforced Plastics Pvt. Ltd., New Delhi (Money given to company) IIT Delhi was to provide technology	20	0.25
<p><u>Project Context :</u> IIT Delhi developed a know-how to produce vinyl ester at a 1 kg/day scale and the company took up the task of setting up a pilot plant of 100 kg/day production capacity with TIFAC assistance.</p> <p><u>Status:</u> The process know how was demonstrated to the company by IIT-Delhi in presence of Monitoring Committee. The company had taken up the project work at the premises of its sister concern M/s Hind Protective Coatings Limited, New Delhi which was also a major customer to the intended product under information to TIFAC. The company, however, failed to complete the project citing up-scaling difficulties. HGT Apex Board considered the project in its last meeting and observed that "TIFAC may constitute an Empowered Committee to decided on the repayment aspects of these projects. While considering these cases the Committee should keep in mind that finance is not the only criteria- any decision of the Committee should look at maximizing technological returns through ensuring commercialization by hand-holding the entrepreneur financially". Dr. Kota Harinarayan's Committee had also considered the case and recommended legal action.</p> <p>TIFAC started recovery actions against the company in 2008. The company repaid an amount of Rs. 25,000/- to prove its bonafide. Subsequently in January and April 2011, the company informed that it was not in a position to take any project related activities as its sister concern, where TIFAC project related assets were situated, was seeking a revival package from BIFR which was yet to be finalized. It proposed to repay TIFAC an amount of Rs. 2 lakh equivalent to the current value of the project related assts as per its own assessment. This was not accepted and TIFAC sought an improved proposal.</p> <p><u>Recommendations :</u> The Committee noted the facts of the case and recommended to call the party for a discussion and arrive at a One Time Settlement. The case was recommended to be closed thereafter.</p>				

29	Manufacture of Nutan Himveer Bhukari	M/s. Yamuna Fabricators Yamunanagar, Haryana (Money given to firm) NRDC licensed the lab scale technology developed by Indian Oil Corporation Limited, Faridabad	29.5	14.54
<p>Project Context : The research center of Indian Oil Corporation Ltd., Faridabad developed an improved design, known as Nutan Himveer Bukhari with 20% kerosene savings compared to the conventional systems. The field performance of these bukharies was found satisfactory and the firm took up the task of setting up a floor shop to manufacture these bukharies with a production capacity of 3000 units/annum with TIFAC assistance.</p> <p>Status: The firm successfully set up the floor shop but despite its best efforts didn't get any orders. It earned no profit from the project. The repayment schedule was revised by TIFAC on firm's request and it had repaid an amount of Rs. 14.54 lakh so far. Firm's last request made in December 2009 seeking waiver of surcharge of Rs. 5.9 lakh and, payment of the outstanding principal in half yearly installments during 31st March 2010 -31st March 2013 was agreed by TEC. The firm is accordingly making the payment.</p> <p>Recommendations : The Committee noted facts of the case and observed that the product did not find commercial success. The Committee recommended that in place of staggered payment over next 2 years the firm may be invited for a discussion and a One Time Settlement may be arrived at and the file may be closed thereafter.</p>				
30	Establishing production and marketing set up for evaporating boats used in metalizing (coating of aluminum on plastic films) industry	M/s Supervac Oils, New Delhi (Money given to firm) Technology was developed jointly by the firm and ARC-I, Hyderabad and joint patent was applied	44	Nil
<p>Project Context : The firm jointly developed a bench scale technology to produce 3 component boats based on TiB₂ +AlN+ BN with the help of ARC-I, Hyderabad for use in metalizing (coating of aluminum on plastic films) industry and applied for a joint Indian Patent. The field trials of the boats provided positive feed back and the firm</p>				

set up a unit to manufacture 45, 000 boats/annum at the Technology Incubation Center of ARC-I, Hyderabad with TIFAC assistance.

Status:

The production capacity did not exceed 6000 boats/annum, due to erratic behavior of a hot press imported from Russia by ARC-I, in the past that was provided to the company at concessional price. Efforts to fix the problems did not succeed. In the meantime availability of better quality 2 component evaporation boats from China at much lower prices completely changed the market dynamics. The Indian firm was unable to bring down the production cost to the Chinese rates, rendering the technology uneconomical and commercially failure. With the consent of the firm based on Monitoring Committee's advice all the assets of the firm at ARC-I, Hyderabad were taken into the custody of ARC-I and the premises was closed to recover TIFAC dues to the extent possible from the sale of these assets. Dr. Kota Harinarayan's Committee considered the case and recommended transfer of the assets to ARC-I, Hyderabad. TIFAC Executive Committee (TEC) accepted the above recommendation and advised their implementation after seeking legal advice. Director ARC-I was accordingly requested several times to inform TIFAC whether assets created under the project can be gainfully utilized by ARC-I. The last communication was sent in June 2011 and his response is still awaited.

Recommendations :

The Committee noted the facts related to the case and recommended that the assets created under the project may be surveyed for their economic value as on where is basis with the help of a registered surveyor and after completing the legal formalities for the transfer of assets to ARC-I. However, the option of their disposal, auction or possession must be left to ARC-I, Hyderabad which is also a DST funded autonomous R&D organization. The money provided by the firm to ARC-I for procuring the hot press must be returned by ARC-I to TIFAC.

31	Establishing an incubator centre for manufacture of gasket sheets and seals from exfoliated graphite	M/s. Falcon Graphite Industries, Hyderabad (Money given to company) ARC-I, Hyderabad was to provide technology	19.90	Nil
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Project Context :

This project was taken up by the firm promoted by first generation entrepreneurs. The technology was developed by ARC-I and involved exfoliated graphite sheets to manufacture gaskets. The new products were expected to replace the conventional products made from asbestos and synthetic rubber.

Status:

The firm had initially intended to supply its total production of reinforced sheets to M/s Sankar Sealings Ltd. Chennai and M/s Wheels and Axle Plant, Indian Railways, Bangalore to manufacture gaskets for the automobiles and seals for the

railways, respectively. In subsequent years due to availability of a similar material (although of inferior quality) from Chinese and Korean markets at much cheaper prices upset the market dynamics of the product. The firm did not receive sufficient orders from Indian companies. This compelled the firm to look at alternative applications for the product and it decided not to avail the remaining approved TDA assistance of Rs. 19.85 lakh.

The firm has successfully developed bi-polar plates for use in fuel cells with the active help of ARC-I. Limited supplies have been made to BHEL. The market for bi-polar plates is yet to be evolved and presently limited to only R&D efforts. The firm is also working on products such as electro-static shield, flame and thermal retardant. Dr. Kota Harinarayan's Committee considered the case and recommended transfer of assets to ARC-I and technology to a new entrepreneur. TEC accepted the above recommendations and suggested their implementation after seeking legal advice. A legal demand notice was served to the firm in October 2010 in response to which the firm expressed its inability to repay TIFAC dues and proposed a One Time Settlement at an amount of Rs. 1.0 lakh as full and final payment a decision on which is yet to be taken.

Recommendations :

The Committee noted the facts related to the case and recommended the following

- in case the firm is willing to surrender the assets to TIFAC and ARC-I is willing to accept the assets, the same may be transferred to ARC-I, Hyderabad as recommended by the TEC.
- in case the firm is unwilling to surrender the assets to TIFAC, an OTS may be negotiated with the firm
- in case the firm is willing to surrender the assets to TIFAC and ARC-I is not willing to accept the same, these may be disposed off to recover TIFAC dues in terms of agreement /deed of hypothecation

The file may be closed after executing one of the above options.

32	Up-gradation of technology for manufacture of phytase enzyme and development of technology to manufacture other enzymes and synergic products such as fungal enzymes like cellulase, practinase, proteinase and fungal bio-pesticides etc.	M/s. Ekta Agro Industries Limited, New Delhi (Money given to company) The technology was in house development	22	Nil
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Project Context :

Di-calcium phosphate is used in livestock industry as an additive in the composite feed to meet the requirement of phosphorous. Addition of phytase enzyme from 0.2 % to 0.6 % in place of costlier di-calcium phosphate can also meet the same requirement and can lead to overall improvement in the economics of poultry industry. M/s Ekta Agro Industries Limited, a manufacturer of poultry feed had developed a know how to manufacture phytase enzyme by solid state fermentation

and downstream processing. The company took up the present project with TIFAC assistance to scale up the technology to pilot scale.

Status:

In place of setting up the pilot plant of 50 kg/day, the company set up a plant of 300 kg/day capacity in the 1st phase and proposed 2nd phase up scaling up to 1000kg/day from it. The Monitoring Committee was, however, not satisfied with the technical procedures adopted by the company and suggested fine tuning of technology with the help of subject experts at the present scale. Monitoring Committee felt that the company didn't implement its various technical suggestions made during earlier meetings and the project may not be economically viable if allowed to be continued as such and recommended its foreclosure. The company differed and represented to TIFAC but the Monitoring Committee adhered to its recommendations which were also agreed by TIFAC. The HGT Apex Board considered the case in its last meeting and recorded, "The Monitoring Committee has recommended closure of the project at the present stage as the company's technical team is not able to master the biotechnology in spite of efforts by them". A legal notice was sent by TIFAC in June 2006 demanding TIFAC dues. The company refused to repay the same stating the project closure was unilaterally and arbitrarily done by TIFAC. Dr. Kota Harinarayan's Committee considered the case and observed that since the project was foreclosed by TIFAC on the recommendation of the Monitoring Committee, recovery action may not be feasible and legal advice may be taken regarding implications. TEC is yet to decide on this recommendation as the case could not be presented due to loss of file which has been recreated.

Recommendations :

The Committee recommended that legal advice may be taken regarding the recovery in terms of clause VIb of the agreement pertaining to the foreclosure by the Monitoring Committee and if it is not favorable then the dues may be written off and the file may be closed.

33	Development of the wet type synthetic friction material for 2/3 wheelers clutch application	M/s. Thirumani Auto Ancillaries Ltd., Hyderabad (Money given to company) The technology was in house development	24	8.60
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Project Context :

The new two wheeler clutch assembly uses superior synthetic friction material for improved performance. M/s Thirumani Auto Ancillaries Ltd., Hyderabad, developed a new wet type synthetic friction material with qualities meeting international products (wear resistance being 6 times better compared to conventional cork based products) and with TIFAC assistance proposed to set up a pilot facility to manufacture 1 lakh rings per month based on new material for different set of

vehicles.

Status:

The company set up the pilot plant of envisaged capacity and invested significantly in developing alternate products based on new material. It, however, failed to successfully commercialize the product due to change in excise policy by the AP state government and establishment of the similar auto ancillary units based on imported technologies in other parts of the country. Export efforts also didn't succeed and the company became sick.

TIFAC accepted company's initial OTS offer to repay the principal amount of Rs. 24 lakh in 26 monthly installments. The company, however, failed to honour the same and a new OTS offer to repay Rs. 10 lakh within a stipulated period was agreed. The company has also not honoured the modified OTS and after legal persuasion has repaid only Rs. 8.60 lakh so far. The company has sold its assets and facilities without any prior permission from TIFAC.

Recommendations :

The Committee noted the facts and recommended that TIFAC may issue a legal notice to the company seeking immediate repayment of remaining dues as agreed within a specified time failing which initiation of the criminal action against the company may be communicated as contrary to the terms of agreement, it has sold project related assets without prior permission of TIFAC. The case may be closed if the remaining OTS amount is paid by the company.

34	Commercialization of decorative Zirconium Nitride (ZrN) coating using physical vapour deposition (PVD) technique	M/s. Multi Arc India Limited, Mumbai (Money given to company)	100	48
		Technology was in house development		

Project Context :

The company had developed a prototype ZrN Cathodic Arc PVD system of 20" size with 3 Zr cathodes in its in-house R&D and got good feedback for the coatings on decorative items in limited field trials. The company proposed to develop a higher capacity computer controlled cathodic arc PVD system with 40" dia and 33 " height and set up a commercial decorative ZrN coating plant along with a coating characterization laboratory.

Status:

The project was implemented by the company and initial two installments totaling Rs. 24 lakh were also returned in time. The repayment of next two installments worth Rs. 24 lakh was, however delayed on account of difficulties in commercialization of ZrN coatings due to 300% increase in the cost of Zr in international market that badly affected the commercial viability of the project. The company's financial difficulties continued and it sold part of its existing business pertaining to other Surface Enhancement Technologies like Plasma Ion

	<p>Nitriding (PIN), Chemical Vapour Deposition (CVD) and Vacuum Heat Treatment to M/s Ionbond Coatings Pvt. Ltd.</p> <p>The latest status of the project related assets at Umergaon could not be ascertained as for a very long duration all TIFAC communications sent at company's known addresses returned undelivered and the residential address of the company's CMD Shri A.K. Jani could only be traced recently to deliver the legal notices demanding entire dues. TIFAC also filed cases under section 138 of the negotiable instruments act for the bouncing of post dated cheques provided by the company to repay TIFAC dues and a legal notice was served in August 2011. Dr. K. Balasubramaniam, Director, NFTDC, Hyderabad has been appointed arbitrator in the case by Secretary, DST.</p> <p><u>Recommendations :</u> The Committee noted the facts related to the case and recommended the continuation of already initiated legal recovery action by TIFAC in terms of the agreement.</p>			
35	Flexible Machining Centre	<p>M/s Vaddigiri Factory Automation Pvt. Ltd., Hyderabad (Money given to company)</p> <p>The proprietary sister concern of the company developed the know-how</p>	25	21
<p><u>Project Context :</u> This project was to develop and commercialize a machine, namely, "Flexible Machining Centre" with TIFAC assistance. This machine will have the capability to be used both as a full fledged horizontal and vertical machining center by just repositioning of head stock with a manipulator and by filling automatic tool changer by 90° effortlessly by a single operator to achieve high production volumes of machined items.</p> <p><u>Status:</u> The company developed and commercialized the machine and made repayment of initial 6 installments in time. It, however, faced difficult market situation and recession compounded its woes in the subsequent years. A moratorium of 2 more years was provided to the company to repay remaining 4 installments backed by post dated cheques. Out of four only one has been paid so far and the company vide its letter dated 5th August 2011 addressed to Secretary DST requested for further moratorium of 2 more years to repay the remaining 3 installments of Rs. 3 lakh each. The request was to be considered by a designated Committee as per the new policy. In the mean time, TIFAC filed a criminal case under section 138 of the negotiable Instruments Act (NIA) against the company to recover its remaining dues.</p>				

	<p><u>Recommendations :</u> The Committee considered the facts of the case and said that meeting of working capital requirement should not be an excuse for repayment to TIFAC and it should not be delayed. The company has registered net profit in the financial year 2010-11. It should therefore clear TIFAC dues early. The present request of the company may, however, be accommodated by TIFAC to the extent possible and feasible. An OTS option may also be considered for the early closure of the case.</p>		
36	<p>Establishing a pilot plant for catalytic converters for diesel exhaust emission control (for fork lifts)</p>	<p>M/s Nimra Cerglass Technics (P) Ltd., Hyderabad (Money given to company) ARC-I, Hyderabad was to provide ceramic honeycomb technology</p>	<p>75 Nil</p>
<p><u>Project Context :</u> The company took up the task of setting up a pilot plant for producing 2000 units of catalytic converters per annum for use in diesel operated fork lifts based on the technology developed jointly by the company and ARC-I which involved production of ceramic honeycombs, alumina wash coating, catalyst coating and canning. Initial user response from Voltas and other customers for the product was satisfactory.</p> <p><u>Status:</u> There was an inordinate delay in project implementation and project completion could not be seen by the Monitoring Committee as disputes erupted between the company and ARC-I regarding the promised quality of the honeycombs and the company alleged bearing significant loss on this account. The short comings pertain to wall thickness, ovality and warpage of the honeycombs. ARC-I efforts to achieve the quality did not succeed.</p> <p>The company filed an FIR against the Director and Associate Director of ARC-I under section 405 read with sections 415, 418, 420 IPC read with sections 34 and 120 B IPC etc., and the matter is sub-judice.</p> <p>The assets hypothecated to TIFAC were taken into custody and legal advice suggested that no arbitration and civil suit proceedings can be initiated due to recovery becoming time barred.</p> <p><u>Recommendations :</u> The Committee noted that disputes arose as the specifications for the honeycomb quality and performance were not well defined by both the parties at the time of technology transfer. The Monitoring Committee failed to give a clear final view in its recommendations. The agreement signed between the company, ARC-I and TIFAC didn't have any clause that prevented the parties directly approaching the</p>			

	court without arbitration in case of a dispute. The Committee recommended, since the project related assets hypothecated to TIFAC are in custody of ARC-I, the same may be disposed off to recover TIFAC dues to the extent possible after taking legal advice on file and the case may be closed thereafter.			
37	Manufacture of jute jumbo bags	M/s Stanpacks (India) Limited, Madras (Money given to company) Know how was in house development	25	Nil
<p><u>Project Context :</u> M/s Stanpack (India) Limited, Madras developed technology for jumbo jute bags with the capacity to handle 250-1000 kg of various materials based on a preliminary work of Indian Jute Industries Research Association (IJIRA), Kolkata. The company set up a pilot (25,000 bags pa) with the assistance from TIFAC. The bags met international FIBC (Flexible Intermediary Bulk Containers) standards for safety and bagged several awards. An Indian patent was also filed in the year 1995.</p> <p><u>Status:</u> The company however could not sell the product on account of its larger weight and higher cost compared to other synthetic polymer based products and reported failure in August 2002. In response to the TIFAC legal notice the company declined to pay the dues citing various stipulations of the agreement and legal advice has been given to write off the dues as they have become time barred.</p> <p><u>Recommendations :</u> The Committee noted that Monitoring Committee clearly didn't declare the commercial success of the project as stipulated in the agreement and the company also declined to repay TIFAC dues on this account. Further, recovery is not possible as per legal advice due to same becoming time barred. The case file therefore may be closed and dues , if any , may be written off.</p>				
38	Developing, designing and manufacturing specialized industrial microwave drying and heating systems	M/s Hi-Tek Engineers , Mumbai (Money given to firm) The know how was developed by Society for Applied Microwave Electronic Engineering and Research (SAMEER)	20	Nil
<p><u>Project Context :</u> Microwave dryers are used for removal of final traces of moisture finds applications in chemical and pharmaceuticals industries. M/s Hi-Tek Engineers, Mumbai took the technology from SAMEER, a unit of Tata Institute of Fundamental Research</p>				

(TIFR), Mumbai. The unit developed 4 customized microwave dryers of varying specifications to suit such industrial applications with TIFAC assistance.

Status:

The firm developed 4 prototypes and integrated with different applicators, namely, fluidized bed drying, conveyer belt drying, and fluid carrying systems. One unit was sold to CMERI, Durgapur and another to IARI, Delhi. The unit could generate sufficient orders to sustain business. Development of other application such as tea leaf drying required additional investment and firm could not source funds.

The firm didn't repay TIFAC assistance and offered an OTS at Rs. 10 lakh in 2007 which was not agreed. The company's chief promoter Shri S.B. Bhosle, thereafter, shifted to Oman after his business failed in India due to recession. He was served a legal notice there and he proposed to repay an amount of Rs. 20 lakh from the sale proceeds of one microwave dryer unit lying idle at SAMEER campus and by paying an amount of Rs. 5000 to Rs. 10,000 every month from his current earnings. TIFAC gave permission to sell the above unit but didn't accept other proposal. Shri Bhosle was asked to increase the proposed monthly amounts which he refused due to his poor financial health.

TIFAC has now filed a civil suit against the firm to recover only the last installment of Rs. 7 lakh to prevent it becoming time barred.

Recommendations:

The Committee noted the facts related to the case and observed that the OTS offer of the firm was not agreed and a civil suit was filed to recover last installment of Rs. 7 lakh to prevent the case becoming time barred. The Committee recommended TIFAC may reexamine the case and try for an out of court settlement in view of the time and cost involved in the pursuing the civil case.

39	Silicon-Iron castings	M/s. Mukherjee Industries, Calcutta (Money given to firm)	7	5.25
		Technology was in house development		

Project Context :

The manufacturing of high silicon iron based components with improved corrosive resistance finds applications in chemical plants, defense requirements and fertilizer plants etc. These materials are difficult to manufacture. The firm owned by an IIT Kharagpur graduate took up the task of setting up a unit at Howrah to develop and manufacture such high silicon iron castings with TIFAC assistance.

Status:

The firm achieved a capability to process 400-500 kgs of the charge material in single heat with about 50 % average yield and developed the necessary know how to meet the altered quality demands of different customers. The castings finally produced found acceptance in the market and the conditional project success was

declared by the Monitoring Committee in December 2000 suggesting analysis of three random samples from different heats by NML. Despite several reminders the firm never sent the analysis report and the repayment is being recovered in dribbles through legal and administrative persuasion.

Recommendations :

The Committee noted the facts related to the case and recommended if the firm is willing to pay entire outstanding principal amount of TIFAC assistance in one installment TIFAC may waive the surcharge and close the file.

40	Pilot plant for improved evaporative cooling based air-ambiators	M/s Thermo Devices Pvt. Ltd., Mohali (Money given to company) Technology was in house development	16	Nil
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Project Context :

The company had developed a window mounted two stage (indirect and direct) evaporative cooling system, named, air-ambiator. The system offered higher energy efficiency, lower noise levels, improved power factor (by 0.9), and improved air quality, compared to desert coolers and air conditioners. The performance of the unit was vetted by APITCO.

TIFAC provided assistance to set up a pilot plant to manufacture, sale and field test 600 units of such air-ambiators. As a part of the assistance, the firm was to set up a special purpose machine to manufacture heat exchanger, made up of perforated synthetic sheets.

Status:

In place of setting up the special purpose machine, the company assembled around 35 units and sold the same to interested customers in Punjab. The firm also deviated from the initially agreed project implementation plan and completely changed its business plan and decided to get the product manufactured from outside vendors at Delhi and Gurgaon. TIFAC didn't agree for such frequent changes. The project was foreclosed on company's request. The company's request to write off TIFAC dues was not agreed and a civil suit was filed in the Delhi High Court and an ex-parte decree for Rs. 25,42,1999/- on 23.10.2007 with interest thereon at 10 % per annum was obtained.

TIFAC filed execution petition in 2009 but the summons could not be served to the company. The Delhi High Court has now issued Dusti Notice to the JDs, Moga and Mohali to execute summons through them. TIFAC representative visited the project implementation site at Mohali in May 2010 and November 2011 and found no project related activities there. The address was now owned by some other company.

	<p>Recommendations : The Committee noted facts related to the case and recommended that ongoing legal process may be continued unless the party shows interest for a One Time Settlement.</p>			
41	The manufacture of activated carbon from coconut shells	M/s. Palakkad Chlorates and Allied Chemicals Pvt. Ltd., Palakkad (Money given to company) Know-how was given by IIT Madras	10	Nil
<p>Project Context : In the present project M/s Palakkad Chlorate & Allied Chemical Private Ltd. took up TIFAC assistance for setting up a fluidized bed based pilot unit of a 150 MT/Annum capacity to produce activated carbon from coconut shells as per a know how developed by IIT Madras.</p> <p>Status: The company availed only part of the approved TIFAC assistance and successfully set up the plant and optimized the process technology. Despite the plant running being economical and the product being comparable with imported products, the company decided to transfer the technology to outside agencies. TIFAC revised the repayment schedule on the above account but the company defaulted regularly. A legal notice served on the company returned undelivered and thereafter legal advice was in favour of closing the case due to recovery becoming time barred.</p> <p>In trying to ascertain the onsite status of the unit and the project related assets in 2009, the company's promoter informed that he had sold the facility to M/s Strategic Engineering Ltd, Chennai and shifted the project related assets to its premises. TIFAC has filed a criminal complaint against the company and its promoters with Commissioner of Police, Chennai in May 2011.</p> <p>Recommendations : The Committee noted the facts related to the case. It observed that there was a violation of the agreement clause pertaining to the prior permission of TIFAC for change in the management of the company. Arbitration proceedings could have been a better option. The Committee felt that since the criminal complaint had now been filed, the same maybe pursued to recover TIFAC dues.</p>				

42	Commercialization of pelletizing technology for biomass and other combustible wastes	Hi-Tech Agro Projects (P) Ltd., Kolkata (Money given to company) Technology was in house development	12.74	8.0
<p><u>Project Context :</u> M/s Hi-Tech Agro Projects (P) Limited, Kolkata proposed to setup a biomass pelletization plant with a capacity of 5000 MT pa to monitor the process parameters related to the technology for large scale commercialization and comparison with other fuels in terms of calorific value, environmental, transportation and labour costs etc.</p> <p><u>Status:</u> A pilot plant of 1 Ton/hr capacity was installed and the company carried out several experiments to pelletize biomass mixtures. The project was declared successful by the Monitoring Committee in 2002 as the primary objectives of the project were achieved and the repayment of the TIFAC assistance as per the revised repayment schedule was agreed.</p> <p>The company made a small initial repayment and thereafter continuously defaulted citing several business related difficulties. TIFAC accepted the company's offer to repay the outstanding principal amount in 5 installments between 30th June 2009 to 31st March 2013 and the company was repaying its dues with minor delays.</p> <p><u>Recommendations :</u> The Committee noted the facts related to the case and recommended the recoveries as per the agreed OTS might be continued and the file may be closed after full recovery of the agreed OTS amount.</p>				
43	Lactic acid and its derivatives	M/s. Sangita Bio-chem Limited, Calcutta (Money given to company) Technology was in house development	45	Nil
<p><u>Project Context :</u> M/s Sangita Bio-chem Limited, Kolkata had developed the know how to produce lactic acid and its derivatives in association with Institute of Microbial Technology, Chandigarh and a US based company. With TIFAC assistance it proposed to scale up the fermenter capacity to 10,000/- liters and further optimization of the downstream processes at Balassore, Odisha.</p> <p><u>Status:</u> There was a significant delay in project implementation. The project was extended up to 31st March 2003. There was lack of sincerity on the part of company. The</p>				

Monitoring Committee regretted that the company was unable to utilize the incentives given by TIFAC to upgrade their home grown technology and recommended the foreclosure of the project and the recovery of Rs. 67.5 lakh was recommended.

A legal recovery suit was filed in Delhi High Court in July 2006. A favorable decree was passed by Delhi High Court on 1st May 2008 for the recovery of Rs. 67.5 lakh as on 7th June 2003 with simple interest @ 8 % per annum till the date of realization. TIFAC petition for execution of the order at Delhi High Court, was disposed of by Delhi High Court by issuing a case transfer certificate to TIFAC for filing the execution petition at District Court, Balassore as the company's assets are situated there and Delhi High Court has no jurisdiction there. The execution petition for this decree has been filed at District Court Balassore (Odisha) in the beginning of 2010.

Recommendations :

The Committee noted the facts. Since it is a legal matter, the Committee recommended that matter might be examined by a competent lawyer afresh for his advice.

44	Manufacture of 3, 4 Dichloroaniline (DCA) using solvent free separation technology	M/s Clarisis Organics Limited, Vadodara (Money given to company) Technology was in house development	70	9
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Project Context :

M/s Clarisis Organics Limited , Vadodra set up a pilot plant of 600 MT pa capacity to manufacture 3,4 Dichloro Aniline (DCA) using solvent free separation technology developed in-house. The process used low cost raw materials, involved lesser steps, lower impurity profile and no formation of unwanted compounds.

Status:

The company set up the plant. There was a time over run in implementation of the project and accordingly repayment schedule was revised.

The company's financial position in subsequent years became weak due to easy availability of several chemicals manufactured by it at comparatively lower prices from China and the company repaid only Rs.9 lakh to TIFAC. In 2005, the company approached BIFR for a rehabilitation package and in 2007, BIFR declared it as sick. Its appeal for reconsideration was rejected by the appellate authority and Gujarat High Court was asked to begin the winding up proceedings. The court had to appoint an official liquidator for the purpose. TIFAC is being represented by a lawyer in the Gujarat High Court to safeguard its interests and a legal suite is also being filed in Delhi High Court by TIFAC based on legal advice to ensure no rejection of TIFAC's claim on the company's movable assets by the official liquidator on the pretext of recovery becoming time barred.

Recommendations :

The Committee noted the facts and recommended that TIFAC might follow up in Gujarat High Court to claim its dues from the official liquidator during the winding up proceedings against the company. TIFAC might also follow up civil suit filed by it in Delhi High Court to ensure that its claims are not rejected by the official liquidator on the pretext of recovery becoming time barred. TIFAC might, however, procure company's balance sheets for last three years and examine if the secured loan from TIFAC had been duly shown there. If yes, the filing of the civil suit may be re-examined.

45	Development of stationary phase monolithic DeNox catalyst(s) and SO ₂ oxidation for environmental pollution control	M/s. Associated Cement Companies Ltd., Mumbai (Money given to company) Technology was in house development	109	Nil
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Project Context :

The technology was initially developed by Japan as a post combustion NO_x control technique during the late seventies and was considered superior as it provided more than 95 % NO_x reduction efficiency compared to less than 70 % offered by other techniques. The technology was available in the international market at an exorbitant price and a need was felt to develop the same indigenously.

ACC Thane developed Selective Catalytic Reduction (SCR) technology for NO_x abatement at lab scale and proposed to set up a pilot plant with 60 cu.mt. pa capacity. On the advice of TIFAC the project was divided in two phases and in the first phase only the task of developing and field testing the technology to establish its technical viability was taken up.

Status:

The technology and its efficacy was demonstrated at two places viz. Caprolactum plant of Fertilizers and Chemicals Travancore (FACT) Ltd., Cochin and NTPC's coal fired Badarpur thermal power plant. Monitoring Committee recommended to demonstrate the commercial viability of the technology in the 2nd phase of the project at a 25 MW capacity Power Plant for which an investment of about Rs. 25 crore was required.

Since the Ambient Air Quality regulations didn't create a demand, efforts were made to convince Ministry of Power (MoP) to accept the assimilation of technology. The response of MoP was not encouraging and stated that (i) NO_x emission norms are not recommended for coal fired plants at this stage as these would add to the cost of generation at around Rs. 25 lakh/MW (ii) other cost effective measures like low NO_x burners, furnace air staging and flue gas re-circulation which result in 30-50 % NO_x reduction were available.

The phase II of the project did not take off. TIFAC sought to recover its assistance and issued a legal notice in 2009. The company refused to repay TIFAC dues on the pretext of recovery becoming time barred and alleging that there was no response from TIFAC for its phase-II project. TIFAC sought the status of the project related capital assets on which it had ownership in terms of agreement. But there is no response from the company. Further legal action had not been advised due to recovery becoming time barred.

Recommendations:

The Committee noted although the technology was successfully developed and demonstrated there appears no possibility of its commercial exploitation in near future. Since legal advice had indicated towards recovery of dues as per agreement to be time barred the dues may be written off and case may be closed. TIFAC might, however, examine the balance sheets of the company for last 3 years to verify the status of assistance and check out the ownership status on the project related equipment, machinery, books and journals worth Rs. 46 lakh.

46	Manufacturing of briquetted coal (bio-coal) from agriculture waste	M/s Aditya Agro Industries, Loni, Dist. Ahmadnagar, Maharashtra (Money given to firm) Know how was in house development	10	Nil
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Project Context :

M/s Aditya Agro Industries in 1998 had set up a briquetting press/unit based on saw dust at Loni, Dist Ahmadnagar with a capacity of 500 kg/hr. The firm proposed to enhance the production capacity to 1500 kg/hr by suitably modifying and augmenting the machinery. Briquetting of alternate biomass, namely, wood chips, ground nut shells, rice husk, cotton stack, sugarcane husk, wheat straw, baggase, baggase pith and press mud etc. and effect of specialty coatings on the life of the dies and other wearing parts of the machinery were also planned.

Status:

The firm scaled up the capacity to 1000 kg/hr. It achieved 30 % reduction in specific power consumption through this scale up and generated know how for briquetting various other raw materials and their specific ratios. The effect of specialty coating on the wear parts of the machine, however, could not be studied due to closure of firm's operations on account of increase in raw material prices and liquidity crunch due to interrupted supplies to customers. TIFAC modified the repayment schedule but the firm couldn't resume its operations on account of unavailability of the raw material from nearby industries and no repayments were made to TIFAC.

Arbitration proceedings started in January 2010 and the firm had proposed to TIFAC to recover its dues from the sale of the hypothecated assets in terms of the agreement.

	Recommendations : The Committee noted the facts and recommended that TIFAC may wait for the outcome of the ongoing arbitration proceedings.			
47	Up scaling technology for processed coir-pith blocks production	M/s Kaveri Agri Care Pvt. Ltd., Bangalore (Money given to company) Know how was in house development	68.21	Nil
	<p>Project Context : Cleaned coir pith supplemented with plant nutrients finds use as growing medium in Precision Agriculture practiced by western growers under plastic/glass covers. The company, with TIFAC assistance proposed to set up 1.5 tons/day capacity fully automated continuous process pilot plant to produce coir pith blocks. The know-how developed in-house involved removal of chemical impurities, nutrients supplementation, moisture reduction and deactivation of biological contaminants as per the given specifications and compression to make blocks.</p> <p>Status: The company set up a pilot plant of 0.5 tons/day capacity. With a view to improve the financial viability of the project, TIFAC provided an additional assistance of Rs. 28.21 lakh to achieve a better material and energy efficiency as well as higher production capacity of 1.5 tons/day. The repayment schedule was also modified. The company, however, didn't repay its dues citing several difficulties. TIFAC filed two civil suits in Delhi High Court based on legal advice and to avoid cases becoming time barred. In one case the High Court directed for arbitration first. The arbitrator was appointed in August 2010 and since then 4 hearings have taken place and decision is awaited.</p> <p>Recommendations : The Committee noted the facts and recommended that TIFAC may wait for the outcome of the ongoing arbitration proceedings.</p>			
48	Dehydration of fruits & vegetable by continuous explosion puffing process (CEPP)	M/s Ghatge Precision Engineering Pvt, Ltd., Satara (Money given to company) Design know how was in house development	25	Nil
	<p>Project Context : M/s Ghatge Precision Engineering Pvt, Ltd., Satara, with TIFAC assistance, proposed to manufacture Continuous Explosion Puffing Process (CEPP) machines of 5 kg/batch and 1 MT per hour capacities. Such machines were used to enhance shelf life of the fruits and vegetables.</p>			

Status:

The company didn't implement the project and changed its location from Kolhapur to Satara without informing TIFAC. It neither repaid TIFAC assistance nor followed Monitoring Committee advice during a meeting at New Delhi. TIFAC has filed a legal recovery suit in Delhi High Court in July 2010.

Recommendations :

The Committee noted the facts and observed that PDCs should have been presented by TIFAC in this case and in case they were not cleared criminal cases under section 138 would have been helpful along with recovery suit. The follow up of the civil suit was recommended.

49	Development of robots for manufacturing	M/s. Systemantics India Pvt. Ltd., Bangalore (Money given to company) Know how was in house development	90	Nil
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Project Context :

M/s Systemantics India Pvt. Ltd., Bangalore proposed development and commercialization of pick and place robots with 4 degree of freedom for use in industrial productions lines with TIFAC assistance. Such robotic arms were available to from overseas suppliers at an exorbitant cost and their timely service back up was a problem.

Status:

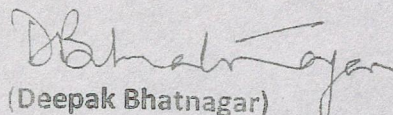
The company successfully developed 5 robotic arms and supplied the same to IIT Delhi and few others. TIFAC provided an additional assistance of Rs. 15 lakh to the company to meet five orders received from different customers requiring customized products at 30-40 % lower cost as the company faced working capital problems and Monitoring Committee felt that a significant time is required by industrial users in developing confidence in such high tech low cost indigenous systems for replacement in their existing production lines. TIFAC also revised the repayment schedule accordingly.

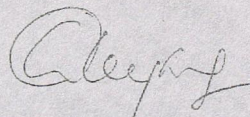
The company couldn't exploit the technology and failed to honour its repayment commitments. TIFAC issued a legal notice. In response, the company proposed to repay the principal amount to TIFAC which was not accepted. TIFAC did not agree to the recommendation of Chairman Monitoring Committee to convert the repayment to sharing of sales revenues @ 2.5 % in place of fixed installments. A fresh legal notice seeking repayment of Rs. 130.50 lakh was issued to the company in November 2011.

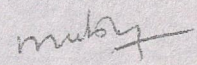
	<p><u>Recommendations :</u> The Committee noted the details pertaining to the case and recommended that TIFAC may favorably consider the company's past OTS offer to repay Rs. 90 lakh in fixed installments. This will be a better option compared to filing a civil suit which involves significant time, cost and effort.</p>			
50	Jute coir geo-materials	M/s. Aspinwall Geotech Limited, Cochin (Money given to company) Know how was developed by IIT Delhi	175.20	Nil
<p><u>Project Context :</u> M/s Aspinwall Geotech Limited, Cochin, with TIFAC assistance, proposed to set up a plant to manufacture jute-coir union, blends, combinations and composites based geotextiles in woven, non woven, needle felted and braided forms for various applications based on an IIT Delhi technology.</p> <p><u>Status:</u> The company set up the plant with the production capacity of 40000 sq meters jute-coir geotextiles for soil erosion control. The company sold limited quantities of product to Konkan Railways and other customers and got repeat orders which were not exploited. The company argued commercial failure of the project and in December 2002 reported a fire accident in the unit due to electric short circuiting causing significant loss. The company received insurance proceeds worth Rs. 67 lakh for the capital assets damaged in the fire accident and the same was held in a bank account of the company.</p> <p>TIFAC laid its claim on full insurance proceeds but the company stated that the same needed to be shared with ICICI who also co-funded to the project under SPREAD Programme. On enquiry from ICICI about the veracity of its claim TIFAC learnt that ICICI provided an unsecured loan and the company got double financing for a critical component (an imported MST machine) of the project.</p> <p>Arbitration proceedings to recover full insurance amount and other TIFAC dues started in September 2010 and 3 hearings have taken place so far. The company without any prejudice to their stand in arbitration proceedings, had now given an OTS proposal to pay Rs. 75 lakhs as full and final payment to TIFAC based on several arguments related to the maximum possible recovery through legal and administrative channels.</p> <p>Although the legal advice is favour of accepting the OTS, the proposal has not been accepted so far.</p>				

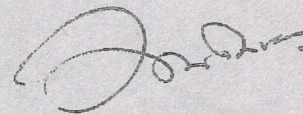
Recommendations :

The Committee observed if the insurance policy had an endorsement in the name of TIFAC, the insurance claims from insurance company would have come directly to TIFAC. The Committee recommended examination of the last three years balance sheets of the company to ascertain its financial position to take a view on its OTS proposal without compromising regular follow up of ongoing arbitration proceedings.


(Deepak Bhatnagar)
Member


(Dr. D. Yogeswara Rao)
Member


(Sajid Mubashir)
Member


(S. B. Krishnan)
Chairman