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UNITED STATES INTERNATIONAL DEVELOPMENT COOPERATION AGENCY
AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D.C. 20523

INDIA

PROGRAM FOR ADVANCEMENT OF COMMERCIAL TECHNOLOGY

PROJECT PAPER

386-0496

AUGUST 1985

UNCLASSIFIED

Project Paper

Program for Advancement of Commercial Technology
(386-0496)

Table of Contents
Vol. I

I. Project Summary 4

II. Rationale 6

A. Role of Science and Technology in Development 6

1. Program for the Advancement of Commercial Technology 7
2. Relationship to USAID Strategy 8

B. Problems of Indigenous Commercial Technology Development 8
C. GOI Policy on Technology Development 9

III. Project Description 10

A. Goal 10
B. Purpose 10
C. Detailed Description 11

1. Overview 11
2. Organizational Components 12

a. Councils 12
b. ICICI 14
c. Other Institutions 19

3. Process 19
4. Evaluation of Proposals 22

a. Selection Criteria 22
b. Developmental Considerations 25
c. Technical Evaluation 26
d. Subproject Approval 27

5. Subproject Agreements 28
6. Monitoring of Subprojects 29

IV. The Financial Plan 29

A. Financing of the PACT 29
B. Cost of the PACT 31

V. The Implementation Plan 35

A. Anticipated Sequence of Events 35
B. Funds Commitment and Disbursement 36
C. Procurement and Contracting Procedures 38
D. AID Monitoring and Evaluation 39

VI. Analyses 40

A. Financial Analysis 40
B. Economic Analysis 42
C. Institutional Analysis 44
D. Environmental Analysis 46

VII. Project Agreement, Conditions, Covenants, Termination 47

A. Project Agreement 47
B. Conditions 47
C. Covenants 48
D. Termination 48

Appendices

Vol. II

Appendix I	Logical Framework
Appendix II	Project Identification Document Approval Cable (State 355495, December 1984)
Appendix III	AID/W Determination on Project Finance and Guidance on Other Project Related Issues (State 096872, March 1985)
Appendix IV	Project Checklist
Appendix V	Cash Flow Analysis of Illustrative Financing Options
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Appendix VII	Policy Environment for Joint Ventures in R&D in India and Assessment of Interest of Indian Private Enterprise in the PACT, report for USAID/I by Price Waterhouse & Co., New Delhi (April 1985)
Appendix VIII	Assessment of Interest of U.S. Private Enterprise in the PACT, report for USAID/I by Development Associates, Inc. (April, 1985)
Appendix IX	Study on the Options for the Program Advisor, U.S. Office, report for USAID/I by Development Associates, Inc. (April 1985)
Appendix X	GOI Letter of Request

AGENCY FOR INTERNATIONAL DEVELOPMENT

PROJECT DATA SHEET

1. TRANSACTION CODE: A (A = Add, C = Change, D = Delete) — Amendment Number: _____

DOCUMENT CODE: 3

2. COUNTRY/ENTITY: INDIA

3. PROJECT NUMBER: 386-0496

4. BUREAU/OFFICE: ASIA — 04

5. PROJECT TITLE (maximum 40 characters): Program for the Advancement of Commercial Technology

6. PROJECT ASSISTANCE COMPLETION DATE (PACD): MM 06 DD 30 YY 90

7. ESTIMATED DATE OF OBLIGATION (Under "B." below, enter 1, 2, 3, or 4)

A. Initial FY 85 B. Quarter 3 C. Final FY 87

8. COSTS ($000 OR EQUIVALENT $1 = Rs.12.00)

A. FUNDING SOURCE	FIRST FY 85 B. FX	C. L/C	D. Total	LIFE OF PROJECT E. FX	F. L/C	G. Total
AID Appropriated Total	3,000		3,000	11,100		11,100
(Grant)	(3,000)	( )	(3,000)	(11,100)	( )	(11,100)
(Loan)	( )	( )	( )	( )	( )	( )
Other U.S. 1. PRE Bureau (AID)	250		250	1,000		
Other U.S. 2.						
Host Country ICICI		60	60		300	300
Other Donor(s) Borrowers		1,000	1,000		2,700	2,700
TOTALS	3,250	1,060	4,310	12,100	3,000	15,100

9. SCHEDULE OF AID FUNDING ($000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	C. PRIMARY TECH. CODE 1. Grant	2. Loan	D. OBLIGATIONS TO DATE 1. Grant	2. Loan	E. AMOUNT APPROVED THIS ACTION 1. Grant	2. Loan	F. LIFE OF PROJECT 1. Grant	2. Loan
(1) 103	751	870		-0-	-0-	12,100	-0-	12,100	-0-
(2)									
(3)									
(4)									
TOTALS				-0-	-0-	12,100	-0-	12,100	-0-

10. SECONDARY TECHNICAL CODES (maximum 6 codes of 3 positions each): 840

11. SECONDARY PURPOSE CODE:

12. SPECIAL CONCERNS CODES (maximum 7 codes of 4 positions each)

A. Code: RGEN

B. Amount:

13. PROJECT PURPOSE (maximum 480 characters)

To contribute to building a market oriented R&D capacity in the Indian private sector.

14. SCHEDULED EVALUATIONS

Interim MM 06 YY 88 MM YY

Final MM 03 YY 90

15. SOURCE/ORIGIN OF GOODS AND SERVICES

☒ 000 ☐ 941 ☒ Local ☐ Other (Specify) _____

16. AMENDMENTS/NATURE OF CHANGE PROPOSED (This is page 1 of a _____ page PP Amendment.)

17. APPROVED BY

Signature

Title: Owen Cylke, Director, USAID/India

Date Signed MM DD YY

18. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION MM DD YY

AID 1330-4 (8-79)

UNITED STATES INTERNATIONAL DEVELOPMENT COOPERATION AGENCY
AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D.C. 20523

ACTION MEMORANDUM FOR THE ASSISTANT ADMINISTRATOR
BUREAU FOR ASIA AND NEAR EAST

FROM: ANE/ASIA/PD, Peter Bloom

SUBJECT: India - Program for Advancement of Commercial Technology (386-0496)

Problem: You are requested to authorize the Program for Advancement of Commercial Technology (386-0496) for India involving planned obligations of $11.1 million in grant funds over a five year period beginning with $4.0 million in FY 1985.

Background: Indian private enterprise, long shielded from competition by import barriers and a regulated commercial environment, has invested very little in the risky undertaking of technology research and development. Capital is channeled into more assured investments and desired technologies are acquired primarily through licensing agreements and minor adaptation of the technologies imported under these agreements. Consequently, Indian industry has developed only a very limited capacity for market oriented research and development.

There is, however, a growing recognition among government officials and Indian businessmen that a commercial R&D capacity is important to domestic growth and critical to ensuring India's competitiveness in world markets. Recent policy trends reflect that recognition.

One trend is a major change of emphasis in science and technology policy that will give up the practice of considering science and technology as a sector in its own right and ensure that the large, highly talented science and technology community becomes an integral part of the country's economic activity; another is liberalization -- especially the reduction of barriers to imports of technology and foreign collaborations -- which will lead to increased technology-based as well as price-based competition.

Discussion: The Program for the Advancement of Commercial Technology (PACT) will stimulate commercial research and development in India by promoting and financing Indian-U.S. R & D joint ventures. Exposure to U.S. firms is intended to transfer strategies, analytical methodologies, and management styles conducive to successful technology development and commercialization.

An Indian Council and an American Council will be created to jointly provide advice and guidance for PACT operations and to oversee the general management of the program. Day to day responsibility for PACT operations will rest with the Industrial Credit and Investment Corporation of India (ICICI). ICICI will manage promotional efforts in the U.S. and India to publicize the advantages of Indo-U.S. joint ventures in R&D and the incentives available to such ventures through PACT. It will facilitate the negotiation of joint venture agreements between partners and assist as requested in the preparation of subproject proposals. Once proposals have been submitted for financing, ICICI will ensure that those selected satisfy program objectives and undergo a technical, financial, and legal evaluation. Finally, ICICI will monitor the joint ventures financed through PACT, reviewing progress against pre-established benchmarks in the technology development phase and compliance with PACT terms.

To support PACT, AID will provide $11.1 million in grant funds from the India program budget and $1 million in grant funds from the Bureau for Private Enterprise budget.

Of the $11.1 million from the India program budget, $10 million will go into an ICICI special account to finance Indo-U.S. joint ventures. Terms available to the joint ventures will cover a spectrum of financing options.

The remaining $1.1 million from the Indian program budget will support the Councils, the ICICI promotional effort in India, and program evaluations. It will also support a USAID-managed promotion effort through which activities will be co-sponsored with organizations other than ICICI. USAID/India will retain $400,000 for this effort, which is included in the project authorization but will not be included in the project agreement. This will be obligated by separate contracts with Indian entities other than the ICICI.

The $1 million from the Private Enterprise Bureau will cover the cost of the promotion effort in the U.S. The PRE Bureau plans to incrementally fund its contribution to the project over five years. The first year contribution of $250,000 in FY 85 funds has already been authorized for the project.

Obligations from FY 1985 funds would be $4,000,000 from the India program budget and $250,000 from PRE, both of which would be committed through one grant agreement with ICICI. The balance would be obligated through FY 1989.

FAA Section 612(b)

When the development assistance program in India was re-established in FY 1978, the Development Coordinating Committee on December 21, 1977, determined that project local costs could be dollar-financed

rather than funded with U.S.-owned excess rupees. Consistent with this policy, the ABS for FY 1986, which includes the Program for the Advancement of Commercial Technology (then entitled Fund for Technology Development), was reviewed and approved by AID/W, thus confirming the use of dollars for local costs of the project. The provisions of Section FAA 612(b) have been considered and the use of dollars for local costs of this project can be approved. Your signature on the attached authorization will constitute the certification required under this section.

Congressional Notification: A CN was submitted on May 22, 1985 and will expire on June 5, 1985.

Recommendation: That by signing the attached project authorization, you approve $11.1 million in grant funds for the Program for the Advancement of Commercial Technology.

Clearances:
ANE/ASIA/PD:PBloom
ANE/ASIA/PD:RPratt
SA/A/AID:EHarrell (draft)
PRE/PPR:RDodson (draft)
GC/PRE:SCarlson (draft)
PRE:RBeckman (draft)
ANE/ASIA/GC:
ANE/ASIA/DP:
ANE/BI:AMcDonald
ANE/ASIA/TR:BSidman
ANE/ASIA/PD/SA:PMatheson
DAA/ANE/ASIA:EStaples
AID/ASIA/ANE/PD/SA:DDevin:pw/ka:6/03/85:x29000:#4485k

/1

United States International Development Cooperation Agency
AGENCY FOR INTERNATIONAL DEVELOPMENT
Washington, D.C. 20523

PROJECT AUTHORIZATION

INDIA

Program for the Advancement
of Commercial Technology
Project No. 386-0496

1. Pursuant to Section 106 of the Foreign Assistance Act of 1961, as amended, I hereby authorize the Program for Advancement of Commercial Technology (the Project) involving planned obligations not to exceed Eleven Million One Hundred Thousand United States Dollars ($11,100,000) in Grant funds, over a five year period from the date of authorization, subject to the availability of funds in accordance with the A.I.D. OYB/allotment process, to help in financing foreign exchange and local currency costs for the project.

2. The Project is intended to accelerate the pace and quality of technology innovation for products and production processes in industry, agriculture, health, energy, and other areas important to Indian development. Through the Project, A.I.D. and the Industrial Credit and Investment Corporation of India (ICICI) will support Indo-U.S. joint ventures in technology development and finance promotion activities in the U.S. and India.

3. The Project Agreement, which may be negotiated and executed by the officer to whom such authority is delegated in accordance with A.I.D. regulations and Delegations of Authority, shall be subject to the following essential terms and major conditions, together with such other terms and conditions as A.I.D. may deem appropriate.

3.a. Source and Origin of Goods and Services

Goods and services, except for ocean shipping, financed by A.I.D. under the Project shall have their source and origin in the Cooperating Country or the United States, except as A.I.D. may otherwise agree in writing. Ocean shipping financed by A.I.D. under the Project shall, except as A.I.D. may otherwise agree in writing, be financed only on flag vessels of the United States.

3.b. Conditions Precedent and Funds Utilization Upon Completion/Termination

(i) Conditions Precedent to Disbursement

Prior to any disbursement under the Grant for subproject financing, or to issuance by A.I.D. of documentation pursuant to which such disbursement will be made, the Grantee shall, except as A.I.D. may otherwise agree in writing, furnish to A.I.D., in form and substance satisfactory to A.I.D., evidence that:

(a) The Councils have been established, have their authorities defined and have adopted (i) the policies and operational procedures for the PACT, (ii) the first PACT annual operating plan and budget, and (iii) the appointments of the Program Advisor, India and the Program Advisor, U.S.

(b) The Technology Development Division has been organized including the definition of duties and authorities, relationship to the Program Advisor, India and the Program Advisor, U.S., and proposed staffing.

(ii) Funds Utilization Upon Completion/Termination

After completion of the Project or upon the Project Agreement being terminated by either of its parties, ICICI, AID, and the Government of India shall confer and agree in writing to utilization thereafter of all assets then held in the Special Account or to be acquired by the Special Account, tangible and/or intangible, in a manner consistent with the purposes and objectives of this Project.

Signature Charles W. Greenleaf Jr.
Charles Greenleaf
Assistant Administrator
Bureau for Asia and Near East

Date 6/14/85

Clearances: ANE/ASIA/PD:PBloom
ANE/ASIA/PD:RPratt
GC/ASIA:
ANE/DP:
ANE/ASIA/BI:AMcDonald
ANE/ASIA/TR:BSidman
DAA/ANE/ASIA:EStaples

AID/ASIA/ANE/PD/SA:DDevin:pw/ka:6/07/85:x29000:#4485

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I. PROJECT SUMMARY

The Program for the Advancement of Commercial Technology (PACT) is an experimental project designed to accelerate the pace and quality of technological innovation for products and production processes having application in industry, agriculture, health, energy and other areas beneficial to the development of India. This goal will be achieved by contributing to development of capability in the private sector to translate research already completed at the idea and laboratory stage into products and processes that will succeed in the market place. The focus of the project will be on the "development end" of R&D where ninety percent of the cost, risk and time involved in producing commercially successful innovations is invested.

The problem addressed by this project is the slow pace of technological innovation in India relative to the potential of the country. India is at a stage where the potential for productive, direct interaction between India's large pool of scientific and technological manpower and private enterprise can make an important contribution to the country's development.

Among constraints to realizing potential for technology development in the private sector are the limited exposure of firms to commercial R&D and, as might be expected in these circumstances, lack of experienced R&D project managers and a generally weak R&D culture. The PACT has been designed to act as a catalyst in the technology institution building and training process that will lead to increased private sector R&D capability.

Building on India's nascent commercial R&D experience, the PACT will bring together Indian enterprise interested in developing their R&D capability with the United States' more mature technology culture and experienced R&D project managers. Through collaborations in R&D with U.S. enterprise, Indian enterprise will increasingly apply financial resources and engage staff in technology development and innovation. Formation of Indo-U.S. joint ventures in R&D will engage Indian firms in a collaborative process which will not only introduce new technology and processes from the U.S., but also acquaint the Indian partner with U.S. R&D strategy, project selection methodologies and management techniques.

AID grant resources of $ 12,100,000 will be used to bring about the Indo-U.S. joint ventures that are critical to achieving the institution building and training objectives of this project. The AID resources will fund a promotional and financing program managed by the Industrial Credit and Investment Corporation of India

(ICICI). ICICI will carry out its responsibilities in consultation with an India Council and U.S. Council, that will meet jointly approximately six times during the five year life of project. The Councils' membership will be predominantly prominent business persons. Indian members will be appointed by the ICICI Chairman and U.S. members by the AID Administrator.

ICICI will plan and execute a promotional effort that will inform U.S. and Indian business persons about the opportunities and incentives available for joint ventures in commercial R&D in India; identify Indian and U.S. firms with interest in R&D collaboration and encourage them to explore joint ventures; finance small prefeasibility studies to explore these ideas; structure plans to test their technical and commercial viability; facilitate the formation of joint ventures between partners; and help entrepreneurs obtain the necessary U.S. and GOI approvals.

A PACT special account will be established by ICICI financed by $10,000,000 from the AID grant to ICICI. The special account will be utilized to finance Indo-U.S. joint ventures in R&D. In establishing financial mechanisms and their terms and conditions ICICI, in consultation with the Councils, will consider and may utilize a spectrum of financing alternatives The criterion guiding selection of the financing vehicles and their terms and conditions is modalities used elsewhere for similar types of private sector, innovative technology development.

Services to be provided by ICICI in managing the account are assistance to joint ventures in preparation of R&D proposals for consideration for PACT finance; evaluation of proposals for commercial potential and technical feasibility; monitoring progress of approved projects against pre-establishd benchmarks and routine disbursement, collection and reporting services.

In order to implement the promotional and financing program, ICICI in consultation with the Councils will have a Program Advisor, U.S. Office in the U.S. and appoint a Program Advisor in India. ICICI will also establish a Technology Development Division. The staff of the Technology Development Division will be career ICICI personnel. The two Program Advisors will report to the person designated by ICICI to manage the Technology Development Division. That person will also serve as the principal contact point for the Councils and AID for the PACT. The costs of the two Program Advisors are to be AID financed. The costs of the Technology Development Division will be borne by ICICI.

AID, from the funds authorized for this Project, will retain $400,000 to be utilized to directly engage, by grant, contract or otherwise, other institutions to broaden the scope and institutional base of the PACT. Undertakings financed through this activity are outside of the mandate of the grant to ICICI but will be supportive of its goals. Funds may be made available to assess formal training requirements for R&D managers, run courses on R&D management and strengthen ties between the university and business R&D communities.

The project will be evaluated jointly by AID and ICICI early in years three and five. The evaluation in year three will concentrate on the effectiveness of the operatonal aspects of the project. The evaluation in year five will focus on assessing achievement of the project's goal and purpose. The year five evaluation will also consider a future course of action for the PACT including continuation, termination, restructuring or "spinning out".

Implementation of the Project is intended to rely heavily upon the private sector expertise of ICICI and the Councils. Therefore, subject to certain limitations and criteria, ICICI in consultation with the Councils is to develop the appropriate policies and procedures, and most advantageous financing mechanisms. These policies and procedures when adopted by the Councils will constitute the operating policies of the program.

Similarly, procurement and contracting requirements of ICICI and subproject joint ventures will, to the maximum extent allowable, be in accord with the procuring entities standard procurement procedures as well as good commercial practice.

II. RATIONALE

A. Role of Science and Technology in Development

Sustained technological innovation is one of the salient characteristics of the developed countries of North America, Europe and East Asia. The successful transition of countries in these regions from traditional agricultural to modern industrial societies has been accompanied by a fundamental change in general availability of food, shelter, health services and material goods. Application of science and technology above all has been a key factor in and symbol of that change.

India, despite its considerable progress in the industrial field, is still predominantly a rural agrarian society looking forward to transform itself into a modern industrial one in which basic necessitites will be widely available. In planning for this structural transformation, science and technology from the very outset have been given high priority. Since Independence, the Government of India has invested steadily and heavily in creating science and technology infrastructure. Today India ranks among the top fifteen spenders on R&D in the world. In 1948 total expenditure on R&D was on the order of $1 million; in 1983-84, $1,000 million. In terms of training technical manpower, the number of persons holding engineering, medical, agricultural, and science degrees has risen from less than 0.2 million in 1950 to an estimated 2.2 million in 1984. India now has the fifth largest pool of technical manpower in the world. Government of India policy continues to be very supportive of building the country's science and technology capability.

1. Program for Advancement of Commercial Technology

The Program for Advancement of Commercial Technology (PACT) is an experimental activity designed to accelerate the pace and quality of commercial technology development and innovation for products and production processes having application in industry, agriculture, health, energy and other areas important to the development of India. It is based upon the following key assumptions:

-- technological progress plays a critical role in economic and social development;

-- indigenous technology development capability to complement the import of technology from other countries is important for technological progress;

-- indigenous technology development capability can be significantly improved by engaging the resources of private enterprise.

The program focuses on the "development end" of the innovation process. The aim is to translate research already completed at the idea and laboratory feasibility stages to full scale commercial production. Although there are many iterative stages in the innovation process, 90 percent of the cost, risk and time are involved in the translation steps. This is an area in which the strength of U.S. private enterprise can be brought to bear through collaborations with Indian enterprise to help improve commercial R&D in India.

2. Relationship to USAID Strategy

The PACT supports the aim of USAID's Research and Technology Development (R&TD) Strategy of helping India to utilize its scientific and technological talent better through applying it to the process of innovation. The PACT is a cross cutting activity that will help to translate research results into innovative, commercially viable products and processes that can be spread through the marketplace.

In proposing the PACT, USAID will draw upon a fundamental strength of the U.S. by opening a channel to the U.S. private sector's capacity to identify and execute R&D projects designed to be successful in the marketplace. It should be noted that the Mission views this project as requiring active participation in its formulation and implementation of other organizational entities of the USG such as the Department of Commerce, AID's Bureau for Private Enterprise and the Embassy's Commercial and Science sections. The Mission's R&TD strategy is premised on a comprehensive USG effort rather than one centered strictly around AID's capabilities.

The output of this project will be complementary to research projects AID is funding in agriculture and energy and is designing in forestry, family planning and biomedicine. For example, joint ventures resulting from this project conceivably might include technology development on products and processes in fields such as electronic devices, energy conservation, pollution control, farm equipment, plant growth nutrients, and biosynthetic products for use in agriculture and health.

B. Problem of Indigenous Commercial Techology Development

While India was establishing its impressive science and technology infrastructure, Indian firms under the protective umbrella of import substitution were gaining considerable technical skill and experience as local production progressively replaced imports. Also, capacity to assess, choose and operate conventional, imported technology became widespread among Indian enterprises. By the 1980s India had arrived at a stage where important potential for productive interaction between the science and technology community and industrial enterprises to accelerate the pace and increase the scope of indigneous technological development was widely perceived.

Despite the perceived potential for indigenous technology development, the interaction between the science and technology community and enterprises remained weak and the pace and scope of indigenous commercial innovation relatively slow and limited. The extensive network of national laboratories has not developed strong links with industry and has not been very successful in producing commercially viable technology. Indian industry, long shielded from competition by import barriers and a regulated commercial environment, has not invested much of its human or financial resources in the risky undertaking of technology research and development to earn a profit. Private enterprise, which accounts for a small proportion of R&D expenditure, depends largely on imported technology for new products and production processes. In 1980-81, for example, expenditure on R&D was less than one half of that on technology imports. R&D expenditure, using the term loosely, though increasing in recent years, has tended to concentrate on minor adaptation and assimilation of imported technology. Projects leading to new products and processes are few.

The meagre commercial output of India's national R&D network and industry has made technology imports the main source of technological innovation. India is acutely aware of both the limitations and the hazards of habitual adoption of such a soft option. This healthy awareness coupled with the keen desire to rapidly modernise the industrial sector is reflected in GOI's recent policies supporting indigenous commercial R&D.

C. GOI Policy on Technology Development

The Approach Paper to the Seventh Five Year Plan, 1985-1990 indicates a major change of emphasis in Science and Technology Policy.

> "The attempt will be to give up the practice of considering science and technology as a sector in its own right and to ensure that the bulk of science and technology effort is an integral part of all economic and strategic sectors."

The above is implicit recognition of the underutilization of India's large science and technology community and the potential contribution it can make to economic development by closer interaction with producers.

The GOI now directly encourages firms to undertake R&D. The Income Tax Act, for example, allows full deductions for all R&D expenditure including expenditures incurred within three years before commencement of a business. Import regulations have been relaxed to allow in-house R&D units/laboratories to import their full requirements of technical and professional equipment, raw materials, components, spares or other items on Open General License.

At the same time that the GOI is pressing for increased in-house R&D, it is also encouraging foreign collaborations as a means of acquiring technology. Priority industries include electronics, energy, machine tools, chemicals, automotive ancillaries, agriculture related industries and pharmaceuticals. Foreign collaborations have risen from 389 in 1981, 590 in 1982, 673 in 1983 to more than 700 in 1984.

In brief, the GOI has enacted incentives and relaxed regulations and their interpretation in recent years to accelerate technological change both through increased indigenous R&D and foreign collaborations. Further enhancement of indigenous commercial R&D is officially recognized as important both for efficient assimilation of technology acquired abroad and for developing indigenous technology.

III. PROJECT DESCRIPTION

A. Goal

The broad sector goal to which this project will contribute is acceleration in the pace and quality of technology innovation for products and production processes culminating in new businesses in industry, agriculture, health, energy and other areas important to Indian development.

B. Purpose

The project's purpose is to contribute to building market oriented R&D capability in the Indian private sector.

The rationale for the PACT is that by facilitating and financing Indo-U.S. joint ventures, India's industrial and business communities will be encouraged to invest resources in and develop effective R&D capabilities to sustain new businesses based on Indian technological advancement.

The use of the Indo-U.S. joint venture approach will engage Indian organizations in a collaborative process which will, aside from introducing new technology and processes from the U.S., aquaint and orient the Indian partner to U.S. R&D strategy, methodology and management. The subprojects promoted and funded under this project will be selected with the transfer of the R&D management process in mind.

C. Detailed Description

1. Overview

Indo-U.S. joint ventures in commercial R&D will be the modality for achieving the project purpose. The PACT, through promotional efforts and financing, will encourage the formation of the joint ventures deemed critical to project success.

The promotional effort will have both an Indian and a U.S. component. These components will publicize the advantages of undertaking commercial R&D in India as well as the incentives and assistance available from the PACT to stimulate and facilitate formation of joint ventures in commercial R&D. Over the five year life of the project AID will provide the promotional effort in India an $800,000 grant -- $400,000 to the Industrial Credit and Investment Corporation of India (ICICI) and $400,000 to selected Indian institutions -- to engage in promotional campaigns. Through the Bureau for Private Enterprise (PRE), AID will provide $1,000,000 for the U.S. component of the promotional effort.

The financing, which will be managed by ICICI, will provide additional impetus to formation of joint ventures in R&D. AID will capitalize the PACT special account by a grant to ICICI of $10,000,000. These funds will be available to Indo-U.S. joint ventures for financing R&D projects.

To provide policy and guidance for PACT operations two councils - an India PACT Council and an U.S. PACT Council - will be formed. ICICI in consultation with the Councils will manage the PACT. On behalf of the Councils, AID will provide a $200,000 grant to be administered by ICICI to cover costs of meetings of the Councils during the life of project.

Two major evaluations of the PACT will be undertaken - one during the third year of the project; the other, during the fifth year. AID will provide a grant of $100,000 for these evaluations. ICICI will provide an annual report to the Councils on the progress of the PACT.

2. Organizational Components

The entities that will be directly involved in the PACT operation are:

- an Indian Council and an American Council in joint meeting;[1/]
- ICICI; and
- Other institutions such as business associations, consultancy services, and universities.

a. Councils

In order that the PACT may benefit from the commercial experience of both Indian and American entrepreneurs and to heighten the visibility and thus extend the reach of the program, an Indian PACT Council and an American PACT Council will be established.

i. Functions

The Councils will provide advice and guidance for PACT operations and will oversee the general management of the program. The Councils will adopt:

(1) the policy and operational procedures for the PACT program addressing, among other things, subproject selection criteria, models of joint ventures that will be eligible, technical evaluation processes, and terms and conditions for subproject financing;

(2) annual operating plans and budgets for PACT activities;

(3) the appointments of the Indian and American program advisors;

1/ Henceforth the word "Councils" will be used to refer to both in joint meeting.

(4) any management fee schedule for reimbursing ICICI for costs incurred in carrying out the program; utilizing return flows and the corpus could be considered for this purpose.

The Councils will review the progress of the PACT based on reports presented by ICICI including those by the Program Advisor, India and the Program Advisor, U.S. Outside of the meetings, they will be apprised of PACT activities by regular reports, and when necessary, telephone calls, telexes, letters, and other forms of communication. Council members will receive notification from ICICI when a subproject proposal of more than $500,000 is to be considered by the screening committee.

ii. Composition

Each Council will consist of five members. The Indian Council will be chaired by the Chairman of ICICI and will include an official from the Government of India and three prominent business persons. The U.S. Council will include a representative of the U.S. Government and four prominent business persons.

The Chairman of ICICI and the Administrator of AID, or persons designated by them, will select members for the India and U.S. Councils respectively. The business persons on both Councils will be chosen for their experience in managing programs known for translating R&D into commercially viable products and for their wide-ranging contacts in the business communities of the two countries.

iii. Meetings

The Councils will meet approximately six or seven times over the five year life of the program. Meeting sites may alternate between the two countries with the first meeting held in India. The Chairmen of the India and U.S. Councils will alternate as the chair of the Joint meetings. The Indian and American program advisors will also be invited to attend the meetings as non-voting participants as will the head of the Technology Development Division who will be designated Secretary to the Councils.

iv. Finance

From the grant, $200,000 will be utilized to support the Councils. The grant will cover the expenses of meetings including travel, out-of-pocket expenses of Council members, the Secretary to the Council, the two Program Advisors, the cost of communications, and other related miscellaneous expenses that might arise.

b. ICICI

"The Industrial Credit and Investment Corporation of India Limited (ICICI) is a financial institution set up in 1955 to encourage and assist industrial development and investment in India."

"Its objectives, inter alia, include providing assistance in the creation, expansion and modernisation of industrial enterprises, encouraging and promoting the participation of capital in such enterprises and encouraging and promoting industrial investment and the expansion of capital markets. These objectives are pursued by providing finance in the form of long and medium-term loans or equity participation, sponsoring and underwriting issues of shares and debentures, guaranteeing rupee and foreign currency loans from other sources, making funds available for reinvestment by revolving fixed investments as rapidly as prudent and furnishing managerial, technical and administrative advice to Indian industry."

" The primary function of ICICI is to act a channel for providing development finance to industry. While performing this function it has been ICICI's constant endeavour to play a more effective role in India's economic development, by adapting its operations to the changing needs of the nations economy." 1/

The principal functions to be carried out by ICICI for the PACT utilizing the organizational subcomponents noted below are a promotional effort and management of the PACT special account for financing R&D subprojects proposed by Indo-U.S. joint ventures.

1/ The Industrial Credit and Investment Corporation of India, "A Source of Capital for Industry."

The PACT promotional efforts in India and the U.S. are intended to publicize the available incentives, identify potential joint venture partners and projects, and facilitate formation and implementation of Indo-U.S. collaboration.

The organizational sub components to be engaged in and/or managed by ICICI for the PACT to carry out the above functions are the following:

- Screening Committee
- Program Advisors, and Technology Development Unit, ICICI
- Resource Panels

i. Screening Committee

A PACT Screening Committee will be established for subproject approvals. The Committee will include the Chairman of ICICI, the head of the Technology Development Division, legal counsel and one or two persons from outside ICICI with professional competence to evaluate subproject proposals for joint ventures in R&D. The Program Adviser, India and Program Adviser, U.S. (as available) will be invited as non voting participants to the meetings of the Committee.

ii. Technology Development Division and Program Advisors

In India, day-to-day operations of the PACT will be handled by the head of the Technology Development Division working closely with the Program Advisors, India and U.S. Their responsibilities will fall into the broad categories of promotional activities aimed at surfacing and developing R&D proposals with commercial potential, managing the financial approval and follow up process and monitoring the progress of PACT collaborations.

The Technology Development Division and Program Advisors will carry out the following functions:

- inform U.S. and Indian businessmen about the opportunities and incentives available for joint ventures in commercial R&D in India;
- identify Indian and U.S. firms with potential interest in R&D collaborations and encourage them to explore joint ventures;

- finance small prefeasibility studies to explore promising but not fully developed ideas and structure plans to test their technical and commercial viability;

- facilitate the negotiation of joint ventures between partners;

- help entrepreneurs obtain the necessary U.S. and GOI approvals.

Services provided for financing will be as follows:

- assist joint ventures in preparation of R&D proposals for consideration for finance;

- evaluate R&D proposals for their commercial potential and technical feasibility;

- negotiate subproject financial agreements with joint ventures appropriate to the portfolio goal of encouraging high risk, high return R&D;

- monitor the subproject portfolio progress against pre-established benchmarks;

- provide routine disbursement, collection and reporting services.

Technology Development Division

The Technology Development Division will consist of a senior career officer and staff. The senior officer shall be a person with experience in developing new programs, a science or engineering background and thorough knowledge and experience of ICICI's procedures and support staff. The staff of the Division will between them possess the skills required for full and effective functioning of the PACT. The senior officer in charge of the Division and the staff will be career ICICI direct hire staff. The Division will report to the Chairman, ICICI.

Program Advisor, India

The person filling the position of Program Advisor, India position will be recruited from outside ICICI. A long term contract will be offered. The individual selected will have a combination of promotional and technical skills and a background in management in the private sector. Experience in managing new business involvement in commercial R&D and familiarity with U.S. business and its practices will also be considered in the selection process. The appointment to this high level position will be made by ICICI in consultation with the Councils.

Once appointed, the Program Advisor, India will be provided office space, secretarial services and other normal office overheads on ICICI's premises and in the same location as the Technology Development Division. The Program Advisor, India will travel to the U.S. at least once each year. The Program Advisor, India will be invited to attend subproject screening committee meetings as a non-voting participant.

Program Advisor, U.S. Office

A Program Advisor, U.S. office will be established to publicize PACT in the U.S., to identify potential U.S. partners for Indian firms interested in joint ventures in R&D in India, and to acquaint U.S. business with the opportunities in India. The Program Advisor, U.S. will report to the head of the Technology Development Division and work closely with the Program Advisor, India. The Program Advisor, U.S. office will be located in a major U.S. city and may be housed with a relevant non-profit institution such as the U.S. Chamber of Commerce or Industrial Research Institute (see Appendix IX for discussion of options for the Program Advisor, U.S. Office).

The Program Advisor, U.S. will be selected from outside ICICI and offered a long term contract. The Program Advisor, U.S. will have the same kinds of experience and qualifications as the Program Advisor, India with the emphasis on first hand business experience and contacts in the U.S. and knowledge of India and its commercial environment. Selection for this high level position will be made by ICICI in consultation with the Councils.

The Program Advisor, U.S. will spend the initial period of his assignment in India to participate in the start up activities of the PACT, to develop working relationships with ICICI staff and the Program Advisor, India and to familiarize himself with potential

Indian business clients and the present Indian business environment. The Program Advisor, U.S. will travel to India a minimum of one time each year. Also, the Program Advisor, U.S. will have an invitation to attend subproject screening committee meetings as a non-voting participant.

iii. Resource Panels

To assist the promotional effort in India and the U.S., resource panels consisting of approximately fifteen members each will be organized in both countries. The panel members will be volunteers and will be appointed by the respective PACT Councils. In the U.S., functioning of the Resource Panel will be the responsibility of the Program Advisor, U.S. office and in India the Technology Development Division and the Program Advisor, India. Resource Panel members will be chosen for their contacts and technical expertise in fields expected to be particularly relevant to Indo-U.S. technology development joint ventures. The Councils will strive to appoint a mix of entrepreneurs, chief executives, and managers of R&D operations from enterprises with strong R&D orientations. Panel members will be called upon to help identify joint venture partners and projects.

iv. Budget

ICICI operating costs, salaries and overheads of its staff including office space, secretarial assistance, etc. have been estimated at $300,000 over the five year life of project. ICICI may propose, subject to agreement by the Councils, reimbursement for routine and extra ordinary costs it may incur in carrying out the PACT. These may be billed directly to clients or charged to return flows or the corpus of the special account.

The Program Advisor, India will have salary and travel and per diem costs, except to participate in the Councils' meetings, paid from the $400,000 AID grant to ICICI for promotional activities.

The Program Advisor, U.S. office will have costs covered from a $1,000,000 grant provided from AID/W central funds by the Bureau for Private Enterprise.

No funds have been projected for the Resource Panels and such expenditures as may be required may be drawn from the funds allocated for ICICI managed promotional activities.

c. Other Institutions

To broaden the institutional base and scope of the PACT, USAID/India will manage a program to involve Indian organizations and institutions in addition to ICICI in the promotion of indigenous R&D capacity. Activities financed through this program will be outside the scope of the PACT's operational mandate, but will be directly supportive of its goals and purposes. For example, funds may be made available to assess formal training requirements of R&D managers, run experimental courses on an R&D management, undertake a study on constraints to technology collaborations, assess the adequacy of information systems for R&D managers, establish stronger links between university and industrial communities in R&D, and support workshops, conferences, and seminars on topics relevant to commercial R&D.

There are a number of organizations and institutions such as the Association of Indian Engineering Industries (AIEI), Technical Consultancy Organizations (TCOs) in several states, Indian Institutes of Technology (IITs) and of Management (IIMs) that have capacity to make contributions to Indian private sector R&D development. There are other organizations such as the Indo-U.S. Joint Business Council and the Indo-American Chamber of Commerce that have also expressed interest in the PACT.

To engage other institutions in the PACT, the range of AID implementation mechanisms including grants and contracts may be utilized. Evaluations will be done by USAID staff.

The project contains $400,000 for this component of the PACT.

3. Process

In the previous section, the PACT organizational components consisting of Councils and ICICI were described in detail. In this section a scenario of how the Councils and ICICI will operate is presented.

The initial step in the establishment of the PACT will be selection of persons for the India PACT Council and the U.S. PACT Council by the ICICI Chairman and AID Administrator respectively, or their designees. The two Councils will as soon as possible thereafter be called to their first joint meeting. At that meeting the role, rules and procedures for the Councils will be specified. Also, selection of the Program Advisor, India and the Program Advisor, U.S. and a plan for PACT implementation will be considered.

A second joint meeting will be scheduled four-to-six months thereafter on PACT policies and procedures and an annual operating plan and budget for the first year of operations. The Councils will meet thereafter at least once a year to review program progress, to consider annual operating and budget plans, and such other matters as may require the Councils' attention.

During the first six months in addition to appointment of the two Program Advisors, ICICI Technology Development Division staff will be appointed. The Program Advisors and Technology Development Division working together will formulate operating procedures and policies, an annual operating plan and budget. The Program Advisor, U.S. will spend time in India to participate in the start up phase.

Significant interest in the PACT has already been generated among firms in India and a few in the U.S. during the PACT design phase. It is expected this could become active pursuit of PACT financial resources and other services by Indian and U.S. businesses. To develop additional interest, promotional efforts will be mounted in India and the U.S. to highlight to Indian and U.S. enterprises the commercial advantages of Indo-U.S. joint ventures in R&D and the resources and incentives that PACT can offer to assist in bringing the enterprises together in partnership. The PACT Program Advisors in India and the U.S. will lead the promotional effort. They will each make a minimum of one trip per annum to the U.S. and India respectively and will work closely with one another under the supervision of the head of the Technology Development Division.

When an interested firm without a joint venture partner is identified, PACT staff will assist in locating prospective partners, formulating proposals, acquiring appropriate GOI and USG clearances and securing PACT finance. Similarly existing Indo-U.S. joint ventures will be assisted in formulating proposals, acquiring necessary clearances and securing PACT finance. No hard and fast rules have been or will be set detailing the nature of cooperation between partners. The partners in a joint venture must make their own best judgment on division of responsibilities and benefits, and then reach their own agreement.

Proposals submitted for PACT funding will be evaluated under conditions of strictest confidentiality. In overseeing this process, ICICI will ensure that proposals satisfy program objectives and undergo rigorous technical, economic, financial, and legal evaluation. The resources of other ICICI units will be drawn upon and consultants with speciality skills will be engaged as needed.

Proposals will be sent to the U.S. National Bureau of Standards (NBS) for technical evaluation and non-binding recommendations on feasibility. Upon completion of the proposal evaluation, the Program Advisors, India and the U.S. and the head of the Technology Development Division will recommend approval or disapproval to Screening Committee. The Councils' members will be notified by the head of the Technology Development Division when PACT finance in excess of $500,000 for a single proposal is to be considered by the Screening Committee.

The head of the Technology Development Division will call a meeting of the Screening Committee to approve or reject PACT funding for a subproject proposal. The Program Advisors, India and U.S. (as available) will be invited to attend the Screening Committee meeting as non voting participants. The maximum PACT financing for any single project will be $1,000,000.

The types of expenditures that will be eligible for funding include specific work on product and process development involving engineering and experimental design studies, manufacture of prototypes and laboratory and market testing and pilot scale trials. This may entail financing equipment, specialized infrastructural facilities for housing the activity, materials, spare parts, special consultation charges, expenses for documentation and procurement of information, short term specialized technological training of limited number of personnel, and reasonable travel and overhead expenses.

The Technology Development Division will monitor all aspects of PACT including subproject progress, disbursements, and compliance with PACT assistance terms. Quarterly progress reports, annual budgets and operating plans as well as an annual report of PACT activities will be distributed for review by the Councils' members. These reports, budgets and plans will be prepared by the the Technology Development Division and the Program Advisors, India and U.S..

In the third year of the project AID will undertake a midterm evaluation of the PACT focused on management effectiveness. In the fifth year an evaluation will be undertaken to assess the overall management impact of the PACT. The evaluation will consider whether to terminate, continue, restructure, or "spin out" the Program. At that time it will be determined whether to seek additional funds for capitalization of the PACT. Because the PACT is an experimental project, breaking new ground, estimates of demand for finance and reflows have a higher than normal degree of uncertainty. Although projections can be generated to indicate the conditions under which the PACT Special Account can be self sustaining, they will have little validity without operational experience.

4. Evaluation of Subproject Proposals

Proposals for funding subprojects from the PACT Special Account will undergo rigorous technical, econmomic, financial and legal evaluation. This section describes subproject selection criteria, developmental considerations, technical evaluation and approval procedures.

a. Selection Criteria

i. Basic Criteria

To qualify for consideration of PACT support, a subproject will have to:

- involve the development, through commercial R&D, of an innovative product or process which promises tangible, direct benefit for the Indian economy and its developmental objectives;
- be proposed by an Indian-U.S. company or company team, each member of which has a significant role and capability in the development and commercialization;
- be capable of reaching the point of readiness for commercialization at a development cost to PACT of not more than $1,000,000 over a three year period;
- demonstrate that the proposing partners have, or will have ready access to, the technical and financial resources both to implement the project and to benefit from the commercial potential of the product or process developed.

ii. Nationality

With respect to nationality requirements, the basic rule is that one or more Indian enterprises or individuals, and one or more American enterprises or individuals, must be jointly involved in the proposal submission. These entities must present satisfactory evidence of ownership or control by nationals of India and the U.S. AID by Project Implementation Letter will provide its regulatory requirements on

nationality. Essentially, two or more entities, at least one from each country, will apply as a team on the basis of at least a preliminary understanding between them. This understanding may be conditional on their obtaining PACT financing and the necessary approvals of the Indian and U.S. Governments.

It is impossible at this juncture to address all the possible issues on nationality. For example, Indian or U.S. companies with subsidiaries or affiliates in the other country may not be found eligible to submit proposals jointly with their subsidiaries or affiliates, unless there is clear evidence of exceptional development benefit, and of active participation by both entities. Unanticipated formulations of potential subproject applicants will require judgement by ICICI in consultation with the Councils as to whether the companies and their proposal meet the basic objectives of PACT. Given the experimental nature of this program as much flexibility as is possible should be allowed.

iii. Innovations

In evaluating a proposal, consideration will be given to the context of the innovation, both its relationship to other products and processes that have been developed or are planned by the joint venture partners and by competing enterprises. Further, the innovation must be technically credible, i.e. initial feasibility sufficiently proven to warrant additional investment to commercialize the product or process.

iv. The Market

PACT, while recognizing the uncertainties implicit in predictions of future markets and possible competition for any new product or process, will need adequate evidence that the companies have made a thorough analysis of the market and constraints. Typically such an analysis will include identifying:

- what market need is served;
- the performance features and selling price, and thus the manufacturing cost, necessary to penetrate the market;

- a reasonable projection of the rate of growth of sales of the product or process;

- the regulatory barriers to overcome;

- an assessment of what competition exists or can be predicted which could seriously affect the success of the project.

v. Commercialization

The ultimate object of any PACT undertaking is the commercialization of the R&D effort. Thus, proposals will be evaluated on the basis of whether the potential financial exposure and expected return from successful commercialization are reasonable. With respect to the financial criteria, such factors as whether the companies can cope with the peak and aggregate investments, and the extent to which partial achievement of sales goals will be adequate to merit the initial investment, will be taken into consideration.

Projects will also be judged in terms of how the companies plan to implement a commercial program. Some of the questions to be considered include:

whether the participating companies will engage in the manufacture of the product or part of the product;

who will sell to which market region;

whether the companies currently have a suitable sales and service network, or whether it needs to be created;

to what extent the necessary resources for commercialization are available within the companies;

if additional resources are required, how it is proposed to acquire them.

vi. Organization and Management

An R&D joint venture is often a complicated undertaking requiring close cooperation between the partners. Proposals to PACT will therefore be evaluated in terms of the management arrangements contemplated, the internal review procedures, and the relationship of this joint venture organization to the heirarchies of the companies.

The ultimate determining factor in the successful commercialization of innovation is, of course, the people and the companies involved. Therefore PACT assessment of the participating partners should include their:

- record of performance in similar undertakings;
- the degree to which the proposed project can be absorbed into the existing structure of the company;
- the relationship of the proposed project to other company projects that receive support from outside agencies;
- financial information which demonstrates that the companies can not only contribute their share of project cost, but have resources available for the commercialization phase;
- the resumes of key personnel.

vii. Budget

PACT review will include the budgets for the subproject for each year by each of the participating partners against specific benchmarks of progress to be achieved. Disbursement by PACT will be made against progress on the approved research plan. These budgets should encompass phases of the project up to actual production and sales.

b. Development Considerations

PACT is a major effort to build private sector research and technology development capacity, closely matching the Indian Government's priorities for technological competitiveness of the economy. The program will finance subprojects involving technological innovation for products and processes having application in industry, agriculture, health, energy and other areas of developmental benefit. The preference will be for activities with a high developmental priority for India and relating to sectors or industries important in the development process. The program will focus on R&D joint ventures in technology development capable of reaching the point of readiness for commercialization in a three year period.

Subprojects will not be financed which involve defense products or processes those which are inconsistent with India's development plans, or which are excluded from AID financing by policy, legislation or regulation. These limitations are to be found in the Grant Agreement and will be contained in the initial implementation letter and other materials to be furnished to ICICI. (See Section VII on Conditions and Covenants).

The Mission considered explicitly tying USAID's overall program strategy objectives to this program, or in spelling out a developmental criteria for PACT applicants. We concluded that at this "start-up" phase it will be more important to keep PACT flexible and closely paralleling the conventions of the business and financing community in selecting proposals. In the Mission's view, India's developmental orientation is sufficiently in tune with AID's objectives, and, given that ICICI is fundamentally a development bank, there are sufficient built-in assurances that developmental considerations will be given adequate treatment.

The Mission intends to include, in the third year evaluation, an assessment of the PACT subproject portfolio's characteristics to determine whether specific developmental criteria should be added.

c. Technical Evaluation

Technical evaluation of proposals will be carried out by ICICI using resources of the U.S. National Bureau of Standards (NBS) and such others as may be necessary. The objective will be to evaluate the proposal with respect to newness, soundness of scientific and engineering principles and likelihood of completion within a three year period. The proposed R&D subprojects will be analyzed in the context of the state of the art. This would include defining the required properties and functions of the end item; achievements necessary to accomplish the objectives; availability of suitable techniques or requirements for new developments; technical and economic constraints; patent searches; and assessment of the proposal in light of commercial technology development in both countries.

Accordingly, in India ICICI will make full use of its various departments to undertake this evaluation. Where appropriate, it will draw on independent consultants and technology experts to provide this assessment.

In the U.S., NBS will be requested to perform this service. AID will enter into an agreement with NBS setting forth the services to be provided and the cost of the service to PACT.

Evaluation report costs initially will be funded out of the PACT promotional grant. Where subproject proposals are approved for funding, in most cases such report costs will be added to the credit extended to the venture and recovered according to the agreed financing terms.

The technical evaluation process presents a particularly sensitive area when it relates to commercial R&D. To protect the interests of the applicants, PACT will enter into a confidential disclosure agreement with the submitting partners. PACT will maintain the confidentiality of information so given, and use it only for purposes of evaluating the proposal. It will, however, be incumbent on the partners to identify information which they deem confidential, or over which they claim proprietary rights.

d. Subproject Approvals

After final review and approval PACT will enter into a subproject agreement with the proposing partners. This agreement, amongst other things, will specify the maximum amount of PACT financing, the amount of partners funding, the disbursment period, the research plan and the specific benchmark for achievement, the manner and amounts of payments to PACT, procurement requirements, remedies of ICICI and rights with respect to patents, technology and equipment upon default, termination, bankruptcy, etc. Subproject funding will be effected by a Screening Committee constituted for approval of the application. The Committee will include the Chairman of ICICI, a person with professional competence to evaluate subproject proposals from outside ICICI and head of the Technology Development Division, ICICI. The head of the Technology Development Division will act as Secretary to the Screening Committee. Minutes will be recorded. The Screening Committee will meet as often as necessary, to screen and approve or reject proposals. The Program Advisor, India and Program Advisor, U.S. (as available) will be invited to attend Screening Committee meetings as non-voting participants.

For any subproject with total funding in excess of $500,000 from the PACT special account, the head of the Technology Development Division will notify members of the Councils sufficiently in advance of consideration to allow members time to register with the Screening Committee any concerns or suggestions they may have about the proposal.

5. Subproject Agreements

In this section terms and conditions of financing from the PACT special account and other conditions to be included in agreements between ICICI and subproject applicants are outlined.

a. Financing Terms and Conditions

Given the uncertainty about market response to different PACT funding options and sustainability of the special account under these different options, the parties will allow flexibility in setting financing terms and conditions during the PACT start up phase. Based on early experience, ICICI, in consultation with the Councils, will determine and implement the subproject funding options that will most appropriately meet PACT objectives.

The principal criterion guiding selection of the repayment terms and conditions will be those prevailing elsewhere for similar types of private sector innovative technology development. In proposing this criterion it is recognized that in India, where private commercial R&D is not extensive and financial markets have their own unique characteristics, very different terms and conditions may be required. This aside, the objectives in applying the criterion are to develop a portfolio of R&D subprojects significantly differentiated from the normal portfolio of a term lending institution by higher levels of risk. Of course, associated with higher level of risks, should be the portential for a higher return which would improve prospects for reflows to the special account.

b. Termination of Subprojects

The broad spectrum of financing mechanisms available to ICICI, ranging from true proportionate equity participation to conditional grant to loan, do not allow this paper to develop precise language setting forth all ICICI entitlements to disposition of tangible or intangible assets upon or prior to failure or, "winding up" of a special account financed subproject. These rights will, however, be addressed by ICICI in its agreements as part of its commercial terms and conditions and will, consistent with project objectives, reflect appropriate commercial practice. Related issues, such as security, collateralization and reporting will be similarly addressed. The terms and conditions will be submitted to AID as a precondition to AID disbursements for subprojects. See Section VII.

6. Monitoring of Subprojects

The subproject agreement with the Indian-U.S. partners will specify that they agree to do the work as set forth in their proposal in accordance with good standards relevant to such undertakings and expend funds in accordance with the proposal and the requirements of the subproject agreement. In satisfying these commitments, they will provide to the PACT semi-annual fiscal and technical reports, and a summary report on subproject execution at the end of each year of support. The formats for such reports shall be described in a form and substance agreed to by AID and contained in a PACT Operations Handbook prepared by ICICI. The approved subproject applicants will maintain business and financial records and books of account for the work done for the subproject separate and apart from other business records. Such books and records will show the Indian and U.S. companies' contribution and evidence of compliance. PACT will have access to the financial records relating to the subproject for two years after its completion, or for as long as payments are due PACT.

These reporting requirements will flow into the PACT Technology Development Division. In operational terms, supervision and monitoring of the program will be largely entrusted to the Technology Development Division within ICICI. This Division will have the minimum necessary staff and authority within ICICI to monitor all aspects of the Program including sub-project progress, compliance with conditional grant terms, and so forth. Additionally, this Division may obtain assistance from outside professionals, such as technical experts, to monitor and audit projects sponsored by PACT.

The Technology Development Division will be expected to provide the members of the Councils and AID with regular progress reports on the operations of PACT, including anticipated new applications, identification of sub-project problems, and disbursements.

IV. Financial Plan

A. Financing of the PACT

The PACT involves several distinct activities, to be undertaken and partly financed by different entities for the five year life of project. These are as follows:

a) Indo-U.S. Private Sector Partners, which obtain subproject financing, will provide anywhere from 30 up to 50 percent of each subproject's total cost;

b) ICICI will contribute in kind operating expenses estimated at $300,000 for managing the PACT;

c) other institutions such as the Association of Indian Engineering Industries (AIEI), Indian Institutes of Technology and Technology Consultancy Organizations which qualify for USAID managed promotional grant support, will provide their requisite share of activity costs; and

d) AID will provide resources to cover (a) capitalization of the special account, (b) the PACT promotional activities (c) the Councils' operating expenses and (d) evaluation of the PACT.

With respect to AID, two Bureaus will provide the funds for the private sector R&D program in India:

a) Bureau for Asia will commit up to $11.1 million of the India Country Program level in the form of grant funding for the PACT; and

b) Bureau for Private Enterprise will commit up to $1 million of grant funding for U.S. promotional office expenses over a five year period.

Out of the $11.1 million grant from the country program $10.7 will be a grant to ICICI, the remaining $0.4 will be disbursed by AID to other institutions using standard contract and grants procedures.

a) $10 million for subproject financing managed by ICICI;

b) $0.4 million for promotional activities in India managed by ICICI;

c) $0.2 million for the PACT Councils' operating expenses managed by ICICI;

d) $0.1 million for evaluation of PACT;

e) $0.4 million to broaden the scope and institutional base of the PACT managed by USAID/I.

The above information is provided in tabular form by source, amount, program activity, and management in Table 1.

B. Cost of the PACT

1. PACT Special Account

The main cost in establishment of the PACT will be capitalization of the special account. AID has budgeted $10 million over 5 years. Because this is an experimental project the level of demand for finance from the Special Account is uncertain. In the fifth year of this experimental project a review will be undertaken to estimate future demand for finance, likely reflows and capitalization needs and, if appropriate, alternative mechanisms for utilization of funds and reflows.

2. PACT Councils

The PACT Councils will meet at least six times, alternating between India and the U.S. A budget for the Councils follows:

Budget for Joint Meetings of the PACT Councils

1. Standard costs for a meeting of the Councils

Travel, international	@ $ 3,000
Travel, in country (India)	@ $ 200
Travel, in country (U.S.)	@ $ 300
Honoraria for business members	@ $ 100 per day
Per diem @ $ 100 per day	
Misc. travel cost	@ $ 100 per meeting
Other expenses, e.g. secretarial, communications, documentation, and other misc. meeting costs	$ 3,100 - 3,200

2. Participants

a. India - seven participants

i. Council

ICICI Chairman
Three business members
GOI representative

ii. Non Council participants

Program Adviser, India
Secretary to the Councils, ICICI

b. U.S. - six participants

i. Council

Four business members
U.S.G. representative

ii. Non Council Participants
U.S. Program Adviser

3. Budgets for three meetings of Councils in U.S. and three meetings of Councils in India follows:

a. Councils joint Meeting in India

Travel U.S.-India-U.S.	6 persons	$ 18,000
Travel, in country	4 persons	800
Per diem for 5 days	10 persons	5,000
Honoraria for 3 days	7 persons	2,100
Misc. travel costs	10 persons	1,000
		26,900
Other expenses		3,100
		30,000
Total for three meetings in India		$90,000

b. Council Joint Meeting in U.S.

Travel, India-U.S.-India	7 persons	$21,000
Travel, in-country	5 persons	1,500
Per diem for 5 days	12 persons	6,000
Honoraria for 3 days	7 persons	2,100
Misc. travel costs	12 persons	1,200
		31,800

Other expenses		3,200
		35,000
Total for three meetings in U.S.	105,000	
Total for six meetings of Councils in India and U.S.		195,000
Contingency		5,000
Total Councils budget		$200,000

3. PACT Promotional Activities

The PACT Promotional activities for India have been budgeted at $400,000 for the promotional activities to be carried out by the Program Adviser, India and Technology Development Division and $400,000 for Other Institutions to be managed by USAID.

The budget for the promotional activities in India is expected to include the salary of the Program Adviser, India and at least one trip each year by that person to the U.S. The grants may be spent for expenses for consultants to assist in subproject development activities, seminars/workshops, promotional expenses covering information and publicity brochures , costs of idea development and prefeasibility studies and limited within India travel for Program Adviser, India and Technology Development Division staff. A notional budget for one year follows:

Annual Budget for ICICI Managed PACT Promotion

Program Adviser, India	
salary	$8,000
international travel	$3,000
per diem	3,000
domestic travel	2,000
per diem	2,000
Technology Development unit	
domestic travel	6,000
per diem	6,000
Promotional materials	5,000

Seminars/Workshops	5,000
Consultancies	10,000
Idea Development and prefeasibility studies	30,000
Total Promotion	80,000

4. Program Adviser, U.S. Office

The approximate cost of the PACT promotion in the U.S. for one year follows:

Annual Budget for Program Advisor, U.S. Office

Program Advisor, U.S. salary	$100,000
Support staff salary	30,000
Telephone	10,000
Telex	5,000
Overhead/Office	20,000
International travel	9,000
Incountry travel	6,000
Per diem	10,000
Misc., publicity brochures, seminars/ workshops	10,000
Idea development and prefeasibility studies	50,000
Total	250,000

5. Other Institutions

The $400,000 retained by AID for utilization by other institution in the PACT effort is expected to disburse at an average rate of $80,000 per annum.

6. Evaluation

The costs for two major evaluations will be $45,000 and $55,000 each. This will cover salaries, travel, per diem and miscellaneous costs for approximately three person months for each of the evaluations.

V. Implementation Plan

A. Anticipated Sequence of Events

In Section III. C. 3., Process, a narrative sequence of events was presented. The sequence of anticipated events is outlined below:

Program Event	Estimate of Cummulative Time Elapsed
1. Grant Agreement Signing	
2. First meeting of Councils & meeting of initial CPS	2 mos.
3. Selection and placement of PACT personnel.	3 mos.
4. Formulation of operating procedures and policies, annual operating plan and budget, promotional strategy, terms and conditions of finance.	6 mos
5. Promotional effort commences	6 mos
6. Second Councils meeting and meeting of all CPS	7 mos
7. first subprojects approved	9 mos
8. First contract/grant with Other Institution signed	9 mos
9. Third Councils meeting review progress, annual budget and operating plan.	1-1/2 years
10. Mid term evaluation focused on management effectiveness	2 years
11. Fourth Councils meeting	3-1/2 years
12. Evaluation of project impact and requirements for additional resources.	4 years

13. First sales of products from subprojects.	4-1/2 years
14. Sixth Councils meeting, Recommendation to GOI and AID on future of PACT	4-1/2 years
15. GOI and AID mutually agree on course of action and take steps to implement	4-1/2 years
16. Final evaluation	6 years

B. Funds Commitment and Disbursement

There are five different grant financing elements in the project:

(1) The $10 million bilateral assistance grant to ICICI to finance joint venture R&D activities;

(2) The $600,000 bilateral assistance grant to ICICI to finance the promotional effort in India and the costs of the two Councils;

(3) The $1 million grant from the Private Enterprise Bureau to finance the U.S. promotional effort;

(4) The $400,000 bilateral assistance grant retained by USAID/India to co-sponsor activities and programs with Indian institutions and organizations; and

(5) The $100,000 bilateral assistance grant to ICICI to finance the project evaluation.

Following is a description of the planned disbursement procedures for each element. These procedures are subject to change should they prove to be inappropriate in terms of needs or timeliness. Any changes will be made in consultation with the USAID/India Controller.

1. $10 Million for Financing Joint Venture R&D Activities

After ICICI has satisfied the Conditions Precedent to disbursement, AID will make $10 million of grant funds available for financing joint R&D actvities. Upon receipt of a letter from ICICI that a joint venture R&D activity has been sanctioned, AID will, using the procedures now in practice, release the appropriate amount of dollars to

the Reserve Bank of India which will in turn credit the ICICI account with the equivalent amount of rupees. ICICI will subsequently make the rupee disbursement to the joint venture. Should the joint venture require dollar funds it will apply to the Reserve Bank of India where it will receive preferential treatment as a participant in this program.

2. $600,000 for ICICI Promotional Effort/Council

AID will make available $400,000 to finance the promotional effort in India and $200,000 to cover the costs of the two Councils. ICICI will claim reimbursement for these types of expenditures by submitting Form 1034 to AID on a quarterly or semi-annual basis. (An exception here could be the travel costs of the U.S. Council members and the costs of Council meetings held in the U.S. In these instances, it is likely that the Program Advisor, U.S. will make the initial financial outlay from his resources and then claim reimbursement by submitting Form 1034 to USAID/India.)

3. $1 Million for U.S. Promotional Effort

The Private Enterprise Bureau will contribute $1 million so that an office can be set up in the U.S. to promote joint ventures in R&D with Indian firms. The funds will support the salary and travel of one full time Program Advisor as well as the costs of operating the U.S. Office, including supplies and secretarial support and subproject idea development and prefeasibility studies. To acquire these services, PRE will enter into a contractual agreement with the Program Advisor, U.S. Disbursement will be made by PRE upon receipt of the Form 1034 from the Program Advisor. Because supervision of the Program Advisor will be the responsibility of ICICI and not the PRE Bureau, ICICI will communicate to PRE on a quarterly basis on the Program Advisor's performance.

4. $400,000 for In-India Promotional Efforts

USAID/India will obligate up to $400,000 to support Indian institutions and organizations with activities that encourage the growth of an R&D culture in the Indian business community. It is expected that AID will obligate these funds through contractual or grant agreements with such institutions and organizations and disburse according to the terms of the specific agreements.

5. $100,000 For Evaluation

The $100,000 for evaluation will be obligated to ICICI and committed by AID through contractual agreements with the firms or individuals chosen to conduct the evaluations. Disbursements will be made in accord with standard procedures.

6. Disbursements

The disbursement period for PACT will be five years. Estimated annual disbursements are set forth in Table 2.

C. Procurement and Contracting Procedures

1. ICICI Subproject Financing Procurements

Recognizing the desirability of maximizing the ability of ICICI and the subproject ventures to utilize traditional private sector mechanisms for procurement and contracting, USAID will seek blanket and *ad hoc* reflief from AID regulations as to source/origin/nationality, shipping and competition identified as incompatible with this interest. There is considerable PRE precedent for such relief. Procurement, however, may not raise significant concerns because of availability of a US dollar contribution from the US participant in the joint venture not subject to AID regulatory constraint which will be used for foreign exchange procurement. Similarly, the Indian Rupee contribution by the Indian participant is not subject to AID regulatory constraint and will be utilized for local currency procurements.

Subproject financing agreements entered into by ICICI will incorporate relevant AID procurement regulations but, wherever possible and commercially reasonable, deference will be given to the joint ventures or industry's customary procurement and contracting practices.

2. USAID Support of Other Institutions and PRE Activities

USAID will explore the full range of procurement options, special support grants, cooperative agreements, institutional and non-institutional contracts, "buy-ins", etc. to implement the support of other institutions component of the Project. AID regulations, with appropriate waivers, will be followed.

PRE will finance and implement the US promotional effort as otherwise described in the Project Paper.

D. Monitoring and Evaluation

1. Monitoring

This project will be managed out of the Science and Technology Division that USAID/India is currently in the process of establishing. It is expected that a senior foreign national will devote fifty percent of his/her time to the project and the U.S. direct hire division chief will contribute approximately ten to fifteen percent of his/her time. The project officer will monitor the progress of the project. The officer will follow the anticipated sequence of events outlined in Section V.A. above and ensure that events are proceeding in a timely manner. The officer will track the progress of PACT by occasional visits to ICICI and by reviewing reports as well as the budgets and operating plans. Visits to research sites will be made to verify compliance with AID procurement and contract procedures. Case studies will be completed annually to identify strengths and weaknesses of the program and to recommend improvements.

2. Evaluation

This project will be jointly evaluated by AID and ICICI early in years three and five using a team independent of the Councils and ICICI. The evaluation in year three will look primarily at the effectiveness of the operational aspects of the project. For example, it will review the financial packages that are being offered, examine the success of the promotional effort, assess the performance of the entities formed for the PACT including the Program Advisor, U.S. office, the Program Adviser, India and Technology Developemnt Division and the Councils. The team will also explore the PACT subproject portfolio with

a view to assessing the innovativeness and developmental relevance of subprojects approved, types of collaborations, technology transfer likely to occur and broadly the emerging characteristics of the portfolio.

The focus of the evaluation in year five will be on the overall impact of the PACT with respect to project goals and purpose. In addition to reviewing operational aspects, the year five evaluation will determine the number of collaborations sponsored under the project, the sales of the early collaborations, pay-back to ICICI and assets created. The level of innovativeness of products and processes developed, and the impact on the enterprises' future research and development plans will be reviewed. Also an assessment will be made of demand for special account finance, likely reflows and whether new infusions of financial support are warranted and justified.

VI. Analyses

A. Financial Analysis

The key issue in the financial analysis is the tension between the PACT purpose of encouraging high risk, potentially high return investments in R&D and the requirement that the special account become self sustaining. An important factor in this regard is that company laws (specifically the Companies' Act), fiscal incentives and securities markets are not conducive to a venture capital concept as practiced in the U.S., namely sharing risk through equity participation. For example, the Companies' Act does not allow a company to buy back its shares without going through the Courts. India does not have an Over-the-Counter or unlisted securities market. Stock exchange listing rules and Companies' Act requirements make it very expensive for a small or medium size firm to issue shares. In other words, exit for the venture capitalist is difficult. Also, limited partnerships are not allowed under the Partnership Act. This and other attractive fiscal incentives available in the U.S. for venture capitalists are not available in India. The overall effect is that taking an equity position in an R&D venture is not likely to be a financially attractive proposition. Under these circumstances the special account must look for the most part to other means to recoup finance made available to Indo-U.S. joint ventures. This does not, of course, preclude the Councils or ICICI from raising with authorities changes in public policy that would make venture capital a more attractive proposition.

In design of the project an in depth analysis of different financial terms on the character of the portfolio and sustainability of the account was carried out. A cash flow analysis was undertaken which took account of the disinclination of firms to borrow for R&D and the likelihood of a higher rate of subproject failure associated with funding R&D subprojects. The analysis shows for different interest rates, the levels of investor exposure (determined by the financial incentive offered to the investor by the PACT) and risk to the special account (average likelihood that subprojects will result in commercial sales), the PACT can offer and accept and remain self sustaining. This analysis, which is attached as Appendix VI, was prepared for internal puposes to help determine the terms and conditions of AID funding to ICICI. It centered on the issue of the impact of AID financial terms on the operational effectiveness of the project. The very same issues AID faced in determining terms of finance to ICICI are also the ones the Councils and ICICI will have to resolve in setting terms and conditions for subprojects.

Tables 1 and 1.1 (see Appendix V) show cash flow for the illustrative Sales Agreement repayment model also described in Appendix V. The Tables differ in that Table 1 is based on the premise that 50 percent of the finance to subprojects is paid back in full (approximately twice what was drawn from the Special Account with three years grace and five years thereafter to repay) and Table 1.1, on the premise that 80 percent is paid back in full. Table 1 shows the special account not to be sustainable with a 50 percent success rate. In year 6 the account runs a negative balance and even with reflows never manages to reach a sustainable level. Table 1.1 is more promising. However, to achieve this level of sustainability requires a portfolio with an 80 percent success rate. If this constraint is accepted the portfolio would either have to be heavily weighted with relatively risk free types of R&D in order to take on more venturesome subprojects or edge over, as a whole, toward what is already taking place in the market, namely financing of minor adaptations of imported technology.

An alternative to the above scenario is to tighten the financial terms to the joint ventures. Tables 2 and 2.2 (see Appendix V) offer a different, less attractive set of financial terms to the joint venture. Tables 2. and 2.1 are indicative of the cash flow from the illustrative Sales Agreement/Loan and Conditional Loan/Loan repayment options respectively which are also described in Appendix V. The Tables differ in that Table 2 assumes a 50 percent payback of the Sales Agreement and Conditional Loan portions of the finance and Table 2.1, 80 percent. In both case the prospects are for the special account to be self sustaining, though in the case of Table 2, without infusions of new capital, the account only reaches year 5 levels of disbursements in year 10 and Table 2.2, in year 8. The major question raised by Tables 2 and 2.2 is whether the tighter

terms will be attractive enough to draw Indo-U.S. joint ventures into the market. The preliminary indication based on the surveys of U.S. and Indian business persons (See appendices VII and VIII) is that they probably are not for the illustrative Conditional Loan/Loan option.

The cash flow analyses undertaken for this Project Paper are primarily useful as indicators of the issues the Councils and ICICI will have to grapple with in fixing the terms and conditons for repayments to the special account. The PACT in India is stepping off into largely unchartered waters. The empirical foundation for making an informed judgement about the repayment terms and conditions that should be adopted does not exist. The kinds of R&D proposals that will come forward, likely success rates, behaviour of the firm in response to various financing options are unknowns. Until experience becomes available, fixing on one or two option as the method of repayment may be counterproductive. Hence, flexible criteria for subproject financing have been adopted for the start up phase of the PACT.

B. Economic Analysis

The underlying economic premise of this project is that India is at a stage in its development where acceleration of the pace of indigenous technology development will yield significantly positive economic benefits to the country. At present private commercial R&D is less than 1 percent of turnover as compared with rates of 2 percent to 4 percent in most developed countries. Corollaries of this relatively low level of R&D are almost total reliance on imported technology for technological innovation and significant underutilization of the science and technology capability of the country. While there is little question that purchase of technology will remain an important source of innovation, failure to develop indigenous capability to innovate exposes the country to technological stagnation during periods when foreign exchange is tight and over the longer term condemns India to a disadvantage in technological competition for its own domestic and world markets. At the same time, an additional cost is imposed on the economy by the inability to develop means to harness the substantial investment in scientific and technological manpower and infrastructure to economic ends.

The main economic issue for the PACT is whether now is the right time to contribute to building a culture of private sector R&D. The presence of a large pool of skilled human resources, an increasingly technically sophisticated business community and rapidly growing markets for more technically advanced products indicate that the requisites for successful encouragement of private

sector, commercial R&D are in place. In the prefeasibility analysis for the PACT three interrelated constraints to private sector R&D were identified in the areas of information, human resources and finance. Constraints in these areas, of course, are only partial answers to the question of why more private sector R&D is not happening. The policy and regulatory environment, especially as it affects market structure plays an important role in determing the level of R&D. The actions of the Government of India in recent months toward liberalizing the economy are very encouraging in this respect.

In approaching the economic analysis for this project the Mission determined that the payout in terms of additional insight gained by trying to develop assumptions about income streams from R&D subprojects required to achieve an adequate rate of return would be insufficient to warrant its being undertaken. The problems posed by the uncertainties surrounding factors such as costs, types of R&D subprojects, and access to data aside, the institution building goal suggested alternatives that could be explored with benefit to the project. The focus of the economic analysis is on the policy and regulatory environment and the investment behaviour of the Indian and American enterprise with respect to technological innovation.

To the above end the Mission commissioned two studies -- one in the India and the other in the U.S. (see Appendices V and VI). The study in India covers the impact of the Indian policy and regulatory environment on commercial R&D and factors affecting investment behavior of the enterprise in selecting sources of technological innovation. The U.S. study covers the response of U.S. enterprise in investing in joint ventures in R&D in India and factors affecting that response.

The findings of the two studies taken together indicate that numerous aspects of the policy and regulatory environment of India and to a degree the U.S. act as disincentives to collaborations in technology development. However, both studies concluded that the perception and the reality of the trends in the policy and regulatory environment are more favorable toward Indo-U.S. collaborations in R&D than in the past. The India study emphasizes that in the short term the liberalization now underway will tend to favor purchase of technology and minor adaptations and assimilation of imported technology as sources of technological change over investments in R&D. At the same time, the scale of the PACT is such that adequate scope exists for promoting and financing joint ventures in R&D. The responses of business persons to the surveys in the U.S. and India strongly supports the conclusion that scope exists now for promoting private sector R&D. The joint ventures that will be formed are anticipated to have a significant demonstration value and "help in ushering in an R&D culture". Taken from this perspective the PACT will be working at the frontier of technology development in India.

C. Institutional Analysis

1. Definition of Development Finance Corporation

Development finance corporations have generally been established in developing countries where commercial banks are not able to provide either the longer term financing needed for development projects or short-term loans to unproven entities that nevertheless have the potential to contribute to growth. Commercial banks in these countries traditionally finance inventories in urban trade and industry. Their loans are generally short term; the borrowers' inventories form collateral; and the recipients of the funds typically have an established financial record. Because these banks are usually risk-adverse, and do not have the capacity to evaluate longer-term or unusual projects submitted by unproven borrowers, commercial bankers neglect the investment opportunities that could be profitable beyond the short term. Development finance corporations were conceived to meet several needs--to make the long-term loans or equity investment required by a growing industrial sector; to strengthen national development strategies by investing in rural areas by improving project appraisal methods; and, no less important, to introduce new financing concepts.

2. ICICI Programs

Beginning with its creation in 1955, ICICI has directed its financial resources to support the development priorities of India. In the early years the priority was rapid industrial development through wider entrepreneurship, and increased output of essential consumption and durable goods and diversified capital goods. Later, ICICI expanded its mandate to assist in the process of balanced regional growth and development of backward areas. In 1984, ICICI's sanctions of direct assistance to projects located in backward areas amounted to 57 percent of its total sanctions.

ICICI has demonstrated a consistent willingness to break new ground in India and has been notably successful in making these new ventures work. In 1977, it became the Indian pioneer in the merchant banking business where it is involved with projects from the time the proposal is formulated to the time the enterprise goes into production and becomes a bankable proposition. In its role of merchant banker, ICICI renders advice on plant capacity, product mix, mobilization of finance, and even marketing of output. Also in 1977, ICICI sponsored the creation of the Housing Development Finance Corpoation. In 1984, ICICI became the first term lending institution in India to enter the leasing business.

ICICI has been instrumental in setting up industrial and technical consultancy organizations to guide entrepreneurs through the design, implementation, and management of projects and in supporting various training institutions.

Because of its well established reputation in program development and financial management, ICICI has been tapped as a source of technical assistance to development banks in Ghana, Sri Lanka, Jamaica and Nepal.

3. ICICI Ownership and Resources

Ownership shares of ICICI are largely held by public sector corporations, including a number of nationalized commercial banks. Of ICICI's issued share capital of Rs.270 million ($25.5 million), public institutions hold 79%, foreign shareholders (mainly commercial banks) hold 14% and the remaining 7% is held by some 2,056 private Indian investors.

ICICI is operationally autonomous except in respect of the procedures for appointing auditors. Relations between GOI and ICICI are good and, through its close contact with the business community, ICICI continues to be an important link between the private sector and the Government. As of December 31, 1983, ICICI's resources totalled Rs.15.7 billion (US $1.49 billion). Foreign exchange equivalent to Rs.6.4 billion (US $607.7 million) accounted for 41 percent of the total, while domestic resources provided the balance of Rs.9.3 billion (US $880 million), or 59 percent. Much of ICICI's foreign currency resources have come from the World Bank. Of the total foreign exchange raised by ICICI up to December 31, 1983, the fourteen Bank loans accounted for US $733 million, net of cancellations, or 71%. Twenty two lines of credit from Kreditanstalt fur Wiederaufbau (KfW), totalling US $82 million equivalent, accounted for 8% and eight United Kingdom tied lines of credit accounted for 2% of total foreign exchange resources. The remaining 19% was primarily made up of four Euro-currency loans, one floating rate note issue, one USAID loan and one Swiss Franc bond issue and two Eurocurrency syndicated loans.

4. ICICI Management and Staffing

ICICI is well managed and operates effectively under a competent and experienced Board. Mr. S.S. Nadkarni is Chairman of the Board and Managing Director with overall responsibility for all operational aspects of ICICI. The fifteen members of the Board represent the GOI (2 members), public financial institutions (2 members), foreign shareholders (2 members), the professions and

business (7 members), and full-time executives of ICICI (2). The Board sets ICICI's overall financial and operational policies and decides on individual project proposals involving an exposure above Rs.20 million (approximately $1.68 million). ICICI's organizational structure is sound and it continues to have a strong and capable middle management. On December 31, 1984 ICICI's total staff numbered 700 of which the number of professional staff was 281. The overall quality of ICICI's staff remains high and turnover remains relatively low.

5. Characteristics and Impact of Past Assistance

As of December 31, 1983, ICICI had approved assistance totalling Rs.26.4 billion (US $2.49 billion) for some 3,900 projects. The sectoral distribution of assistance reflects ICICI's concentration on non-traditional and technologically more advanced industries: more than half the total was to the engineering sector, including metal and metal products, mechanical and electrical machinery and transport equipment, and to the chemical and petrochemical industries. Other subsectors receiving a significant proportion of ICICI financing were textiles, pulp and paper, and cement. ICICI's clients are predominantly medium to large sized private sector companies, and ICICI's average assistance per project amounts to Rs.9 million (approximately $750,000) corresponding to about 20% of total project costs. ICICI has a strong emphasis on encouraging the modernization and upgrading of clients' plant and equipment to improve overall industrial efficiency. These efforts extend also to advice to clients at the appraisal stage on technology choice and engineering design.

D. Environmental Analysis

Pursuant to Sections 216.2(c) (2) (ii) and 216.2(c) (2) (x) of Regulation 16, an environmental analysis was not required in conjunction with the PACT project design. The PACT will support controlled experimentation for the purpose of accelerating the pace and quality of commercial R&D and technology development in India. The R&D generated by the project will be subject to careful evaluation and monitoring by Indion--U.S. joint ventures interested in establishing commercial and technical feasibility for new products and processes. AID support will assist in the capitalization of for the prupose of making sub-loans to promising commercial R&D ventures; such AID support does not involve reservation of the right to review and approve individual loans made by the ICICI.

In the course of PACT project implementation, AID will seek to ensure that appropriate environmental review procedures are incorporated in ICICI's system of funding specific R&D ventures. AID's own environmental policy and strategy, including environmental design criteria and guidelines for project development, will be provided to PACT's two Councils, which will have oversight responsibility for project operations. Part of the AID grant of $400,000 to ICICI for R&D promotion and consultant services may be targeted for environmental analysis and pre-feasibility work associated with R&D initiatives carrying some or an unknown degree of risk to the environment. To the extent possible, AID will work with ICICI to promote specific types of R&D and technological innovation that may provide solutions to environmental problems currently impeding India's development.

VII. Project Agreement, Conditions, Covenants, Termination

A. Project Agreement

As pointed out by AID/W in State 096872, there is no previous model for this innovative project. It is the Mission's intention to obligate the US dollars 10.7 million (U.S..dollars 4.0 million in U.S. FY 85) to ICICI through the standard Bilateral Grant Project Agreement with only minor revisions to reflect the identity of the recipient and, if advantageous, incorporating earlier AID/W approved "India specific" modifications to the standard provisions. Since this is to be fully grant funded, loan concerns such as negative pledges, collateralization, payback, guarantees, and maintenance of value need not be addressed.

B. Conditions

In addition to the standard provisions, the following Conditions Precedent will be included in the Project Agreement:

1. Condition Precedent to First Disbursement

An opinion of Counsel acceptable to AID that this Agreement has been duly authorized and/or ratified by, and executed on behalf of, the Grantee, and that it constitutes a valid and legally binding obligation of the Grantee in accordance with all of its terms and in accordance with the laws of India; and that the Grantee is a Company duly incorporated under the laws of India, having the corporate power to conduct its business as presently conducted and to enter into this Agreement and commit itself to the terms therein.

2. Conditions Precedent to Disbursement for financing of Subprojects

(a) In form and substance satisfactory to AID, ICICI will have transmitted evidence that the Councils have been established, have their authorities defined and have adopted (i) the policies and operational procedures for the PACT, (ii) the first PACT annual operating plan and budget, and (iii) appointments of the Program Advisor, India and the Program Advisor, U.S.

(b) In form and substance satisfactory to AID, ICICI will have transmitted evidence that the Technology Development Division has been organized including the definition of duties and authorities, its relationship to the two Program Advisors and proposed staffing.

C. Covenants

In addition to the standard Project Evaluation covenant, the following covenant to protect confidentiality of subproject information will be included in the Project Agreement:

1. Confidentiality: ICICI will maintain the confidentiality of product and/or process information provided to it and marked as "confidential" by applicants for subproject financing.

2. ICICI shall, in addition to other reports, records, inspections and audit provisions of this Agreement, provide or cause to be provided to USAID and the Councils in a timely manner (a) quarterly reports, as to fund activities including but not limited to fund commitments, disbursements, receipts and organization and (b) annual, external independent audits of the fund.

D. Fund Utilization Upon Completion/Termination

In addition to the Standard Grant Provision requiring utilization of AID Financial resources for project objectives after completion of the project (HB 3, App. 6A-2, Article B, Section B, 3) and establishing AID's rights upon termination (HB 3, App. 6A-43, Article D), an additional clause will be included in the Project Agreement requiring that, upon project termination or completion, the parties will agree to a utilization of all special account assets then held or to be acquired, tangible or intangible,

consistent with Project objectives. Recognizing that neither the quality, quantity, time of receipt of special account assets can be projected at this time nor the restructuring that may occur at the time of evaluation, to be more specific is dysfunctional. The Project Agreement clause is as follows:

After completion of the Project or upon the Project being terminated by either of its parties, to this Agreement, ICICI, AID and the Government of India shall confer and agree in writing to the utilization thereafter of all assets then held by the special account or to be acquired by the special account, tangible and/or intangible, consistent with Project objectives. The requirement herein set forth is in addition to and does not replace or modify any other provision of the Agreement.

Thus in the event the PACT terminates, future royalty payments or interest or other obligations owed by sub borrowers to the special account as well as any intellectual property or other assets held in the special account will have their utilization determined by ICICI, AID and the Government of India. It is not in the interest of any of the parties that recipients of grants or loans from the Program will obtain a windfall gain should the PACT terminate.

Cash Flow Analysis of Illustrative Financing Options

Illustrative financing options extensively discussed with ICICI are described below as the Sales Agreement, Sales Agreement/Loan, and Conditional Loan/Loan options. They reflect a continuum of alternatives ranging from a form of venture capital financing on one end to more conventional bank financing on the other. Testing some of these alternatives as well as others in the initial phase of the project should generate enough information by year three to enable sound assessment of:

which financing option(s) are most appropriate for the PACT objective and purpose; and

which formulations have the greatest prospect for sustaining the PACT special account.

1. Sales Agreement Option

Under the Sales Agreement option the PACT assumes the risk of commercial technology development with the joint venture. The PACT's exposure in the form of a conditional grant will be 50 percent of total technology development project cost; the joint venture will bear the remaining 50 percent. The PACT's exposure in any one project should not exceed $1 million. The PACT will recoup its contribution from the joint venture through sharing in sales revenues generated by the commercialization of the product or process, paid to the PACT within a specified time and up to a limit possibly of two or three times the conditional grant amount. For example, a conditional grant agreement could include a repayment formula of 5% of sales annually, up to the amount drawn from the PACT and thereafter 2.5% annually of sales, up to two times the amount invested by the Program in the five-year period from the first sale of the product or process. In addition, if sales revenues failed to generate revenues as envisaged, then the compensation period could be extended another three years and the limit of compensation amount that could be recouped raised to three times the amount drawn from the PACT.

2. Sales Agreement/Loan Option

This option provides an immediate stream of interest income back to the Special Account. It may improve prospects for reflows to the Account, but may push the PACT toward less risky, less innovative subprojects. Under this option ICICI will approve a sales agreement such as described above for one half of the funds made available by the PACT to a joint venture for an approved subproject. The other half of the funds would be made available as a suitably secured loan to the joint venture repayable with interest from the time of disbursement. The PACT Special Account will cover up to 70 percent of total project cost with a ceiling of $1,000,000 for any single subproject. The loan component will have a repayment term on average of eight years.

3. Conditional Loan/Loan option

The Conditional Loan/Loan option will be the least difficult for ICICI to administer. Also, at standard ICICI interest rates this will probably be the least marketable of the three options. ICICI will loan up to 70% of projects costs at its going rate of interest (currently 14 percent); the loan will be suitably secured. One half of the loan will be repayable after disbursement irrespective of the success of the venture; the other half of the loan will be repayable in full if the subproject results in sale of the product or process developed. The term for the conditional half of the loan will be three years grace period with on average five years to pay back principal and interest including that charged to the loan during the grace period.

4. Analysis

Tables 1 and 1.1 show cash flow for the illustrative Sales Agreement repayment model. The Tables differ in that Table 1 is based on the premise that 50 percent of the finance to subprojects is paid back in full (approximately twice what was drawn from the Special Account with three years grace and five years thereafter to repay) and Table 1.1, on the premise that 80 percent is paid back in full. Table 1 shows the special account not to be sustainable with a 50 percent success rate. In year 6 the account runs a negative balance and even with reflows never manages to reach a sustainable level. Table 1.1 is more promising. However, to achieve this level of sustainability requires a portfolio with an 80 percent success rate. If this constraint is accepted the portfolio would either have to be heavily weighted with relatively risk free

types of R&D in order to take on more venturesome subprojects or edge over, as a whole, toward what is already taking place in the market, namely financing minor adaptations of imported technology.

An alternative to the above scenario is to tighten the financial terms to the joint ventures. Tables 2 and 2.2 offer a different, less attractive set of financial terms to the joint venture. Tables 2. and 2.1 are indicative of the cash flow from the illustrative Sales Agreement/Loan and Conditional Loan/Loan repayment options respectively which were also described in Section III.5. The Tables differ in that Table 2 assumes a 50 percent payback of the Sales Agreement and Conditional Loan portions of the finance and Table 2.1, 80 percent. In both case the prospects are for the special account to be self sustaining, though in the case of Table 2, without infusions of new capital, the account only reaches year 5 levels of disbursements in year 10 and Table 2.2, in year 8. The major question raised by Tables 2 and 2.2 is whether the tighter terms will be attractive enough to draw Indo-U.S. joint ventures into the market. Preliminary indications based on the surveys of U.S. and Indian business persons (See appendice IV & V) is probably not for the illustrative Conditional Loan/Loan option, which Tables 2 and 2.2 most accurately reflect.

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PROGRAM FOR ADVANCEMENT OF COMMERCIAL TECHNOLOGY

(386-0496)

APPENDICES

Vol. II

Appendices

Vol. II

Appendix I	Logical Framework
Appendix II	Project Identification Document Approval C ... (State 355495, December 1984)
Appendix III	AID/W Determination on Project Finance and Guidance on Other Project Related Issues (State 096872, March 1985)
Appendix IV	Project Checklist
Appendix V	Cash Flow Analysis of Illustrative Financing Options
Appendix VI	Financial Analysis Prepared for AID/W Determination on Project Finance by USAID/I (February 1985)
Appendix VII	Policy Environment for Joint Ventures in R&D in India and Assessment of Interest of Indian Private Enterprise in the PACT, report for USAID/I by Price Waterhouse & Co., New Delhi (April 1985)
Appendix VIII	Assessment of Interest of U.S. Private Enterprise in the PACT, report for USAID/I by Development Associates, Inc. (April, 1985)
Appendix IX	Study on the Options for the Program Advisor, U.S. Office, report for USAID/I by Development Associates, Inc. (April 1985)
Appendix X	GOI Letter of Request

APPENDIX I

Logical Framework

386-0496, Program for the Advancement of Commercial Technology

	Verifiable Indicators	Important Assumptions
Sector Goal: To accelerate the pace and improve the quality of technology innovation for products and production processes in industry, agriculture, health, energy and other areas important to Indian development.	The number of new products and new production processes being introduced for domestic and export markets will increase.	Within the existing policy framework an accelerated pace of technology development is feasible.
Project Purpose: To contribute to building R&D capacity in the Indian private sector.	Commercial enterprises will increase investment in technology development.	An enhanced technology development capacity will prove to be financially profitable to Indian firms.
Inputs: 1. Promotion and Management Effort a. U.S. and Indian Councils b. ICICI Technology Development Division & Program Advisor, India c. Program Advisor, U.S. d. Promotional materials prefeasibility studies 2. Finance for engineering and experimental design studies, the manufacture of prototypes, laboratory and field trials, research materials and equipment, and other costs of research.	Councils and technology development division established, staff appointed. Number of loans by ICICI to joint ventures in technology development. Promotional material prepared. Prefeasibility studies financed.	ICICI is an experienced credit institution capable of managing seed capital provided under project. U.S. and India promotional effort can be successfully launched. GOI restrictions on foreign collaboration will not hinder project. U.S. Govt. restrictions on the export of technology will not hinder projects.
Outputs: Commercially viable new products and production processes. An established mechanism to identify and promote joint venture opportunities. A recognition of the potential of venture capital for commercial technology development. An increased institutional capacity for technology development and for management of technology development programs.	Increased sales of new products and new processes. Increased demand for international collaboration in technology development. Technology development begins to compete with technology adaptation and licensing for human and financial resources in Indian enterprise. Increased demand for venture capital.	Joint ventures between Indian and Americans firms can be mutually beneficial. India has the policy environment and technical base on which a technology development capacity can be established.

APPENDIX II

Project Identification Document Approval Cable

(State 355495, December 1984)

FM SECSTATE WASHDC
TO AMEMBASSY NEW DELHI PRIORITY 5571
BT
UNCLAS STATE 355495

Project 386-0496

AIDAC

E.O. 12356: N/A
TAGS:
SUBJECT: FUND FOR TECHNOLOGY DEVELOPMENT (386-0496)

1. PID APPROVED BY AA/ASIA 11/19/84. FOLLOWING COMMENTS ARE PROVIDED AS GUIDANCE FOR PP DESIGN.

A. APAC DETERMINED PP APPROVAL WILL BE IN AID/W.

B. LOAN TERMS/FORGIVENESS OF DEBT: (1) APAC DISCUSSED IMPACT ON ICICI OF LIKELY TERMS OF A.I.D. LOAN TO ICICI AND POTENTIAL FORGIVENESS OF DEBT TO SUB-BORROWERS. PROVISIONS IN THE FY85 CONTINUING RESOLUTION REQUIRE INTEREST RATES FOR LOANS TO PRIVATE ENTERPRISES AT COST OF FUNDS TO US TREASURY, YET PID AND MISSION REP CLEARLY UNDERLINED NECESSITY OF LOW INTEREST (2-3 PERCENT. LOAN TO ICICI FOR PROJECT SUCCESS. THIS ISSUE IS CURRENTLY UNDER REVIEW IN PPC, SO NO DEFINITIVE GUIDANCE CAN AS YET BE PROVIDED. IN-DEPTH PP FINANCIAL ANALYSIS SHOULD DEMONSTRATE PROBABLE EFFECTS ON PROJECT'S FINANCIAL VIABILITY OF DIFFERENT A.I.D. LOAN TERMS AND RATES FROM MOST CONCESSIONAL TO COST OF FUNDS TO U.S. TREASURY AND APPROPRIATE MARGINS BETWEEN THE END BORROWER AND ICICI.

AMOUNT OF POTENTIAL FORGIVENESS OF DEBT AND FACTORS WHICH WILLTRIGGER FORGIVENESS WILL ALSO BE FACTORS IN THIS ANALYSIS AS WELL AS PREVAILING MARKET RATES IN INDIA. (2) YOU SHOULD REPORT RESULTS OF THAT ANALYSIS AND YOUR RECOMMENDATIONS ON LOAN TERMS AND RATE STRUCTURES TO BUREAU BEFORE COMMITMENTS ARE MADE TO ICICI FOR AID/W CONSIDERATION. BASEDON YOUR ANALYSIS AND THOSE DISCUSSIONS, BUREAU WILL ADVISE YOU OF MINIMUM - ACCEPTABLE A.I.D. LOAN TERMS FOR PROJECT. MISSION AND ICICI WILL THEN BE ABLE TO DECIDE WHETHER TO PROCEED WITH PROJECT ON THOSE TERMS. IN VIEW OF THIS APPROACH. YOU MAY WANT TO COMPLETE FINANCIAL ANALYSIS AND REACH GO-NO GO DECISION BEFORE CARRYING OUT OTHER PP DESIGN WORK. MISSION SHOULD ALSO CONSIDER EFFECT DIFFERENT LOAN TERMS MAY HAVE ON TYPE OF SUB-PROJECT (DEGREE OF RISK, WHICH ICICI MAY BE WILLING TO ENTERTAIN.

(3) IN ADDITION, LAST SPRING THE U.S. GOVERNMENT STATED ITS OPPOSITION TO A PROPOSED ADB LOAN TO ICICI ON THE

GROUNDS OF ITS "DEMONSTRATED ABILITY TO OBTAIN COMMERCIAL CREDIT." THE PP SHOULD ADDRESS THIS ISSUE, DISTINGUISHING A.I.D.'S DEVELOPMENT OBJECTIVE FROM PURELY COMMERCIAL ACTIVITIES AND INDICATING WHY DEVELOPMENT ASSISTANCE FUNDS ARE REQUIRED IF THE PROJECT IS TO BE VIABLE.

C. FORGIVENESS OF DEBT: THE LEVEL OF RISK TO THE ENTREPRENEUR SHOULD BE MAINTAINED AT A LEVEL HIGH ENOUGH TO ENCOURAGE THE CARRYING TO COMPLETION OF A SUCCESSFUL VENTURE. MORE ANALYSIS IS NEEDED TO JUSTIFY THE FORGIVENESS OF DEBT PROVISION SUGGESTED IN THE PID. OTHER MORE APPROPRIATE MECHANISMS SUCH AS INSURANCE SHOULD BE EXPLORED. THE PP SHOULD EXAMINE THE APPLICABILITY OF THE BIRD FOUNDATION MODEL (ISRAELI-US VENTURES) TO INDIA.

D. INCENTIVES FOR U.S. FIRMS: A BASIC FEASIBILITY ISSUE IS THE DEGREE TO WHICH U.S. FIRMS ARE LIKELY TO PARTICIPATE IN APPROPRIATE JOINT VENTURES. POTENTIAL INTEREST OF U.S. FIRMS SHOULD BE STUDIED IN DESIGN, AND IF POSSIBLE, AN ILLUSTRATIVE LIST OF POTENTIAL PARTICIPANTS SHOULD BE DEVELOPED. ASIA BUREAU IS EXPLORING WAYS TO ADDRESS THIS QUESTION AND WILL ADVISE MISSION OF ITS RECOMMENDATIONS ASAP.

E. TARGETTING OF TECHNOLOGIES: PID SCOPE IS LARGE AND EXPANSIVE. IN ORDER TO FOCUS ON PRIORITY ACTIVITIES FOR

TECHNOLOGY DEVELOPMENT, DEVELOPMENTAL CRITERIA FOR-SUB LOANS SHOULD BE ESTABLISHED DURING DESIGN AND INCLUDED IN PP AND IN LOAN AGREEMENT. THE PP ANALYSIS SHOULD RESULT IN A CLEARER UNDERSTANDING OF THE SECTORAL EMPHASES OF THE PROJECT, PARTICULARLY IN THE LIGHT OF THE THOUGHTFUL ERIKSSON REPORT RECOMMENDATIONS AND THE PLANNED S AND T PROJECT. SCATTERING OF ACTIVITIES SHOULD BE GUARDED AGAINST. THE FOLLOWING FACTORS SHOULD BE CONSIDERED:

A. FOCUS R AND D VENTURES ON ADAPTATION AND COMMERCIAL DEVELOPMENT, NOT BASIC RESEARCH. EXPECTED COMMERCIAL VIABILITY WITHIN A CERTAIN PRE-DETERMINED TIME, PERHAPS 2-3 YEARS, SHOULD BE A CLEAR CRITERION.

B. DEFINE CRITERIA DIRECTING PROJECT RESOURCES TOWARDS ACTIVITIES MEETING HIGH PRIORITY DEVELOPMENT OBJECTIVES THAT ACCORD WITH MISSION'S PROGRAM STRATEGY SUCH AS INCREASED RURAL EMPLOYMENT AND INCOME, EXPORT EARNINGS AND LABOR INTENSIVE INDUSTRIALIZATION. FOR EXAMPLE, IN OTHER COUNTRIES "POSITIVE" LISTS OF CRITERIA WERE DEVELOPED AND SUB-PROJECTS WERE REQUIRED TO MEET AT LEAST ONE OF THE CRITERIA., THESE CRITERIA, HOWEVER,

59

SHOULD NOT BE DEFINED SO BROADLY AS TO JUSTIFY VIRTUALLY ANY ACTIVITY WITH GENERALLY LAUDABLE OBJECTIVES (E.G., EMPLOYMENT GENERATION).

C. IN ADDITION TO THE "POSITIVE" CRITERIA, A.I.D. LEGISLATIVE AND POLICY MANDATES SHOULD BE REVIEWED AND ANY NECESSARY "NEGATIVE" CRITERIA DEVELOPED TO ASSURE THAT SUB-LOANS DO NOT FINANCE INAPPROPRIATE ACTIVITIES, SUCH AS PALM OIL, COTTON, ETC.

F. U.S. PROMOTION MECHANISM: PRE AGREED IN PRINCIPLE TO FINANCE THE U.S. PROMOTIONAL MECHANISM COSTS WITH GRANT FUNDS, SUBJECT TO AVAILABILITY OF FUNDS. PRE IS NOT ABLE TO MANAGE THE GRANT, HOWEVER, BEYOND PARTICIPATION IN CONTRACTOR SELECTION PROCESS AND PERIODIC REVIEWS AND LIAISON AS APPROPRIATE. ASIA BUREAU WILL PROVIDE SUPPORT IN THE CONTRACTING AND MONITORING/LIAISON PROCESSES IN COLLABORATION WITH PRE. PRE WILL PROVIDE GUIDANCE ON SELECTION OF APPROPRIATE MECHANISM AND PERSON DURING THE SELECTION PROCESS. ALSO, PP SHOULD FULLY SPELL OUT RELATIONSHIP OF THE U.S. PROMOTER VIS A VIS ICICI. APAC FELT STRONGLY THAT ICICI SHOULD ASSUME RESPONSIBILITY FOR PERFORMANCE OF THE U.S.

PROMOTIONAL MECHANISM . PRE RECOMMENDED AND APAC AGREED THAT REPRESENTATIVE OF U.S. PROMOTIONAL MECHANISM SHOULD PARTICIPATE IN REVIEW OF PROPOSED SUB-LOANS FOR JOINT VENTURE ACTIVITIES SO THAT PROMOTIONAL EFFORTS ARE FOCUSED ON ACTIVITIES WHICH ARE LIKELY TO MEET REVIEW BOARD'S CRITERIA.

G. INTRODUCTION OF AN EXPEDITIOUS PROCEDURE FOR OBTAINING ROUTINE GOI INVESTMENT RELATED APPROVALS IS ESSENTIAL FOR PROJECT SUCCESS. PID MENTIONS THAT A GOI "ONE STOP" CENTER HAS BEEN ESTABLISHED. THE PP ANALYSIS SHOULD DETERMINE WHETHER THE NEW CLEARANCE PROCESS WILL MEET PROJECT REQUIREMENTS OR IF FURTHER STEPS NEED TO BE TAKEN TO ENSURE THAT SUB-PROJECT APPROVALS WILL NOT BE DELAYED BEYOND A REASONABLE AMOUNT OF TIME.

H. ICICI STAFFING AND OPERATIONS: ICICI SHOULD ISSUE SPECIAL OPERATING GUIDELINES THAT MEET A.I.D. APPROVAL. IN ADDITION, THE PP SHOULD DISCUSS THE ISSUE OF ICICI STAFF SELECTION AND TRAINING, OUTLINING A VARIETY OF PROPOSED TRAINING ACTIVITIES FOR THE PROJECT STAFF.

I. POTENTIAL OPIC ROLE: MISSION REP ADVISED THAT HIS CONTACTS INDICATE POTENTIAL OPIC INTEREST AND ASSISTANCE IN IDENTIFYING FIRMS CAPABLE OF MANAGING THE GRANT OR EXPRESSING INTEREST IN PARTICIPATING IN A JOINT VENTURE.

J. POLICY CONSTRAINTS: PP SHOULD IDENTIFY POLICY CONSTRAINTS THAT HINDER PRIVATE R&D AND THE LINKAGE OF THIS PROJECT TO REMOVAL OF THESE CONSTRAINTS. PP SHOULD OUTLINE ANY POTENTIAL PROBLEMS THAT MIGHT KEEP THE PROJECT FROM MOVING (SPECIFICALLY, ROYALTY AND LICENSING POLICY), AS WELL AS WHAT MIGHT BE DONE TO ADDRESS THESE PROBLEMS.

60

K. REVOLVING FUND: THE PP SHOULD CONFIRM THE APAC'S UNDERSTANDING THAT THE LOAN FUND TO BE ESTABLISHED WITH ICICI WILL BE A REVOLVING FUND.

L. HOST COUNTRY CONTRIBUTION: 25 PERCENT OF TOTAL PROJECT COSTS (GRANT AS WELL AS LOAN, WILL NEED TO BE SUPPLIED BY SOURCES OTHER THAN A.I.D. PID BUDGET DOES NOT REFLECT THIS. FIRMS' OWN CONTRIBUTIONS TO THE R&D SUB-PROJECTS CAN BE COUNTED.

M. GRAY AMENDMENT: MISSION SHOULD REVIEW POSSIBILITY OF USING A MINORITY OR WOMEN-OWNED FIRM OR ORGANIZATION FOR ASSISTANCE IN PROJECT DESIGN AND/OR IMPLEMENTATION. DISCUSSION OF THE GRAY AMENDMENT MUST BE INCLUDED IN THE PP AS WELL AS IN FUTURE PIDS.

N. CARGO PREFERENCE: SER/COM ADVISES THAT A "DETERMINATION OF IMPRACTICABILITY OF CARGO PREFERENCE ACT REQUIREMENT" WILL HAVE TO BE SOUGHT FROM AA/SER AND A/AID IF 50/50 SHIPPING REQUIREMENTS CANNOT BE MET. AN EXAMPLE OF A JUSTIFICATION FOR SUCH A DETERMINATION WAS PROVIDED TO THE MISSION REP.

O. PROCUREMENT AND CONTRACTING PROCEDURES: APAC ASSUMES MISSION, IN STATING PROCEDURES FROM HB. 1. CHAPTER 19, WILL ENSURE A.I.D. PROCUREMENT AND CONTRACTING REGULATIONS FOLLOWED. REQUEST YOU WORK CLOSELY WITH RLA IN ORDER TO AVOID POTENTIAL DIFFICULTIES IN THIS ARENA. SHULTZ
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APPENDIX III

AID/W Determination on Project Finance

and

Guidance on Other Project Related Issues

(State 096872, March 1985)

UNCLAS STATE 096872 Project 386-0496

AIDAC ISLAMABAD FOR ELA SPIELMAN, BOMBAY FOR THORMANN

E.O. 12356: N/A
TAGS:
SUBJECT: FUND FOR TECHNOLOGY DEVELOPMENT (FTD) PROJECT DESIGN (386-0496)

REF: (A) STATE 070675 (B) NEW DELHI 06192

1. ASIA BUREAU, IN COLLABORATION WITH PPC, PRE, GC AND HARRELL, HAS REVIEWED THE INTEREST RATE QUESTION BASED ON MISSION'S FINANCIAL ANALYSIS AND CONSIDERED A NUMBER OF OTHER PROJECT QUESTIONS. WE HAVE ARRIVED AT A SERIES OF RECOMMENDATIONS PERTAINING TO PROJECT DESIGN, BASED IN PART UPON FEEDBACK FROM INDUSTRY PARTICIPANTS AT A SEMINAR HOSTED BY THE INDIA U.S. BUSINESS COUNCIL AT WHICH DEVELOPMENT ASSOCIATES PRESENTED FINDINGS OF A U.S. DEMAND SURVEY AND THORMANN PRESENTED THE FTD PROJECT; AND UPON PRESENTATION OF BIRD FOUNDATION'S PROGRAM BY ITS EXECUTIVE DIRECTOR.

A NUMBER OF THE RECOMMENDATIONS RELATE TO SPECIFIC PROJECT DESIGN SUBJECTS NORMALLY LEFT TO MISSIONS TO RESOLVE. HOWEVER, WE OFFER GUIDANCE ON THEM BECAUSE MANY AROSE THROUGH THE PROCESS DESCRIBED ABOVE AND WE FEEL THEY ARE IMPORTANT TO SUCCESS OF THIS INNOVATIVE PROJECT FOR WHICH AID HAS NO PREVIOUS MODEL.

AID/W URGES YOU TO CONSIDER THE ISSUES AND RECOMMENDATIONS DESCRIBED BELOW, INCLUDE THEM IN DISCUSSIONS WITH ICICI AND GOI COUNTERPARTS IN WHICH MERRIFIELD AND HARRELL WILL PARTICIPATE AND INCORPORATE THEM IN DESIGN AS APPROPRIATE. WE DO WANT FEEDBACK FROM YOU, HOWEVER, AS TO OUTCOME OF INITIAL NEGOTIATIONS ON LOAN VS. GRANT, BOARD COMPOSITION AND CHAIRMANSHIP, QUALIFICATIONS/SELECTION OF MANAGING DIRECTOR AND WHO HE WOULD REPORT TO, SUB-PROJECT FUNDING FORMULA, AND U.S. PROMOTIONAL MECHANISM ISSUES PRIOR TO HARRELL AND MERRIFIELD VISIT. LOOK FORWARD TO SEIFMAN BRIEFING OF ASIA BUREAU ON THESE ISSUES UPON COMPLETION OF HIS TDY.

2. FINANCE: ON THE KEY ISSUE OF LOAN VERSUS GRANT FUNDING FOR THE FTD, USAID IS AUTHORIZED TO NEGOTIATE A

GRANT FOR A TOTAL OF DOLS 11 MILLION OVER 5 YEARS. IN ADDITION, THE MISSION SHOULD REQUEST THE AMBASSADOR TO ALLOCATE THE EQUIVALENT OF DOLS 1 MILLION PER ANNUM OF PL 480 RUPEES OVER 5 YEARS TO HELP ENSURE THE FINANCIAL VIABILITY OF THE FUND. U.S. COMPANIES ARE MORE RECEPTIVE TO CONDITIONAL GRANT CONCEPT THAN TO LOAN TERMS (14 PER CENT) IN COLLABORATIVE TECHNOLOGY DEVELOPMENT. ON OTHER HAND FUND'S VIABILITY AFTER 4-5 YEARS WILL BE A QUESTION UNLESS FUNDS FROM AMBASSADOR ARE INSERTED TO BUILD UP CASH RESERVE. THE DOLS 5 MILLION WOULD GENERATE EARNINGS TO SUSTAIN THE FUND DURING THE NEAR TERM BEFORE REFLOWS REACH SIGNIFICANT LEVELS. IN RETURN FOR THESE U.S. CONTRIBUTIONS AID/W RECOMMENDS THAT ICICI SHOULD CONTRIBUTE ADMINISTRATIVE/OPERATING COSTS OF FTL ON NON-REIMBURSABLE BASIS, AT LEAST DURING NEAR TERM WHEN FTL CASH FLOW MAY BE A PROBLEM. IN THE ABSENCE OF AMBASSADOR'S FUND, AID CONTRIBUTION MAY HAVE TO BE 1/2 LOAN 1/2 GRANT TO BE PASSED ON TO JOINT VENTURES 1/2 CONDITIONAL GRANT AND 1/2 MARKET RATE LOAN SO THAT THERE WOULD BE SOME INTEREST INCOME TO FUND. OUR STRONG PREFERENCE IS FOR FIRST OPTION. (FOR DEFINITION OF CONDITIONAL GRANT SEE PARA 4 BELOW)

3. MANAGEMENT OF THE FUND. A SPECIAL ACCOUNT FOR THE GRANT FUNDS SHOULD BE ESTABLISHED WITHIN ICICI. THE ICICI WOULD MANAGE THE FUND ON A MANAGEMENT FEE BASIS OR OTHER APPROPRIATE ARRANGEMENT. A BOARD OF DIRECTORS WOULD BE ESTABLISHED TO DIRECT ICICI ON MANAGEMENT OF THE FUND. A MANAGING DIRECTOR WOULD BE SELECTED BY THE BOARD. SEE PARA 6 BELOW. THE MANAGING DIRECTOR WOULD ALSO REPORT TO THE BOARD. IN THE DEVELOPMENT OF THE PP, THE ICICI AND USAID SHOULD AGREE ON A PLAN WHICH SHOWS

TO WHOM THE ASSETS OF THE FUND WOULD BE TRANSFERRED AND THE MECHANISM TO BE USED WHEN THE PACD IS REACHED AND THEREAFTER, IF THE FUND CONTINUES AND IS SUBSEQUENTLY TERMINATED. THIS PLAN SHOULD INCLUDE A PROVISION FOR COMPETITIVE SELLING THE FUTURE ROYALTIES INCOME STREAM FROM THE JOINT VENTURES TO THE FUND. ISSUES OF PROPRIETARY RIGHTS TO INNOVATIONS SHOULD ALSO BE ADDRESSED.

4. TERMS TO END USERS. THE GRANT SHOULD BE PASSED ON TO ULTIMATE RECIPIENTS AS CONDITIONAL GRANTS, THAT IS, THE FUND SHOULD ASSUME THE RISK WITH THE RECIPIENT ON A SHARED BASIS BUT WOULD RECOUP ITS INVESTMENT BY RECEIVING A SMALL (APPROXIMATELY FIVE PER CENT) SHARE OF THE REVENUES GENERATED BY SUCCESSFUL PROJECTS UP TO SOME LIMIT. FOR EXAMPLE, ICICI AND THE JOINT VENTURE COULD AGREE UPON A PERCENTAGE OF REVENUES FROM SALES OF PRODUCTS OR PROCESSES DEVELOPED TO BE RETURNED TO THE

64

FUND FOR A SPECIFIED TIME AND UP TO A LIMIT SUCH AS TWO TO THREE TIMES THE CONDITIONAL GRANT (OR MORE). CONDITIONAL GRANT BASIS WOULD RESOLVE ISSUE RAISED IN PARAS 2(I) AND (L) REF A.

5. THE BOARD OF DIRECTORS. THE MEMBERSHIP SHOULD BE AN EQUAL NUMBER OF DISTINGUISHED REPRESENTATIVES OF THE PRIVATE SECTOR IN EACH COUNTRY SELECTED THROUGH PROCESSES YOU DEVELOP IN PP. THE FUNCTIONS OF THE BOARD SHOULD INCLUDE; TO SET POLICIES, APPROVE OPERATING PLANS FOR THE FUND, APPROVE SUBPROJECTS OVER A CERTAIN LIMIT, APPROVE SELECTION OF THE MANAGING DIRECTOR AND REVIEW FINANCIAL AND SUB PROJECT PROGRESS. THE CHAIRMAN OF THE BOARD SHOULD PREFERABLY NOT BE FROM ICICI IN ORDER TO PRESERVE OBJECTIVITY AND OVERSIGHT RELATIONSHIP BETWEEN MANAGEMENT AND BOARD AS IS COMMON WITH OTHER SIMILAR BOARDS. THORMANN PRESENTED REASONS WHY CHAIRMAN SHOULD BE ICICI REPRESENTATIVE. MISSION IS ASKED TO CONSIDER THIS ISSUE CAREFULLY AND SUPPORT ARRANGEMENT TO BE PRESENTED IN PP WITH THOROUGH ANALYSIS.

6. MANAGING DIRECTOR. WE FEEL STRONGLY THAT PROJECT SUCCESS WILL DEPEND HEAVILY ON PERFORMANCE OF THE FTD PRINCIPAL OPERATING OFFICER. THE DIRECTOR MUST BE VERY DYNAMIC AND COMMAND RESPECT AMONG INDIAN AND U.S. BUSINESS EXECUTIVES. HE/SHE WOULD HAVE PREVIOUS PRIVATE SECTOR EXPERIENCE AND US TRAINING OR EXPOSURE. BECAUSE THAT FUNCTION WILL BE SO CRITICAL, WE BELIEVE IT IMPORTANT THAT USAID PARTICIPATE IN THE SELECTION PROCESS, DIRECTLY OR INDIRECTLY THROUGH BOARD OF DIRECTORS OR APPROVAL UNDER A CP.

7. ROLE AND AUTHORITY OF U.S. PROMOTIONAL MECHANISM. THIS PERSON(S) SHOULD CARRY OUT UNDER CONTRACT THE FUNCTIONS AS DESCRIBED ON P. 7 OF THE PID.

THE CONTRACTOR WOULD REPORT TO THE MANAGING DIRECTOR OF THE FUND IN BOMBAY. PAYMENT TO THE CONTRACTOR WOULD BE FROM ICICI, USAID OR ITS DESIGNEE. AID/W WILL PROVIDE UP TO DOLS 250,000 PER YEAR FOR 5 YEARS IN GRANT FOR THE U.S. PROMOTIONAL COMPONENT OF THIS PROJECT OUTSIDE OF DA BUDGET.

8. USAID'S ROLE. IN ADDITION TO MONITORING AND EVALUATION DESCRIBED IN P. 13 OF THE PID, THE MANAGER OF THE FUND SHOULD SUBMIT REGULAR QUARTERLY REPORTS TO USAID AND PROVIDE FOR ANNUAL INDEPENDENT AUDITS OF THE FUND WITH COPIES SUBMITTED TO THE BOARD; USAID AND ICICI.

9. TECHNICAL EVALUATION OF PROPOSALS. PP SHOULD ADDRESS SELECTION CRITERIA (EG WILL R AND D ACTIVITIES HAVE TO RELATE TO CERTAIN DEVELOPMENT OBJECTIVES?) BUREAU IS CONCERNED THAT THE TECHNICAL EVALUATION OF PROPOSALS FOR NEWNESS OF IDEAS AND COMPETITIVE NICHE BE CARRIED OUT BY PERSONS/INSTITUTIONS RECOGNIZED FOR INDEPENDENCE, RESPECT FOR CONFIDENTIALITY AND KNOWLEDGE OF STATE OF THE ART IN COMMERCIAL R AND D. THIS WILL REQUIRE ARRANGING FOR U.S. BASED EXPERT ASSESSMENT OF

PROPOSALS AS NEEDED. THIS CONCERN SHOULD BE TAKEN INTO ACCOUNT. USAID AND PTD SHOULD CONSIDER ARRANGEMENT WITH THE U.S. NATIONAL BUREAU OF STANDARDS TO PROVIDE THIS SERVICE. TO THE EXTENT THERE IS PROCUREMENT, MISSION WILL WANT TO CONSIDER EFFECT OF VARIOUS PROCUREMENT RULES ON OBJECTIVES OF FUNDING JOINT VENTURES.

10. TAX TREATMENT. PER PARA 2 (C) REF A USAID SHOULD EXPLORE TAX STATUS OF THE FUND AND ARRANGE TO MINIMIZE THE TAX BURDEN CARRIED BY THE FUND TO MAXIMIZE ITS GROWTH. AID/W PLANS AND PROJECTIONS FOR FTN GROWTH OVER TIME SHOULD BE CLEARLY EXPLAINED IN PP, PER PARA 2 (F) REF A. USAID NEGOTIATORS COULD POINT OUT TO GOI THAT IF SUCCESSFUL PROJECT WILL RESULT IN SIGNIFICANT TAX CONTRIBUTION FROM NEW JOINT VENTURES CREATED WHICH WILL MORE THAN OFFSET TAX LOSS BY GIVING SPECIAL ADVANTAGE TO FUND.

11. U.S. BUSINESS INTEREST. PER PARA 3 OF REF B BUREAU FEELS THAT DEMAND SURVEY CONDUCTED FOR MISSION BY DEVELOPMENT ASSOCIATES PROVIDES ADEQUATE BASIS FOR PROCEEDING WITH PROJECT DESIGN.

12. PROJECT PAPER, AUTHORIZATION AND AGREEMENT SCHEDULE. WE DISCUSSED PROSPECTS FOR COMPLETING DESIGN IN TIME TO INCLUDE PROJECT AGREEMENT SIGNING OR AT LEAST AUTHORIZATION, IN TIME FOR MID-JUNE VISIT OF PRIME MINISTER. BUREAU AGREED THAT PROJECT DESIGN SHOULD PROCEED AT PACE REQUIRED FOR PRUDENT DESIGN AND FULL RESOLUTION OF ISSUES. PLEASE ADVISE SOONEST YOUR ANTICIPATED SCHEDULE SO WE CAN DECIDE WHETHER TO LEAVE PROJECT ON AGENDA FOR THE PRIME MINISTER OR DELETE. ALSO, PLEASE PROVIDE ASSESSMENT OF ANY ADDITIONAL TDY ASSISTANCE REQUIRED. SHULTZ
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APPENDIX IV

Project Checklist

PROJECT CHECKLIST

Listed below are statutory criteria applicable generally to projects with FAA funds and project criteria applicable to individual fund sources: Development Assistance (with a sub-category for criteria applicable only to loans); and Economic Support Fund.

CROSS REFERENCES:	IS COUNTRY CHECKLIST UP-TO-DATE?	Yes.
	HAS STANDARD ITEM CHECKLIST BEEN REVIEWED FOR THIS PROJECT?	Yes.

A. General Criteria for Project

1. Continuing Resolution Unnumbered: FAA Sec. 653(b); Sec. 634A. (a) Describe how Committees on Appropriations of Senate and House have been or will be notified concerning the project; (b) is assistance within (Operational Year Budget) country or international organization allocation reported to Congress (or not more that $1 million over that figure)?	(a) A Congressional Notification will be forwarded prior to the initial obligation of funds. (b) Yes.
2. FAA Sec. 611(a)(1). Prior to obligation in excess of $100,000 will there be (a) engineering, financial and other plans necessary to carry out the assistance and (b) a reasonably firm estimate of the cost to the U.S. of the assistance?	(a) Yes. (b) Yes.
3. FAA Sec. 611(a)(2). If further legislative action is required within recipient country, what is basis for reasonable expectation that such action will be completed in time to permit orderly accomplishment of purpose of the assistance?	Not applicable.
4. FAA Sec. 611(b); Continuing Resolution Sec. 501. If for water or water-related land resource construction, has project met the standards and criteria as per the Principles and Standards for Planning Water and Related Land Resources dated October 25, 1973?	Not applicable.

5. FAA Sec. 611(e). If project is capital assistance (e.g., construction), and all U.S. assistance for it will exceed $1 million, has Mission Director certified and Regional Assistant Administrator taken into consideration the country's capability to effectively maintain and utilize the project?	Not Applicable.
6. FAA Sec. 209. Is project susceptible to execution as part of regional or multilateral project? If so, why is project not executed? Information and conclusion whether assistance will encourage regional development programs.	The project is not susceptible to execution as part of regional or multilateral project.
7. FAA Sec. 601(a). Information and conclusions whether project will encourage efforts of the country to: (a) increase the flow of international trade; (b) foster private initiative and competition; (c) encourage development and use of cooperatives, credit unions, and savings and loan associations; (d) discourage monopolistic practices; (e) improve technical efficiency of industry, agriculture and commerce and (f) strengthen free labor unions.	(a) This project will enhance India's competitiveness on the world market. (b) Yes, it will foster private initiative in technology development. (c) Not Applicable. (d) Not Applicable. (e) Yes. (f) Not Applicable
8. FAA Sec. 601(b). Information and conclusions whether project will encourage U.S. private trade and investment abroad and encourage private U.S. participation in foreign assistance programs (including use of private trade channels and the services of U.S. private enterprise).	This project will directly encourage U.S. private investment and private U.S. participation in foreign assistance programs by promoting and financing Indo-U.S. joint ventures.
9. FAA Sec. 612(b); Sec. 636(h). Describe steps taken to assure that, to the maximum extent possible, the country is contributing local currencies to meet the cost of contractual and other services, and foreign currencies owned by the U.S. are utilized to meet the cost of contractual and other services.	Indian partners in the Indo-U.S. joint ventures will finance a reasonable share of project costs.

10. FAA Sec. 612(d). Does the U.S. own excess foreign currency of the country and if so, what arrangements have been made for its release?	U.S. owned rupees are being used for various U.S. government agencies programs and administrative support. India will shortly be declared a "Near-Excess" country.
11. FAA Sec. 601(e). Will the project utilize competitive selection procedures for the awarding of contracts, except where applicable procurement rules allow otherwise?	Yes.
12. Continuing Resolution Sec. 522. If assistance is for the production of any commodity for export, is the commodity likely to be in surplus on world markets markets at the time the resulting productive capacity becomes operative, and is such assistance likely to cause substantial injury to U.S. producers of the same, similar or competing commodity.	Development of export commodities is a possibility under project, however, specific commodities to be developed are not known at this time.

B. Funding Criteria for Project

1. Development Assistance Project Criteria

a. FAA Sec. 102(b); 113; 281a. Extent to which activity will (a) effectively involve the poor in development, by extending access to economy at local level, increasing labor-intensive production and the use of appropriate technology, spreading investment out from cities to small towns and rural areas, and insuring wide participation of the poor in the benefits of development on a sustained basis, using the appropriate U.S. institutions; (b) help develop cooperatives, especially by technical assistance, to assist rural and urban poor to help themselves toward better life, and otherwise encourage democratic private and local governmental institutions; (c) support the self-help efforts of developing countries; (d) promote the participation of women in the national economies of developing countries and the improvement of women's status; and (e) utilize and encourage regional cooperation by developing countries?	(a) Indirect benefits will be realized by the poor. (b) Not Applicable. (c) This project supports Indian self-help in technology development. (d) Women owned firms will be encouraged to participate in the program. (e) Not Applicable.
b. FAA Sec. 103, 103A, 104, 105, 106, & 107. Is assistance being made available: (include only applicable paragraph which corresponds to source of funds used. If more than one fund source is used for project, include relevant paragraph for each fund source).	
(1) [103] for agriculture, rural development or nutrition; if so, extent to which activity is designed to increase productivity and income of rural poor.	It is likely that many of the technologies developed will have an impact on the incomes and productivity of the rural poor.
c. [107] is appropriate effort placed on use of appropriate technology?	Yes.

d. FAA Sec. 110(a). Will the recipient country provide at least 25% of the costs of the program, project, or activity with respect to which the assistance is to be furnished (or has the latter cost-sharing requirement been waived for a "relatively least-developed country)?	Participants will provide at least 25% of the costs of the program.
e. FAA Sec. 110(b). Will grant capital assistance be disbursed for project over more than 3 years? If so, has justification satisfactory to the Congress been made and efforts for other financing, or is the recipient country "relatively least developed"?	Not Applicable.
f. FAA Sec. 281(b). Describe extent to which program recognizes the particular needs, desires and capacities of the people of the country; utilizes the country's intellectual resources to encourage institutional development; and supports civil education and training in skills required for effective participation in governmental and political processes essential to self-government.	India has a large and talented science and technology community. This project will draw upon that community to build a research technology development capacity in the Indian private sector.
g. FAA Sec. 122(b). Does the activity give reasonable promise of contributing to the development of economic resources, or to the increase or productive capacities and self-sustaining economic growth?	Yes. By promoting technology development and innovation.

2. Development Assistance Project Criteria (Loans Only)

This section not applicable.

3. Project Criteria Solely for Economic Support Fund Support Fund

This section not applicable.

APPENDIX V

CASH FLOW ANALYSIS OF ILLUSTRATIVE FINANCING OPTIONS

Cash Flow Analysis of Illustrative Financing Options

Illustrative financing options extensively discussed with ICICI are described below as the Sales Agreement, Sales Agreement/Loan, and Conditional Loan/Loan options. They reflect a continuum of alternatives ranging from a form of venture capital financing on one end to more conventional bank financing on the other. Testing some of these alternatives as well as others in the initial phase of the project should generate enough information by year three to enable sound assessment of:

which financing option(s) are most appropriate for the PACT objective and purpose; and

which formulations have the greatest prospect for sustaining the PACT special account.

1. Sales Agreement Option

Under the Sales Agreement option the PACT assumes the risk of commercial technology development with the joint venture. The PACT's exposure in the form of a conditional grant will be 50 percent of total technology development project cost; the joint venture will bear the remaining 50 percent. The PACT's exposure in any one project should not exceed $1 million. The PACT will recoup its contribution from the joint venture through sharing in sales revenues generated by the commercialization of the product or process, paid to the PACT within a specified time and up to a limit possibly of two or three times the conditional grant amount. For example, a conditional grant agreement could include a repayment formula of 5% of sales annually, up to the amount drawn from the PACT and thereafter 2.5% annually of sales, up to two times the amount invested by the Program in the five-year period from the first sale of the product or process. In addition, if sales revenues failed to generate revenues as envisaged, then the compensation period could be extended another three years and the limit of compensation amount that could be recouped raised to three times the amount drawn from the PACT.

2. Sales Agreement/Loan Option

This option provides an immediate stream of interest income back to the Special Account. It may improve prospects for reflows to the Account, but may push the PACT toward less risky, less innovative subprojects. Under this option ICICI will approve a sales agreement such as described above for one half of the funds made available by the PACT to a joint venture for an approved subproject. The other half of the funds would be made available as a suitably secured loan to the joint venture repayable with interest from the time of disbursement. The PACT Special Account will cover up to 70 percent of total project cost with a ceiling of $1,000,000 for any single subproject. The loan component will have a repayment term on average of eight years.

3. Conditional Loan/Loan option

The Conditional Loan/Loan option will be the least difficult for ICICI to administer. Also, at standard ICICI interest rates this will probably be the least marketable of the three options. ICICI will loan up to 70% of projects costs at its going rate of interest (currently 14 percent); the loan will be suitably secured. One half of the loan will be repayable after disbursement irrespective of the success of the venture; the other half of the loan will be repayable in full if the subproject results in sale of the product or process developed. The term for the conditional half of the loan will be three years grace period with on average five years to pay back principal and interest including that charged to the loan during the grace period.

4. Analysis

Tables 1 and 1.1 show cash flow for the illustrative Sales Agreement repayment model. The Tables differ in that Table 1 is based on the premise that 50 percent of the finance to subprojects is paid back in full (approximately twice what was drawn from the Special Account with three years grace and five years thereafter to repay) and Table 1.1, on the premise that 80 percent is paid back in full. Table 1 shows the special account not to be sustainable with a 50 percent success rate. In year 6 the account runs a negative balance and even with reflows never manages to reach a sustainable level. Table 1.1 is more promising. However, to achieve this level of sustainability requires a portfolio with an 80 percent success rate. If this constraint is accepted the portfolio would either have to be heavily weighted with relatively risk free types of R&D in order to take on more venturesome subprojects or edge over, as a whole, toward what is already taking place in the market, namely financing minor adaptations of imported technology.

An alternative to the above scenario is to tighten the financial terms to the joint ventures. Tables 2 and 2.2 offer a different, less attractive set of financial terms to the joint venture. Tables 2. and 2.1 are indicative of the cash flow from the illustrative Sales Agreement/Loan and Conditional Loan/Loan repayment options respectively which were also described in Section III.5. The Tables differ in that Table 2 assumes a 50 percent payback of the Sales Agreement and Conditional Loan portions of the finance and Table 2.1, 80 percent. In both case the prospects are for the special account to be self sustaining, though in the case of Table 2, without infusions of new capital, the account only reaches year 5 levels of disbursements in year 10 and Table 2.2, in year 8. The major question raised by Tables 2 and 2.2 is whether the tighter terms will be attractive enough to draw Indo-U.S. joint ventures into the market. The preliminary indication based on the surveys of U.S. and Indian business persons (see Appendices VII and VIII) is that they probably are not for the illustrative Conditional Loan/Loan option.

PACT

Table 1: ICICI Disbursements and Receipts
(Unit: U.S. Dollar)

Year	USAID Grant for SUB-LOANS	USAID Grant for Promotional Exp.	Conditional Sub-Loans: Disbursement to Sub-Loanees	Conditional Sub-Loans: Forgiveness of Debt Multiplier 1 = 0.5	Receipts from Sub-Loanees: Instalment (Total)	Receipts from Sub-Loanees: Interest	Receipts from Sub-Loanees: Principal
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	500,000	80,000	500,000	0	0	0	0
2	1,500,000	80,000	1,500,000	0	0	0	0
3	2,000,000	80,000	2,000,000	0	0	0	0
4	3,000,000	80,000	3,000,000	250,000	107,887	51,854	56,033
5	3,000,000	80,000	3,000,000	750,000	431,549	199,571	231,978
6			125,014	1,000,000	863,099	374,511	488,588
7			683,376	1,500,000	1,510,423	617,233	893,190
8			1,321,716	1,500,000	2,157,747	803,310	1,354,437
9			1,959,604	62,507	2,076,835	626,654	1,450,180
10			1,868,785	341,689	1,900,628	494,501	1,406,127
11			1,682,176	660,858	1,754,272	434,715	1,319,556
12			1,524,897	979,802	1,529,780	453,204	1,076,576
13			1,288,937	934,392	1,285,693	496,292	789,401
14			1,032,807	841,088	1,621,689	560,231	1,061,458
15			1,356,159	762,448	1,803,267	569,771	1,233,497
16			1,471,981	644,468	1,796,195	530,755	1,265,440
17			1,445,177	516,404	1,596,215	460,703	1,135,512
18			1,260,517	678,080	1,485,604	442,376	1,043,227
19			1,187,830	735,991	1,440,249	448,981	991,268
20			1,157,498	722,598	1,423,052	460,082	962,970
21			1,146,478	630,259	1,416,919	455,992	960,927
22			1,142,584	593,915	1,450,369	444,650	1,005,719
23			1,174,927	578,749	1,407,503	423,891	983,612
24			1,128,735	573,239	1,337,268	405,084	932,184
25			1,070,253	571,292	1,271,972	393,074	878,898
26			1,018,579	587,463	1,253,504	391,877	861,626
27			1,010,057	564,368	1,240,752	388,309	852,444
28			999,463	535,127	1,221,927	379,961	841,967
29			983,479	509,289	1,194,330	367,720	826,610
30			960,124	505,029	1,165,734	356,746	808,988
31			937,102	499,732	1,127,873	347,140	780,733
32			905,252	491,739	1,096,531	339,832	756,699
33			881,103	480,062	1,072,767	333,467	739,301
34			862,794	468,551	1,055,187	327,150	728,037
35			849,326	452,626	1,032,572	319,106	713,466
36			830,252	440,551	1,007,033	310,599	696,435
37			809,382	431,397	980,993	302,577	678,416
38			788,348	424,663	957,085	295,680	661,405
39			769,363	415,126	934,030	289,187	644,842
40			750,828	404,691	913,343	282,849	630,494
41			734,459	394,174	893,329	276,338	616,991
TOTAL	10,000,000	400,000	49,119,383	23,432,367	48,815,206	15,455,973	33,359,233

Net Present Value of Funds at the end of Year 40 = Dollars 26,524

77

PACT

Table 1: ICICI Disbursements and Receipts (Continued-Page 2)
(Unit: U.S. Dollar)

Outstanding Balance of Sub-Loans	Salary and Overheads: Multiplier for Inflation Rate = 1.05	Promotional and Other Expenses: Multiplier for Inflation Rate = 1.05	Taxes and Levies Multiplier 2 = 0	Funds Available with ICICI (at the end of the year)
(9)	(10)	(11)	(12)	(13)
500,000	75,000	80.000	0	(75,000)
2,000,000	78,750	80,000	0	(153,750)
4,000,000	82,688	80,000	0	(236,438)
6,814,353	86,822	80,000	0	(215,372)
9,193,533	91,163	80,000	0	125,014
8,311,503	95,721	84,000	0	683,378
7,324,007	100,507	88,200	0	1,321,716
6,513,602	105,533	92,610	0	1,959,604
6,990,618	110,809	97,241	0	1,868,785
7,276,125	116,350	102,103	0	1,682,176
7,296,119	122,167	107,208	0	1,524,897
7,236,456	128,275	112,568	0	1,288,937
7,251,550	134,689	118,196	0	1,032,807
6,786,832	141,424	124,106	0	1,356,159
6,514,199	168,325	162,962	0	1,471,981
6,386,611	174,119	176,879	0	1,445,197
6,428,564	162,037	173,661	0	1,260,517
6,294,299	146,305	151,469	0	1,187,830
6,109,262	140,016	142,734	0	1,157,498
5,929,176	137,484	139,090	0	1,146,478
5,787,965	136,570	137,765	0	1,142,584
5,616,911	138,145	137,297	0	1,174,927
5,508,169	137,584	141,184	0	1,128,735
5,407,522	131,381	135,633	0	1,070,253
5,302,687	124,787	128,606	0	1,018,579
5,155,066	121,050	122,397	0	1,010,057
5,020,080	119,916	121,373	0	999,463
4,900,137	118,349	120,100	0	983,479
4,792,962	116,027	118,179	0	960,124
4,682,263	113,259	115,372	0	937,102
4,579,542	110,016	112,606	0	905,252
4,473,150	106,649	108,779	0	881,103
4,366,061	104,096	105,877	0	862,794
4,257,895	102,184	103,677	0	849,326
4,159,089	100,262	102,059	0	830,252
4,064,500	97,885	99,766	0	809,382
3,971,805	95,386	97,259	0	788,348
3,878,579	92,992	94,731	0	769,363
3,787,875	90,752	92,450	0	750,828
3,698,394	88,662	90,223	0	734,459
2,877,041	86,724	88,256	0	718,350
2,877,041	4,730,861	4,646,612	0	

PACT

Table 1.1: ICICI Disbursements and Receipts
(Unit: U.S. Dollar)

Year	USAID Grant for SUB-LOANS	USAID Grant for Promotional Exp.	Conditional Sub-Loans: Disbursement to Sub-Loanees	Conditional Sub-Loans: Forgiveness of Debt Multiplier 1 = 0.2	Receipts from Sub-Loanees: Instalment (Total)	Receipts from Sub-Loanees: Interest	Receipts from Sub-Loanees: Principal
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	500,000	80,000	500,000	0	0	0	0
2	1,500,000	80,000	1,500,000	0	0	0	0
3	2,000,000	80,000	2,000,000	0	0	0	0
4	3,000,000	80,000	3,000,000	100,000	172,620	82,966	89,653
5	3,000,000	80,000	3,000,000	300,000	690,479	319,314	371,165
6			448,676	400,000	1,380,958	599,217	781,741
7			1,201,237	600,000	2,416,677	987,572	1,429,104
8			2,227,969	600,000	3,452,395	1,285,296	2,167,099
9			3,254,253	89,735	3,434,676	1,056,353	2,378,323
10			3,226,627	240,247	3,331,531	922,712	2,408,819
11			3,113,079	445,594	3,410,235	955,171	2,455,064
12			3,180,861	650,851	3,498,013	1,151,450	2,346,564
13			3,257,170	645,325	3,576,254	1,358,334	2,217,919
14			3,323,368	622,616	4,496,111	1,564,388	2,931,723
15			4,230,581	636,172	5,179,555	1,681,756	3,497,799
16			4,851,378	651,434	5,534,876	1,732,536	3,802,340
17			5,165,862	664,674	5,558,738	1,751,665	3,807,073
18			5,171,860	846,116	5,905,342	1,920,668	3,984,675
19			5,511,864	970,276	6,505,472	2,167,816	4,337,655
20			6,082,293	1,033,172	7,190,773	2,417,731	4,773,041
21			6,723,581	1,034,372	7,851,799	2,607,687	5,244,112
22			7,337,106	1,102,373	8,607,355	2,788,111	5,819,243
23			8,044,988	1,216,459	9,246,639	2,982,670	6,263,969
24			8,633,473	1,344,716	9,892,997	3,221,378	6,671,619
25			9,235,522	1,467,421	10,642,596	3,504,819	7,137,777
26			9,938,192	1,608,998	11,634,514	3,840,458	7,794,055
27			10,873,221	1,726,695	12,712,216	4,181,868	8,530,348
28			11,879,604	1,847,104	13,800,835	4,520,096	9,280,739
29			12,892,751	1,987,638	14,910,646	4,869,866	10,040,780
30			13,926,331	2,174,644	16,131,453	5,268,382	10,863,070
31			15,067,767	2,375,921	17,455,314	5,718,770	11,736,544
32			16,304,415	2,578,550	18,925,785	6,214,986	12,710,799
33			17,679,745	2,785,266	20,545,238	6,746,311	13,798,927
34			19,193,674	3,013,553	22,316,170	7,314,700	15,001,470
35			20,848,660	3,260,883	24,191,233	7,919,934	16,271,299
36			22,598,076	3,535,949	26,193,670	8,575,604	17,618,067
37			24,467,328	3,838,735	28,368,998	9,293,937	19,075,061
38			26,499,700	4,169,732	30,758,860	10,082,907	20,675,952
39			28,733,685	4,519,615	33,358,619	10,938,039	22,420,580
40			31,162,597	4,893,466	36,176,779	11,859,093	24,317,686
41			33,795,153	5,299,940	39,221,776	12,851,790	26,369,987
TOTAL	10,000,000	400,000	420,082,647	65,278,243	478,678,198	157,256,356	321,421,842

Net Present Value of Funds at the end of Year 40 = Dollars 1,539,217

PACI

Table 1.1: ICICI Disbursements and Receipts (Continued-Page 2)
(Unit: U.S. Dollar)

Outstanding Balance of Sub-Loans	Salary and Overheads: Multiplier for Inflation Rate = 1.05	Promotional and Other Expenses: Multiplier for Inflation Rate = 1.05	Taxes and Levies Multiplier 2 = 0	Funds Available with ICICI (at the end of the year)
(9)	(10)	(11)	(12)	(13)
500,000	75,000	80,000	0	(75,000)
2,000,000	78,750	80,000	0	(153,750)
4,000,000	82,688	80,000	0	(236,438)
7,002,964	86,822	80,000	0	(150,640)
9,909,652	91,163	80,000	0	448,676
9,947,058	95,721	84,000	0	1,201,237
10,274,897	100,507	88,200	0	2,227,969
10,891,473	105,533	92,610	0	3,254,253
11,850,513	110,809	97,241	0	3,226,627
12,890,832	116,350	102,103	0	3,113,079
13,961,545	122,167	107,208	0	3,180,861
15,398,644	128,275	112,568	0	3,257,170
17,035,580	134,689	118,196	0	3,323,368
18,003,877	141,424	124,106	0	4,230,581
19,325,866	170,192	157,985	0	4,851,378
20,978,247	187,847	181,163	0	5,165,862
22,952,641	193,966	192,911	0	5,171,860
24,923,479	200,343	193,135	0	5,511,864
26,996,334	217,346	205,832	0	6,082,293
29,262,485	240,058	227,134	0	6,723,581
31,699,964	263,611	251,082	0	7,337,106
34,238,818	288,373	273,993	0	8,044,988
37,146,493	312,738	300,428	0	8,633,473
40,353,790	335,071	322,404	0	9,235,522
43,810,625	359,517	344,887	0	9,938,192
47,444,977	390,166	371,127	0	10,873,221
51,387,073	426,568	406,044	0	11,879,604
55,696,681	464,458	443,626	0	12,892,751
60,389,555	502,854	481,461	0	13,926,331
65,466,919	543,627	520,058	0	15,067,767
70,998,664	588,215	562,683	0	16,304,415
76,980,472	637,176	608,864	0	17,679,745
83,440,936	691,340	660,224	0	19,193,674
90,424,222	750,750	716,759	0	20,848,660
98,021,735	814,595	778,562	0	22,598,076
106,276,654	882,451	843,892	0	24,467,328
115,224,265	955,602	913,696	0	26,499,700
124,909,919	1,035,583	989,592	0	28,733,685
135,408,982	1,123,006	1,073,017	0	31,162,597
146,786,103	1,217,905	1,163,721	0	33,795,153
125,324,793	1,320,590	1,262,030	0	36,639,157
125,324,793	16,583,845	15,772,549	0	

PACT

Table 2: ICICI Disbursements and Receipts
(Unit: U.S. Dollar)

Regular Sub-Loan Component ; Multiplier I = 0.5

Year	USAID Grant for SUB-LOANS	USAID Grant for Promotional Costs	Disbursement to Sub-Loanees	Receipts from Sub-Loanees: Instalments (Total)	Receipts from Sub-Loanees: Interest	Receipts from Sub-Loanees: Principal	Outstanding Balance of Sub-Loan
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	500,000	80,000	250,000	35,000	35,000	0	250,000
2	1,500,000	80,000	750,000	140,000	140,000	0	1,000,000
3	2,000,000	80,000	1,000,000	280,000	280,000	0	2,000,000
4	3,000,000	80,000	1,500,000	527,821	490,000	37,821	3,462,179
5	3,000,000	80,000	1,500,000	851,284	694,705	156,578	4,805,601
6			844,700	1,120,825	791,042	329,783	5,320,518
7			686,327	1,443,836	840,958	602,878	5,403,967
8			1,005,170	1,811,485	897,279	914,206	5,494,931
9			1,346,108	2,054,909	957,745	1,097,163	5,743,875
10			1,527,027	2,154,060	1,017,926	1,136,134	6,134,769
11			1,564,532	2,233,876	1,077,902	1,155,974	6,543,326
12			1,599,536	2,224,530	1,140,001	1,084,530	7,058,333
13			1,572,526	2,238,773	1,208,320	1,030,452	7,600,407
14			1,576,542	2,450,129	1,284,773	1,165,356	8,011,592
15			1,753,559	2,737,695	1,367,121	1,370,574	8,394,577
16			1,980,336	2,960,050	1,452,488	1,507,562	8,867,350
17			2,135,647	3,105,446	1,540,420	1,565,027	9,437,970
18			2,221,929	3,237,003	1,632,386	1,604,617	10,055,282
19			2,305,147	3,403,594	1,730,460	1,673,133	10,687,295
20			2,425,710	3,600,363	1,835,821	1,764,542	11,348,464
21			2,571,537	3,838,468	1,948,800	1,889,668	12,030,333
22			2,748,073	4,112,708	2,068,977	2,043,731	12,734,675
23			2,948,842	4,381,733	2,195,692	2,186,041	13,497,475
24			3,139,641	4,633,475	2,329,196	2,304,279	14,332,838
25			3,314,017	4,891,097	2,470,560	2,420,537	15,226,317
26			3,494,497	5,179,226	2,620,914	2,558,313	16,162,501
27			3,701,654	5,500,983	2,780,982	2,720,001	17,144,154
28			3,935,056	5,846,677	2,951,089	2,895,588	18,183,622
29			4,184,301	6,212,093	3,131,509	3,080,584	19,297,339
30			4,445,920	6,594,052	3,322,656	3,271,396	20,461,863
31			4,718,139	6,990,952	3,525,200	3,465,752	21,714,250
32			5,000,490	7,409,511	3,740,064	3,669,447	23,045,293
33			5,299,021	7,858,650	3,968,204	3,890,446	24,453,869
34			5,620,783	8,341,447	4,210,451	4,130,995	25,943,657
35			5,967,337	8,855,135	4,467,539	4,387,596	27,523,398
36			6,335,486	9,397,540	4,740,244	4,657,297	29,201,587
37			6,723,292	9,970,315	5,029,483	4,940,832	30,954,047
38			7,132,462	~~10,576,597~~	~~5,336,311~~	~~5,240,286~~	~~32,876,223~~
39			7,565,742	11,219,935	5,661,875	5,558,064	34,883,902
40			8,025,871	11,904,124	6,007,368	5,896,756	37,013,017
41			8,515,545	11,439,630	5,181,822	6,257,808	39,755,209
TOTAL	10,000,000	400,000	134,932,500	193,765,031	96,103,285	95,661,746	30,755,209

Net Present Value of Funds at the end of Year 40 = Dollars 670,934

PACT

Table 2: ICICI Disbursements and Receipts (Continued-Page 2)
(Unit: U.S. Dollar)

Conditional Sub-Loan Component ; Multiplier 2 = 0.5

Disbursement to Sub-Loanees	Forgiveness of Debt Multiplier 3 = 0.5	Receipts from Sub-Loanees			Outstanding Balance of Sub-Loans
		Instalment (Total)	Interest	Principal	
(9)	(10)	(11)	(12)	(13)	(14)
250,000	0	0	0	0	250,000
750,000	0	0	0	0	1,000,000
1,000,000	0	0	0	0	2,000,000
1,500,000	125,000	53,944	25,927	28,017	3,407,176
1,500,000	375,000	215,775	99,786	115,989	4,596,766
844,700	500,000	431,549	187,255	244,294	4,937,945
686,327	750,000	755,211	308,616	446,595	4,788,834
1,005,170	750,000	1,078,873	401,655	677,218	4,727,944
1,346,108	422,350	1,207,195	394,447	812,748	5,042,334
1,527,027	343,163	1,193,456	351,840	841,616	5,549,830
1,564,532	502,585	1,194,571	338,258	856,313	5,997,480
1,599,536	673,054	1,161,365	357,976	803,389	6,444,679
1,572,526	763,513	1,167,197	403,867	763,330	6,858,026
1,576,542	782,266	1,322,518	459,255	863,263	7,165,735
1,753,559	799,768	1,519,566	504,283	1,015,283	7,489,366
1,980,336	786,263	1,641,987	525,227	1,116,760	7,945,299
2,135,647	788,271	1,691,709	532,381	1,159,328	8,512,934
2,221,929	876,779	1,740,589	551,933	1,188,656	9,091,635
2,305,147	990,168	1,830,309	590,898	1,239,410	9,644,013
2,425,710	1,067,823	1,945,988	638,865	1,307,123	10,208,981
2,571,537	1,110,964	2,086,112	686,299	1,399,813	10,804,719
2,748,073	1,152,573	2,243,327	729,388	1,513,939	11,441,294
2,948,842	1,212,855	2,388,360	769,002	1,619,358	12,141,966
3,139,641	1,285,769	2,515,926	808,981	1,706,945	12,908,048
3,314,017	1,374,036	2,648,073	855,006	1,793,066	13,716,620
3,494,497	1,474,421	2,804,922	909,796	1,895,126	14,551,569
3,701,654	1,569,821	2,984,985	970,084	2,014,901	15,424,439
3,935,056	1,657,008	3,176,659	1,031,688	2,144,970	16,355,439
4,184,301	1,747,248	3,375,810	1,093,800	2,282,010	17,351,858
4,445,920	1,850,827	3,581,569	1,158,210	2,423,359	18,414,847
4,718,139	1,967,528	3,794,369	1,227,037	2,567,332	19,545,577
5,000,490	2,092,150	4,019,780	1,301,556	2,718,224	20,743,156
5,299,021	2,222,960	4,264,016	1,382,083	2,881,933	22,007,737
5,620,783	2,359,069	4,528,047	1,467,921	3,060,126	23,345,321
5,967,337	2,500,245	4,808,303	1,558,095	3,250,208	24,766,182
6,335,486	2,649,511	5,102,612	1,652,617	3,449,995	26,278,018
6,723,292	2,810,391	5,412,569	1,752,538	3,660,030	27,884,216
7,132,462	2,983,668	5,740,852	1,858,995	3,881,857	29,587,920
7,565,742	3,167,743	6,089,834	1,972,576	4,117,258	31,394,069
8,025,871	3,361,646	6,461,571	2,093,420	4,368,152	33,308,923
8,515,545	3,566,231	6,857,182	2,221,573	4,635,609	26,824,380
134,932,500	55,412,671	105,036,679	34,173,136	70,863,543	26,824,380

PACT

Table 2: ICICI Disbursements and Receipts (Continued-Page 3)
(Unit: U.S. Dollar)

Salary and Overheads: Multiplier for Inflation Rate = 1.05	Promotional and Other Expenses: Multiplier for Inflation Rate = 1.05	Taxes and Levies Multiplier 4 = 0	Funds Available with ICICI (at the end of the year)
(15)	(16)	(17)	(18)
75,000	80,000	0	(40,000)
78,750	80,000	0	21,250
82,688	80,000	0	218,563
86,822	80,000	0	713,505
91,163	80,000	0	1,689,400
95,721	84,000	0	1,372,653
100,507	88,200	0	2,010,340
105,533	92,610	0	2,692,216
110,809	97,241	0	3,054,054
116,350	102,103	0	3,129,063
122,167	107,208	0	3,199,073
128,275	112,568	0	3,145,052
134,689	118,196	0	3,153,084
141,424	124,106	0	3,507,118
158,549	138,041	0	3,960,671
174,851	155,893	0	4,271,293
185,178	168,119	0	4,443,858
192,386	174,911	0	4,610,294
201,019	181,462	0	4,851,421
212,323	190,953	0	5,143,074
226,002	202,433	0	5,496,146
242,022	216,330	0	5,897,683
258,676	232,134	0	6,279,283
274,214	247,154	0	6,628,033
289,295	260,881	0	6,988,994
305,752	275,089	0	7,403,308
324,460	291,396	0	7,870,112
344,965	309,770	0	8,368,601
366,672	329,390	0	8,891,840
389,358	349,985	0	9,436,278
412,926	371,414	0	10,000,980
437,607	393,641	0	10,598,042
463,958	417,142	0	11,241,566
492,349	442,471	0	11,934,674
522,714	469,752	0	12,670,971
554,835	498,733	0	13,446,584
588,699	529,261	0	14,264,924
624,493	561,471	0	15,131,484
662,452	595,579	0	16,051,742
702,805	631,801	0	17,031,089
721,397	670,348	0	16,905,067
11,799,854	10,631,790	0	

PACT

Table 2.1: ICICI Disbursements and Receipts
(Unit: U.S. Dollar)

Regular Sub-Loan Component ; Multiplier 1 = 0.5

Year	USAID Grant for SUB-LOANS	USAID Grant for Promotional Costs	Disbursement to Sub-Loanees	Receipts from Sub-Loanees: Instalments (Total)	Receipts from Sub-Loanees: Interest	Receipts from Sub-Loanees: Principal	Outstanding Balance of Sub-Loan
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	500,000	80,000	250,000	35,000	35,000	0	250,000
2	1,500,000	80,000	750,000	140,000	140,000	0	1,000,000
3	2,000,000	80,000	1,000,000	280,000	280,000	0	2,000,000
4	3,000,000	80,000	1,500,000	527,821	490,000	37,821	3,462,179
5	3,000,000	80,000	1,500,000	851,284	694,705	156,578	4,805,601
6			925,616	1,132,153	802,370	329,783	5,401,433
7			821,456	1,474,082	871,204	602,878	5,620,011
8			1,246,857	1,875,568	961,361	914,206	5,952,662
9			1,701,811	2,181,031	1,071,626	1,109,405	6,545,068
10			1,966,214	2,362,111	1,191,580	1,170,531	7,340,751
11			2,063,887	2,548,400	1,316,649	1,231,751	8,172,887
12			2,194,183	2,676,117	1,451,390	1,224,727	9,142,344
13			2,287,144	2,856,847	1,600,128	1,256,719	10,172,768
14			2,451,966	3,242,738	1,767,463	1,475,275	11,149,459
15			2,935,077	3,732,316	1,957,835	1,774,481	12,210,054
16			3,295,847	4,176,553	2,170,826	2,005,727	13,500,174
17			3,674,626	4,566,233	2,404,472	2,161,761	15,013,038
18			3,980,198	4,979,636	2,659,053	2,320,583	16,672,654
19			4,320,508	5,481,938	2,939,043	2,542,895	18,450,267
20			4,765,216	6,065,849	3,250,168	2,815,681	20,399,802
21			5,288,526	6,742,174	3,596,366	3,145,808	22,542,520
22			5,890,646	7,506,269	3,980,643	3,525,625	24,907,540
23			6,562,954	8,320,170	4,405,869	3,914,301	27,556,194
24			7,267,643	9,177,681	4,875,337	4,302,344	30,521,493
25			8,003,264	10,118,938	5,393,466	4,725,472	33,799,286
26			8,817,076	11,186,829	5,966,291	5,220,538	37,395,824
27			9,753,860	12,393,211	6,600,816	5,792,396	41,356,288
28			10,814,386	13,729,959	7,303,894	6,426,064	45,744,611
29			11,984,984	15,201,274	8,082,143	7,119,131	50,610,463
30			13,267,297	16,818,295	8,942,886	7,875,408	56,002,352
31			14,674,072	18,597,023	9,894,699	8,702,324	61,974,100
32			16,222,183	20,564,315	10,947,480	9,616,835	68,579,448
33			17,937,301	22,751,441	12,112,345	10,639,097	75,877,652
34			19,847,634	25,181,787	13,401,540	11,780,247	83,945,040
35			21,971,525	27,871,102	14,828,319	13,042,783	92,873,783
36			24,319,342	30,839,375	16,407,037	14,432,338	102,760,786
37			26,907,580	34,118,029	18,153,571	15,964,457	113,703,909
38			29,765,789	37,744,624	20,085,758	17,658,866	125,810,831
39			32,928,722	41,759,446	22,223,537	19,535,908	139,203,645
40			36,431,871	46,205,327	24,588,972	21,616,354	154,019,161
41			40,311,893	45,483,560	21,562,683	23,920,877	130,098,284
TOTAL	10,000,000	400,000	412,498,154	513,496,505	271,408,528	242,087,977	130,098,284

Net Present Value of Funds at the end of Year 40 = Dollars 3,580,371

PACT

Table 2.1: ICICI Disbursements and Receipts (Continued-Page 2)
(Unit: U.S. Dollar)

Conditional Sub-Loan Component ; Multiplier 2 = 0.5

Disbursement to Sub-Loanees	Forgiveness of Debt Multiplier 3 = 0.2	Receipts from Sub-Loanees: Instalment (Total)	Interest	Principal	Outstanding Balance of Sub-Loans
(9)	(10)	(11)	(12)	(13)	(14)
250,000	0	0	0	0	250,000
750,000	0	0	0	0	1,000,000
1,000,000	0	0	0	0	2,000,000
1,500,000	50,000	86,310	41,483	44,827	3,501,482
1,500,000	150,000	345,240	159,657	185,582	4,954,826
925,616	200,000	690,479	299,609	390,870	5,674,807
821,456	300,000	1,208,338	493,786	714,552	6,059,563
1,246,857	300,000	1,726,198	642,648	1,083,549	6,500,723
1,701,811	185,123	1,959,447	644,541	1,314,905	7,059,086
1,966,214	164,291	1,984,116	596,761	1,387,355	7,790,107
2,063,887	249,371	2,069,341	609,426	1,459,915	8,625,042
2,194,183	340,362	2,139,014	687,425	1,451,589	9,682,871
2,287,144	393,243	2,299,970	810,462	1,489,508	10,844,719
2,451,966	412,777	2,692,946	944,398	1,748,548	11,930,441
2,835,077	438,837	3,166,866	1,063,688	2,103,178	13,068,780
3,295,847	457,429	3,526,014	1,148,756	2,377,258	14,411,028
3,674,626	490,393	3,784,997	1,222,801	2,562,196	15,977,649
3,980,198	567,015	4,084,963	1,334,527	2,750,436	17,732,566
4,320,508	659,169	4,510,284	1,496,355	3,013,929	19,649,653
4,765,216	734,925	5,021,391	1,684,146	3,337,245	21,758,295
5,288,526	796,040	5,605,900	1,877,378	3,728,522	24,055,571
5,890,646	864,102	6,250,995	2,072,299	4,178,695	26,567,832
6,562,954	953,043	6,917,355	2,277,988	4,639,367	29,374,105
7,267,643	1,057,705	7,605,307	2,506,018	5,099,289	32,522,080
8,003,264	1,178,129	8,370,365	2,769,569	5,600,795	36,015,704
8,817,076	1,312,591	9,262,034	3,074,468	6,187,566	39,860,904
9,752,860	1,453,529	10,279,501	3,414,150	6,865,351	44,094,637
10,814,386	1,600,653	11,397,403	3,781,006	7,616,397	48,775,112
11,984,984	1,763,415	12,615,599	4,177,754	8,437,845	53,955,484
13,267,297	1,950,572	13,948,987	4,614,776	9,334,211	59,695,142
14,674,072	2,162,877	15,416,750	5,102,449	10,314,300	66,058,119
16,222,183	2,396,997	17,045,362	5,647,151	11,398,212	73,102,132
17,937,301	2,653,459	18,862,714	6,252,883	12,609,832	80,887,171
19,847,634	2,934,814	20,884,781	6,922,418	13,962,363	89,490,597
21,971,525	3,244,437	23,118,247	7,659,481	15,458,765	99,008,276
24,319,342	3,587,460	25,577,358	8,471,643	17,105,715	109,544,522
26,907,580	3,969,527	28,291,856	9,370,219	18,921,637	121,206,946
29,765,789	4,394,305	31,296,899	10,366,989	20,929,910	134,112,725
32,928,722	4,863,868	34,626,828	11,472,182	23,154,646	148,391,599
36,431,871	5,381,516	38,315,849	12,695,385	25,620,464	164,187,236
40,311,893	5,953,158	42,399,510	14,047,644	28,351,866	141,349,042
412,498,154	60,565,134	429,385,511	142,454,319	286,931,192	141,349,042

PACT

Table 2.1: ICICI Disbursements and Receipts (Continued-Page 3)
(Unit: U.S. Dollar)

Salary and Overheads: Multiplier for Inflation Rate = 1.05	Promotional and Other Expenses: Multiplier for Inflation Rate = 1.05	Taxes and Levies Multiplier 4 = 0	Funds Available with ICICI (at the end of the year)
(15)	(16)	(17)	(18)
75,000	80,000	0	(40,000)
78,750	80,000	0	21,250
82,688	80,000	0	218,563
86,822	80,000	0	745,871
91,163	80,000	0	1,851,231
95,721	84,000	0	1,642,911
100,507	88,200	0	2,493,714
105,533	92,610	0	3,403,623
110,809	97,241	0	3,932,428
116,350	102,103	0	4,127,775
122,167	107,208	0	4,388,366
128,275	112,568	0	4,574,287
134,689	118,196	0	4,903,931
141,424	124,106	0	5,670,154
163,991	143,497	0	6,591,693
186,496	166,819	0	7,349,252
204,843	185,991	0	7,960,396
222,124	201,458	0	8,641,017
243,107	218,683	0	9,530,432
268,997	241,191	0	10,577,051
299,102	267,679	0	11,781,293
333,200	298,155	0	13,125,909
370,056	332,184	0	14,535,285
408,607	367,852	0	16,006,528
450,065	405,085	0	17,634,152
496,866	446,276	0	19,505,721
550,299	493,641	0	21,628,773
610,024	547,370	0	23,969,968
675,659	606,620	0	26,534,594
747,613	671,524	0	29,348,145
826,678	742,728	0	32,444,366
913,990	821,086	0	35,874,601
1,010,990	907,897	0	39,695,269
1,118,929	1,004,588	0	43,943,051
1,238,576	1,112,089	0	48,638,684
1,370,651	1,230,924	0	53,815,159
1,516,380	1,361,927	0	59,531,577
1,677,484	1,506,596	0	65,857,444
1,855,844	1,666,687	0	72,863,742
2,053,390	1,843,999	0	80,623,786
2,198,497	2,040,387	0	83,644,187
23,482,355	21,159,166	0	

APPENDIX VI

Financial Analysis Prepared for AID/W

By

USAID/INDIA

February 1985

Fund for Technology Development (386-0496)

FINANCIAL ANALYSIS

Summary

Following approval of the Project Identification Document (PID) and as instructed by the Bureau for Asia Project Advisory Committee (APAC) the Mission has undertaken a detailed financial analysis of the Fund for Technology Development (FTD) project with a view to recommending an AID interest rate charge to the Industrial Credit and Investment Corporation of India (ICICI), the intermediary that will implement the project.

The analysis provided insights into the impact of AID financial terms on the operational effectiveness of the proposed FTD project. The impact of AID interest rate charges on the average level of risk of FTD funded R&D projects and on the relative size of the financial incentive to be offered by ICICI to sub borrowers were estimated. As AID's financial terms rise towards market rates, the level of risk ICICI can accept without sustaining losses in approving loans for R&D projects and the size of the financial incentive ICICI can offer declines, i.e. application of screening criteria will be tightened and the magnitude of the "forgiveness of debt" reduced.

In undertaking the financial analysis the Mission considered a range of interest rates from AID's standard terms of 2 percent, 3 percent up to 6 percent, 9 percent.[1/] The Mission concluded from the analysis that if the project must be loan funded the interest rate should be at AID's standard terms (2 percent, 3 percent) or close to it in order to maintain enough room for experimentation and as a safeguard against the risk of changes in variables beyond ICICI's control such as the exchange value of the rupee against the dollar and the interest rate ICICI can charge sub borrowers. With an AID interest rate charge much above 2 percent, 3 percent ICICI will be driven towards a portfolio that on balance will be only marginally different from the types of R&D projects that are being done now by the private sector, i.e. mainly minor adaptation of imported technology.[2/]

1/ When AID interest rates are cited as 2 percent, 3 percent or 6 percent, 9 percent, the first rate is for the 10 years grace period; the second, for the thirty years thereafter.

2/ ICICI has a dual mandate to promote industrial development and to provide its more than 4,000 shareholders an adequate return on investment. Accordingly, ICICI is committed to maximizing the developmental impact of the FTD project subject to the constraint that it not sustain a long term financial loss. If ICICI borrows for the Fund, the room for adjustment to project implementation experience and the level of risk in R&D projects approved for financing will necessarily be less than for a grant funded project.

89

The Mission's first preference and recommendation is that the FTD project be entirely grant funded. With grant funding ICICI could be more experimental in developing a R&D project portfolio and in the terms extended to borrowers. The potential benefits from grant funding extend much beyond the room for experimentation as defined in the financial analysis. The change in status from borrower/manager of the fund to simply manager of the fund would allow ICICI to substitute more of the approach and attitudes of the venture capitalist in place of those of the traditional banker.

Introduction

The APAC cable on the FTD required an in depth financial analysis for the Project Paper (PP). The principal issue was the interest rate at which AID will loan funds to ICICI; also, at issue was the appropriate margin between ICICI and sub borrowers.

The AID interest rate charge to ICICI is critical to the design of the FTD. Accordingly the Mission has decided, as suggested by the APAC (see State 355495) to undertake the financial analysis now and based on that analysis to seek AID/W guidance on the appropriate interest rate charge prior to fielding the PP design team.

The type of financial analysis most relevant to the main issue at hand is a cash flow analysis. Given the assumptions set out below, tracking the cash flow will indicate the impact of AID interest rate charges on key financial variables. The effectiveness of the FTD project, including sustainability of the loan fund, will largely rest on the room for adjusting these variables in response to project implementation experience.

The analysis of the terms of AID finance to ICICI should not be viewed in isolation from the purpose and character of the FTD project.[1/] The purpose of the FTD is to create capacity in the

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1/ Annex II is the Project Identification Document (PID) approved by the APAC. Readers may find it useful to understand the purpose and character of the FTD project.

private sector for dynamic and high quality R&D programs, i.e. institution building. The most important characteristic of the project from the perspective of the financial analysis that follows is its experimental character. Achievement of the FTD purpose will require room to experiment with the means of engaging both U.S. and Indian enterprises in joint ventures in R&D in India.

Assumptions

The cash flow analysis of impact of alternative loan terms on critical project variables was carried out under the following assumptions:

a) Fund amount $10 million;

b) Tax rate on net annual income of Fund 57.75 percent;

c) Annual inflation rate 7.5 percent;

d) Discount rate for computing net present value 12 percent;

e) Base year management costs $75,000;

f) Base year promotional costs $100,000;

g) ICICI interest rate charge to sub borrowers 14 percent.

Additional assumptions are as follows:

a) Disbursement of AID loan will be spread over five years in the following amounts:

Year	Disbursement	Percentage
1	$0.5	5%
2	1.5	15
3	2.0	20
4	3.0	30
5	3.0	30

b) Sub loans for R&D sub projects will cover up to 70 percent of project costs with a ceiling of $1.0 million per loan;

c) From 30 to 70 percent of sub loans (or up to one half of total R & D project cost) will be paid back in accordance with ICICI's standard terms; the balance will be payable if the R&D project financed with the sub loan results in a commercial transaction of the product or process developed;

d) All principal repayments to the Fund and interest income from the Fund minus expenses will be returned to the Fund for relending

Key Variables

The analysis is keyed to two variables -- the commercialization rate (CR) and the sub borrower's risk as a percentage of total R&D project costs (SBR).

a) The CR is the percentage of R&D projects in monetary terms that will result in a commercial sale and hence will require payment of the conditional loan component of the ICICI sub loan.

b) The SBR is the percentage of total R&D project cost the sub borrower will have at risk if the project is not a success, i.e., it does not result in a commercial sale of the product or process being developed.

The CR and SBR are important because they are the main levers available to ICICI to adjust not only to ensure achievement of project purposes, but also to cover against changes in exogenously determined parameters such as sub borrower interest rates, foreign exchange risk, tax rates, etc.

Commercialization Rate (CR)

The GOI interest in the Fund for Technology Development (FTD) derives in part from the low return to investments in the public sector industrial research laboratories and the belief that investments in private sector R&D will yield a higher rate of return on investment. The public sector industrial R&D facilities consist of 38 national laboratories and over one hundred extension centers and regional stations managed by the Council for Scientific and Industrial Research (CSIR). One study of CSIR R&D projects found that through 1978 out of a total of 2015 CSIR developed processes referred for licensing, 856 were taken up by firms; out of these only 369 were reported to have gone into production. The CR for only those CSIR R&D projects considered promising enough to be referred for licensing was less than 20 percent.

Appendices

Vol. II

Appendix I	Logical Framework
Appendix II	Project Identification Document Approval Cable (State 355495, December 1984)
Appendix III	AID/W Determination on Project Finance and Guidance on Other Project Related Issues (State 096872, March 1985)
Appendix IV	Project Checklist
Appendix V	Cash Flow Analysis of Illustrative Financing Options
Appendix VI	Financial Analysis Prepared for AID/W Determination on Project Finance by USAID/I (February 1985)
Appendix VII	Policy Environment for Joint Ventures in R&D in India and Assessment of Interest of Indian Private Enterprise in the PACT, report for USAID/I by Price Waterhouse & Co., New Delhi (April 1985)
Appendix VIII	Assessment of Interest of U.S. Private Enterprise in the PACT, report for USAID/I by Development Associates, Inc. (April, 1985)
Appendix IX	Study on the Options for the Program Advisor, U.S. Office, report for USAID/I by Development Associates, Inc. (April 1985)

Data on the CR for private sector R&D is not readily available. Whatever the actual rate for the private sector, the CR for FTD financed R&D will be dependent on the types of proposals that come forward, ICICI's application of screening criteria and the measure of commercial success.

a) The type of R&D proposals that come forward will depend on factors within ICICI's control such as the financial incentive offered by ICICI and the scope and effectiveness of the promotional as well as factors beyond its control such as changes in tax laws, industrial licensing regulations and very broadly the business climate.

b) The application of screening criteria to approval of loans will be governed in part by the cost of AID funds to ICICI. The higher the rate the more likely ICICI will be pushed towards less risky types of R&D until at the extreme, i.e. when the cost of the AID loan approaches the market rate, the FTD portfolio and ICICI's existing portfolio will in all probability be only marginally different.

c) ICICI has considered several measures of R&D project success and concluded that a commercial sale of the product or process developed is the best criterion to

trigger repayment of the conditional loan component of the total loan. At the same time, ICICI recognizes drawbacks to the criterion and is quite prepared to adjust it based on experience.

Sub Borrower's Risk (SBR)

The SBR agreed upon in discussions with ICICI was approximately 65 percent, i.e. the one half of the loan borrowed from ICICI at standard terms, which may cover as much as 70 percent of project costs, and the joint ventures 30 percent investment. Conceptually the SBR might be as low as 27 percent if the joint venture has taxable income against which to write off R&D project losses. The balance of R&D project costs, 35 percent, is the conditional loan component (one half of the loan that may cover as much as 70 percent of total project cost) which will be written off by ICICI if the R&D project does not result in a sale of the product or process developed.

The financial incentive offered by the conditional loan component is critical to the success of the project. There is a dearth of high risk venture capital for R&D in India despite widely available low cost scientific and technological talent, a sizeable domestic market for advanced products and processes as well as world wide demand. It should be noted in this regard that in the U.S. financial incentives have played a major role in stimulating R&D.

The FTD financial incentive, in the form of partial "forgiveness of debt" if the R&D project does not result in a commerical sale, is required to set in motion the growth of private sector R&D. In present circumstances, the level of private sector R&D is low and Indo-U.S. joint ventures in R&D virtually non existent except for in-house contract arrangements by a few of the multinationals.

What is the appropriate level for the financial incentive? Neither ICICI nor USAID would claim certainty about the appropriate level. In designing the FTD it was agreed that initially a 50 percent conditional sub loan component, which would put sub borrowers at risk for between one third and two thirds of total project costs depending on their tax situation, was a reasonable starting point. If anything, the BIRD Foundation model suggests the SBR should be lower. The BIRD Foundation's SBR, which was set at one half of total project costs, has been very successful in attracting U.S. and Israeli enterprise to set up R&D joint ventures in Israel.

ICICI's Role

ICICI's objective in participating in the FTD is to maximize the project's development impact subject to the constraint that ICICI not sustain a long term financial loss. The objective and constraint have been built into the cash flow analysis.

ICICI is participating in the FTD because it has a mandate as a development bank to explore new ways of promoting industrial development.

The constraint that ICICI not sustain a long term loss from taking on the FTD combined with standard policies that apply to funds it borrows from capital markets will affect the level of risk ICICI will be willing to absorb in managing the FTD. The higher AID's interest rate charges on the FTD loan, the less experimental room is available for ICICI to manage the loan. In other words, loans close to the market rate will drive ICICI towards its traditional portfolio and away from the venture capital concept and higher risk, potentially high return R&D.

Cash Flow Analysis

The cash flow analysis tracks on an annual basis over the 40 year life of the loan the following: AID loan disbursements to ICICI, loan disbursements by ICICI to sub borrowers, interest and principal payments by ICICI to AID, interest and principal payments by sub borrowers to ICICI, management costs, promotional costs, loan write off costs and tax payments.1/

Table 1 shows the combinations of risk taking and financial incentive open to ICICI for a given AID interest rate charge and a net present value (NPV) of 0 for the fund at the end of 40 years.2/ The set of interest rates considered ranged from 6 percent, 9 percent down to AID's standard terms of 2 percent, 3 percent. As the AID interest rate drops from 6 percent, 9 percent toward 2 percent, 3 percent, the room for experimentation with different combinations of CR and SBR increases. AID's standard terms establish the outer boundary or limit for flexibility and innovation in implementing the FTD project using loan funds.

1/ The details of the spreadsheet analysis, which was executed on the Wang PC using the Lotus 1,2,3 spreadsheet are found in Annex I. A copy of the floppy disc that was used for the analysis has been sent along with this paper in the event AID/W would like to undertake additional analysis.

2/ This NPV is subject to the condition that over the long term GOI taxes on ICICI income from the Fund are non negative.

Table 1

USAID Interest Charge to ICICI with Varying Commercialization Rate and Sub-Borrower's Risk at Break - Even for ICICI at the end of Year 40

(Unit : Percent)

Notes:

1. Figures in cell are USAID interest charge to ICICI with varying commercialization rate and sub-borrower's risk at Break-Even for ICICI at the end of Year 40.
2. Break-Even concept assumes that incidence of taxes over the life of loan on income of ICICI from the Fund is non-negative and that net present value of funds with ICICI at the end of 40-year period is non-negative.
3. Dash (-) indicates that ICICI does not break even at USAID's minimum annual interest rate of 3% for normal period and 2% for grace period.
4. Star (*) indicates that ICICI makes profit at near market rates of 9% for normal period and 6% for grace period.

Sub-Borrower's Risk (SBR)	Commercialization Rate i.e., Percentage of Successful R&D Sub-Projects											
	25%	30%	35%	40%	45%	50%	55%	60%	65%	70%	75%	80%
	(USAID Interest Rates - Percent Per Annum ; first figure is for grace period and second for normal period.)											
50%	-	-	-	-	-	-	-	-	2%,3%	3%,5%	4%,6%	5%,8%
55%	-	-	-	-	-	-	-	-	2%,3%	3%,5%	4%,6%	5%,8%
60%	-	-	-	-	-	-	-	2%,3%	3%,5%	4%,6%	5%,8%	6%,9%
65%	-	-	-	-	-	2%,3%	2%,3%	3%,5%	4%,6%	4%,6%	5%,8%	6%,9%
70%	-	-	-	2%,3%	2%,3%	2%,3%	3%,5%	4%,6%	4%,6%	5%,8%	6%,9%	*
75%	-	2%,3%	2%,3%	2%,3%	3%,5%	4%,6%	4%,6%	4%,6%	5%,8%	5%,8%	6%,9%	*
80%	2%,3%	3%,5%	3%,5%	4%,6%	4%,6%	4%,6%	5%,8%	5%,8%	6%,9%	*	*	*

Assumptions :

1. Fund amount of $10.0 million loan is disbursed to ICICI in first five years. (5% in year 1, 15% in year 2, 20% in year 3, and 30% each in year 4 and 5)
2. Loan period is 40 years including grace period of 10 years.
3. USAID interest rates for the normal period of 30 years are about 1-1/2 times the grace period interest rates.
4. Interest rates (first figure is for grace period and second figure is for normal period) varying between 2%, 3% (AID's statutory minimum) and 6%,9% (Near market rates for ICICI) were considered.
5. Management costs (MC) are assumed to be $75,000 in year 1.
6. Promotional costs (PC) are assumed to be $100,000 in year 1.
7. An inflation rate of 7.5% per annum is applied to management and promotional costs up to year 14 i.e., roughly one third of the total loan period. Thereafter for the remaining loan period, the management costs' proportion to total operations (sub-loans' disbursements and repayments and the promotional costs' proportion to total sub-loans are maintained at the level of year 14.
8. Tax rate on income of ICICI equals 57.75%
9. Discount rate for computing net present value is 12%.

The expectation is that ICICI, given its commitment to maximizing the developmental impact of the FTD subject to the constraint that it not sustain a financial loss, will be working along the boundary or limit set by the AID interest rate charge.

The cells marked with a dash (-) and to the left of AID's standard terms are combinations of CR and SBR at which ICICI would require an interest rate lower than 2 percent, three percent in order not to sustain a financial loss. The cells marked with an asterisk (*) are combinations of CR and SBR which leave little room for experimentation, if AID charges an interest rate higher than 6 percent, 9 percent. The room for experimentation at these higher interest rates, i.e. above 6 percent, 9 percent was considered too narrow, taking into account uncertainty about the impact of higher SBRs and the type of R&D likely to be associated with higher CRs. In other words, as SBR and CR move above 65 percent, the financial incentive may be too small to attract sub borrowers and the type of R & D funded by ICICI may begin to shade too far towards what is already being done by private enterprise.

Table 2 shows the impact of allowing a modified break even concept which includes a contingency fund for changes in factors beyond ICICI's control such as a decline in the exchange value of the rupee against the dollar or a fall in the interest rate ICICI can charge its sub borrowers. Instead of setting NPV of the loan fund at break even of 0 at the end of forty years, the break even is set at an NPV of 1 percent of the value of the AID loan.

71

Table - 2

USAID Interest Charge to ICICI with Varying Commercialization Rate and Sub-Borrower's Risk at Break - Even for ICICI at the end of Year 40

(Unit : Percent)

Notes:

1. Figures in cell are USAID interest charge to ICICI with varying commercialization rate and sub-borrower's risk at Break-Even for ICICI at the end of Year 40.
2. Break-Even concept assumes that incidence of taxes over the life of loan on income of ICICI from the Fund is non-negative and that net present value of funds with ICICI at the end of 40-year period is 1% of the Fund amount .
3. Dash (-) indicates that ICICI does not break even at USAID's minimum annual interest rate of 3% for normal period and 2% for grace period.
4. Star (*) indicates that ICICI makes profit at near market rates of 9% for normal period and 6% for grace period.

Sub-Borrower's Risk (SBR)	Commercialization Rate i.e., Percentage of Successful R&D Sub-Projects											
	25%	30%	35%	40%	45%	50%	55%	60%	65%	70%	75%	80%
	(USAID Interest Rates - Percent Per Annum ; first figure is for grace period and second for normal period.)											
50%	-	-	-	-	-	-	-	-	2%,3%	3%,5%	4%,6%	5%,8%
55%	-	-	-	-	-	-	-	-	2%,3%	3%,5%	4%,6%	5%,8%
60%	-	-	-	-	-	-	-	2%,3%	3%,5%	4%,6%	5%,8%	6%,9%
65%	-	-	-	-	-	-	2%,3%	3%,5%	4%,6%	4%,6%	5%,8%	6%,9%
70%	-	-	-	-	-	-	2%,3%	3%,5%	4%,6%	5%,8%	6%,9%	*
75%	-	-	-	-	-	2%,3%	3%,5%	4%,6%	4%,6%	5%,8%	6%,9%	*
80%	-	-	-	-	2%,3%	2%,3%	3%,5%	4%,6%	4%,6%	5%,8%	6%,9%	*

Assumptions :

1. Fund amount of $10.0 million loan is disbursed to ICICI in first five years. (5% in year 1, 15% in year 2, 20% in year 3, and 30% each in year 4 and 5)
2. Loan period is 40 years including grace period of 10 years.
3. USAID interest rates for the normal period of 30 years are about 1-1/2 times the grace period interst rates.
4. Interest rates (first figure is for grace period and second figure is for normal period) varying between 2%, 3% (AID's statutory minimum) and 6%,9% (Near market rates for ICICI) were considered.
5. Management costs (MC) are assumed to be $75,000 in year 1.
6. Promotional costs (PC) are assumed to be $100,000 in year 1.
7. An inflation rate of 7.5% per annum is applied to management and promotional costs up to year 14 i.e., roughly one third of the total loan period. Thereafter for the remaining loan period, the management costs' proportion to total operations (sub-loans' disbursements and repayments and the promotional costs' proportion to total sub-loans are maintained at the level of year 14.
8. Tax rate on income of ICICI equals 57.75%
9. Discount rate for computing net present value is 12%.

The impact of taking into account contingencies such as foreign exchange risk is to dramatically narrow the room for experimentation. For example, at 6 percent, 9 percent the lowest combinations of CR and SBR that can be experimented with is CR75, SBR 70 and CR 80, SBR 60. At 2 percent, 3 percent the range of combination runs between CR 45, SBR 80 and CR 65, SBR 50.

Conclusion

The FTD project will be breaking new ground and will require flexibility in implementation. The degree of flexibility will be directly determined by AID's interest rate charge to ICICI. In terms of the analysis the issue is whether for a given AID interest rate charge, the room for experimentation with CR and SBR will be enough to enable ICICI to implement the FTD project in order that project purpose will be achieved.

Taking into account the uncertainty about the appropriate level of the CR and SBR and variables beyond ICICI's control such as the foreign exchange rate and interest rate for sub borrowers, the conclusion based on Table 2 is that an AID interest rate charge to ICICI should be at or close to 2 percent, 3 percent. An interest rate much above AID's standard terms may defeat the purpose of the project.

The above said, the Mission's first preference is that the project be entirely grant funded as is the highly successful BIRD Foundation. The change in status from borrower/manager to simply manager of the fund would allow ICICI to substitute more of the approach and attitudes of the venture capitalist in place of those of the traditional banker. ICICI could be more innovative and experimental in screening of projects and in the terms extended to sub borrowers.

APPENDIX VII

Policy Environment for Joint Ventures in R&D in India and Assessment of Interest of Indian Private Enterprise in the

PACT

Report for USAID/India

Price Waterhouse & Co., New Delhi

April, 1985

CONTENTS

CHAPTER			PAGE NO.
1.	INTRODUCTION		
	1.1	Background	1
	1.2	Objective and Scope of Work	2
	1.3	Methodology	4
	1.4	Overview of the Report	9
2.	MANAGEMENT SUMMARY		
	2.1	Objectives and Scope of Work	10
	2.2	Data Sources	10
	2.3	Policy and Regulatory Environment	10
	2.4	Motivation Analysis	12
	2.5	Private Sector Response	13
	2.6	FTD Scope and Impact	14
3.	THE POLICY AND REGULATORY ENVIRONMENT		
	3.1	Policies and Regulations Influencing R&D Effort	16
	3.2	Industrial Licensing Policy	16
	3.3	Policy on Reservations for Public Sector, Cottage and Small Scale Industries	18
	3.4	FERA and MRTP Regulations	18
	3.5	Foreign Collaborations Policy	20
	3.6	Import Control Policy	20
	3.7	Price and Distribution Controls	21
	3.8	Incentives for R&D	22
	3.9	Taxation Laws	22
	3.10	Proprietory Rights Protection	23
	3.11	Technology Policy	26
	3.12	Summary	26
4.	MOTIVATION ANALYSIS		
	4.1	Factors Limiting Private R&D Activity	28
	4.2	Variations in R&D Efforts of Firms in the Same Industry	30
	4.3	Reasons for Low/Inadequate R&D which can be tackled by FTD	31

5. PRIVATE SECTOR RESPONSE

5.1 Interest and Scope 34

5.2 Reservations Expressed 36

5.3 Potential 37

5.4 Analysis of Potential 38

5.5 Response to Package of Assistance 41

5.6 Other Measures Suggested 43

5.7 Summary 44

6. FTD: ASSESSMENT OF SCOPE AND IMPACT

6.1 Scope 46

6.2 Impact 47

7. APPROVAL PROCESS

7.1 Policy and Guidelines for Approval of Foreign Collaborations 52

7.2 Approval Process 52

LIST OF EXHIBITS

EXHIBIT NO.	TITLE	REFERENCE SECTION	PAGE
1.1	OBJECTIVE OF STUDY	1.2	3
1.2	PROJECT TEAM	1.31	4
1.3	DATA SOURCES	1.32	6
1.4	PROFILE OF FIRMS CONTACTED	1.32	7
1.5	BASIS FOR SELECTION OF FIRMS	1.32	8
3.1	ADEQUACY OF PATENT LAW PROTECTION IN INDIA	3.10	23
5.1	INTEREST IN R&D COLLABORATIONS	5.1	34
5.2	SCOPE BY NATURE OF R&D	5.1	34
5.3	RESPONSE TO CONCEPT	5.3	37
5.4	OVERALL ASSESSMENT OF POTENTIAL	5.3	37
5.5	POTENTIAL ANALYSIS BY OWNERSHIP	5.4	39
5.6	RESPONSE TO PACKAGE OF ASSISTANCE	5.5	41
6.1	SCOPE FOR FTD	6.1	48
6.2	IMPACT THROUGH DIRECT ASSISTANCE	6.2	49
7.1	OVERVIEW OF APPROVAL PROCESS	7.21	53
7.2	PROCEDURE FOR APPROVAL OF (SINGLE) APPLICATIONS FOR FOREIGN COLLABORATION	7.22	55
7.3	PROCEDURE FOR APPROVAL OF COMPOSITE APPLICATIONS	7.23	57

LIST OF APPENDICES

NO.	TITLE	PAGE NO.
1.	DETAILS OF DATA SOURCES	58
2.	LIST OF 25 INDUSTRIES DELICENSED	62
3.	AREAS OF MANUFACTURE ALLOWED TO FERA/MRTP COMPANIES	64
4.	TEXT OF ELECTRONICS POLICY	70
5.	INCENTIVES FOR UNDERTAKING R&D	76
6.	SALIENT POINTS OF BUDGET SPEECH AND FINANCE BILL 1985	80
7.	SALIENT FACTS REGARDING PROPRIETORY RIGHTS PROTECTION IN INDIA	82
8.	LIST OF FIRMS WITH POTENTIAL FOR INNOVATIVE R&D IN COLLABORATION WITH US FIRMS	85
9.	POLICY AND GUIDELINES FOR APPROVAL OF FOREIGN COLLABORATIONS	88
10.	COMPOSITION AND FUNCTIONS OF VARIOUS APPROVAL AGENCIES	95
11.	PROCEDURE FOR APPROVAL OF FOREIGN COLLABORATIONS (SINGLE AND COMPOSITE)	100
12.	DELEGATION OF POWERS TO ADMINISTRATIVE MINISTRIES FOR SANCTIONING FOREIGN COLLABORATIONS	103

1. INTRODUCTION

1.1 BACKGROUND

Private Commercial Research and Development (R&D) efforts in Indian industry are of a very low order, being less than 1 per cent of turnover as compared to 2 - 4% for private industry in most of the developed countries. Even this low order of R & D effort is almost entirely in the area of improvements to existing products/processes and assimilation and adaption of foreign technology rather than frontline research and development. This situation exists despite India having the fifth largest pool of technical manpower in the world. To accelerate the pace and improve the quality of private commercial R & D in India, the U.S. Agency for International Development (USAID) intends to finance a project that will promote joint ventures in R & D between Indian and U.S. firms.

In September-November 1983 Price Waterhouse & Co. (PW) conducted a study for USAID to analyze the feasibility of a binational research and development foundation. This study was conducted when USAID was yet at a very preliminary stage in its planning of this project and only a very basic outline had been drawn up of the role, scope and functions of the proposed foundation. PW's report assessed the status of private sector R & D efforts and reviewed the Indian regulatory environment; it analyzed the limiting factors on private sector R & D efforts and collaborative R & D projects and discussed the role that the foundation could play in promoting such activity.

Since this study there have been various developments - considerable progress in the planning of the project and some significant changes in the Indian policy and regulatory environment influencing R & D efforts.

In this background, PW have been engaged by USAID to undertake a study "to understand better the impact of the various constraints, especially in the policy and regulatory environment, and to test the efficacy of the package of incentives to be offered by the FTD to overcome some of the constraints."[1]

[1]Background to Scope of Work Contract Document - February 26, 1985

1.2 OBJECTIVE AND SCOPE OF WORK

The objective of the study undertaken by PW has been "to assess likely impact of the proposed Fund for Technology Development (FTD)"[2] (See EXHIBIT 1.1). To this end the contract agreement proposed the following as the scope of work:

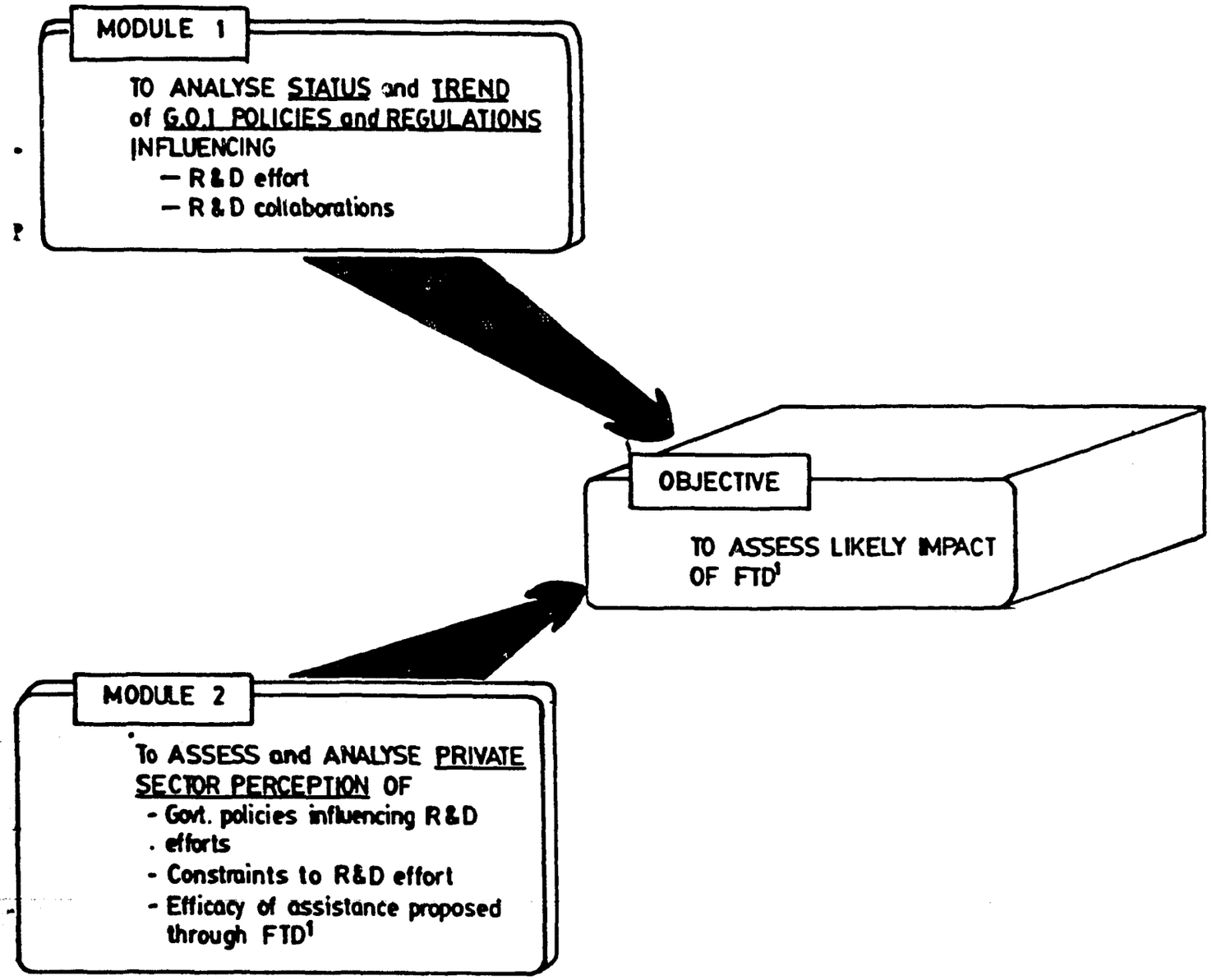
a. The contractor will provide an overview of GOI policies, rules and regulations that affect a firm's decision to undertake R & D. The overview will identify, explain, and assess impact of policies, rules and regulations established to promote technology development and those that have hindered growth of private sector R & D. The contractor will also examine and analyze recent trends in GOI policies, rules and regulations to determine whether the environment is becoming more or less conducive to private sector R & D.

b. The contractor will examine the policies that relate to collaborations in R & D between Indian and foreign firms. Particular attention will be devoted to the GOI approval process. Specific questions to be answered include: a) What steps are necessary to obtain GOI approval for collaborations in R & D with foreign firms? b) What GOI ministries are involved and what are their roles in the process? c) How long does the average approval take? d) What are the identifiable trends in the approval process?

c. The contractor will identify six to eight private firms currently engaged in R & D of a type that is more than minor modifications of imported technology and where R & D expenditures are on the order of Rs.200,000 or more. The contractor will explore the motivation of those firms for undertaking R & D. The contractor will match the six to eight firms doing R & D with firms either not active or only minimally active in R & D and attempt to determine why the matched firms are not more active and under what conditions they would become so. In probing conditions under which the firms would become more active, specific questions relating to incentives

[2] PW Work Plan - March 11, 1985.

EXHIBIT 1:1: OBJECTIVE OF STUDY



1. FTD: Fund for Technology Development

to be offered by the FTD will be raised by the contractor with a view to assessing the likely responsiveness to those incentives.

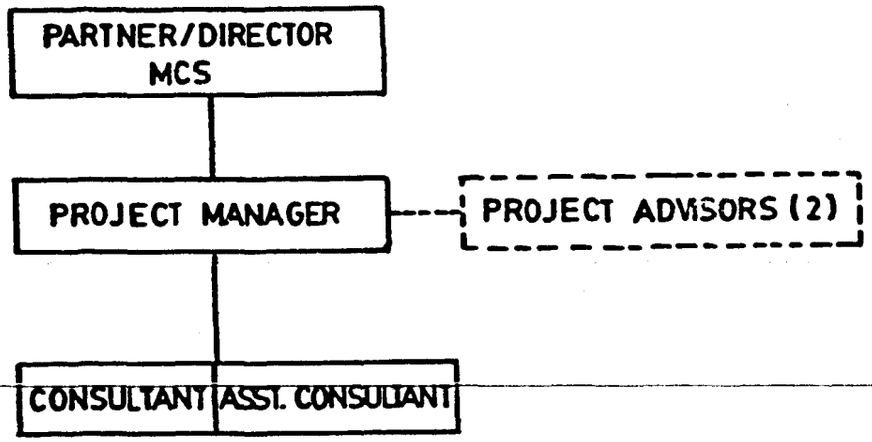
d. Based on an assessment of the existing business environment and trends and the interviews with firms, the contractor will assess the likely responsiveness of Indian firms to the proposed FTD package of incentives and recommend modifications, if any, that might elicit a better response.[3]

1.3 METHODOLOGY

1.31 PROJECT TEAM

The assignment was discharged by a professional consulting team of the appropriate mix, working under the overall supervision of the Partner and Director of PW's Management Consulting Practice (EXHIBIT 1.2). Valuable assistance for the field study was also provided by PW's Bombay and Calcutta offices.

EXHIBIT 1.2 PROJECT TEAM



3 Statement of Work, Contract Documents - February 26, 1985.

1.32 DATA SOURCES

The findings of the study are based on

* Discussions with top executives of 30 private sector firms;
* Discussions with government officials in the Department of Science and Technology, Department of Economic Affairs and Department of Industrial Development;
* Desk Research & Analysis;
* Discussions with informed people e.g. project staff at USAID office, concerned officers from The Industrial Credit & Investment Corporation of India Ltd. (ICICI), patent law attorneys, members of the Indo-American Chambers of Commerce, etc. (See EXHIBIT 1.3).

The private sector response has been assessed in the course of personal interviews during a two-week field survey conducted in Bombay, Calcutta and Delhi. As discussed at the Work Plan Meeting on 11th March 1985, the coverage was extended beyond the 12 - 16 firms required by the contract to 30 firms spread over different industries and varying widely in size, ownership pattern and current R & D efforts (See EXHIBIT 1.4). It is emphasised that even with this enlarged coverage the sample selection and size do not permit the findings of the survey to be simply extrapolated for drawing conclusions holding good for the industry at large.

The basis and data sources used for selection of firms is contained in EXHIBIT 1.5.

The sources of data are listed in detail in Appendix 1 to this report.

EXHIBIT 1.3: DATA SOURCES

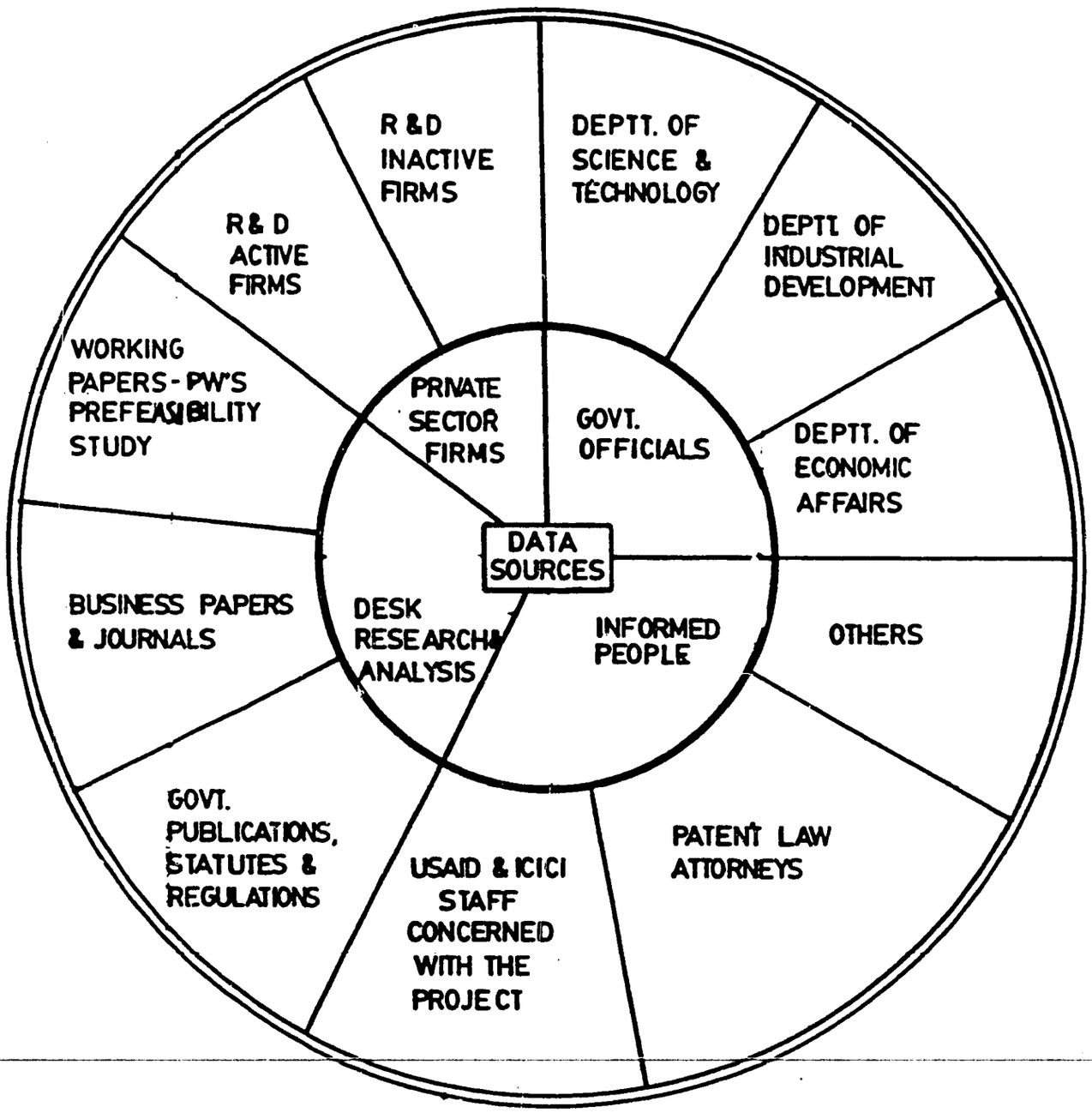
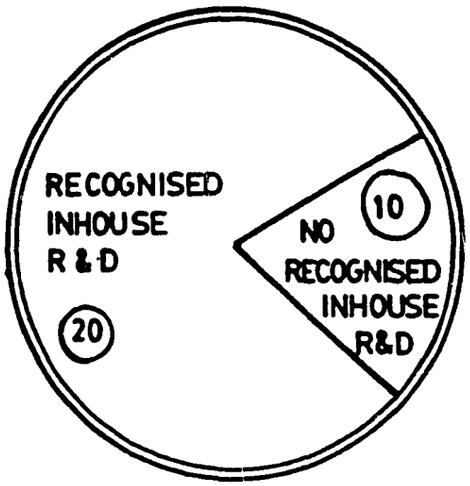


EXHIBIT 1.4: PROFILE OF FIRMS CONTACTED

R&D FACILITIES



OWNERSHIP PATTERN

		No. of firms
Wholly Indian		11
Foreign Equity participations		
- US	7	
- Others	12	19
		30

TURNOVER

	no. of firms
T < Rs.100 million	-
Rs.100 ≤ T < 250 "	10
250 ≤ T < 500 "	5
500 ≤ T < 1,000 "	4
1,000 ≤ T < 2,000 "	5
T ≥ 2,000 "	6
	30

RANGE OF INDUSTRIES

- ELECTRONICS
- COMPUTERS
- ELECTRICALS
- AUTOMOTIVE COMPONENTS
- INDUSTRIAL MACHINERY & EQUIPMENT
- AGRICULTURAL MACHINERY
- DRUGS & PHARMACEUTICALS
- HEALTH CARE EQUIPMENT
- INDUSTRIAL CHEMICALS & GASES
- PETROLEUM PRODUCTS
- PAINTS & ALLIED PRODUCTS
- METAL PRODUCTS & PACKAGING
- TYRES & RUBBER PRODUCTS, etc.

EXHIBIT 1.5 : BASIS FOR SELECTION OF FIRMS

OBJECTIVE : * Selection of firms active in R&D
* Matching with similarly placed inactive firms

Factors considered in Selection & Matching :	Data Sources :
* Existence of Recognised in-house R&D Unit	* Directory of recognised in-house R&D Units (DST)
* Expenditure on R&D (absolute and in relation to turnover)	* Annual Reports of companies
* Nature and quality of R&D effort	* Working Papers of PW's Pre-feasibility study (1983)
* Industry and product lines	* Stock Exchange Directory
* Location	* Key Financial Data on Larger business units (CMIE)
	* Economic Times Article on R&D Expenditure of private firms
	* Discussions with DST Officials

DST : Department of Science & Technology
CMIE: Centre for Monitoring Indian Economy

1.4 OVERVIEW OF THE REPORT

This report is set out in 7 sections:

* Chapters 1 and 2 present an introduction and summary of PW's analysis and conclusions;
* Chapter 3 examines the policy and regulatory environment influencing R & D effort, the perceived trends in this and their likely effect on R & D efforts of the private sector;
* Chapter 4 contains a motivation analysis reviewing changes in the limiting factors on R & D efforts and examining the reasons why some companies spend more on R & D than others in the same industry;
* Chapter 5 presents an analysis of the potential for Indo - U.S. collaborative R & D projects for commercial ends based on private sector response to the concept and reactions to the measures of assistance proposed to be extended;
* Chapter 6 draws conclusions on the scope for the Fund's activities and assesses the impact that the project can be expected to make on the Indian R & D scene;
* Chapter 7 deals with the GOI approvals process and examines the approvals that may be required for collaborations in R & D between Indian and foreign firms, the procedure for granting such approvals and the time periods typically required.

119

2. MANAGEMENT SUMMARY

This chapter contains a summary of PW's findings, analysis and conclusions.

2.1 OBJECTIVES AND SCOPE OF WORK

* The OBJECTIVE of this study has been to assess the likely impact of the proposed Fund for Technology Development (FTD) and suggest modifications which may be required in the proposed package of assistance.
* The SCOPE OF WORK involved was
  - To analyse status and trends of Government policies and regulations influencing
    - R & D effort
    - R & D collaborations
  - To assess and analyse private sector perception of
    - Government policies influencing R & D effort
    - Constraints to R & D effort
    - Efficacy of assistance proposed through FTD
  - To examine the approval process for R & D collaborations between Indian and foreign firms

2.2 DATA SOURCES

The findings of the study are based on

* Discussions with top executives of 20 private firms having R & D facilities and 10 firms not having recognised R & D facilities spread over a wide range of industries;
* Discussions with Government Officials in the Departments of Science and Technology, Economic Affairs and Industrial Development;
* Desk Research and Analysis;
* Discussions with informed people in relation to the project.

2.3 POLICY & REGULATORY ENVIRONMENT

The policy and regulatory environment has an important influence on R & D efforts of the private sector. The major policies/regulations having

a significant effect are:

* Industrial licensing policy
* Policy regarding reservations for public sector
* Policy regarding reservations and preferences for small-scale and cottage industries
* Policy regarding FERA companies
* MRTP Regulations
* Foreign Collaborations Policy
* Import Control Policy
* Price and Distribution Controls
* Incentives for R&D efforts
* Taxation Laws
* Proprietory rights protection
* Technology Policy

While the Government continues to regulate the environment, in recent times there is a trend towards liberalisation of controls and simplification of procedures. Emphasis is being laid on raising technology levels in the country.

A new policy has been announced for electronics which is being given a high priority. The number of companies falling under the MRTP Act has been reduced substantially with the raising of the asset limit from Rs.200 million to Rs.1,000 million. While the annual import policy (1985-86) has still to be announced, a liberalisation in project imports and imports of advanced computers has already been made, while import duty has been raised on mini and micro computers. There is also a liberalisation in permitting foreign collaborations. Corporate tax and personal income tax rates have been lowered and further reduction would be made in the next two years in the corporate tax rates. Wealth tax rates have been reduced and estate duty abolished. The tax incentive of a weighted deduction (125%) for approved inhouse R&D projects has been removed.

As a consequence of the combined effect of all these changes, the policy and regulatory environment is expected to become generally more favourable for R&D efforts in the long term than it has been till now. In the short

121

term, while assimilative, adaptive and product improvement R&D efforts would be encouraged, R&D for development of new products and processes may not be influenced significantly and may even be retarded in certain areas.

2.4 MOTIVATION ANALYSIS

2.41 FACTORS LIMITING PRIVATE R&D

A wide range of factors tend to limit private R&D spending in India.

The most general reason seems to have been a 'general absence of technology based competition'. There are indications that this may change fairly significantly particularly in certain Industries but with liberalisation in technology and product imports, the 'Preference for technology purchase' may replace it in these industries as the more significant limiting factor on R&D efforts, particularly when the factor of 'underdeveloped production base' also operates and there is a wide technology gap between Indian and foreign industry.

The other factors, which receive varying emphasis in different companies are:

- Restrictions on price and scale of output
- Scarcity of funds
- Lack of equipment
- Lack of R&D management skills
- Access to parent R&D facilities for multinationals
- General absence of research culture.

A fundamental limiting factor appears to be one of attitudes or a basic reluctance to taking risks with the availability of "easier, quicker and surer ways of making money".

2.42 DIFFERENCES IN COMPANY SPENDING ON R&D

Companies in the same or similar industries have wide variations in

the level and quality of R&D efforts. The major reason for this is that the limiting factors indicated above do not necessarily operate to the same extent in all firms in the same industry. More specifically different companies in the same industry differ in their R&D efforts for the following reasons:

- Differences in attitudes, policy and perceptions
- Differences in access to foreign technology
- Differences in company situations
- Kind of R&D head.

2.5 PRIVATE SECTOR RESPONSE

* A large number of firms in the private sector are willing to consider collaborations with US companies in commercial R&D.
* 17 out of the 30 firms interviewed saw high- moderate scope for collaborative projects of an adaptive R&D nature(including major adaptions requiring innovative work) while only 7 saw similar scope for R&D efforts for development of new products or processes in the lines of business in which they were interested.
* A number of firms expressed interest in doing R&D on behalf of their principals or other US firms and felt that they could provide an incentive to the US firms in the way of cost-effective research while benefiting from the exposure and experience gained.
* Reservations which have been commonly expressed relate to
  - Limited scope for mutually advantageous arrangements due to technology gap, market differences, etc.
  - Government approvals
  - Confidentiality of information.
* The response to the package of incentives proposed has been generally favourable. The financial assistance and risk sharing measure is considered to be the most significant in terms of the requirement. However, many firms felt that the terms were rather stiff particularly as firms are averse to using loan funds for innovative or other high risk R&D and the risk coverage in the proposed measure is only for

123

R&D risks which is only a small portion of the total risk attached to R&D effort. Some additional measures of assistance were also suggested.

2.6 FTD SCOPE AND IMPACT

* The policy and regulatory environment is becoming more favourable for R&D efforts. Technology based competition is expected to increase and with this change a major precondition for the success of the FTD project is being satisfied.
* In the short term the limiting factor of existing technology gap, absence of production base and preference for purchase of technology — combined with easier access to import of products and foreign technology due to policy changes — are expected to emphasise technology imports, build up of production facilities and bridging of the technology gap. Most R&D effort during this period would be for assimilation and adaption of foreign technology and improvements in products or processes rather than for development of new products and processes.
* The interest and scope for collaborations for commercial R&D of an assimilative and adaptive nature and for taking up of research projects on behalf of US firms is fairly high and the FTD could substantially promote these efforts through the measures of assistance proposed.
* There is lesser interest and scope — atleast in the short term — for taking up of collaborative R&D projects of an innovative and high risk nature; a strong need is assessed for modifying the financial/risk sharing measure to liberalize the terms, change its loan character without creating reservations regarding effective rights to technology, and extending risk coverage to include the total business risk attached to the R&D effort.
* With suitable modification in the financial/risk reduction measure, PW envisage adequate scope for a Fund of the size envisaged directed towards encouraging:

  - R&D for development of new products or processes

124

- Sub-contract R&D, particularly of innovative nature
- R&D for major adaptions of existing products requiring innovative work.

* The FTD is expected to have a larger impact than purely in terms of the directly assisted R&D projects which are taken up only or mainly due to assistance provided. These projects are expected to have good demonstration value and help in ushering in an R&D culture.
* To enhapce the demonstration effect and the consequent impact pf the assisted projects on innovative R&D efforts of industry in general it may be necessary to take specific measures to promote R&D attitude changes in top management. This assumes particular significance in view of the limited size of the funds available.

125

3. THE POLICY AND REGULATORY ENVIRONMENT

The policy and regulatory environment, amongst other factors, influences significantly the nature, extent and direction of R&D efforts. This chapter identifies the various policies and regulations influencing R&D effort, reviews trends by way of recent changes made and analyses their practical impact in terms of these changes on R&D spending by companies.

3.1 POLICIES AND REGULATIONS INFLUENCING R&D EFFORT:

The policies and regulations influencing R&D effort are:

- Industrial Licensing Policy
- Policy on reservations for public sector, cottage and small scale industries
- Foreign Exchange Regulations Act
- Monopolies and Restrictive Trade Practices Act
- Foreign Collaborations Policy
- Import Control Policy
- Price and Distribution Controls
- Incentives for R&D
- Taxation Laws
- Proprietory Rights Protection
- Technology Policy

3.2 INDUSTRIAL LICENSING POLICY

3.21 Industrial licensing determines the specific products which may be manufactured, the capacity of the manufacturing unit and regulates the location of industries. This limits capacity in the industry, providing protection to licensed units and reducing the need for R&D. Uncertainty regarding issue of a licence and its terms (capacity and location), which may make commercial application uneconomic, also deter R&D efforts.

3.22 RECENT CHANGES

Broadly, the changes recently brought about in Industrial licensing are:

- Delicensing of 25 industries (See Appendix 2) except for for companies covered by FERA/MRTP Regulations.
- Broad banding of licences in chemicals, paper & pulp products, machine tools, automobiles and certain areas of electronics.
- More liberal attitude toward allowing increases in production capacity.
- Simplification of procedures.

3.23 PERCEIVED IMPACT ON R&D EFFORT

- With the delicensing of 25 industries, coupled by the fact that the asset limit for companies covered under the MRTP regulations increased from Rs. 200 million to Rs. 1 billion a larger number of companies would enter into the manufacture of items covered by these industries. This should lead to increased availability of items, lower costs due to economies of scale and increased competition in the market. All this is likely to have a favourable impact on innovative R&D in terms of newer methods of manufacture for obtaining lower costs and better quality to get an edge over competitors.

- The broad banding of licences in certain industries gives increased flexibility to manufacturers for optimal utilisation of investment through changes in product mix to cater to market demand. This eliminates the need for obtaining fresh licences for related products and to that extent reduces the uncertainty as well as the time involved in getting the licence. The impact of this measure is expected to be favourable for innovative R&D efforts due to improved profitability of existing units and increased competition.

- With a trend towards simplification of procedures in industrial licensing, time lags are intended to be reduced. This again, should have a favourable impact on R&D activity in general.

121

3.3 POLICY ON RESERVATIONS FOR PUBLIC SECTOR, COTTAGE AND SMALL SCALE INDUSTRIES

3.31 The government has through its Industrial Policy Resolution and through industrial licensing regulations reserved certain sectors of the industry to the public sector and the cottage and small scale sectors. Approximately 800 items are currently reserved for manufacture by the small scale sector.

3.32 TREND INDICATORS

- The private sector has been allowed to set up units in certain areas of communication and power earlier restricted for the public sector. Digital Electronic watch modules may also be allowed to be manufactured by a private sector unit if demand exceeds supply in this area.

- Some of the electronic components earlier reserved for the small-scale sector are to be de-reserved.

3.33 PERCEIVED IMPACT ON R&D EFFORT

The effect of these changes should be to increase R&D effort in the areas now open to general private sector companies due to increased competition.

3.4 FERA & MRTP REGULATIONS

3.41 . Restrictions have been imposed by the Industrial Policy Resolution on the areas of manufacture allowed for MRTP/FERA companies (see Appendix 3). Consequently, the R&D efforts of such companies are restricted to these areas.

Apart from the restrictions on areas of manufacture, MRTP clearance is required for expansion/diversification projects which inevitably is long drawn and increases the uncertainty in obtaining industrial licences for the purpose. Naturally, this has had an adverse impact on R&D effort.

3.42 TREND INDICATORS

- In the recently announced electronics policy, (please refer to Appendix 4) the government has welcomed the participation of FERA companies "to set up manufacturing facilities for electronic components, materials and other closely held high technologies where the country has not been able to invest sufficiently in research and development."

- The assets limit applicable to MRTP Companies has been raised from Rs. 200 million to Rs. 1 billion. With this, a large number of companies earlier coming within the purview of the MRTP Act are now out of the net. "Finance Ministry officials estimate that of 186 corporate groups which were in the MRTP net, more than 110 will fall out of it. And the actual number of individual companies will come down to just about 800 from the more than 1,300 registered in 1983[1]".

- Exemptions from obtaining MRTP clearances under section 21 & 22 of the Act, with regard to expansions/setting up of new undertakings has been extended to cover some more items in electronics under the new electronics policy.

3.43 PERCEIVED IMPACT ON R&D EFFORT

With the increase in the assets limit for MRTP companies, a large number of companies that were virtually stagnating will now be allowed to grow freely till such time as their assets reach the Rs. 1 billion ceiling. Such companies will no longer be subject to the restrictions on areas of manufacture applicable to MRTP companies and can now go in for expanding their activity in "low priority" industries. The delicensing of 25 industries at the same time further increases the growth opportunities for these companies. These measures should also increase competition and consequently the need for R&D in these companies as well as in industry in general.

1 Source: INDIA TODAY, April 15, 1985

129

3.5 FOREIGN COLLABORATIONS POLICY

3.51 While there is no change in the guidelines for approval of foreign collaborations, recent statements made by the Union Minister of Finance and the new electronics policy indicate a more liberal attitude on the part of the Government towards foreign collaborations in terms of permitting imports of technology and simplification in procedures. The new electronics policy specifically states that import of technology would be permitted freely to develop an appropriate electronics base in the country and that industries would be encouraged to establish an in-house technology base. The policy on foreign collaborations also provides that adequate arrangements for research and development, engineering design and training of technological personnel be made for the absorption, adaptation and development of the imported technology. It may be noted that the Indian Government permits repatriation of foreign capital invested, the earnings thereon by way of dividends and interest, and payments by way of royalty lumpsum payment or fee for technical services which may accrue under the terms of an approved collaboration, subject only to payment of taxes and compliance with procedural formalities; there are no known cases of such repatriations being subsequently denied once the collaboration has been approved in principle.

3.52 PERCEIVED IMPACT ON R&D EFFORT

Liberalisation in technology imports for the purpose of upgradation of existing technology, is likely to give considerable impetus to assimilative and adaptive R&D effort. However it may retard innovative R&D in the short term though in the long term, with increased availability of high quality products and a better components base, this will have a favourable impact.

3.6 IMPORT CONTROL POLICY

3.61 The Import Control Policy for 1985-86 has yet to be announced. However some indication of the policy has been given in the recent budget:

- Duty on project imports has been reduced from 65% to 45%, in general, and to 25% for power projects & a total exemption granted in the case of fertiliser equipment.

- Concessional duty of 45% has been extended to warranty spares of fuel-efficient commercial vehicles and components of fuel injection pumps.

- In the area of electronics, customs duty on advanced computers has been abolished; however, it has been increased to 200% from 150% in the case of mini & micro computers. Concessional duty of 25% (earlier 75%) will be levied on imports of four basic computer components and excise duty has been removed on 24 types of electronic components.

3.62 PERCEIVED IMPACT ON R&D EFFORT

With increasing liberalisation in the import of high tech items and project imports, competition should increase stimulating R&D efforts, particularly for product improvement in the short term. Fears have been expressed that innovative indigenous research effort may suffer in the short run due to easier access and a preference for imported items. However, freer availability of basic components will enable R&D effort to be carried on to meet the need created by increased competition from imported items.

3.7 PRICE AND DISTRIBUTION CONTROLS

3.71 TREND INDICATORS

Administered prices of cement, steel, aluminium and paper have been increased during the last year. Prices of some important drugs were reduced while at the same time prices of certain others were increased. A recommendation has also been made to decontrol 40% of the drugs that were earlier covered under the Drugs (Price Control) Order 1979.

131

3.72 PERCEIVED IMPACT ON R&D EFFORTS

Price and distribution controls restrict profits, reducing the motivation for R&D efforts, particularly when the administered prices are perceived as allowing inadequate return for the degree of risk that R&D involves.

While price adjustments have only a limited impact, decontrol or liberalisation in controls - if and when effected - is likely to have a favourable impact on R&D efforts in the affected industries.

3.8 INCENTIVES FOR R&D

3.81 To promote and support research and development efforts the Government offers a wide range of incentives. These have been listed out in Appendix 5 to this report. It is pertinent to note here that the weighted deduction of 125% earlier available on the amount spent on in-house research and development units on approved programme was reduced by the Finance Bill 1984 to a full deduction of expenditure incurred. The new Finance Bill (1985) does not give any additional direct incentives for private sector R&D efforts.

3.82 PERCEIVED IMPACT ON R&D EFFORTS

The withdrawal of the weighted deduction has some adverse impact on R&D spendings but not to a significant extent as genuine R&D effort is probably more dependent on need than on any tax incentives.

3.9 TAXATION LAWS

3.91 TREND INDICATORS

The 1985 budget makes a significant departure from the minor modifications and adjustments which have characterised earlier budgets. Bold in approach, the budget has reduced taxation rates; personal taxation rates have been reduced at all income levels and the maximum marginal rate brought down from 62 per cent to 50 per cent, wealth tax exemptions have been increased and the maximum rate slashed from 5 per cent to 2 per cent,

132

estate duty has been abolished, corporate tax rates reduced by 5 per cent point (with indications of further reduction next year) and certain corporate tax disallowances have been removed. Tax holiday benefits available to new undertakings in specific areas has been extended for a further period of 5 years and some simplifications have been effected in the tax laws. Other significant developments are the decision to have a stable long term fiscal policy, making it co-terminus with five year plans, and the initiation of a public debate on the merits of certain concessions that were earlier built into the statute books. These and other major changes in taxation laws are contained in Appendix 6 which highlights certain aspects of the Budget Speech and Finance Bill 1985.

3.92 PERCEIVED IMPACT ON R&D EFFORT

The reduction in tax rates, removal of certain disallowances and extension of tax holiday is intended to increase resource availability in the corporate sector. An ECONOMIC TIMES study estimates that the country's top 141 large companies will save some Rs. 330 million in tax. More important still, the amendments in taxation laws provide a significantly increased incentive for creation of wealth. The intention, as stated by the Finance Minister, is to encourage every sector to grow, to have competition in the economy and at the same time to regulate the path of economic development. The taxation laws amendments are expected to be favourable for R&D effort not only because of increased competition and a higher incentive for taking risks/creating wealth but also due to increased resources with industry.

3.10 PROPRIETORY RIGHTS PROTECTION

Patent protection may be analysed in terms of statutory and practical protection afforded. Statutory protection is based on the terms regarding:

- Term of patent
- Nature of patent
- Qualifying for patentability

133

- Compulsory Licences
- Licences of right
- Deemed endorsement with licences of right.

- Right to use by Government
- Extent of information to be filed
- Confidentiality of information
- Enforcement and remedy for infringements.

- The degree of protection afforded by the Indian Patent Act, 1970 in respect of these factors is summarised in Appendix 7.

- Discussions with patent law attorneys, the former Controller General of Patents and a cross-section of businessmen have indicated that the Indian industrial environment provides an additional high degree of practical protection, over and above the statutory protection, due to the fact that the general state of technology is such that firms cannot usually set up production facilities for manufacture of any medium-hi-tech product without having full details of drawings, designs and technical assistance in putting up the project.

- The adequacy of combined statutory and practical protection is best examined in terms of the category of product/process to which the patent relates (see EXHIBIT 3.1).
  - Collaborative R&D would not be relevant for easily imitable/duplicable products requiring low investment.
  - The overall protection is perceived as weak in case of food, medicines or drug substances and this reduces the incentive for undertaking R&D with view to the Indian market.
  - In case of medium-hi-tech items, the overall protection is good and the adequacy of proprietory law protection should

134

EXHIBIT 3.1: ADEQUACY OF PATENT LAW PROTECTION IN INDIA

	STATUTORY PROTECTION				PRACTICAL PROTECTION	PERCEIVED IMPACT ON R&D
	NATURE OF PATENT	TERM OF PATENT	LICENSING PROVISIONS	OVERALL		
FOOD, MEDICINE OR DRUG SUBSTANCE	ONLY PROCESS PATENT PERMITTED -BURDEN OF PROOF OF INFRINGEMENT ON PATENTEE	5 YRS. FROM DATE OF SEALING OR 7 YRS. FROM DATE OF PATENT- WHICHEVER IS SHORTER	NORMAL[1] + LICENCES OF RIGHT (DEEMED)	WEAK	WEAK	REDUCES INCENTIVE FOR R&D FOR INDIAN MARKET
OTHER SUBSTANCES PREPARED OR PRODUCED BY CHEMICAL PROCESSES	"	14 YEARS FROM DATE OF PATENT	"	LIMITED	REASONABLE	NOT SIGNIFICANT
EASILY IMITABLE/ DUPLICABLE PRODUCTS REQUIRING LOW INVESTMENT	PRODUCT PATENT CAN BE OBTAINED	"	NORMAL	REASONABLE	WEAK	—
MEDIUM-HI-TECHNOLOGY ITEMS	"	"	"	"	GOOD	POTENTIAL FOR INCREASED R&D EFFORT

1 NORMAL LICENSING PROVISIONS UNDER INDIAN PATENT LAW GIVE WIDE POWERS TO THE GOVT. FOR GRANTING COMPULSORY LICENCES OR ENDORSING THE PATENT WITH LICENCES OF RIGHT, THOUGH THESE HAVE RARELY BEEN EXERCISED.

not deter R&D efforts in this area.

3.11 TECHNOLOGY POLICY

- Though there has been no formal technology policy announcement since January 1983, The recently announced electronics policy indicates an increasing emphasis on upgradation of technology. Various other announcements also indicate the emphasis on technological modernisation, through import of technology wherever considered expedient.

- PERCEIVED IMPACT ON R&D EFFORTS

  There would be a favourable impact on assimilative and adaptive R&D effort as a result of these changes. However innovative R&D efforts would gain increased impetus only after the stage when the existing technology is upgraded.

3.12 SUMMARY

While the Government continues to regulate the environment, in recent times there is a trend towards liberalisation of controls and simplification of procedures. Emphasis is being laid on raising technology levels in the country.

A new policy has been announced for electronics which is being given a high priority. The number of companies falling under the MRTP Act has been reduced substantially with the raising of the asset limit from Rs. 200 million to Rs. 1,000 million. While the annual import policy (1985-86) has still to be announced, a liberalisation in project imports and imports of advanced computers has already been made, while import duty has been raised on mini and macro computers. There is also a liberalisation in permitting foreign collaborations. Corporate tax and personal income tax rates have been lowered and further reduction would be made in the next two years in the corporate tax rates. Wealth tax rates have been reduced and estate duty abolished. The tax incentive of a weighted deduction (125%) for approved inhouse R&D projects has been removed.

As a consequence of the combined effect of all these changes, the policy and regulatory environment is expected to become generally more favourable for R&D efforts in the long term than it has been till now. In the short term, while assimilative, adaptive and product improvement R&D efforts would be encouraged, R&D for development of new products and processes may not be influenced significantly and may even be retarded in certain areas.

137

4. MOTIVATION ANALYSIS

PW's Report on An Analysis of the Feasibility of the Proposed Bi-National R&D Foundation (November 1983) identified the factors that tend to limit the level of R&D in the Indian private sector and also determine its basic nature. Since then certain important changes have taken place, particularly in the policy and regulatory environment as discussed in the previous chapter, which have their influence on these limiting factors.

The first part of this chapter takes another look at these limiting factors to see the extent to which they continue to operate. In the background of these factors as currently operating, the second part of this chapter analyses why different firms in the same industry, or otherwise similarly placed, show wide variations in the level and nature of their R&D effort. The chapter concludes by identifying the reasons for inadequate/low R&D effort which could be tackled by the FTD.

4.1 FACTORS LIMITING PRIVATE R&D ACTIVITY

(1) LACK OF MOTIVATION

The most general reason limiting R&D activity and determining its basic nature has been a lack of motivation for this effort due to

- relative absence of technology based competition
- restrictions on price and scale of outputs
- high taxation rates.

Our discussions with private sector executives support the conclusion of our analysis of the trends in the policy and regulatory environment (Chapter 3) that technology based competition is likely to increase fairly rapidly in the near future. With the reduction in the personal and corporate income tax rates, wealth tax rates and abolition of estate duty there is also likely to be an increase in the motivation for creation of wealth. The effect of these trends should be favourable for R&D efforts and lack of motivation is expected to operate as a limiting factor on R&D to a significantly lesser extent.

(2) PREFERENCE FOR TECHNOLOGY PURCHASE/ LICENSING RATHER THAN DEVELOPMENT

This limiting factor continues and has, in fact, assumed even greater significance due to a more liberal Government policy relating to

foreign co [illegible]one, which has eased the access to foreign technology, coupled with a significant increase in the willingness and desire of foreign firms to collaborate with Indian firms for a share in the rapidly growing Indian markets. This factor also tends to focus Indian R&D efforts, at least in the short term, on assimilative and adaptive R&D as distinguished from R&D efforts for development of new products and processes.

(3) UNDER-DEVELOPED PRODUCTION BASE

This factor will continue to limit R&D efforts in the short term in certain industries, particularly electronics and computers. Various Government measures are expected to bridge the technology gap between Indian and foreign industries and result in the setting up of production facilities in India for the manufacture of basic components on a large scale at internationally competitive prices and using state-of-the-art technology. With the establishment of this production base this factor will cease to operate — but this may take three to five years. In the intermediate period a few firms may disregard this limiting factor in anticipation of the development of the production base.

(4) RESOURCE CONSTRAINTS

Resource constraints of

- Scarcity of Funds
- Lack of Equipment
- Manpower for R&D, particularly top-level specialized R&D management

continue to operate and limit R&D effort. A marginal improvement is expected in the funds position due to reduction in taxation rates coupled with a higher capacity to mobilise funds. However, due to an increase in business opportunities, there will be much greater demand on the funds available.

(5) ACCESS TO PARENT R&D FACILITIES

This factor regarding limited research effort in India due to access to larger research done by parent companies continues to operate unchanged.

(6) ABSENCE OF RESEARCH CULTURE

This factor of a lack of awareness of the need for, and inadequate appreciation of the benefits from research efforts, is perhaps the most important fundamental reason for the low level and nature of research efforts in India. The reason for this may lie in Indian attitudes which traditionally encourage conservative "safe" action rather than risk-taking.

(7) LACK OF STABILITY IN FISCAL AND OTHER POLICIES

Research activity, particularly of an innovative nature, requires a stable policy environment. The recent announcement of the intention to lay down fiscal policies for a period which is coterminus with the planning period is therefore favourable for R&D effort. However, at the moment — while significant policy changes are being announced — there is a tendency to hold back on major and long duration research projects till specific details are published and seen to have been put into practice.

4.2 VARIATIONS IN R&D EFFORTS OF FIRMS IN THE SAME INDUSTRY

While some of the limiting factors discussed above (e.g. lack of motivation, under-developed production base) operate almost to the same extent on all firms in the same industry, some of the other factors (e.g. resource constraints, access to parent R&D facilities) affect to varying extents in different firms. These differences are generally responsible for the variations in R&D efforts of firms in the same industry. Based on our discussions with the top executives of a cross-section of firms — some active and others inactive or minimally active in R&D — the following have been identified as the factors which are generally responsible for variations between firms in the same industry.

(1) ATTITUDES/POLICY/PERCEPTION

The most fundamental and widely pervasive reasons for differences in R&D efforts are

- Differences in owner/management attitudes and willingness to take risks
- Differences in the attitude or policy of the parent or associated company
- Differences in perceptions as to

140

- future of industry
- need for adaptions
- market trends
- Government policy trends.

(2) ACCESS TO FOREIGN TECHNOLOGY

Different firms are in varying positions with respect to access to foreign technology and this may be the reason why one firm (with limited or no access to foreign technology), goes in for R&D efforts while another (with ready access to foreign technology of collaborator) does not see any need to do so.

(3) COMPANY SITUATION DIFFERNCES

Different companies in the same industry may have differences in their immediate situations responsible for differences in R&D efforts. These differences could be in

. resource availability
. problems/constraints faced (e.g. labour problems, power shortage) which tend to draw managements attention
. other needs (e.g. some companies may feel a need for consolidation at a particular stage and may therefore limit innovative R&D efforts).

(4) R&D HEAD

A very important factor is the ability of the R&D head and the confidence he inspires in the top management. It has been found that this has a tremendous influence on the attitude and ability of a company in respect of its R&D effort. A good R&D head can increase the level and nature of R&D efforts in his company significantly. On the other hand, in some companies the absence of a suitable R&D head has been the primary factor limiting R&D.

4.3 REASONS FOR LOW/INADEQUATE R&D WHICH CAN BE TACKLED BY FTD

An outside agency can tackle only some of the reasons for low inadequate R&D effort. It can be particularly and directly useful in helping firms

141

overcome the resource constraints on R&D, i.e. funds, equipment and training for R&D manpower. Measures for risk reduction and concessional finance can only improve motivation — provided a need is otherwise felt. The FTD can perhaps also help in ushering in a research culture, particularly in changing the attitudes of the top management towards research and risk taking and encouraging such projects through risk reduction.

For encouraging Indo-US collaborations in commercial research an outside agency can help:

* by identifying and bringing together Indian and US partners;
* increasing US interest in entering into such collaborations by way of
  - providing financial and risk reduction incentives
  - informing US businesses on the opportunities and benefits of such collaborations and the conditions for doing business in India.

5. PRIVATE SECTOR RESPONSE

This chapter presents an analysis of the potential for Indo-US collaborative R&D projects for commercial ends based on private sector response to the concept and the measures of assistance proposed to be extended.

The analysis consists of the following sections:

* Interest and Scope
* Reservations expressed
* Potential
* Analysis of Potential
* Response to package of assistance
* Other measures suggested

Note that sample selection and size do not permit simple extrapolation of the findings of the survey of private firms.

5.1 INTEREST AND SCOPE

The majority of firms interviewed showed a willingness to consider colaborations with US firms for commercial R&D (See EXHIBIT 5.1).

EXHIBIT 5.1 INTEREST IN R&D COLLABORATIONS

WOULD YOUR COMPANY BE WILLING TO CONSIDER COLLABORATIONS WITH U.S. FIRMS FOR COMMERCIAL R&D?	
YES	19
MAY BE	8
NO	3
	30

The advantages of such collaborations for the Indian firms were perceived as access to US scientific expertise and technology enabling quicker and better solutions to research problems and the bringing in of a "business approach" to R&D.

EXHIBIT 5.2 SCOPE BY NATURE OF R&D

NATURE OF R&D	SCOPE FOR COLLABORATION
- Assimilative	Not discussed
- Adaptive	High
- Innovative	Low
- "Sub-contract"	Moderate

144

Discussions on scope for R&D collaborations (Refer EXHIBIT 5.2) revealed that maximum scope for such collaborations lay in the field of adaptive research efforts. This covers efforts centred around an existing product/process (available abroad or manufactured with foreign collaboration) for adaption to Indian requirements (or for other foreign markets). The adaption could be by way of substitution of materials or change in product design or features due to differences in specifications of materials available, differences in product usage and user requirements, differences in the cost-economics of production, market differences etc. It may vary from minor adaptions resulting in little or no change in product features to major adaptions bordering on new product development and requiring innovative work in materials, process or design.

A number of firms also expressed interest in doing research on behalf of their US principals or other US firms which may be interested (loosely termed as 'sub-contract R&D'). The nature of this research may be adaptive or innovative.

The scope for collaborations for innovative R&D was perceived as limited. For this purpose innovative R&D is taken as restricted to R&D for development of new products or processes. Most firms felt that due to differences in state of commercial technology in their particular industry between India and elsewhere the need for innovative R&D either did not exist or was not strong. Considering the higher risk attached to this effort with the low perceived need, most firms were not inclined to direct research efforts in this area.

143

5.2 RESERVATIONS EXPRESSED

Certain reservations were expressed during the course of our discussions with the firms. The more widely expressed of these reservations are summarised below:

(1) U.S. Companies not seriously interested in doing business in India, misinformed on the Indian situation and potential;

(2) Low US interest in promoting assimilative and adaptive R&D (which is the "real need") as distinguished from R&D for new products and processes;

(3) U.S. and Indian Governments will not permit such collaborations or create too many hinderances/Red tape;

(4) Reservations regarding confidentiality of information and rights to technology due to involvement of assisting body;

(5) State of art technology sensitive information and mutually advantageous arrangement difficult to arrive at;

(6) Areas of commonality are very limited in certain industries having little scope for mutually advantageous arrangements due to

- technology gap
- market differences

(7) Possibility of conflict of interest with "principals";

(8) Uncertainty regarding

- Availability of funds for commercializing the results of R&D efforts
- Government approvals (licensing, MRTP clearances)
- Future Government policies
- Market factors

5.3 POTENTIAL

The response of the firms contacted in terms of interest expressed and scope envisaged is summarised in EXHIBIT 5.3.

EXHIBIT 5.3: RESPONSE TO CONCEPT

	INTEREST	SCOPE	
		ADAPTIVE	INNOVATIVE
HIGH	8	4	3
MODERATE	11	13	4
LOW	8	10	6
NONE	3	3	17

Based on a combined consideration of degree of interest, scope envisaged, and existing R&D facilities, effort and attitude, PW have classified the firms contacted in terms of OVERALL POTENTIAL ASSESSED FOR COLLABORATIVE R&D EFFORTS OF INNOVATIVE NATURE WITH US FIRMS into 5 categories by degree of potential assessed.

EXHIBIT 5.4: OVERALL ASSESSMENT OF POTENTIAL FOR RESPONDENTS

RATING	POTENTIAL	NUMBER OF FIRMS
A	GOOD	6
B	FAIR	3
C	MAY BE	7
D	POOR	11
E	NON-EXISTENT	3

In compliance with USAID's request for the names of firms contacted which may offer potential for such collaborations, a list of these firms and the specific areas of interest indicated by them, if any, are given in Appendix 8. The final outcome would obviously depend on the terms on which both firms find such collaborations mutually advantageous and whether these terms are acceptable to both Governments.

5.4 ANALYSIS OF POTENTIAL

The potential for collaborative R&D can be analysed by

* Nature of R&D efforts
* Ownership pattern
* Turnover (size)
* Industry
* Existing R&D facilities and effort

(1) NATURE OF R&D EFFORTS

Nature of R&D	Potential
. Adaptive	High
. Innovative	Low
. 'Subcontract'	Moderate

This has been discussed in Section 5.1

148

(2) OWNERSHIP PATTERN

EXHIBIT 5.5: POTENTIAL ANALYSIS BY OWNERSHIP

OWNERSHIP PATTERN	SCOPE FOR R&D COLLABORATION WITH U.S. FIRM
WHOLLY INDIAN OWNED	Exists; particularly high with technical collaborator for adaptive R&D
U.S. EQUITY PARTICIPATION	. High with U.S. Principals . Low with others, except where there is clearly no conflict of interest with the principals
FOREIGN (NON US) EQUITY PARTICIPATION	. Low-except where there is clearly no conflict of interest with the principal; . May be high with principal's associated U.S. subsidiary

Particularly high potential is assessed for R&D collaborations of Indian firms having US equity participation with their 'principals'. Progressive wholly Indian firms also offer good potential as they are not constrained by possible objections of foreign 'principals'. Note that the term 'principal' is being used loosely and includes a firm holding less than 50% equity if it enables effective practical control over policy or a right to veto technology proposals.

(3) TURNOVER

The firms contacted by PW in the course of the study ranged in turnover from Rs. 100 million to Rs. 4 billion. Higher potential is seen in firms with turnover of Rs. 500 million or more than in smaller firms. This is perhaps due to the size of resources (financial, management) and ability to take risks. Another significant factor may be the growth rate; even smaller firms with high growth rates may offer potential due to dynamism of management and a need to maintain high growth rates.

(4) INDUSTRY

Little potential for collaborative research seems to exist in certain industries where wide market differences restrict the areas of commonality or in industries where the technology or product line is mature and leaves little scope for development. Scope seems to exist particularly in the area of electronics and its application to various industries, energy saving products and devices, industrial machinery and chemicals.

(5) EXISTING R&D FACILITIES AND EFFORT

While resource constraints may limit the size of R&D efforts it was felt that complete absence of R&D in a firm was attributable to low perceived need or an otherwise unfavourable attitude to R&D (risk-aversion, availability of "easier, quicker and surer ways of making money", etc.) Project specific assistance may improve ability and motivation but cannot substitute for the basic precondition of a perceived need for R&D. It is therefore felt that more potential for collaborative research exists in firms which have existing R&D than in others.

Some of the firms who expressed interest in R&D collaborations did not have any on-going R&D; further discussions usually revealed that they were "risk-aversive" and were really interested in technology transfers, often with minimal R&D for assimilation,

150

proposed be extend not significantly change their preference for other low-risk options. It is however, expected that with significant changes in the policy and regulatory environment, or due to other market changes, more firms may feel the need for R&D and potential for collaboration may exist in their cases.

5.5 RESPONSE TO PACKAGE OF ASSISTANCE

It was generally felt that the measures of assistance proposed to be extended through the FTD are appropriate in the sense of addressing themselves to the significant constraints to R&D collaborations correctible by an outside agency (See EXHIBIT 5.6).

EXHIBIT 5.6: RESPONSE TO PACKAGE OF ASSISTANCE

ASSISTANCE MEASURE	SIGNIFICANT REQUIREMENT	REMARKS
FINANCIAL ASSISTANCE/ RISK REDUCTION	24/30	Interest rate too high and risk coverage does not cover total business risk; modification required.
IDENTIFICATION OF PARTNER	16/30	Generally not considered significant by those having US principals
TRAINING	12/30	Emphasis on approach/management of R&D efforts to make them more purposeful and productive.

In terms of adequacy of assistance and modifications required in its nature, two important aspects emerged:

(1) MODIFICATION IN FINANCIAL/RISK REDUCTION ASSISTANCE

It was found that companies do not employ loan funds for R&D activity attracting high-risk and are averse to doing so.

It was pointed out that success or failure of R&D effort is only a small part of the total risk surrounding R&D effort. In addition to this technological risk, there is the market risk (market acceptibility of product at economic price) and the additional risks of whether a licence

151

would be obtained for commercial production, whether the licensed capacity would be economic, whether finance for the project would be available, etc. A product or process which succeeds in a research laboratory and is even technologically amenable for commercial production may still not be produced due to Government imposed restrictions; even if it does go into commercial production it may still fail at the market place or bring in only a small contribution. The risk reduction measure as proposed would not cover these risks and would, therefore, be an inadequate incentive for innovative R&D.

During discussions with USAID one of the suggestions mooted was to extend the assistance for R&D as a grant on the condition that a percentage of turnover of the product resulting from commercialization of successful R&D effort be repaid to the FTD. This may be a satisfactory arrangement to encourage innovative R&D effort with high attendant risk but only if the rights to technology clearly lie with the collaborators in R&D and a reasonable ceiling is laid down both in terms of absolute amount of royalty and its period of operation . The ceiling amount should not exceed the amount extended plus reasonable concessioned interest thereon and the period of royalty should not exceed say 5 years of commercial production.

With regard to the rate of interest (or its substitute incorporated in the royalty ceiling) it was felt that the proposed rate of interest, at around 14% p.a., while admittedly concessional in comparison to normal bank finance at around 18% p.a., was rather stiff. It was pointed out that concessional finance for other priority activities (such as exports) is being made available at lower rates, even when they do not attract equal risk. A reduction in the interest rate to 9-11% p.a. may, therefore, be considered.

(2) FOCUS OF TRAINING

It was widely felt that Indian technologists have good technical knowledge and there is, therefore only a limited need for technical

152

training. However, a number of executives expressed the opinion that there was need for practical training focussing on approach to R&D work and training in management of R&D efforts to make them more purposeful (goal-oriented) and productive. Experience of working in R&D facilities of US collaborators or working with the collaborators R&D managers on research projects taken up jointly and executed here was perceived as being of great value.

5.6 OTHER MEASURES SUGGESTED

Certain other measures of assistance which have been suggested during discussions with the private sector are :

- Promotion of R&D culture targetting at top management attitudes
- Educating US firms on business opportunities and conditions for doing business in India
- Technological Data bank
- R&D equipment bank

(1) PROMOTION OF R&D CULTURE/TOP MANAGEMENT ATTITUDE CHANGES

A need was expressed for specific promotion measures, targetting at top management, to create a greater awareness of the need and benefits of R&D and bring about the necessary attitude changes.

- While the project specific assistance measures proposed to be extended by the FTD should help in promotion of an R&D culture in the assisted units, the impact on the Indian industry at large would be rather limited unless some attempt is also made to change top management attitudes to R&D in Industry in general and particularly in traditional Indian businesses.

(2) EDUCATING US FIRMS ON BUSINESS OPPORTUNITIES IN INDIA

Some firms suggested that US firms are not adequately informed, and sometimes even misinformed, about business opportunities in India and often have an exaggerated view of the difficulties of doing business in India.There is therefore a need for specific measures to

educate US firms on these matters and to arouse their interest.

(3) TECHNOLOGICAL DATA BANK

Some R&D Managers suggested the need for enabling research units in India to have access to technological data banks providing available information on state of art technologies and developments in India and abroad, and sources of specialised raw material and technical services required in R&D efforts.

(4) EQUIPMENT BANK

A need was also expressed for setting up of equipment banks at major focal points of research activities containing equipment required for research efforts but which is too expensive for individual firms to purchase for the extent of use to which it would be put.The bank could concentrate on precision equipment which is required for a wide range of research fields (eg electron microscopes) and may provide testing and technical services or, to safeguard confidentiality of research efforts, allow the client's staff to use this equipment.

Keeping in view the limited resources available with the FTD, it was felt that the project specific assistance measures should take priority over these macro measures. However, some attention to the need for promotion of attitude changes in top management may still be necessary to create the pre-conditions for the FTD acting as a catalyst in upgrading the R&D efforts of industry at large and thereby increasing the effective impact of the FTD.

5.7 SUMMARY

* A large number of firms in the private sector are willing to consider collaborations with US companies in commercial R&D

* 17 out of the 30 firms interviewed saw high-moderate scope for collaborative projects of an adaptive R&D nature (including major adaptions requiring innovative work) while only 7 saw

154

6. FTD: ASSESSMENT OF SCOPE AND IMPACT

This chapter gives the conclusions of PW's study to assess the likely impact of the Fund for Technology Development.

The issue of likely impact requires to be addressed at two levels:

- Whether adequate scope exists for extension of assistance by the FTD?
- What impact is expected to be made by the extension of this assistance?

6.1 SCOPE

The policy and regulatory environment is becoming more favourable for R&D efforts. Technology based competition is expected to increase and with this change a major precondition for the success of the FTD project is being satisfied.

In the short term the limiting factors of existing technology gap, absence of production base and preferance for purchase/licensing of technology-combined with easier access to imports of products and foreign technology due to policy changes-are expected to emphasise technology imports, buildup of production facilities and bridging of the technology gap with most R&D being of an assimilative and adaptive or product improvement nature.

As scope clearly varies with nature of R&D effort it is examined separately for

- Assimilative and adaptive R&D
- 'Sub-contract' R&D
- Innovative R&D

(1) ASSIMILATIVE & ADAPTIVE R&D

- High interest
- High Need
- Maximum Scope
- Good Potential

(2) **'SUB-CONTRACT' R&D**

- Moderate Interest
- Moderate Scope
- Reasonable Potential

(3) **INNOVATIVE R&D**

- Limited Interest
- Low - Moderate Scope
- Limited Potential

Taking into account the objectives of the FTD and keeping in mind the limited funds available, PW suggest that the FTD should encourage:

- R&D for development of new products or processes
- 'Sub-contract' R&D, particularly of innovative nature
- R&D for major adaptations of existing products requiring innovative work.

To provide adequate incentive for encouraging this kind of R&D,all of which involves considerable risk,modification in the financial assistance/ risk reduction measure is necessary to liberalise terms and extend risk coverage to the total business risk attached to such effort.

PW understand that the size of the proposed fund is US $ 10 million. Assuming that the FTD would assist the range of projects mentioned above and that the financial/risk reduction assistance would be suitably modified, PW envisage adequate scope for a project of this size.

6.2 IMPACT

The project is seen as making an impact not only in terms of direct assistance (See EXHIBIT 6.2), which is limited due to the size of the funds, but also as a catalyst for R&D efforts in general.

To assess the impact that the FTD can be expected to make in the size

156

EXHIBIT 6.1: SCOPE FOR FTD

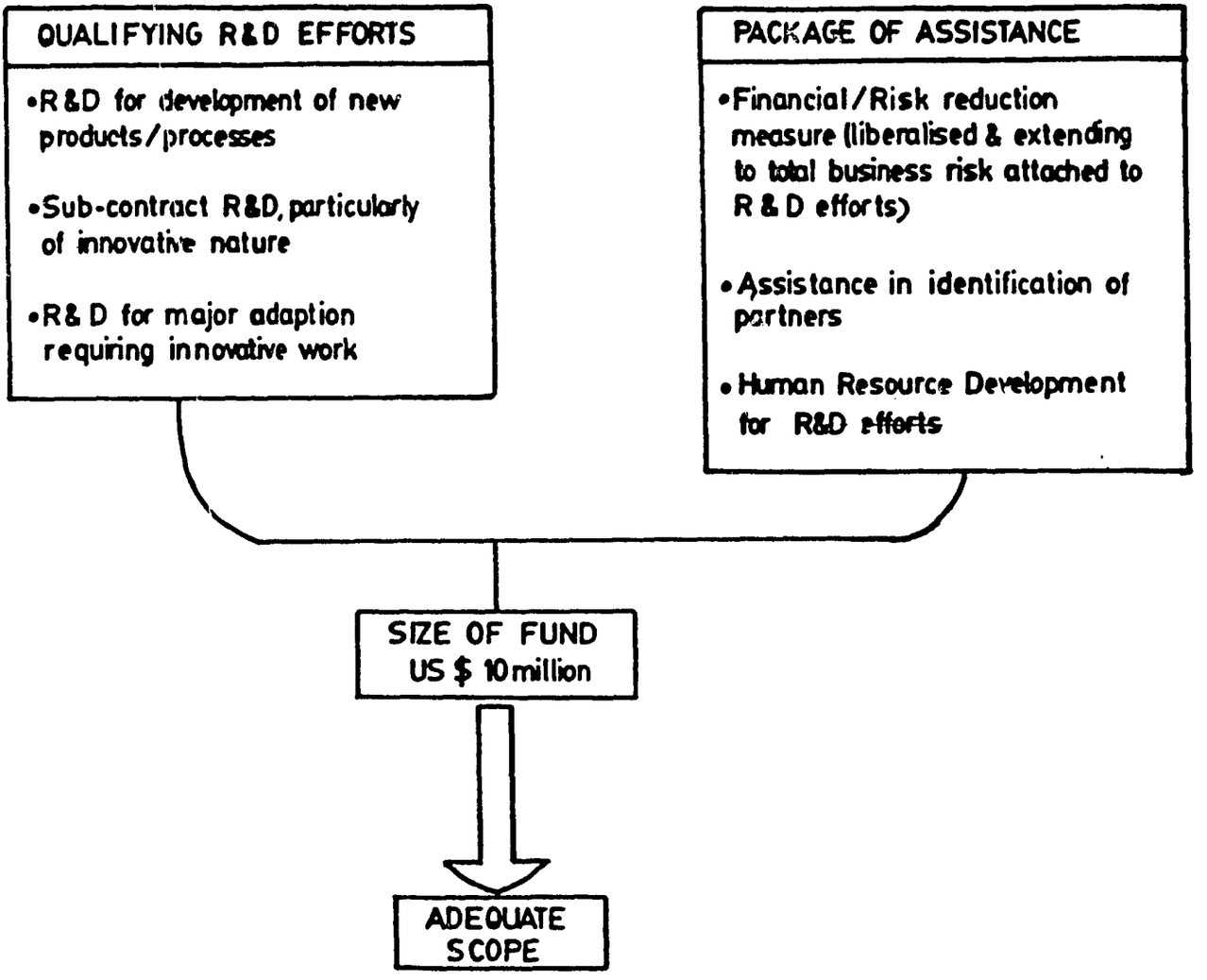


EXHIBIT 6.2: IMPACT THROUGH DIRECT ASSISTANCE

FACTORS LIMITING PVT. R&D	TRENDS	FTD IMPACT-DIRECTLY ASSISTED PROJECTS
(1) LACK OF MOTIVATION . Relative absence of technology based competition . Restrictions on price and scale of output . High taxation rates	INCREASE IN MOTIVATION Increase in technology based competition, liberalisation in controls and lower taxation rates	IMPROVED MOTIVATION Through risk reduction and concessional finance
(2) PREFERENCE FOR TECHNOLOGY PURCHASE/LICENSING RATHER THAN DEVELOPMENT	PREFERENCE CONTINUES; ACCESS EASIER	NIL
(3) UNDER-DEVELOPED PRODUCTION BASE	SHOULD BE BUILT UP IN NEXT 3-5 YEARS	NIL
(4) RESOURCE CONSTRAINTS . Funds . Equipment . R&D Management & Manpower	NO SIGNIFICANT CHANGE	SIGNIFICANT ASSISTANCE
(5) ACCESS TO PARENT R&D FACILITIES	CONTINUES	NIL
(6) ABSENCE OF RESEARCH CULTURE	CONTINUES	SOME IMPROVEMENT

CONCLUSION: FTD can make significant impact-through direct assistance-on R&D efforts of some firms where limiting factors can be relaxed/removed by assistance measures.

158

and quality of R&D efforts of Indian industry, it is necessary to examine:

- Whether it can motivate the R&D inactive firms to become active?
- Whether it will increase R&D efforts of assisted firms?
- Whether it will increase R&D efforts of industry at large?

(1) INACTIVE FIRMS

The major factors for firms being inactive in R&D have been identified as low perceived need or an otherwise unfavourable attitude to R&D(risk-aversion, availability of 'easier quicker and surer ways of making money' etc.). While some of the firms which are inactive for these reasons may be adequately motivated by the risk reduction measure of the proposed package, PW assess that in the absence of these basic pre-conditions for any R&D effort, particularly of an innovative nature, project specific assistance will generally not be adequate to motivate these firms to become active in R&D.

In case of other inactive firms which may be inactive due to resource constraints, R&D efforts may be increased due to direct assistance extended by the Fund. However, most firms with resource constraints would probably still not be motivated to go in for R&D for development of new products/processes because of difficulty/uncertainty of raising resources required for setting up production facilities for commercial exploitation of the results of the research efforts.

The Fund is therefore perceived as having a low impact amongst these firms unless there is a change in this basic attitude to R&D.

(2) ASSISTED FIRMS

The Fund is expected to increase R&D efforts of the assisted firms- not only in respect of the projects directly assisted but also, through exposure and experience gained, in respect of other R&D efforts. However, due to the small size of the Fund the number of firms directly assisted is likely to be small.

(3) INDUSTRY AT LARGE

The assisted project could have a significant demonstration effect

159

on industry at large and thereby become a catalyst for encouraging innovative R&D efforts in general. To enhance this demonstration effect and the consequent impact on innovative R&D efforts of other firms it may be necessary to take specific measures to promote R&D attitude changes in top management, in addition to giving project specific assistance. This assumes particular significance in view of the limited size of the funds available.

160

This chapter examines the approval process for foreign collaborations in R&D. Currently, no separate procedure exists for approval of such collaborations and there have been few precedents. Discussions by PW staff with Government of India officials indicated that the approval process for R&D collaborations is likely to be similar to the existing process for approval of foreign collaborations. Conceivably though, the Department of Science and Technology will have a greater role in the approval process as a scrutinising agency. Accordingly, to provide a perspective on policies and procedures for foreign collaborations in R&D, the present chapter reviews the position in respect of policy and approval process for foreign collaborations.

7.1 POLICY AND GUIDELINES FOR APPROVAL OF FOREIGN COLLABORATIONS

Government attitude towards permitting foreign collaborations is selective. Appendix 9 to this report contains the policy and guidelines in this respect.

Foreign equity participation, if permitted is normally restricted to 40%. Technical collaborations are normally entered into on the basis of annual royalty payments based on actual production, normally not exceeding 5 percent, and/or lumpsum payments for import of drawings, documentations and other forms of know-how. However, the Government of India is quite pragmatic in approving foreign collaboration agreements and examines every proposal on its merits.

The present Guidelines for Approval of Foreign Collaborations are framed for technology transfers rather than collaborative research or technology development; some modification in these, or a separate set of guidelines, may therefore be necessary.

7.2 APPROVAL PROCESS

7.21 AN OVERVIEW

EXHIBIT 7.1 shows the major approval agencies for different categories of applications.

EXHIBIT 7.1: OVERVIEW OF APPROVAL PROCESS

CATEGORY OF APPLICATION	MAJOR APPROVAL AGENCY	
LOI	MRTP COMMITTEE (MRTP HOUSE)	(NON MRTP HOUSE) LICENCING COMMITTEE (INDUSTRIES MINISTRY)
FC	FOREIGN INVESTMENT BOARD (FINANCE MINISTRY)	
COMPOSITE*	PROJECT APPROVAL BOARD (INDUSTRIES MINISTRY)	

* LOI + FC
LOI + FC + CG
FC + CG etc.

Legend: LOI - Letter of Intent
FC - foreign Collaboration
CG - Capital Goods Import Clearance

162

- Applications may be for:
  - Letters of intent alone; or
  - Foreign Collaborations alone, or
  - Composite applications, which could be for obtaining clearance of letters of intent and foreign collaborations or letters of intent, foreign collaborations and capital goods licence or foreign collaboration and capital goods licence etc.

- The procedure relevant for foreign collaborations in R&D will however be only the second or third categories and not for letters of intent alone.

- Composition and functions of the various approval agencies involved, applicable to the second and third categories are given in Appendix 10.

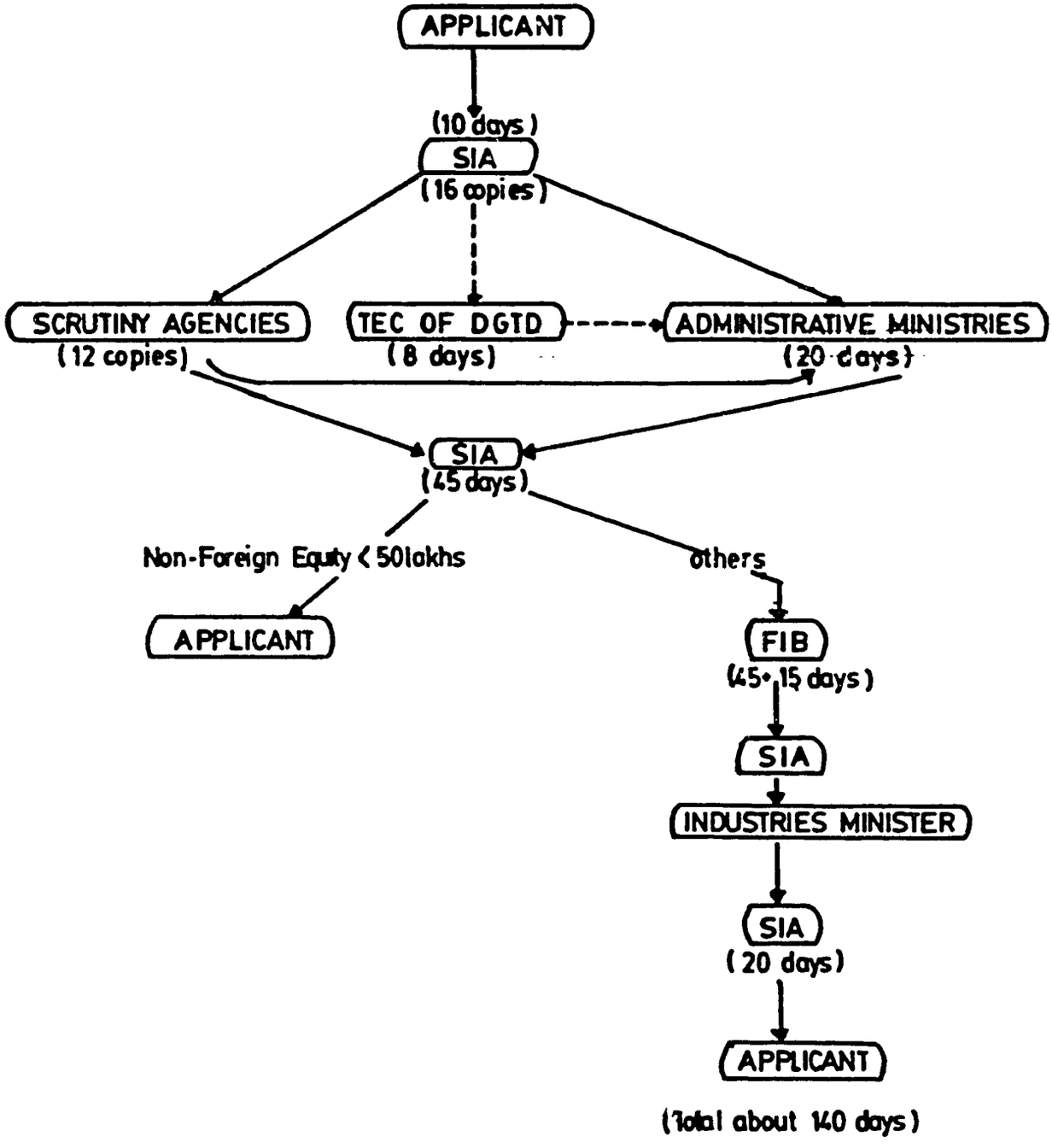
7.22 PROCEDURE FOR APPROVAL OF (SINGLE) APPLICATIONS FOR FOREIGN COLLABORATIONS

- EXHIBIT 7.2 outlines the procedure for approval of applications for foreign collaborations. Details of the procedure are given in Appendix 11 to this report.

- Typically, as indicated in the exhibit, it takes about 5 months for final approval of the application in the case of applicants having foreign equity participation. Maximum time is taken for clearance of the Foreign Investment Board which meets at regular frequencies and on an average it takes about 60 days. In case clarifications are sought by the Minister for Industry, the clearance process may take even longer.

- Administrative Ministries have been delegated powers to dispose of applications at their level under certain conditions. These are listed out in Appendix 12 to this report. As indicated in Exhibit 7.2 in such cases the time requirement is much less (approximately one and a half months).

163

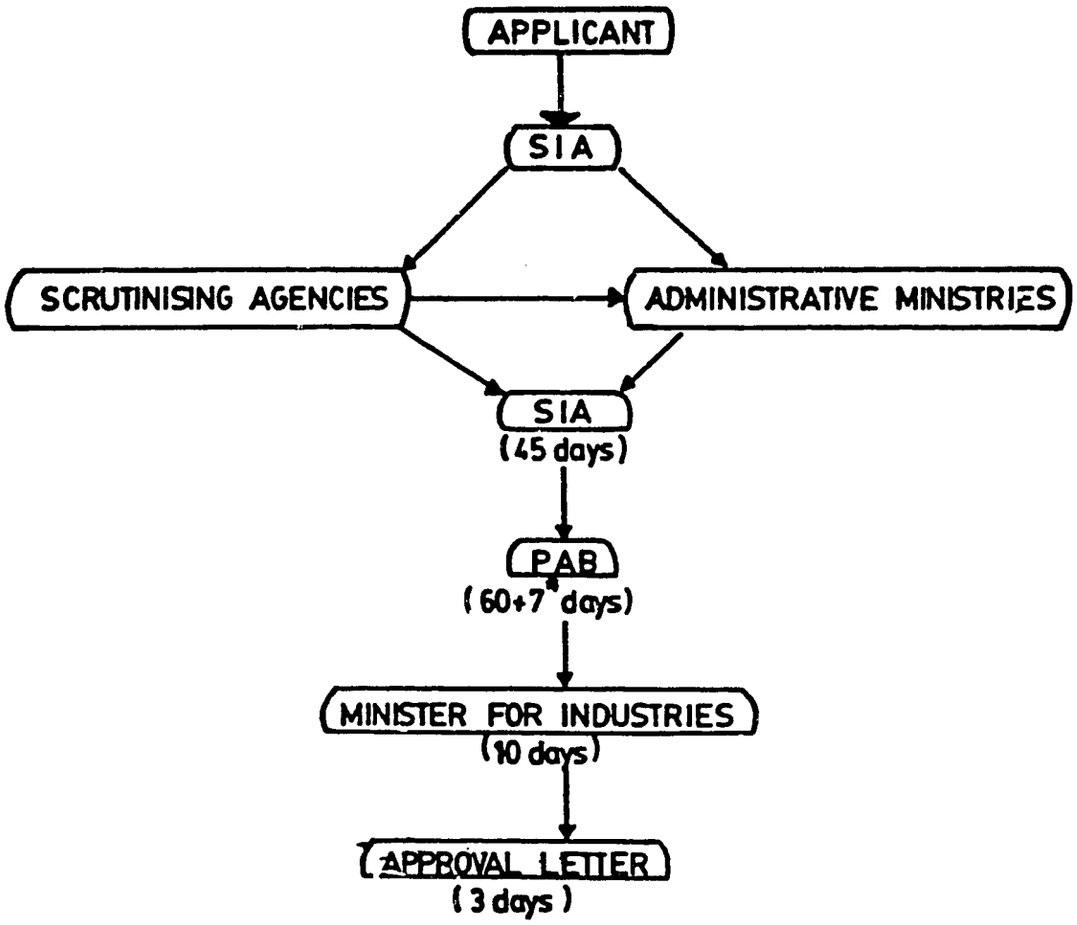

APPLICANT
(10 days)
SIA
(16 copies)
SCRUTINY AGENCIES
(12 copies)
TEC OF DGTD
(8 days)
ADMINISTRATIVE MINISTRIES
(20 days)
SIA
(45 days)
Non-Foreign Equity < 50lakhs
others
APPLICANT
FIB
(45+15 days)
SIA
INDUSTRIES MINISTER
SIA
(20 days)
APPLICANT
(Total about 140 days)

7.23 PROCEDURE FOR APPROVAL OF COMPOSITE APPLICATIONS FOR FOREIGN COLLABORATION

- As indicated in EXHIBIT 7.3, about 4 months are required for the processing of composite applications. The Project Approval Board takes upto 60 days on an average for clearance after 45 days at the Administrative Ministries and Scrutinising Agencies (as in the case of single applications for foreign collaboration).

- Once the approval letter has been issued, the applicant has to get the approval registered with the Administrative Ministry before it is effective. This procedure for registration, can take from as little as 10 days to as much as almost a year after the approval letter has been issued. A proposal to eliminate this procedure is now under consideration.

165



(Total about 125 days)

*7 days required for minuting PAB's decisions

APPENDICES

DETAILS OF DATA SOURCES

(A) PRIVATE SECTOR DISCUSSIONS

	Company	Industry	Person Met
1.	Advani Oerlikon Ltd.* (Ador Group)	Diversified (Welding consumables and equipment, Industrial and power electronics, motors, transformers, office and business machines, solar energy products etc.)	Deputy Chief Executive
2.	Asian Paints*	Paints and Allied Products	Managing Director General Manager (Finance & Materials)
3.	Asiatic Oxygen Ltd.	Diversified (Industrial and health care products particularly gases and related equipments and plants, welding equipment and consumables, explosives, etc.)	Senior Vice President
4.	Chloride India Limited*	Batteries	Director REsearch
5.	Consolidated Pneumatic Tool Co. (India) Ltd.	Compressors and pneumatic tools and equipment	Vice President: Operations Vice President: Finance
6.	Dunlop India Limited*	Tyres and other rubber products	Director Research and Technical Services
7.	Eicher Research Centre* (Eicher Tractors India Ltd.)	Agricultural machinery	General Manager (Research and Development)
8.	Escorts Scientific Research Centre* (Escorts Limited)	Diversified (tractors, motor cycles, industrial machinery, automotive components etc.)	General Manager (Research and Development

	Company	Industry	Person Met
9.	Gabriel India Ltd.	Automotive components (Shock absorbers, bearings)	Vice Chairman and Managing Director
10.	Genelec Ltd.*	Electrical equipment and installations	Executive Director, Marketing and Development Division Executive Director, Projects Division.
11.	Guest Keen Willimas Ltd.*	Engineering (industrial machinery, engineering intermediates, fasterners, special steels and alloys, forgings, electrical stampings and laminations, automotive pressings etc.)	Director (Technical)
12.	Indian Aluminium Co. Ltd.*	Aluminium and related fields	Managing Director Manager (Research and Development)
13.	Indian Explosives Ltd.(ICI Group)*	Diversified (chemicals and allied products, paints, fertilizers, explosives, drugs and pharmaceuticals etc.)	Director (Technical)
14.	Indian Oxygen Ltd.*	Diversified (Industrial and health care products particulars gases and related equipment and plants, welding electrodes, etc.)	Director (Gases Division)
15.	Indian Sewing Machine Co. Ltd.	Sewing and knitting machines, household products	Managing Director
16.	The Indian Tube Co. Ltd.*	Tubes	Chief Marketing Manager
17.	Indrol Lubricants and Specialities Ltd.*	Petroleum products	Chief Executive and Managing Director

169

	Company	Industry	Person Met
18.	International Computers Indian Manufacture Ltd.*	Computers	Managing Director
19.	Kesoram Industries and Cotton Mills Ltd.	Diversified (textiles, rayon, cement, transparent paper etc.)	President (Accounts and Taxation) and Secretary
20.	Macneill and Magor Ltd.*	Diversified (electrical equipment, reprographics, material handling, industrial diamond products, chemical equipment, pumps, valves, drying systems, exports, tea and fibre products)	Controller, Engineering Division (Also Director, Dewrance Macneill & Co. Ltd. Vice President, Worthington Pumps India Ltd.)
21.	May & Baker Ltd.	Drugs and pharmaceuticals	Managing Director
22.	Metal Box India Ltd.*	Packaging, printing machinery etc.	Manager, Research and Development
23.	Monotype India Ltd.*	Printing machinery and equipment (mechanical and electronic)	Dy. Managing Director
24.	The National Insulated CAble Co. of India Ltd.	Diversified (wires, cables, conductors, automotive batteries etc.)	Manager, Research and Development
25.	Poysha Industrial Co. Ltd.	Metal containers	General Manager, Technical
26.	The Standard Batteries Limited*	Batteries	General Manager, Industrial Division Manager, Research & Development Manager, Product Development
27.	STP Ltd.*	Waterproofing, dampproofing, anti-corrosives	President Chief Technical Executive

170

	Company	Industry	Person Met
28.	V[illegible]as Ltd.*	Diversified (airconditioning, refrigeration, industrial and agricultural machinery, mining , etc.)	President
29.	Waldies India Ltd. (Gillander Arbuthnot & Co. Ltd.)	Basic industrial chemicals	Chief Executive
30.	Willard India Ltd.	Batteries	President

Note: Asterisk indicates that the company has a recognised in-house R&D unit.

(B) GOVERNMENT OFFICIALS

1.	Department of Science and Technology	Advisor and Director, Technical Utilisation Division
2.	Department of Economic Affairs	. Director . Joint Secretary
3.	Department of Industrial Development	Joint Secretary

(C) OTHERS

1.	Remfry & Sons (Patent Law Attorneys)	Partner
2.	~~The Industrial Credit & Investment Corporation~~ of India Ltd.	~~Dy.General Manager~~
3.	Arthur Andersen & Co.	Partner
4.	Dr. William Correa (Consultant)	
5.	Dan Schwartz (Design Engineer)	
6.	USAID Project Staff	

171

APPENDIX - 2

LIST OF 25 DELICENSED INDUSTRIES

1. Special alloy, SG and malleable iron castings, sponge iron and pelletisation;
2. Steel structurals.
3. Electrical equipment, namely, a) Equipment for exploitation of alternate source of energy like solar, wind power, bio-mass including bio-gas, geothermal energy tidal power and sea power; b) Steam turbines of and below 20 MW and mini and micro hydel systems, equipment, c) Power and distribution, transformers, power capacitors, switch gears, electrical motors, and GLS Lamps, d) Diesel Generating Sets.
4. Electronic components.
5. Automotive ancillaries.
6. Cycles.
7. Industrial machinery, including rubber machinery, printing machinery, footwear machinery, meat and poultry machinery.
8. Machine tools,
9. Agricultural implements.
10. Miscellaneous mechanical and engineering industries, namely, a) Plastic moulded goods; b) Hand tools, small tools and cutting tools; c) Pressure cooker, cutlery and steel furniture; d) Lanterns of all types; e) Fuel efficient stoves; f) Water pumps beyond 10 cms.
11. Industrial Sewing Machines.
12. Office equipment as listed below:-
    (1) Multiplication and reproduction equipment;
    (2) Word processors;
    (3) Cash registers/invoicing machines;
    (4) Dictaphone
    (5) Micro-filming/micro fichereaders.
13. ~~Surgical, industrial and scientific instruments.~~
14. Industrial and medical gases.
15. Following drugs/drug intermediates, Rifampicin, Depsone, Olofazmine, Primaquin, YWME (Ethexy Methylene Malconic Ester), Nevaldiamine, Insulin, Anti cancer drugs, Vitamin B6, Norgestrol, Piperazine, New bulk drugs developed through indigenous research.

16. Paper and pulp namely: (a) writing, printing and wrapping paper from agricultural residue, waste and bagesse (b) cotton seed linter pulp.
17. Canned fruit and vegetable products, protein and processed foods, vegetable based wearing food, marine products and cattle feed.
18. Vegetable oils, namely: (a) solvent extraction of oil/oil cakes from minor seeds excluding cotton seeds; (b)rice bran oil.
19. Soap and cosmetics, namely (a) soap, cosmetics, perfumery and toilet preparations. (b) detergents of ISI standards.
20. Leather goods.
21. Glassware.
22. Ceramics, namely (a) refractories and furnace lining bricks, (b) Chinaware, pottery and sanitaryware. (c) H.T. insulators (d) tiles (e) Graphite ceramics.
23. Insulating boards, gypsum boards, wall boards and the like.
24. Printing including litho printing.

Note:-Delicensing of the above mentioned industries is subject to the following conditions;

- The industrial undertaking does not fall within the purview of MRTP/FERA Regulations.
- The articles are not reserved for the small scale sector.
- The industrial undertaking is not located within urban limits.

173

AREAS OF MANUFACTURE ALLOWED TO MRTP/FERA COMPANIES

1. MRTP and FERA companies are allowed to participate mainly in the core and heavy investment sectors and industries having potential for export and import substitution listed under Appendix I to the Industrial Licensing Policy Statement of February, 1973.

2. Such companies can also be allowed to set up new undertakings or expand production in non-Appendix I areas provided they undertake specific export obligation. The minimum export obligation acceptable in such cases would be 60% of the new or additional production if the item is not reserved for small scale sector and 75% if the item is reserved for small scale sector.

3. Keeping in view the need for developing backward areas, the MRTP/FERA companies are now permitted into non-Appendix I industries which are not reserved for small scale sector with an export obligation of 50% for setting up industries in Category B and C backward districts and 30% in respect of Category A districts vide Press Note dated 27th April 1983. Appendix 1 Industries are listed out below:-

1. METALLURGICAL INDUSTRIES

    1. Ferro alloys.
    2. Automotive castings, SG iron castings, steel castings and steel forgings.
    3. Non-ferrous metals and their alloys, including aluminium foils,
    4. Sponge iron and Pelletisation.

2. BOILERS AND STEAM GENERATING PLANTS

3. PRIME MOVERS (OTHER THAN ELECTRICAL GENERATORS):

    1. Industrial turbines.
    2. Internal combustion engines.

174

3. Alternate energy systems like solar, wind, etc. & equipments therefor.

4. Gas/hydro/steam turbines from 20 MW to 60 MW.

4. ELECTRICAL EQUIPMENT

1. Equipment for transmission and distribution of electricity including power and distribution transformers, power relays, HT-switchgear, synchronous condensers.
2. Electrical motors
3. Electrical furnace including industrial furnaces.
4. X-ray equipment.
5. Electronic components and equipment.
6. Component Wires for manufacture of lead-in wires.
7. Hydro/steam/gas generators from 20 MW to 60 MW.

5. TRANSPORTATION

1. Mechanised sailing vessels upto 10,000 DWT including fishing trawlers.
2. Ship ancillaries.
3. (1) Commercial Vehicles, public transport vehicles including automotive commercial three-wheeler jeep type vehicles, industrial locomotives.
   (2) Personal transport vehicles:
      (i) Passenger cars;
      (ii) Automotive two-wheelers and three-wheelers. Regarding two-wheelers, only expansion of existing units, subject to an export obligation of 25% on additional capacity.
   (3) Specialised automotive components, such as pistons and piston rings, fuel injection equipment; auto-electricals, such as starter motors, generators, spark plug, rear axle assembly, brake and clutch assembly, tyre/tube valves, wheels for automobiles and bimetal bearings.

6. INDUSTRIAL MACHINERY

Industrial machinery including specialised equipment:

1. High performance and high fidelity industrial valves as may be specified by the Ministry of Industry.
2. Centralised lubrication system.
3. Gears, gear boxes and couplings.
4. Rolls for paper mills, rolls for rolling mills.
5. Pollution control equipment.
6. Process equipment for utilisation of recycling of wastes.

7. 1. Machine tools including controls and accessories.
   2. Jigs, fixtures, tools and dies of specialised types and cross land tooling.
   3. Engineering production aids such as cutting and forming tools, patterns and dies and mining tools.

8. AGRICULTURAL MACHINERY

Tractors.

9. EARTH MOVING MACHINERY

Earth Moving Machinery and construction machinery and components thereof.

10. INDUSTRIAL INSTRUMENTS

Indicating, recording and regulating devices for pressure, temperature, rate of flow, weights, levels and the like.

11. SCIENTIFIC AND ELECTROMEDICAL INSTRUMENTS AND LABORATORY EQUIPMENTS.

12. NITROGENOUS & PHOSPHATIC FERTILIZERS falling under
    (1) Inorganic fertilizers under "18-Fertilizers' in the First Schedule to the I(D&R) Act, 1951.

13. CHEMICALS (Other than fertilizers)

1. Heavy organic chemicals including petro-chemicals
2. Heavy inorganic chemicals
3. Organic fine chemicals
4. Synthetic resins and plastics.
5. Man-made fibres.
6. Synthetic rubber.
7. Industrial explosives.
8. Technical grade insecticides, fungicides, weedicides and the like,
9. Synthetic detergents.
10. Miscellaneous chemicals (for industrial use only) including:
    1. Catalysts and Catalyst supports
    2. Photographic chemicals.
    3. Rubber chemicals.
    4. Polyols
    5. Isocyanates, Urethanes, etc.
    6. Speciality chemicals for enhanced oil recovery.
    7. Heating fluids.
    8. Coal tar distillation and products therefrom
    9. Tonnage plants for the manufacture of industrial gases.
    10. High altitude breathing oxygen/medical oxygen.
    11. Nitrous oxide.
    12. Refrigerant gases like liquid nitrogen, carbon dioxide, etc. in large volumes.
    13. Argon and other rare gases.
    14. Alkali/acid resisting cement compound
    15. Leather chemicals and auxiliaries.

14. DRUGS AND PHARMACEUTICALS

~~For FERA drug companies~~

(a) Drug intermediates from the basic stage for production of high technology bulk drugs;

177

(b) High technology bulk drugs from basic stages and formulations based thereon with an overall ratio of bulk drug consumption (from own manufacture) to formulations from all sources of 1:5.

For non-FERA MRTP companies
All bulk drugs and formulations with an overall ratio of 1:10 between the value of production of bulk drugs and of formulations.

15. 1. Paper and Pulp including paper products.
    2. Industrial laminates.

16. 1. Automobile tyres and tubes, including automobile tyre/tube valves.
    2. Rubberised heavy duty industrial beltings of all types.
    3. Rubberised conveyor beltings.
    4. Rubber reinforced and lined fire fighting hose pipes.

17. PLATE GLASS

    1. Float glass
    2. Toughened glass insulators.
    3. Glass Fibres of all types.

18. CERAMICS

    1. Refractories
    2. Furnace lining bricks— acidic, basic and neutral
    3. Ceramic Fibres.

19. CEMENT PRODUCTS

    1. Portland cement.
    2. Gypsum boards, wall boards, and the like.

20. HIGH TECHNOLOGY REPRODUCTION AND MULTIPLICATION EQUIPMENT

178

21. CARBON AND CARBON PRODUCTS

1. Graphite electrodes and anodes
2. Impervious graphite blocks and sheets.

22. PRETENSIONED HIGH PRESSURE RCC PIPES

23. RUBBER MACHINERY

24. PRINTING MACHINERY

1. Web-Fed high speed offset rotary printing machines having output of 30,000 or more impressions per hour.
2. Photocomposing/type setting machines.
3. Multi-colour sheet-fed offset printing machines of size 18" x25" and above.

4. High speed Rotogravure Printing machines having output of 30,000 or more impressions per hour.

NOTE: 1. Items of manufacture reserved for the Public Sector under Schedule A to the Industrial Policy Resolution 1956 or for production in the Small Scale Sector, as may be notified from time to time, will be excluded from the application of the list.

2. According to the new electronicspolicy the government would allow FERA companies to set up manufacturing facilities for electronic components, materials and other closely held high technologies, where the country has not been able to invest sufficiently in research and development.

TEXT OF NEW ELECTRONICS POLICY

1. Broad banding of industrial licences: Henceforth, to optimally utilise the investments, 'broad band' licences will be issued for the following:
   i) Entertainment electronics, covering radio receivers, tape recorders, two-in-one, amplifiers, record players, record changers, TV sets- black & white and colour, CCTV systems, but excluding those reserved for small scale industry;
   ii) Electronic toys, including radio controlled ones and games ;
   iii) Computer peripherals;
   iv) Electronic test and measuring instruments, excluding those reserved for small scale industry; and
   v) Discrete semiconductor devices.

2. Policy for VCR/VCP and Microwave Ovens: Keeping in view the approach of producing electronic equipment at near international prices, government is drawing up an Industrial and Licensing Policy for the manufacture of Video Cassette Recorders/ Video Cassette Players and Microwave Ovens on the basis of the following:-

   VCR/VCP: The Department of Electronics or its designated agency will purchase technology for VCR/VCP, including the technology for manufacture of Deck Mechanism. Deck Mechanismincluding Head/Drum Assembly will be manufactured by a Public Sector Enterprise to be designated by the Department of Electronics. In addition to this, another unit in private sector has already been approved for the manufacture of Deck Mechanism.

   The existing licensed/ registered units which wish to enhance their capacity will be asked to apply afresh and their applications will be considered along with other applications.

   A minimum complement of production and test equipment, as decided by the Department of Electronics, from time to time, would be required to be installed in each production unit.

   Microwave Oven: The Department of Electronics or its designated agency will purchase technology for this item. The same approach as given for VCR/VCP Policy will be adopted.

   Digital Electronic Watches: The existing industrial and technology policy

180

for electronic watches had reserved the marketing of Digital electronic watches (DEW) to the Central and State Public Corporations. In view of the changed technology, as a result of which very cheap digital electronic watches are now available internationally, the following has been decided:-

(a) Semiconductor Complex Ltd. (SCL) would be allowed to manufacture and sell low cost DEW modules to DEW assemblers, both in the State public sector and small scale units, as well as other units engaged in the manufacture of mechanical watches, handicrafts, etc.

(b) The small scale units may be permitted to sell low cost DEW or other DEW module based products directly in the market.

If the demand out-strips the capacity of SCL, a second unit in the private sector will be permitted to manufacture these modules.

4. All consumer durable products mentioned in para 1. (i) above would be de-licensed for applicants who will not draw on the resources of Financial Institutions.

5. Quality & Reliability: The government will set up adequate facilities for quality certification of electronic consumer durable goods so that consumers are assured of reliable products.

6. Liberal Growth: At the time of issuing industrial licences for any new product, the anticipated demand in the foreseeable future, as well as the techno-commercial viability, will be kept in mind. The Government will insist on a minimum investment in capital equipment to ensure adequate added value in the country and technology absorption and development. A minimum production capacity will be insisted on. Once a licence has been issued, the licence holder will be assured of liberal upward growth.

7. In approving phased manufacturing programmes, the Government will ensure that reliance on imported populated printed circuit boards is reduced and genuine manufacture within the country is encouraged.

8. ~~Indian companies including those with foreign equity of 40% or less will~~ no longer be debarred from any field of electronics which is open to the organised private sector, only because of their foreign equity holding.

181

9. FERA Companies: The government would welcome foreign equity companies (i.e., those having more than 40% foreign equity) to set up manufacturing facilities for electronic components, materials and other closely held high technologies, where the country has not been able to invest sufficiently in research and development.

10. Import of technology would be permitted freely to develop an appropriate electronics base in the country. However, industries will be encouraged to establish inhouse technology base so that repeated import of technologies does not have to be resorted to.

11. Centralised purchase of technology will be resorted to only if a variety of technologies renders the indigenous products costly in comparison with international prices, because one of the objectives of this policy is to make equipment available at near international price.

12. Location: Electronics industry will be allowed to be established in any of the permissible locations. Greater efforts will be made to develop electronics industry in the hill districts on a larger scale.

13. Exemption from Sections 21 & 22 of MRTP Act: Electronic components (other than all types of integrated circuits, viz., VLSI, LSI, MSI, SSI Semiconductors, Photo-voltaic components etc.), computer peripherals, computer software, magnetic tapes for use in computer, video equipment, hard discs, floppy discs and diskettes for computers and test and measuring instruments, are already exempted from Sections 21 & 22 of MRTP Act. This exemption will be extended to the following items — materials for electronics, computers, broadcasting equipment, control instrumentation and industrial & professional electronics, and communication equipment.

14. The Finance Minister, in his Budget speech , has removed excise duty on 24 types of electronic components, computers and computer peripherals. This is another step in reducing the prices of locally manufactured electronic goods bringing them closer to international levels.

15. Manpower Development: Electronics is knowledge-intensive area and is characterised by rapid innovation as well as absolescene. A regular supply, in large numbers of specialised and trained manpower and a continuous updating of the skills of this manpower stock are, therefore, of crucial importance for the growth of electronics, be it in the field of research and development, production, maintenance, servicing of applications. In the context of

182

Government's declared objective of bringing about a rapid development of the electronics sector, the urgent need to devote attention to manpower training in the electronics sector has been increasingly engaging the attention of Government. The various initiatives, steps and programmes being undertaken in this crucial area are summarised below:-

i) Teachers training programme is being initiated at the 5 major institutions, viz., the four IITs at Bombay, Delhi, Kanpur and Madras, and at Jadavpur University, for training teachers in computer science.

ii) Teachers Training Programme for Diploma in Computer Application: This programme has been initiated at six instutitions across the country . Training for teaching DCA courses is provided through 4 modules of six weeks duration each.

iii) Master of Computer Application programme has been initiated in 14 centres.

iv) The Master's programme in electronics is expected to be started in three Universities next year. In addition to the traditional Maths, Physics and Chemistry combination available now at B.Sc. degree level, the introduction of Electronics as a separate subject in different combinations has also been finalised.

v) 28 centres have been identified for starting one-year Post-B.Sc. Diploma in Computer Application, out of which 17 centres have started this course.

vi) 18 months Post-Polytechnic DCA Programme in Polytechnics: This programme has been introduced at 16 centres.

vii) Training Course in the Industrial Training Institutes (ITIs) in two trades — "Console Operator-cum-Programme Assistant", and "Data Preparation Assistant", has been finalised for 13 centres.

viii) Continuing Education Programme at IIT, Delhi: The programme aims at providing modular courses of short duration to computer professionals from industry and teachers from academic institutions. 60% of the seats are reserved for teachers. The programme has been started in December, 1984.

16. To plan this industry in an integrated manner and to ensure minimum drain on our foreign exchange, it is necessary to have detailed data from all electronic manufacturers, both in the organised and the small scale sectors. It is, therefore, proposed to introduce a compulsory single proforma which would be submitted by the industrial units, once a year, to the Department of Electronics.

17. In order to speed up scrutiny of proposals by financial institutions, they would be encouraged to set up separate cells for electronics and would be invited to participate in the projects appraisal committees of the Department of Electronics.

18. The Computer Policy announced on 19th November, 1984, will be suitably extended and applied by the Department of Electronics to electronic control instruments, instrumentation and systems, industrial and professional electronics, and data communication equipment.

19. Components: Electronic component industry has already been de-licensed vide a Press Note issued by Ministry of Industry and Company Affairs on 16th March, 1985. In light of this, entrepreneurs wishing to set up component industries to produce components could register with the D.G.T.D.

20. The government had earlier announced that components need to be manufactured in large volume; it is therefore, proposed to de-reserve some of the components which today are reserved for the small scale sector.

21. Normally, manufacture of components is not permitted from intermediate levels. However, in the case of bipolar, linear and digital integrated circuits where heavy investments are called for, industry will be permitted, to begin with, to assemble from intermediate stage, provided an investment of at least Rs. 5 crores is made.

22. Communications: In the area of communications, certain product lines were thrown open to the private sector as announced by the Deputy Ministry for Electronics in March, 1984. As a result of this policy, 5 Letters of Intent for electronic PABXs, and 27 Letters of Intent for electronic telephone instruments have been issued for the Private Sector. One Letter of Intent for the manufacture of electronic teleprinter, two for the manufacture of public telephones, and two for telephone answering and recording machine have also been issued to the Private Sector. It was proposed earlier that for switching systems, private party's participation beyond 49 percent would

184

not be permitted; however, considering the limitations of the government's resources and the gap in availability which is likely to emerge in the switching area, it is now proposed to set up an ESS factory using the technology that is being developed indiganously by the Centre for Development of Telematics (CDOT). The investment of the government in this venture would be restricted to 26 per cent , 25 per cent would be offered to private sector party and 49 per cent would be thrown open to the general public. Necessary action to modify the Industrial Policy Resolution will be taken.

23. Research & Development : In order that our electronics industry in the Eighth Five-Year Plan does not have to depend largely on foreign technologies as is the position today, the government has taken up several major research and development programmes. It has set up a Centre for Development of Telematics (CDOT), it has been encouraging research through the National Radar Council; it is rendering financial assistance for research in educational institutions and public sector enterprises through its Technology Development Council. It has recently announced the setting up of a National Microelectronics Council and proposes to set up a Centre for development of materials for electronics.

185

INCENTIVES FOR UNDERTAKING RESEARCH AND DEVELOPMENT

1. INCOME TAX BENEFITS

The Income Tax Act contains certain provisions which are specifically directed to encourage research and development activities within the industry. For claiming deduction on expenditure incurred for scientific research, prior approval will be required of such expenditure incurred from the Department of Science and Technology. For tax purposes, 'scientific research' means any activities for the extension of knowledge in the fields of natural or applied science including agriculture, animal husband ry or fisheries. Expenditure relating to acquisition of rights as a result of scientific research will not be covered under the above definition. Reference to scientific research in relation to a business or class of business include:

(a) Any scientific research which may lead to or facilitate an extension of that business or, all business of that class;

(b) any scientific research of medical nature which has a special relation to the welfare of workers employed in that business or all business of that class.

1.1 Revenue expenditure incurred on scientific research, by an in-house Research and Development unit on activities relating to the business of the company, is fully admissible as a deduction in the year in which it is incurred, in computing the taxable profits of the business.

1.2 Revenue expenditure incurred within 3 years before the commencement of the business will be allowed against the profits of the year in which the business commenced.

1.3 Capital expenditure on scientific research related to the business carried on, could be fully deducted from the profits of the year in which such expenditure was incurred.

1.4 Capital expenditure incurred within 3 years immediately preceding the

186

commencement of the business, will be allowed against the profits of the year in which the business commenced.

1.5 Where the company does not carry out scientific research on its own and instead makes contribution to a scientific research association, university, college or other institution approved by the Department of Science and Technology, such contribution will be allowed as a deduction fully even if unrelated to the business of the company except in the field of social science or statistical research where it must be related to the business of the company.

1.6 Where lumpsum consideration has been paid for acquiring know-how, one sixth of the amount incurred will be deductible in that previous year and the balance in equal instalments for each of the five immediately succeeding years. If however, the know-how has been developed in a University or Institution, one third of the amount incurred will be deductible in that previous year, and the balance in equal instalments in each of the two immediately succeeding years.

1.7 Investment allowance will be granted at an enhanced rate of 35% (as against the normal rate of 25%) of the actual cost of machinery or plant installed before April 1, 1987 for the business of manufacture or production of any article or thing which utilises any know-how, technology or process developed in, or invented by, a laboratory owned or financed by the Government or a public sector undertaking or a university or by an institution recognised in this behalf by Department of Science and Technology. However, Investment Allowance will not be admissible for the manufacture of items listed in the Eleventh Schedule of the Income Tax Act, 1961 on plant or machinery installed in any residential accommodation

187

including guest house or on any office appliances or road transport vehicles.

2. LICENSING BENEFITS

2.1 Industrial undertakings other than those which come within the purview of Monopolies and REstrictive Trade Practices Act (MRTP) and Foreign Exchange Regulation Act(FERA) which take up the manufacture of any item based on the technology developed by any of the laboratories established by the Council of Scientific and Industrial Research and laboratories approved by Department of Science and Technology will be exempted from the licensing provisions of the Industries (Development and Regulation) Act This includes sponsored research undertaken by such laboratories on behalf of the industrial undertaking, but is subject to the condition that the item of manufacture is not reserved for development in public sector or small scale sector or governed by special regulations.

2.2 In respect of the commercial exploitation of the results of in-house R&D industrial undertakings, other than those coming within the purview of MRTP Act and foreign companies as defined under FERA, would be allowed to set up capacity based on these results. Industrial undertakings covered by the MRTP Act and foreign companies would be required to obtain an industrial licence in terms of existing statutory provisions, which would ordinarily be given provided this is in an area covered by Appendix I to the Industrial Licensing Policy Statement of February 1973 or prior approval of the Government for proceeding with research in that area has been obtained.

3. IMPORT FACILITIES

All the recognised research and development units laboratories and institutions can import their full requirements of technical and professional equipments, raw materials, components, spares or other items (excluding consumer goods and office machines) on Open General Licence, with the condition that they are the actual users of the items imported.

4. CUSTOMS DUTY EXEMPTION

4.1 Scientific and technical instruments, apparatus and accessories excluding consumable items imported by research institutions are exempted from the payment of customs duty, subject to certain conditions. Such institutions should, however not be engaged in any Commercial activitiy; in-house research and development units recognised by the Department of Science and Technology are not eligible for this exemption.

4.2 Consumable items of research material imported by public funded research institutions upto Rs.50,000 would be exempted from import duty according to the recent budget.

5. TECHNICAL DEVELOPMENT FUND (TDF)

The Industrial Development Bank of India provides direct loans to industrial units to enable them to utilise the import licences under the Technical Development Fund Scheme of the Government of India. Generally, the limit for total import under the scheme is US$ 250,000 per undertaking per year. The scheme covers all industries as also import of any other inputs needed by industrial units for improving export capabilities.

APPENDIX 6

SALIENT POINTS OF BUDGET SPEECH AND FINANCE BILL, 1985

GENERAL

1. Emphasis placed on the need to bring about closer co-ordination among fiscal, industrial and trade policies; need for regulations that facilitate growth in response to the changing external and technological environment.

2. 25 industries proposed to be delicensed.

3. Assets limit for MRTP companies revised to Rs. 1,000 million from Rs. 200 million.

4. To facilitate mobilisation of resources by the corporate sector, the maximum interest payable on issues of convertible debentures for non- MRTP/FERA Companies raised from 13.5% to 15%.

5. New electronics policy announced (refer Appendix 4).

DIRECT TAXES

6. Personal-income tax rates reduced and surcharge eliminated.

7. Statutory rate of corporate tax reduced by 5% for all categories of companies.

8. Extension of tax holiday concession available to new industrial undertakings, hotels & shipping companies for a further period of 5 years.

9. Tax incentive to exporters for increasing available resources for technological upgradation & product development by way of deductibility of 50% of export profits.

10. Discontinuance of disallowance of 20% of expenditure in excess of Rs. 100,000 on advertisement, publicity & sales promotion, running and

maintenance of aircraft and motor cars and payments made to hotels.

11. Lumpsum considerations for acquiring know-how to be deductible & written off over six years.

12. Open debate invited on proposals for the next two years to further reduce corporate tax rate and eliminate surcharge and companies profits surtax.

13. Wealth Tax exemption limit raised from Rs. 150,000 to Rs. 250,000; maximum marginal rate of tax reduced from 5% to 2%.

14. Estate duty abolished.

INDIRECT TAXES

15. Reductions in import duty on:
    - Four important components of advanced computers from 75% to 25%
    - Specified machinery used for leather processing
    - Components of gem & jewellery machinery
    - Raw wool
    - Items of medical equipment such as Nuclear Magnetic Resonance Scanner, CAT Scanner and Linear Accelerator.
    - Eight drug intermediates
    - Warranty spares for fuel efficient commercial vehicles
    - Exhaust gas analysers and smoke meters.

16. Exemptions from import duty on:
    - Advanced (maxi) computers costing over Rs. 10 million.
    - Pulp and wood chips
    - Wind operated electricity generators and wind operated battery chargers.
    - 3 drug intermediates
    - Consumable items of research materials imported by public funded research institutions upto Rs. 50,000.

17. Increase in customs basic duty from 150% to 200% in the case of mini and micro computers.

18. Exemption from excise duty for computers & black & white TV's.

19. Increased excise duty on commercial vehicles.

SALIENT FACTS REGARDING PROPRIETORY RIGHTS PROTECTION IN INDIA

Term of Patent:

- 14 years from date of patent [Except for "food, medicine or drug substance" when it is 7 years from date of patent or 5 years from date of sealing, whichever is shorter]

- No provision enabling extension of term

[Comparison: 15-20 years in most countries]

Nature of Patent

Only process patent allowed in case of
- "food, medicine or drug" substance
- Other substance prepared or produced by chemical process

[Note: Other countries which allow only process patents are

- FOR CHEMICAL COMPOUNDS — Austria, Brazil, Bulgaria, Chile, Czechoslovakia, East Germany, Hungary, Japan, Netherlands, Pakistan, Poland, Spain, Switzerland, U.S.S.R., Yugoslavia.

- FOR PHARMACEUTICAL PRODUCTS — The above countries and also Canada, China, Denmark, Italy and Sweden].

Note: In India, unlike some other countries (e.g. China) burden of proof of infringement is on the patentee even for a process patent; this is practically impossible to prove in case of imported items.

Qualifying for patentability: While requirements are comparable with other countries in practical application it is easier to qualify than would be in advanced countries, e.g. U.S.A.

Licensing

- **Compulsory Licensing & Licence of right**: The provisions of the Indian law are wider in scope than in most other countries but, in practical terms,

these have been exercised only in rare cases (barely 5-6 instances).

- Deemed endorsement with licences of right: These provisions appear strenuous but, in practical terms, are infructuous in case of food, medicine or drug substances due to short life of patent.

- Right to Use by Government: Exists and is wider than in most other countries.

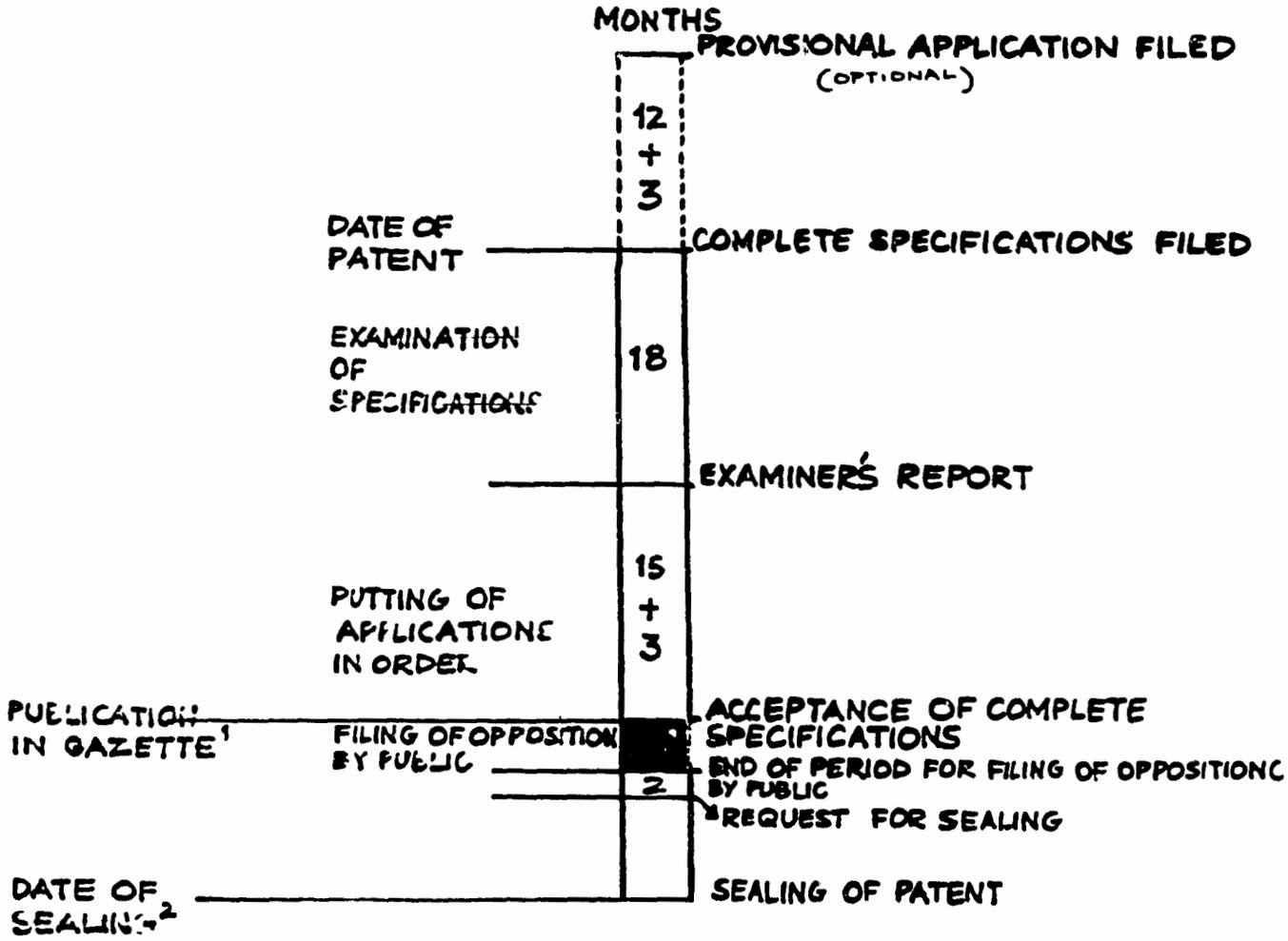
Extent of information to be filed with patent application: Extensive, comparable to US.A.

Confidentiality of information with patent office before acceptance of Complete Specifications: Very high.

Enforcement & Remedy for infringement: Very few cases; fair and reasonable to patentee but time consuming process.

Application and granting of patents: Normally takes 3-4 years from the date of filing to the date of sealing though of late there has been a significant reduction in this time and is now closer to 3 years. The various stages involved are set out in the diagram on the following page.

APPLICATION AND GRANTING OF PATENTS



NOTE: TIME PERIODS INDICATED ARE STATUTORY LIMITS

[1] NO DAMAGES CAN BE CLAIMED FOR INFRINGEMENTS PRIOR TO THIS DATE

[2] NO SUITS CAN BE BROUGHT PRIOR TO THIS DATE

LIST OF FIRMS WITH POTENTIAL FOR INNOVATIVE R&D IN COLLABORATION WITH US FIRMS

POTENTIAL RATING: 'A' (GOOD)

	Name of Firm	Industry	Specific areas of interest indicated, if any.
1.	Advani Oerlikon Ltd. (Ador Group)	Diversified (Welding consumables and equipment, industrial and power electronics, motors, transformers, office and business machines, solar energy products etc.)	Industrial Electronics; solar energy products.
2.	Chloride India Ltd.	Batteries	Battery technology; Photo-electro-chemistry
3.	Escorts Scientific	Diversified (tractors, motor cycles, industrial machinery, automotive components etc.)	Engine updating programmes
4.	Indian Explosives Ltd.	Diversified (chemicals and allied products paints, fertilizers, explosives, drugs and pharmaceuticals etc.)	Speciality chemicals; Plant protection chemicals
5.	Macneill & Magor	Diversified (Electrical equipment, reprographics, material handling, industrial diamond products, chemical equipment, pumps, valves, drying systems, exports, tea and fibre products)	Pumps for special applications
6.	Voltas Ltd.	Diversified(airconditioning, refrigeration, industrial and agricultural machinery, mining, etc.)	

195

POTENTIAL RATING : 'B' (FAIR)

	Name of Firm	Industry	Specific areas of interest indicated, if any
1.	Indian Aluminium Ltd.	Aluminium and related fields	
2.	Standard Batteries Lrs.	Batteries	Battery technology-industrial batteries, batteries using solar energy, batteries for electric vehicles and low maintenance batteries for use in rural areas
3.	STP Ltd.	Waterproofing, dampproofing, anti-corrosives	Walling and flooring material; automobile sealants; electronics

POTENTIAL RATING: 'C' (MAY BE)

1.	Asiatic Oxygen Ltd.	Diversified (Industrial and health care products particularly gases and related equipments and plants, welding equipment and consumables, explosives, etc.)	
2.	Eicher Research Centre (Eicher Tractors Ltd.)	Agricultural machinery	Improving engine efficiency.
3.	Gabriel India Ltd.	Automotive components (shock absorbers, bearings)	Automobile components
4.	Guest Keen Williams Ltd.	Engineering (Industrial machinery, engineering intermediates, fasteners, special steels and alloys, forgings, electrical stampings and laminations, automotive pressings etc.)	Special steels, special purpose machines (including those with numeric controls), cutting tools, process controls; magnetic materials, electronics

	Name of Firm	Industry	Specific areas of interest indicated, if any
5.	Indian Tube Co. Ltd.	Tubes	Plastic coatings for tubes
6.	Indrol Lubricants and Specialities Ltd.	Petroleum Products	Flow improvers and other chemicals
7.	The National Insulated Cable Co. of India Ltd.	Diversified (wires, cables, conductors, automotive batteries etc.)	Cable Technology (Improvement in cable designs, modifications in compounds, etc.); electronics.

POLICY AND GUIDELINES FOR APPROVAL OF FOREIGN COLLABORATIONS

A. GENERAL

1. All proposals involving foreign technical and/or financial participation must be cleared through the Foreign Investment Board of the Government of India.

2. Induction of advanced technology will be permitted
   - to encourage exports by increasing competitiveness of Indian industry abroad;
   - to enable industry to produce better quality products at lower costs to benefit consumers in terms of price and quality.

3. An illustrative list has been issued by the ministry of industries where no foreign collboration, financial or technical, is considered necessary in view of the fact that indigenous technology is fully developed (List reproduced in section F of this Appendix). Import of technology may, however, be considered even in these industries if they conform to guidelines, particularly if
   - indigenous technology is too closely held;
   - to update existing technology;
   - for substantial exports.

4. Indian firms importing technology would be required to set up adequate Research and Development (R&D) facilities so that imported technology is properly adapted and assimilated; Government to monitor these efforts. Companies with well established R&D organisations and having demonstrated their ability to absorb, adapt and disseminate modern technology will be permitted to import such technology as will improve their efficiency and cost-effectiveness.

B. EQUITY PARTICIPATION

5. Government attitude towards permitting foreign equity participation is selective. FActors considered are priority of industry, nature of technology involved, export potential, alternative terms available for securing the same or similar technological transfer, etc.

6. Ceiling for foreign equity participation is normally 40 per cent; exceptions may be considered on merits e.g. in priority industries if the technology is sophisticated and not available in the country or if the venture is largely export-oriented. Companies with direct non-resident investments not exceeding 40 per cent are treated at par with Indian companies for taxation, future expansion, etc.

7. Foreign share capital should be by way of cash without being linked to tied imports of machinery and equipment or to payments for know-how, trade marks, brand names etc.

C. TECHNICAL COLLABORATIONS

8. Technical collaborations are considered on the basis of annual royalty payments, linked with the value of actual production. Percentage of royalty will depend on nature of technology, normally not exceeding 5 per cent for domestic sales. Higher rate of royalty may be considered in exceptional cases or in respect of those ventures which would export a major part of this production or in respect of export sales portion only.

9. Royalty is to be calculated on the basis of net ex-factory sale price of product exclusive of excise duties, minus the cost of the standard bought out components and the landed cost of imported components. If appropriate payment of a fixed amount of royalty per unit of production is preferred. There should be no requirement for payment of a minimum guaranteed royalty regardless of quantum and value of production.

10. Lumpsum payments may be considered in appropriate cases for import of drawings, documentations and other forms of know-how, normally payable in three equal instalments.
    1st : after the agreement is taken on record;
    2nd : on delivery of technical documentation;
    3rd : on commencement of commercial production OR 4 years after the agreement is taken on records, which ever is earlier.

11. Reasonableness of payment considered by taking into account the value of production so that the lump sum payment and recurring royalty (if any) is an acceptable proportion of the value of production. Total lumpsum and royalty payment should not be more than

8 per cent of total expected sales (calculated on ex-factory value basis) over a period not exceeding 10 years (normally period of agreement is 8 years and royalty for 5 years, allowing 3 years for commencement of commercial production).

D. RENEWAL OF COLLABORATION AGREEMENTS

12. Extension of collaboration agreement allowed only when the Government is satisfied that there is a need. It may be considered

(a) if the item of manufacture is sophisticated and extension is necessary to enable Indian party to fully absorb knowhow;

(b) if collaboration is for a large number of items and the Indian party could start manufacturing some of the items only at a later stage;

(c) if the extension would be in the interest of exports. Effort would be made to reduce the rate of royalty payable for the extended period.

E. GUIDELINES FOR ENTREPRENEURS

13. The Government has issued certain guidelines which the entrepreneurs are required to take note of in negotiating proposals for foreign collaborations so as to ensure that such proposals conform to the policies of the Government.

(i) They should, to the fullest extent possible, explore alternative sources of technology, evaluate them from a techno-economic point of view and furnish the reasons for preferring the particular technology and the source of imports;

(ii) The Indian party should be free to sub-licence the technical knowhow/product design/engineering design under the agreement to another Indian Party on terms to be mutually agreed to by all the parties concerned including the foreign collaborator and subject to the approval of the Government;

(iii) The royalty wherever allowed will be calculated on the basis of the net ex-factory sale price of the product exclusive of

excise duties, minus the cost of standard bought out components and the landed cost of the imported components, irrespective of the source of procurement including ocean freight, insurance, customs duties, etc. The payment of royalty at the rate mentioned above will be restricted to annual licensed/registered capacity plus 25% in excess thereof. In case of production in excess of this quantum, prior approval of Government would have to be obtained regarding the terms of payment of royalty in respect of such excess production;

(iv) There should be no requirement for the payment of a minimum guaranteed royalty regardless of the quantum and value of production;

(v) Arrangement or clauses which in any manner bind the Indian party with regard to the procurement of capital goods, components, spares, raw materials, pricing policy, selling arrangements, etc. should be avoided;

(vi) To the fullest extent possible, there should be no restrictions on free export to all countries;

(vii) The use of foreign branch names will not be permitted for internal sales;

(viii) Government do not favour requests for extension to the duration of collaboration agreement. All efforts should, therefore, be made by Indian party to assimilate the technology within the initial duration of the agreement;

(ix) Suitable provision should be made for the training of Indians in the fields of production and management. There should also be adequate arrangements for Research and Development (R&D), engineering design, training of technological personnel and other measures for the absorption, adaptation, and development of the imported technology. Such measures can be undertaken through in-house facilities of the entrepreneur or in collaboration with recognised engineering design, consultancy, R&D organisations in the public or private sectors and recognised scientific and educational institutions, where the necessary facilities exist;

(x) Consultancy services required to execute the project should be obtained from Indian consultancy firms. If foreign

101

is also y, an Indian consu tancy firm should be the prime consultant;

(xi) If the proposed item of manufacture is covered by a patent in India, it should be ensured that the payment of royalty/lump sum payment for the duration of the agreement would also constitute compensation for the use of patent rights till the expiry of the life of the patent and that the Indian party would have the freedom to produce the item, even after the expiry of the collaboration agreement, without any additional payments;

(xii) Collaboration agreement will be subject to Indian Laws.

F. ILLUSTRATIVE LIST OF INDUSTRIES WHERE NO FOREIGN COLLABORATION, FINANCIAL OR TECHNICAL, IS CONSIDERED NECESSARY

1. Metallurgical Industries

Ferrous	:	Ordinary Castings, Bright Bars, Structurals, Welded C I Steel Pipes and Tubes.
Non-Ferrous	:	Antimony, Sodium Metal, Electrical Resistance Heating (Nickel free alloy) Aluminium litho plates.

2. Electrical Equipment

Electric fans, Common domestic appliances, Common types of winding wires and strips, Iron clad switches, AC motors, Cables and Distribution transformers.

3. Electronic Components and Equipments

General purpose transistors & Diodes, Paper, Mica and variable Capacitors, T.V. Receivers, TApe Recorders, Teleprinters, P.A. Systems, REcord Players/Changers.

4. Scientific and Industrial Instruments

Non-specialised types of valves, meters, weighing machinery and mathematical, surveying and drawing instruments.

5. Transportation

Railway wagons, Bicyles.

-02

6. Industrial Machinery

Building and constructional machinery, Oil mill machinery, conventional rice mill machinery, Sugar machinery, Tea Processing machinery, General Purpose machinery.

7. Machine Tools

Forged hand tools, General purpose machine tools.

8. Agricultural Machinery

Tractor Drawal implements, Power tillers, Foodgrain dryers, Agricultural implements.

9. Miscellaneous Mechanical Engineering Industries

10. Commercial Office and House-hold Equipments of Common Use

11. Medical and Surgical Appliances

12. Fertilizers

Single super phosphate, granulated fertilizers.

13. Chemicals (Other than Fertilizers)

Acetic acid: Acetanilide; Ethyl Chloride; Viscose filament yarn/staple fibre; Melathion technical; Sulphate of alumina; Potassium chlorate; Fatty Acid & Glycerine; Butyl Titanate; Warfarin; Silica gel; Lindane; Endosulfan; Phantheate; Nitrofen; Ethyl ether; Plastipeel.

14. Dyestuffs

Benzidine; O-Tolidine; Carbozole Dioxazine Violet pigment; Cadmium sulphide orange.

15. Drugs and Pharmaceuticals

Caffeine (natural); Butazone; Tol Butamide; Paracetamol; Phannacetin; Senna extract; Diasgenin; Clofibrate; 4-Hydroxy cumarin; Xenthopotoxin; Calcium gluconate; Choline chloride; Glyceryl gulacolate; Phenylethyl biguanide hydro-chloride; Scopolamine hydrobromide; Niacinamide; Ortholelyl biguanide; Colchicine; Diazepam; Sorbitol fromdextrose mono-hydrate; Berberine hydrochloride; Balladonna; Acroflavine; Calcium hypophosphite; Chloridiazepoxide.

16. Paper and Pulp including Paper Products

17. Consumer Goods

18. Vegetable Oils and Vanaspati

19. Rubber Industries

Viscose tyre yarn; Metal bonded rubber; Latex foam; Rubberised fabrics; Bicycle tyres and tubes.

20. Leather, Leather Goods and Pickers

Belting-leather; Cotton & hair finished leather; Pickers; Picking bands; Vegetable tanning extracts; Fat liquors other than synthetic.

21. Cement and Gypsum Products

22. Cement and Gypsum Products

Note: The list is illustrative and not exhaustive.
Clarification of details within the broad headings is the responsibility of administrative Ministries.

COMPOSITION AND FUNCTIONS OF VARIOUS APPROVAL AGENCIES

1. SECRETARIAT FOR INDUSTRIAL APPROVALS (SIA)

The main functions of the SIA are :-

- Registration of applications for IL, FC, CG, Composite, Change of Location, COB Licence and applications for Hundred per cent Export-Oriented Undertakings, and applications for import of designs and drawings.
- Issue of Letters of Intent (LI) and Industrial Licences (IL); and issue of disposal letters in respect of all applications.
- Monitoring the progress of implementation of approvals accorded.

APPROVAL COMMITTEES

The following approval committees have been set up to assist the SIA in discharging its functions:

- Project Approval Board.
- Licensing-cum-MRTP Committee.
- Licensing Committee.
- Full Licensing Committee.
- Capital Goods Committee.
- Foreign Investment Board.
- Board of Approvals for 100% Export-Oriented Undertakings.

The SIA functions as the secretariat for the approval committees listed in the above paragraph.

2. PROJECT APPROVAL BOARD (PAB)

CONSTITUTION:

Chairman	(1)	Secretary, Department of Industrial Development, Ministry of Industry, or his nominee.
Members	(2)	Secretary, Department of Company Affairs, or his nominee.
	(3)	Secretary, Planning Commission, or his nominee.

(4) Secretary, Department of Economic Affairs, Ministry of Finance, or his nominee.

(5) Secretary, Ministry of Commerce, or his nominee.

(6) Secretary, Department of Science and Technology, or his nominee.

(7) Secretary, Technical Development, DGTD, or his nominee.

(8) Secretary of the Administrative Ministry, or his nominee.

(9) Development Commissioner, Small SCale Industries, or his nominee.

(10) Director General, Council of Scientific and Industrial Research, or his nominee.

(11) Secretary, Department of Environment, or his nominee.

(12) Secretary, Department of Agriculture, or his nominee.

(13) Joint Secretary in-charge of Secretariat for Industrial Approvals.

FUNCTIONS:

(1) Consideration of composite and simultaneous applications for industrial approvals for FC and /or CG. (Any proposal seeking more than one approval simultaneously is treated as a composite application. Even proposals involving Registration with technical authority seeking FC and CG approvals simulataneously are treated as composite applications).

(2) Review of IL, FC, CG and MRTP applications.

(3) Policy questions affecting a large number of applications.

(4) Overall supervision of other approval committees.

4. FOREIGN INVESTMENT BOARD (F.I.B.)

CONSTITUTION:

Chairman	(1)	Secretary, Deptt. of Economic Affairs.
Members	(2)	Secretary, Deptt. of Industrial Development.
	(3)	Secretary, Technical Development. DGTD
	(4)	Secretary, Deptt. of Petroleum.
	(5)	Secretary, Ministry of Commerce.
	(6)	Secretary, Planning Commission.
	(7)	Secretary, Deptt. of Company Affairs.
	(8)	Secretary, Deptt. of Science and Technology.

206

(9) Director General, Council of Scientific & Industrial Research.

(10) Secretary of the Administrative Ministry.

(11) Joint Secretary in charge of SIA, Deptt. of Industrial Development.

FUNCTIONS:

Consideration of applications for foreign collaboration (foreign investment import of technology).

4. TECHNICAL ORGANISATIONS

The following technical authorities are looking after the various aspects of the industries mentioned against each:

(i)	The Directorate General of Technical Development	Engineering and Chemicals
(ii)	The Iron and Steel Controller	Iron and Steel
(iii)	The Coal Controller	Coal and Coke
(iv)	The Jute Commissioner	Jute
(v)	The TExtile Commissioner	All Textiles

Besides, certain Ministries have their technical wings to render advice, e.g.,

Department of Electronics,

Department of Petroleum,

The Directorate of Sugar,

The Directorate of Vanaspati, Vegetable Oils and Fats.

FUNCTIONS:

The main function of the technical authorities is to render technical advice and guidance in regard to the development of industries under their charge, and raw material and other infrastructural support to be provided to them to ensure a steady rate of growth. The necessary advice is also provided to various offices of the Central Government, Planning Commission, and entrepreneurs in the large, medium and small scale sectors. The Technical Authorities also register undertakings which are outside the scope of licensing under the IDR Act.

207

5. DIRECTORATE GENERAL OF TECHNICAL DEVELOPMENT (DGTD)

The Directorate General of Technical Development (DGTD) is the principal technical advisory agency. The organisation is headed by the Director General of Technical Development, an officer of the rank of Secretary to the Government. Their main responsibility is to advise the local officers of the Chief Controller of Imports and Exports, Department of Customs and other organisations, on import of machinery. They also provide feed back to the Headquarters Office on the activities of the industrial units operating in their regions, particularly on their products, the level of technology, quality upgradation, standardisation, capacity utilisation of those units, development of ancillaries, liberalisation of approach towards private entrepreneurs, streamlining and simplification of procedures.

6. TECHNICAL EVALUATION COMMITTEE (TEC)

A Technical Evaluation Committee (TEC), which has advisory functions, operates under the Chairmanship of Secretary (Technical Development) in the Directorate General of Technical Development, Ministry of Industry.

CONSTITUTION:

(i)	Secretary, Technical Development & DGTD	Chairman
(ii)	Representative of Department of Science & Technology	Member
(iii)	Representative of Department of Science & Technology	Member
(iv)	Representative of National Research Development Corporation	Member
(v)	Representative of DGTD	Member

FUNCTIONS:

The Technical Evaluation Committee examines proposals for foreign collaboration, technical consultancy services, etc., with reference to availability of indigenous know-how, its level of commercialisation, the feasibility of horizontal transfer of indigenous technology, the need for inducting foreign technology for the manufacture of the proposed item, the terms of payment involved, the competence of the proposed foreign

collaborator, details of services rendered by them to the Indian Company, the set-up of the Indian company intending to receive and absorb the imported technology with the help of the R&D facilities that are expected to be provided along with the project etc.

The necessary technical advice is given to the Foreign Investment Board, the Project Approval Board and the Board of Approvals for Hundred percent Export-Oriented Undertakings, as well as to the Administrative Ministries dealing with foreign collaboration cases under the delegated powers.

209

PROCEDURE FOR APPROVAL OF FOREIGN COLLABORATIONS

1. All proposals for foreign investment and technical collaboration require Government approval. The Foreign Investment Board (FIB) headed by the Secretary, Department of Economic Affairs with representatives of other concerned Ministries or departments as members, considers all such applications and makes recommendations to the Government. The Board takes into account the need for foreign technology, appropriateness of the technology sought to be imported and the terms of the Collaboration.

2. All applications for foreign collaboration are received by the Secretariat for Industrial Approvals (SIA). They are processed and placed before the FIB for consideration. The SIA, before placing the application before the FIB, obtains the comments from the concerned administrative Ministry, the Directorate General of TEchnical Development (DGTD), the Council of Scientific and Industrial Research (CSIR) and other concerned organisations in the Government so that the FIB could have sufficient information to take a decision. The FIB itself is composed of very senior officers of various Ministries and thus the Board can make a thorough examination of the investment on collaborations proposed. While taking decisions the Board would consider all aspects of the case in the light of the various policy objectives of the Government. If the information supplied by the applicant for collaboration is insufficient, the applicant might be requested to furnish further information as early as possible. If considered necessary, the Board may also give opportunity to applicants to explain and convince the Board of their case.

3. Entrepreneurs desirous of setting up an industry with foreign collaboration have first to obtain a letter of intent from the Secretariat for Industrial Approvals (Foreign Collaboration Unit), Department of Industrial Development, Government of India if the item of manufacture pertains to a scheduled industry and the undertaking is not exempt from licensing under the current licensing policy of the Government. An application for a letter of intent can be made by a person or a company, Indian or foreign. The letter of intent enables entrepreneurs to ascertain within a reasonable period of time, the conditions under which the Government might be willing to grant an

Industrial licence. A letter of intent is a commitment on the part of the Government that a licence will be issued after the applicant fulfils the requirements regarding foreign collaboration, arrangement for the import of capital goods, issue of capital and phased manufacturing programmes. Other conditions may also be stipulated depending on the nature of individual cases. Letters of intent are normally valid for a period of twelve months. However, in certain cases, depending upon the nature of the industrial project, the Government might even extend the validity period.

4. Applications for foreign collaboration should also be submitted to the Secretariat for Industrial Approvals (Foreign Collaboration Unit). Department of Industrial Development Udyog Bhawan, New Delhi in the prescribed form. Information required to be furnished includes particulars of applicant/ company which will implement the project, particulars of line of manufacture, capital cost and import content, and details of foreign collaboration.

5. The approvals given for foreign collaboration are valid for a period of six months from the date of issue. In case the terms of collaboration approved by Government are acceptable to the Indian party, an intimation in this regard has to be sent by him to the concerned administrative Ministry. The Indian party can then execute the collaboration agreement with the collaborator which should be strictly in accordance with the terms approved by the Government. The agreement executed, signed by both the collaborating parties, is required to be furnished to the Ministry, which would scrutinise the same and, if found to be in accordance with the terms specifically approved by the Government, would be taken on record and an intimation sent to the party. A copy of the agreement is then transmitted to the Reserve Bank of India through the Ministry of Finance (Department of Economic Affairs) on the basis of which remittances to the foreign collaborator are authorised by the Reserve Bank of India. Representations against the terms and conditions of collaboration approved by the Government can be made to the Secretariat for Industrial Approvals. The secretariat would send the representation to the administrative Ministry/Department concerned with the item of manufacture who will deal with such representations and take appropriate action.

211

Composite Applications

6. Entrepreneurs may submit composite applications for a letter of intent as well as for foreign collaboration. In such a case, it is the intention of Government to give a simultaneous disposal to both the applications. Application for capital goods clearance, if required, must also be obtained before the letter of intent can be converted into an industrial licence. An application for an industrial licence, accompanied by a corresponding application/notice under the Monopolies and Restrictive Trade Practices Act(where required) can be made either at the same time as the application for foreign collaboration approval and capital goods clearance, or subsequent to obtaining these clearances. Please note that an application for an industrial licence must be made and a letter of intent obtained before raising any capital, before undertaking any construction, and before placing orders for plant and machinery required by the undertaking.

7. With a view to streamlining and expediting theprocedures for securing approvals relating to foreign collaboration proposals, the Government has delegated powers to the Administrative Ministries to accord approvals for foreign collaborations in cases of the type specified. In such cases the SIA will forward the applications to the Administrative Ministries for disposal.

DELEGATION OF POWERS TO ADMINISTRATIVE MINISTRIES FOR SANCTIONING FOREIGN COLLABORATION PROPOSALS

With a view to streamline and expedite the procedures for securing approvals relating to foreign collaboration proposals, Government has delegated powers to the Administrative Ministries to accord approvals for foreign collaboration proposals in the types of cases mentioned below:

1. Where there is no foreign equity participation in the proposal.

2. The applicant is not a company with existing foreign equity investment.

3. The item proposed to be manufactured is consistent with the priorities set out in the Industrial Policy Statement.

4. The proposal is not one envisaging extension of the period of collaboration approved earlier.

5. The royalty payable is not more than 5% (taxable) and will be comprised within the period of agreement which may extend to 10 years. The total lumpsum and royalty payments should not be more than8% of total expected sales (calculated on an ex-factory value basis) over a period not exceeding 10 years. The above would be treated as upper ceilings and the rate of royalty, the amount of lumpsum and the period of the ~~rate of royalty, the amount of lumpsum and the period of the~~ agreement in respect of individual cases would be decided by the Administrative Ministries on a case to case basis, taking into account all relevant factors. It is desirable that normally the period of agreement should be for eight years and royalty for five years allowing three years for commencement of commercial production.

6. Lumpsum payments, if any, are paid in three standard instalments, the first instalment to be paid after the agreement is taken on record, the second instalment on delivery of technical documentations and the third and last instalment to be paid on the

213

commencement of commercial production of four years after the agreement is taken on record, whichever is earlier. If the Indian party so desires, the lumpsum amount sanctioned could be net of Indian taxes with taxes being borne by the Indian party.

7. The foreign exchange outgo in each case on lumpsum payments, if any, and royalty together does not exceed Rs.50 lakhs in the aggregate.

8. Excessive outgo on royalty and/ or lumpsum would not be permitted.

214

APPENDIX V11

Assessment of Interest of U.S.
Private Enterprise in the PACT

Report for USAID/India
By
Development Associates Inc.
April, 1985

APPENDIX VIII

Assessment of Interest of U.S. Private Enterprise in the PACT

Report for USAID/India

by

Development Associates Inc.

April, 1985

TABLE OF CONTENTS

	Page
EXECUTIVE SUMMARY	iii
A. Introduction	1
B. Methodology	2
C. Findings	4
1. Telephone Survey Interview	4
Question #1 Business Firms in India	6
Question #2 Willing to Participate in Project	6
Question #3 Incentives	9
Question #4 Additional Incentives	13
Question #5 U.S. Promotion	15
2. Conference Summary	18

APPENDICES

A. Survey Questionnaire

B. List of Survey Firms

C. List of Participants

D. Results of Survey Analysis

2788B

EXECUTIVE SUMMARY

This study was designed to provide AID and the USAID mission in India with information to complete the project paper on the Fund for Technology Development Project (FTD).

The specific purpose of the project is to promote joint R&D ventures between American and Indian firms for the development of new commercial products or processes in order to "accelerate the pace and quality of commercially relevant technological innovation in India."

The Indian business community has responded enthusiastically to the project but the level of interest by American firms in the project was not known. The objective of this study, therefore, was to determine whether adequate incentives exist to attract participation by the U.S. business community. In order to carry out this study, Development Associates conducted a national telephone survey and organized a one day conference to discuss the results of the survey and obtain other information which may be relevant to incorporate into the project. Below is a brief discussion of the telephone survey and the one day conference.

Telephone Survey

Telephone survey questionnaires were completed on 125 U.S. firms which are currently doing business in India or have done business there recently.

Respondents were asked whether they would consider joint ventures with Indian firms for bringing new products or processes into the marketplace within 2 to 3 years. Of those interviewed 43% replied they would be willing to consider such joint ventures.

However, of those persons declining to consider, approximately 70% indicated that they were not basing their decision on the merits or potential of the project; rather, they indicated for a number of reasons that it was not applicable to current business operations or investment policy. Thus, if these responses are

discounted because of the lack of options to consider joint ventures, then approximately 70% of those interviewed who possessed the options to judge the merits of the project, responded favorably. There is obviously considerable interest in the project across a wide range of the U.S. business community.

Respondents were also asked to comment on the project's incentives to attract U.S. firms to joint R&D ventures. Clearly, the major incentives expressed by 52% of those surveyed was access to new Indian markets. Other incentives such as (1) access to India's scientific expertise,(2) dollar risk capital loans,and (3) partial debt forgiveness were considered major incentives by less than 1/3 of those surveyed, although capital loans was a major incentive to more smaller firms than large ones. However, a key point here is that the provisions of the loan agreements will undoubtedly play a significant role in how much of an incentive this would be to both small and large firms alike.

One Day Conference

Mr. Orville L. Freeman, Chairman of the India-U.S. Business Council, opened the conference with a report on the business climate in India today and was very enthusiastic that the Indian Government is taking major steps to encourage foreign business investment and is shifting from a protectionist to a freer, consumer oriented market. India is changing its policy and opening up the country to more competition. He challenged the U.S. counterparts in both business and government to take advantage of the current and potential opportunities. Following Mr. Freeman's introductory remarks, a presentation was made on the AID project and the Bird Foundation which serves as a model for the Fund for Technology Development Project. Concluding these morning discussions was a presentation on the results of the telephone survey indicating a high level of interest in the project by American firms.

The afternoon session focused intently on the actual mechanism of the Fund and in particular on the subject of risk capital loans, how they should be managed, and whether the Fund should be financed by a loan or some sort of grant, (or other alternatives) and the recovery by the Fund of the loan/investment from successful ventures.

There were some suggestions that The Bird Foundation model needs to be carefully examined in terms of its guidebook on criteria for loans, recovery of monies by a certain percentage on the sales proceeds rather than profits because the latter is more difficult to identify, and making the joint ventures actual "joint risks" between the business partners and the Fund rather than requiring a certain percent of loans to be repaid should ventures fail. There was great interest in how the fund would be organized and managed including the lending and recovery procedures. In addition, there was a discussion on how the project should be promoted in the U.S. and the relationship between U.S. promotional efforts and the Fund's operating and management responsibilities in India. What appears to be essential is to define precisely the responsibilities of the "Project Staff" in India and the U.S. promotional efforts so that no incidental conflict of purpose occurs and that misunderstandings and ambiguities with regard to the application and approval process for R&D joint ventures are scrupulously avoided.

Many constructive suggestions were offered in the conference discussions and the concensus of participants was that the Fund for Technology Development Project is a very sound, good idea which holds considerable promise and potential for U.S.-India business in technological innovation.

2760B

A. INTRODUCTION

This project was carried out under an AID work order under Contract No. PDC-0000-I-21-3077-00, technology survey and conference, "Project Development and Support, Fund for Technology Development." The objective of the contract was to assist USAID/India to develop the project paper for the Fund for Technology Development Project. The basic feasibility issue to be examined is whether adequate incentives exist to attract participation in the project by U.S. firms. Apparently, there is a great deal of interest and enthusiasm on the part of Indian business firms in the Fund for Technology Development Project.

The specific purpose of this contract was:(1) to conduct a telephone survey of the U.S. business community to ascertain whether and to what degree there was any interest on the part of U.S. firms in conducting joint R&D ventures with Indian firms for new products and processes;(2) to organize a one day conference to discuss the results of the survey and acquire input of the U.S. business community in the design of the project.

The Fund for Technology Development Project (FTD) is designed to "accelerate the pace and quality of commercially relevant technological innovation in India by promoting joint R&D ventures between Indian and American firms with complementary resources and objectives" The Indian business community has responded enthusiastically to the proposed project but there was some concern that American firms would not be as eager to participate. Thus, this contract was to survey the American business community in order to gauge the level of interest in the project and to identify further incentives to attract U.S.-Indian joint R&D ventures.

One of the key AID incentives to attract U.S. firms is to make available risk capital to India/U.S. firms who undertake a joint venture in R&D. AID proposes to provide loan funds with a 40-50% debt forgiveness provision should a joint venture sponsored under the Fund for Technology Development Project fail.

AID also felt that two other incentives would attract the American business community. One was that this project would provide American firms with access to India's large pool of scientific expertise. The other was gaining access to India's mass markets through collaboration with an Indian firm.

B. METHODOLOGY

Development Associates designed a two part study to meet the objectives of this study. The first consisted of a telephone survey to a select number of U.S. firms which are doing business in India or which had done business there previously. However, an attempt was made to identify active firms who are currently engaged in some business operations in India. The second part of the study was to convene a one day conference to discuss the results of the survey and to elicit input from the U.S. business community and others on the design of the FTD project. Below is a brief description of the study methodology.

1. Telephone Survey

A telephone survey guide was developed in order to conduct telephone interviews with representatives of the U.S. business community. The guide consisted of instructions to the interviewer describing in general terms the Fund for Technology Development Project as an important bi-national effort between the U.S. and Indian governments. The guide included five basic questions to ascertain whether in fact the firm contacted was currently doing business in India and an attempt was made to find out if there was any interest or plans to do business there in the future. Two other remaining questions explored potential interest in undertaking joint R&D ventures in India and attitudes toward incentives for considering such joint ventures. The last question focused on promoting the Fund for Technology Development in the United States. A copy of the telephone survey guide is found in Appendix A.

List of U.S. Business Firms Surveyed

The major source for identifying the U.S. firms to survey was the U.S. Business Directory for India published periodically by the commercial section of the American Embassy in New Delhi, India. From this directory, a preliminary list of U.S. firms was drawn up and categorized by type of business. This list was augmented by a supplementary list from other published sources on U.S. business

in India. All the firms on the preliminary list represented well known American companies with R&D capacity and operations. The supplemental list contained well known established companies but also included smaller and less well known firms doing business in India. In addition to these lists (attached as Appendix B), further names were obtained througn sources at AID, the Department of Commerce and the India-U.S. Business Council of the Chamber of Commerce of the United States.

2. <u>One Day Conference</u>

After the telephone survey was completed, a one day conference was held to discuss the survey results and to explore areas in which the Fund for Technology Development Project could provide optimum benefits to both U.S. and Indian firms. In addition, discussions focused on (1) the operational components and ways in which the project might be most effectively promoted in the U.S., (2) under what organizational rubric it might best function, and (3) specific relationship and interaction with the Indian counterparts and the Fund itself.

The conference was jointly sponsored by AID and the India-U.S. Business Council of the Chamber of Commerce of the United States. Persons invited to the conference included representatives of the U.S. business community, U.S. Government Agencies including AID and the Department of Commerce and other organizations concerned with business ventures and R&D between U.S. and Indian firms.

In summary, the methodology proposed for this study consisted of a national telephone survey of selected U.S. business firms doing business in India, followed by a one day conference participated in by representatives of the business community and other organizations in addition to government officials, and Development Associates staff.

C. FINDINGS

The findings of this study will be divided into two basic areas: one dealing with the telephone survey and the other a summary of the conference proceedings. Each of these areas are discussed next in sequence.

1. Telephone Survey Interview

Using the lists discussed earlier, Development Associates called over 150 U.S. business firms to ascertain their interest in undertaking joint R&D ventures with Indian firms. A survey questionnaire was completed on 125 U.S. companies. Out of this total 53 or approximately 43% responded they would be willing to consider joint ventures in India for new products and processes. This proves to be an extraordinary survey response for a number of reasons which will be briefly discussed.

First, none of the company respondents had any advance notice of the survey and more importantly had no knowledge of AID's Fund for Technology Development Project. Thus, the interview began with a subject entirely unknown to the respondents for whom an introduction and explanation of AID's project was required in order to elicit any meaningful responses. Second, although the project was conceptually sound (based on the successful Bird Foundation model) with clearly apprehended objectives, many of the operational details remained to be finalized. For these reasons, the explanation of the project was confined to broader conceptual issues and the interviews and discussions moved on more of an idealogical plane. In other words, the interviewers were not promoting a tangible product like investment securities or a stock prospectus but essentially an idea or concept with which representatives could relate to through experience.

In spite of these inherent difficulties, there was a positive response to the AID project. As an example, interviews on several occasions lasted over 30 minutes and this included firms which were willing to consider joint ventures as well as those which were not willing to consider the project. The key point here is that a good many of the firms which were doing business in India were

eager and willing to discuss their general experiences and to provide comments on how to strengthen the U.S. Indian business relationships. A chord of interest was clearly struck.

However, it should be noted that mixed in with this willingness to discuss the project were frequent comments on some of the difficulties of doing business in India. The most common observations were bureaucratic delays, patent laws, licensing procedures and restrictions on fees, royalities and profits. In addition, import duties on some necessary equipment were considered excessive (i.e., 150% duty on computers).

Most comments were directed at changing policy and it would seem clear that relaxing government restrictions and taking steps to encourage foreign investments would make the project more viable since India is viewed as having considerable potential for business.

However, these observations should be tempered by the fact that U.S./India negotiations are currently in progress to effect many of the proposed changes voiced by the respondents, and the new Indian leadership is viewed by some of those interviewed as creating "better atmosphere and positive feedback to resolve problems of red tape and restrictions." Also, of some note is the recent successfully concluded negotiations between American and Indian delegations to facilitate the export of American high technology products to India (India Abroad, March 15, 1985). Thus, retrospectively the climate and conditions of doing business in India would seem to be of major concern to many of the survey respondents; however, prospectively the changes that are taking place with regard to those expressed concerns will provide increased opportunity for U.S. business investments and an optimistic climate.

Survey Results

The survey questions provided a broad range of responses from those interviewed and in order to put the study in some perspective it will be useful to discuss each of the relevant survey questions in terms of both their quantitative and qualitative aspects. Below is a description of the interview questions and responses.

Question #1

"Are you currently doing business in India"?
Yes ☐

No ☐

If yes, can you please generally describe.

_____

_____

Of 125 firms surveyed, 84% are currently doing business in India. Those no longer doing business there gave a variety of reasons ranging from non-profitability of the enterprise, difficulty in transferring technology to simply no longer a market strategy. Those firms doing business in India ranged from joint ventures, licensing only, equity only, service and trade to some R&D. Most of the firms, however, were engaged in a licensing agreement with some joint ventures.

Question #2

"Would your firm be willing to consider undertaking joint ventures in India with Indian firms in commercial research and development with the objective of bringing products or processes in the marketplace within 2 or 3 years?

Yes ☐

No ☐

If no, are there any factors involving the process and environment of doing business in India which mainly affected your decision?

Yes ☐

Please Describe_____

_____

Approximately 43% of the respondents indicated they would be willing to undertake joint R&D ventures with Indian firms. While it is difficult to identify which category to classify these firms because many of them are multi-nationals engaged in a number of activities, most appeared to represent

equally the following categories: (1) industrial machinery and equipment;(2) chemicals, drugs and pharmaceuticals; (3) electronic parts and components. The remaining firms represented telecommunications/computers, machine tools and other categories. Below is an exhibit displaying firms by business category. However, no meaningful conclusions should be drawn from this as the survey was limited; and with respect to the Fund for Technology Development, there is an infinity of potential R&D areas for new products or processes by large, mid-level and small industries.

Those firms which were not willing to undertake joint R&D ventures with Indian firms (53%) declined for a number of reasons, many of which had nothing to do with their perceptions on the merits concerning the AID project. (Also, 4% of the firms did not respond, i.e., they deferred or could not answer.)

EXHIBIT-1

DISTRIBUTION BY BUSINESS
CATEGORY OF FIRMS WILLING
TO CONSIDER JOINT R&D VENTURES

Category	Percent Total
1. Drugs/Chemicals	23%
2. Capital Equipment/Heavy Machinery/Industry	21%
3. Electric/Electronics	19%
4. Telecommunications/Computers	14%
5. Machine Tools	7%
6. Other Automotive Agricultural Equipment Engineering Coal/Mineral Other	16%
Total	100%

Top Three of Total	
Drugs/Chemicals Equipment Electrical/Electronics	63%

For example, it is a policy for many firms that all R&D is done in the U.S. and no consideration would be given to undertaking such joint ventures in any foreign country. Other firms indicated that R&D was simply not applicable to their business activity in India or that they had no interest in expanding their operations. Other firms, most of which had licensing agreements with Indian firms, were precluded by virtue of their agreements from further involvement, or they did not want a dual role in India. Approximately 69% of the survey respondents gave the aforementioned reasons for not considering joint R&D ventures. The remaining firms or approximately 31% declined primarily because of their dissatisfaction of doing business in India, specifically with regard to red tape, bureaucracy and licensing restrictions. Thus, 7 out of 10 firms who declined participation did so for matters which were neutral to the Fund for Technology Development Project. This would appear to strongly reinforce the positive 43% response of firms willing to consider R&D joint ventures. Moreover, one might reasonably discount these firms from the sample in view of the fact that they were predisposed by certain characteristics to respond in only one way and possessed no options for consideration. The other firms who declined for negative reasons (i.e., red tape) presumably had options to exercise based on the merits of the project and the potential for doing business in India.

If we recast the responses to interpret the results of the survey based on whether a firm judged the merits of the project, then approximately 70% of the survey responses indicated a positive consideration of joint R&D ventures:

# of firms surveyed	125
# willing to consider R&D	53
# not willing to consider R&D	72
Of the 72 firms, 69% or approximately 50 declined for neutral reasons	50

Thus, discount 50 firms from 125 for a representative sample of 75; 53 out of 75 is approximately 70% willing to consider joint R&D based on the merits of the project and provided they possessed the option.

Regardless of the percentages derived from the survey, there is obviously substantial interest by U.S. firms in the project and in doing business in India.

Question # 3

"In your consideration of undertaking joint R&D ventures in India, how much of an incentive would each of the following be? (1) major incentive (2) moderate incentive (3) minor incentive.

Now, how much of an incentive would be:

a. Gaining access to India's vast pool of scientific expertise? _____

b. Having the opportunity to explore new markets in India through collaborative efforts with Indian firms? _____

c. Obtaining dollar risk capital loans? _____

d. Obtaining partial debt forgiveness for failed R&D projects? _____

A second key focus of this study was to ascertain whether U.S. business will be attracted by the incentives provided in the proposed FTD project. For those respondents who indicated they would be willing to consider R&D joint ventures, the above question was posed, explaining each of the incentives and requesting comments.

Statistically, with the exception of incentive b, opportunity to explore new markets, the responses were generally not significant. Most firms responded based on their own individual needs, resources and investment policy which was differentiated not by size or product of the firms but by their unique circumstances and attendant charcteristics. For example, most of the incentives were fairly evenly split between whether they constituted a major, moderate or minor one, although more firms considered all of the incentives except one as

minor (i.e., approximately 40% of the firms thought that incentives a, c and d were minor). The remaining 60% of the firms split almost down the middle on whether they thought those incentives were major or moderate.

The one exception, as indicated earlier, was incentive b (access to new markets) which 52%, or a majority, thought was a major incentive. It seems clear that outside of gaining access to new markets, what is a major, moderate or minor incentive is not very significant for the group as a whole but becomes so depending on each firm's requirements and needs.

We can further define the significance of these incentives by dichotomizing the results so that the responses are combined for looking at the distinction between major incentives and moderate to minor incentives. This may more graphically illustrate the relative degree to which the incentives attract the U.S. business community represented in the survey. Exhibit 2 shows the combined results.

EXHIBIT 2

COMBINED SUMMARY

	Major	Mod-Minor
a.	32%	68%
b.	52%	48%
c.	29%	71%
d.	27%	73%

Thus, approximately 1/3 of the firms thought incentives a, c, and d were major, while approximately 2/3 thought they were moderate to minor. While these figures can provide an overall quantitative analysis of the incentives, it might be useful to discuss in more detail some of the comments in an anecdotal fashion. Below is a brief description of the four incentives.

a. Gaining Access to India's Vast Pool of Scientific Expertise

Most survey respondents recognized India's highly trained pool of professional scientists and this incentive scored second (32%) as a major attraction for U.S. business. Some comments indicated that India has excellent theoretical scientists but lacked practical application. This observation was of course relevant only to the particular kinds of research U.S. firms were engaged in and for which trained scientists were experienced and available. On the other hand, Indian scientists said to have done very well in computer programming and software, semi-conducted design circuits, system design and telecommunications; but there is a weakness in manufacturing infrastructure.

A reasonable assumption that Indian scientists are perceived as more theoretical than practical is the absence of more opportunity to apply science to technology in some fields. However, the exporting of Indian scientists to firms in the U.S., Europe and other parts of the world is convincing evidence that, overall, Indian scientific expertise is a valuable commodity notwithstanding a more theoretical than practical background.

There is a corollary to this available Indian scientific expertise which probably has significant implications for the eventual translation of R&D into commercially manufactured products as well as developing a trained, technology labor force. Certain firms expressed opinions that more vocational and practical training is needed in order to develop a technology infrastructure to support markets and R&D. While this may be applicable, depending on the technology, a spin off of the Fund for Technology Development, over and above the creation of an Indian R&D capability, is the trained technicians needed to support markets, technology development and research. Thus, the project has implications for human resource development, education and vocational training as well.

b. Having the Opportunity to Explore New Markets in India Through Collaborative R&D Efforts with Indian Firms

This was a major incentive for the majority of firms responding to the survey question. Over 52% replied that gaining access to new markets through Indian firms was a key attraction to the proposed project. However, there were some caveats expressed regarding the ability to take advantage of those new markets. There were some concerns that less government protection of markets was a key factor to attracting more foreign investment and that India should lessen or remove protectionist barriers. A few comments were "Less government restrictions and a freer market is a must" -- "Assurances are needed from being excluded from markets" --." Open up Indian markets with less government protectionism ..."

However, India and the subcontinent were viewed by some firms as "an important potential market" and this attraction was obviously the overriding one in terms of the project incentives.

c. Obtaining Dollar Risk Capital Loans

This incentive was rated a major one by 29% of the survey respondents and 39% indicated it was minor. There seemed to be no pattern to the category of respondents in terms of being a large well known giant in its field or a lesser known relatively smaller firm. Some large firms thought it would be a major incentive as did some smaller firms although overall, there were more large firms which considered risk loans a minor incentive. Part of the explanation may be due to the R&D budgets which are set aside in major manufacturing/industrial firms which can be tax deductible. Nevertheless, in terms of the project incentives for medium to small sized firms in R&D, dollar risk capital loans would undoubtedly be a key consideration and attraction in undertaking joint R&D ventures. However, much will depend on the conditions and terms of the loan and how it is managed.

d. Obtaining Partial Debt Forgiveness for Failed R&D Projects

Although statistically not significant, this incentive was rated a major one by the lowest percentage of firms (27%); however, as respondents could not be advised in more detail it was difficult for them to understand anything more than the general idea. In addition, some psychological aspects of this incentive may have conditioned responses, since it has essentially a negative connotation which most persons, although willing to accept the incentive, may not want to admit to it as a major incentive for possible failure. Moreover, as in three of the other incentives, the split between major, moderate and minor is not all that statistically significant. That is, it might be reasonably assumed that this incentive would be a key aspect of any actual negotiation of R&D firms depending on their relative finanial conditions and investments.

Question #4

"What additional incentives do you believe are either necessary or desirable in order to conduct joint R&D efforts with Indian firms?"

Most of the comments regarding additional incentives related to the difficulties which the firms experienced in doing business in India. Virtually all respondents indicated that reducing red tape and bureaucratic structures would be an incentive for further investment.

Indeed, comments on removing the bureaucratic entanglements was a priority, as many firms stated it is very difficult doing business in India because of the Indian Government's disposition on foreign activities including changing tax rates and improving royalties, fees and profits. Also, of considerable concern was the restrictions on licensing, its duration and the ability of the firm to market after expiration of certain licenses. A pivotal incentive was protection of technology and intellectual property regarding joint R&D ventures.

In order to clarify and classify the additional incentives suggested by survey respondents, a list of those commonly expressed is presented below in Exhibit 3.

EXHIBIT 3

OTHER INCENTIVES FOR INDUCING U.S BUSINESS VENTURES IN INDIA AND WITH INDIAN FIRMS

- Ensure adequate protective tariffs on U.S. products developed in India.
- Reduce tax rates and tax forgiveness (tax rates not attractive for business).
- Easier credit terms from Indian banks.
- Guarantee free and open access to Indian markets (Protectionism).
- Protection of patents and respect for intellectual property.
- Relax U.S. Department of Commerce policy on export of technology.
- Repatriation of profits and taxing only Indian businesses and not U.S.
- Guarantee that once a product is developed, U.S. firm would be able to register it properly and obtain a production license.
- Ease U.S. Department of Commerce procedures for obtaining export licenses.
- Ease Indian foreign exchange controls -- process is lengthy and time consuming.
- Need official assurances of fair dealing between U.S.-India Firms.
- India Government pricing policies need to be improved.
- Revise licensing restrictions to extend time period (up to 15 years).
- Change Indian Governments import restrictions for import relief (i.e., currently there is 150% duty on computer equipment).
- Access to more vocationally trained personnel at practical levels of technology -- many of Indian scientists very good but more theoretically oriented than applied.

In summary, the concensus is that the Indian Government and the private sector should work to ease government restrictions on doing business in India, reduce bureaucratic barriers to getting things done, and to take steps to protect patents and new research for proper registration and marketing/distribution.

However, several interviewees suggested that other incentives would be directly related to U.S. policy and government procedures and processes which delay export licenses as well as what kinds of technology U.S. firms would be allowed

to bring to India for R&D. In one case a firm reported losing a multi-billion dollar contract to a foreign firm because of U.S. delays in the review process and restrictions. Thus, the process for creating viable incentives for R&D seems to be a genuine bi-national issue which, as indicated earlier, is making important progress. Indeed, several firms reported that under India's new leadership "favorable things are happening." And it appears that major changes on a number of fronts are being formulated, promoted and implemented through such organizations as the India-U.S. Business Council as one example.

Other incentives were discussed during the one-day conference but these were directly related to the project as opposed to the foregoing discussion in which U.S. firms responded to across the board issues for improving business and R&D joint ventures in India. The specfic incentives discussed during the conference focused on terms and conditions of risk capital loans, payback provisions and alternatives to debt-forgiveness for failed projects. However, these will be covered in more detail in subsection 2, which discusses the conference proceedings and outcomes.

Question #5

> "If the United States did undertake a Project to provide some capital and assistance to joint U.S.-Indian ventures, in what ways do you feel the project should be promoted in the U.S.?"

This question was interpreted by all of the respondents as to what procedures and through what mechanisms can the project be brought to the attention of the U.S. business community. Only peripherally, in some cases, did comments include suggestions relative to the organizational and staffing components of the promotional effort. These suggestions included conducting national telephone surveys and promotions similar to this study, using national networks such as the U.S. Chamber of Commerce, and direct mailings such as the marketing list sent out by the Department of Commerce.

Following is a list of other suggestions which respondents felt would be effective ways to promote the project:

- Ads and articles in professional journals.

- Brochures/mass mailings.
- President Reagan and the Prime Minister Rajiv Gandhi should issue a joint initial statement.
- Utilize local and state chambers of commerce as a networking mechanism.
- Trade shows.
- Direct mail campaign.
- Through the network of U.S.-India Business Council.
- U.S. Chamber and AID should "kick off" the promotional effort.
- U.S. should push the payback potential.
- Image is a problem; improve it best through organizations and not governments.
- Conduct international promotion through state chambers of commerce.
- Use Indian organizations in U.S.
- Hire a lobbyist in Washington, D.C.
- Use Trade Associations for each industry as a conduit.*
- Stress relative advantage of Indian labor costs and production.
- Seminars (Periodically).
- Trade fairs.

Obviously, the above comments and suggestions represent a thoughtful and serious consideration of interest on the part of respondents. Most comments can be considered as realistic and effective strategies to promote the Fund for Technology Development Project.

Since the two essential objectives of promotion are to (1) reach the right or intended audience and (2) deliver a relevant message of appeal, the suggestions noted above would in many ways achieve those objectives. Also, it would not be unlikely that all of the suggestions could be part of a continuous promotional effort using the different strategies as part of an integrated promotion plan.

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* Note: Trade Associations were the most frequently mentioned.

Certainly, the use of trade associations as a means of reaching U.S. companies who might have an interest in joint R&D ventures with Indian firms is one sound approach for promoting the project from a public affairs perspective. Many of the comments reflected the positive use of such associations in alerting certain segments of U.S. industry to the project. However, it seems clear that a number of promotional activities would be effective depending on the timing and scheduling to meet appropriate goals and objectives of the project. Whatever mechanisms and strategies may be devised for promotion, however, the networking mechanism of the India-U.S. Business Council, Chamber of Commerce of the United States should be involved as part of the promotional efforts.

This concludes our discussion of the results of the survey analysis. In the next section we provide a summary of the one day conference.

2. Conference Summary

The conference, convened and chaired by Orville Freeman and attended by 25 persons*, was held at the U.S. Chamber of Commerce, Washington, D.C., March 19, 1985, to obtain comments from selected representatives of U.S. industry to the proposed India-U.S. Fund for Technology Development Project (FTD). It was believed that the discussion would provide useful insights into the perceptions of U.S. industry concerning the likelihood that such a funding mechanism would encourage Indo-U.S. collaborative efforts in R&D by private firms. It was also hoped that the discussion would provide guidance with respect to the alternative terms, conditions and incentives which might be offered by the FTD that are likely to cause the most positive (or cost-effective) response from industry towards the project's goals.

The morning session was devoted to five presentations. Mr. Freeman reviewed the Indian investment climate in terms of recent political events, concluding that, in his view, based on his recent travels to India, there was considerable cause for optimism. David Goldman, speaking for Assistant Secretary Bruce Merrifield, Department of Commerce, described the functioning of the "Israel-US Bird Foundation," now in its seventh year, and which is a prototype for the proposed FTD.

Mr. Edgar Harrell explained the concept of the proposed FTD, and the economic development objectives which it is intended to serve in facilitating R&D efforts among Indian private firms.

Mr. Peter Thormann provided a description of the specifics of the proposed FTD, the background and status of the negotiations to date with the government of India and the Industrial Credit and Investment Company of India (ICICI), and the relationship of the project to the USAID Mission's strategy of assistance to India.

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* See Appendix C for list of participants

Mr. Robert Haupt presented the results of the survey, conducted by Development Associates, to determine the degree of interest among US private companies in availing themselves of the facilities to be offered by the proposed FTD.

The afternoon session was devoted to a discussion of the FTD by the invited industry participants. The discussion centered around four issues:

a. Grant vs. Loan of USAID Funds

Negotiations to date between the USAID project design team, the GOI and the ICICI had been predicated on the assumption that the $10 million fund would be made available as a concessional loan (2-3% interest, 40 year repayment) to ICICI, and that ICICI would have to assume the full repayment obligation and would administer these funds for its own account and risk. ICICI had therefore taken the position that it would have to manage the Fund in accordance with its established internal loan approval criteria and procedures, to take full responsibility for preservation of the loan principal. Since the proposed FTD would have an important "venture capital" aspect to its operation, some concern was expressed that ICICI would tend to be more conservative in its lending practices than is required to serve the project purposes.

The possibility was raised of providing the funds to ICICI as a grant to overcome this problem. It was pointed out that such a change in AID's project terms would radically change the ground rules that underlay all previous negotiations with ICICI and GOI; such a change would probably reduce or eliminate ICICI's resistance to external private sector involvement in the loan development and approval process.

It is clear that ICICI would be more inclined to manage the FTD in accordance with the "venture capital" concept and spirit of the project, if it were not burdened with the obligation to repay the funds to the U.S. Government. Removing ICICI's risk of loss of principal is therefore desirable, at least during the 1st round of funding until the project's viability can be demonstrated to ICICI. It does not necessarily follow,

however, that a "grant" of funds to ICICI is the only, or even an effective alternative to achieve this. A grant of funds to ICICI might induce ICICI to take as much of a proprietary interest in the funds as a loan. Once the grant is added to ICICI's asset listing, it might be as reluctant to risk loss as it would if it had a repayment obligation. On the other hand, if ICICI were administering the funds for another organization's risk and account, and were paid for its services with a fee, it might be free to manage the funds purely on a professional basis with more of a joint venture R&D mentality.

It is recognized that AID normally provides funding on only two bases: loan and grant. And yet, US interests might be best be served, in the case of the FTD, for some modification in AID's standard terms. It would seem preferable for the US Government to assume the risk of "on-lending," and to allow for forgiveness of principal in case of loss, without actually "granting" the funds to ICICI.

b. Collateralization of Loans

The proposed loan terms, as developed with ICICI, call for 70% of the actual R&D costs to be eligible for financing by the FTD. Of that amount, one half (35%) would be covered by a foregiveness provision in event of failure; the other half, plus interest, would be repayable to the Fund even in the event of failure.

The discussion indicated that such an arrangement would make it difficult for US companies to take advantage of the program and may make it unworkable. If half the loan were repayable, there might be a requirement for collateral security. What would be the respective responsibility of the US partner and the Indian partner? How much legal work and cost would be associated with recovery? How much of a burden would be added to the loan approval procedures?

It was the consensus that the entire FTD portion (probably up to 50% of the total R&D cost) should be covered by the forgiveness procedure. Of course,

if the borrowers could not finance their entire contribution to the project cost, ICICI could make a separate commercial loan to them.

c. FTD Recovery of Loan/Investment From Successful Venture

The experience of the Israel-U.S. Bird Foundation suggests that very precise terms and conditions need to be established in the loan agreement to make a determination whether an R&D venture has succeeded or failed. The criteria for loan approval requires that the R&D must lead to commercial production within 3 years. The guidebook developed by the Bird Foundation carefully defines how "failure" is determined and establishes the rights of all parties to the intellectual property derived from the research in the event of failure (or success). In the event supplementary funding and/or time is required to complete the research, the Bird Foundation must review and approve such a request from the borrower.

It was also recommended that the loan payback be based on a percentage of the sales proceeds, because it is easier to verify than any payback formula based on profits. Payback is planned over two to four years from the beginning of sales.

d. FTD Promotion of Joint Venture Proposals

Discussion centered around the difficulties of operating a bifurcated project development and promotion effort, with the function split between a U.S. office and a Bombay office. There was general agreement with AID's approach, as the most reasonable way to solve the logistics problems entailed by the communications and transportation difficulties of working with U.S. industry and Indian industry. But questions of direction, initiative to be taken , locus of responsibility, and coordination among the two operating cells were identified as being difficult to manage, even given the most constructive attitudes by all parties. These problems areas were not considered to be fatal flaws to the proposed approach, but need careful consideration and planning.

The Bombay operation, in addition to searching for and screening proposals from Indian industry, would also involve itself in facilitating governmental approvals. The U.S. operation, in addition to promoting interest by U.S. firms in the FTD, developing possible proposals, and locating suitable partners for Indian firms, may be looked to, by U.S. industry, as the responsible agent to secure Indian Government approvals. Thus, the two operations will be totally interdependent.

In conclusion, the discussion considered the concept of FTD to be valid and feasible at this time. It should be possible to structure terms and conditions to attract U.S. industry to take advantage of the program. However, there is a need to consider developing a mechanism to assume the risk of loss of the principal amount made available by the U.S. to fund the program, and thereby relieving ICICI of that burden.

The conference concluded in an optimistic note with a high degree of interest in the project, although it was recognized that a number of issues and details need to be finalized.

3. Ingersoll Rand Co.
4. Purolater, Inc.
5. Sperry Rand Corp.
6. Kelvinator International Corp.
7. Clayton Mfg. Co.
8. Crane Co.
9. Combustion Engineering, Inc.
10. Envirotech Corp.

D. Machine Tools & Hand Tools

1. Dana Corp.
2. W.A. Whitney Mfg. Corp.
3. Monarch Machine Tool Co.
4. Chicago Pneumatic Tool Co.
5. Jarvis Corp.
6. Verson All Steel Press Co.
7. Unicast Development Corp.
8. Abex Corp.
9. Smith Tool Co.
10. Latrobe Steel Co.

E. Drugs and Pharmaceuticals

1. Abbott Universal Ltd.
2. Johnson & Johnson
3. Parke Davis & Co.
4. Pfizer International, Inc.
5. E.R. Squibb & Sons, Inc.
6. Upjohn Co.
7. Warner Lambert Co.
8. Rochelle Laboratories
9. Merck & Co.
10. USU Pharmaceuticals Corp.

APPENDIX B

FIRMS TO CONTACT BY CATEGORY - PRELIMINARY LIST

A. Electrical and Industrial Equipment

1. Bendix Corporation
2. Black & Decker Mfg.
3. Cutler Hammer World Trade
4. Dresser Industries
5. General Electrics Co.
6. International Tel & Telegraph Corporation
7. Combustion Engineering Co.
8. Automation Industries, Inc.
9. Westinghouse Electric Corp.
10. Denver Instrument Co.

B. Electronic Parts and Components

1. Honeywell, Inc.
2. RCA Corp.
3. Raytheon Co.
4. Microsemiconductor Corp.
5. Oak Industries, Inc.
6. Electronic Universal Corp.
7. Electronic Application Co.
8. Kirkwood Industries
9. Yardney Electric Corp.
10. Sprague Electric Co.

C. Industrial Machinery

1. Babcock & Wilcox Co.
2. American Hydrotherm overseas

3. Ingersoll Rand Co.
4. Purolater, Inc.
5. Sperry Rand Corp.
6. Kelvinator International Corp.
7. Clayton Mfg. Co.
8. Crane Co.
9. Combustion Engineering, Inc.
10. Envirotech Corp.

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6. Upjohn Co.
7. Warner Lambert Co.
8. Rochelle Laboratories
9. Merck & Co.
10. USU Pharmaceuticals Corp.

7. FOR THOSE WITH DEFINITE "YES" on CONFERENCE, ask if they are any other issues they believe should be included on the conference agenda?:

_____

_____

_____

TERMINATION OF INTERVIEW: Thank the respondent very much for their cooperation (no matter where the conversation ceased). This interview relates to a very important bilateral project under consideration between the United States and India concerning trade and investment. Therefore it is essential to have the input of U.S. businesses in helping to shape future direction. In that regard, the respondent has been helpful.

2423B

5. If the United States did undertake a project to provide some capital and assistance to joint U.S.-Indian ventures, in what ways do you feel the project should be promoted in the U.S.? _____

_____

_____

_____

(Optional - depending on level of interest expressed)

6. The U.S.-India Business Council of the U.S. Chamber of Commerce and AID are planning to hold a conference in Washington on March 19 to explore with interested firms the types of incentives which would attract R&D ventures with Indian firms. Would you or a representative of your firms be interested in participating?

If No.....terminate interview

If Yes.....say that we will have the U.S.-India Business Council send them an invitation. Obtain specifics on mailing address and addressee.

_____

_____

If say, DONT KNOW or WANT MORE INFORMATION, provide details on the conference, as follows:

- A one-day conference will be held at the facilities of the Chamber of Commerce of the United States in Washington D.C.
- Purpose is to obtain the insights and thoughts of U.S. business interested in collaborating with Indian Firms on joint R&D efforts to market new products on processes in India and elsewhere.
- Participants must take care of all their expenses, except lunch on the day of the conference.
- Benefits for them are having a chance to 1) learn about U.S.-Indo 2) having to say in a new effort to facilitate joint ventures between U.S. and Indian firms.

TRY TO GET DEFINITE YES OR NO. Respondent expresses some interest but cannot commit over the phone say we will send an invitation and we will follow up within a few days for confirmation.

Yes_____ (please go on to #3)

No_____

If no, are there any factors involving the process and environment of doing business in India which mainly affected your decision.

Yes_____

Please describe:_____

_____

_____

_____

No: Conclude interview

3. In your consideration of undertaking joint R&D ventures ventures in India, how much of an incentive would each of the following be? (1) major incentive, (2) moderate incentive (3) minor incentive.

Now, how much of an incentive would be:

a. Gaining access to India's vast pool of scientific expertise._____

_____

b. Having the opportunity to explore new markets in India through collaborative R&D efforts with Indian Firms._____

_____

c. Obtaining dollar risk capital loans._____

_____

d. Obtaining partial debt forgiveness for failed R&D projects_____

_____

4. What additional incentives do you believe are either necessary or desirable in order to conduct joint R&D efforts with Indian firms._____

_____

_____

_____

Name: _____

Company: _____

Address: _____

_____

Telephone No. _____

Contact: _____

Status Complete _____ Hold _____

D. Survey Guide Questions

1. Are you currently doing business in India?

Yes _____

If yes, can you please generally describe _____

_____

_____

Summary: Licensing only _____ Equity _____

Licensing and Equity _____ Trade _____

Service _____ R&D _____ other _____

Please go on to Question #2

No _____

If no, do you have any plans or interest in doing business in India?

Yes _____

If yes, please describe _____

_____

_____

(Please go on to #2)

If interviewee answers No, discontinue questions and politely conclude interview. If interviewee answers Yes go on to next question.

2. Would your firm be willing to consider undertaking joint ventures in India with Indian firms in commercial research & development, with the objective of bringing products or processes into the marketplace within 2 or 3 years?

C. Telephone Procedures

(1) On making telephone contact (unless you have the specific name of a person) inquire first as to who is responsible for the firm's foreign or international operations and investments. (Note: you may pass through several connections before reaching the right party, and may have to explain the nature of the call. In this case do not elaborate. Simply indicate you are inquiring on potential interest of the firm in joint ventures in R&D with Indian firms and potentially new business and markets.)

(2) On establishing contact with the right person, proceed in the following manner:

(i) Identify yourself and explain our contract with U.S. AID to conduct a survey on identifying potential interest of U.S. firms in joint ventures in R&D with Indian firms. Mention that the U.S. government, including AID and the Department of Commerce are very interested in this project as well as the joint Indo-U.S. Business Council and the U.S. Chamber of Commerce, among others. Do not mention the AID project or fund but indicate the U.S. and Indian governments are looking at financial and other incentives to attract U.S. firms to collaborate with Indian firms in R&D for new products and processes. This is a very important binational effort between the U.S. and India Governments and may lead to other important trade developments between the two countries.

(ii) Then say, "May I ask you a few questions, which will be kept confidential. Our interest is to identify some key issues and problems, the results of which will only be used for quantitative analysis by objective category." Depending on interviewee response, adjustments may be necessary, but try to adhere to the following format and sequence. Also, be sure to note name, position, telephone number and other information. If asked why we called their particular company, tell the person we obtained names of American firms through AID, the joint Indo-U.S. Business Council, the Commercial Affairs Office, U.S. Embassy and other organizations working with U.S. firms in India.

APPENDIX A

INTERVIEW GUIDE FOR IDENTIFYING U.S. FIRMS INTERESTED IN JOINT INDO-US R&D EFFORTS FOR NEW PRODUCTS/PROCESSES

Instructions to Telephone Interviewer

A. General

The purpose of this interview is to obtain the reactions of key business executives on doing business in India, specifically Research & Development (R&D) jointly with Indian firms. The focus is to identify what incentives are needed or desired to induce U.S. business firms to undertake joint efforts with Indian firms in developing industrial technology for new products and processes which are commercially viable.

B. Specific

The Agency for International Development (AID) is interested in developing a project to accelerate the growth of commercial R&D in private enterprise to stimulate technological advancement and support the Indian economy by the development of private sector capability in R&D through collaboration with U.S. firms which have the managerial and technical expertise to transmit certain skills to the private sector Indian community.

To this end, a Technology Development Fund is being proposed along with other support projects to promote, monitor, manage and sustain the collaboration of Indo-US firms in the development of industrial technology R&D.

In order to determine the feasibility of this project, AID will undertake a preliminary study consisting of (1) a telephone survey of U.S. firms to gauge their interest and requirements for joint Indo-U.S. R&D collaborative efforts; (2) a conference attended by representatives of such interested firms to determine what incentives would attract U.S. collaboration and what constraints exist which must be addressed to ensure reasonable success of the project and mutually beneficial results of Indo-U.S. firms.

APPENDICES

APPENDIX A:	Interview Guide for Identifying U.S. Firms Interested in Joint Indo-US R&D Efforts for New Products/Processes
APPENDIX B:	Firms To Contact By Category - Preliminary List
APPENDIX C:	Participant Roster Conference on Fund for Technology Transfer in India
APPENDIX D:	Results of Survey Analysis

F. Agricultural Chemicals

1. Agricultural Industrial Corp.
2. Chevron Chemical Co.
3. Cooperative Fertilizers, International
4. M. Golodetz & Co., Inc.
5. Monsanto Co.
6. Rohm & Haas Co.
7. U.S. Steel Corp.
8. Woodward & Dickerson, Inc.
9. International Minerals and Chemicals Corp.
10. The Ansul Co.

G. Chemicals

1. Allied Chemical Corp.
2. Dow Chemical Co.
3. E. I. Dupont de Nemours Co.
4. General Mills Chemicals, Inc.
5. B. F. Goodrick Chemical Co.
6. Miles Laboratories
7. Phillips Petroleum
8. Kerr-McGee Chemical Corp.
9. Ireco Chemicals
10. Reichhold Chemicals, Inc.

H. Other Major Firms

1. Ford Motor Co.
2. ~~Caterpillar Co.~~
3. Texas Instruments
4. Hewlitt-Packard
5. Litton Industries

6. Burroughs Corp.
7. ZM Company
8. Techtronics, Inc.
9. Honeywell
10. IBM
11. Ingersoll Rand
12. Digital Equip. Corp.
13. Polardid
14. AT&T Bell Laboraties
15. Bay State Controls Corp.

FIRMS TO CONTACT BY CATEGORY-SUPPLEMENTARY LIST

A. Electrical and Industrial Equipment

1. Mines Safety Appliances Co.
2. Sybron Corp.
3. Austed Industries International
4. Research Cottroll, Inc.
5. North American Manufacturing Co.
6. Prefromed Line Products Co.
7. Revere Corp. of America
8. General X-Ray Corp.
9. Repographer International Manufacturing Co.
10. Airpreheater Co. Inc.
11. Trion, Inc.
12. Eclipse, Inc.
14. Repco Industries, Inc.

B. Electronic Parts and Components

1. Silemans Allis, Inc.
2. Hatachi Magnets Corp.
3. Cornell Dubiller Electronics
4. RFL Industries, Inc.
5. Semiconductor Equipment Corp.
6. Sigma International, Inc.
7. Microft
8. Sentinel Computer Corp.
9. Bunter Ramo Corp.
10. ~~Rosemount, Inc.~~
11. CSI Escondido
12. Mowbrays Co.

C. Industrial Machinery

1. Hammer Mills, Inc.
2. McNally Pittsburgh Manufacturing Corp.
3. Tecumseh Products Co.
4. Dana Corporation
5. Bryant Grinder Corp.
6. Environmental Elements Corp.
7. Food Motor Co.
8. Essochem, Inc.
9. Wean United
10. Whiting Corp.

D. Machine Tools and Hand Tools

1. Skill Corp.
2. Stewart Warner
3. Mulhead Ltd.
4. National Acme
5. Farrel and Co.
6. The Cross Co.
7. Scully-Jones Co.
8. Devlieg Machine Co.

E. Chemicals

1. Tenneco Chemicals
2. Budger America, Inc.
3. Freeman Chemical Corp.
4. SCM Gidden International Co.
5. ~~Ashland Chemicals Co.~~
6. Stauffers Chemicals Co.
7. Technical Enterprises, Inc.
8. Siltec Corp.
9. Chemtex, Inc.

F. Energy

1. Independent Living
2. Sunthane, Inc.
3. UOP Process International, Inc.
4. Exxon Research and Engineering Co.
5. Universal Oil Process
6. Fluoroceas Services International, Inc.
7. Wayne Engineering Corp.

G. Automative Ancilliaries

1. Standard Car Truck Co., Inc.
2. Uniroyal, Inc.
3. Lipe Rolling Corp.
4. Wagner Electric Corp.
5. Eaton Corp.
6. A.C. Sparklug

APPENDIX C

PARTICIPANT ROSTER
CONFERENCE ON FUND FOR TECHNOLOGY TRANSFER IN INDIA

Robert W. Beckman
Agency for International Deveopment

Edgar C. Harrell
Agency for International Development

Fred Haynes
U.S. Department of Commerce

Ayinash Deolalikar
Volunteers in Technical Assistance

W.T. Ryder
D.N.R. International

Nick Valko
Rohm and Hass Company

J.C. Kirchner
General Electric Company

Albert Gomes
P.K.F.

Edwin Cope
Mosanto

Charles Hough
Honeywell, Inc.

Harold Larson
Rockwell International

David T. Goldman
U.S. Department of Commerce

Lu Rudel
Agency for International Development

Susan Magee
India International, Inc.

Shiva Singh
India International, Inc.

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Richard Seifman
Agency for International Development

Vijay Mehta
Mehta Associates

Prakash Shah
India Chamber of Commerce of America

Jonathan A. Green
Green International

Arthur Wasserman
Allis Chalmers

Peter Thormann
USAID/India

N. Bhagat
Department of Commerce

Ayinash Deolarikar
Vita

Danyar Sidratan
Asian Indian Chamber of Commerce

Henry Norman
Vita

Sam Nablo
Energy Sciences, Inc.

David Devin
Agency for International Development

APPENDIX D

RESULTS OF SURVEY ANALYSIS

Questions

1. "Are you currently doing business in India?"

Yes	84%
No	16%

2. "Would your firm be willing to consider undertaking joint ventures in India with Indian firms in commercial research and development with the objective of bringing new products or processes into the marketplace within 2 or 3 years?"

Yes	43%	
No	53%	(4% Non-resp)

3. In your consideration of undertaking joint R&D ventures in India, how much of an incentive would each of the following be? (1) major incentive (2) moderate incentive (3) minor incentive?

   a. Access to Indian scientific expertise
   b. Access to Indian markets
   c. Dollar risk capital loans
   d. Debt forgiveness on failed projects.

	Major	Moderate	Minor
a.	32% (14)	27% (12)	41% (18)
b.	52% (23)	23% (10)	25% (11)
c.	29% (13)	32% (14)	39% (17)
d.	27% (12)	34% (15)	39% (17)

Combined Summary

	Major	Mod-Minor
a.	32%	68%
b.	52%	48%
c.	29%	71%
d.	27%	73%

Reasons for not Considering Joint R&D Efforts

- R&D done in U.S.
- Not interested
- Not applicable
- Do not want dual role

69%

- Red Tape
- Bureaucratic problem
- Licensing

31%

Comments: 52% of those interviewed complained of dificulty of doing business in India. However some firms expressed relationships with Indian firms were good.

OTHER INCENTIVES FOR INDUCING U.S BUSINESS VENTURES IN INDIA AND WITH INDIAN FIRMS

- Ensure adequate protective tariffs on U.S. products developed in India.
- Reduce tax rates and tax forgiveness (tax rates not attractive for business).
- Easier credit terms from Indian banks.
- Guarantee free and open access to Indian markets (Protectionism)
- Protection of patents and respect for intellectual property.
- Relax U.S. Department of Commerce policy on export of technology.
- Repatriation of profits and taxing only Indian businesses and not U.S.
- Guarantee that once a product is developed U.S. firm would be able to register it properly and obtain a production license.
- Ease U.S. Department of Commerce procedures for obtaining export licenses.
- Ease Indian foreign exchange controls -- process is lengthy and time consuming.
- Need official assurances of fair dealing between U.S.-India Firms.
- India Government pricing policies need to be improved.
- Revise licensing restrictions to extend time period (up to 7 years).
- Change Indian Governments import restrictions for import relie. .e., currently there is 150% duty on computer equipment.)

- Access to more vocationally trained personnel at practical levels of technology -- many of Indian scientists very good but more theoretically oriented than applied.

In summary, the concensus is that the Indian Government and the private sector should work to ease government restrictions on doing business in India, reduce bureaucratic barriers to getting things done, and to take steps to protect patents and new research for proper registration and marketing/distribution.

The most commonly expressed concerns are bureaucratic delays, licensing procedures, limitations on fees/profits and respect for intellectual property.

Finally, there has been some concern expressed on U.S. Department of Commerce procedures which delay granting of export licenses as well as restrictive policy on technology export.

DISTRIBUTION BY BUSINESS CATEGORY OF FIRMS WILLING TO CONSIDER JOINT R&D VENTURES

Category	Percent Total
1. Drugs/Chemicals	23%
2. Capital Equipment/Heavy Machinery/Industry	21%
3. Electric/Electronics	19%
4. Telecommunications/Computers	14%
5. Machine Tools	7%
6. Other Automotive Agricultural Equipment Engineering Coal/Mineral Other	16%
Total	100%

Top Three of Total

Drugs/Chemicals Equipment Electrical/Electronics	63%

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APPENDIX IX

Study on the Options

for the

Office of the U.S. Program Advisor

REPORT ON THE U.S. COMPONENT OF THE PROMOTIONAL EFFORT

Overview

This report is an addendum to the final report "Survey Analysis and Conference on Fund for Technology Development Project", submitted under IQC No. PDC-1000-I-21-3077-00, Work Order No. 21.

The objective of this study is to provide India USAID with additional information to complete the project paper, but with specific regard to the organization, function, staffing and operation of the U.S. "Office" to be established for the Program for Advancement of Commercial Technology (PACT) (formerly FTD). The scope of work, as outlined in the contract addendum, is to prepare a "Report on the Character, Content, Structure and Cost of the U.S. component of the Promotion Effort." In addition:

1. The report shall analyze and define requirements for effective operation of the U.S. component in light of the overall design of the FTD as described in the Project Identification Document (PID) and taking into consideration that ICICI has expressed increasing interest in eventually posting a person in New York to work on FTD.

2. The report shall contain a description of qualifications and experience of the person(s) who would be engaged to run the U.S. component.

3. The report shall present pros and cons of alternative organizational arrangements such as:

   a. a full or part-time person working from his own office or in ar office sharing arrangement with a business promotion association;

   b. a contract or grant agreement with a not-for-profit business promotion organization;

   c. a contract with a U.S. consulting firm qualified in the joint venture promotion and technology development field; and

   d. such other arrangements that may appear feasible.

This report is the result of an analysis of the survey demand study completed earlier and the seminar in which the U.S. promotion effort was discussed with a focus on organization, function and staffing.

In addition, interviews were conducted with a select number of representatives from both the public and private sectors including AID, Department of Commerce, Overseas Private Investment Corporation (OPIC), World Bank, U.S. Chamber of Commerce, Private Enterprise, Public Foundations and individual consultants previously involved in the feasibility study which laid the foundation for the PACT. The results and recommendations drawn from these interviews are incorporated into the study findings and conclusions.

Before proceeding with a discussion of the task report, it should be noted that any consideration of the U.S. promotional effort necessarily implies judgments based on certain assumptions regarding the overall design of the PACT and the functions of the Executive Director and the Bombay Office (or wherever the project may be domiciled). Discussion of one must be posited in light of the other and each within the context of the project as whole.

The interview guide used for this study report contained statements and questions which were based in part on the Project Implementation Design (PID) but also on certain assumptions regarding how the PACT effort in India will be organized and how it will basically function. The three critical assumptions are that: (1) the project will be under the aegis of the ICICI; (2) that an independent Board of Governors will be established separate from ICICI (but including representatives) and be responsible for setting policy and approving projects; and (3) the Executive Director will report to and be responsible to that Board of Governors or other plenary council or authority to be established. All of these assumptions were raised and discussed by many of those persons interviewed and the concensus was that they were important to the overall success of the project. The independence of the project was considered to be critical notwithstanding that ICICI would be the grant recipient with administrative responsibility. Another issue which surfaced during the interviews was the position of Executive Director of PACT. It was assumed (and where not it was recommended) that the position be filled with a professional hired by ICICI but not from within its ranks. Whether in fact these assumptions hold in final negotiations must be seen, but they reflect the experience gained by the interviewers in similar projects including the Bird Foundation and others.

The key issues imbedded in these assumptions will affect the U.S. promotional effort and the manner in which it is organized and how it should or will function. Because of this it is important to highlight them as a prelude to the study findings and discussion. Following is an analysis of the various aspects of the U.S. office.

A. Operation Requirements

The U.S. component of the PACT will involve three basic functions to support the Bombay (Indian) office and ICICI. These are: (1) promotion and dissemination of the PACT by interacting with the U.S. business community; (2) brokering deals with Indian and U.S. companies by bringing them together or finding the appropriate U.S. firm to engage in joint ventures with an Indian firm; and (3) conducting preliminary review and judgment on the merits of the project for joint ventures where applications for approval will be forwarded to the Executive Director and the Board of Governors or other approval authority which may be established.

Below is a brief description of each of these functions.

1. U.S. Promotion

This function will require access to a network of the U.S. business community so that knowledge of potential and existing R&D capability can be used to respond to requests from India to match or find suitable joint venture partners who may be interested in a particular commercial technology project. It will also require promoting the PACT through various public affairs activities such as contacting trade associations, trade journals, other business-related media, individual companies, and other organizations which may be helpful in bringing awareness of the project to the U.S. business community. This will demand that the U.S. office has access to or be connected with in some formal or informal arrangement with established U.S. business networks.

2. Interacting with the U.S. Business Community and Brokering

The role of the U.S. office should be an active one and not merely reactive. In addition to promoting the effort through various traditional public affairs efforts, there will be a requirement to interact personally with individual firms which may show an interest in participating in the project.

This perhaps will comprise the largest portion of the U.S. Office Director's time and activities. There will be a need to "nurse" the potential joint ventures through the process. This will undoubtedly require frequent interaction as the project matures to a point where the application is completed and submitted to the Bombay office. A variety of ways exist through which the U.S. office can promote and broker joint ventures. For example, preliminary judgment may be passed on the firm and the potential product or process to meet the PACT criteria and guidelines which presumably will be established once PACT is formally negotiated and materialized. On other occasions it is conceivable the U.S. Office Director will be requested by the Indian office to locate a potential joint partner for an Indian firm. Still other ventures may be consummated by the Indian and American firms which then may seek only technical assistance in preparing their proposal and application. There are undoubtedly current arrangements between U.S. and Indian firms which may decide to participate in the PACT once formally in operation. Also, it is expected that proposed R&D projects will be in various stages of development including established prototypes requiring additional testing or study. Frequent travel by the U.S. office director is anticipated, not only in the U.S. but to India for following up and coordinating with the Bombay office.

3. Review of Proposed Projects

There seems no doubt that one of the key functions of the U.S. Office Director will be to make preliminary judgments on the merits and appropriateness of projects which originate in the U.S. with a U.S./Indian

firm. A principal responsibility will be to ensure that once an application or proposed project is presented, that it meets all the necessary requirements so that the Bombay office receives projects which it can act on with the assurances that the U.S. office has carried out its support activities with careful adherence to PACT procedures, processes and standards. The U.S. Office then would function as a support component of the Bombay Office and report to the Bombay Executive Director.

4 Other Considerations

Other considerations would include the following:

Staffing

The U.S. Office could be staffed by a full-time executive director and a secretary on the payroll of the PACT Project. Someone must monitor the office while the Director is on travel. The actual management of the office in terms of being an individual operation or whether it is housed in another organization is discussed is Section 3 of this report.

Equipment

The U.S. Office will require a capability for extensive information handling and storage, especially as the PACT project matures over the first year. It would be desirable to have mini computer capability for receiving and storing information on U.S./Indian firms, R&D activities, promotion, and joint venture profiles. Telephone usage would be expected to be frequent. Other than these requirements the office may be modest in other appurtenances.

Location

While it appears that location is not a factor either in the effectiveness or efficiency of the office, the two most convenient locations in terms of proximity to relevant public and private sector entitites most likely to be concerned with PACT are New York and Washington. However, the U.S. office

could be located anywhere that is reasonable to satisfy the communication and information requirements.

Relationship to the Bombay Office

The U.S. Office should be a support service to the Bombay Office and be subordinate to it in the final "brokering" of joint ventures and approval of projects. On the other hand, the U.S. Office should not be merely a promotion or public affairs office but actually be an extension of the PACT Executive Director and staff to provide linkages and coordination which facilitate the application process.

The essence of the PACT project is quick turn around time on R&D proposals. The Indian Office must be able to quickly and effectively respond to potential R&D joint venture projects. Undue delays or slow responses, especially in the first year, will harm the credibility of PACT. In this regard, the U.S. Office can provide the Bombay Office with invaluable support and assistance by screening projects and in assisting U.S. firms which may wish to participate in joint ventures with Indian firms.

It can also respond to requests from the Bombay office (ICICI) on technical matters, follow up with joint venture U.S. firms, and overall to facilitate the review and approval process.

B. Qualifications and Experience of the Director of U.S. Office

The success of PACT comes down to one thing -- the quality of the personnel both in Bombay and in the U.S. Office. Morover, no other single consideration is of such paramount importance as the capability of the key figures to make PACT work. No other factor will bring more harm to the idea of PACT than to have it staffed with professionals who lack the necessary qualifications and motivation to succeed. The U.S. Office is ultimately no less than the Bombay Office.

A number of important qualifications will be required to effectively carry out the functions of the U.S. Office. In order to place the qualifications in some

order of importance we will divide them for convenience into two categories: required and highly desirable.

Required

1. Credibility

The individual must be credible to the U.S. R&D business community and possibly to the academic R&D community as well. This means the person must be able to speak the language of business decision makers and know how business and joint ventures function.

2. Motivated

The person should be highly motivated to make PACT work. He or she must have a commitment to this proposed project over and above the job itself. The types of activities and involvement with different people and diverse projects will require patience and feasibility, high interpersonal skills (diplomatic) and a motivation to bring about development projects.

3. Technical and Business Background

One aspect of the U.S. Director's role in brokering will be the capability to recognize a deal when it is seen. This will require some technical capability and understanding of technical matters. In addition, a business sense of what is commercially viable and what factors influence business decisions is also necessary. This goes back to the first requirement of being credible to the U.S. business (and R&D) community.

A good understanding of technical and business matters and the ambience of both is a necessity. Moreover, the person should know where to go for critical technical and business information relevant to a proposed joint venture. A good deal of time will be spent on acquiring the right information and the person should know how and where to acquire it.

4. Brokering

The skills to put together joint ventures and broker deals should be a must Someone who has the ability to bring firms together and go through the necessary hand-holding is important.

Highly Desirable

1. Self-Starter

The person should ideally be a self starter or exhibit the type of personality that is aggressive and creative.

2. International Experience in Third World

Experience in international business, preferably in India and the Third World, would be an important asset. International business and marketing acumen and the pitfalls associated with foreign investment would add to credibility.

3. Attitude

Attitude towards PACT concept and working with Indian business firms should be positive and is related to motivation. The person must be good with people, especially South Asians, have a low frustration threshold and be flexible in outlook. This person should not be easily discouraged.

4. Sense of Development

PACT is in reality a development project of which business (R&D joint ventures) is the vehicle to bring about desired change. While business deals are critical to success, the long-range objective is to institutionalize technology R&D in the Indian private sector. This can be learned of course but it would be highly useful if the person, through experience, recognizes the distinction.

All of the , and may not be found in one individual (and this has implications for the organizational arrangements discussed next) but they provide a range of degree which can be used in selecting the personnel. If the qualifications and experience can be reduced to two factors, these would probably be (1) credibility in technical and business matters and (2) motivation to make PACT successful.

C. Organizational Arrangements

There are several organizational arrangements through which the U.S. promotional effort can function. A discussion of these potential arrangements follows with comments on the advantages and disadvantages to these arrangements.

1. Contract with an Individual Consultant to Open an Office and be Responsible for the Promotional Efforts

Advantages

This arrangement would probably be less costly and be more flexible to project demands.

Disadvantages

It would be difficult to identify an individual who could provide all the necessary support services and networking capability. Also there would probably be limited commitment.

2. Contract with an Individual to Work Out of a Non-Profit Organization such as the U.S. Chamber of Commerce

Advantages

The availability of an infrastructure to the U.S. business community and the support services would be immediately available. Little, or at least less, time would be spent on building and accessing a network of U.S. R&D firms. In addition, members of the organization could be available to provide support on specific international and Indian issues as well as provide

and to the U.S. effort. A particular advantage of this would be the network of the India-U.S. Business Council, a semi-independent adjunct of the Chamber, and the Indian and U.S. business contacts at its disposal. This could prove to be a key factor in promotion of the project as well as in bringing together Indian and U.S. joint venture partners, as well as brokering the deals.

Another major advantage would be the binational network which the India-U.S. business council could bring to the project, including Indian business and government contacts as well as American and Indian-American business firms. This location would also allow the PACT representative to have access to the the extensive communications network of the U.S. Chamber of Commerce, which includes a variety of widely circulated periodicals as well as television and radio outlets. Finally, modest office space might be made available through negotiation with the Council and Chamber of Commerce.

Disadvantages

Unless resolved, the bureaucracy of a large organization such as the Chamber and the India-U.S. Business Council could be a hindrance to the project in terms of quick reaction and turnaround time for processing joint venture projects. In addition, other priorities may subordinate the U.S. promotional effort since there is no mandate for this project and numerous other organizational goals and objectives may supercede the PACT. Also, the Chamber is essentially concerned with policy and advocacy and these considerations could conceivably constrain U.S. promotional efforts unless provisions or arrangements were agreed upon which would avoid the aforementioned constraints. This could be done through careful wording of the contract and project roles and responsibilities. It should also be noted that the major goal of the U.S. Chamber is to help and support U.S. business, although if the project were supported by, and in the administrative mechanism of the India-U.S. Business Council, then some of these disadvantages may be neutralized.

Advantages

A grant or contract to a U.S. non-profit organization such as the India-U.S. business council in the U.S. Chamber of Commerce would bring a ready made infrastructure and network to the U.S. business community which is critical to the success of the PACT.

However, the grant or contract should probably be made to the Council rather than the Chamber so that other policy goals and objectives do not interfere or subordinate the U.S. promotional effort.

There is an existing model for this mode of cooperation between an AID-funded activity and an organization related to the U.S. Chamber. At present, an American representative of the Egypt-U.S. Business Council is resident in Cairo, working under an AID-funded contract to reduce "red tape" and other bureaucratic delays to increased business activity.

Other U.S. non-profit organizations such as the National Association of Manufactures (NAM) would offer no singular advantage such as the special arm of the U.S. Chamber of Commerce that is the India-U.S. business Council. The Council, with its own mandate of promoting U.S.-India Business, is less bureaucratic and not likely to subordinate the PACT effort or constrain its activities.

The goals and objectives of the Council are also highly compatible and congruent with the PACT and the U.S. effort.

The Council, in this case, would hire a Director for the effort and be responsible to the Bombay Office in its functions and activities. The Council would bring specific business experience in India to the U.S. effort as well as vast contacts with U.S. and Indian business firms including an awareness of India's business climate, economic and development goals and current changes and policy direction in India's attitude toward U.S. foreign investment.

There might not be sufficient independence and control of the project if it is housed in a U.S. non-profit organization. Also, incentives and motivation could be a problem for an organization which has basically another policy and program agenda. Moreover, the organization would have to hire the right person who can put business deals together and play an active brokering role. This is not usually characteristic of the main public relations role that non-profit organizations play and which is compatible with their mandate. Any consideration of a grant or contract to the Chamber or the Council would have to be structured to avoid these disadvantages.

4. Contract with a U.S. Private Consulting Firm (Business) to Promote Joint Ventures and Technology Development

Advantages

A firm which had the in-house capability would be an advantage in that experience and qualifications of staff would provide a broad based support to the U.S. effort and probably have a network or access to a network of the business community, in addition to the necessary logistical and office equipment support. Incentives would probably be higher in a business or consulting firm to perform and get the job done effectively and efficiently.

Disadvantages

Depending on the business, cost could be higher with this arrangement and the person may not have the desired level of commitment if already on board. But finding the right firm or business would be difficult. Also, if firm is large and international, the project could be a conflict of interest with other contracts.

Support may not alwys be available because of other business priorities. This would depend greatly on the type of firm, its size and its management experience and track record. If the person(s) is not on board to run the project, then the firm would have to hire the staff who should be scrutinized carefully.

In summary, all four options are viable and there may not be a great deal of difference between them in terms of getting the job done. Cost could be a variable factor but again this would depend on the flexibility of the grant or contract process. For example, a person working out of an office at maximum government rates would be less expensive than that person hired by a firm with overhead and fee costs. However, there are tradeoffs, since the latter would provide in-kind support services and a network capability which would be costly for the former to acquire. On the other hand, some private consultants who do joint ventures and brokering can be very expensive and require waivers for their fee or salary rates. The key to the U.S. effort, however, is the type of person who has the dedication, motivation and credibility of perform the work.

This person could function out of any organizational arrangement or structure, which would be secondary to the qualifications and experience of the person to run the U.S. promotional effort.

Ideally, a private consultant who would work under the aegis of the India-U.S. Business Council either (or both) in New York and Washington would probably provide optimum background, networking and support services.

This might be, relatively speaking, more advantageous than the other options providing the contract language was specific in terms of roles, responsiblities and reporting. Whether the contract was to the individual with cost sharing arrangements with the Council or whether the Council would be the recipient of the grant contract is a legal and organizational question for the AID contracts office. Other arrangements however might work out equally well such as negotiating office space with the IRI and having a consultant work out of their office in New York. Also, any of the other arrangements would be viable and could be negotiated, although there is <u>more advantage</u> to providing the Director of the U.S. Office with sufficient linkages and support services with established network capability or at least access and capability to tap into a network of U.S. companies, Indian companies and R&D resources. This would lead toward an organization like the India-U.S. Business Council.

D. Cost

AID has proposed a grant of up to $250,000 per year for the U.S. promotional component of the project. This ceiling is probably well within the costs which might be incurred in setting up an office with a full-time director and secretary, along with office space and equipment. However, the costs could be reduced to below the $250,000 level depending on the organizational arrangements. However, it would appear that whatever arrangement is finally established, the minimum cost would probably be $150,000 and this would not provide optimum support services. The essential question is what kinds of support can be provided and what arrangement will best promote the project with assurances of commitment, capability and continuity. Parenthetically, it should be noted that charging firms a fee for services at some point was suggested. While this may appeal to AID in terms of revenue to support the project in a kind of revolving fund, it is NOT recommended. Too many conflicts of interest would occur if firms are competing with one another for services, which is what would undoubtedly happen if a fee structure was part of the promotion effort.

H.C. Pant,
Director,
Tel:3012020

सत्यमेव जयते

सचिव
SECRETARY

वित्त मंत्रालय
आर्थिक कार्य विभाग
GOVERNMENT OF INDIA
MINISTRY OF FINANCE
Department of Economic Affairs
नई दिल्ली/New Delhi.

New Delhi, the 29th August, 1985.

Dear Mr. Cylke,

This has reference to our recent discussions on the Project entitled Programme for Advancement of Commercial Technology (PACT). Government of India hereby request for U.S. assistance of $ 10.6 million for this Project. These funds together with ICICIS contribution in kind of $ 300,000 will finance the cost of implementation of this Project over a period of about 5 years.

We would appreciate your earliest consideration of this request for assistance.

With regards,

Yours sincerely,

(H.C. Pant)

Mr. Owen Cylke,
Director,
USAID,
American Embassy,
New Delhi

279