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Agency for International Development

Washington, D.C. 20523

Egypt: Project 263-0090

Industrial Productivity Improvement

Grant

Industrial Technology Application

Sub Project Paper

263-0090.2

1981

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6. PROJECT ASSISTANCE COMPLETION DATE (PACD) 01 93 01 86		7. ESTIMATED DATE OF OBLIGATION (Under 'B.' below, enter 1, 2, 3, or 4) A. Initial FY 81 B. Quarter 4 C. Final FY 86									
8. COSTS (\$000 OR EQUIVALENT \$1 =)											
A. FUNDING SOURCE		FIRST FY 81		LIFE OF PROJECT							
		B. FX	C. L/C	D. Total	E. FX						
All Appropriated Total		7,500	2,500	10,000	7,500						
(Grant)		(7,500)	(2,500)	(10,000)	(7,500)						
(Loan)		()	()	()	()						
Other:											
1. U.S.											
2. Host Country			4,600	4,600							
3. Other Donor(s)					4,600						
TOTALS					14,600						
9. SCHEDULE OF AID FUNDING (\$000)											
A. APPROPRIATION	B. PRIMARY PURPOSE CODE	C. PRIMARY TECH CODE		D. OBLIGATIONS TO DATE		E. AMOUNT APPROVED THIS ACTION		F. LIFE OF PROJECT			
		1. Grant	2. Loan	1. Grant	2. Loan	1. Grant	2. Loan	1. Grant	2. Loan		
1. SA	753B	874				10,000					
(2)											
(3)											
(4)											
TOTALS											
10. SECONDARY TECHNICAL CODES (maximum 6 codes of 3 positions each)						11. SECONDARY PURPOSE CODE					
830		840		960		759B					
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A. Code											
B. Amount											
13. PROJECT PURPOSE (maximum 480 characters)											
(1) to assist public, private and joint venture sector industrial firms to make more productive use of technology and, to identify, assess and introduce new and suitable technology in an effective manner, and (2) to institutionalize Egyptian capacity to provide such assistance through increasing reliance on Egyptian expertise.											
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Interim		MM	YY	Final		MM	YY				
		04	84			01	86				
						<input checked="" type="checkbox"/> 000 <input type="checkbox"/> 941 <input type="checkbox"/> Local <input type="checkbox"/> Other (Specify)					
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		Title Director				Date Signed 07 22 81					
						MM DD YY 01 29 81					

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SUBPROJECT PAPER

INDUSTRIAL TECHNOLOGY APPLICATION
Project 263-0090.2

PAGE

Facesheet

I. SUMMARY AND RECOMMENDATIONS

A. Executive Summary. . . . .	.1
B. Recommendations. . . . .	.2
C. Description of the Project. . . . .	.4
D. Summary Findings. . . . .	.6
E. Issues. . . . .	.7
1. Appropriate Technology. . . . .	.8
2. U.S. Industry Role. . . . .	.8
3. Level of Demand. . . . .	.9
4. Retention of Egyptian Staff. . . . .	.9

II. PROJECT BACKGROUND AND DETAILED DESCRIPTION

A. BACKGROUND. . . . .	.10
B. DETAILED DESCRIPTION. . . . .	.12
1. Overview. . . . .	.12
a. Goal and Purpose. . . . .	.12
b. End of Project Status. . . . .	.13
c. Outputs and Inputs. . . . .	.14
2. The Project. . . . .	.16
a. Implementing Agency. . . . .	.16
b. Activities. . . . .	.19
i. Solving industry problems. . . . .	.21
ii. Developing awareness. . . . .	.31
iii. Institutionalizing. . . . .	.32
3. Relationship to other Projects. . . . .	.37
a. Other Donor Projects. . . . .	.37
b. AID Projects. . . . .	.40

III. PROJECT ANALYSES

A. ECONOMIC ANALYSIS. . . . .	.40
B. SOCIAL SOUNDNESS ANALYSIS. . . . .	.42
1. Beneficiaries. . . . .	.42
2. Sociocultural Feasibility. . . . .	.42
3. Role of Women. . . . .	.43
C. TECHNICAL FEASIBILITY. . . . .	.43
D. ADMINISTRATIVE FEASIBILITY. . . . .	.47
E. ENVIRONMENTAL CONCERNS. . . . .	.49

PLANS

A. FINANCIAL PLAN. 49
B. IMPLEMENTATION PLAN. 56
C. EVALUATION PLAN. 59
D. CONDITIONS AND COVENANTS. 63

V. ANNEXES

A. Logical Framework A-1
B. Consultant's Report A-3
C. EIDDC Profile A-58
D. Contractor Role A-65
E. The Technical Specialist and the Resource Specialist A-68
F. World Bank Small Industry Project A-70
G. Economic Analysis Supplement, PENNTAP data A-74
H. Financial Plan Notes A-77
I. Project Performance Network A-82
J. Environment Statement A-85
K. 5 C (2) - Project Checklist A-86
L. 612(b) Recommendation to Authorize Purchase of Egyptian Pounds with U.S. dollars A-102
M. Cable Traffic A-104

SUBPROJECT PAPER
INDUSTRIAL TECHNOLOGY APPLICATION
Project No. 263-0090.2

I. SUMMARY AND RECOMMENDATIONS

A. EXECUTIVE SUMMARY

PROBLEM. As a result of the economic liberalization underway in Egypt since 1974, Egyptian businessmen and managers in industry, or contemplating industrial ventures, are today confronted with a variety of unfamiliar pressures and opportunities. Among other things these result from greater competition, access to foreign partners and insistence on better public enterprise performance. To cope with these changing conditions, industrialists need information about the range of technologies available and how to acquire them, and assistance in adapting, developing and exploiting present technology. As the pressures become greater, and the opportunities clearer, there is readiness to acknowledge this need, as can be seen in growing demand for information and assistance. Currently there is an absence of an accessible, credible source businessmen can turn to with confidence that useful information or technical assistance will be found for them at a reasonable price.

STRATEGY. This \$14.6 million project sets out to find solutions to industrialists' technology-related problems and, in the process, to institutionalize the system. Project strategy is based on using an existing organization serving industry--the Engineering and Industrial Design Development Center (EIDDC)--to establish an accessible channel through which businessmen know that reliable, affordable technical assistance or information will be found for them. To enhance effectiveness, the project will provide assistance from abroad when it is unavailable in Egypt, or can fruitfully be used in conjunction with local expertise. The need for Non-Egyptian experts should decline as Egyptian specialists are trained or re-oriented. Furthermore the fee system should provide self generating funds by the end of the project to cover the operating costs of the Industrial Technology Application Program (ITAP) unit which will be institutionalized within EIDDC during the life of the project.

Quality service plus an educational/promotional campaign to increase awareness will build the constituency the program needs for effective institutionalization. Delivery capability, equally essential, will be built up through development of information systems and informal networks, formal plus on-the-job training of local staff by U.S. specialists participating in service delivery, and assistance in organizational/administrative development to integrate the new program into EIDDC.

RELATIONSHIP TO CDSS. The primary criteria of the country development strategy in the 1982-1986 period are concerns of stability, productivity and equity. During the recent past, stability has had top priority. It will continue to be important, but productivity and equity will now have higher priority than has been the case. Productivity is central to the liberalization of the Egyptian economy. Thus, more targeting of investments is needed to have the greatest possible impact on productivity. The effectiveness with which technology is utilized and the choice of technology, when it is to be introduced are key determinants of productivity in the industrial sector. By improving both, as is the goal of this project, the productivity of the industrial sector can be increased, which is a most promising source of employment growth and of improvement in overall economic productivity in Egypt.

B. RECOMMENDATIONS

USAID/Cairo recommends that AID/W approve a grant to the Government of Egypt (GOE) in the amount of \$10 million. USAID also recommends that the full sum required for this project (\$10 million) be obligated in FY 1981. Further, it recommends that a determination be made pursuant to Section 612(b) of the Foreign Assistance Act to permit dollar financing of local currency costs. Such costs represent 48% of total costs and the part funded by AID is 25% of the AID grant recommended. Egyptian sources will pay approximately 31% of total project cost, which we consider reasonable.

Table I: SUMMARY COST ESTIMATE AND FINANCIAL PLAN
(US\$ 000)

Inputs ¹	AID		GOE	Totals		Total
	FX	LC	LC	FX	LC	
I.a. Personnel, L.T. and support	1,658	374	331	1,658	705	2,363
I.b. Personnel, S.T.						
1. U.S.	790	270	-	790	270	1060
2. Egyptian	-	346	71	-	417	417
II. Services	675	-	-	675	-	675
III. Information Dis.	81	181	-	81	181	262
IV. Training	432	64	-	432	64	496
V. Commodities	216	-	-	216	-	216
VI. Operations	72	165	141	72	306	378
VII. Special Costs	10	6	246	10	252	262
VIII. Evaluation	51	29	-	51	29	80
IX. Contractor, Over- head & Fee	1,000	-	-	1,000	-	1,000
X. Indirect Support	-	-	1,778	-	1,778	1,778
SUBTOTAL	4,985	1,435	2,567	4,985	4,002	8,987
Inflation	2,151	939	1,809	2,151	2,748	4,899
Contingency	372	118	200	372	318	690
TOTAL	\$7,508	\$2,492	\$4,576	\$7,508	\$7,068	\$14,576

¹ Line items are described in the Financial Plan text and more fully defined in Annex H.

C. DESCRIPTION OF THE PROJECT

The goal of this five year 14.6 million dollar project is increased productivity and employment resulting from increased industrial productivity and expansion of the industrial sector. The project purpose is (1) to help public, private and joint venture industrial firms to make more productive use of technology, and to identify, assess and introduce new and suitable technology, in an effective manner and (2) to institutionalize Egyptian capacity to provide such services through increasing reliance on Egyptian expertise. The problem which the project addresses is the absence of an accessible, credible source through which businessmen can find useful information or technical assistance at a reasonable price to help them solve technological problems and/or identify and exploit technological opportunities. It is a significant problem that grows in importance as Egypt's business community tries to respond to the opportunities and pressures of the post-1974 liberalization policies.

The project will provide information and technical assistance to the Egyptian public and private industrial sector starting as a first step with in-firm diagnostic studies. This will be followed up by providing technical information in usable form and helping industrialists identify and arrange for assistance from qualified Egyptian specialists. When the latter cannot be identified, assistance will be obtained from U.S. specialists. Services will be provided to financial and other institutions serving the industrial community, as well as to members of that community. In addition, the project includes a campaign to increase general awareness of technology and the benefits available from systematic selection, improvement and proper use of it. It will spotlight technology developments likely to be of particular interest to Egyptian industry and generally promote project services. Finally, to ensure that the services are institutionalized, the project will include training for staff involved in service delivery, and consultancy services to strengthen overall management and central support services of the implementing agency.

The project will be implemented by a new unit to be created within the Engineering and Industrial Design and Development Center (EIDDC) of the Ministry of Industry and Mineral Wealth. The new unit--tentatively ITAP: Industrial Technology Applications Program--will have field staff in

Alexandria, Upper Egypt and at least one other location, as well as field and data resource staff in Cairo. Professional Egyptian staff will increase from seven at the start to at least sixteen by project completion. EIDDC/ITAP will be assisted during most of the life of the project by a technical assistance team of three industrial engineers, including a project manager, and for two years by a technical information specialist. AID will finance a host-country contract for this team, short-term U.S. and Egyptian technical assistance at the level of approximately 70 p.m.'s for U.S. personnel and up to 150 p.m.'s for Egyptian personnel, U.S. and in-country training (150 p.m.'s), documentation and access to formal and informal information networks as well as commodity procurement such as vehicles, and office equipment. Funds will be obligated for the full five years. GOE will fund costs of EIDDC personnel, office space, support staff for ITAP, staff incentives, most operating costs in Egypt, support from other EIDDC departments and other Ministry agencies, support EIDDC management and support staff services. ITAP clients will pay a fee for services received. Nominal at the start, the fee will gradually be raised and its revenues increasingly used to take over local costs from AID and AID-related sources in such a way that fee revenues will fully finance ITAP by the end of the project.

An incentive program of salary supplements for ITAP staff is to be prepared by EIDDC and proposed to the Ministry of Economy for approval for financing from the Special Fund accrued from CIP loan repayments.¹ Use of this fund will gradually decrease after the third year as it is expected that fee revenues from ITAP sources will be partly used to pay incentives for ITAP personnel.

An external Advisory Committee will be established to provide advice and assistance to the project and help promote and evaluate it. Membership will be kept small and be drawn from the industrial and financial community, including the Egypt-U.S. Joint Business Council.

By the end of the project, in 1987, it is expected that approximately 1000-2000 firms will have been helped to obtain assistance resulting in

1. See page 68 for footnotes.

more productive use of suitable technology and/or in effective identification, assessment and introduction of technology. Moreover, by that time EIDDC alone is to be providing the services developed and found effective during the life of the project, and doing so for a growing proportion of Egyptian industry, relying increasingly on Egyptian science and technology resources and receiving significant financial support for the services from their users.

External project assessments ("mini-evaluations") are planned on a semi-annual basis the first two years of the project. Formal external evaluations are scheduled during the second half of the third year, to permit major adjustments, and at the end of the project. The final evaluation will be in two phases, one the final months of the project, the other eight to ten months later to assess extent of institutionalization.

D. SUMMARY FINDINGS

This project fills a gap in the existing Mission set of industrial sector projects, and its timing coincides with rapid growth in the market it will serve. Egyptian businessmen and managers in industry, or contemplating industrial ventures, are today confronted with a variety of unfamiliar pressures and opportunities brought by such forces as competition and access to foreign partners. These are a result of the continuing economic liberalization program in effect since 1974, which has lessened control on prices and stimulated competition. To cope with these new pressures and opportunities, there is a need for information about technology available and how to acquire it, and for assistance in adapting, developing and exploiting present technology. That need is gradually being recognized. As the pressures become greater, and the opportunities clearer, a readiness to acknowledge room for improvement and a demand for information and assistance are growing. In the view of the Mission, this project will come on stream at a very opportune time.

Project design is based on inputs from Egyptian industry and government circles, on EIDDC experience with large and small industry, and on Mission experience with industrial sector projects and with the Egyptian

science and technology community. It has borrowed from the experience of organizations in the U.S. and Brazil providing similar services to similar clients, and, it has taken into account the experience of the Egyptian implementing agency with a limited extension service for small industry. (See Annex B) The Mission is confident that it is feasible in economic, technical and social terms.

ETDEC agency is already a service organization working effectively with industry at the shop floor level. It is expanding its activities to emphasize outreach to the private sector with the help of the World Bank through a project which the present one will usefully complement, by making it possible to meet service requests now beyond the Center's present capacity. Recognizing the additional burdens such a project adds to the organization's management and support services, we have included resources to strengthen both, and to minimize the demands the presence of foreign advisors places on them. On balance, the Mission considers that the project is administratively feasible and that it can be effectively institutionalized.

While there are administrative steps to be taken by the GOE prior to implementation, these will be Conditions Precedent and/or Covenants to the Project Agreement and are directly linked to AID support for the project. Thus, the Mission considers the project ready for implementation once the Project Paper is approved and the Project Agreement signed.

The project meets all applicable statutory criteria. The Statutory Checklist is attached as Annex K.

5. ISSUES

Appropriate Technology

Overall, it is assumed that the project will deal with technology of all degrees of sophistication, and that it will concern itself with improving the utilisation of existing technology as well as identification and selection of technologies to be introduced. The statement of purpose

speaks of "suitable technology" to emphasize the fact that this is by no means to be a vehicle for seeking out only the latest capital-intensive technology. Where technology selection is concerned, it is a project to broaden options.

Recognizing the existence in Egypt, as elsewhere, of "engineering man" inclined to opt for the sophisticated because of its sophistication, project policy will be to make sure other possibilities receive attention. It is obvious that there are limits to how much one can successfully push on firms technology that responds to factor availability but not to relative factor prices when the two are not mutually consistent (as is often the case in Egypt). However, when assistance and/or information is sought in identifying or assessing technology options, ITAP staff will ensure that wherever possible options appropriate to Egypt's factor endowment are among those communicated. Furthermore, the importance of seeking technology which fits the production environment will be stressed in technology evaluation/choice training. The contractor will be asked to ensure the consideration--and to encourage the adoption--of technology compatible with actual factor endowment and the priority the USAID and the GOE place on employment generation.

2. U.S. Industry Role

Project design includes an assumption that private U.S. firms can be found that will be willing to provide information and in some cases even technical assistance to Egyptian firms. The identification and involvement of such firms would be a key role of the U.S. contractor. This would be a particularly valuable source of assistance, not only for the solution of immediate problems but also for the possibilities it offers for the establishment of lasting relationships between Egyptian and U.S. firms. The fact that it has been, and is being done in other contexts convinces us that it can be accomplished in Egypt. Volunteers in Technical Assistance (VITA) and the International Executive Service Corps (IESC) have made extensive use of private industry and individuals within them as sources of technical information for twenty years. PENNTAP does the same

in the Pennsylvania context. (See Annex B, Appendix 1). The "Fundacion Chile" in Santiago de Chile taps such sources through a U.S. contractor. Moreover, as Princeton Lyman pointed out in a document he prepared for the Mission when this project was first being contemplated, industry representatives at the UNCSTD offered such assistance. The Mission believes involvement of U.S. industry as anticipated is highly desirable and well worth making a serious effort to obtain; contractors will be asked to include convincing ways of doing this in their proposals.

3. Level of Demand

The likelihood of adequate demand for the services is dealt with in the context of technical feasibility. Basically, there are well over 4,000 industrial firms with ten or more workers and few people question that most or all of them could benefit significantly from the proposed service. (See Annex B). However, it is recognized that however high need may be, demand does not match it. Recognition of the need is increasing as competition and new opportunities become more evident; the result is growing demand, as the Mission has had from the Egypt/U.S. Business Council and the GOE, and as EIDDC has discovered with its pilot small industry extension service. The project design does not rely on the natural growth of demand, any more than do family planning programs, but includes an educational/promotional element to accelerate the pace at which need is being recognized and converted to demand. Marketing will be needed, but the Mission is confident that there will be more than adequate demand for project services.

4. Egyptian Staff Retention

EIDDC provides its staff with incentive payments above and beyond benefits obtainable through its GOE budget. The present incentive program has been approved by the Center's Higher Committee and is funded by fees charged for Center services to industry. At present 37% of fee revenues is allocated for incentive payments. This has helped to hold professional staff turnover to relatively low levels. This same mechanism will apply to staff working on this project. In addition, EIDDC will propose a supplemental incentive program for staff involved in this;

project. They will submit their proposal to the Ministry of Economy for approval for financing from the Special Fund established for this and similar purposes under GOE agreement with AID for the use of local currency generated by repayment of Commodity Import Program loans. All such proposals must receive Mission approval after acceptance by the Ministry of Economy. The GOE is to consider the possibility of shifting at least part of the financing of these incentives to ITAP fee revenues as of the fourth year of the project, and is to permit EIDDC to generate fee revenues for this purpose after the end of AID support (and access to the Special Fund). Both of these matters are dealt with in Covenants to the Project.

II. PROJECT BACKGROUND AND DETAILED DESCRIPTION

A. BACKGROUND

In 1974, Egypt began moving away from the reliance on centralized planning and control of its economy which had dominated its approach to development for two decades. Since then, the government has liberalized economic policies, giving a growing role to market forces and encouraging private investment by both Egyptians and foreigners. It seeks thus to obtain the increases in national and per capita income and in quality of life.

In its Country Development Strategy Statement, (CDSS), the Mission makes clear its support for these efforts of the GOE. A key element of the AID strategy during the 1982-1986 period set forth in the CDSS is improvement of overall productivity within Egypt's economy, particularly that of the industrial, agricultural and infrastructure sectors. As noted in the CDSS, the sector which offers great potential for productivity gains, total contribution to growth and increase in employment is the industrial sector. The CDSS is reflected in the present project's focus on the industrial sector, on facilitating its growth and on increasing productivity within it. As explained in Annex B, the project has evolved out of experience both with industrial projects and with Egyptian science and technology. It is designed to complement the other parts of the Mission's project portfolio in both areas to the overall benefit of the industrial sector and the economy as a whole.

Technology is a vital determinant of the characteristics of the industrial sector and its continued development. Technology is knowledge. It is related to equipment, but is not synonymous with it. It can be thought of as referring to the package of product designs, production and processing techniques and managerial systems that are used to produce particular products or services.²

The present project fills an important gap in the Mission's industrial sector portfolio. Existing projects provide industry with financial resources to buy equipment, assist with organizational and management improvement in industrial firms and help develop the industrial labor force.³ Still, technology must be chosen before it is transferred. It is not transferred until it is received, it contributes to the economy only when it is effectively used. In terms of productivity, the choice of suitable technology establishes potential. The ability to introduce and use the technology determines the extent to which that potential is realized. Thus, what comes before and after is at least as important as the transfer of technology to the user from the manufacturer, the licensor, the research institute or other local or foreign source.

In Egypt, recognition of this last fact is increasing as the dynamics of the economic environment continue to change in the aftermath of the post-1974 liberalization. Competition from imports, insistence on public sector performance improvement, availability of foreign exchange, access to joint ventures, increased management freedom of action in public sector firms, are all sources of new pressures and opportunities. Unfortunately, in the economic environment of the past, there was little pressure to perform or freedom to exploit opportunities. Productivity has suffered because neither the habits nor the systems to ensure a technologically well-informed, dynamic industrial community have been developed.

As increasing numbers of Egyptians recognize these facts, demand for information about technology available and how to acquire it accelerates, as does desire for assistance in adapting, developing and better exploiting

present technology. The Mission has been asked by the Egyptian Branch of the Egypt-U.S. Joint Business Council to help meet this growing demand, and there have been several GOE requests for such help on an ad hoc basis for public sector firms. AID consultants confirm both the need and the growing demand (See Annex B).

The problem addressed by this project is the absence of a source to which companies and entrepreneurs in Egypt can turn with confidence that competent information or technical assistance will be found for them at a reasonable price. They need this to help them solve technological problems and/or identify and exploit technological opportunities. Evidence of need for such assistance include: reluctance to invest due to limited choices available, major delays in start-up of new operations, interruptions of production, high levels of machine down-time, equipment unable to operate at rated capacity, high levels of product rejection and of materials wastage, production capacity inappropriate to the market, or to available raw materials.

B. DETAILED DESCRIPTION

1. Overview

a. Goal and Purpose

This project is based on the premise that productivity in the Egyptian economy will be increased by sound expansion of the industrial sector as a major part of the economy, and by improved productivity in individual industrial firms.

Thus, the project goal is increased productivity and employment resulting from increased industrial productivity and expansion of the industrial sector. Increased productivity in the industrial sector will result from the selection and introduction of technologies that are appropriate, and--at least as important-- more productive use of present technology. Expansion of the industrial sector will result from growth of individual firms and establishment of new ones.

The project purpose, in brief, is,

1. to assist public, private and joint venture sector industrial firms:
 - a. to make more productive use of technology at.
 - b. to identify, assess and introduce new and suitable technology in an effective manner,
2. to institutionalize Egyptian capacity to provide such assistance through increasing reliance on Egyptian expertise.

As noted earlier, the project will be concerned with improving utilization of technology in place, and introduction of technology; in neither case is it limited to a particular category of suitable technology. The project is expected to deal with technology of all degrees of sophistication. It is to : use the options open to the individual firm, to provide assistance in : ing the options, and in these ways to :rease the likelihood that the technology selected is appropriate.

b. End of Project Status

By the end of the present project, in 1987, it is expected that,

- o approximately 1000-2000 firms will have obtained assistance resulting in more productive use of technology and/or in effective identification, assessment and introduction of new technology,
- o an Egyptian organization will be continuing to provide the services developed and found effective during the life of the project for a growing proportion of Egyptian industry, relying increasingly on Egyptian science and technology resources and receiving significant financial support for the services from their users.

3. Outputs and Inputs

Project outputs are:

1. Solutions to technological problems of industrialists and prospective industrialists (at least 2000-3000 requests met during project life to solve industry problems in the industrial sector);
2. Growing demand for assistance in solving technological problems (requests for services increase 5 to 10 times from Year Two to Year Five);
3. A functioning Egyptian technical assistance and information service (at least 16 fulltime professionals trained and staffing the program by project end; 50-75% of information and technical assistance requests met by Egyptian sources of expertise the final year; 40-60% of requests from repeat clients by the final year);
4. Strengthened parent organization (EIDDC) (absence of significant project delays attributable to overstretched management or support services of EIDDC).

Inputs are described in functional terms in the table on the following page,, where the corresponding budget line items are also indicated. Total AID funding will be a grant of \$ 10 million, all of which is to be obligated in FY 81 for the life of the project. The GOE contribution is the equivalent of \$ 4.6 million to be provided in local currency or in kind over the life of the project.

I N P U T S

Estimated level of effort for each input (\$000)

<p>1. Service to firms</p> <p>a. individual company diagnostic studies</p> <p>b. technical information in response to inquiries</p> <p>c. technical assistance to firms by foreign specialists</p> <p>d. industrialists introduced to local expertise for technical assistance.</p>	<p>1. Personnel L.T., U.S. 1354</p> <p>Personnel, Short-term, US 594</p> <p>Personnel, Short-term, Egyptian 396</p> <p>Infor. Services 607</p> <p>Training 345</p> <p>Commodities 730</p> <p>Operations 224</p> <p>Special Costs 168</p> <p>Evaluation 43</p> <p>Contractor, overhead & fees 560</p> <p>Indirect Support 1245</p> <p>SUBTOTAL 5,666</p> <p>Inflation Factor 3,089</p> <p>Contingency 435</p> <p>AID & GOE TOTAL \$9,190</p>
<p>2. Promotion</p> <p>a. use of media, publications, workshops, conferences</p> <p>b. visits of industrialists EIDOC engineers and others to US industrial firms for special problem/technology issues.</p>	<p>2. Personnel, L.T. 236</p> <p>Personnel, Short-term, U.S. 106</p> <p>Infor. Services 68</p> <p>Information Dissem. 262</p> <p>Operations 37</p> <p>Special Costs 26</p> <p>Evaluation 11</p> <p>Contractor overhead & fee 100</p> <p>Indirect Support 178</p> <p>SUBTOTAL 1024</p> <p>Inflation factor 558</p> <p>Contingency 79</p> <p>AID & GOE TOTAL \$1,661</p>
<p>3. Delivery Capacity Development</p> <p>a. staff training</p> <p>b. staff mobility, communications and operations ensured with needed equipment, vehicles, etc.</p> <p>c. documentation and access to information services.</p> <p>d. technology contacts and networks in Egypt and abroad.</p> <p>e. local data bases developed.</p> <p>f. organization development.</p>	<p>3. Personnel, L.T., U.S. 773</p> <p>Personnel Short-term, US 360</p> <p>Personnel Short-term Egyptian 21</p> <p>Training 151</p> <p>Commodities 86</p> <p>Operations 117</p> <p>Special Costs 68</p> <p>Evaluation 26</p> <p>Contractor & Overhead fee 340</p> <p>Indirect Support 355</p> <p>SUBTOTAL 2,297</p> <p>Inflation factor 1,252</p>

2. The Project

a. Implementing Agency

The project will be implemented by the Industrial Technology Application Program (ITAP), a new organizational unit within the Engineering and Industrial Design Development Center, a semi-autonomous Egyptian organization operating under the aegis of the Ministry of Industry and Mineral Wealth. The Center was established in 1968 and currently operates from facilities, including extensive workshops, at two locations in Cairo. Its current objective is to assist industry by developing product and industrial designs, improving engineering technology, construction of prototype equipment, and the dissemination of technical information. With a staff of over 400, including 60 engineers, it serves large and small industry of the public, private and joint-venture sectors. Its present service departments are:

- o Product Design & Development
- o Processing Equipment Design
- o Engineering (production technology & tool design)
- o Process Design
- o Workshops (for prototypes)
- o Heat Treatment and Material Testing
- o Training
- o Small Industry Development

EIDDC is further described in other parts of the Project Paper and in Annex C.

An Advisory Committee will be established for ITAP to provide it with policy recommendations, to unofficially monitor its implementation of the project and to assist in both promoting and evaluating its activities. AID and EIDDC representatives have agreed that membership should be kept small and should include the Minister of Industry and Mineral Wealth as Honorary Chairman, the Chairman of the Egypt Branch of the Egypt-U.S. Joint Business

Council, the Chairmen of the Development Industrial Bank and the Misr-Iran Bank, the Director of the National Research Center, the Director General of EIDDC, and, on an ex officio basis, a USAID representative to be named by the Mission Director.

EIDDC staff in ITAP will consist initially of a program head, two Technical Specialists and four Resource Specialists; the specialists' numbers are to increase to ten and six respectively over the life of the project. The Technical Specialist will be the field engineer who does diagnostic studies and is the link between the industrialist and information sources. The Resource Specialists maintain and operate the information system. (See Annex E for brief job descriptions).

In the context of this project, the ITAP unit in EIDDC (ITAP/EIDDC) will play the role of: a) a provider, b) a broker, c) a promoter. The first two roles will largely depend on the type of assistance sought.

As a provider, the ITAP unit will itself provide direct assistance to companies in the form of:

- o diagnostic studies;
- o information regarding technology, sources of technology, and sources of assistance in using technology;
- o training in technology choice and diagnostic skills;
- o technical assistance from abroad; and
- o technical assistance and training in EIDDC's areas of expertise.

The last of these will be provided by the technical, small industry and training divisions of EIDDC, but the others will be provided by the ITAP directly or indirectly by subcontracting Egyptian and/or U.S. specialists and through the Small Industry Development Department depending on the type of assistance needed.

As a broker, the ITAP unit will be a middleman when it cannot itself provide the expertise needed. For example, it will identify Egyptian sources of assistance and then, depending on client wishes, assist in

initial discussions, in assessing the source's ability to cope with the problem in question, and even in negotiating a contract or working agreement. When local sources are unable to meet the need, ITAP will arrange, through the contractor, to identify U.S. specialists with appropriate qualifications, who will then be brought to Cairo by EIDDC. Or, the client can simply obtain from the Center names and references of sources of assistance and make the necessary arrangements without Center involvement. In this case, as in all others, the final role of ITAP is one of follow-up to ensure that the help sought was obtained, to learn its results and to identify any further needs the Center can meet.

For both roles, AID funding will permit EIDDC to provide Egyptian and U.S. consulting services at what will initially be subsidised rates, with AID funding diminishing over the life of the project (See II.B.2.b, below).

As a promoter, the ITAP unit will organize a continuing campaign to keep the business community informed of technology developments, the benefits available from improving technology and the use of it, and the services available through the Center.

Inasmuch as the promotional effort is to increase Egyptian interest in using technology to benefit the country, the project will provide some participant training funds to help firms strengthen their own R&D capacity when this is a useful adjunct to information and/or technical assistance.

EIDDC will be assisted during the life of the project by a US contractor with a team (two to four people) on site long-term, by short-term expertise in a wide range of technical areas, and by a back-stopping organization in the U. S. to provide staff training, information searches, identification of technical consultants, visits U.S. industry and other needed support. The resident team will ensure project management and direction, industry assistance (with ITAP staff) and staff training in Cairo and in the governorates, and development and initial exploitation of the information system. The role of the contractor is described in in the pages that follow and in detail in Annex D.

D. Activities

Four matters of ITAP policy should be mentioned before going into project activities.

First, the project will serve large, medium and small public, private and joint venture industrial sector firms as well as individuals or organizations about to start industrial ventures. The only firms excluded will be handicraft enterprises; ie. less than 10 employees.

Second, the subproject is to serve industry through Egypt. EIDDC currently operates from two locations in Greater Cairo (one being in Giza), but plans to gradually increase its accessibility to the rest of the country. In the second half of 1981, it expects to open in Ismailia its first provincial branch office. From there, a small technical staff would undertake diagnostic studies in local industry and identify problems for reference to the technical departments in Cairo and Giza. EIDDC and the Mission have agreed that the ITAP activity will function through at least three branch offices outside the Greater Cairo area by the end of the project. One office will be added each of the first three years, starting in Alexandria, including one other office in the North and one in Upper Egypt.

Third, the activities of the project will not be limited in terms of the technical fields to be addressed, other than that they be industrial. The fields will be determined by those seeking assistance. Thus, focus will be broad in terms of industry sub-sector. However, there are areas of "soft technology" relevant to all subsectors and generally considered to be major needs in Egyptian industry. Principal among these are preventive maintenance and manufacturing process control.⁴ Given their pervasive importance, it is possible that demand for assistance in one or another of these areas may justify special project efforts; possibly, a U.S. specialist in one of these areas on more than a short-term consultancy basis. No such special attention is pre-programmed, but there will be sufficient flexibility in design and contractual arrangements to permit appropriate action with AID concurrence should EIDDC consider it desirable.

Finally, clients will be asked to pay a fee for ITAP services, as they now pay for other services from EIDDC. Apart from discouraging frivolous requests and ensuring that results are taken seriously, this fee is expected to eventually generate significant revenues. Prior to the arrival of the contractor, EIDDC is to prepare and submit to AID for approval a policy for ITAP service fees and a schedule for periodic review and revision of that policy during the life of the project. It is assumed that fees will be nominal at the start and will be increased subsequently, at least by the end of the third year when service value has been demonstrated and the level of demand can reasonably be estimated. Policy objectives will include (a) avoiding fee levels so high during the early years that potential clients are reluctant to try the unproven service; and (b) having fee revenues at a level by the end of the project to cover Egyptian costs which were funded by AID during the life of the project. These costs would include recurrent local currency operating costs, staff compensation at or above the level attained with the use of Special Fund resources during the project, and the local currency equivalent of recurrent foreign exchange costs for information system subscriptions and/or access. (GOE agreement to this use of fee revenues and to continued financing of ITAP to the extent fund revenues fall short of ITAP costs is stipulated in a Covenant to the project.) It is assumed that by the end of the project, Egyptian capacity would be sufficient that there would no longer be need to call upon more expensive external advisory services.

In practice, the use of fee revenues to finance operating costs will begin before the end of the project. AID project budgeting assumes that AID financing of certain local costs (e.g. promotional activities, international telex and telephone operating expenses) will diminish in years four and five, to be increasingly covered by fee revenue. In addition, the GOE is to review Special Fund financing of ITAP staff incentives late in Year 3 to determine whether a portion of this cost cannot be financed from fee revenues starting already in year four; this is the subject of a Covenant to the Project Paper.

The project will involve three sets of activities described in the following pages, which will provide project outputs:

- i. Solving industry's problems, by responding to requests for assistance, with in-company diagnostic studies of the problems, technology information services, and help in identifying and, in some cases, obtaining consulting services;
- ii. Developing awareness through publications, advertisements, conferences and taking small groups of industrialists and engineers to look into particular technology issues in U.S. firms;
- iii. Institutionalization through the activities just cited, and through training of ITAP staff and organizational development consultancy inputs to facilitate integration of ITAP into EIDDC and to strengthen the overall organization.

1. Solving Industry's Problems

Requests for assistance and information will reach EIDDC in a variety of ways,

- o as a result of unsolicited visits to companies by Technical Specialists,
- o via telephone, letter or telex,
- o through the field activities of the Center's Small-Scale Industry Department,
- o through the intermediary of other arms of the Ministry of Industry and Mineral Wealth, e.g. the Productivity Centers throughout the country,
- o through referrals from other organizations, such as the Industrial Development Research Council of the Academy of Scientific Research and Technology, the Investment Authority, financial institutions, and other USAID project organizations involved in industry (see list in footnote 3).

Each request for information or technical assistance will be assigned to a Technical Specialist upon receipt. The assignment will be on the basis of technical speciality, experience and workload. The Technical Specialist will remain responsible for the request through evaluation of the response's value to the user.

Diagnostic. The Technical Specialist will first ensure that the inquiry accurately reflects what the requestor is seeking, that all relevant supporting information needed is incorporated, and that there are no obvious reasons the requestor will be unable to benefit from the information or assistance sought. In the vast majority of cases, this would be done through a visit to the requestor.

When the request is only for information, a single visit and a very superficial diagnostic survey should be sufficient to probe the request and acquire at least the general sense of the firm and its management needed to put the request in context. In some instances, this can be done by telephone particularly when the firm is known from prior experience or when a diagnostic has been done under other auspices (e.g. the Management Development for Productivity Subproject) and shared with EIDDC.

A more thorough diagnostic will be required when technical assistance is sought through the Center. It is also essential as a prelude to any significant investment. Thus, such a diagnostic study could be a useful addition to an application for bank financing. The diagnostic study is an assessment of the technological obstacles and opportunities, generally as they relate to the request at hand, in a particular company context. The purpose is to identify ways in which production and productivity can be increased through suitable technology, taking into account managerial, organizational and operational aspects of the company. Thus, it involves evaluating both strengths and weaknesses. It assesses the company's awareness of and responsiveness to opportunities to benefit from technology with new or existing products, processes, by-products or materials. It will also identify ways to reduce costs, for example, through better use of

existing equipment, more efficient plant layout or energy conservation.

Situations will be encountered in which neither the Technical Specialists and the contractor team nor other EIDDC staff have the experience needed for a satisfactory diagnostic study. For example, this could arise in food processing or clothing manufacturing, both areas in which EIDDC has not worked to date. In such cases, the contractor can authorize engagement of an Egyptian consultant for assistance in diagnostic studies. The contractor will be responsible for approving the candidate and the scope of the assignment, but formal arrangements will be made by EIDDC and payment will be by AID. Rates paid will be governed by AID regulations, and normally assignments will not exceed four days for an individual request.

In the course of the diagnostic, the Technical Specialist and contractor personnel will be particularly attentive to situations in which there exist, or could usefully be developed, a Research and Development unit in a firm. Where these exist, the project makes provision for assisting in-company R&D units through staff training in the U.S. and, wherever possible, through establishment of collaborative relationships with U.S. researchers in industry and elsewhere with similar interests.

The results of the diagnostic will be presented to the client by the Technical Specialist orally and in a concise written form. The report will make clear potential opportunities for increasing benefits from technology, the action required to more accurately evaluate them (e.g. information gathering and analysis), and action needed to remove constraints to realizing the benefit (e.g. through retraining of personnel, new staff, organization change, plant layout modification). The client will also be told how EIDDC can help further through its information sources, its technical capabilities in-house, or its technical assistance sources, and where assistance beyond the scope of the project and EIDDC can be found (e.g. through other USAID industry-sector or science and technology projects).

Information. Given a request for information, and after having

undertaken at least the superficial diagnostic described earlier, the Technical Specialist will consult the Center's documentation facilities and its data base on Egyptian information, research, experience and expertise. This will often lead the Technical Specialist to an Egyptian source of expertise or information outside EIDDC itself; this searching process is a key part of the ITAP service and will involve both the Resource Specialist and the Technical Specialist. When these sources do not provide an answer the Technical Specialist considers sufficiently complete, he will tap the data bases abroad to which he has access, including those accessible through other Egyptian institutions and networks available through the contractor. This would normally be done by telex or telephone to obtain the information with as brief a delay as possible.

The telex reply or--more often--replies received will be analyzed by the Technical Specialist, who will prepare a response for the client in understandable terms and, normally, in Arabic. Supporting technical documentation will usually be left in its original language for subsequent translation at client expense if translating is considered necessary. As in the case of the diagnostic, the Technical Specialist will report the answer personally to the client with sufficient discussion to ensure that it is understood, that problems likely to arise in using it are identified, and that the client knows he can obtain further help if it is needed. After four to six months (or more, if experience so dictates), the Technical Specialist will call on the client to learn what results were obtained from the information; this feedback will be used to improve program planning and as inputs to the on-going public education effort.

When the objective of a request is identification of suitable technology, the Technical Specialist (and contractor personnel) will ensure that wherever possible options appropriate to Egypt's relative factor endowment are among those communicated, and that their appropriateness in the particular case is duly considered.

The types of information requested are expected to be highly varied, including, for example,

- o identification of technology options,
- o sources of equipment for particular purposes,
- o possible licensors,
- o marketing channels overseas,
- o sources of particular raw material or processed inputs,
- o solutions to specific technical problems,
- o sources of expertise in a given field.

In the context of the project, EIDDC/ITAP and the contractor will develop an Egyptian data base identifying individuals and organizations with qualifications and experience likely to respond to industry needs. This will become a major asset to ITAP, and the planning for its development will be a high priority on the agenda of the contractor's information specialist during the first year. A key first step will be identifying and obtaining copies of directories that have already been prepared by the Academy of Scientific Research and Technology, the Confederation of Engineers and others. Information updating these will be acquired as they are used, without special costly surveys. In fact, EIDDC's own activity will be a major source of inputs to its expertise data base.

The contractor will also assist EIDDC in developing a data base to identify Egyptian firms by their products if other foreign assistance is not available for this purpose. (It may be part of the World Bank project described below.) This will be undertaken more gradually to identify sources of experience, as well as to provide a guide for the marketing of project services. In addition, the Center will organize its technical information resources to facilitate access to them, and will build on the present base. Where it is practical, the ITAP data bases will be kept on EIDDC's computer system. This is particularly appropriate for those parts likely to change frequently, including the expertise file. AID will provide for ITAP some supplementary memory capacity and terminals for the small computer system EIDDC has recently purchased, and short-term consultants will be used to supplement resident team expertise as needed

for data base building. When possible, information and technical assistance will be found in Egypt and when it is not available in-country, it will be sought abroad.

The Applied Science and Technology Project (263-0016) with Egypt's Academy of Scientific Research and Technology will provide EIDDC with access to the computer-based technical information system to be developed and introduced under that project. At present, this means telex inquiries and postal replies using Lockheed and BRS data bases via Georgia Institute of Technology. The Center also has access to UNIDO's technology data bank.

In the U.S. a variety of data bases and industrial firms willing to share some of their experience with Egyptian companies will be accessible to EIDDC through the Contractor. During most of the project life, these will be reached through the Contractor. However, by project end, EIDDC should have its own network and direct access to those commercial services found most useful and not readily available through other Egyptian channels.

Consulting Services. When a technical assistance request is received, a diagnostic study will precede any further action. Normally, this will be a relatively extensive assessment as described earlier. However, there will also be cases of new ventures being considered where there is no on-going operation to assess and the diagnostic will be limited to preparatory work done to date.

Standard policy will be to search first in Egypt for a source of the needed expertise. Sources of technical assistance will be found in Egypt through the data base to be developed by the Center, and through the informal networks of Center staff. In addition to EIDDC itself, prospective sources of expertise include the industrial and research communities, universities, consulting firms, productivity centers, and retired individuals with industrial experience. When there is a need for help outside the scope of this project but complementing that directly related to technology to ensure maximum benefit from the latter, USAID projects providing services in management development, vocational training,

and investment financing are expected to be important sources of assistance on which EIDDC can help its clients draw.

As outlined above under "Implementing Agency," EIDDC will help the client obtain the expertise if he wishes, or will give him the names and references with which he can make his own arrangements. In many cases, it may be possible that EIDDC itself can provide the technical assistance and/or training needed to complement technical assistance from other sources. However, there will be many needs in areas in which the Center has no expertise. In these cases, if the client wishes, the Technical Specialist will assist the client in obtaining and evaluating proposals and in negotiating an agreement for assistance.

Whether the assistance is obtained from an EIDDC technical department or from another individual or organization in Egypt, there is likely to be a charge for it. As a matter of principle, this should be borne by the primary beneficiary, the client. In practice, it is clear that many cases will arise in which industrial clients will be reluctant to pay going rates to Egyptian consultants whose reputation has not been established; there will also be cases in which the clients cannot afford the cost of consulting services. AID will provide funds to permit EIDDC to pay a part of the cost of the consulting services provided by Egyptian specialists exclusively in the context of the ITAP program; EIDDC and the contractor will approve use of these funds on a case by case basis. The client will be expected to also pay a part of the cost. In such instances, the client would have a contractual arrangement with EIDDC/ITAP at a certain rate, and the consultant would have a contract with EIDDC/ITAP to provide the service at a higher rate. The difference would be financed from ITAP's AID budget. As the project progresses, local consultants will acquire experience, develop credibility and demonstrate what they can accomplish in industry; industrialists will learn that they can benefit from the consultants, and that their services have a real value. As this occurs, much of the reason for the subsidizing of the consultants should vanish. Assuming this to be true, reason, the subsidization of Egyptian consultants will be gradually diminished over the life of the project. The rate at

which it is reduced and whether the fraction of the cost paid by ITAP decreases, or the number of cases in which consulting services are project-subsidized declines, or both, are among policy matters to be proposed by EIDDC and approved by AID. A Condition Precedent requires of EIDDC a statement of policy guidelines to govern the use of services of Egyptian consultants to assist companies, including acceptable fee levels, level of effort limits for single projects.

It should be noted that this arrangement is not envisaged for the use of the services of EIDDC itself or of other GOE organizations (e.g. the National Research Center). GOE-financed, public service organizations should be able to make their services available to those in need of them without subsidies via this AID project.

By the end of the project, EIDDC/ITAP role in educating the industrial community to the value of Egyptian consultants and its role in developing the capability of these consultants should have reached the point at which the industrialists are prepared to pay the market rate for the consulting services from their own company budgets. By this point, EIDDC/ITAP's role will be mainly a broker for information and technology services, except to the extent that EIDDC staff can, itself, provide the services needed. ITAP will continue to charge fees for all the services it will provide.

After consultation with local specialists, should the Technical Specialist and the client feel that expertise is needed from abroad for a particular task, this option will be reviewed with the EIDDC project manager and the contractor team leader. If there is agreement that the contractor in the U.S. should be asked to identify a consultant, EIDDC will solicit from other firms in the business community expressions of interest in the services of the proposed consultant during his time in Egypt, with the understanding that there will be a modest charge for the service at about the level of moderate Egyptian consulting services. To help stimulate interest in getting more from technology and to maximize the benefits from consultants' visits, they will normally be brought in only if there is a reasonable likelihood of serving other firms, in addition to the

initial requestor, through consultancies and workshops. Consultants will be identified for EIDDC by the contractor, but their inputs will be procured directly by the Center via Purchase Order (See Implementation Plan).

Requests to the U.S. contractor to identify specialists would be accompanied by diagnostic reports and any other information the Technical Specialist, the project manager and the contractor team leader consider important to ensure optimal recruitment.

Requests are likely to be highly varied, but are expected to include assistance in,

- o selection of suitable technology for a new venture,
- o adapting process operation to local raw materials,
- o increasing product quality,
- o increasing consistency of output quality
- o reducing system downtime,
- o removing production bottlenecks,
- o new product design,
- o product adaptation to local conditions of use,
- o process development or improvement,
- o research project development,
- o establishment of company R&D unit,
- o product redesign or identification.
- o design of Energy efficient power supply and use.

Whenever it is feasible, in terms of availability of qualified specialists and their interest, an Egyptian specialist will be invited by the Center to work with the expatriate on the assignment. The charge to the client(s) for the foreign consultant will

finance compensation for such Egyptian specialists. They will be involved for the contribution they can make, for the added experience they can gain, and for the assistance they can provide later in following up the mission of the outside specialist.

Given its limited resources, ITAP will not be able to subsidize consulting missions of any great length for a single firm. The average intervention should be about five-six days, perhaps spread over a month, bearing in mind that one is dealing with experts in specialized areas. The maximum should probably be set at about ten days, subject to revision on the basis of experience, bearing in mind both the limit on fund availability and the project objectives in terms of companies served and requests receiving responses. Where longer consultancies are clearly needed, ITAP will identify specialists for the client (often an Egyptian specialist who has worked with an American brought in by ITAP during the short-term intervention) and assist in negotiations for assistance; it will provide the same service with foreign consultants, and in this context, will bring the IESC and VITA to the attention of its clients.

The conduct of the consultancy missions will vary considerably with the nature of the assignment(s). However, practical results will be the objective; and, in general, there will be only brief, written reports required by EIDDC outlining the work done, follow-up or complementary effort required and the results expected. Basically, the consultancy work for each firm will be confidential, but the Center will be provided enough information to evaluate results, including the provision of such assistance, in order to support the specialist's work with follow-up monitoring and assistance as needed, and to build its data bases on companies, technology and sources of expertise.

As in the case of the information activity, four to six months after completion of the consultancy assistance (or longer, if that proves to be necessary), the Technical Specialist will re-visit the client to obtain the client's assessment of the value of the assistance. This will be a key input to project records and the evaluation process.

To complement the consulting, ITAP will offer training on a regular basis for some topics and, on an ad hoc basis for others. Thus, practical training will be scheduled regularly to teach key client company managers and technical personnel diagnostic skills and technology evaluation methodology. Furthermore, on the basis of expressed interest in the industrial community, special training will also be arranged on topics of broad interest, such as preventive maintenance, energy conservation, or assessing licensing opportunities. As noted earlier, participant training funds are available for use in helping firms establish or strengthen R&D units where the contractor and EIDDC determine use of such funds would be beneficial. The precise form of training that might be provided has intentionally not been defined so to permit maximum responsiveness.

ii. Developing Awareness

As noted earlier, promotion will be a vital part of the project. A vigorous effort will be undertaken to increase awareness of industry's needs for technology-related information and assistance to resolve problems and the role of EIDDC/ITAP in meeting those needs. This effort will have three foci,

- o educating the industrial community to the broader concept of technology ("more than a machine") and to the benefits available from systematic selection, improvement and proper use of it,
- o keeping the business community informed of technology developments likely to be of interest in Egypt, and
- o making known the services available from the project and EIDDC.

Contractors will be asked in their proposals to describe the ways in which they would propose to implement this effort. Apart from use of the media, the plans should include workshops or mini-seminars utilizing short-term consultants who have been brought in to provide technical assistance. Such workshops and services may be jointly organized with universities, research centers and similar organizations. At least twice during the life of the project, there should

be a major conference dealing with technology and productivity; these are anticipated in the budget. As follow up to these conferences and workshops, technical bulletins in Arabic will be issued to the Egyptian business community. To complement the awareness effort, the contractor will organize carefully planned visits to firms in the U.S. by small homogeneous groups of industrialists and technologists from EIDDC, research centers and other resource institutions. Approximately eight groups of eight persons each will take part in them during years two, three, four and five. Awareness efforts will be aimed at varied audiences, including organizations and projects concerned with industry, business and engineering associations, financial institutions and foreign donor agencies. At least one should include persons responsible for in-company R&D units. Particular attention and a substantial part of the effort will go to reaching the very large (in number of firms) and highly dispersed private sector.

During the early months of the project, once staff training in the U.S. is complete, an initial promotional campaign will be built around the use of short-term specialized consultants. A consultant will be brought in for four to six weeks, spending his first ten days making brief get-acquainted visits to plants previously identified by ITAP staff. He will make it clear to each industrialist that he can return for a longer, more analytical visit during the later part of his stay in the country. The visits will be accompanied by newspaper and radio publicity and the assistance of members of the ITAP Advisory Committee. Scheduling will be up to the contractor and EIDDC, but three to five such visits touching different subsectors appear to be ample to make the project known in the industrial community.

iii. Institutionalization

The institutionalization of ITAP will result from a number of forces: the building of demand through quality service delivery and promotional activities; the establishment of ITAP Egyptian and foreign information and assistance networks; the development of local data bases; the growth of a cadre of experienced staff are key among these forces. This will be brought about, in large part, by concentration on solving

industry problems and on developing awareness and demand. However, project activity also includes staff training as a key component to make institutionalization possible in personnel terms, and consultancy assistance to help EIDDC integrate ITAP and adjust to its own changed character.

As noted earlier, ITAP staff will consist initially of a Program Head, two Technical Specialists and four Resource Specialists whose jobs are described in Annex E. Their numbers are to increase as follows over the life of the project,

<u>Staff</u>	<u>Year</u>				
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
Program Head	1	1	1	1	1
Technical Specialists	2	4	6	8	10
Resource Specialists	4	4	6	6	6

Development of this staff will involve taking graduate engineers, with industry experience in the case of the Technical Specialists, providing them with specialized training, then putting them on-the-job working with the contractor's resident specialists to sharpen their skills.

The Technical Specialists will need training primarily to develop skills in problem identification and diagnosis, interpersonal communications, and organization of their own work, plus some familiarity with conventional and computer data bases. In addition, they will have to be introduced to the reality of a technology information/assistance program in operation to develop an understanding of what can be done, and how. Some of the specific skills needed can be taught in the classroom, but they should also be observed and applied in practice away from the pressures of the job in Egypt and, subsequently, with coaching assistance on the job in Egypt. The contractor will be asked to design a training program for the Technical Specialists. Three months is considered sufficient for the necessary instruction and familiarization with such systems in the U.S., if one is working with engineers with some industry experience and a good command of English.

The Resource Specialists should have engineering training but may not necessarily have any industrial experience. With ITAP they will have to build, maintain and exploit an information system utilizing a range of Egyptian and foreign sources, formal and informal. They will also have to teach EIDDC personnel how to use the system and to participate in the development of it. They will have to be capable of effectively communicating with the technical users of their services. While they may have an engineering education on which to build, they may have no background at all in information sciences. Their training will require more than the three months envisaged for the Technical Specialists, and formal training will be a larger part of their program. That program should include formal classes in an information sciences program, plus on-the-job experience with an organization responding to industry requests for technological information (preferably the Contractor for the familiarity it would give the Egyptian staff with their back-up resources and people). It is anticipated that six months of formal training will be needed in addition to two months of on-the-job training.

Given that EIDDC does not currently have engineers who possess the qualification of a Resource or Technical specialist, and since the presence of these specialists are critical for initiating this project, USAID will fund the initial training program for four Resources Specialists and the two Technical Specialists from the Technology Transfer and Manpower Development III Project 263-0026 immediately after the approval by AID/W of this project.

It is anticipated that the first trainees will return to EIDDC shortly after the U.S. long term contractor is on board. In case of any delay in training implementation, project funds are provided to the contractor to use the services of U.S. short term technical specialists to start project activities until return of EIDDC trainees. The remaining ITAP staff will be trained on a yearly basis in accordance with a training plan designed by the contractor. In order to utilize the diagnostic and information tools essential to the success of this project, a good command of technical English is essential for all ITAP staff. AID language programs can be used to meet this requirement.

Training program design will be the responsibility of the contractor, and proposals will outline available resources and a draft program. The latter should incorporate the following characteristics and considerations,

- o reliance primarily on short-term training for each individual/group during the life of the project;
- o training in Egypt and abroad;
- o practical experience in operations similar to those of ITAP (or a part thereof), as well as more formal training;
- o attention to establishment of contacts/networks abroad and in Egypt as well as to development of knowledge, attitudes and skills;
- o staff should be familiar with the ways in which industry adversely impacts the environment, and with principal technologies which minimize such impacts;
- o staff should be informed of, and be sensitive to, the existence of light capital options for many technologies, and capable of helping industrialists evaluate them;
- o recognition of the fact that training abroad can play an incentive role as well as a learning role; and
- o recognition of the likelihood of staff turnover during the life of the project.

In the interest of developing collaboration within EIDDC and other Egyptian entities, there may be occasions in which non-ITAP personnel should participate in ITAP's training for its own staff; this option will be open to EIDDC and the contractor. In addition, advantage will be taken

of opportunities to develop staff in conjunction with training sponsored by other projects and/or organizations, including the Small Scale Industry project within EIDDC and the National Science and Technology Information Project of the Egyptian Academy of Scientific Research and Technology (AID Project No. 263-0016).

The enhancement of EIDDC, itself, as a base for ITAP will result from the development of ITAP. Thus, in its outreach function for EIDDC's Technical Services and Training Departments, and as a resource for these and the Small Industry Development Department, ITAP will strengthen EIDDC. The project does not include assistance explicitly programmed for these other divisions, which are aided by multilateral and other bilateral donors. However, as is the case with other Egyptian organizations with which collaboration is important for achievement of project aims, they are likely to be represented on some technology teams visiting the U.S. and, as noted above, some of their personnel may be included in ITAP staff training activities.

Beyond this, the subproject includes modest inputs to provide EIDDC assistance in coping with growing, changing demands on its management and support services. New organizational requirements are established by the growth and change of character of EIDDC implicit in the expanding small industry extension activity and the introduction of ITAP. They create both an opportunity and a need to review, adapt at least the informal management practices of the organization to ensure full integration of the new activities with the old, and to avoid overloading a system established for more limited aims. In addition, EIDDC support services will be confronted with new and increased demands and importance as a result of the particular characteristics of these new activities--highly mobile staff, large numbers of clients widely scattered, domestic and foreign networking, clientele for whom service value is inversely related to the delay in providing it.

The need this will create for review and strengthening of central management and support systems is recognized at EIDDC and by the Mission.

Thus, to strengthen ITAP's EIDDC base and to facilitate its absorption by EIDDC, the project includes provision for a consulting/training input during the first year and a half, when the World Bank project is also expected to be coming on stream (see Annex F). The U.S. contractor will plan and carry out a process consultation to identify, plan and implement with EIDDC officials appropriate changes in management and support systems to maximize the effectiveness of the expanded organization. Detailed planning of the effort will be done by the contractor. This activity is expected to involve an initial period of approximately two-four weeks of work at EIDDC with the staff, followed by several shorter interventions during the project's first 18 months while changes are introduced, results judged and modifications made.

The contractor should investigate the possibility of using the AID-funded Management Development for Productivity (MDP) project as a part of the organizational development effort. The breadth of the effort needed at EIDDC goes beyond what MDP is designed to offer. However, the inclusion of a small cadre of management staff from EIDDC in one or two MDP programs that are not industry-specific could strengthen the broader effort within the Center and increase its impact. In addition, the possibility of local training to upgrade the skills of accounting and other key support functions is anticipated. EIDDC management and the contractor will determine needs and EIDDC will make the administrative arrangements.

Thus, the overall subproject strategy with regard to EIDDC institutionalization is (a) to build the ITAP capability; (b) to strengthen internal linkages via the management training and selective involvement of non-ITAP staff in training principally for ITAP personnel; and (c) to assist in an analysis and improvement of the overall organization in light of the new activities it is undertaking.

4. Relationship to Other Projects

a. Other Donor Projects

EIDDC is receiving assistance from several bilateral and multilateral

sources. The bilateral sources include the Federal Republic of Germany, Austria, the Netherlands, Sweden and Italy, from whom funds are available primarily for equipment and participant training, not necessarily tied to specific projects.

The principal multilateral sources are the World Bank and UNDP. The latter, having been involved through UNIDO with EIDDC since its creation in 1968, continues to provide assistance in the form of short-term specialists, fellowships and some limited commodity support. Its current program with EIDDC involves general support, as just described, which will end in 1981, and a project to develop the Center's Training Department. The latter project will end its first phase in 1981. A second phase (three years, \$2.5 million) will begin in 1982, providing resident audio-visual and training methodology specialists for one year, short-term technical specialists, fellowships and some equipment. The 1982-1986 UNDP Country Program also calls for an ILO-administered three-year project to expand the Center's ability to deliver management training and advisory services to entrepreneurs and workers in small industry in three northern governorates, and a first phase of a project to develop agricultural machinery for small scale farmers. (See Annex C).

The World Bank is just completing a small-scale industry extension service pilot project in which EIDDC has served as the implementing agency. World Bank funding was channeled through the Development Industrial Bank (DIB) which sees a need for such services for its small business clients. An ILO extension specialist funded by the Bank has been working with a Center field team for just over a year, focussing on engineering, metalworking, plastics, woodworking and furniture-making. A second team is to be fielded in mid-1981. This assistance will be continued for another year with UNDP and other support. Meanwhile, the World Bank is preparing to include, in a new loan to the DIB, funds for the mid-1982 implementation of a 2.5 year program under which EIDDC is to gradually build up to six field teams operating out of Cairo and Alexandria (See Annex F).

The bilateral and UNIDO assistance tends to focus mainly on the Technical Services and Training activities of EIDDC. However, the flexibility of these donors is such that they can make it possible for a program such as ITAP to utilize non-American expertise that would be inaccessible if AID were the only funding source.

The Small Industry Development Department is of particular interest in the context of this project because of its active outreach function and need to respond to a wide variety of problems. The aims and concepts of this project and that of the World Bank have been discussed with the EIDDC director, the ILO/World Bank extension specialist at the Center, his section head at ILO, Geneva, and the World Bank officer responsible for the project and involved with it since its early development in 1977. The consensus is that the two very effectively complement each other. ITAP will (a) greatly strengthen a key EIDDC weakness--its information services--to the benefit of the small industry project and (b) will provide access to experienced U.S. industrialists not accessible through the Bank's project, as well as to more short-term expertise than is available there. On the other hand, the small industry extension service will greatly increase EIDDC outreach, bringing businessmen and ITAP services together. In addition, ITAP will add the following:

- o. assistance for many firms not targeted by the small industry program, e.g., larger companies, subsectors outside its scope (food-related and clothing, for example), prospective--as opposed to actual--industrialists, financial and other non-industrial organizations serving industry;
- o bridge-building from industry to the science and technology community; and
- o strengthening of the central management and support structures of EIDDC on which all of the activities depend heavily.

AID Projects

As was pointed out at the beginning of the Subproject Paper, this subproject forms part of a panoply of Mission activities focussed on industrial development. (See footnote 3). To increase their individual and collective effectiveness, the Mission will promote inter-project coordination and collaboration. Recognizing the complications created by the involvement of different implementing agencies, contractors and offices within the Mission, strategy will be to avoid trying to command coordination, but to focus on creation of an environment in which opportunities conducive to active inter-project communication and collaboration are possible. Within the Mission, an industrial sector task force of project managers responsible for projects aimed at that sector will be established. Its purpose will be to ensure effective communication within the Mission regarding project activities, and to review and promote such communication among implementing agencies and contractors. It will also organize periodic briefings on different project activities for key Egyptian and expatriate personnel of industrial sector projects.

III. PROJECT ANALYSES

A. ECONOMIC ANALYSIS

In the case of this subproject, as is generally true of human resource development projects, it is difficult to identify and quantify economic impacts, whether direct, indirect, tangible or intangible. Even after the fact, it is difficult to attribute specific impact values to specific causes. It is all the more difficult in advance. Nevertheless, there are several qualitative economic observations which provide sound arguments for project support.

One way of looking at the reasonableness of the AID investment is to estimate the annual savings or increased earnings this project would have to produce to generate an internal rate of return of 15 percent, the estimated opportunity cost of capital in a competitive environment. Assuming equal annual project disbursements in constant 1980 dollars, and

returns starting the third year for twenty years, the annual savings/earning would need to be \$ 1.5 million to have an IRR of 15 percent. This would result from an average 1 percent increased value in output in firms with a total output value \$ 150 million annually. This represents only 2.5 percent of the estimated \$6.0 billion gross value of industrial production in 1980. It does not seem unreasonable to believe that this project will have such an impact on firms with at least this level of aggregate output.

In this context, the experience of a somewhat similar service in the United States, that of PENNTAP, in Pennsylvania is encouraging. On conservative estimates of benefits in the period 1972-1980, PENNTAP brought about savings, or increased earnings, for client organizations of \$4.5 million annually. This was done without the broader consulting service anticipated in the present project. According to PENNTAP data this is being achieved with annual costs that have averaged about \$318,000, i.e. one dollar invested by the Government in PENNTAP earned or saved over \$14 for PENNTAP clients. There are certainly many reasons for not automatically assuming that this is a valid target figure in Egypt, among them subsidies in Egypt that hide--or discourage--savings in such areas as energy consumption that are important in the U.S., the more industrialized character of the Commonwealth of Pennsylvania, and the value put on time saved in the U.S relative to that in Egypt. Nevertheless, it does not appear to be unreasonable to assume that in Egypt it is possible to realize the IRR indicated above by achieving savings of at least one-third the \$4.5 million annual average realized by PENNTAP⁶.

Finally, the favorable conclusions implicit in the results of the hypothetical internal rate of return analysis are reinforced by other project impacts that go beyond firms using the services during the life of the project. Of particular import among them,

- o development within industry of habits--reflected in behavior--conducive to adapting, developing and exploiting technology in a continuing effort to do more with what is available;

- o establishment of lasting Egyptian and international networks linking scientific, technological and industrial specialists and institutions on which Egyptian business can call for assistance well beyond the life of the project;
- o increased contacts between industry and Egyptian research and university communities, and resulting increases in collaboration between the two to meet industry R&D needs; and
- o establishment within a single organization of a lasting capacity to find assistance for industry and--in some areas--to provide it.

B. SOCIAL SOUNDNESS ANALYSIS

1. Beneficiaries

The subproject will serve public, private and joint-venture industrial firms and also individuals or organizations about to start industrial ventures. The only firms excluded will be handicraft enterprises (with less than ten employees).

Project beneficiaries will be the firms and entrepreneurs seeking and receiving assistance through the project. The Egyptian science and technology community, and individual members of it, will also benefit from their involvement. However, the intent of the subproject is to contribute to industrial sector expansion and to increased employment and productivity; from these, the beneficiaries are those in the labor force who obtain the new jobs, and those in the general public for whom there is an increase in the availability, affordability and quality of food, clothing, shelter and other products that influence their quality of life.

2. Sociocultural Feasibility

The basic source of sociocultural difficulty overall is likely to be

a strongly engrained tendency on the part of Egyptian individuals and organizations to hold information very closely; free sharing of information will not come easily or automatically. However, EIDDC and the research establishment (NRC) have demonstrated in recent years a degree of readiness to be disseminators and sharers of information; it is on this and the fact that the project will emphasize in word and deed the extent to which technological progress depends on information sharing that the Mission bases its confidence that old habits can be overcome.

3. Role of Women

No special provisions are included herein to ensure the involvement of women. In practice, at EIDDC women constitute approximately half the staff at professional (engineering) levels in the technical, training and small industry departments, and they will be well represented in this project, as well. To the extent they are found in the involved private and public firms, as they are to a considerable degree in some areas (e.g. textiles and electronic assembly), women in the firms will also participate in project activities. The benefits from the project are seen to accrue to Egyptian society as a whole and will benefit women in so doing.

C. TECHNICAL FEASIBILITY

The general technical feasibility of ITAP is demonstrated in the experience of other programs from which characteristics have been liberally borrowed. Two such programs, one in Pennsylvania and one in Brazil, are described in the appendices to Annex B of the Project Paper. Other whose experience has been taken into account include Volunteers in Technical Assistance (VITA) and the International Executive Service Corps (IESC).

In the Egyptian and EIDDC contexts, key issues related to technical feasibility are as follows:

- o level of demand;

- o ability to establish and maintain effective working relations with industry;
- o ability to develop and employ sources of information and technical assistance external to EIDDC; and
- o ability to develop useful data bases.

Output planning targets anticipate 2,000-3,000 requests for information and/or assistance from approximately 1,000-2,000 companies during the life of the project. A working hypothesis is growth from approximately 100 requests the first year to 1,000 or more the final year. It is assumed that many firms helped with one problem will return with others, as occurs in other such programs (e.g. see Appendix I of Annex B). A single EIDDC small industry team assisted roughly 100 firms in its first year of activity focused on four subsectors only; it found many requests for assistance it could not provide for want of a resource such as ITAP. ITAP will reach firms through that team, new ones being added to it and also its own field staff of Technical Specialists (two at the start); thus, it will have far more antennae than did the small industry pilot project with its single extension team. It will also be making itself available to a larger market. Current data are lacking, but there were nearly 4,000 private industrial firms with more than ten workers in 1970/71 and the consensus is that the number has grown substantially; in addition, over 130 large public sector firms report to the Ministry of Industry and Mineral Wealth. The firms are there. The need is also there, in the view of various Mission consultants and of many Egyptians. The demand is growing with the recognition of the need by individual businessmen. The Egypt/US Business Council has brought this to Mission attention, as has the GOE. It can be expected to grow faster in response to a campaign to heighten awareness of the need, of the benefits that can result from seeking assistance of the type ITAP is to offer, and of the availability of the assistance. There must be promotion to accelerate the conversion to active requests of the latent demand that is represented by technical need. This is recognized in the project design. Education/promotion will

be undertaken to accelerate the pace at which need is being recognized and converted to demand. There can be no doubt that a quality service will have ample demand for the assistance it can provide.

EIDDC has already demonstrated through its small industry extension pilot project and its earlier technical work that it has a practical orientation and can effectively work with industry and its capacity to do so will be reinforced through the technical assistance to be provided by the World Bank for small industry work and by AID for ITAP.

Linkages, both local and foreign, are vital to the project. Informal ties within Egypt are already good. They are strengthened through formal mechanisms such as membership of EIDDC's Director General on the Industry Committee of the Academy of Scientific Research and Technology and on the Board of the Federation of Egyptian Industry, and the inclusion on EIDDC's High Policy Committee of the Chairman of the General Organization for Industrialization (GOFI) and of the Director of the National Research Center (NRC). Further development of such ties is not expected to present major problems. Linkages abroad exist now, to some degree, and the Mission is confident that the contractor selected will bring to the project, and to EIDDC, significant additional linkages abroad.

While linkage development should not be a problem, maximum effective use of the linkages will require special effort on the part of EIDDC management to avoid the natural tendency of Center staff to focus primarily on assistance they or EIDDC can provide, as has been standard policy in the past. However, discussions with EIDDC staff have turned up several cases of clients being referred elsewhere for assistance the Center could not provide, a practice which ITAP will institutionalize, actively seeking such cases. EIDDC management knows this and accepts the challenge, which it and the Mission are convinced EIDDC can meet successfully.

There is also some risk that if other Egyptian organizations or individuals are asked to help clients, but do not "produce," staff will become disinclined to use the local linkages for fear their own credibility

will suffer. There are enough cases, however, of Egyptian scientists, professors and others working effectively with industry to demonstrate that it can be done productively. Nevertheless, it cannot be taken for granted. ITAP staff will have to be careful in recommending consultants and will have to follow-up with its clients to ensure that they are being helped. This is not a risk that puts feasibility in question, but is one that could cause difficulties if not recognized and given management attention.

Data base development will be done on a highly pragmatic basis, beginning with existing compilations of information, e.g. a relatively recent compendium of industrial firms prepared by the Ministry of Industry, and a directory of scientists and engineers prepared not long ago by the ASRT. These will be supplemented by others now being, or about to be prepared, for example, a directory being compiled by the Federation of Engineers of its members, their qualifications and experience. Through the work of its own outreach arms and of the various parts of the Ministry of Industry, EIDDC will up-date existing data bases and, where they are not already recorded in readily accessible media, will insert them into the EIDDC computer system. This activity will be coordinated with the National Science and Technology Information Project which the Mission is supporting via ASRT to ensure that they are mutually supportive and not unnecessarily duplicative. The major relevant feasibility issues are as follows:

- o the ability of the Ministry to ensure that its various elements (e.g. GOFI-which issues permits to new firms, and Productivity Institutes which do training and some consulting for firms) participate in the data collection and communicate the results to EIDDC, and
- o the ability of EIDDC to ensure that its staff regularly input into the system information they accumulate on individuals, companies, sources of information and assistance, and particular technologies.

It should be noted, in terms of overall technical feasibility, that EIDDC management must be prepared to make adjustments to ITAP--its "product line" and/or delivery mechanisms--on the basis of experience. The Mission has no doubt as to technical feasibility, but recognizes that experience with implementation is likely to demonstrate that some initial design characteristics are more appropriate than others, and that improvement in overall design will be possible. The evaluation plan takes this into account, as will Mission readiness to approve suitable modifications during the life of the subproject.

D. ADMINISTRATIVE FEASIBILITY

EIDDC has been briefly described in earlier parts of the subproject Paper and is dealt with in more detail in Annex C. Preliminary approval has recently been given a new higher level status for EIDDC, in which it will report directly to the Minister; this will put it in a stronger position to implement the project. As noted in the preceding section, it has good formal links with relevant parts of the economy and the science and technology community through the Ministry of Industry and Mineral Wealth and through its own Higher Committee--a policy body--on which sits the Director of the National Research Center, as well as industry leaders. EIDDC also has good informal ties in the private and public sectors in Egypt, and in donor agencies in Europe, through its very experienced, respected Director General.

The Industrial Technology Application Program (ITAP) will be established as a separate division of EIDDC. Its head will report to the Director. Initial technical staff will consist of two Technical Specialists operating from Cairo and two from Alexandria as the key communicators with industry, and four Resource Specialists responsible for development and operation of information resources, and training of Center staff in their use. The contractor's project manager and support staff will work with the ITAP head, EIDDC management and support staff to handle the special requirements imposed by frequent use of short-term specialists and by AID reporting and control requirements.

The number of Technical Specialists is to grow to eight or more from at least four locations by project termination in 1987, and the Resource Specialist staff to at least six over the same period. Training programs discussed earlier will build toward this goal, taking into account the likelihood of some staff attrition.

The retention of technical staff on government salaries is a problem at EIDDC, as elsewhere. EIDDC has dealt with it by instituting incentive payments funded by fees charged for services. This has been moderately effective, although it has not brought salaries even close to private sector rates. ITAP will provide a new source of revenues and, with the small industry extension service, will draw in far more clients than were dealt with in the past. EIDDC will obtain AID approval of its fee policy/guidelines, keep AID informed of the fees it is charging, and ensure that they are not set at levels that discourage use of ITAP services, but that they gradually increase enough to pay program costs. As noted earlier, EIDDC will propose a special incentive pay program for ITAP staff to the Ministry of Economy for funding from the Special Account resulting from repayment of AID commodity loans. These costs are among those to be gradually financed from fee revenues starting from the fourth year of project implementation. (See Chapter I.E. "Issues".)

As was acknowledged above, the addition of ITAP at the same time the small industry extension program is expanding is expected to add significant burdens to both management and support services at EIDDC. This fact is to be coped with in two ways. One is through the provision via the contractor of some support capability within ITAP as indicated above, the other is by including in the project some inputs to strengthen management, as was described earlier. In addition, in response to a request from EIDDC, AID will fund the services of a consultant to assist the Center in preparing for the advertisement of pre-qualification statements, drafting the Request for Proposals, and evaluating the resulting proposals. Given this assistance, the Mission believes that the Center will not only be able to handle the administrative requirements of the subproject and of contract management, but will be strengthened in the process.

Within the Mission, the subproject will be managed by the Science and Technology Office of HRDC. Progress assessments, and the interim and final evaluations will call for outside specialists. These are funded within the budget, except for Phase II of the final evaluation, which is in the sixth year and will be funded through a later action.

Communications and collaboration among the Mission's various industrial sector (and related) projects is important, as noted earlier. The Mission's role in ensuring it will be one of promoting, facilitating and--above all--keeping itself informed. This will not require additional staff, but it will call for some extra effort as described earlier.

E. ENVIRONMENTAL CONCERNS

The subproject will involve no construction and no purchase of industrial equipment and is not expected to directly impact the environment. However, EIDDC staff from all parts of the Center will be provided training to familiarize them with the adverse environmental impacts of industry and the technologies that have been developed to minimize such impacts so that they can better advise industry.

A negative determination was approved by the Environment Office NE/TECH in AID/W at the PID stage.

IV. PLANS

A. FINANCIAL PLAN

The total cost of the subproject is estimated at \$14.6 million. AID will provide a grant of \$10.0 million. The GOE contribution of approximately \$4.6 million, (31% of total costs) will be mostly in kind, with the exception of staff incentives which will be paid by the GOE from the Special Account.

AID funds will be utilized for all estimated foreign exchange requirements. These comprise approximately 52% of total project costs. Seventy percent (\$5.2 million) of this input will finance the procurement of 14.5 man-years and seventy man-months respectively of long-term and short-term technical assistance to be provided in Egypt, the former through a host country contract with a U.S. contractor, the latter via a subgrant to be awarded by USAID to EIDDC. Forty-four percent of the balance (\$1,016,000) will be used to procure technical information services from U.S. sources, academic and on-the-job training of project staff in U.S., training of company R&D staff, commodities, project management travel to/from Egypt, evaluation and contractual assistance to EIDDC.

An estimated \$2.5 million or 25% of AID total funding will be utilized for local currency expenditures. Forty-five percent of this sum (\$1.1 million) is for costs directly related to logistics for long and short term, U.S. technical assistance (housing, office staff, travel and per diem for short-term consultants). One quarter (\$0.6 million) is for short term Egyptian consultants. The balance is for local project promotion, travel costs of groups of industrialists and engineers to visit U.S. firms, local operating costs of the contractor, and part of training costs (air travel) and local training in management.

AID expenditures are anticipated on the following schedule:

	<u>U.S. \$'000</u>		
<u>Project Year</u>	<u>FX</u>	<u>LC</u>	<u>Total</u>
1	793	169	962
2	1,519	513	2,032
3	1,781	681	2,462
4	1,765	606	2,371
5	1,650	523	2,173
	<u>7,508</u>	<u>2,492</u>	<u>10,000</u>

The GOE contribution consists of (a) EIDDC staff assigned full-time to the project; (b) operating costs of the ITAP head office and at least three branch offices to be opened during the life of the project; (c) staff incentives; and (d) indirect support in the form of office space for the contractor and EIDDC staff, training and workshop facilities, data processing and industrial equipment, staff inputs from EIDDC and other GOE personnel; and (e) company fees paid for services offered to fund some project costs.

Line item allocations are summarized in Table 1 and are presented by year and by source in Table 2. Further description of the line items is presented in Annex H and a description of the role of the contractor is in Annex D.

Table 3 presents an allocation of input levels of effort to the outputs anticipated from the project. While the allocation is necessarily subjective in most elements, it is based on the assumptions underlying the project design and reflects our best estimates at this time.

Financial Viability of the Project

The GOE contribution will represent an increase in the budget of the EIDDC and will thus create recurrent costs. Current Ministry of Industry policy encourages organizations such as the Center to charge fees for their services wherever possible to help finance their own costs. At present, EIDDC allocates 37% of its fee revenues to pay staff incentives, the remaining 63% is allocated for EIDDC operating costs. Although new service resulting from this project will generate additional revenue, it is not expected to earn enough to cover all its costs during the life of this project.

It is anticipated that by the end of the third year, EIDDC/ITAP will be in a better position to make projected cost expenditures and revise their fees in such a way that by the end of the subproject most of the operating costs can be collected from fee revenues. In case ITAP cannot earn enough to cover all its costs, the GOE will be expected to increase EIDDC's budget allocation in order that ITAP will function at least at the level maintained during the project. These costs are within the capability of GOE to carry.

Very little of the AID input is for recurrent costs that must continue beyond AID involvement, but one item is important and not negligible in cost. This is subscriptions to information services. These are hard currency costs. They are vital to the information/technical assistance program envisaged and they must be kept current if they are to be valid. These costs could approach \$300,000 annually by the end of the project but we expect the GOE to be able to meet them.

Finally, it is noted that the Special Fund generated by accumulation of counterpart funds from CIP loan reimbursements is to be used to finance ITAP staff incentives for at least the first three years of the subproject, after which incentives money should be gradually generated from fee revenues. We are including in the Subproject Paper a covenant to the effect that ITAP/EIDDC will periodically revise its fee schedule for services in order that by the end of the third year ITAP/EIDDC will derive sufficient fee revenues to cover staff incentives, and by the end of the project there should be sufficient revenues to cover its operating costs including staff incentives.

Table I: SUMMARY COST ESTIMATE AND FINANCIAL PLAN
(US\$ 000)

Inputs ¹	AID		GOE	Totals		Total
	FX	LC	LC	FX	LC	
I.a. Personnel, L.T. and support	1,658	374	331	1,658	705	2,363
I.b. Personnel, S.T.						
1. U.S.	790	270	-	790	270	1060
2. Egyptian	-	346	71	-	417	417
II. Services	675	-	-	675	-	675
III. Information Dis.	81	181	-	81	181	262
IV. Training	432	64	-	432	64	496
V. Commodities	216	-	-	216	-	216
VI. Operations	72	165	141	72	306	378
VII. Special Costs	10	6	246	10	252	262
VIII. Evaluation	51	29	-	51	29	80
IX. Contractor, Over- head & Fee	1,000	-	-	1,000	-	1,000
X. Indirect Support	-	-	1,778	-	1,778	1,778
SUBTOTAL	4,985	1,435	2,567	4,985	4,002	8,987
Inflation	2,151	939	1,809	2,151	2,748	4,899
Contingency	372	118	200	372	318	690
TOTAL	\$7,508	\$2,492	\$4,576	\$7,508	\$7,068	\$14,576

¹ Line items are described in the Financial Plan text and more fully defined in Annex H.

Table 2: ESTIMATE OF EXPENDITURES BY PROJECT YEAR
(US\$ 000)

Subproject No. 263-0090.2	Title: Industrial Technology Application					
AID INPUTS ¹ /YEAR	1	2	3	4	5	TOTAL
I. Personnel, long-term & Support	268	535	485	435	309	2,032
II. Personnel, short-term						
a. U.S.	45	253	356	253	153	1,060
b. Egyptian	9	94	114	82	47	346
III. Information Services	75	150	150	150	150	675
IV. Information Dissemination	30	61	61	57	53	262
V. Training	74	42	88	131	161	496
VI. Commodities	118	43	33	11	11	216
VII. Operations	40	59	62	39	37	237
VIII. Special Costs	16	-	-	-	-	16
IX. Evaluations	9	18	25	-	28	80
X. Contractor overhead and fee	127	254	235	216	168	1,000
SUBTOTAL	811	1,509	1,609	1,374	1,117	6,420
Inflation @12%	94	425	732	880	949	3,090
Contingency @5%	47	98	121	117	107	490
TOTAL AID	952	2,032	2,462	2,371	2,173	10,000
GOE INPUTS¹						
I. Personnel, long-term and support	42	56	70	79	84	331
II. Personnel, short-term Egyptian	-	-	-	23	48	71
VI. Operations	21	27	32	29	32	141
VII. Special	32	42	53	58	61	246
IX. Indirect Support	285	323	368	395	407	1,778
SUBTOTAL	380	448	523	584	632	2,567
Inflation @17%	65	165	315	510	754	1,809
Contingency @5%	21	31	42	55	69	200
TOTAL GOE	466	644	880	1,149	1,455	4,576
TOTAL AID AND GOE	1,418	2,676	3,342	3,520	3,628	14,576

¹ Line items are described in the text and more fully defined in Annex H.

Table 3: COSTING OF PROJECT OUTPUTS/INPUTS
(US\$ 000)

Subproject No. 263-0090.2

Title: Industrial Technology Application

INPUTS	OUTPUTS	Solutions to Technology Problems	Growing Demand for the Service	Functioning Egyptian Service	Combined
I.a. Personnel		1,138	203	691	2,032
II.a. Personnel, short-term, U.S.		594	106	360	1,060
II.b. Personnel, short-term Egyptian		325	-	-	346
III. Information Services		607	68	-	675
IV. Information Dissemination		-	262	-	262
V. Training		345	-	151	496
VI. Commodities		130	-	86	216
VII. Operations		133	23	81	237
VIII. Special Costs		8	2	6	16
IX. Evaluations		43	11	26	80
X. Contractor overhead & fee		560	100	340	1,000
SUBTOTAL		3,883	775	1,762	6,420
Inflation		1,869	373	848	3,090
Contingency		296	60	134	490
TOTAL AID		6,048	1,208	2,744	10,000
GOE Inputs					
I. Personnel, long term and support		216	33	82	331
II. Personnel, short term, Egyptians		71	-	-	71
VII. Operations		91	14	36	141
VIII. Special Fund		160	24	62	246
XI. Indirect Support		1,245	178	355	1,778
SUBTOTAL		1,783	249	535	2,567
Inflation		1,257	175	377	1,809
Contingency		70	88	42	200
TOTAL GOE		3,110	512	954	4,576
<u>TOTAL PROJECT</u>		<u>\$9,158</u>	<u>\$1,720</u>	<u>\$3,698</u>	<u>\$14,576</u>

¹ Outputs are those identified earlier in the subproject and in Annex A, Logical Framework.

² Line items are described in the text and more fully defined in Annex H.

B. IMPLEMENTATION PLAN

IMPLEMENTATION SCHEDULE AND MILESTONES

<u>Mile-</u> <u>stones</u>	<u>Responsible</u> <u>Party</u>	<u>Project</u> <u>Month</u>
X Subproject Approved, AID/W ITAP staff U.S. training	USAID USAID	-1 0
X Project Agreement Signed	GOE & USAID	0
(CP) ITAP service charge policy agreed upon	EIDDC & USAID	1-4
(CP) Admin. action taken to establish ITAP and personnel posts	GOE	1
Advertize for Pre-qualification statements	EIDDC & USAID	1
Draft Request for Proposals	EIDDC	1-3
X Request for Proposals sent out	EIDDC	
Proposal Review/Ranking	EIDDC	5
X Contract Negotiation	EIDDC/Cont.	5-6
X First ITAP trainees return to EIDDC		8-10
X Contractor team installed	Contractor	10-11
Development of ITAP management systems, procedures, promotion program, plans of operation through month 36; establishment of Alexandria Office	EIDDC/Cont.	8-11
Semi-Annual Report to AID/C (see narrative)	EIDDC/Cont.	11
Progress Assessment (see "Evaluation Plan")	USAID	11
X Start of organization development consultancy	EIDDC/Cont.	12
X ITAP staff to U.S. for training		13-18
X Start of promotion, using consultant missions, and of diagnostic, information and consulting activities	EIDDC/Cont.	13
Annual Report submitted to AID/C	EIDDC/Cont.	17

Progress Assessment	USAID	17
Semi-Annual Report to USAID/C	EIDDC/Cont.	23
Second field office opened	EIDDC	13-24
Progress Assessment	USAID	23
Annual Report submitted to USAID/C	EIDDC/Cont.	29
Interim Evaluation	USAID	30-31
Semi-Annual Report to USAID/C with Plan of Operations for final two years	EIDDC/Cont.	35
Third Field Office opened	EIDDC	25-36
Annual Report submitted to USAID/C	EIDDC/Cont.	41
Semi-Annual Report to USAID	EIDDC/Cont.	47
Progress Assessment (option open to AID)	USAID	47
Annual Report submitted to USAID	EIDDC/Cont.	53
X Final Evaluation, Phase I	USAID	59-60
Final Report to USAID	EIDDC/Cont.	60
X Final Evaluation, Phase II	USAID/C	68

The Ministry of Economy will be the official signatory of the agreement which will also be signed by the Minister of Industry and Mineral Wealth. The prime responsibility for implementing this project will rest with EIDDC which will be assisted by a U.S. contractor. A host-country contract will be employed, with EIDDC serving as the contracting entity. Normal assistance will be provided to EIDDC by the Mission contract office. At EIDDC request, funds are anticipated to provide a consultant to help prepare the Request for Proposals and aid in evaluating proposals. This will be arranged through the Mission. Pre-qualification statements will be requested to establish a short-list of up to five firms or consortia which will be asked to respond to a request for proposals. Organizations in the technology information business, industrial engineering consulting firms, and broad-based engineering/management consultancy firms are considered the most likely interested parties; the establishment of consortia by some is to be expected.

The services of U.S. and Egyptian short term consultants will be financed through a subgrant to be awarded by the Mission to EIDDC in accordance with AID rules and regulations and subject to satisfaction of the Conditions Precedent set forth for this purpose. Short-term consultants, American and Egyptian, will provide reports to EIDDC and its clients on the basis of EIDDC Purchase Orders issued in conformity with AID regulations and procedures. The Mission will make payment on the Purchase Orders on the basis of documentation from EIDDC confirming completion of the work called for. U.S. contractor responsibility in this area will be limited to identifying prospective consultants, (preferably from private voluntary organizations such as VITA, IESC), providing any needed technical assistance to EIDDC in executing required procedures, and appraising consultant reports.

Project commodities as further described in Annex H-3 consist of project vehicles, office equipment and computer peripherals. These will be purchased by the U.S. contractor using standard HCC procurement procedures. Recommendations as to individual items and quantities will be submitted by the U.S. contractor to AID project officer for prior approval.

Monitoring on a routine basis is the responsibility of the AID sub-project manager in the Science and Technology Office of the Cairo Mission. EIDDC will require reports from the contractor as outlined in the Evaluation Plan and will provide copies of these to the AID project manager. AID monitoring will be based on these reports and on informal meetings with the Director General, the ITAP head at EIDDC, and the contractor.

C. EVALUATION PLAN

The inputs, outputs, purpose and indicators identified in the subproject logical framework (Annex A) are the fundamental bases for evaluation. This is to be reflected in all reporting and record-keeping by EIDDC and the contractor.

Also reflected should be the following criteria on which a service system such as ITAP can usefully be judged from the client's viewpoint:

- o ACCESSIBILITY: service can be acquired relatively easily and when needed.
- o ACCEPTABILITY: clients believe the system works for them and turn to it when in need.
- o COMPREHENSIVENESS: services provided are broad enough to ensure that needs are met.
- o SENSITIVITY: clients perceive that their needs are understood, that the system is responsive to those needs and that they--the clients--come first.
- o COMPLETENESS: there is follow-through with the client to ensure that needs arising after or as a result of initial assistance are met.

ITAP will develop, utilize and refine as necessary a method of evaluating its services to industry. Such evaluation will be in terms of benefit to clients and of service strengths and weaknesses (see preceding paragraph). It will supplement data normally gathered when an inquiry is initiated, e.g. client industrial activity, source of learning about ITAP. EIDDC and the contractor will also be expected to develop whatever other information systems they find necessary for their own management purposes to stay informed as to project progress and to identify weaknesses calling for corrective action.

Special studies to establish baseline data are not expected to be necessary. Prior to project implementation, the contractor for the Management Development for Productivity (MDP) project (263-0090) will have completed studies that can be used in this project, and a special survey of small industry problems to be undertaken late in 1981 will also have produced useful baseline information regarding management, economic activity and technology in key subsectors. The MDP project evaluation plan calls for further surveys similar to the initial ones after two years and at project termination after 4.5 years; these will provide further information inputs for the present project.

EIDDC and the contractor will keep complete, systematic records that make internal and external evaluation possible over time. These will include at a minimum a complete file of all contacts made, detailed information on those cases where specific benefits are achieved, complete records on activities including requests for service (even when it cannot be provided), participation in group programs and cases of special interest. In so doing, they will keep in mind AID special mandates and ensure that they keep information regarding, for example, experience with firms deciding between technologies well-suited and those less well suited to relative factor endowments, and the involvement of women in project activities.

EIDDC, will copy to AID reports from its contractor as follows:

- o during the first year of contractor activity, quarterly reports on activities, input/output realizations, anticipated delays/advances in scheduled activities, and significant problems;
- o starting Year Two of the contractor's involvement, mid-year reports covering the same points as did the monthly reports the first year;

- o annual reports summarizing the year's activity, accomplishments and problems, being in general more comprehensive and more analytical than the mid-year report;
- o a final report succinctly reviewing the activities, accomplishments and lessons of the project, anticipating the future of the program, and providing such other elements of internal evaluation as EIDDC, the GOE and AID consider at the time to be warranted.

The evaluation plan calls for evaluation by AID at two levels of intensity, that of the "progress assessment" and that of the interim and final evaluations. The progress assessment will be a brief semi-annual review by an outside consultant during at least the first two years of project activity (see Implementation Schedule). These assessments will be based on project reports, information from project staff and records, and limited interviewing of clients, advisory Committee members, and knowledgeable people in government, financial and scientific circles in Egypt. Their aims will be the following

- o to compare what was planned with what was achieved and is being done in terms of inputs, outputs, methodology and progress toward planned end-of-project status;
- o to review and reassess assumptions underlying the project, and plans for the balance of the project;
- o to recommend to AID, the EIDDC and its contractor any action indicated to correct weaknesses identified and ensure timely progress toward the desired end-of-subproject status.

During the second half of the third year of project activity, an in-depth interim evaluation will be undertaken by a team of direct hire and independent specialists. Their evaluation will involve tapping at least the information sources indicated in the project log frame (B3, C3, D3), including interviews with ITAP Advisory Committee members and a sample

of ITAP clients and of people in other organizations (e.g. banks, research institutions, concerned ministries, and non-client industrial firms). The aims stated above for the progress assessments will also be those of the interim evaluation, but in the latter case, the comparison, review, assessment and recommendations called for will be more broadly based. In effect, it will provide AID and the GOE the basis for judgements as to whether—and what—subproject redesign or policy changes are needed during the second half of the subproject's life. The timing will be such that these conclusions can be reflected in the plans of operations for the last two years, and that AID will have the evaluation report as an input to its review of those plans.

Among the questions to be addressed to the extent feasible by both the interim and the final evaluations will be the following;

- To what extent did a company improve its competitive position?
- How many new companies or jobs were created?
- To what extent was the economic base of the community improved?
- How much net profit was generated?
- What cost reductions resulted?
- How many new products were developed/introduced?
- What was the percentage increase in the payroll?

Given the relative uniqueness of the project, an end-of-subproject evaluation similar to the above is included as the final part of the plan. It would be undertaken in two phases, the first during the last two months of subproject activity, and the second eight to ten months later. Phase I would be similar in design to the interim evaluation, but would focus particularly on end-of-subproject status, indicators of goal achievement and identification of lessons likely to be applicable elsewhere. During the second phase, the same factors would be reviewed, but with a special focus on institutionalization in an effort to determine and to explain the extent to which the project's activities have become effective, on-going services. The present budget includes funding for four project assessments during the first three years and the interim and final evaluations, except Phase II of the latter which is to be funded by the GOE.

D. CONDITIONS PRECEDENT AND COVENANTS

The following Conditions Precedent and Covenants will apply to the project.

Conditions Precedent to Disbursement

(1) First Disbursement

Prior to any disbursement or to the issuance of any commitment documents under the Grant, the Cooperating Country shall, except as the Parties may otherwise agree in writing, furnish to A.I.D. in form and substance satisfactory to A.I.D.:

(a) A statement of the names and titles, of the persons who will act as the representatives of the Cooperating Country, together with a specimen signature of each person specified in such statement;

(b) Such other documentation and information as AID may reasonably require.*

* Will not be included in the Project Authorization

(2) Additional Disbursements for long term Technical Assistance Contractor to be provided to the Engineering and Industrial Development Center. Prior to any disbursement or to the issuance of any commitment documents under the Grant for the purpose of financing of long term technical services to be provided to the Engineering and Industrial Development Center, the Cooperating Country shall, except as the Parties may otherwise agree in writing, furnish to A.I.D., in form and substance satisfactory to A.I.D.:

(a) An executed contract for long-term technical advisory services with a firm acceptable to A.I.D.;

(b) Evidence of the establishment of the Industrial Technology Application Program (ITAP) as a permanent unit within the Engineering and Industrial Design Development Center (EIDDC) including a copy of the procedures and policies for its operation; and

(c) Evidence of the establishment of a subproject advisory Committee consisting of members of the private and public industrial and financial communities which evidence will include formal designation of the members and delineation of the functions of the Committee;

(d) Such other documentation and information as AID may reasonably require.*

* Will not be included in the Project Authorization

(3) Additional Disbursements for Short-term Consultant Services.

Prior to any disbursement or to the issuance of any commitment documents under the Grant for the purpose of financing short term U.S. and Egyptian consultant services other than short-term consultant services to be provided as assistance to EIDDC in connection with the procurement of the long-term technical advisory services, the Cooperating Country, except as the Parties may otherwise agree in writing, shall have satisfied the condition precedent set forth in section b. (2) above and , furnish to A.I.D. in form and substance satisfactory to A.I.D.:

(a) An established schedule of charges for the ITAP services to be provided to end-users by the Engineering and Industrial Development Center (EIDDC) along with a plan for the periodic revision of such schedule.

(b) A statement of the policy guidelines governing the use of services of Egyptian consultants to assist ITAP/EIDDC and end users of ITAP/EIDDC services which policies shall include established compensation levels and level of effort limitations for single end users; and

(c) Such other information and documentation as AID may reasonable request.*

* Will not be included in the Project Authorization

Covenants

(1) Existing Information and Data. The Cooperating Country shall covenant to provide or cause to be provided to EIDDC and the ITAP unit upon request all relevant data and information relating to industrial technology presently available to the organizations of the Cooperating Country except to the extent that such data and information is subject to legally mandated distribution limitations. The Cooperating Country shall also seek to secure such data and information from non-governmental sources and furnish it to EIDDC.

(2) Data Collection. The Cooperating Country shall covenant to assist EIDDC upon request in the collection of data and information required by EIDDC to carry out its operations.

(3) Operational Procedures. The Cooperating Country shall covenant to ensure that EIDDC establishes and implements operational procedures which include:

- (a) Maintenance of a complete file of all contacts made;
- (b) Provision of detailed information on those cases where specific benefits are achieved;
- (c) Relating on activities including requests for service; participation in group programs and cases of special interest; and
- (d) Periodic follow-up contacts to improve the quality of the effectiveness of the services provided.

(4) Level of Fee Revenues.* The Cooperating Country shall covenant to revise periodically the fee schedules for services to be provided by ITAP/EIDDC in order that by the end of the third year of the subproject ITAP/EIDDC will derive sufficient fee revenues to cover costs reasonably required to retain its professional staff and to derive sufficient revenues by the end of the Project to cover all of its operational costs.

(5) Support for ITAP.* The Cooperating Country will covenant to finance the costs of maintaining the ITAP unit as a permanent organization within the EIDDC to the extent that such costs are not covered by fees and revenues generated by services provided by ITAP.

(6) Extension of ITAP Services. The Cooperating Country shall covenant that the Industrial Technology Application Unit will extend its services to the major population centers in the Cooperating Country.

(7) Support for ITAP Unit. The Cooperating Country shall covenant to provide the ITAP unit with the fulltime personnel, office space, and office furnishings necessary to carry out its operations.

* Will not be included in the Project Authorization

FOOTNOTES

¹ Special account established pursuant to the Grant Agreement for Commodity Imports (no. 263-0119) dated August 19, 1979 and (No. 263-K-602) dated June 30, 1980, and in accordance with the Memorandum of Understanding Regarding Special Account dated June 30, 1980.

²The definition has been changed here slightly to refer to more than manufacturing industry, but otherwise is that of J. Baranson, Technology and the Multinationals, Lexington Books, 1978, as quoted in World Bank Staff Working Paper No. 344, International Technology Transfer: Issues and Policy Options. There is some further discussion of the definition of technology in Part III of Annex B.

³The principal complementary projects are as follows:

- a) "Industrial Production Project", Project No. 263-0101
- b) "Commodity Assistance Program." While this is not technically a project, it does provide financial resources for the acquisition of industrial equipment and some related soft technology.
- c) "Private Investment Encouragement Fund", Project No. 263-0097
- d) "Development Industrial Bank", Project No. 263-0018 and 263-0045
- e) "Management Development for Productivity", Project No. 263-0090,1
- f) "Vocational Training for Productivity", Project No. 263-0062 (0090.3)
- g) "Applied Science and Technology Research", Project No. 263-0016
- h) "Small Scale Enterprises Credit and Advisors" Project No. 263-0078
- i) "Production Credit" Project NO. 263-0147

⁴Expatriate engineers working in Egypt recommend using the term "manufacturing process control" or a similar expression to describe the action necessary to ensure product quality, the term "quality control" in Egypt tending to signify inspection of the final product. The former is to minimize rejects (and increase productivity), the latter merely to identify them.

⁵Looked at from another perspective, industrial and business firms which in 1980 quantified dollar savings in reports to PENNTAP estimated direct gains or savings at more than \$12,500 per firm, which represent total benefits of over \$35,000 per company when indirect gain is included. Indirect benefits are estimated on the basis of a formula developed for PENNTAP by two Wharton School economists. Note that PENNTAP assists schools, hospitals, municipalities and others, as well as business firms. The business firm averages here presented were computed by USAID consultants on the basis of data obtained from PENNTAP officials in a personal communication. It is also important to recognize that PENNTAP reports of benefits are based on what clients tell PENNTAP; in practice, only 37% return evaluation forms and by no means all of these quantify benefits (36.6% did so in 1980). The business/industrial company averages reported in the text are based on 264 evaluations received, of which 29% (74) reported benefits totaling over \$2.6 million (including indirect benefits); 14% reported man/day savings; 48% said the help was useful or was expected to be, but did not quantify benefits, or indicated that no

decision regarding its application had yet been made. The balance had nothing to report, or anticipated no savings. Additional PENNTAP data are presented in Annex F, and PENNTAP itself is described in some detail in Appendix I of Annex B.

ANNEXES

LOGICAL FRAMEWORK

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
<p><u>Goal:</u></p> <p>Increased productivity and employment resulting from increased industrial productivity and expansion of the industrial sector.</p>	<p><u>Measures of Goal Achievement:</u></p> <p>Overall economic and sectoral performance, productivity measures, growth, competitiveness (with foreign products in Egypt and/or abroad).</p>	<ul style="list-style-type: none"> Sector data from GOE agencies. existing relevant sector and/or sub-sector analyses (e.g. by UNDP, AID, IBRD or other foreign assistance agencies, or by university groups) 	<ol style="list-style-type: none"> Liberalization policy continues. This project and others in the AID/C portfolio are coordinated and complementary. GOE policies encourage/allow factor prices to reflect relative scarcity and give them meaningful role in public sector investment decisions.
<p><u>Purpose:</u></p> <ol style="list-style-type: none"> to assist public and private sector industrial firms to make more productive use of technology and to identify, assess and introduce new and suitable technology, in an effective manner, to institutionalize Egyptian capacity to provide such assistance through increasing reliance on Egyptian expertise. 	<p><u>End of Project Status:</u></p> <ol style="list-style-type: none"> Approximately 1000-2000 firms will have obtained assistance resulting in more productive use of technology and/or in effective identification, assessment and introduction of new technology. EIDDC will be continuing to provide the services developed and found effective during the life of the project for a growing proportion of Egyptian industry, relying increasingly on Egyptian science and technology resources and receiving significant financial support for the services from their users. 	<ul style="list-style-type: none"> Organization records and interviews with business and government officials at end of project and during subsequent year. 	<ol style="list-style-type: none"> Significant results are obtained in companies using project services. News of significant company results from project services is effectively spread throughout the industrial community. Individuals and organizations in the Egyptian science and technology community are willing and able to adjust to exigencies of applying their knowledge and skills to the needs of industry, and industry is willing to help them do so. Companies are willing and able to pay for the services provided. The assumptions made with regard to the link between inputs and outputs hold valid. (see below)
<p><u>Outputs:</u></p> <ol style="list-style-type: none"> Solutions to technological problems of industrialists and prospective industrialists. Growing demand for assistance in solving technological problems. A functioning Egyptian technical assistance and information service. 	<ol style="list-style-type: none"> At least 2000-3000 requests met during project life to solve industry problems, at least 2/3 in the private sector. Requests for services increase 5 to 10 times from Year Two to Year Five. 8-12 fulltime trained Technical Specialists staffing program by project end; 6-10 fulltime trained Resource Specialists staffing program by project end; 50-75% of information and technical assistance requests met by Egyptian sources of expertise final year; 40-60% of requests from repeat clients by final year. 	<p>Project records regarding such matters as requests, responses, assessment of results.</p> <p>EIDDC and contractor reports, Progress Assessments and Mid-project and <u>ex post</u> evaluations.</p> <p>EIDDC, contractor and AID records and reports.</p>	<ol style="list-style-type: none"> Companies in the target subsectors are motivated to make the kinds of changes the project is designed to help and to seek/employ external assistance in so doing. Project organization is able to retain its Egyptian professional staff. EIDDC staff can orient itself to helping clients find assistance wherever the source may be, not only within EIDDC itself. Other MOA agencies will cooperate in gathering information for data bases. EIDDC staff and others will overcome any disinclination to share information. Companies can/will pay for Egyptian expertise at a rate acceptable to those with the expertise.

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
	Estimated level of effort for each input (\$000)		
<p><u>Inputs</u></p> <p>1. Service to firms</p> <p>a. individual company diagnostic studies</p> <p>b. technical assistance to firms by foreign specialists</p> <p>c. technical information in response to inquiries</p> <p>d. industrialists introduced to local expertise for technical assistance.</p> <p>2. Promotion</p> <p>a. use of media, publications, workshops, conferences</p> <p>b. visits of industrialists EIDDC engineers and others to US industrial firms for special problem/technology issues.</p> <p>3. Delivery Capacity Development</p> <p>a. staff training</p> <p>b. staff mobility, communications and operations ensured with needed equipment, vehicles etc.</p> <p>c. documentation and access to information services.</p> <p>d. technology contacts and networks in Egypt and abroad.</p> <p>e. local data bases developed.</p> <p>f. organization development.</p>	<p>1. Personnel L.T., U.S. 1354</p> <p>Personnel, Short-term, US 594</p> <p>Personnel, Short-term, Egyptian 396</p> <p>Infor. Services 607</p> <p>Training 345</p> <p>Commodities 130</p> <p>Operations 224</p> <p>Special Costs 168</p> <p>Evaluation 43</p> <p>Contractor, overhead & fees 560</p> <p>Indirect Support 1245</p> <p>SUBTOTAL 5,666</p> <p>Inflation Factor 3,089</p> <p>Contingency 435</p> <p>AID & GOE TOTAL \$9,190</p> <p>2. Personnel, L.T. 236</p> <p>Personnel, Short-term, U.S. 106</p> <p>Infor. Services 68</p> <p>Information Dissem. 262</p> <p>Operations 37</p> <p>Special Costs 26</p> <p>Evaluation 11</p> <p>Contractor overhead & fee 100</p> <p>Indirect Support 178</p> <p>SUBTOTAL 1024</p> <p>Inflation factor 558</p> <p>Contingency 79</p> <p>AID & GOE TOTAL \$1,661</p> <p>3. Personnel, L.T., U.S. 773</p> <p>Personnel Short-term, US 360</p> <p>Personnel Short-term Egyptian 21</p> <p>Training 151</p> <p>Commodities 86</p> <p>Operations 117</p> <p>Special Costs 68</p> <p>Evaluation 26</p> <p>Contractor & Overhead fee 340</p> <p>Indirect Support 355</p> <p>SUBTOTAL 2,297</p> <p>Inflation factor 1,252</p> <p>Contingency 176</p> <p>AID & GOE TOTAL \$3,725</p>	<p>1. Industrialists and prospective industrialists have technical problems susceptible to solution with technical information and/or technical assistance.</p> <p>2. Industrialists and prospective industrialists are willing to seek, or at least accept assistance in resolving technical problems.</p> <p>3. Qualified contractor(s) can be identified and engaged.</p>	<p>EIDDC, contractor and AID records and reports.</p>

ANNEX B
TECHNOLOGY AND INDUSTRY IN EGYPT

An Overview and Recommendations for Action

Richard S. Roberts, Jr.
and
James B. Haybyrne
May 1981

I. BACKGROUND

In April, 1980, a USAID-sponsored team of science and technology specialists recommended that AID/Cairo undertake "a selective exploration of specific ways in which the U.S. can cooperate with Egypt" to solve what the team felt were priority problems in science and technology in Egypt.¹

¹The team's report, dated April 1980, was entitled "U.S. cooperation with Egypt in Science and Technology." It is briefly discussed in Part II, 1. of the present document. The team in question consisted of the following:

Princeton Lyman, Special Assistant to the Director of the International Development Cooperation Agency. Team Leader. Dr. Lyman's experience included background in AID program planning and direction and the role of Deputy Director, later Director of the Planning Office, for the Institute for Scientific and Technological Cooperation.

Herman Pollack, Professor of International Affairs at George Washington University. Professor Pollack's experience included ten years as Director of the Bureau for Scientific Affairs in the Department of State, and previous analyses for AID of science and technology issues in the Middle East.

Courtney Nelson, Consultant to the Office of Science and Technology Policy, Executive Office of the President. Dr. Nelson had been for several years Director of the Ford Foundation's regional office for the Middle East and the author of several studies on the role of science and technology in foreign assistance programs.

Carl Gotsch, Food Research Institute of Stanford University. Dr. Gotsch's experience included several years work on agricultural economics analyses in the Middle East and, most recently, analysis for USAID/Cairo of the potential of new lands development in Egypt.

At Mission request, Princeton Lyman, the team leader, returned to Cairo in June and prepared an initial set of suggestions as to possible approaches to cooperation in one area of interest to the Mission, industrial R&D.²

Further consideration of the subject was encouraged by the insights and ideas provided by these reports, experience with existing industrial sector projects, an assessment of industrial management needs undertaken in early 1980, and informal requests from the Egypt-U.S. Business Council for help in accessing technology and Mission strategy focus on increasing productivity. The present report is a result of a subsequent USAID/Cairo request for assistance in approaching the issues from an industry perspective to develop a user-oriented project to (a) help Egyptian industry meet R&D and related needs, and (b) build Egyptian capacity to assist industry in this area, both of which are viewed as important components of the USAID and GOE efforts to increase production and productivity.*

²These suggestions were incorporated in a draft Project Identification Document (PID) in June, 1980; the draft is discussed in Part II, 1, of the present report.

*Note that "industry" is used in this report to refer to a collectivity of companies; it is not synonymous with the word "company".

II. METHODOLOGY AND SOURCES

The findings reported here and otherwise shared with Mission staff responsible for project design are based primarily on two types of input sources:

- documents dealing with science, technology and industry in Egypt, and with relevant experience in other countries, and
- discussions with a wide variety of informed people in Egypt and, to a lesser extent, in the U.S.

The present consultants also brought to the assignment recent experience with both the management and the science and technology communities in Egypt. During the first half of 1980, the consultants worked closely with Egyptian industry personnel and the Mission developing inputs to the user-oriented "Management Development for Productivity" project (No. 263-0090). In the course of the management needs assessment undertaken for that project, one of the consultants interviewed over eighty Egyptian managers in the public and private sectors and numerous management education specialists and Government of Egypt (GOE) officials concerned with industry. In the process of assisting the Mission staff responsible for project design, the two consultants subsequently discussed management needs and available services with industry and GOE personnel in the more specific context of ways in which identified needs might be met. Given the close interrelationships between management functions conventionally defined and technology-related issues, including R&D, this experience

provided very useful background against which to identify and consider these latter issues from industry's point of view.³

An equally useful perspective was provided through work one of the consultants had done in 1979 and early 1980 with Egypt's Academy of Scientific Research and Technology (ASRT) on management of applied research and the marketing of applied research capabilities.⁴ The latter was particularly relevant, dealing as it did with relationships between the Egyptian scientific research community and its real and prospective clients in industrial, agricultural and other circles in the country.

A. Documents

The principal documents used in the present study are here identified and briefly commented upon under four headings:

- Science and Technology in Egypt
- Industry in Egypt
- USAID Strategy in Egypt
- Relevant Experience Elsewhere

1. Science and Technology in Egypt.

Of the three documents described here, the two prepared for USAID/Cairo in 1980 are of particular importance for their strategic and

³The results of the needs assessment have been reported in Coopers & Lybrand, "An Assessment of Management Development Needs in the Arab Republic of Egypt," a Report to A.I.D., August, 1980.

⁴This was undertaken in the context of a Denver Research Institute sub-contract to the National Academy of Sciences under AID's Project No. 263-0016, "Applied Science & Technology Research".

conceptual content, and the third is of special interest for the insights it provides into differing views of the possibilities for science-industry interaction in Egypt.

a) As mentioned earlier, a report entitled "U.S. Cooperation with Egypt in Science and Technology" was submitted to USAID/Cairo in April 1980, by a team consisting of Messrs. Princeton Lyman, Herman Pollack, Courtney Nelson and Carl Gotsch. This team had been asked to prepare the way for "a broad assessment of the present role of science and technology in Egypt and the degree to which the Government of Egypt's science policy strengthens that role." The team concluded that the Government of Egypt had largely done what had been envisaged in the broad assessment. It therefore recommended that, rather than proceed as initially planned, there should now be a selective exploration of prospective forms of collaboration in the area of S&T, and that this should be undertaken "within a strategy of S&T cooperation which focuses on key objectives and addresses certain of the major constraints."

The theme of the strategy proposed by the team is "to build Egyptian S&T capacity for economic development." They noted that not all appropriate steps can be separated out into discrete "S&T" activities; some would have to be achieved through sectoral programs. Through whichever channel,

Funds which promote Egyptian research of relevance to national needs, which promote cooperation between production managers and the Egyptian science and technology community, which improve technological decisions and foster adaptations, and which help the Egyptian S&T community concentrate on key technological problems affecting the country's future--all of these are critical.

The report clearly highlighted the potential existing in the Egyptian S&T community, the very real desire on the part of many members and leaders

of that community to contribute more directly to development, and the obstacles--both real and psychological--that must be overcome if their contributions are to approach their potential. At least implicitly, it thus acknowledges that an industry-focused project may have to either limit its aim to some of industry's S&T needs, or rely on sources of help outside the Egyptian S&T community to meet needs that cannot be satisfied locally at present for one reason or another. At the same time, it emphasizes the need to make special efforts to solve industry problems with local S&T resources, alone whenever possible, and in conjunction with outsiders when the latter are needed.

b) The rough draft of a Project Identification Document prepared by Princeton Lyman in June, 1980, and cited earlier, is the second key document. It profitably draws on the insights developed by the author and his distinguished colleagues in preparing the report referenced in (a) above, on their prior experience and on discussions in June with members of the Industrial Development Research Council of Egypt's Academy of Scientific Research and Technology (ASRT). The draft very usefully placed the proposed project in the context of other USAID activities in Egypt as follows,

USAID has heretofore addressed the "S&T" problem from the "supply" side. Projects with the ASRT, and with the University of Cairo, have helped move the research community toward an applied research mode, and encourage it to establish linkages with the potential user of its research. These projects are helpful, not only in changing the attitudes of the S&T community but in identifying real gaps in skills and equipment for practical research.

However, successful industrial R&D depends heavily on industrial management's understanding of the role of R&D. Moreover, many industrial R&D functions are best served from within the industry, not outside it. A productive

relationship between industry and the S&T community should thus include an "internalizing" of both R&D understanding and capacity within industry.

USAID programs with industry touch on several aspects of R&D but do not address this question specifically. USAID is providing funds for equipment modernization, management training and is designing a program for technical/vocational education. In its equipment modernization program, USAID is making available

American expertise to help industrial managers select among alternative technologies. This will provide, however, only scant indigenous training for technology assessment, and will not actively involve Egyptian S&T experts from outside the specific industrial plants.

The proposed project thus adds an essential element to industrial development strategy. R&D however, cannot be treated separately from other aspects of industrial development. Therefore, this project should be designed and managed in close relationship to USAID's other industrial and relevant S&T projects.

Three possible approaches that had been suggested for strengthening industry-S&T interaction were briefly sketched by Dr. Lyman, with an acknowledgement that further effort would be required before a single approach could be recommended. One of the options outlined--the "systems approach"--is based on the premise that management skills, markets and marketing ability, and other factors must be considered in conjunction with attention to R&D. While none of the three options is singled out for preference, and it is even urged that others be sought and considered, the fundamental logic reflected in the systems approach was seen as important. Thus, the recommendation that when a decision is made,

the design should include as many of the "systems analysis" variables as possible, simply because R&D cannot be successful in a vacuum.

This advice has guided the present study, the results of which reflect a definite kinship with the systems approach of the earlier document; the organizational and program conclusions differ, but more extensive industry

inputs have suggested other modalities to take assistance to more firms and to increase responsiveness to company needs.

c) The third particularly pertinent document in this area is the proceedings of a workshop on "Science and Industry Interaction" sponsored by the University of Alexandria Research Center (UNARC) in April, 1980.⁵ This was of special interest because the workshop brought together for four days, not only representatives of the science and industrial communities in Egypt, but also several from these same areas in the U.S., among them senior R&D executives from major U.S. firms. The prepared presentations and subsequent discussions offer useful insights into the ways in which Egyptian businessmen and researchers view (a) each other, (b) desirable modes of interaction, and (c) constraints to such interaction. These views were put in special perspective by the reactions and suggestions of the U.S. industry and science representatives present, a perspective further enhanced by an interview during the present study with one of the U.S. industry participants at the workshop.

The UNARC workshop reflected the same types of desire for increased interaction, and the same constraints to it that the Lyman team was to describe in the report it was preparing at about the same time. It was also a timely reminder that science resources, initiative for science-industry interaction, and industry itself are not limited to the Cairo region in Egypt.

⁵"Proceedings of a Workshop on Science and Industry Interaction", Alexandria, Egypt, 14-17 April 1980. (University of Alexandria Research Center-UNARC).

2. Industry in Egypt.

Three different categories of document dealing with Egyptian industry were of particular utility. Each having a different focus, they conveniently complement each other:

- A broad overview of the industrial sector and more detailed descriptions of the principal subsectors is provided in a report prepared by Arthur D. Little, Inc. late in 1977.⁶
- The part of the industrial sector represented by small-scale industry (10 to 50 workers) is the subject of a World Bank study also completed late in 1977⁷, and of a piece of research undertaken the following year by Suzanne Berger of M.I.T.⁸; both studies are particularly interested in small industry's problems and prospects.
- On a more detailed plane are AID project records concerning specific companies, technology choices and related matters; while these deal only with large, public sector enterprises, they nonetheless provide a useful counterpoint to the macro-level studies and -excellent background from which to go into company-level interviews on the subject at hand.

The industry data base in Egypt is uneven, at best. It is particularly weak for the private sector, which is estimated to account for

⁶Arthur D. Little, Inc., "An Assessment of Egypt's Industrial Sector." Report to the Special Interagency Task Force Reviewing the U.S. Security Supporting Assistance Program for Egypt. January 1978.

⁷World Bank. "Arab Republic of Egypt: Survey of Small Scale Industry." Report No. 1818-EGT. December 2, 1977.

⁸Suzanne Berger, "Problems and Prospects of Egyptian Small-Scale Industry." Dept. of Political Science, Massachusetts Institute of Technology. August 1978. (Preliminary Draft for Comments and not for Circulation.)

approximately 25% of industrial production and to be growing faster than the public sector.⁹ Recognizing the data limitations, one does nevertheless obtain from these documents a useful sense of industry's structure, strengths and weaknesses, performance, prospects for growth and constraints--external, as well as internal to firms. The proposals for action they describe are also instructive. Although they often do not focus on science and technology, or on R&D, they are always relevant, bearing in mind the systemic nature of the subject. This same fact makes the understanding of the industrial sector provided by these documents particularly pertinent to the task at hand; appreciating the diverse opportunities and constraints in the industrial environment is essential to any effort to increase the contribution of S&T to industry's development.

3. USAID Strategy in Egypt

The basic document for this subject is the Country Development Strategy Statement (CDSS) prepared by the USAID Mission in Cairo. The most recent such documents have been used, the CDSS submitted in January of 1980 for fiscal year 1982 and again a year later for FY 83 with no significant change, but with the addition of seven technical annexes. Of the latter, Annex XI (Technology Choice in Egypt) and Annex XV (Manpower and Employment) were of particular interest in the present context.

⁹International Monetary Fund, "Arab Republic of Egypt, Recent Economic Developments." February 19, 1980. (A limited circulation report.)

4. Documents on Relevant Experience Elsewhere

A number of other useful documents have contributed to the conclusions reached in the present study. Three of particular relevance bear mention here.

a) In a 1979 book by Harvey W. Wallender III, the Fund for Multinational Management Education reports the results of a study it sponsored of technology transfer to developing countries.¹⁰ Of particular interest in this study is its approach, based on the premise that technology is not transferred until it is effectively received. Thus, the focus is on user behavior in an effort to identify the kinds of factors which affect firms in acquiring and using technology. Mr. Wallender reports that,

The major conclusion of this study is that firms of developing countries have a limited capability for diagnosing problems and little understanding of how application of new technologies can be useful and valuable to them. These findings, coupled with the turbulent environment in which these firms operate, explain their

¹⁰Harvey W. Wallender III, Technology Transfer and Management in the Developing Countries: Company Cases and Policy Analyses in Brazil, Kenya, Korea, Peru, and Tanzania. Ballinger Publishing Co., Cambridge, MA. 1979. 296pp. The aim of the study is described thus,

To contribute to an understanding of the problems of the user firm, particularly as they affect his receipt and use of technology, this research project was organized to study different kinds of organizations in a variety of developing countries. With the assistance of the International Executive Service Corps (IESC), the study team, consisting of five development specialists and academics, analyzed a total of sixty-seven consulting projects with specific organizations from five developing countries--Brazil, Peru, Korea, Tanzania, and Kenya--and prepared detailed case studies based on this analysis. Environmental analyses were developed to describe the political and technological environments of the five countries. An additional survey was carried out covering 405 similar consulting projects with similar technology transfer activities in forty-three developing countries. Through analysis of this information, some of the factors that inhibit the ability of local firms to identify their technological needs and therefore to seek and utilize technology more effectively can be discerned. The important role of the local environment, and how it stimulates or inhibits the local firms in their technology search and utilization, can also be understood. (pp. 3-4)

weak commitment to planning and setting long-range goals and the consequent reluctance to seek new technologies that could facilitate attaining these goals.¹¹

The study provides considerable food for thought in the context of the Egyptian situation. One example is the proposition of "stages of user firm development for receipt of technology."¹²

Stages of User Firm Development for Receipt of Technology	
ORGANIZATION DEVELOPMENT	<ol style="list-style-type: none"> 1. Building the initial organizational structure (management and initial technical assistance). 2. Developing an internal problem solving and diagnostic capability at the general management level.
SEARCH AND ACQUISITION	<ol style="list-style-type: none"> 3. Searching for alternative technology after diagnosis and internal problem identification has been carried out. 4. Acquiring alternate technologies. 5. Transferring and exploiting specific technologies.
MAINTENANCE AND MODIFICATION	<ol style="list-style-type: none"> 6. Maintaining and modifying technologies already transferred (product modification and system adaptation).
RD & E	<ol style="list-style-type: none"> 7. Developing unique internal technology capabilities (R&D and product engineering). 8. Exporting (sales) technology to other firms.

In Egypt, there are clearly firms at every point along the spectrum of stages of such development, and this explains the difficulty one has in identifying a single neatly packaged assistance program to increase the use of S&T resources in industry. Needs are too diverse.

¹¹ibid. p. 4.

¹²ibid, p. 48.

b) Several documents have been reviewed in an effort to learn all that is relevant to the present effort from the experience of PENNTAP, a 16 year old technical assistance program of the Commonwealth of Pennsylvania, the Pennsylvania State University and, more recently, the U.S. Department of Energy.¹³ By all accounts a highly effective program, PENNTAP emphasizes the use of a small cadre of technical staff to receive inquiries from business firms, municipalities and others, and to deliver and interpret responses, insisting that person-to-person communications are essential to effective communications. It also stresses follow-up, focusing on results in terms of money saved or gained as a result of its efforts, not on questions answered. It is responsive, but also proactive--taking the initiative to make new technology known to those who may have an interest in it.

During the period 1972-1979, PENNTAP answered 12,776 inquiries and provided inquiries estimated by the users to have saved or gained over \$28.5 million. A cost analysis comparing cost to the Pennsylvania Department of Commerce in the period 1972-1978 with benefits reported by users in the same years indicated benefits exceeded costs by a ratio of 28 to 1. Considering the relevance of the PENNTAP experience, a more detailed description of its policies, principles and practices is presented in Appendix A.

¹³PENNTAP documentation found particularly useful included the program's 1979 annual report, information handouts regarding the program, special areas of activity and its technical field agents, and statements prepared for testimony by PENNTAP's Director in various fora, including appearances on July 12, 1979 and September 7, 1979, before the Subcommittee on Science, Research and Technology of the (U.S.) House Committee on Science, Research and Technology. The statement prepared for the September, 1979, appearance provides a good overview of the program and its lessons, including aspects of particular relevance for Egypt and is reproduced in Appendix A.

c) A model similar to that of PENNTAP has been tried in Brazil with mixed results, lessons from which are pertinent in the Egyptian context.¹⁴ A Technology Information Center was established at Brazil's National Institute of Technology, an industrial research institute dependent on the Ministry of Industry and Commerce. The Center provided selective dissemination of information on its own initiative to industry, and also operated a question/answer service utilizing technical agents who helped businessmen frame their inquiries and interpret the responses. The answers were obtained through data bases tapped in Brazil and abroad, and through the research staff of the National Institute of Technology. The program grew rapidly and the level of demand for its services suggests that industry found it very beneficial.

Useful lessons from the Brazilian experience include the following,

- such a service is feasible and can be widely appreciated,
- the use of technical field agents between the researcher, computer or library and the industrialist is important, and
- if the service requires organizational characteristics incompatible with the parent organization, one or the other must change, or fail.

¹⁴This experience was described by the former head of the information service in a paper entitled "Industrial Extension Services: The Experience of Two Research Institutes in Brazil." by Angela L. Pompeu Davig. This paper was presented by its author at a workshop on Management and Development of Contractual Research in Guatemala City, Guatemala, in June 1978. One of the authors of the present study directed the workshop at which the paper was presented and later edited the part of it relating to one research institute to produce a teaching case. That case is reproduced in Appendix B in view of the lessons from the Brazilian experience that should be kept in mind in Egypt.

In Brazil, the information service did fail to survive, in spite of its apparent utility to industry, and organizational stresses it created were major contributors to its elimination. A more complete description of the information service and its problems is presented in Appendix B.

B. Interviews

Discussions with various informed people have taken place intermittently between October, 1980, and May, 1981, as understanding and concepts evolved. In most cases, interviews have been used for both information gathering and testing of ideas, "trial balloons". They have at times been brainstorming sessions. As a result of the extensive interplay in such meetings, and of the very constructive suggestions from many quarters, project design ideas evolved considerably from the earliest discussions to the latest. Basic concepts have changed little since they were discussed unofficially with H. E. Taha Zaki, Minister of Industry and Mineral Resources, in December, 1980, and were presented to a large meeting of USAID/Cairo staff. On the other hand, it is since then that proposals regarding mechanisms and relative emphases have been developed in more detail in preparation for the process of actual project design with those Egyptians ultimately to have implementation responsibility.

Meetings with individuals and groups have involved,

- In the Egyptian S&T community, senior officials and researchers in the Academy of Scientific Research and Technology (ASRT), its National Research Center and the University of Alexandria Research Center.
- In Egyptian industrial circles, members of ASRT's Industrial Development Research Council, the chairmen and some other senior

managers of several firms in the Cairo and Alexandria areas, and officials of the Egypt arm of the Egypt-U.S. Joint Business Council.

- In the Ministry of Industry, the Minister (seen unofficially), senior planning and research officials of the General Organization for Industrialization, which has some supervisory and staff functions for public sector companies, and at the Engineering and Industrial Design Development Center, its head and the director of its consumer products department.
- At USAID/Cairo, participation by senior officials from most parts of the Mission in one or more meetings on the proposed project, continuing, constructive involvement throughout of U.S. and Egyptian staff (the latter with valuable experience and contacts in local industry) concerned with programming, science and technology, industry and agro-industry, and useful inputs from contractors working on industrial development projects.

III. CONCEPTS

A. Technology

Equipment embodies technology, but technology is not synonymous with equipment. Technology is knowledge. It can be thought of as referring to the package of product designs, production and processing techniques and managerial systems that are used to produce particular products or services.¹⁵

In another study, technology has been considered as referring to,

...knowledge necessary for the productive functioning of an enterprise. The term includes process (engineering), management, marketing, and production know-how. It is dynamic, continuing, sequential, and complex.¹⁶

A distinguished Egyptian authority has also underscored the point that technology is much more than equipment. Speaking to Egyptian and American businessmen and researchers, Dr. Ibrahim Helmi Abdel-Rahman pointed out that,

Technology as a capacity--not as a piece of goods--can only be acquired by qualified persons, who become, as a result of this acquisition, more efficient solvers of problems and producers of goods and services.¹⁷

It is technology in this broad sense with which we are concerned here.

¹⁵Although it has been changed here slightly to refer to more than manufacturing industry, this definition is from J. Baranson, Technology and the Multinationals, Lexington Books, 1978, as quoted in World Bank Staff Working Paper No. 344, International Technology Transfer: Issues and Policy Options.

¹⁶Fund for Multinational Management Education, Public Policy and Technology Transfer. New York. 1978. vol. 1, p. 4. (cited in Wallender, op. cit.)

¹⁷From the presentation of Dr. Ibrahim Helmi Abdel-Rahman, former Egyptian Minister of Planning, Former Executive Director, United Nations Industrial Development Organization (UNIDO), speaking at the "Workshop on Science and Industry Interaction" organized 14-17 April, 1980, by the University of Alexandria Research Center. Quoted in Workshop Proceedings, p. 156.

B. Technology Transfer

We have neither the desire nor the need to try to definitively define "technology transfer" here. There are ample writings on the subject. What is important is that it be understood that, a) we fully subscribe to the idea put forth by Mr. Wallender to the effect that technology is not transferred until it is received.¹⁸, b) we share with Mr. Marlow, Director of PENNTAP, the conviction that effective technology transfer is a human activity, or at least regularly requires human intervention to ensure--often through interpretation or adaptation--that the technology transferred fits the need for which it was sought and so is effectively received; and c) we are here concerned with the effective transfer of technology from whatever source--Egyptian or foreign--into the head and hands of the user in Egypt.

C. Technology and Productivity

Technology establishes technical potential, and thus possible levels of productivity. At the firm level, the choice of technology and the effectiveness with which it is used--"soft" as well as "hard" technology, determine productivity, which can therefore be raised by improvements in selection and in application. In the economy, expansion of a sector of high productivity technology (e. g. industry), increases overall productivity. USAID policy in Egypt focuses on both.

¹⁸The principal complementary projects, in order of their mention in the text are:

- a) "Industrial Production Project", Project No. 263-0101
- b) "Commodity Assistance Program." While this is not technically a project, it does provide financial resources for the acquisition of industrial equipment and some related soft technology.
- c) "Private Investment Encouragement Fund", Project No.
- d) "Development Industrial Bank", Project No.
- e) "Management Development for Productivity", Project No. 263-0090
- f) "Vocational Training for Productivity". (Project Paper Stage)
- g) "Applied Science and Technology Research". Project No. 263-0016

D. Technology and the AID/Cairo Project Portfolio

Mission assistance to the industrial sector currently takes many forms. Several projects provide financial resources to firms for the acquisition of technology in the form of equipment. One new project will soon be providing problem-oriented management development and consulting services to industrial firms; among other things, it will increase their ability to utilize technology and the likelihood of their perceiving it as a dynamic factor that can be used to increase production, productivity and profits. A vocational training project presently in the design stage will complement major inputs in that field from other donors to make more effective and more responsive to industry's needs the system that provides training to the labor force working with industrial technology. Finally, through another effort, AID is working with the Egyptian Academy of Scientific Research and Technology (ASRT) to encourage an increase in applied research responsive to the needs of industry and other sectors, and a strengthening of the capacity of ASRT and its component research organizations to do such work.¹⁹

¹⁹Wallender, op. cit., pp. 27-28.

IV. OVERVIEW

Considering the volume of existing studies and reports dealing with Egyptian science and technology, and industry, the present report is limited to an overview of the situation. The emphasis is on industry's need for S&T, or R&D, and on ways of meeting those needs effectively, now and in the future.

A. Industry.

It has become commonplace to read, hear or observe that production technology in Egyptian industry is generally outdated, and that plant and equipment are often poorly maintained. It is not unusual to find unplanned interruptions of production, high levels of machine down-time, equipment unable to operate at rated capacity, high levels of product rejection, high levels of wastage of materials, technology installed with capacity inappropriate to the market. In general, companies,

- often do not seem to appreciate or know how to act on existing opportunities - to increase income and/or decrease costs through more effective use of existing plant and equipment, e.g. through improved maintenance and product or process quality control;
- have difficulty defining their technological interests, needs or problems;
- are unable to describe these in terms scientists or others from outside the industry can understand;
- are not familiar with a wide range of potential sources of help in meeting technology-related needs, or doing relevant R&D;

- lack an awareness of the possibilities available through adaptive or developmental research.

Needless to say, the situation differs from one company to another, and some generalizations fit the public sector more than the private. For example, good equipment maintenance is more common in private companies in which managers' rewards vary directly with the firm's economic performance than it is in the public sector, where the two have been, at best, indirectly related. Still, while the particular type of technology-related need, problem or opportunity--and thus the appropriate type of response--depends on the individual firm and circumstance, there is a considerable difference between "what--in technological terms--is" and "what could--and should--be" in most, if not all companies. Firms in Egypt are accustomed to purchasing technology in the form of equipment (from limited options), but few have normally sought to improve production performance, or quality, or to reduce costs through the adaptation or development of technology. Thus, the habits, the systems and the fruits of such practices have not been developed.

Now, however, it is increasingly clear that the dynamics of the economic environment in Egypt are changing as a result of the post-1974 liberalization. The open door policy, the encouragement of the private sector and of joint ventures with foreign firms, the competition of imports, the availability of foreign exchange for local industrial investment, and pressure on public sector managers to show economic performance, along with freedom of action to make it possible, all of these are new stimuli. Expatriate and Egyptian specialists working in consulting and training capacities with present and prospective industrialists are struck by the impact these stimuli are having. Pushed by the pressures of

competition, and pulled by the opportunities of the marketplace, Egyptians in the public and private sectors alike are seeking ways to respond effectively.

Coping with the pressures, or benefitting from the opportunities, necessarily involves technology--frequently "hard" technology, almost invariably "soft" technology. At a minimum, it involves exploiting technology, and--depending on the case--it is also likely to involve identification, selection, adaptation and/or development of technology.

Egyptians know this. There is a growing awareness of a need for information about technology available, and how to acquire it, and for help in adapting, developing and exploiting it to improve, expand or start a business. At present, however, most engineers, managers and technicians have little exposure, or even convenient access to information such as,

- current developments in their field which could stimulate innovative thinking and action on their part;
- technology options and techniques for comparing them;
- alternative uses of raw materials and by-products being developed elsewhere;
- other people and organizations in Egypt (and other countries) working on relevant technology or research;
- sources of technology licensing and qualified assistance in evaluating proposed licensing agreements;
- sources of information or assistance related the above.

Neither the habits nor the systems to ensure a technologically well-informed, dynamic industrial community were developed in the economic environment of the past, in the absence of pressure to perform and freedom

to exploit opportunities. But the environment is changing, as we (and many others) have noted. The business community is responding, and growing. So, too, are its needs--and demand--for technology, "soft" and "hard".

B. S&T Resources

The R&D and technology-related needs of industry are highly varied. Some lend themselves to the attentions of the research scientist, while others call for the imagination of a mechanical engineer, the analytical expertise of an industrial engineer, or the skills of a technician familiar with industrial operations and trained in the use of information systems; often, no one alone is adequate. Some situations call for accessing members of a network of scientists. In other cases, a network of manufacturers in the same or similar lines of business elsewhere would be far more useful.

Egypt has significant resources that can help meet the technology information and assistance needs of industry. Some are specialized industrial research institutes closely linked to large public sector companies, others are found throughout the higher education and research communities. The system provides useful research services in some areas (e.g. textiles, pharmaceuticals, metallurgy) and has the potential to be of much more service. The situation was well summarized by the Lyman team in its April, 1980, report,

Egypt has a very high regard for science, and a very sizeable and well-trained science community. Two-thirds of all graduate degrees are in the pure and applied sciences. There are over 22,500 holders of M.Sc. and Ph.D. degrees and more than 260 research institutes. There are gaps in expertise, and problems in institutional orientation which inhibit the organized and systematic application of knowledge to development problems. There are, however, examples of institutional as well as individual research excellence.

There is a strong desire and perceptible movement on the part of Egyptian scientific leadership to enhance the contribution of Egyptian scientific capacities to development, specifically to bridge the gap that exists between academic research, on the one hand, and the needs of industry, agriculture, health and other sectors of the economy on the other. Projects and innovative management styles to this effect can be found in the ASRT, the National Research Center, several universities, and in a few industries.²⁰

While ASRT, its affiliated institutions and the universities are at the "research" end of the spectrum, much closer to the "development" and "technical assistance" end is the Engineering and Industrial Design Development Center (EIDDC). An autonomous unit under the Ministry of Industry and Mineral Resources, the Center works closely with public and private industrial firms but is linked to the scientific community through its Higher Committee, which includes the Director of the National Research Center as well as representatives of industry. EIDDC is very much involved in product and process design (principally in metal- and wood-working subsectors, and engineering), and in training in industrial engineering and related skills. Its activities are undertaken in response to requests from firms, and it charges fees for its services. The fee revenue makes possible regular bonus pay to staff to supplement traditionally low government salaries. Under a World Bank loan to the Development Industrial Bank, the Center has recently been experimenting with the use of field technical agents to provide services to small scale enterprises, and it is about to begin a USAID-funded pilot project in preventive maintenance system development and introduction in larger public sector firms.²¹

²⁰Lyman et al, op. cit. pp. 2-3.

²¹The pilot project is being funded under the Industrial Production Project (Project No. 263-0101) through the McKee-Kearney Joint Venture.

Sources of technology-related assistance in the private sector are limited to consultants and equipment suppliers. There are as yet very few consultants with the kind of industrial experience and either breadth or depth of knowledge generally needed by industry in general. Moreover, the most experienced tend to be very costly, particularly from the point of view of smaller firms. Equipment suppliers are principal sources of information on production equipment and technology, but their main interest is selling equipment, not ensuring informed technology choices. In a few cases, particularly joint ventures and large public sector firms, arrangements with foreign firms ensure access to technical assistance and technology in general, but this is not common and is too costly for most firms.

In spite of EIDDC, the numerous organizational units of the sizeable research community, and the existence of private sector consultants and equipment suppliers, there are major gaps in the system. For some subsectors, some categories of firms, and some kinds of problems, there are good sources of assistance available, and, to many whom they can help, they are known. To a great many, however, they do not have appropriate experience, skill or equipment (or are so perceived), or they serve only other categories of firm, (e.g. the public sector), or they are too costly, or they do not provide the service needed, or they simply are not known. As a result, the range of technology and R&D-related needs of the growing, diversifying industrial sector of the economy is only partially being met. (That this should be so in Egypt cannot be surprising when one considers the important role PENNTAP plays in as industrialized a place as Pennsylvania!)

In other circumstances, businessmen would have established networks through which to obtain the information they need. Competent service organizations would have evolved and proven their worth to industry. Problem-solving, technology-adapting and product development capabilities would be well developed within firms. The environment has not stimulated this in Egypt. Motivation has been lacking until recently. That is now changing, as we observed earlier. There is increasingly perceived incentive to enter industry and expand existing enterprises, to select, adapt and effectively exploit technology, to develop products and more economical ways of producing them, and to seek help in so doing in order to avoid costly errors.

V. CONCLUSIONS AND RECOMMENDATIONS

Companies and entrepreneurs in Egypt need a source to which they can turn with confidence that competent information, technical assistance or similar help will be found for them--somewhere--at a price they can afford, to help them solve technological problems and/or identify and exploit technological opportunities.

The S&T community in Egypt needs help in communicating with industry, in understanding it, in learning to apply its skills to industry's needs, and in building credibility in the industrial sector. Bridge-building from the industry side is needed to complement that from the research community side.

Productivity in the Egyptian economy will be increased by sound expansion of the industrial sector as a part of the economy, and by improved productivity in individual industrial firms. Both will be stimulated and accelerated if a way can be found to,

- respond effectively to companies' perceived needs for technological information, and to stimulate awareness and action through selective dissemination of unsolicited information;
- help companies assess their technological obstacles and opportunities, and the relation of these to their organizational and wider environmental context; and to
- help companies overcome obstacles and profit from opportunities of a technological nature.

The recommendations which follow propose action based on these conclusions.

1. USAID should work with the GOE and the Egypt-U.S. Business Council to establish a mechanism that will help industrialists and prospective industrialists to obtain, early and economically:
 - useful information about the range and sources--including licensing--of technology available to them for replacement or expansion of capacity, or for development of new products or companies;
 - assistance in assessing such options and selecting among them;
 - information about current technological developments in their fields;
 - assistance in identifying ways in which production and productivity can be increased through better use of technology, taking into account relevant aspects of the organizational environment;
 - assistance in making better use of technology and in otherwise removing technological constraints to increased production or productivity;
 - assistance in product or process development, principally through adaptation; and
 - training to increase the ability of company personnel to choose and use technology, and to cope with the problems it may pose.

2. Focus should be on the private as well as the public sector, on small, medium and large firms, but with attention to ensure that small and medium private firms receive at least as high a priority as public sector

companies. Some subsectoral emphasis may be necessary for technical staffing reasons for some periods, but the ultimate aim should be to serve all parts of the industrial sector.

3. Stress should be on obtaining results for those seeking help, on making certain that help sought is received. Given the diversity of needs, this must be recognized to imply a need for a clearinghouse function and access to a wide range of sources of assistance.

4. The effort should be built around:

- person to person service, recognizing that technology transfer is a human activity;
- diagnosis of a company situation as part of any technical assistance;
- developing linkages with science, technology and related organizations in Egypt and abroad on which to draw information and assistance;
- follow-up to all requests to ensure that help is received and to determine its utility, or reasons for non-use;
- conscious action to build credibility, to educate the industrial and scientific communities to the potential of technology, its dynamic character and the services available to make it an asset instead of a constraint;
- a charge for services, although it is not likely to be possible to cover costs;

- continuing evaluation and feedback, and use of flexibility to adapt the effort to changing needs, fluctuating types of demand, and the inevitability that some services will require improvement or replacement.

5. While the primary and immediate term objective should be to provide timely, affordable, meaningful service to industry, a high priority longer-term aim should be to help develop Egyptian ability to provide the R&D and technology assistance industry needs, as well as Egyptian ability to find foreign sources of such assistance when there is no local source.

Thus, while it will be important to develop active networks in industry and research circles in the U.S., Europe and the more advanced developing countries, attention should be given to building local networks and to further developing local strengths by, for example,

- developing a data base on local expertise and turning to it before looking abroad for help;
- funding the use of local expertise at competitive local market rates;
- teaming Egyptian specialists from the local expertise data base with foreigners when the latter are brought in for short-term assignments; and
- involving Egyptian specialists from the data base in workshops and similar such activities.

6. USAID assistance should consist primarily of funds to ensure financing of foreign expertise, a substantial part of which is likely to short-term, but there should also be provision for staff development in-country and

abroad, and probably some equipment. Flexible, expeditious administrative procedures are essential if effective, timely responses are to be provided to requests for assistance and/or information; USAID should delegate approval authority for such matters as short-term technical assistance to the implementing agency and the contractor.

7. There should be an insistence on imaginative network building and resource tapping, for example taking advantage of,

- opportunities to obtain low cost, high value short-term technical assistance from small and medium sized firms in the U. S.;
- the readiness of major U. S. suppliers of industrial inputs to collaborate in R&D efforts to adapt their materials to local products or processes, or vice versa;
- the skills available through the International Executive Service Corps (IESC);
- the information and expertise available through private and voluntary organizations (PVO's), such as Volunteers in Technical Assistance (VITA) and public systems in the U. S., such as PENNTAP.

8. Recognizing the vital interrelationships connecting technology issues, management, and capital goods financing, USAID should give special attention to ensuring coordination and collaboration among its various projects concerning industry and technology. Of particular importance will be doing all possible to create an environment and opportunities conducive to collaboration among implementing agencies, contractors, and USAID project managers, and to make clear to all concerned that it is expected for the benefit of all projects and clients.

9. This effort should be organized through a single implementing agency, although meeting varied needs will obviously involve many others at one time or another. The organization should,

- have credibility in industrial firms of both the private and public sectors;
- have a high degree of operational autonomy;
- be able to pay its personnel at rates competitive with those of the private sector
- be oriented to (or, at least, not away from) outreach and technology application;
- be oriented to (or, at least, not away from) information sharing;
- be prepared to play a clearinghouse role, in addition to any technical service role, accepting that its primary responsibility is ensuring that a solution is found, a need met; and
- be reasonably likely to be able and willing to continue the service after the end of USAID assistance, assuming results are as anticipated.

The only Egyptian institution of which we are aware that fits these criteria even reasonably well is the Engineering and Industrial Design Development Center (EIDDC). That Center also has the advantage of existing linkages with both public and private industry and with the S&T community. It would be a good base for the recommended effort.

10. Project design should be worked out with the implementing agency agreed upon by USAID and the GOE. Starting from the existing strengths and

weaknesses of the implementing agency with respect to the objectives of the proposed program, the design should identify what must be done to strengthen, expand and add to that which exists to create the capability--and, above all, to provide the service--here recommended.

A P P E N D I X A

STATEMENT

PREPARED FOR TESTIMONY BEFORE
SUBCOMMITTEE ON SCIENCE, RESEARCH AND TECHNOLOGY

OF THE
HOUSE COMMITTEE ON SCIENCE, RESEARCH AND TECHNOLOGY
U.S. HOUSE OF REPRESENTATIVES

LOWER PAXTON MUNICIPAL BUILDING
HARRISBURG, PENNSYLVANIA
SEPTEMBER 7, 1979

BY

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To the members of the House Subcommittee on Science, Research and Technology a description of how the technology transfer program known as PENNTAP operates.

September 7, 1979

Mr. Chairman:

I represent the Pennsylvania Technical Assistance Program which is well known by the acronym PENNTAP. PENNTAP is a statewide technical information network that is jointly sponsored by The Pennsylvania State University, the Pennsylvania Department of Commerce and the federal Department of Energy through the Energy Extension Service. It is administered as a continuing education service of the University.

The Pennsylvania State University Heritage

The Pennsylvania State University has a long, documented record of providing public service to organizations and individuals within the Commonwealth, establishing and practicing the land-grant tradition of making information available to all citizens. Penn State's first successful outreach activity for economic benefit occurred in 1886, when engineering information was prepared for Pennsylvania companies to make them more competitive.

From this early start, Penn State has been a pioneer and a national leader in innovative programming to provide service to citizens. The Board of Trustees in 1909 indicated that the service provided must be "adjusted constantly to the changing needs of the times." In 1910, Continuing Education was established as a separate unit within the University, functioning in cooperation with its many colleges.

Through the years the University has established many service oriented units - Institute of Public Safety, Small Industries Research, Institute for Research on Land and Water Resources, Planning Studies, educational television (WPSX-TV), the Pennsylvania Technical Assistance Program (PENNTAP), Mine Maintenance Mechanics Program, Institutional Engineering Advisory Services, and others. In 1964, the Board of Trustees adopted a policy statement on Continuing Education which said in part,

"The University shall undertake such a variety of programs as is required to provide instruction to meet the needs of its constituency, not being limited by past patterns of action in administration and teaching. Experimentation and research, related to the content of the program, to those who participate, and to the methods of instruction shall be encouraged.

Research shall be encouraged in all aspects of continuing education, interpretation and dissemination results of this research shall be encouraged."

In 1971, the Trustees created the position of Vice President for Continuing Education, placing the commitment to the Commonwealth for continuing education and public service on the same par with resident instruction and research.

These brief historical statements demonstrate that the University has had a long and varied commitment to provide services to the constituents of the Commonwealth.

PENNTAP - the Pennsylvania Technical Assistance Program

PENNTAP was established in 1965 as the operations control center for a technical information network to help private and public sectors throughout Pennsylvania obtain and apply appropriate scientific and technical information.

What kind of information? It may be fundamental guidelines for starting a business. It may be comprehensive formulas that save businesses or industries thousands of dollars in energy conservation. It may be the newest, sophisticated data on use of delicate metals. It could be an entirely new technology.

That range and variety of information may be passed on to a small, independent businessman, or to an officer or research director from a much larger organization. Requests for assistance may come through one of the 24 Continuing Education offices around the Commonwealth, or directly into the PENNTAP headquarters at University Park.

Upon receipt of a question, the unique machinery of the PENNTAP concept whirls into action. The problem or question is funneled to one of the full-time technical specialists for personal attention. (These specialists, incidentally, are not clerical or lab-bound people working in a file-filled room in PENNTAP headquarters. They are PENNTAP employees whose experience and range and depth of knowledge qualifies them as experts, and they are located in the various and appropriate colleges and areas at University Park where their particular specialities and resources of knowledge are centered.) The specialist then makes a personal contact to define and

discuss the problem. Solutions and/or suggestions may come from the specialists' own expertise or they may represent a combination of the specialists' and other faculty members' knowledge, or from the vast resources of Penn State libraries and any other depository of information. Thus, the major feature and obvious attraction and popularity of PENNTAP is the personal contact Pennsylvanians have with highly competent specialists.

PENNTAP's people are the bridge between the problem and the possible solution -- and they have crossed that bridge, hand-in-hand with thousands of Pennsylvanians.

It is appropriate at this point to note the respect PENNTAP's operation has fostered in the eyes of non-biased experts.

Louis Rukeyser, well-known business economist, has written in his syndicated column: "PENNTAP remains the most sophisticated state program of its kind." And the innovative and effective work attracted an out-of-state team of administrators to study PENNTAP's program. They agreed with Rukeyser and concluded: "PENNTAP is a program that other states should emulate."

PENNTAP's Specific Objectives

1. To provide personal, face-to-face contact and special service for those Pennsylvania organizations which recognize their problem and realize the potential to gain economic benefits by using new, appropriate and updated information.
2. To further develop and intensify awareness among Pennsylvania companies and organizations of the vast stockpile of scientific and technical information which can be transmitted for their practical application.
3. To respond to specific requests for assistance and to initiate appropriate action and follow-through to assure effective response and benefits.
4. To foster liaison with state, federal, and private agencies to maximize dissemination of information for economic gain.
5. To prepare, translate and present existing helpful information in practical forms so that it can be readily understood and applied.
6. To recommend sources of assistance, when necessary, that would help public and private organizations apply appropriate information to effect solutions. (Implementing final solutions is, of course, the responsibility of the enterprise itself.)
7. To search for useful technology in federal laboratories and elsewhere which can be shared with potential users.

8. To evaluate the results.

Operational Procedures

The major contribution of PENNTAP is the special, personal service which it provides to Pennsylvanian's who request help. PENNTAP also actively seeks out potential users through a structured search procedure. Its responses are tailored to particular organizational needs and every attempt is made to transfer the most current comprehensive information as rapidly as possible in terms that the client can understand.

A typical case is processed through six steps:

1. The request for assistance:

A user of this service calls one of the 24 Penn State Continuing Education Offices (to save a long-distance call) or the PENNTAP Office located at University Park.

2. Analyze:

A technical specialist responds to the question as quickly as possible to discuss and to define the problem. Then with the scope and nature of the problem determined, sometimes after a personal visit, an initial plan of action is developed.

3. Search:

The staff member searches all available resources -- libraries, government agencies, manufacturers, consultants and other sources of potential information -- to uncover possible solutions.

4. Deliver:

The agent presents, in person, by telephone, or by mail, all the compiled data for consideration by the user.

5. Assist:

After the user has received the data, the agent remains ready and available to answer questions about the information and suggestions and to supply assistance in its application toward the solution of the problems.

6. Evaluate:

Once the information has been applied, the user determines the benefit derived from PENNTAP's assistance.

Credibility of the information being distributed is of utmost importance.

The user's confidence in the organization and its representative is no less important. A working relationship has been established between each PENNTAP staff person and a university college of expertise. Each specialist has an "academic home" responsible for the accuracy of the technical content of all information being disseminated. Each works closely with his department, his college and with professional colleagues to assure the information transferred is current, valid and of the greatest possible economic benefit to the user.

The heart of this activity is the PENNTAP staff. Printed material alone, even expertly prepared, cannot stimulate interpersonal relations, define a problem, answer related questions, involve consulting authorities, provide follow-through on a problem, or relate to other agencies. The PENNTAP staff person can and does do this.

The specialists travel extensively in all sections of Pennsylvania to assist in definition and investigation of problem areas, to obtain information for solutions to problems, and to translate, interpret and disseminate the information for practical application.

Opening New Horizons

Because PENNTAP is actively involved with many information sources, it often locates new information or ideas which can be helpful to a user. Many times an answer exists for a problem before the user is even aware of a problem. PENNTAP does not carry "Cinderella" answers, looking for problems that fit, but in the process of developing answers for existing questions, it is constantly logging in new information and experiences that might apply to other types of conditions and situations. Therefore, there are times PENNTAP staff members do find answers before questions have been asked. To make this new information valuable, PENNTAP puts it to work by this process:

1. Awareness:

PENNTAP, through its involvement with those who develop new information, is constantly on the look-out for items that can be economically beneficial for Pennsylvania organizations.

2. Contact:

PENNTAP contacts potential users to encourage them to review the new concept or new information.

3. Match:

PENNTAP brings the new information, its developers and potential users together. On-site observations of the system, relevant materials

and potential literature usages are explored. The developer explains the process and gives the potential user an opportunity to determine if the information may be useful.

4. Develop:

Most times, even for sophisticated users, the new information must be put into a form understandable to the user in the context of the user's problem. A heavy emphasis is placed on interpreting the information to meet the specific user's needs. This is expensive, time consuming, and it involves more than just "broadcasting existing information" but it is the basic ingredient of a successful overall program. A pilot program can be and has been undertaken in cooperation with potential users.

5. Deliver:

If the pilot program determines the information does, indeed, have economic benefit to the user, a series of workshops is conducted to inform similar organizations of this potential economic benefit.

6. Assist:

Later, a technical specialist works with the seminar participants on an individual follow-up basis to insure a successful transfer.

7. Evaluate:

Once the new information has been understood and applied, PENNTAP, with the cooperation of the user, evaluates the transfer to determine economic benefits.

The PENNTAP Library Information System

All technical specialists are supported by the PENNTAP Library Information System.

The Penn State libraries contain one of the largest collections of materials in the Commonwealth and cooperative agreements exist with other large libraries to obtain any information not available in the University Park system.

The enormous amount of information from research, development and manufacturers appearing today in more than 50,000 journals makes it impossible for any organization or individual to keep up-to-date. The PENNTAP Library Information System has significantly assisted industries by supplying literature to assist them in problem solving and to help them be current in the latest methods and devices within their areas of interest. Trained librarians, using the indices and other tools available to them, can quickly retrieve

information that would take an industrialist considerably more time to uncover. Since time is costly, this can be a valuable savings to organizations of the Commonwealth. Basically, organizations using resources of the Library Information System, can:

1. Improve product or services by being aware of what others are doing in the field,
2. Reduce duplication of research projects,
3. Increase rate of production, lower cost ratios, and increase income by getting assistance with their problems.

Collections in the University libraries and in those of cooperating institutions are broad enough to offer some services to almost any organization requesting information. In the few instances data is not part of the present library collection, an appropriate source outside the system is found.

Continuing Education Organization

Continuing Education is the administrative unit responsible for making available any and all resources of the total university to any citizen in any area of Pennsylvania.

Continuing Education operates 24 offices located strategically throughout the Commonwealth. Each office serves as a local contact for the geographic area being served and each office carries out the functions of program awareness, dissemination of general information and acceptance of inquiries.

The offices are located to serve the maximum number of Pennsylvania constituents. No organization is outside an established service area. An entrepreneur in the smallest hamlet can receive the same assistance as his counterpart in our largest city.

Creating User Awareness

Through the cooperation of 118 commercial radio stations in Pennsylvania, a daily program entitled "The Sound of Progress" presents current information for the purpose of stimulating an awareness of PENNTAP's purposes and availability, encouraging inquiries from business, industry and other organizations in the private and public sectors.

Guest interviews with leading scientists, businessmen, industrialists, educators and government officials inform and stimulate the radio audience with glimpses of technological frontiers. These documentaries are five minutes long and are produced at the rate of five per week for distribution

to cooperating stations who air these programs as a public service. Inquiries generated by this radio program are forwarded to the PENNTAP office for action.

Also, other established outlets for public communications are used to create user awareness. Such outlets include the Continuing Education News (a monthly publication to 16,000 Pennsylvania organizations), WPSX-TV (educational television), newspaper releases, brochures and presentations to groups by more than 50 full-time Continuing Education representatives.

Project Coordination/Supervision

To insure that PENNTAP activity functions as effectively as possible with other components of the statewide information network, the activities of all specialists are coordinated through the office of the Director of PENNTAP. The PENNTAP office is responsible for developing administrative procedures, and control of the budget. The Director of PENNTAP is responsible to the University's Vice President for Continuing Education for the overall operation of PENNTAP.

Advisory Council

An active Advisory Council recommends PENNTAP's policies and priorities and evaluates PENNTAP's past efforts. The Council is made up of fifteen people from a variety of professional backgrounds. They occupy positions of responsibility throughout the Commonwealth and bring with them a wide range of viewpoints and experiences with which to perceive Pennsylvania's needs and PENNTAP's role in meeting those needs. They donate their time to provide this guidance for PENNTAP.

We emphasize the active role assumed by the Advisory Council. As a group, and through separate task force assignments, the Council is very much involved and constantly aware of current activities.

Established Relationships

Over the years, PENNTAP has established a close working relationship with a number of state and federal agencies which provide a mechanism for reaching and serving potential users. These organizations are within and outside the University and include such diverse groups as:

1. University resources -- Small Industries Research, Small Business Institute (supported by SBA), Institute for Research on Land and Water Resources, Cooperative Extension, College of Business

Administration, College of Engineering, College of Arts and Architecture, College of Earth and Mineral Sciences, 21 Commonwealth Campuses, Institutional Engineering Advisory Services, Materials Research Laboratory and University Library System.

2. Non-University resources -- The Smaller Manufacturers Council, Manufacturers Association of Erie, Greater Philadelphia Community Development Corporation, National Bureau of Standards, Pennsylvania Small Industry Coalition, The Governor's Office of State Planning and Development, Naval Air Development Station, other defense laboratories, National Technical Information Service, special industrial libraries, Pennsylvania Institutions of Higher Learning, American Council of Independent Laboratories, Inc., Small Business Administration, Pennsylvania Department of Environmental Resources, National Fire Prevention and Control Administration, and Pennsylvania Fire Commissioner.

Evaluation

Economic benefits can be measured to a point, but not totally and not immediately. PENNTAP's own investment of time in assisting a particular organization cannot be evaluated until that organization acts -- an action at the user end of PENNTAP services.

The evaluation not only helps the user appraise the particular innovation in relation to his own operation but it provides PENNTAP with a bank of experience data that can be useful to other clients, and at the same time, provide PENNTAP with an assessment of its own performance.

Uppermost in PENNTAP's mission is the mandate to achieve results -- economic benefit to the user and to the Commonwealth.

Total accomplishment is not easily measured, but since PENNTAP is geared to the results-oriented mode in delivery of its services, it keeps close tab on what and how much it is accomplishing for the Department of Commerce, for the Governor's Energy Council, and for the University.

From 1972 through 1978, PENNTAP received 10,451 requests for assistance. Actual and calculated economic benefits from PENNTAP service during the period amounted to almost \$23 million. (Comparing the investment by the Department of Commerce, the ratio of benefit to investment was 28-1 -- for every \$1 invested by the state, \$28 were returned to the state's economy.)

The philosophy of PENNTAP has been and will continue to be results oriented. Great emphasis is placed upon the evaluation of efforts and the

results of the specialists. The major criteria for evaluation will be how well an organization is able to improve its operation through this transfer network. Evaluation will be based upon the answers to such considerations as:

To what extent did an industry improve its competitive position?

How many new companies or jobs were created?

To what extent was the economic base of the community improved?

How much net profits were generated?

What cost reductions resulted?

How many new products were developed?

What was the percentage increase in the payroll?

Approximately four to six weeks after a specialist delivers the potential solution to a problem, a one page user evaluation form is sent. The user is asked to state the economic value of PENNTAP's services. This may be expressed in dollar savings, jobs created, or improved manpower efficiency. If more time is needed a later follow-up occurs. The case is never closed until the user indicates the final effect of PENNTAP's services. The annual total benefits stated by PENNTAP is a summation of all of the economic benefits as calculated by the users.

To insure complete evaluation, the PENNTAP office continues to:

1. Maintain a complete file of all contacts made,
2. Provide detailed information on those cases where specific benefits are achieved,
3. Report on activities including requests for service, participation in group programs and cases of special interest,
4. Periodically follow-up contacts to improve the quality of the effectiveness of the service provided. Comments are solicited from both the user and the non-user.

I have given much thought to your concern about what the federal government should do to improve current technology transfer efforts.

I feel that first the practice of transfer must be regimented by a system that is uniform in concept, in administrative organization, in the mechanics of availability and delivery, and in assessing the use and benefits of the

technology that has been transferred.

The uniformity is vital to the success of any transfer system. With it, there would be a clear definition of what technology was available, where it was available, and how it could be obtained -- uniformity that would provide consistency to the vast federal resources and inspire better and wider use by outside organizations because they would have distinct paths of accessibility to needed technology.

The federal government has created a number of inter-agency organizations for the purpose of transferring technology within the federal agencies, and these have been quite successful. Generally, however, the federal technology sources have not given priority to making their information available to the public sector.

As I mentioned in my testimony before this committee on July 14 of this year, many federal agencies and laboratories have been an excellent resource to PENNTAP. As I also indicated, PENNTAP has been able to assist some of the federal agencies, and I would hope that this working relationship can be continued and even expanded. The exchange has been beneficial in both directions.

Based upon our 14 years of experience, I am firmly convinced that many of the nation's problems -- inflation, decreased productivity, energy consumption, foreign competition, product quality, etc. -- could be greatly reduced through the transfer and application of research data that already exists and is gathering dust on shelves within industry, at universities and within the government.

I would encourage this committee to develop the impetus for a unified federal technology transfer program, encompassing the breadth of federal laboratories and federally-sponsored research, as an orderly and ultimate method to utilize for the welfare of all citizens the billions of dollars of unused research technology.

How would you go about organizing the variety of federal labs, agencies, departments? Or, more to the point, could you organize the federal sources? I am not naive enough to suggest that we need another federal agency, or bureau or department; nor would I suggest that there is a practical way to bring all federal sources into a single unit, single control situation. Idealistically, it should be the goal, and it could be a national ultimatum if federal decision-makers really understood the tremendous amount of benefit to the economy and the tremendous amount of relief for our major problems that could be achieved by application of our unused technology.

But, a realistic goal would be establishment of a blue-ribbon Joint Congressional Commission that would be charged with drawing operational guidelines for a unified system of technology dissemination, by which all federal sources would be compelled to function. Thus, each federal source could remain intact within its present administrative base, but it would provide technology transfer according to policies and procedures consistent with those designed by this special Commission and approved by Congress. Having fulfilled the design responsibilities, the Commission could be disbanded; or it could be retained with the status of an advisory/review committee to the appropriate committees of Congress. Congress itself would assume the authority for overseeing proper performance of federal transfer activities.

To set the stage for such a Commission and to provide an immediate need, I would encourage this committee to continue to explore ways and means that would promote productive, practical, results-oriented mechanisms for transferring known scientific and technical information for practical benefits.

I believe it is becoming more and more obvious that technology transfer, in the practical sense, is an idea whose time has come. Realistically, then, it is time to provide a proper and methodical mechanism for transmission of federal-source technology. By the same degree of urgency, it is time for the federal government to encourage — by deeds and dollars — on a continuing basis practical results-oriented technology dissemination activities.

Experience has shown that when technology is properly transferred the benefits far exceed the cost of the mechanism. The federal government has provided leadership in instituting research that can meet national needs. Since federal tax dollars have financed this research, the logical conclusion is that the fruits of research should be made available to the taxpayers, by aggressive methods, so they can achieve the benefits.

Thank you, Mr. Chairman, for this opportunity to explain PENNTAP's philosophy and the support of our technology transfer activities by Penn State, the Commonwealth and the Department of Energy.

August, 1979

A P P E N D I X BTHE TECHNOLOGY INFORMATION CENTER¹

In October 1968 the Technology Information Center (CIT) was established within the Division for Documentation and Training of the National Institute of Technology (INT) in Brazil. INT is an industrial research institute belonging to the Ministry of Industry and Commerce.

CIT was created to establish communication channels between INT and its potential clients and to promote innovation. It was the first industrial information center of its type to be set up in Brazil under government sponsorship and had to start from scratch. The problems it faced were technical (such as translating documents into Portuguese and the nonavailability of reference books, specialized journals and trained personnel), political (for example, convincing the authorities of the Ministry of the need for industrial information services), and eventually organizational.

CIT provided the following services with the objective of assisting small and medium-sized companies:

- Abstracting service
- Question and answer service
- Extension services
- Bibliographic Service
- Translations
- Duplication of documents

All the services were free of charge except for duplication of documents and translations.

SDI (Selective Dissemination of Information) services using COMPENDEX tapes directed to the major 200 industrial companies, were initiated in August 1974.

CIT services were developed in successive steps. It reached its full functioning in the beginning of 1973 with the implementation of the extension service.

¹The present case is taken, with very minor editing, from a paper entitled "Industrial Extension Services: The experience of two research institutes in Brazil," by Angela L. Pompeu Davig. This paper was presented by its author at a DRI/ICAITI workshop on Management and Development of Contractual Research in Guatemala City, Guatemala, in June 1978.

CIT Users

The highest priority users of CIT were industrialists in the sectors of metals, rubber products, plastics, foods, packaging, ceramics, glass and electrical equipment.

Other users of CIT were the researchers of industrial and technological institutes and government agencies.

By the end of 1974 6,142 individuals or organizations were receiving CIT abstract bulletins and were thus potential users of its other services. Of these, 4,500 were in industrial companies, 1,408 in government and private institutions, and 234 in companies with foreign capital.

CIT Services

The Abstract Service

Articles were selected from 400 technical journals to be abstracted and published in six different monthly specialized bulletins. Copies of the original articles were provided upon request.

The analysis of the demand for this service enabled CIT to evaluate the preference of companies for certain subjects, as well as to select the most productive periodicals. In 1974 the rate of utilization of that service was 40%. That is, 40% of the individuals in the organizations receiving the abstract bulletins ("potential users") had actually requested copies of the abstracted articles.

Question and Answer Service

Stimulating the use of the Question and Answer Service was the next step accomplished by sending (along with the abstract bulletins) a request form to be filled in by the industrialist and returned to CIT.

Publication in "CIT News," a newsletter sent to all users, of the principal technical questions already answered was another motivating factor that encouraged the industrialists to pose questions. Answers to these questions were ready, needing only occasional update or other minor adaptations.

The types of questions varied from standards and specifications to suppliers of equipment, quality control, management, lubrication, layout, and so on.

The quality of the service and the practical results obtained by the companies were checked by questionnaires, visits and letters.

The Question and Answer Service used several information sources from abroad like UNIDO information service, the Canadian Technical Information Service, VITA in the U.S., Technical Information Service of CANACYT in Mexico, DTO in Denmark, Production Engineers Research Association of Great Britain, and others. The proportion of use made of sources of information is in the ratio of 6 : 3 : 1 for CIT internal sources, other sources within the country and foreign sources, respectively.

The average cost of a technical enquiry was around U.S.\$60 in September 1974.

It should be mentioned that several questions have led to further studies that resulted in technical reports by CIT engineers prepared to solve common problems of groups of companies which presented questions on related subject areas.

The Extension Service

Personal contact was a particularly effective means to attract and stimulate industry's demand for information. The extension service consisted of unsolicited visits made by specially trained engineers to selected CIT users. Companies to be visited were selected among the regular users of the abstract and technical enquiry services.

The extension service not only stimulated the industrialist to increase the use of the information services, but also created a growing procurement of the services provided by the research institute.

With regard to the services that industrialists have requested from the National Institute of Technology, some actual samples can be given:

1. Request for technical assistance to design an industrial quality control department and laboratory;
2. Request for technical assistance to diversify production;
3. Request for technical assistance to solve problems of the shelf-life of a product;
4. Request for technical assistance on alternative compositions of fire retardant products;
5. Request for technical assistance on alternatives for plant and production expansion and layout;
6. Requests for technical assistance related to by-products applications;
7. Request for assistance to adapt a piece of production equipment;
8. Tests and analyses;
9. Training courses.

The extension service was carried out by two engineers, especially trained and having more than ten years of experience in industrial companies.

179 visits were made in 1973, and 634 from January to September 1974.

CIT Resources, Problems, and Activity Data

a) Personnel

At the end of 1973, CIT had a staff of 77 persons. In 1974 it had a staff of 95 persons distributed as follows:

Technical Staff: 41

Engineers	16
Librarians	8
Chemists	5
Economists	4
Journalists	4
Metrologists	2
Translator	1
Accountant	1

Office Staff: 37

Student Trainees: 17

b) Office Area

Including the INT library (which in 1971 was attached to CIT), the CIT office occupied an area of 1590 m².

c) Budget

CIT budget in 1973 was equivalent to U.S.\$746,000, and in 1974 increased to U.S.\$968,000.

d) Cost Analysis

CIT developed an accounting and analysis system to follow up the execution of its activities. Two reports were extracted monthly. One report was quantitative, giving costs per CIT units and services. The other was analytic, giving comparisons between supply and demand for information, the degree of impact of CIT work by geographic areas and industrial sectors, and information subject areas most frequently requested.

CIT Main Problems

The design and operation of the abstract service presented the problems of selecting the periodicals, establishing criteria for selecting the articles to be abstracted, adopting standards for writing the abstracts, the technical editing of the abstracts and translations of original articles.

The major problem, however, was locating the potential users, due to the lack of industrial information in the country.

In the beginning of CIT work, 30% of the abstract bulletins were returned because of address problems.

The Question and Answer Service presented several difficulties, too. One of them was building up the information material collection and gradually expanding it. It was necessary to establish informal agreements with specialized libraries like COPPE and Petrobras in Rio, for instance. On several occasions, enquiries were forwarded to other research institutes like ITAL and IPT in Sao Paulo and CETEC in Minas Gerais.

Difficult problems were faced by the extension service, mainly with respect to the relationship between the extension service men and INT researchers. In nearly all the cases where extension service resulted in requests for INT services, the extension men had to get involved, to a certain degree, in the execution of the job.

Some of the requests called for more technical assistance than INT could handle for various reasons, like lack of personnel, equipment out of order, and

so on. Other types of requests were related to industrial engineering services not provided by INT. In those cases, the users were referred to proper institutions like productivity centers and the Brazilian Center for Management Assistance (CEBRAE).

Training for the extension men was another problem. Although CIT was created in 1968 and had its abstract and question and answer services operating by the end of 1970, it was only possible to initiate the extension service in 1973, after two engineers completed a three-month course at the Canadian Technical Information Service, now called Canada Institute for Scientific and Technical Information.

Some CIT Figures

1) Solicited copies of journal articles

Years	Requests	Rates
1971	1,300	100,0
1972	3,952	304,0
1973	8,301	638,5
1974 (Sept.)	12,238	945,2

2) Technical enquiries

Years	Technical Enquiries	Rates
1971	113	100
1972	144	127,4
1973	438	387,6
1974 (Sept.)	1,520	1345,1

3) Extension service

Years	Number of Visits	Rates
1973	179	100
1974 (Sept.)	634	354,2

4) Growth of CIT number of potential users

Years	No. of Potential Users	Rates
1971	1900	100,0
1972	2500	131,6
1973	3938	207,3
1974 (Sept.)	6142	323,1

5) CIT growth rates

Years	Users (Potential)	Solicited Articles	Technical Enquiries	Extension Service (visits)
1971	100	100	100	
1972	131,6	104,0	127,4	
1973	207,3	638,5	387,6	100
1974 (Sept.)	323,1	945,2	1345,1	354,2

CIT and INT

INT researchers were in general very cooperative in writing abstracts and giving technical opinion and literature references for answering technical enquiries. INT researchers were proud of CIT and were satisfied with CIT information services provided to them. Nevertheless, there was some bad feeling because:

- a) CIT staff was better paid than INT personnel in general. This was especially true in the case of the extension service men.
- b) The researchers felt they were not getting enough credit for cooperating with the Question and Answer Service.
- c) Extension service men were bringing in industrial problems they didn't want, didn't have time for, or were not prepared to handle.

On the other hand, the extension service engineers and CIT staff in general felt that they worked harder than INT personnel and were better organized. They also felt that the money allocated to the CIT budget was being unjustly spent to support other activities of INT.

Extension service men felt that for several reasons at times some researchers did not want to give out the information needed by an industrial company.

On two occasions, information available from research projects could not be passed on and/or sold to companies before the researchers published the results and received the principal recognition for the work.

Also, the size of the CIT budget and the dimensions of its staff were overloading INT administrative sections.

Although data were not formally collected to study the relationship between the extension service group and other INT groups, several differences between them were observed:

1. Objectives
 - a. Extension service and Question and Answer groups had as their main objectives the utilization of knowledge, promotion of INT and CIT services, identification of industrial clients' problems and bringing them in for a proper solution by INT.
 - b. INT researchers had as their main objectives to do research, to publish and have their general research programs periodically approved and funded by the Government.
2. Recognition
 - a. Extension service and other CIT groups would receive recognition from the users very fast. A well-answered technical inquiry could produce a nice letter from a happy user in 30 days. Monthly reports providing information about users' responses to the services were anxiously awaited.
 - b. INT researchers would receive recognition from their work several months after they finished a research project and an article was published. Research reports sent to government agencies did not produce any feedback at all.
3. Organization
 - a. CIT staff had flexible hours, INT staff didn't.
 - b. CIT had greater flexibility to hire its personnel, which represented 20% of INT total staff.
 - c. INT administration thought CIT expenses on facilities and audiovisual aids were very high.
 - d. CIT personnel thought INT administration was slow, especially the purchasing section.
4. Time
 - a. The extension service group thought the clients' requests they brought in should have high priority and ought to be attended to as fast as possible.
 - b. INT researchers thought the extension service group was putting pressure on them, disturbing their long-term research work, and did not understand the various problems INT had.

In trying to solve those problems, CIT was developing more and more its own organization structure, making integration more and more difficult. Thus, along

with the clients, research opportunities, and more recognition from the private sector, CIT brought in several problems to INT.

The most serious problem was related to the capabilities of INT to serve the clients that CIT was bringing in. It became clear that CIT work did not take into full consideration INT objectives, existing programs, technical capabilities, and mainly was not aware of INT weaknesses.

On the other hand, CIT periodical reports on the utilization of the information services and on users' information needs were not used by INT top management to design research projects and programs.

* * *

Management of INT wondered where the situation was heading, and whether it was worth the problems that were developing. Management of CIT asked itself similar questions.

ANNEX C

THE ENGINEERING AND INDUSTRIAL DESIGN DEVELOPMENT CENTER

The Center was established in 1968 with UNDP financial support and UNIDO acting as the executing agency for an initial five-year period. General UNDP support has continued through 1981, after which only project support is expected. At the end of 1975, the former ILO-sponsored Institute of Small Industries, which operated from 1969 until 1973, when ILO ended its support, was attached to the Center.

The Center has a Board (Higher Committee) which is chaired by Deputy Minister Sharkas (head of GOFI) and includes the Center's Director General, who ranks as an Undersecretary. The Committee Members are,

- a. Deputy Chairman of the General Organization for Industrialization (GOFI)
- b. Director, National Research Center
- c. Chairman, Egyptian Federation of Industries
- d. Head, Technical Secretariat for Metal Industries and Products (Ministry of Industry and Mineral Resources)
- e. Chairman, El Nasr Authomotive Co.
- f. Chairman, Delta Industrial Co. (Ideal)
- g. Director, Technical Research, GOFI
- h. Director General, Electronics Research Center
- i. Director General, EIDDC

The Center is an autonomous entity affiliated to GOFI. However, revisions of its charter are now in an advanced stage and expected to receive approval in the near future. With the anticipated changes the Center will be on an organizational par with GOFI, its Director reporting directly to the Minister.

The GOE budget for the Center for FY 1981/82 is just over one million pounds: LE 650,000 for investment, LE 320,000 for salaries

and related costs, and LE 80,000 for operating expenses. In addition, the Center generates its own revenue from fees charged for its services; half of this income is paid in to the Treasury, half is used for Center expenses, including staff incentive payments.

The main objective of the Center is to assist industry by developing newer and better products and industrial designs, improving engineering technology by better plant layout and tooling, construction of prototype equipment, and the dissemination of technical information. Some of the activities of the Center are described in Appendix 1; training courses are listed in Appendix 2. The Center is organized in nine operating divisions: (1) Product Design and Development; (2) Processing Equipment Design; (3) Engineering (production technology and tool design); (4) Process Design; (5) Workshops (for prototypes); (6) Heat Treatment and Materials Testing; (7) Training, (8) Documentation; and (9) Small Industry Development.

The Center has always been a service institution for industrial clients. Originally it served exclusively large public sector firms. Since the mid-seventies it has increasingly worked with smaller firms and the private sector. This trend was accelerated in 1980 with the initiation of a pilot small industry extension service assisted by the World Bank through the Development Industrial Bank. That activity will continue through mid-1982 with UNDP financing, after which plans are to expand it with World Bank assistance over thirty months. (The World Bank project is described in Annex E to the Project Paper.) The Center has also requested UNDP assistance through the ILO in 1982-1984 to develop its ability to provide management training and advisory assistance to entrepreneurs and workers in small and medium industry seeking new opportunities and possibilities for growth. This half million dollar, three-year project would focus on the Governorates of Alexandria, Beheira and Matruh.

In addition to the above, the UNDP Country Program for 1982-1986 is expected to include for EIDDC a second phase of Industrial Training and

Advisory Services (ITAS), and a first phase of a project entitled Agricultural Machinery for Small Farmers. The ITAS support will be in the form of two specialists for a year each, short-term specialists in technical areas, equipment and staff fellowships; its purpose is to strengthen the Center's Training Department. The Agricultural Machinery project will involve principally field study of current practices and needs, expansion of the Center's ability to design and develop appropriate equipment, prototype design and development directly and through local plants, and preparation of a plan for a second phase in which large scale manufacturing of successful designs would be introduced. EIDDC also receives assistance in the form of short-term specialists, fellowships and equipment from bilateral donors (Federal Republic of Germany, Austria, Netherlands, Italy, Sweden).

EIDDC currently operates from two locations in Greater Cairo (one in Cairo, one in Giza), but plans to gradually increase its accessibility to industry in the rest of Egypt. This is currently done by having technical teams travel out from Cairo, but the Center hopes to open its first governorate branch office in Ismailia by the end of 1981. From there, a small technical staff would undertake diagnostic studies in local industry and identify problems for reference to the technical departments in Greater Cairo.

The Center presently has a staff of more than 400, including 60 graduate engineers, approximately half of whom are women. Consultants from United National specialized agencies are used for special tasks. The Director General of the Center, Dr. Yusuf K. Mazhar, has been in charge since 1973 and is an able man. Staff development and incentive programs for staff (utilizing revenues from nominal fees charged for services) help the Center retain a competent staff.

ANNEX C

APPENDIX 1

ACTIVITIES OF THE ENGINEERING AND
INDUSTRIAL DESIGN DEVELOPMENT CENTER

I. PRODUCT DESIGN AND DEVELOPMENT

1. Switches, sockets, plugs etc. for household use
2. Design of various consumer goods (heaters, fans, small washing machines, table type electric cooker, water heaters and irons.
3. Design of various types of trailers from 4-24 tons capacity (trailers of 4-, 6-, 8- and 10 tons and semitrailer of 10-, 16- and 24 tons). Special trailers for flour transport are also being designed.
4. Design of various types of bus bodies (for public transportation, tourists and schools) on various imported chassis.
5. Design of various components for trailers and bus bodies (turntable, brake-cam, screw jacks, axles, door mechanism, seats, etc.).
6. Various industrial design activities upon request (economy housing, furniture, seat design for transportation industry, interior design, designs for industrial exhibitions, etc.)

II. PRODUCTION TECHNOLOGY AND TOOL DESIGN

1. Production processing and tool design for various products
 - switches, sockets, plugs etc.
 - gate valves for water supply
 - component parts for fluorescent lamp and TV sets manufacture
 - component parts for trailers manufacture
 - spare parts for textile machines
 - plastic moulds for local industries
 - Production technology for transportation trailers

2. Production process planning and layout for various industries

- Redesign of large foundries
- tool room for an electrocable factory
- tool room for a railway wagons factory
- heat treatment workshop for electrocable factory
- heat treatment workshop for production of spare parts of textile machines
- complete new plant for airconditioners and water cooler production
- complete new plant for trailer production
- complete new plant for maintenance of diesel engines, etc.
- maintenance workshop for measurement instruments for a large textile mill

3. Technical assistance and consultancy on specialized fields

- heat treatment process and material testing technology in automotive industry
- heat treatment process for manufacture of component parts for processing industry, etc.

III. PROCESSING INDUSTRIES

1. General assistance in study and revision of projects for processing industries (technology, specifications, preparation, etc.)
2. Assistance in revision of various projects in view of local production facilities
3. Design and unification of material handling equipment for processing industries.

IV. ENGINEERING CONSULTANCY SERVICES TO INDUSTRIAL ENTERPRISES

1. Improvement of material handling facilities (study, system design, relayouting, specifications of new equipment) for various equipment design
2. Food processing industries (system design, engineering services, equipment design)
3. Modification of tin box production lines
4. Building material industries (study and system design)

V. WORKSHOPS AND LABORATORIES

1. Manufacture of prototype
 - agricultural thrashers
 - complete winch unit for heavy traction
 - plate bush roller conveyor
 - components for mobile conveyors
 - components for trailers
 - electrical utility components and component parts, etc.
 - modified windmills
2. Tool manufacture according to design made by the Center for various factories
3. Manufacture of some complicated components or component parts upon request from various factories (gear box, cutters, axles, etc.)
4. Heat treatment of some component parts for various factories (valves, punches, parts, etc.)
5. Testing of various component parts and materials for factories (hardness testing, surface testing, material testing, etc.)

ANNEX C

APPENDIX 2

EIDDC 1981 TRAINING PROGRAM

Following is the program of training courses offered in 1981 for engineers, supervisors and technicians. The courses are fulltime. Duration varies with the course from two to four weeks, with the exception of one eight-week course. Course fees range from LE 60 to LE 120 (\$35-170).

<u>Title</u>	<u>No. Weeks</u>
<u>For Supervisors and Technicians</u>	
- How to Read Mechanical Drawings	4
- Inspection and Quality Control	3
- Mechanical Workshop Management	2
- Welding Technology	3
- Maintenance Technology	4
- Carpentry Machinery and Equipment	4
- Fits and Tolerance	2
- Jigs and Fixtures	2
- Finishing of Furniture	2
- Practical Heat Treatment for Factory Operators	3
- Injection Moulds	2
- Die Manufacturing	2
- Upgrading Dies & Tools Draftsmen's Skills	4
- Advanced Milling Techniques	2
- Upgrading Mechanical Draftsmen's Skills	8
<u>For Engineers</u>	
- Heat Treatment & Material Testing	2
- Feasibility Studies and Planning of Industrial Projects	3
- Compound & Progressive Press Tools	2
- Die Castings Moulds	2
- Industrial Engineering	3
- Factory Planning and Layout Techniques	2
- Systems and Equipment of Material Handling	2
- Industrial Design	2
- Hydraulic and Pneumatic Control Systems	2
- Organization and Management of Maintenance Systems	2
- Value Engineering	2
- Production Processes Techniques	2

ANNEX D

CONTRACTOR ROLE

The AID inputs will be provided through a contractor expected to play a major role both in delivering services to industry and in developing the capability of EIDDC to do the same. Note that for information and short-term consulting services, the contractor is expected to involve U.S. industry sources to a significant extent. A summary description of the different aspects of that role is as follows,

1. Provide close headquarters and field team collaboration with EIDDC management in the planning and monitoring of ITAP progress and in the development of any changes of strategy or tactics required to maximize the likelihood of meeting or exceeding project objectives.
2. Provide at least fourteen and a half (14.5) person-years of long-term technical assistance in the form of,
 - a. 1 project manager (4.5 years) with an engineering and management background to advise EIDDC top management regarding ITAP policy, development and administration, to supervise contractor professional personnel and local support staff, to assist the ITAP Director in developing systems and skills needed to effectively manage the program, to oversee arrangements for short-term specialists, to ensure execution of the general management and support service development activities anticipated in the project, to provide contractor liaison with AID/Cairo, to participate in conception and implementation of project promotion efforts, and to generally ensure that project support, delivery and reporting systems function effectively;
 - b. 2 field engineers (one for 4.5 years, one for 3.5) with industrial engineering backgrounds, to work with the ITAP Technical Specialists in Cairo and Alexandria in the full range of promotional, diagnostic, information seeking/communicating, and assistance procurement and training services they are expected

- † to deliver (see II.B.2.b.iii Institutionalization), providing the Egyptian staff with on-the-job training and coaching related to all aspects of the job, and participating in the delivery of the ITAP services in this training/coaching role; and
- c. 1 information specialist (2 years) with technical information experience to provide on-the-job training/coaching to the Egyptian Resource Specialists, supervisory support to management, technical assistance with data base development and system debugging, and training of EIDDC staff outside ITAP in system utilization.
3. At the request of EIDDC/ITAP via the resident contractor project manager, identify, specialists with solid practical experience with the technology and the industry concerned in individual cases; consultants will be sought primarily to provide technical assistance to industry, but may also be needed to assist the contractor's resident team in implementing the contractor role.
4. Plan, organize, train EIDDC trainers for, and otherwise assist with training programs for key company managers and technical personnel in such areas as technology evaluation and selection, internal diagnostic studies, preventive maintenance and energy conservation.
5. Backstop ITAP Information Services, for example by providing timely search services for technical information ITAP cannot find directly, utilizing industry sources where appropriate as well as commercial data bases and documentation sources.
6. Plan, organize and carry out and/or oversee training of ITAP Technical Specialists and Resource Specialists in the U.S. and in Egypt, ensuring that the training involves a substantial element of relevant practical experience. . .

7. Plan and implement training or other appropriate activities for R&D unit personnel from Egyptian firms selected for assistance in developing a new or existing in-house unit.
8. Plan, organize, carry-out and/or oversee in Egypt the organizational development effort to be focused on EIDDC to strengthen it and integrate ITAP into it.
9. Organize U.S. industry study tours envisioned for Egyptian industrialists, with engineers and scientists from EIDDC and other institutions serving industry to obtain direct information about particular technologies or technological problems of special broad interest.
10. Assist EIDDC commodity selection for procurement by AID/Cairo.

In the body of the Project Paper there are numerous references to the contractor role in particular contexts. Those statements should be taken in conjunction with the present Annex for a more complete picture of the contractor role as anticipated during project design.

ANNEX EThe Technical Specialist and the Resource Specialist1. Technical Specialist

The job of the Technical Specialist will involve promoting technology improvement in company visits and through meetings workshops and other media. It will involve undertaking in-company diagnostic studies focused on technology but taking into consideration management practices, labor skill levels input quality and supply, and other such relevant factors. The Technical Specialist must help firms define needs or problems, then must seek an appropriate reply or solution; this will involve working with ITAP's Resource Specialists and also frequently with Egyptian specialists in other institutions. The job entails communicating findings understandably to the client, in some cases helping him establish a relationship with a local specialist who can assist him, or seeking out others in the subsector with an interest in similar technology and needs that collectively would justify bringing in a foreign specialist. To do all of this well, ITAP Technical Specialists will have to possess good diagnostic skills, be capable of effective communications with businessmen, technicians and scientists, be familiar with conventional and computer data bases, be good organizers and planners of their own work, be good team members, and maintain competence in a technical speciality but have a wide ranging interest in technology.

2. Resource Specialist

The Resource Specialists' job will involve conducting searches for the Technical Specialists (and others in EIDDC) utilizing standard reference works, documents, computer data bases, microfilm/fiche sources, telephone/telex inquiries to individuals and/or organizations in Egypt, and telecommunication queries abroad, principally via the U.S. contractor. Their job will also require the organising of currently available documentation at EIDDC and the establishment and maintenance of new data

bases, at least of Egyptian sources of expertise, and of questions and answers processed through ITAP. They will have to monitor their own experience to identify sources that are more useful than others, and those that are less useful, and to spot gaps in their resources. And their job will involve ensuring that the rest of EIDDC knows what service they can provide and how to use it. In short, ITAP Resource Specialists will have to be capable of building, maintaining and exploiting an information system based on a wide range of Egyptian and foreign sources, formal and informal, of training EIDDC staff in the use of the system, and in the nourishment of it, and of effectively communicating with the technical users of their services.

ANNEX F
WORLD BANK SMALL INDUSTRY PROJECT

Under a 1978 loan to the Development Industrial Bank, the World Bank initiated a pilot program for providing technical assistance to small scale industry. The pilot program had the following components:

- (i) Technical extension services, including project preparation assistance, to improve the productivity of small enterprises in the engineering, metalworking, plastics, woodworking and furnituremaking trades in Cairo, to be organized and implemented by the Engineering and Industrial Design and Development Center (EIDDC).
- (ii) Skill upgrading of workers in engineering, metalworking, woodworking and furniture trades, to be carried out by EIDDC in Cairo.
- (iii) Accelerated training for unskilled or semiskilled workers in the engineering trades, to be implemented by the Productivity and Vocational Training Department of the Ministry of Industry (PVT) in Cairo and Alexandria.
- (iv) Industrial Management training for owners and managers of small industry to be executed by EIDDC in Cairo.

Unforeseen administrative problems delayed implementation of the pilot project by two years. It effectively began with the arrival of the technical extension expert in May 1980. The first year of activity was evaluated early in the summer of 1981. As a result, the World Bank proposes to include a 2.5 year follow-up project in a new loan to be negotiated with the Development Industrial Bank. This would become effective 1 July 1982. Efforts are currently underway to ensure funding in the interim between the end of the pilot effort 6/30/81 and the beginning of the new project a year later.

Pilot Project

EIDDC has been operating a single technical extension team of three extension officers, including an engineer manager and a foreign advisor on extension services. During the nine months from May 1980 to February 1981, the team made 145 field visits to 72 firms, of which 46 employed 10 or more workers. The teams did diagnostic surveys in all 72 firms and provided advice on a number of problems including selection of machinery and raw materials, tool and die design, production planning, factory layout, product and process design. They also referred a number of questions to technical divisions at EIDDC and helped five companies prepare project feasibility studies for loan applications.

EIDDC provided technical training in woodworking and engineering for small businessmen and their employees. Two fourweek courses were given at EIDDC and two shorter on-the-job training activities were undertaken at factory locations. In addition, a number of small scale industry owners participated in regular EIDDC training courses during the year.

The proposed vocational training through PVT was carried out and a cursory review found company owners satisfied. This component is omitted in the proposals for the future because of the understanding that the services will be provided without any inputs on the part of the World Bank.

The anticipated management training was not undertaken because programmed technical assistance had to be cancelled when available funds proved inadequate in the face of cost increases between planned start-up and actual initiation of activities.

Proposed Program

The proposed program would be an extension of the pilot project, both in range and in content. Thus, it will offer more services to more people.

Its target population is small and medium industry, which the bank defines as firms employing up to 150 employees or with fixed assets, excluding land buildings, up to LE 1 million. Priority will be given to DIB clients. Subsector focus will be as with the pilot project.

A second extension team will be operational in July 1981, a third—in Alexandria—in 1983; by project end in December 1984, there are to be four teams operating from Cairo and two from Alexandria. Present plans are for the current extension specialist to remain on post until mid 1983; the balance of the extension staff will be Egyptian, including three unusually highly qualified engineers who will receive substantial salary toppings from special funds of the DIB (reserves of point spread revenue from using OPEC Special Fund loan resources).

The Small Industry Development Department of EIDDC will also add during the project a management services unit to provide businessmen with consulting assistance and help in preparing feasibility studies/reports in support of DIB loan requests, to assist EIDDC's training department in the development of management training programs for small business, and to undertake studies of general interest to small industry. This unit will have an Egyptian staff of three professionals and, for two years, an expatriate advisor.

The proposed program will also include greatly expanded training for small and medium industry. Envisioned are 2-4 week technical and management courses. Technical training will cover engineering subjects, e.g. reading blueprints, analyzing fits and tolerances, design of jigs and fixtures, process design, operation of specialized machine tools. Management development will be oriented especially to managers of small firms and will cover accounting, production management, marketing, procurement, labor law, etc.

Finally, the program includes development of a sub-contracting service within the Small Industry Development Department. The Unit's major functions would be: (a) to develop and maintain an up-to-date

information system containing data on firms interested in sub-contracting, e.g. list of machinery, capacity, skills, record of performance, etc. for evaluating the capability of firms for fulfilling orders with facility for quick access to specific data needs; and (b) to promote sub-contracting opportunities between large and small firms by: (i) contacting large firms to encourage purchase of products, components and sub-assemblies from smaller firms on a sub-contracting basis; (ii) providing information to large firms on capabilities, competitiveness, delivery dates, etc. of potential suppliers; (iii) assisting large firms to purchase their requirements through competitive procurement practices; and (iv) assisting small and medium size firms with technological and management problems encountered in filling sub-contracts with the assistance of the extension unit. The unit would be staffed by two Egyptian professionals; they would be assisted for six months by a foreign advisor.

The World Bank funding also provides for staff fellowships and commodity procurement. Fellowships for training approximately twelve staff members of the extension and management services units are included in the budget, as are funds for study tours. In addition, there is provision for purchase of six vehicles for use by the extension teams, necessary office equipment, and goods and services (e.g. forms, brochures, training films, computer software packages, etc. not readily available locally).

Program cost is estimated at \$975,000 and LE 350,000 over its thirty month life (7/1/82-12/31/84). Dollar funding would come from the World Bank via its loan to the DIB. Local currency would be provided by the GOE through its regular budget, and--in the case of salary topping funds mentioned above--from the special account held by the DIB.

A N N E X G

ECONOMIC ANALYSIS : SUPPLEMENTARY PENNTAP DATA

\$12,566 Every Day

**That's the Average for 1972-80 Period;
Benefit vs. Cost Ratio is 14.4 to 1**

Economic benefits created for Pennsylvania's economy by PENNTAP assistance during the past nine years have averaged \$12,566 a day!

An analysis of the total economic benefits reported by the firms and organizations which have used PENNTAP's services indicates:

- For the years 1972 through 1980 economic benefits totaled \$41,306,947¹; the number of cases totaled 14,216.
- Actual cases averaged 1,580 a year, 132 a month.
- Known benefits averaged \$4.5 million a year, \$382,471 every month, \$12,566 every day, \$523 every hour.
- Without the intangible benefits determined by application of the special economic formula, actual known benefits determined by the user averaged \$1.63 million a year, \$136,597 every month, \$4,488 every day, \$187 every hour.

¹This total includes tangible amounts reported as actual savings and benefits by the users of the service along with intangible considerations which are determined by a special economic analysis formula developed by two economists at the Wharton School in Philadelphia. The formula takes into account practical benefits to firms and communities — benefits of the type which cannot have a dollar value as such. Many of these concern improvements in the quality of life or factors which otherwise defy statistical analysis.

¹Text reproduced from 1980 Annual Report of Pennsylvania Technical Assistance Program (J.Orvis Keller Building, University Park, PA 16802)

In that same period, PENNTAP's operating expenses — covered by the University through Continuing Education and by the Pennsylvania Legislature through the Department of Commerce, plus funding for special projects by several state and federal agencies — amounted to \$2,866,415.

- That breaks down to an annual average of \$318,490.
- The cost-benefit ratio is 14.4 to 1 which shows that for every dollar Continuing Education and state and federal departments invested in PENNTAP, an average of \$14.40 was returned to the state's economy.

1980 Benefits

In 1980 the economic benefits attributed by Pennsylvanians to assistance they received from PENNTAP amounted to \$12,806,981.60, the largest total ever in the nine years PENNTAP has had professional technical specialists responding one-on-one to questions and problems from business and other organizations. Statistically:

- That breaks down to \$1,067,248 a month, \$35,087 every day, \$1,462 every hour.
- Problems in the energy sphere, related to preventive maintenance, production and equipment performance, and building efficiency, accounted for \$10,844,551 of the total.
- By using PENNTAP, business and other organizations said 1,298 mandays of personnel time were saved. That's 260 work weeks or 5 years of personnel time that could be used for other purposes.
- By type of organization, this was the distribution of benefits —

		% of total
Business/Industry	\$2,644,628.80	19.87
Local Government	231,932.40	1.81
Schools/Colleges	9,863,946.40	77.02
Health Care	50,736.00	.40
Nonprofit	106,316.00	.83
Government	5,082.00	.04
Other	2,790.00	.03

¹Represented in these organization totals:
Business/Industry — all sizes of commercial firms;
Local Government — cities, boroughs, townships, regional units, or agencies of these units;
Schools/Colleges — public school districts, private schools and all post-secondary institutions; Health Care — hospitals, nonprofit medical centers, nonprofit nursing homes; nonprofit — churches, YMCAs, etc.; Government — state and federal government departments, bureaus, agencies; Other — entrepreneurs, inventors, professional fields.

Analyzing the Analysis

Record-keeping and the Evaluation Procedures

Since PENNTAP's operation emphasis is on service, the record-keeping reflects that emphasis. Only activities that measure effectiveness are statistically preserved.

- In practice, a service organization such as PENNTAP needs to be prepared to respond quickly and determine the urgency of a problem. The PENNTAP routine is to obtain a minimal amount of contact information from the first call and then maximum and detailed information about the problem itself.
- Aside from the name and address, records show the type of organization, the category of the problem, the type of assistance provided, how the user learned about PENNTAP, and, eventually, the evaluation by the user of benefits achieved. If the user does not choose to evaluate, there is no attempt to speculate or to estimate the benefits.

Implementation of the problem-solving methods or devices seldom show immediate measureable results.

- Time is needed to determine how much improvement or how many dollars have been saved as a result of a change. Generally more than a year of experience must be tracked before an owner or manager can pin down actual benefits.
- PENNTAP technical specialists determine the appropriate time to

send evaluation requests. The average time is approximately six to nine months after the case has been completed. (Frequently specialists will supply information and assistance over an extended period as new data or devices become available that might have potential application.)

About the information and statistics in this Annual Report:

- These 1980 statistics represent what happened during the calendar months of 1980. Economic benefits are based on evaluation forms returned by users during 1980. Benefits reported are from many cases actually received during 1980. But, also the totals include benefits achieved from PENNTAP services performed in 1979 or 1978 where clients chose to hold off reporting them until actual figures were on hand.
- Therefore, there is no correlation of the number of questions received during a calendar year and the total economic benefits recorded for that same year. (The data for each past year could be updated to reflect benefits from cases received in a particular year, but such updating would have insignificant value and would impose inappropriate manpower, computer time, and budget burdens.)
- "Benefits achieved" are not a reflection of activity from another

aspect. The *only* benefit amounts recorded and accounted for are those determined by the user and the *only* method used to learn what benefits amount to is through the evaluation procedure. Thus, if PENNTAP performs the service and the user does not respond in the evaluation process, for whatever reason, PENNTAP has no record of benefits achieved by that user. In short, PENNTAP reports only benefits known and reported by users.

- User names or user problems are never published without clearance since this information many times represents confidential products, processes, or planning.

Percent Returned

What percentage of the evaluation forms are returned?

- The average is 37%
- In 1980, 36.5% of returned evaluations mentioned actual benefits in dollars and mandays saved.
- In 1980, 58.3% of the evaluations said PENNTAP was helpful, but dollar value could not be assigned to the benefits.
(Comments: We now have good background information. Assistance confirms our finding. Not yet able to measure benefits.

Savings will be great, exact amount not yet known. Needed information for research project. Based on your data, the project is not feasible. Project on hold. You gave some ideas we're going to pursue. Your information pointed out several pitfalls we did not anticipate . . . we probably would have lost a bundle. I couldn't find that data anywhere else.)

- In 1980, 5.2% of returned evaluations did not have positive comments or had no comments at all.

Is there an explanation for the nonreturned evaluations?

- Aside from the customary tendencies of human nature not to respond to questionnaires, regardless of their brevity, PENNTAP has found:
 - The percentage of responses to its evaluation process is above average.
 - Assembling benefit data takes time and in most small businesses, for example, owners or managers are busy. Often a second request will be responded to promptly with an apology for the delay.
 - For whatever reason, some people find it difficult to acknowledge assistance from others:

ANNEX H
NOTES TO FINANCIAL PLAN

A. Line Item Definitions

AID INPUTS

I. PERSONNEL

- a. 14.3 man-years of long-term technical assistance consisting of a project manager and an industrial engineer the full five years, another industrial engineer the first four years, and an information specialist the first two years.

- b. 70 man-months of short-term US consultants generally for periods two to six weeks to provide technical assistance to firms following diagnostic work by US and Egyptian personnel on site; some limited use of these same people likely for promotion and for technical training of project staff, and one or two consultants may be used for consultancy/training to strengthen EIDDC (as per Part II.B.2.iv of PP). Consultants' services via EIDDC P/O, with payment by AID/Cairo on EIDDC notice of goods received

- c. 40 man-months of short-term Egyptian consultants, to provide expertise for diagnostic services in fields for which EIDDC has no staff. Consultants' services via EIDDC P/O, with payment by AID/Cairo on EIDDC notice of goods received.

- d. 8 man-months of short term Egyptian consultants for organization development assistance to EIDDC. Consultants' services via EIDDC P/O, with payment by AID/Cairo on EIDDC notice of goods received.

- e. 100 man-months of short term Egyptian consultants to provide assistance to companies otherwise unlikely to get such assistance. Budget provides for partial funding only.

- e. Contractor office staff in Egypt: 2 secretaries, 1 administrative assistant, 1 bookkeeper, 3 drivers.
- f. Contractor personnel inputs in the U.S.: management, 0.5 man-year; information specialist 0.5 man-year; administrative secretary, 1.0 man-year.
- g. Contractor overhead at 100% of salaries and benefits of long-term personnel and home office personnel. Fee at 10% of salary, benefits and overhead.

II. SERVICES

Subscriptions to data sources covering equipment vendors, industrial standards and technology information, and use of commercial data bases on an "as-used" cost basis.

III. INFORMATION DISSEMINATION

- a. advertising of services, publications (brochures, technology sheets, conferences, etc..)
- b. Visits to U.S. firms by industrialists with engineers from FIDUC and other service institutions. Eight groups of eight people years 2, 3, 4, 5 for two weeks each.

IV. TRAINING

- a. For ITAP staff. Costing based on assumption of average 90 day stay for combination of formal and on-the-job training in the U.S. for an initial staff of 7 to which 3 are gradually added. To allow for additional staff the sixth year and for either more rapid growth or attrition (and training of replacements) budget assumes training a total of 25 people.

- b. A small sum (\$5,000) is included for in-country training in management and/or secretarial, accounting or other support skills.
- c. Provision for up to 25 managers and/or researchers from in-company R&D units to spend an average 4 months in the U.S. in special training or collaboration efforts with U.S. colleagues. Demand assumed increasing rapidly years 3, 4, 5.

V. COMMODITIES

The following commodity list is for budgeting purposes and does not commit AID to specific purchase. Recommendations as to individual items and quantities will be submitted by EIDDC to AID for approval, which will be based on project design, progress and need as identified in project implementation.

For the contractor team and the ITAP staff, including the head office and three field offices, as anticipated in the project. Electric and manual typewriters, manual; tabletop copy machines; microfilm/fiche reader-printers; computer peripherals (terminals, memory capacity for use with EIDDC computer); documents, books, journal subscriptions; miscellaneous small items (e.g. calculators); four cylinder passenger cars for the contractor business use and for the Technical Specialists (field agents) and their two U.S. engineer counterparts. Procurement will be via AID/Cairo PIO/C.

VI. OPERATIONS

- a. Contractor Cairo office operating expenses (office supplies, gasoline, and international telephone/telex expenses).
- b. Project management travel. Project Supervisor (EIDDC Director General) and Program (ITAP) Head to US contractor and principal information/technical assistance sources annually three weeks;

1 contractor home office project supervisor to Egypt years 1, 3, 5 for two weeks.

c. Part of cost of establishing branch offices (fix-up, telex installation, etc.).

VII. SPECIAL

Short-term consultant assistance to EIDDC to assist in preparing the advertisement for pre-qualification statements, the request for proposals and in evaluating proposals. To be arranged through the Mission in Cairo

VIII Evaluation

This item includes a consultant for four two-week progress assessments on a semi-annual basis the first two years of project activity, a consultant and an AID/W person for a three-week interim evaluation, and two consultants with an AID/W person for a three week Phase I of the final evaluation. Phase II of the final evaluation cannot be funded not within the five-year limit, but will be funded from another source at the appropriate time.

GOE INPUTS

I. PERSONNEL

ITAP technical staff and support personnel. The former grow from a program head plus six in year one to a head plus sixteen in year five. Support staff increases from four to six. The total, thus from 11 to 24. (Incentive payments to this staff are below under "Special", and indirect personnel inputs are included as part of "Indirect Support.")

VI. OPERATIONS

General operating costs of ITAP at the head office and the three field offices, including partial costs of the establishment of the field offices.

VII. SPECIAL

Incentive payments to ITAP staff and for part-time inputs and responsibility of officials with contract management responsibility at EIDDC. EIDDC is to devise a system and request financing from a Special Account held for this and other purposes by the GOE and funded by local currency repayments of CIP dollar loans. The incentive system will require Ministry of Economy and Mission approval for Special Fund financing. Fee revenues will gradually replace the Special Fund as the source of financing for these incentives.

IX INDIRECT SUPPORT

Office space for ITAP (including the contractor), use of facilities and space of the training center and of engineering workshops, the EIDDC computer and other equipment; management, technical, training and support staff inputs; assistance from other parts of the Ministry in putting together information for data bases, and from governorate authorities in introducing the program in their areas.

AID AND GOE INPUTS

INFLATION

Inflation is figured at 12% for dollar costs and 17% for Egyptian Pound costs. Assuming start-up is approximately one year from now when current prices used for budgeting will have risen, first year costs are inflated from the current estimates used for budgeting purposes.

CONTINGENCY

It is figured at 5 % of the total for both AID and GOE inputs to allow for changes in plans on the basis of experience; some such changes are inevitable in a program such as this that must respond to requests from multiple clients.

PPT FORM
(May be Expanded as Appropriate)

Country: Egypt	Project No: 263-0154	Project Title: Industrial Technology Application	Date: 7/9/81	/ x/ Original / / Revision.#	PPT appn
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or FY: CY	1982					1983					1984														
Month:	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	
0																									
1. ProAg signed																									
2. ITAP/EIDDC established																									
3. RFP issued																									
4. Fee guidelines approved																									
5. Contract negotiated																									
6. ITAP staff to US training																									
7. Contractor team installed																									
8. Egyptian staff return from US training																									
9. Progress Assessment																									
10. First Field Office Operational																									
11. Organiz. Devel. Consultancy																									
12. Begin full service activity																									
13. Progress Assessment																									
14. Progress Assessment																									
15. Second Field Office Operational																									
16. Interim Evaluation																									
17. Plan of Post Operations Last 2 Years																									
18. Third Field Office Operational																									
19. App'l 35, Ch 3, HB 5, Pt I (TM 3:19)																									
Financial Plan:																									
Evaluation Plan:																									

ANNEX I

A-82

PPT FORM
(May be Expanded as Appropriate)

Country: Egypt	Project No: 263-054	Project Title: Industrial Technology Application	Date: 7/9/81	/ x / Original / / Revision #	PPT app
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or FY: CY	1	9	8	5	1	9	8	6	1	9	8	7												
Month:	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S

36

48

60

Prior
Actions

19.
Progress
Assessment

20.
Final
Evaluation
(Phase I)

21.
Final
Evaluation
(Phase II)

Post
Action

App 3G, Ch 3, HB 3, Pt 1 (TM 3:19)

Financial Plan:
Evaluation Plan:

✓

X

X

PPT FORM

Country: EGYPT	Project No: 263-0154	Project Title: Industrial Technology Application	Date: 7/9/81	XX/ Original / / Revision #	Apprvd:
<u>CPI DESCRIPTION</u>					
<ol style="list-style-type: none"> 1. Sept. 1981 Project Agreement signed with GOE 2. 10/81 GOE establishes ITAP/EIDDC and acts to make possible staff recruitment 3. 12/81 Request for Proposals issued to previously short-listed firms 4. 1/82 ITAP service charge (fee) policy/guidelines approved by USAID 5. 3/82 Contract negotiated with organization to provide long-term technical assistance and other services 6. 5/82 Initial ITAP staff sent to the US for approximately 3 months training 7. 8/82 Contractor team of four resident specialists installed in Egypt 8. 8/82 Egyptian staff return from U.S. training 9. 8/82 Progress Assessment 10. 9/82 First field office is operational 11. 9/82 Organization development consultancy begins at EIDDC 12. 10/82 Start of promotion using consultant missions, and of diagnostic, information and consulting activities. 13. 2/83 Progress Assessment 14. 8/83 Progress Assessment 15. 9/83 Second field office operations 16. 4/84 Interim Evaluation 17. 8/84 Plan of Operations for final two years submitted to AID for approval 			<ol style="list-style-type: none"> 18. 9/84 Third field office operational 19. 8/85 Progress Assessment (at AID option) 20. 9/86 Final evaluation, Phase I 21. 5/87 Final evaluation, Phase II 		

App 3G, Ch 3, HB 3, Pt 1 (TM 3:19)

ANNEX J

memorandum

DATE: May 19, 1981

REPLY TO
ATTN OF: NE/PD/PDS, Stephen F. Lintner, *dfL*
Bureau Environmental Coordinator

SUBJECT: EGYPT - Industrial Technology Application - Project
Identification Document (263-0154) - Environmental Clearance

TO: NE/TECH/HRST, Carolyn I. Coleman,
Project Chairperson

I have reviewed the Initial Environmental Examination (IEE) prepared for the proposed project and concur with the recommendation of the Mission that it, be given a "Negative Determination" in compliance with the requirements of 22 CFR 216, "A.I.D. Environmental Procedures".

cc: GC/NE, T. Carter
AID/Cairo, W. McAleer, Mission Environmental Officer
AID/Cairo, L. M. Hager, Senior Legal Advisor
AID/Cairo, J. Riley, Mission project Officer

Annex K

June 22, 1981

5C(2) - PROJECT CHECKLIST

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

CROSS REFERENCES: IS COUNTRY CHECKLIST UP TO DATE? HAS STANDARD ITEM CHECKLIST BEEN REVIEWED FOR THIS PROJECT? Yes
See page 10

A. GENERAL CRITERIA FOR PROJECT1. Continuing Resolution Unnumbered; FAA Sec. 634A; Sec. 653(b).

(a) Describe how authorizing and appropriations Committees 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 than \$1 million over that figure)?

- a. Congress shall be notified in accordance with regular agency procedures.
- b. The intended obligation is within the level of funds appropriated for Egypt.

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

- 2 -

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? N.A.
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 set forth in the Principles and Standards for Planning Water and Related Land Resources, dated October 25, 1973? N.A.
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 effectively to maintain and utilize the project? N.A.
6. FAA Sec 209. Is project susceptible of execution as part of regional or multilateral project? If so why is project not so executed? Information and conclusion whether assistance will encourage regional development programs. N.A.
7. FAA Sec. 601(a). Information and conclusions whether project will encourage efforts of the country to: (a) increase the flow of Through industrial management training and consulting, project will encourage private initiative efficiency of industry, thereby impacting upon b) and e).

- 3 -

international trade; (b) foster private initiative and competition; and (c) encourage development and use of cooperatives, and 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.

8. FAA Sec. 601(b). Information and conclusion on how 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). Project sponsor is Egypt-U.S. Business Council, whose primary purpose is the encouragement of U.S.-Egyptian trade and investment. Project will contribute to improving local management resources of prospective partners.
9. FAA Sec. 612(b), 636(h); Continuing Resolution Sec. 508. 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 in lieu of dollars. Egyptian contributions will be made in-kind and in fees organizations will pay for project services. Justification for U.S. financing of some project local currency costs is included in the Project Paper and the Request for Authorization of such financing in Annex L.
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? All U.S. owned local currency has been programmed. None is available for this project.
11. FAA Sec. 601(e). Will the project utilize competitive selection procedures for the Yes

- 4 -

awarding of contracts, except where applicable procurement rules allow otherwise?

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 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?

N.A.

B. FUNDING CRITERIA FOR PROJECT

1. Development Assistance Project Criteria
- a. FAA Sec. 102(b), 111, 113, 281(a). 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

Project purpose is to identify, assess, and introduce new appropriate technology in an effective manner.

- 5 -

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?

- 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.)

N.A.

(1) [103] for agriculture, rural development; if so (a) extent to which activity is specifically designed to increase productivity and income of rural poor; 103A if for agriculture research; full account shall be taken of the needs of small farmers, and extensive use of field testing to adapt basic research to local conditions shall be made; (b) extent to which assistance is used in coordination with

N.A.

- 6 -

programs carried out under Sec. 104 to help improve nutrition of the people of developing countries through encouragement of increased production of crops with greater nutritional value, improvement of planning, research, and education with respect to nutrition, particularly with reference to improvement and expanded use of indigenously produced foodstuffs; and the undertaking of pilot or demonstration of programs explicitly addressing the problem of malnutrition of poor and vulnerable people; and (c) extent to which activity increases national food security by improving food policies and management and by strengthening national food reserves, with particular concern for the needs of the poor, through measures encouraging domestic production, building national food reserves, expanding available storage facilities, reducing post harvest food losses, and improving food distribution.

N.A.

(2) [104] for population planning under sec. 104(b) or health under sec. 104(c); if so, (i) extent to which activity emphasizes low-cost, integrated delivery systems for health, nutrition and family planning for the poorest people, with particular attention to the needs of mothers and young children, using paramedical and auxiliary medical personnel, clinics and

N.A.

- 7 -

health posts, commercial distribution systems and other modes of community research.

(4) [105] for education, public administration, or human resources development; if so, extent to which activity strengthens nonformal education, makes formal education more relevant, especially for rural families and urban poor, or strengthens management capability of institutions enabling the poor to participate in development; and (ii) extent to which assistance provides advanced education and training of people in developing countries in such disciplines as are required for planning and implementation of public and private development activities.

N.A.

(5) [106; ISDCA of 1980, Sec. 304] for energy, private voluntary organizations, and selected development activities; if so, extent to which activity is: (i) (a) concerned with data collection and analysis, the training of skilled personnel, research on and development of suitable energy sources, and pilot projects to test of suitable energy sources, and pilot projects to test new methods of energy production; (b) facilitative of geological and geophysical survey work to locate potential oil, natural gas, and coal reserves and to encourage exploration for

N.A.

- 8 -

potential oil, natural gas, and coal reserves; and (c) a cooperative program in energy production and conservation through research and development and use of small scale, decentralized renewable energy sources for rural areas;

(ii) technical cooperation and development, especially with U.S. private and voluntary or regional and international development, organizations;

(iii) research into, and evaluation of, economic development process and techniques;

N.A.

(iv) reconstruction after natural or manmade disaster;

(v) for special development problems, and to enable proper utilization of earlier U.S. infrastructure, etc., assistance;

(vi) for programs of urban development, especially small labor-intensive enterprises, marketing systems, and financial or other institutions to help urban poor participate in economic and social development.

c. [107] is appropriate effort place on use of appropriate technology? (relatively smaller, cost-saving, labor using technologies that are generally most appropriate for the small farms, small businesses, and small incomes of the poor.)

N.A.

- 9 -

- 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 latter cost-sharing requirement been waived for a "relatively least developed" country)?
- Yes, in form of in-kind contribution
- e. FAA Sec. 110(b). Will grant capital assistance be disbursed for project over more than 3 years? If so, has justification satisfactory to Congress been made, and efforts for other financing, or is the recipient country "relatively least developed"?
- N.A.
- 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 processes essential to self-government.
- N.A.=
- g. FAA Sec. 122(b). Does the activity give reasonable promise of contributing to the development of economic resources, or to the increase of productive capacities and self-sustaining economic growth?
- N.A.

- 10 -

2. Development Assistance Project Criteria (Loans Only) N.A.
- a. FAA Sec. 122(b). Information and conclusion on capacity of the country to repay the loan, at a reasonable rate of interest.
- b. FAA Sec. 620(d). If assistance is for any productive enterprise which will complete with U.S. enterprises, is there an agreement by the recipient country to prevent export to the U.S. of more than 20% of the enterprise's annual production during the life of the loan?
3. Project Criteria Solely for Economic Support Fund
- a. FAA Sec. 531(a). Will this assistance promote economic or political stability? To the extent possible, does it reflect the policy directions of FAA Section 102? (a) It will contribute to economic and political stability and reflects Section 102 policy directions.
- b. FA Sec. 531(c). Will assistance under this chapter be used for military, or paramilitary activities? No

- 11 -

5C(3) - STANDARD ITEM CHECKLIST

Listed below are the statutory items which normally will be covered routinely in those provisions of an assistance agreement dealing with its implementation, or covered in the agreement by imposing limits on certain uses of funds.

These items are arranged under the general headings of (A) Procurement, (B) Construction, and (C) Other Restrictions.

A. Procurement

1. FAA Sec. 602. Are there arrangements to permit U.S. small business to participate equitably in the furnishing of commodities and services financed? Yes, as per standard AID procedures.
2. FAA Sec. 604(a). Will all procurement be from the U.S. except as otherwise determined by the President or under delegation from him? Yes, except for local cash purchases as authorized.
3. FAA Sec. 604(d). If the cooperating country discriminates against U.S. marine insurance companies, will commodities be insured in the United States against marine risk with a company or companies authorized to do a marine insurance business in the U.S.? N.A.
4. FAA Sec. 604(e); ISDCA of 1980 Sec. 705(a). If offshore procurement of agricultural commodity or product is to be financed, is there provision N.A.

- 12 -

against such procurement when the domestic price of such commodity is less than parity? (Exception where commodity financed could not reasonably be procured in U.S.)

5. FAA Sec. 603. Is the shipping excluded from compliance with requirement in section 901(b) of the Merchant Marine Act of 1936, as amended, that at least 50 per centum of the gross tonnage of commodities (computed separately for dry bulk carriers, dry cargo liners, and tankers) financed shall be transported on privately owned U.S.-flag commercial vessels to the extent that such vessels are available at fair and reasonable rates? Yes
6. FAA sec. 621. If technical assistance is financed, to the fullest extent practicable will such assistance, goods and professional and other services be furnished from private enterprise on a contract basis? If the facilities of other Federal agencies will be utilized, are they particularly suitable, not competitive with private enterprise, and made available without undue interference with domestic programs? Yes
7. International Air Transport. Fair Competitive Practices Act, 1974. If air transportation of persons or property is financed on grant basis, will provision be made that U.S. carriers will be utilized to the extent such service is available? Yes

- 13 -

8. Continuing Resolution Sec. 505.
If the U.S. Government is a party to a contract for procurement, does the contract contain a provision authorizing termination of such contract for the convenience of the United States?

Yes

B. Construction

1. FAA Sec. 601(d). If capital (e.g., construction) project, are engineering and professional services of U.S. firms and their affiliates to be used to the maximum extent consistent with the national interests?

N.A.

2. FAA Sec. 611(c). If contracts for construction are to be financed, will they be let on a competitive basis to maximum extent practicable?

N.A.

3. FAA Sec. 620(k). If for construction of productive enterprise, will aggregate value of assistance to be furnished by the U.S. not exceed \$100 million?

N.A.

C. Other Restrictions

1. FAA Sec. 122(b). If development loan, is interest rate at least 2% per annum during grace period and at least 3% per annum thereafter?

N.A.

2. FAA Sec. 301(d). If fund is established solely by U.S. contributions and administered by an international organization, does Comptroller General have audit rights?

N.A.

- 14 -

3. FAA Sec. 620(h). Do arrangements exist to insure that United States foreign aid is not used in manner which, contrary to the best interests of the United States, promotes or assists the foreign aid projects or activities of the Communist-bloc countries? Yes
4. Continuing Resolution Sec. 514. If participants will be trained in the United States with funds obligated in FY 1981, has it been determined either (a) that such participants will be selected otherwise than by their home governments, or (b) that at least 20% of the FY 1981 fiscal year's funds appropriated for participant training will be participants selected otherwise than by their home government? Yes
5. Will arrangements preclude use of financing:
- a. FAA Sec. 104(f). To pay for performance of abortions as a method of family planning or to, motivate or coerce persons to practice abortions; to pay for performance of involuntary sterilization as a method of family planning, or to coerce or provide financial incentive to any person to undergo sterilization? Yes
- b. FAA Sec. 620(g). To compensate owners for expropriated nationalized property? Yes

- 15 -

- c. FAA Sec. 660. To provide training or advice or provide any financial support for the police, prisons, or other law enforcement forces, except for narcotics programs? Yes
- d. FAA Sec. 662. For CIA activities? Yes
- e. FAA Sec. 636(i). For purchase, sale, long-term lease, exchange or guaranty of the sale of motor vehicles manufactured outside U.S., unless a waiver is obtained. Yes
- f. Continuing Resolution Sec. 504. To pay pensions, annuities retirement pay, or adjusted service compensation for military personnel? Yes
- g. Continuing Resolution Sec. 506. To pay U.S. assessments, arrearages or dues. Yes
- h. Continuing Resolution Sec. 507. To carry out provisions of FAA section 209(d) (Transfer of FAA funds to multilateral organizations for lending.) Yes
- i. Continuing Resolution Sec. 509. To finance the export of nuclear equipment fuel, or technology or to train foreign nationals in nuclear fields? Yes
- j. Continuing Resolution Sec. 510. For the purpose of aiding the efforts of the government of

- 16 -

such country to repress the
legitimate rights of the
population of such country
contrary to the Universal
Declaration of Human Rights?

Yes

k. Continuing Resolution Sec.
516. For publicity or propaganda
purposes within U.S. not
authorized by Congress?

Yes

Annex L

Project 263-0154

612(b) RECOMMENDATION TO AUTHORIZE PURCHASE OF EGYPTIAN POUNDS WITH U.S.
DOLLARS

Over the life of the Industrial Technology Application Project (ITA), approximately \$2.2 million will be used to support local currency costs of the project. Dollar funds will be used in association with GOE disbursement of Egyptian pounds for the costs of the travel, per diem, and shipment of household effects of project consultants; related project support costs such as the travel of Egyptian participants, procurement of secretarial services, hiring of Egyptian consultants, project promotion, incountry training and such local procurement commodities as is authorized. The Mission will purchase Egyptian pounds with U.S. dollars provided by the Project. The Egyptian pounds will, in turn, be made available to the various appropriate entities responsible for project implementation for disbursement in accordance with the agreements reached between USAID and the GOE in the Project Agreement.

JUSTIFICATION: Dollar funds used in conjunction with Egyptian pound costs represent an additional real resource to the Egyptian economy and provide means for speedy implementation of studies and offers some incentive for the Egyptian Government to implement new initiatives that it might otherwise not be able to undertake. U.S.-owned local currency is fully programmed and is not available for use in this Project. In any event, the use of existing U.S.-owned local currency is fully programmed and is not available for use in this Project. In any event, the use of existing U.S.-owned local currency would add no additional real resources to the

economy. Also, given the need of the GOE to restrict the growth in the money supply to correspond to the real growth in real resource in the economy, the inflationary impact of using U.S.-owned local currency would have to be offset by reduced GOE disbursements of other programs. Maintaining the fiscal balance is also required under the terms of the current IMF Standby Agreement with Egypt which the U.S. and other donors have strongly supported.

Consequently, if U.S.-owned local currency were used, it is doubtful that the various Egyptian entities could enter into agreements since they would have to sustain budgetary cutbacks in other areas. Even if the various Egyptian entities were to obtain budgetary funds to provide its full portion of project costs, it is doubtful that it could commit them to this project unless the added fill in of dollar funding for local currency costs were assured. Given the above considerations and the fact the Industrial Technology Application Project supports the U.S. Foreign Policy objectives and the Country Development Strategy Statement of Egypt, we have concluded that local currency costs should be funded with dollar purchased Egyptian pounds.

ANNEX M
CABLE TRAFFIC

J 07070500523
SP RPPPE
BY RDEEC #9838 1071023
ZNR UUUUU ZZH
R 172419Z APR 81
FM SECSTATE WASHDC
TO AMEMBASSY CAIRO 7937
BT
UNCLAS STATE 098838

17 APR 81
TOR: 1.228
CV: 22150
CHRG: AID
ACTION AID-6
INFO A4B
DCM
EC
ICA
CRON 11 1

ACTION TO	<u>WADC</u>	<u>RPPPE</u>
ACTION TAKEN	<u>Re</u>	<u>DATE 4/28</u>
NAME	_____	INITIALS _____

AIDAC

F.O. 12065: N/A

TAGS:

SUBJECT: MEAC REVIEW OF INDUSTRIAL TECHNOLOGY APPLICATION
PID, 223-2154, MARCH 31, 1981.

1. IN VIEW OF QUESTIONS ON SEVERAL KEY POINTS IN SUBJECT
PID, NEAC RECOMMENDS THAT A REVISED PID BE SUBMITTED.
NEAC NOTES THAT THE PID DID NOT CONTAIN A CLEAR STATEMENT
OF THE NEED TO BE ADDRESSED NOR A DISCUSSION OF THE
ALTERNATIVE SOLUTIONS CONSIDERED. ADDITIONALLY, THE
DISCUSSION LACKS PRACTICAL APPLICATION FOR ADDRESSING
DEFICIENCIES IN INDUSTRIAL SCIENCE AND TECHNOLOGY IN
EGYPTIAN INDUSTRY. FOR EXAMPLE, CONSIDERATION SHOULD BE GIVEN
TO STRENGTHENING THE EXISTING CONSULTING FIRMS WHICH ARE
CURRENTLY PROVIDING SERVICES TO INDUSTRY, AS WELL AS TO
WORKING WITH THE TYPE OF INSTITUTION SUGGESTED IN THE PID.
IF EXISTING CONSULTING FIRMS CAN BE STRENGTHENED, THERE
MAY NOT BE A NEED FOR THE TYPE OF INSTITUTION DESCRIBED IN
THE PID. THE NEAC ALSO DISCUSSED THE NEED FOR A CLEARER
STATEMENT OF THE RELATIONSHIP BETWEEN THIS PROJECT AND
OTHER RELATED AID ACTIVITIES. THE PID SHOULD CLEARLY
INDICATE THAT WHAT IS BEING PROVIDED IS NOT AVAILABLE OR
COULD NOT BE MADE AVAILABLE THROUGH OTHER AID PROJECTS.

2. IN ADDITION TO QUESTIONS RAISED IN PARA 1, THE FOLLOWING

ISSUES RAISED BY THE PRC SHOULD BE HELPFUL IN THE
REDRAFT OF THE PID: (A) IN THE EGYPTIAN CONTEXT, ARE
PREVENTIVE MAINTENANCE AND PROCESS CONTROL TECHNOLOGY
PROBLEMS, OR ARE ORGANIZATION AND BUDGET INDUCED
PROBLEMS OF PRIMARY CONCERN? PID SHOULD DESCRIBE
THE S AND T PROBLEM OF EGYPTIAN INDUSTRY AND THE
RATIONALE FOR SELECTING THESE TWO AREAS FOR ATTENTION.
THE PROJECT PURPOSE SHOULD BE EXPANDED TO INCLUDE AND
FULLY DEFINE A FOCUS ON THE APPLICATION OF SCIENCE AND
TECHNOLOGY TO INDUSTRIAL DEVELOPMENT. THE END OF
PROJECT STATUS SHOULD BE CLARIFIED TO INCLUDE A
STATEMENT OF EXACTLY WHAT IS EXPECTED TO HAPPEN AT THE
LEVEL OF THE FIRM. THE PID DOES NOT FULLY ADDRESS
WHAT WILL HAPPEN IN THE INDUSTRIES INVOLVED IN THE
PROJECT IN ORDER TO FACILITATE INCREASED PREVENTIVE
MAINTENANCE AND MANUFACTURING PROCESS CONTROL. (B) THE
PID SHOULD PRESENT A RATIONALE FOR SELECTING FOOD,
HOUSING AND CLOTHING AS THE TARGET SECTORS. (C) THE
PID SHOULD IDENTIFY THOSE GROUPS WITHIN THE FIRM WHO

BEST AVAILABLE DOCUMENT

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A-106

WILL RECEIVE TRAINING AND THE TYPE OF TRAINING TO BE PROVIDED.

3. COPY OF THE PRC ISSUES PAPER WAS HANDCARRIED BY ROBERTS AND MAYBYRNE WHO PARTICIPATED IN NEAR DISCUSSIONS. HAIG

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CAIRO 12752

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 PP RUEHC 1
 DE RUEHFG #2752/01 148 **
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 P 281758Z MAY 81
 FM AMEMBASSY CAIRO
 TO SECSTATE WASHDC PRIORITY 2229
 FT
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CLASS: UNCLASSIFIED
 CERGE: AID 5/23
 APPRV: DDIE:OCYI
 DRFTD: SGT:JFRID
 CLEAR: 1) ERDC:A
 DISTR: AID-E AME
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F.O. 12265:N/A
 SUBJECT: INDUSTRIAL TECHNOLOGY APPLICATION PROJECT,
 263-2154

REF: STATE 98838

1. FOR LEWIS BLADE, NE/TECH.
2. FRC AND NEAC FEEDBACK HAVE BEEN EXTREMELY HELPFUL IN DRAWING ATTENTION TO SEVERAL KEY PROJECT ISSUES AND POINTS THAT NEED CLARIFICATION FOR SUBJECT PROJECT.
3. FOLLOWING IS MISSION RESPONSE TO REFTEL
4. THIS PROJECT IS BASED ON THE PREMISE THAT PRODUCTIVITY IN THE EGYPTIAN ECONOMY WILL BE INCREASED BY SOUND EXPANSION OF THE INDUSTRIAL SECTOR AS A PART OF THE ECONOMY AND BY IMPROVED PRODUCTIVITY IN INDIVIDUAL INDUSTRIAL FIRMS. BOTH WILL BE STIMULATED AND ACCELERATED IF A WAY CAN BE FOUND TO RESPOND EFFECTIVELY TO: A) COMPANIES' PERCEIVED NEEDS FOR TECHNOLOGICAL INFORMATION, AND TO 2) STIMULATE AWARENESS AND ACTION THROUGH SELECTIVE DISSEMINATION OF UNSOLICITED INFORMATION, 3) HELP COMPANIES ASSESS THEIR TECHNOLOGICAL OBSTACLES AND OPPORTUNITIES, AND THE RELATION OF THESE TO THEIR ORGANIZATIONAL AND WIDER ENVIRONMENTAL CONTEXT, AND 4) HELP COMPANIES OVERCOME OBSTACLES AND PROFIT FROM TECHNOLOGICAL OPPORTUNITIES.
5. THE PROJECT GOAL IS INCREASED PRODUCTIVITY AND EMPLOYMENT RESULTING FROM INCREASED PRODUCTIVITY IN THE INDUSTRIAL SECTOR AND EXPANSION OF THAT SECTOR RELATIVE TO THE REST OF THE ECONOMY.
6. PROJECT PURPOSE IS TO ASSIST PUBLIC AND PRIVATE SECTOR INDUSTRIAL FIRMS TO MAKE MORE PRODUCTIVE USE OF TECHNOLOGY AND TO EFFECTIVELY IDENTIFY, ASSESS AND INTRODUCE NEW TECHNOLOGY; AND TO INSTITUTIONALIZE AN EGYPTIAN CAPACITY TO PROVIDE SUCH HELP AND DEVELOP AN INCREASING RELIANCE ON EGYPTIAN EXPERTISE.
7. LOCAL CONSULTING FIRMS WILL BE STRENGTHENED BY THE PROJECT, WHICH EMPHASIZES MEETING NEED THROUGH LOCAL RESOURCES WHEREVER POSSIBLE. THE OBJECTIVE, HOWEVER, IS TO HELP COMPANIES NOW AND TO ENSURE THAT THEY AND OTHERS HAVE ACCESS TO ASSISTANCE IN THE FUTURE. THE NEEDS PRESENTLY EXCEED THE CAPACITY OF LOCAL CONSULTANTS IN TERMS OF

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NUMBERS AS WELL AS OF BREADTH AND DEPTH OF SPECIALITIES, AND LOCAL CONSULTANTS TEND TO BE TOO COSTLY FOR SMALLER FIRMS.

F. AS A RESULT OF DISCUSSIONS WITH THE GOE, IT NOW APPEARS LIKELY THAT THE ENGINEERING AND INDUSTRIAL DESIGN AND DEVELOPMENT CENTER WILL BE THE IMPLEMENTING AGENCY. CENTER IS AN AUTONOMOUS ENTITY UNDER THE MINISTRY OF INDUSTRY AND IS LINKED TO THE RESEARCH COMMUNITY THROUGH THE PRESIDENT OF THE NATIONAL RESEARCH CENTER WHO SITS ON ITS BOARD. IT IS WORKING WITH PRIVATE AND PUBLIC SECTORS ON TECHNOLOGY ISSUES, AND CURRENTLY COMPLETING A SMALL INDUSTRY EXPANSION PILOT PROJECT UNDER WORLD BANK FINANCING IN CONNECTION WITH A BANK LOAN TO THE DEVELOPMENT INDUSTRIAL BANK. FYI, A PROPOSAL TO EXPAND AND CONTINUE THIS THROUGH 1984 IS REPORTEDLY IN PREPARATION FOR IFRO CONSIDERATION IN DECEMBER. DISCUSSIONS WITH THE CENTER DIRECTOR AND WITH CONCERNED TECHNICAL ASSISTANCE SUPERVISORY PERSONNEL IN THE INTERNATIONAL LABOR ORGANIZATION GENEVA INDICATE THAT PROPOSED AID PROJECT WOULD BE A VERY USEFUL COMPLEMENT TO THE BANK PROJECT AND WOULD FILL A MAJOR GAP IN THE CENTER'S CAPABILITIES BY DEVELOPING ITS ABILITY TO ACCESS TECHNICAL INFORMATION AND ASSISTANCE FROM A WIDE BASE FOR ITS CLIENTS.

F. THE PROJECT WILL BE EXPLICITLY DESIGNED TO COMPLEMENT OTHER AID GRANT ACTIVITIES THAT ARE A PART OF THE STRATEGY FOR INCREASING INDUSTRIAL PRODUCTIVITY. MANPOWER DEVELOPMENT FOR PRODUCTIVITY, 263-0090, AND INDUSTRIAL PRODUCTION PROJECT, 263-0101 AND OTHERS FUNDING INDUSTRIAL EQUIPMENT PROCUREMENT ARE ALREADY FUNCTIONING, VOCATIONAL INDUSTRIAL TRAINING FOR PRODUCTIVITY, 263-0062, IS SCHEDULED FOR FY 81 AUTHORIZATION. SUBJECT PROJECT WILL ADD THE LAST OF FOUR COMPANION ACTIVITIES TO COMPLETE THE SPECTRUM. TO PROVIDE SUCH SERVICES THROUGH EXISTING PROJECTS WOULD INVOLVE LIMITING SERVICE TO THE RESTRICTED CLIENTELE OF ONE OR MORE SINGLE PROJECTS. USING EXISTING PROJECTS WOULD NOT HELP FIRMS SEEKING ONLY THIS FORM OF ASSISTANCE.

G. IN THE EGYPTIAN CONTEXT, PREVENTIVE MAINTENANCE AND MANUFACTURING PROCESS CONTROL ARE NEGLECTED AND AS A RESULT PLANT AND CAPITAL STOCK ARE LESS PRODUCTIVE THAN THEY COULD

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AND SHOULD BE. A VARIETY OF FACTORS CONTRIBUTE TO THIS, AND THEIR RELATIVE IMPORTANCE DIFFERS FROM COMPANY TO COMPANY. GIVEN OUR CONCERN WITH PRODUCTIVITY AND THE FACT THAT THE PRODUCTIVITY OF TECHNOLOGY DEPENDS ON ITS USE, WE BELIEVE THIS PROJECT SHOULD BE A SOURCE OF EDUCATION AND ASSISTANCE IN THESE AREAS AS WELL AS OTHERS. HOWEVER, FOLLOWING FURTHER DISCUSSION WITHIN THE MISSION AND WITH THE GCE, WE HAVE DECIDED TO DELETE FROM THE PROJECT DESIGN THE PROGRAMMING OF SPECIAL ATTENTION TO ANY PARTICULAR AREAS.

H. REGARDING TARGET SUBSECTORS, ULTIMATE PROJECT AIM WILL BE SERVICES FOR ALL SUBSECTORS. HOWEVER PRACTICAL CONSIDERATIONS RELATED TO SPECIALIST STAFFING POSSIBILITIES AND THE IMPORTANCE OF EARLY PROJECT SUCCESS TO BUILD CREDIBILITY MAY MITIGATE IN FAVOR OF SOME SUBSECTOR EMPHASIS DURING THE FIRST PART OF THE PROJECT. CONTRACTOR AND IMPLEMENTING AGENCY WILL HAVE OPTION TO DECIDE WHETHER SUCH IS THE CASE SINCE THEY WILL BE THE ONES PRIMARILY CONCERNED WITH THESE PRACTICAL CONSIDERATIONS. SELECTION OF SUBSECTORS FOR SUCH INITIAL FOCUS WILL BE SUBJECT TO MISSION CONCURRENCE. TENTATIVE PRIORITIES ARE FOOD, CLOTHING AND CONSTRUCTION MATERIALS BECAUSE (A) PRIVATE SECTOR IS IMPORTANT IN THEM, (B) SMALL FIRMS ARE WELL REPRESENTED, (C) THEY ARE GROWTH AREAS, (D) US IS RECOGNIZED HERE AS BEING STRONG IN THESE AREAS, (E) ALL PRODUCE GOODS OF IMPORTANCE TO POORER SEGMENTS OF POPULACE, AND (F) THEY ARE HIGH PRIORITY IN GCE PLANS. WHEN THE TIME COMES FOR A DECISION WE WOULD EXPECT TO TAKE INTO ACCOUNT INPUTS FROM PAPANECK STUDY, SMALL SCALE INDUSTRY STUDY AND EARLY ACTIVITY OF MANAGEMENT DEVELOPMENT FOR PRODUCTIVITY PROJECT.

I. TYPES AND RECIPIENTS OF TRAINING WILL BE IDENTIFIED IN THE PP TO THE EXTENT POSSIBLE. PREDICTABILITY IS LIMITED, AS THE ACTIVITY IS LARGELY A RESPONSIVE ONE, BUT BEST ESTIMATES WILL BE MADE WITH AS MUCH DETAIL AS FEASIBLE.

4. TWO COPIES OF DRAFT CONSULTANTS' REPORT BY RICHARD S. ROBERTS, JR. AND JAMES HAYBYRNE WERE POUCHED TO BARRY HEYMAN ON 5/25/81. REPORT SHOULD CLARIFY THE PROBLEM TO BE ADDRESSED, PROJECT RELATION TO OTHER MISSION ACTIVITIES, APPROACH TAKEN TO FINDING A SOLUTION, AND THE COURSE OF ACTION SELECTED.

5. IN LIGHT OF THE FACT THAT ALL ISSUES OUTLINED IN REF-TEL AND PRO ISSUES PAPER ARE HERIN ADDRESSED, PLEASE CONSIDER THIS MESSAGE SUPPORTED BY THE ABOVE REFERENCED REPORT, TO BE THE REVISED PID. THIS WILL ALLOW MISSION TO PROCEED WITH MEETING BY OBLIGATION EXPECTATIONS AND SCHEDULE. PP IS STILL SLATED FOR SUBMISSION BY 6/30/81 AND AUTHORIZATION IS SCHEDULED FOR AUGUST. WENDT

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 CM: 20152
 CHRG: AID
 ACTION: AID
 INFO: AMB
 DCM
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APPROVED TO	<u>HRDC</u>	<u>DPPE</u>
ACTION TAKEN	<u>Re</u>	<u>DATE 7/21</u>
NAME	_____	INITIALS _____

E.O. 12065: N/A

TAGS:

SUBJECT: PROJECT REVIEW COMMITTEE (PRC) MEETING ON SUPPLEMENTAL INFORMATION FOR INDUSTRIAL TECHNOLOGY APPLICATION (ITAP) PID, 253-0154

REF: (A) CAIRO 12752, (B) "TECHNOLOGY AND INDUSTRY IN EGYPT"

1. PRC MET WITH JAMES RILEY ON JUNE 17 AND 19 TO REVIEW RFFS A AND B AND TO CONSIDER OTHER SUPPLEMENTAL INFORMATION PROVIDED BY RILEY. THE NEAR EAST ADVISORY COMMITTEE AUTHORIZES USAID/CAIRO TO NOW PROCEED WITH PP PREPARATION FOR SUBJECT PROJECT.

2. THE FOLLOWING SUGGESTIONS AND CONCERNS SHOULD BE ADDRESSED DURING PP DEVELOPMENT:

(A) PROJECT GOAL SHOULD BE RESTATED TO STRESS EMPHASIS ON INCREASED PRODUCTIVITY AND EMPLOYMENT RESULTING FROM APPROPRIATE TECHNOLOGY CHOICES, AND INCREASED PRODUCTIVITY IN THE "INDUSTRIAL" SECTOR AND EXPANSION OF THAT SECTOR RELATIVE TO THE REST OF THE ECONOMY. THE THRUST OF THE PURPOSE, THEN, IS TO ASSIST PUBLIC AND PRIVATE SECTOR "INDUSTRY" TO EFFECTIVELY IDENTIFY, ASSESS AND INTRODUCE

NEW AND APPROPRIATE TECHNOLOGY.

(B) DISCUSSION OF THE MARKET FOR THE SERVICES OF THE PROJECT REQUIRES FURTHER DISCUSSION. WHILE THE PROJECT WILL SEEK TO INCREASE DEMAND, THE INFORMATION PROVIDED IMPLIES THAT A MARKET ALREADY EXISTS. THE PP SHOULD PROVIDE WHATEVER MARKET RESEARCH INFORMATION HAS BEEN DEVELOPED TO SUPPORT THE PROJECTED SCALE OF OPERATIONS ENVISIONED IN PP, AND CLEARLY DELINEATE THE SIZE AND CHARACTER OF THE MARKET.

(C) FINANCIAL PLAN SHOULD INCLUDE BACKGROUND INFORMATION ON HOW THE FUNDING FIGURE OF DOLLARS 10.5 MILLION WAS DERIVED AND HOW USAID/CAIRO CAN BE SURE THAT THIS AMOUNT WILL BE EITHER NECESSARY OR SUFFICIENT FOR PURPOSES OF PROJECT.

11/DPF

(E) PROJECT FOCUS APPEARS TO BE ON LARGER FIRMS, HOWEVER SMALL FIRMS SHOULD NOT BE EXCLUDED. WHERE SMALL FIRMS ARE AN IMPORTANT PART OF A SPECIFIC SECTOR, SOLVING THE QUESTION OF WHICH TECHNOLOGY TO USE IS AN IMPORTANT SERVICE THAT COULD BE PROVIDED UNDER THIS PROJECT. THE TERM "ARTISAN ENTERPRISES" WAS DISCUSSED IN THIS CONTEXT AND ITS DEFINITION VIS A VIS THIS PROJECT WAS UNCERTAIN. IF "ARTISAN ENTERPRISES" IS TO BE USED IN THE PP IT SHOULD BE SPECIFICALLY DEFINED.

(E) PROJECT ACTIVITIES APPARENTLY WILL NOT BE LIMITED IN TERMS OF THE TECHNICAL FIELDS TO BE ADDRESSED, OTHER THAN THAT THEY BE "INDUSTRIAL". PLEASE DEFINE WHAT IS MEANT BY "INDUSTRIAL".

(F) RESOURCES SECTION OF SUPPLEMENTAL MATERIAL INDICATES THAT A VARIETY OF U.S. DATA BASES AND INDUSTRIAL FIRMS WILLING TO SHARE THEIR EXPERIENCES WITH EGYPTIAN COMPANIES WILL BE ACCESSIBLE TO EIDDC. THE PP SHOULD EXPLAIN THE ASSURANCE THAT THIS SHARING WILL OCCUR.

(G) INSTEAD OF CHARGING CLIENTS A "MODEST FEE" FOR ITAP SERVICES, A "NOMINAL FEE" SEEMS A MORE APPROPRIATE TERM AND SHOULD BE ADEQUATE TO DISCOURAGE REQUESTS THAT ARE NOT SERIOUS.

(H) OTHER BOTHERSOME AND INEXACT TERMS USED DURING THE DISCUSSION WERE "CONSCIOUSNESS-RAISING" AND "MORE PENETRATING DIAGNOSTIC ANALYSIS". SUGGEST THESE TERMS BE DROPPED, REPLACED BY MORE MEANINGFUL EXPRESSIONS, OR ADEQUATE EXPLANATIONS.

(I) INSTEAD OF PLACING A TIME LIMIT OF "WITHIN A DAY OF RECEIPT" ON ASSIGNING A REQUEST FOR INFORMATION OR TECHNICAL ASSISTANCE TO A TECHNICAL SPECIALIST, IT SHOULD SUFFICE TO SAY THAT SUCH ASSIGNMENT WILL BE MADE EXPEDITIOUSLY.

(J) AN EXPLANATION IS NECESSARY CONCERNING THE NEED FOR A FOLLOW-UP CONTACT FOUR TO SIX MONTHS AFTER INITIAL SERVICE.

(K) THE LIST OF LIKELY REQUESTS INCLUDES NEW PRODUCT DESIGN. BECAUSE OF THE COST OF DESIGN, IT MAY BE MORE APPROPRIATE TO LIMIT DESIGN ACTIVITY TO PRODUCT RE-DESIGN OR IDENTIFICATION.

(L) QUESTIONS OF PROPRIETARY INFORMATION SHOULD BE ADDRESSED IN PP. THE CONSULTANCY WORK IS EXPECTED TO BE CONFIDENTIAL, BUT WHEN GENERAL CONCLUSIONS ARE DRAWN THAT ARE APPLICABLE TO OTHERS IN THE INDUSTRY, WILL THAT INFORMATION BE MADE AVAILABLE AT NO CHARGE UPON REQUEST?

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(M) ITAP STAFF IS TO INITIALLY CONSIST OF FOUR TECHNICAL SPECIALISTS AND SIX RESOURCE SPECIALISTS. ILLUSTRATIVE LIST OF DESIRABLE CREDENTIALS AND AREAS OF EXPERTISE SHOULD BE INCLUDED IN PP. STAFF SHOULD BE ABLE TO EFFECTIVELY ADDRESS APPROPRIATE TECHNOLOGY AND EMPLOYMENT POSSIBILITY ISSUES.

3. WHILE THE MISSION HAS NOT YET DEVELOPED THE EMPLOYMENT STRATEGY REQUESTED IN 1982 AND 1983 CDSS REVIEWS, THIS PROJECT IS CLEARLY ONE THAT COULD FIT WITHIN THE OVERALL CONCEPTUAL FRAMEWORK. WE ANTICIPATE THAT THE PP WILL ELABORATE ON THIS RELATIONSHIP.

4. PP SHOULD CONTAIN DETAILED EXPLANATION WHY SERVICES COULD NOT BE EXCLUSIVELY PROVIDED FROM PRIVATE SECTOR.

5. PLEASE INDICATE PROPOSED DATE FOR PP SUBMISSION. HAIG
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