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AGENCY FOR INTERNATIONAL DEVELOPMENT PROJECT PAPER FACESHEET	1. TRANSACTION CODE <div style="border: 1px solid black; padding: 2px; display: inline-block; margin-right: 10px;">A</div> A - ADD C - CHANGE D - DELETE	PP <hr/> 2. DOCUMENT CODE 3
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3. COUNTRY/ENTITY INTERREGIONAL	4. DOCUMENT REVISION NUMBER <div style="border: 1px solid black; width: 20px; height: 20px; display: inline-block; margin-right: 5px;"></div> 113p
5. PROJECT NUMBER (7 digits) <div style="border: 1px solid black; padding: 2px; display: inline-block; margin-right: 10px;">931-1114</div>	6. BUREAU/OFFICE A. SYMBOL: OST B. CODE: 08
7. PROJECT TITLE (Maximum 40 characters) <div style="border: 1px solid black; padding: 2px; display: inline-block; width: 80%;">Science and Technology Inf. Transfer</div>	

8. ESTIMATED FY OF PROJECT COMPLETION FY <div style="border: 1px solid black; padding: 2px; display: inline-block;">79</div>	9. ESTIMATED DATE OF OBLIGATION A. INITIAL FY <div style="border: 1px solid black; padding: 2px; display: inline-block;">77</div> B. QUARTER <div style="border: 1px solid black; padding: 2px; display: inline-block;">4</div> C. FINAL FY <div style="border: 1px solid black; padding: 2px; display: inline-block;">79</div> (Enter 1, 2, 3, or 4)
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10. ESTIMATED COSTS (\$000 OR EQUIVALENT \$1 -)						
A. FUNDING SOURCE	FIRST FY 77			LIFE OF PROJECT		
	B. FX	C. L/C	D. TOTAL	E. FX	F. L/C	G. TOTAL
AID APPROPRIATED TOTAL						
(GRANT)	(120)	()	(120)	(520)	()	(520)
(LOAN)	()	()	()	()	()	()
OTHER U.S.	1. NTIS 2.	150	150	402.7		402.7
HOST COUNTRY	--	700	700	--	2193.8	2193.8
OTHER DONOR(S)						
TOTALS	270	700	970	922.7	2193.8	3116.5

11. PROPOSED BUDGET APPROPRIATED FUNDS (\$000)									
A. APPROPRIATION	B. PRIMARY PURPOSE CODE	PRIMARY TECH. CODE		E. 1ST FY 77		H. 2ND FY 78		K. 3RD FY 79	
		C. GRANT	D. LOAN	F. GRANT	G. LOAN	I. GRANT	J. LOAN	L. GRANT	M. LOAN
(1) SD	754	874		120		200		200	
(2)									
(3)									
(4)									
TOTALS				120		200		200	

A. APPROPRIATION	N. 4TH FY		O. 5TH FY		LIFE OF PROJECT		12. IN-DEPTH EVAL. SCHEDULE
	Q. GRANT	P. LOAN	R. GRANT	S. LOAN	T. GRANT	U. LOAN	
(1)					520		<div style="border: 1px solid black; padding: 5px; display: inline-block;"> MM YY 0 3 7 8 </div>
(2)							
(3)							
(4)							
TOTALS							

13. DATA CHANGE INDICATOR. WERE CHANGES MADE IN THE PID FACESHEET DATA, BLOCKS 12, 13, 14, OR 15 OR IN PRP FACESHEET DATA, BLOCK 12? IF YES, ATTACH CHANGED PID FACESHEET.

1 = NO
 2 = YES

14. ORIGINATING OFFICE CLEARANCE				15. DATE DOCUMENT RECEIVED IN AID/W. OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION			
SIGNATURE				<div style="border: 1px solid black; padding: 5px; display: inline-block;"> MM DD YY </div>			
TITLE <i>Henry A. Arnold</i> Henry A. Arnold, Director, TA/OST							
DATE SIGNED				<div style="border: 1px solid black; padding: 5px; display: inline-block;"> MM DD YY 17 17 77 </div>			

PROJECT PAPER

SCIENCE AND TECHNOLOGY INFORMATION
TRANSFER

TECHNICAL ASSISTANCE BUREAU
PROJECT

April 1977

CORRECTIONS

Project Paper - Science and Technology Information Transfer

- A) Table of Contents: "Annex H - Sample NTIS Agreement and List of Cooperating Agencies"
- List of cooperating agencies is omitted here, but may be found in AMTID, Annex F.
- B) Page 2 - Top: Eliminate Korea and Nigeria as countries in which technical information transfer will be facilitated by strengthening local agencies. As correctly stated on page 4, these two countries have graduated.
- Eliminate Turkey, Jordan and Egypt as countries in which agents will be sought. They are current security assistance recipients. Substitute Liberia, Kenya and Bangladesh as countries in which the possibility of agency agreements will be investigated.
- C) Page 7: Document purchases. Conclusions on increased document purchases listed on this page of the Project Paper are strongly substantiated by document purchase figures for the first three quarters of FY 77 as compared to FY 76 as a whole. These figures have just been released by NTIS and are attached.
- D) Page 15: Summary Cost Estimate and Financial Plan
- Insert Budget Breakdown for AID Source Funding (Attached)
- E) Page 16: The Budget Breakdown for PASA Purposes
- Insert revised budget (attached) with FY 77 corrected Total of \$120 - as on Project Paper Facesheet. See attached breakdowns also for NTIS and Host Countries.
- F) Page 17: Social Analysis - Para 5 - Last Sentence
- Add "(See Annex M - Customer Sample)"
- G) Page 23: Implementation Plan - 2nd Sentence - Para 1
- Change "Annex E" to "Annex N"
- 11th Sentence - Para 1
- Change "Annex F" to "Annex E"

INTERNATIONAL PROJECTS BRANCH

Value of Ad Hoc Document Purchases for 43 Countries
in the International Technical Information
Network

Country	1st QTR	2nd QTR	3rd QTR	YTD	FY 76
<u>ASIA</u>					
+India	\$25,489	\$13,933	\$18,657	\$58,079	\$30,133
*Thailand	635	2,349	2,178	5,162	6,020
*Pakistan	68	4,556	1,025	5,649	2,501
++Sri Lanka					
°Korea	1,289	1,648	3,395	6,332	4,015
*Philippines	906	1,355	1,203	3,464	3,784
+Indonesia	254	1,060	258	1,572	1,356
Bangladesh					
Nepal					
<u>NEAR EAST</u>					
°Turkey	390	382		772	1,767
+Egypt			17	17	213
Jordan	35	82	6	123	108
+Tunisia	12			12	60
Morocco		5	205	210	28
++Portugal		267	630	897	
++Syria		923		923	
Afghanistan					
Bahrain					
Cyprus					
Malta					
Yemen					
<u>AFRICA</u>					
++Cameroon					
++Central African Republic					
++Chad					
Ethiopia					
++Former Portu- guese Terri- tories					
+Ghana	8	49	36	93	73
++Guinea					
+Kenya	24		99	123	255
+Liberia					70

Country	1st QTR	2nd QTR	3rd QTR	YTD	FY 76	
++Mali	-----	-----	-----	-----	-----	
++Mauritania	-----	-----	-----	-----	-----	
°Nigeria A/	407	10	39	456	8,368	
++Niger	-----	10	164	10	-----	
++Rawanda	-----	-----	-----	-----	-----	
++Senegal	-----	-----	49	49	-----	
++Sierra Leone	-----	-----	-----	-----	-----	
++Somalia	-----	-----	-----	-----	-----	
++Sudan	-----	-----	-----	-----	-----	
+Tanzania	-----	12	17	29	333	
++Upper Volta	-----	-----	-----	-----	125	
+Zaire	-----	-----	-----	-----	97	
Zambia	63	12	10	85	-----	
TOTAL	43 Countries	\$29,580	\$26,653	\$27,988	\$84,057	\$59,394

A/ Reflects inability to replenish deposit account.

NTIS
(BUDGET BREAKDOWN)

	FY-77	FY-78	FY-79
Information Transfer Cost			
Personnel salary and benefits	29	41	55
Floor space	14	17	19
Request processing	24	30	20
Workshops	01	02	01
User Education			
AMTID	44	39	32
Exhibits	01	06	06
Commodities	00.1	00.3	00.1
Inflation	08	08	07
	<hr/>		
Total	121	143	140

HOST COUNTRIES
(Budget Breakdown)

	FY-77	FY-78	FY-79
1. Information transfer cost			
a. Personnel salary and benefits	28	161	205
b. Floor space	15	70	79
c. Request processing	08	52	38
2. Seminars	02	10	17
3. Workshops	20	63	31
4. User Education			
AMTID	19	100	86
Printing	02	05	05
Exhibits	02	09	10
Commodities	44	120	07
Inflation	<u>21</u>	<u>21</u>	<u>20</u>
Total	161	611	498

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*see Corrections
Sheet*

PROJECT PAPER (PP)

SCIENCE AND TECHNOLOGY INFORMATION TRANSFER

Part I. Project Summary and Recommendations

- (A) Face Sheet
- (B) Recommendations

Approval of the project and budget as follows:

	FY 1977	\$120,000
	FY 1978	200,000
	FY 1979	200,000
Total new AID obligation (by PASA with National Technical Information Service (NTIS), U.S. Department of Commerce)		<u>\$520,000</u>

(C) Description of the Project

This is a centrally-funded, technical assistance project sponsored by the Office of Science and Technology (OST) to improve access by the less developed countries (LDC) to scientific and technical information resulting primarily from United States Government-controlled research and development (R&D). Government R&D, currently valued at over \$21 billion annually, constitutes more than half of the total annual U.S. investment in R&D, of which over \$9 billion is directed toward civil applications. Information generated as a result of this R&D is available through the National Technical Information Service (NTIS), the project contractor. In addition, NTIS provides access to similar R&D results and technological developments in other countries and to growing bodies of U.S. private sector technological information in the NTIS data base. (Annex D - The NTIS information collection and NTIS acquisitions for 1977).

The project is one of two AID projects with NTIS; each with the same goals and purpose. The other project has a Latin American (LA) setting, and is separately funded by the LA Bureau. There are no conflicts or dependencies between the two, both evolving from a successful pilot project,

This project will operate in Asia, Africa, and the Near East. Improvement in LDC access to U.S. scientific and technical information will be achieved mainly by broadening and strengthening technical

information transfer through local agencies in five countries (~~Korea~~, *
~~Nigeria~~, Pakistan, Philippines, and Thailand) currently cooperating
through bilateral agreements with the National Technical Information
Service (NTIS). The project will also expand the existing technical
information network to include selected cooperating agencies in nine
additional countries: Indonesia, Sri Lanka, ~~Turkey~~, Kenya, Tunisia, *
~~Egypt~~, Ghana, ~~Jordan~~, and Ethiopia. *Liberia, Bangladesh*

The project will be implemented through a Participating Agency
Service Agreement between AID and NTIS giving the latter responsibility
for: (1) providing increased access to U.S. scientific and technical
information products and services to end users through selected agencies
in certain LDCs in Asia, Africa and the Near East; (2) increasing demand
for U.S. technical information by sponsoring seminars in project coun-
tries to broaden awareness of information availability and foster closer
ties between cooperating agencies and their own local end users; (3)
conducting workshops at NTIS (Annex E) for officials of cooperating
agencies to provide them with know-how concerning acquisition of U.S.
scientific and technical information and the operation of a national
technical information service to meet national needs; (4) providing
technical advisory services including user education and marketing sup-
port; (5) publishing and disseminating "Application of Modern Technology
to International Development" (Annex F) to cooperating agencies as a
monthly report of available NTIS acquisitions in LDC interest areas;
(6) priority handling of LDC information requests and administration
of an Air Mail Postal subsidy; (7) providing special information
materials and equipment compatible with the capabilities of each of the
cooperating agencies; and (8) developing selected case studies for as-
essment of program benefits.

These NTIS activities will produce two major results: an operating
network of cooperating agencies for transfer of U.S. scientific and
technical information to fourteen LDCs in Asia, Africa, and the Near
East; and a three-fold increase in the flow of U.S. scientific and
technical information products and services to project countries.

The achievements of the previous NTIS/OST pilot project provide
evidence that inputs can reasonably be expected to produce the outputs
forecast.

D. Summary Findings

With the successful completion of the project under consideration,
AID and NTIS will have opened, to a large group of LDCs, a channel for
broad and regular access to U.S. technical information where no such

channel existed previously. Furthermore, the AID/NTIS series of leading projects will have established in the project countries technical information institutions which are capable of self-support and which can be utilized to exploit other and more advanced technical information transfer possibilities as development takes place.

The Office of Science and Technology (OST) and the National Technical Information Service (NTIS) affirm the readiness of the project for implementation since it builds upon and extends an existing project. Rapid approval will be necessary if project momentum is to be maintained.

E. Project Issues

A project evaluation report prepared in March 1976 resulted from an evaluation team visit to Latin America in the fall of 1975 (Annex A). Modifications and improvements suggested in the evaluation have been generally incorporated in the project design as it appears in this project paper. The basic features of the pilot project have been retained because of the demonstrated soundness of this approach which was not challenged by the evaluation team. The team's overall evaluation is treated in the project paper evaluations that follow. NTIS has been entirely responsive in its effort to accommodate the team's evaluation, and to other AID suggestions, and has maintained close and effective coordination with AID project managers.

NTIS has proven to be very well suited to the purposes of the project. Although there are other U.S. public and private agencies capable of transfer of scientific and technological information, NTIS, with its custody of reports on US Government R&D plus its access to important private sector technological information collections, offers the broadest range and depth of information products and services across the entire spectrum of science and technology. Within the NTIS collection of one million titles there are 600,000 research reports which can be located quickly using NTIS on-line computer search service. Private sector technological reports available through NTIS include Engineering Index, Lockheed Information Systems, the National Library of Medicine, the Urban Institute, the American Railway Association and the Ford Motor Company.

NTIS, in its effort to achieve the widest possible utilization of its technical information collection, has an interest which is complementary to that of AID in the LDCs. Although AID funding represents less than 2% of the NTIS budget, AID's participation has been essential in permitting NTIS to overcome the difficulty and expense of establishing information distribution in LDCs as a supplement to NTIS operations domestically and in the developed countries. The viability of the LDC program is demonstrated by the signing of straight commercial contracts

between NTIS and agent distributors in Korea and Nigeria--both graduates of AID and the pilot project.

NTIS has agreed to continue to maintain close liaison with AID and AID Missions in the selection and use of LDC cooperating agents. Selection and training of competent LDC agents, indispensable middlemen in the information transfer process, is a complex and difficult process with which NTIS has had considerable success. Greater effort will be made to make AID Missions aware of the establishment of a technical information source close at hand and of its usefulness for mission purposes and in-country AID projects.

NTIS has a non-exclusive arrangement with its agents which permits the agents to function as a newly established element in their national information infrastructure and a channel for other technical information flows. Thus the project acquires broader benefits for technical information flows than that represented by the accumulation of new customers for NTIS. Other information systems will be used eventually to supplement the NTIS system in the LDCs.

Until more individual case histories of information use are obtained (and more have been designed into the new project), the evidence of successful information transfer consists of the growth of document sales. Questions automatically arise as to whether the information is appropriate or useful. But the NTIS role is to provide access to a wide variety of potentially useful technical information. Selection of information as to its appropriateness is an internal individual user determination. The growth of information sales indicates that increasing numbers of LDCs buyers find the information appropriate enough that they are willing to pay for it. In fact, many buyers are repeat customers.

Another issue related to project implementation is whether the NTIS system could or should be used to circulate a back flow of technical information originating in LDCs. The LDCs most likely to be interested in circulating information on their own technical adaptations are the emerging economies (Korea for instance) which are likewise emerging from the project's scope. Circulation of technical information from more advanced LDCs like Korea to less advanced LDCs like Colombia is likely to provide appropriate technology to the latter and would accord with accepted AID use of the former. This possible use of the NTIS network will be examined further during the project period.

The Latin American Bureau and the Technical Assistance Bureau will together examine the possibility of putting the two projects,

which have much in common, under common AID management once they have been approved within their respective geographic settings. OST, which managed the first project with NTIS, might be in the best position to manage the two new projects.

The desirability of circulating AMTID, the NTIS announcement bulletin (Annex F), beyond project countries to other LDCs has been considered. AMTID is, however, essentially a market development tool. Until such time as NTIS is prepared to enter and establish additional LDC markets, wider distribution of AMTID, besides requiring additional funds, could lead to an added burden for NTIS and possibly to a dilution of NTIS efforts in project countries.

Part II Project Background and Detailed Description

A. Background

Guidance on the role of technical information in technical assistance was provided some years ago by Stanford Research Institute in a report to the International Cooperation Administration under a section entitled "The Communications Problem."

"In its technical assistance function, ICA is basically a communications agency, in the broadest sense of the word, to provide technical know-how There is an indicated need for a greatly increased flow of technical aids (as distinguished from experts and the knowledge they carry in their heads). Such aids are books, manuals, pamphlets, films, slides, radio programs, technical questions and answers services... There is a strong multiplier effect in printed technical materials available for volume distribution. Much of this material is "handed on" in one way or another, increasing the dissemination of technical information far beyond what a technician could hope to achieve by his personal contacts alone... One of the elements that make a country undeveloped in the first place is that it lacks a developed communication complex--everything that helps ideas and facts flow to a person who can use them. The communication complex of a country must be at least good enough to meet the needs of the technological development being undertaken or that effort will be frustrated and ineffective."

Since that report was written, AID has supported a variety of efforts to increase the flow of information to developing countries. Among the many book and journal distribution efforts were textbook programs in India, and AID technical information backstopping activities provided by the Departments of Agriculture, HEW, Transportation and HUD. Also, AID itself distributes technical literature through in-house staff efforts in Washington, in the field, and through a

commercial arrangement.

Another related but not actually comparable effort was a major program to distribute up-to-date technical publications to select institutions in developing countries by utilizing the resources of the National Academy of Sciences (NAS) and Franklin Book Company. Although the project was beset by delays in shipments, excessive costs, and other administrative problems, it did succeed in heightening LDC awareness of U.S. scientific and technical activities. Yet it could not provide the scope of coverage, contemporaneous information or the organizational support or training needed by LDCs today.

At the request of OST, NAS conducted a 1972 study which recognized that transfer of technology involves many factors but recommended that high priority be given to assistance programs that improve the transfer of scientific and technical information to developing countries and strengthen the information infrastructure of these countries. The NAS report underscored the need for a practical new approach. OST responded by turning to NTIS for assistance in designing and implementing a new approach to transfer of technical information based on NTIS's extensive resources and unique responsibilities as the U.S. Government Agency for the dissemination of public technology.

The first OST/NTIS project made steady progress through several phases. In 1972 and 1973 NTIS prepared quarterly abstracts of selected USG reports believed relevant to LDCs industrial development. The abstracts were disseminated to limited target groups, mostly within the governments and technical institutes. In 1974, NTIS launched Application of Modern Technology to International Development (AMTID) containing MTIS abstracts but also announcements of development-oriented reports and lists of "best sellers." At that time, AMTID was distributed quarterly by direct mail to some 700 addresses in government offices, research institutions, universities, libraries and industry in 40 countries, AMTID contained instructions for ordering and purchasing reports from NTIS. In the first 11 months, 1,098 reports were purchased by 21 LDCs. It soon became evident, through questionnaire surveys and site visits, that while recipients were pleased with AMTID, development of the substantial market potential for U.S. scientific and technical information was inhibited, among other things, by the difficulty of obtaining foreign exchange for individual purchase of reports, and by the narrow concentration of marketing on government agencies and academic institutions. Local involvement, particularly outreach and transactions in local currency through selected local cooperating agencies were seen as essential improvements.

An expanding network of cooperating LDC institutions has since brought greater awareness of, and rapidly growing orders for, available U.S. scientific and technical information. Agreements were concluded with cooperating agencies in 14 countries (sample agreement Annex H), while direct order address lists for countries without cooperating agencies were refined and expanded. AMTID was modified in format and its circulation changed to monthly, while training of representatives of the LDC cooperating agencies was begun at NTIS. NTIS sales in LDCs, which were negligible when the program began in 1972, were \$53,886 in 1974, \$76,000 in 1975, and \$120,000 in 1976. The largest increases were achieved in countries with cooperating agencies (Annex I-"Value of Document Purchases" for project country sales).

The fact that foreign sales (\$2.2 million) accounted for 15% of total NTIS sales in FY 1976 suggests the importance attached by other countries, principally the other developed countries, to keeping abreast of U.S. technological development. The awakening interest of the LDCs is impressively stated. While all foreign sales in FY-76 only rose about 1% over those of FY-75, demand in the 40 NTIS/AID project countries rose by an encouraging 57%.

The current level of scientific and technical information transfer to developing countries can be illustrated by their purchase of NTIS products and services during FY-76 (all figures approximate): India, \$30,000; Thailand, \$6,000; Nigeria, \$5,000; Korea, \$4,000; Philippines, \$4,000; for 37 countries \$120,000. This can be compared with the flow of NTIS information to some developed countries during this period; Canada \$107,000; Japan, \$148,000; and West Germany, \$79,000; and Israel, \$75,000. *

The NTIS project emphasis has been on sales rather than "give-aways," the latter being rejected as a project element at the start. The demonstrated willingness of a growing number of individuals and institutions to review, select, and then commit their own funds to purchase technical information products and services is the best indicator of successful information utilization. In addition, the project emphasizes a strong institutional network linked through cooperative agreements for effective and continuous international communication. The project was cited at the United Nations General Assembly 7th Special Session. Earlier, the project was singled out for proposed expansion in Latin America in USG proposal to the Working Group on Science and the Transfer of Technology of the Meeting of Foreign Ministers. This initiative is expected to be implemented by NTIS for the AID Latin America Bureau commencing in 1977.

* See Corrections Sheet

B. Detailed Description

1. Goal and Purpose

The sector goal is the same as that of the pilot project - to increase LDC capabilities for effective selection, transfer and adaptation of technology by improving access to U.S. scientific and technological information (STI). The project purpose, which serves this goal, calls for expansion of the networks of cooperating agencies in Asia, Africa and the Near East from five to fourteen agencies. Goal achievement will bring with it a wider application of STI in the LDCs. By the end of the project, the expanded operating network will be handling a flow of STI increased three-fold to a dollar value of 200,000.

Underlying the whole project is a series of interlocking assumptions which are expected to be proven by the successful operation of the project. It is assumed that there exists in the project countries a sizeable group of potential end users of technical information such that, if a large body of technical information is made available at a reasonable price and they are aware of its availability, they will seek out appropriate portions to obtain for their use. Furthermore a substantial portion of the information used will be for problem solving in such a way as to positively effect production and economic development with consequent economic and social benefits. The assumption is circular in that successful employment of the technical information raises the technological level and leads to renewed demand for technical problem-solving information but at a higher technical level.

2. The Planned Outputs

- a. Nine new cooperating agency agreements activated in 9 LDCs.
- b. Nine new cooperating agencies trained in information practices and providing local services to improve access to S&T information.
- c. Five existing cooperating agencies provided additional training and support for market promotion and operations.
- d. Completed series of seminars, workshops and indoctrination sessions (both in the U.S. and LDCs) with stimulated awareness of the availability of appropriate STI and individuals trained in information handling techniques.

3. The Planned Inputs

- a. USG information products and services.
- b. Seminars in project countries to expand potential user community's knowledge of, and confidence in local distribution system.
- c. Workshops at NTIS on U.S. information systems.
- d. Technical advisory services to implement bilateral agreements, including marketing and promotion services.
- e. The monthly "Application of Modern Technology to International Development" (AMTID) along with a variety of other NTIS publications and promotional material.
- f. Special information materials and equipment.
- g. A quarterly newsletter for cooperating agencies.

The logical framework for the project is given in Annex B. The connection between inputs, outputs, purpose and goal are based upon comprehensive project experience over a period of more than four years.

Part III. - Project Analysis

A. Technical Analysis Including Environmental Assessment

The previous pilot NTIS project has resulted in the development of a successful, tested technique for the transfer of science and technology information to developing countries. This follow-on NTIS project, by spreading the improved technique over a wider range of LDC countries, will provide needed additional experience to guide the evolution of a system of technical information transfer to LDCs as a continuing and expanding element of U.S. development assistance.

The project design - NTIS information to LDC agency to LDC consumer - appears to be simple. However, the accumulation, storage, processing and marketing of technical information is, in reality, a complex technique in its own right. The implantation of a successful system for receipt and distribution of technical information in the LDCs is in itself a technological transfer of considerable importance. Competence in the handling of information technology is a precondition to successful transfer of technological information on a scale required for LDC development.

Information from NTIS, uncopyrighted and in the public domain, can be widely applied. Technological information successfully utilized by one LDC consumer can be applied by any number of others who have become aware of the potential. In fact, NTIS (see Annex J) has a list of best sellers with a technology spread ranging from computer technology to building earth homes.

Central to the NTIS project design is the counterpart LDC agency. Although the agency has certain common characteristics from country to country, it has no common personality. In Egypt it will be a news-agency. In Korea it was a scientific institute, but now the agency has been passed to a newly created technical information agency. NTIS has been generally successful in finding an appropriate agency in each project country. The generalized NTIS experience in this regard is contained in the agency selection guidelines (Annex G). Since agencies which acquire the technical information function through NTIS are also potentially useful for other in-country AID purposes, it is important that NTIS selects its agents in close consultation with AID Missions and AID/W (OST, PPU and the Regional Bureaus). A provision to that effect will be incorporated in the PASA.

Recent data covering document sales to project countries indicated

a strong growth pattern for countries in which agents had not yet been appointed. NTIS describes these as typical and temporary; a combination of a relatively advanced technological development level and a concentration of purchases. (The Indian Army, for instance, discovered the availability of DOD documents in NTIS). The most recent figures (Annex K) show a more rapid growth of sales to countries with agent representatives. The figures bear out the NTIS contention that a competent LDC implementing institution is essential for the effective use in-country of the technical information inflow. Without such a bridge between the knowledge donor and the host country user, the connection between the two is tenuous and frequently unsatisfactory. The agent provides necessary linkage. With his bibliographic backup, his file of abstracts, and his experience in matching end user requests with NTIS availabilities, the agent can expedite the information flow by helping the LDC customer identify his needs and put them in proper form. The experienced library, reference or documentation center, which frequently fills the agent role, is itself able to assist technological spread by disseminating information through its own publications about the availability of documentation of U.S. technology which it knows to be appropriate to requirements.

The LDC agents established under the project have an obvious, exploitable potential for technical information dissemination that goes beyond their activity as LDC outlets for NTIS data. NTIS has properly made no attempt to establish these centers as an exclusive preserve for the sale of NTIS information products. On the contrary, NTIS has used its good offices for referral of information requests to other U.S. data sources when NTIS itself cannot satisfy the requests. Furthermore, NTIS has expanded the NTIS workshops in the U.S. for LDC information specialists by an extra week so that the specialists can obtain a wider exposure to the U.S. information industry as a whole. NTIS distributors will emerge from the project as technical information centers and one of the essential elements in the information infrastructure required for national development.

As designed, the project will require the full funding (annual rate of \$200,000) and the full remaining 2-1/2 fiscal years for implementation. Anything less would be inadequate to implement the various management/orientation recommendations for improving network operations.

With the technical information distribution resource in place and fully operational, it will become possible at a later stage to expand project country access to other non-duplicative United States Government data bases such as those controlled by the Government

Printing Office, NASA, the Smithsonian Science Information Exchange and the Department of Agriculture. U.S. private sector special purpose data bases could also be utilized by the LDCs for specific development purposes. At a later stage, when development supports a greater technical information flow, more advanced U.S. information industry technology can be utilized in project countries. Appropriate portions of imported technical data bases can be put into local computers for local accessing or U.S. technical data bases can be directly searched through on-line terminals. These are two among numerous possibilities for technical growth.

One of the end-of-project conditions originally foreseen was the establishment of a computerized technical information retrieval network with regional capability. A data base, centered in one country, would be accessed by its neighbors through remote terminals. Technically possible, the concept is considered politically too complicated to be undertaken within the framework of the project.

Aside from fulfilling A.I.D.'s purpose, the project design has assisted the development purposes in the project countries of two other U.S. Government agencies - the Department of Commerce and the United States Information Agency. Commerce interest in expanding U.S. commercial exports is served by the opening up of some project country markets for U.S. information industry products and services. NTIS and other parts of the Commerce Department are coordinating plans for U.S. information industry trade missions and exhibits in several project countries.

USIA has become interested in the use of on-line computer retrieval for information services in the LDCs. In cooperation with NTIS officials, USIA is sponsoring several NTIS demonstrations in project countries. NTIS will be using portable terminals and telephone hookups to access the NTIS data base in the U.S.

Environmental Assessment

The transfer of U.S. scientific and technical information will have no direct impact on the environment of the project countries. However, the indirect and long term influence of improved access to U.S. environmental R&D, including impact statements, can be expected to be beneficial to the LDC and to the world-wide environment.

B. Financial Analysis and Plan

The project is designed to establish a system for the transfer of technical information through LDC agencies which support the

transfer function with revenue obtained from document sales. A.I.D. funds are generally expended for development of this functional capability and are either channeled through NTIS as subsidies to the LDC institutions or are advanced to NTIS as partial support for NTIS project operations related to the establishment of the agencies in project countries and the training of their personnel.

The \$200,000 annual rate of A.I.D. support represents a careful calculation of support costs based on pilot project experience. It will be needed to consolidate gains and broaden program coverage to enough countries with enough variety to have an impact in the Asian-African development area.

The principal particular uses of A.I.D. funds are to support NTIS in its preparation and transfer of information products and services, and in its user education (market development) in the project countries. The major AID-funded subsidy passed along by NTIS to the project country agencies covers transfer of information by air mail postage at a worldwide average of \$3.00 a shipment. Prompt delivery by air mail is an important service feature and adds to the potential value of the information. However, at project end, airmail costs will be passed along to the agent and presumably to the customer.

In the financial plan category "user development/marketing," A.I.D. funds are mainly used for publication of AMTID (Application of Modern Technology in Development). The publication circulates free of charge at the rate of 4,500 copies a month and is the vehicle principally responsible for arousing and maintaining LDC interest in NTIS offerings. At project's end, NTIS will have to consider whether to maintain AMTID as a sales medium, to adapt an announcement bulletin already used by NTIS in the U.S., or to persuade the LDCs agencies to develop their own local version using country-specific material.

NTIS, whose management is based on total cost recovery, maintains that its income to date from LDC transactions, weighed against the staff time taken to accomplish these sales instead of concentrating on the U.S. market, results in a net loss to NTIS. Nevertheless, NTIS remains committed to provide to the project the competent and innovative managerial leadership the project requires. NTIS willingness to do so is in keeping with its Congressional mandate to disseminate technical information as widely as possible to benefit U.S. national and international interests. Furthermore, because it had A.I.D. support during its pioneering effort to establish a market in

the LDCs, NTIS will probably be able to maintain and even expand its LDC programs without a relative net loss after withdrawal of A.I.D. support. Much will depend on the ability of the individual NTIS-selected distribution agents to maintain themselves after withdrawal or modification of AID/NTIS subsidies and other forms of project support. The growing market should enable them to do so.

Through this project NTIS will support its LDC agents by providing products at U.S. prices instead of 100% higher foreign price, granting a 25% commission on all transactions, and by crediting the agent's deposit account with a \$1,000 marketing grant. The airmail subsidy was mentioned above. The agent also receives a computer print-out of those local direct-mail customers who gave NTIS an annual average order of \$50. On top of this the agent receives marketing and promotion support, staff training, bibliographic material, sample documentation and some information equipment.

The subsidies and other forms of assistance appear to be providing sufficient outside support to the agents during the start-up period. For their part, host countries support the program through their agents at a cost exceeding that of A.I.D. and NTIS. In the Summary Cost Estimate and Financial Plan, which follows, the values on host country inputs represent the total derived from an average for all project countries, and are constructed by NTIS on the basis of their experience as to what it costs an LDC agency to add the information function to other functions for which the agency was established and budgeted.

Each cooperating agency contributes a \$2,000 cash deposit in its NTIS account; commits management and clerical time to promote NTIS products and services and to process orders resulting from this effort; provides office space and overhead costs to operate this new function; funds travel throughout the country to educate potential end users and promote the products and service; pays for the participation of its representatives in the NTIS Systems Workshop in Washington; buys postage to distribute AMTID within country to the established user list and to the organization's own mailing list. As promotion increases, so the demand increases and customer service needs increase. The agency's commitment further increases to create a continuously synergetic effect. Actual cost will, of course, differ from country to country.

In the post-project period, NTIS will continue agent discounts, but apply them selectively. Deeper discounts will go to the weaker agents. Prices will, however, begin to rise to its full international price - a price double the domestic price. Despite the higher prices, NTIS feels demand will hold up because of general realization that the value of technical information is potentially so much greater than the buyer's outlay.

3. Financial Plan/Budget Tables

SUMMARY COST ESTIMATE AND FINANCIAL PLAN (3 yr.)
(U.S. \$000)

<u>Source</u>	<u>A.I.D.</u>	<u>Host Countries</u>	<u>NTIS</u>	<u>Total</u>
Information Transfer Cost	233*	656	249	1138
Seminars	36	29	--	65
...Workshops	17	114	4	135
User Education	126*	738	128	492
Case Studies	65	--	--	65
Commodities	18*	171	1	190
Inflation	26	63	20	109
<hr/>				
TOTAL	521	1270	403	2194

* For Breakdown see following table

LDC purchases of USG scientific and technical information products and services are projected to rise to a rate of \$200,000 a year by the end of FY-79.

The budget breakdown for PASA purposes is:

<u>Cost Components</u>	<u>Budget Year</u>		
	<u>FY77</u>	<u>FY78</u>	<u>FY79</u>
1. Preparation and Transfer Information Products and Services			
<u>Salary and Benefits U.S. Technicians</u>	30.5	48.	63.
Project Manager			
Special Assistant			
Information Specialist			
Marketing Specialist			
Program Assistant			
Secretary			
Clerk Typist			
NTIS Overhead (2%) of Personnel Cost	.7	.8	1.2
Floor space, communication, utilities	5.	8.	9.
Request Processing Postage	24.	34.	23.
2. In-Country Seminars	3.	12.	21.
3. Student Subsidy for NTIS Information System Workshop	3.	10.	10.
4. User Education			
AMTID (graphics, print, mailing)	15.	21.	15.
Print Advertising	2.	5.	5.
Audio-visuals	3.4	5.	5.
Exhibits	2.	8.	8.
5. Case Studies	11.	22.	22.
6. Commodities			
Info. Resources Microfiche equip.	3.7		
Visual Search Microfiche	3.7	10.	
7. Inflation	6.	10.0	11.
	<u>120</u>	<u>200.8</u>	<u>200.7</u>

C. Social Analysis

Immediate beneficiaries are public and private LDC institutions and individuals in Asia, Africa and the Near East desiring improved access to information on U.S. technology appropriate to their development. This is the initial target group. The ultimate target group would be a very much larger fraction of the population benefiting from redeployment of savings resulting from use of imported technical information instead of expensive local R&D.

The project has a strong potential for indirect benefit to the poor majority through its employment effect and improvement in quality of living. That potential is more fully explained in Annex L in which NTIS responds to the idea that technical information is really useful only to the LDC professional/managerial entrepreneurial groups.

Besides the poor majority, other groups higher on the social scale (but below the professional group) are expected to benefit from the imported information they obtain through libraries and educational centers. These institutions make up only about 10% of total end users, but almost 100% are NTIS subscribers. They provide for distribution of the more popular less complex technological information and are worthy of particular attention in the implementation of the project.

A profile of some 4,000 regular users of technical information in LDCs shows the following distribution:

Business/Industry/Professional	79%
Government	7%
Individuals	5%
Libraries	4%
Universities	4%
Other Categories	1%

The current user distribution pattern formed within the market place. During the early years of the program, the major targets were government and academic organizations. As targeting widened, the current distribution pattern developed. Even at the beginning, when manufacturing and consulting firms comprised less than 10% of users, they were already contributing over 50% of the total demand. The type of information used by LDC professionals and entrepreneurs demonstrates the pragmatic, problem-solving nature of the information. (See Annex A - Customer Sample)

<u>User Demand</u>	<u>% of Demand</u>
Engineering (Civil, Industrial, Mechanical, Structural, Materials, Mining)	45%
Environment Pollution-Control, Water Resources	16%
Energy Sources	11%
Agriculture, Aquaculture, and Food Technology	11%
Information Sciences, Computers, Communications	11%
Management, Administration	6%

There are no special impediments which would limit information transferal and distribution. The fact that NTIS documents appear only in English has been questioned, but eighty per cent of the AMTID readers responding to a reader survey said that the fact that technical reports are available only in English did not discourage them. In fact, many professionals feel that translations are not particularly useful and can actually be harmful in technical matters because of frequency of misinterpretation of technical vocabulary and nuances. Cooperating agencies report to NTIS that when a handbook or technical guide is ordered, if a customer deems a translation necessary for wide usage in the organization, either appropriate sections or the entire document are translated by someone in the organization who has the English, the technical background, and the vocabulary to do so correctly. Most cooperating agencies do not provide translating services but maintain a roster of reliable persons who do translations for readers who cannot read English.

The previous pilot project was enthusiastically received in the LDCs and, like other information projects, was highly visible. This proposed follow-on project will be an even more visible U.S. effort to provide some tested response to the pervasive LDC demand for technology in all its forms. The mere fact of technical information accessibility in the mass is a partial answer to those in the LDCs who have complained that U.S. scientific and technological information was generally placed beyond the reach of LDCs.

The project enhances the role of women in technology. It adds a technological dimension to library and information sciences, both traditionally large employers of women. The majority of representatives of cooperating agencies trained at NTIS has been women.

The trend towards involvement of a large number of women in the project is expected to continue and will be encouraged in the operating agency agreements.

D. Economic Analysis

It has not been possible to analyze this project on the basis of a quantified judgment of its effect on the economies of the project countries. The economic benefits obtained from transfer of technical information can be traced only with the greatest difficulty. In fact the National Science Foundation (NSF) has proposed a project on the economics of information which will attempt to quantitatively determine the real value of scientific and technical information under various conditions of use. Information values obtained by NSF might eventually be used by AID to estimate use/benefits and cost effectiveness of technical information transfer to LDCs. For the present, it is only possible to reach broad conclusions, based on the high level of document sales obtained in the pilot project, as to the probable economic impact of this proposed NTIS follow-on project. The array of unquantified economic benefit, as against the modest costs of obtaining the information and transferring it, would seem to qualify the project as cost effective and economically justified for AID purposes.

The LDC countries themselves have a very clear appreciation of the economic benefits to be obtained from the transfer of technology and technological information. They recognize the savings to be obtained from not having to duplicate the R&D involved. They clamor for greater opportunity to select, acquire and utilize technological information. The NTIS project directly responds to this strongly expressed need.

This follow-on project builds on an intensive three-year pilot effort to define the LDC technological information market and to develop it. The robust and growing project country markets demonstrate the success of that effort. The overall economic effect of the follow-on project will be an accumulation of economic benefits obtained by the whole group of end users who make up the growing market.

LDC end users of the technical information imports can be separated into two general categories. One is the category of indirect users who retain the information for reference purposes, but without immediate or tangible benefit. The other applies the information directly to operations and derives immediate benefit.

In the first category, governments use technical information for economic planning purposes while institutions use it in libraries, scientific and technological research and training. For instance, information on energy conservation goes to governments who will be able to use it in long run, national energy resource saving programs. Information on this and other U.S. government research findings is most valuable to the emerging LDC scientific community and has long range capability to contribute to economic development. Those in the category of government and institutional end users however, are already almost totally subscribers to the NTIS service. So it is to the second category, the direct users, that the project must look for dynamic market growth and more immediate direct accumulation of economic benefit.

The LDC buyers who use imported technical information for problem solving in their operations include R&D managers, engineers, consultants and similar professionals. Unfortunately, NTIS has only a small collection of case histories wherein it can be demonstrated that a specific piece of technical information was applied to obtain a specific production increase. (Evaluation of the current project calls for the accumulation of more case histories to guide future development efforts.) Yet the rapid growth in private sector end users continuously supports the assumption that availability of a wide choice of technical information will result in wide use by LDC consumers who value the productive potential of the information well above its cost. Furthermore, where production increases have occurred, increases in all factor incomes will result.

Continuing expansion of a country market for NTIS documents will depend upon the agent's being persuaded to follow an economic strategy of market growth rather than profit maximization. Fortunately, there are a number of constraints which act to dissuade the agent from following the latter strategy to the exclusion of the former. None of the agents are solely dependent on the profitability of the technical information function. Most agents are either governmental or quasi-governmental entities who follow government policy, but even if the agent belongs to the private sector, he will feel the pressure of the government imperative for widespread availability of a commodity so important for national development. Furthermore, NTIS marketing and information management assistance emphasizes market development at the sacrifice of immediate profit. Since the agent operates under contract to NTIS, the NTIS recommendations on good marketing practice can be expected to prevail.

Technical information is delivered to LDCs through the project at a very modest price relative to the U.S. cost of producing and transferring the information. Information from U.S. Government R&D represents a sunk cost to the U.S. Government, but Congress has directed that the information be used for public benefit by being made publicly available after serving its original purpose. NTIS charges depositing agencies for its services in retaining the information in producible form. The price charged for the subsequent sale of the information in the U.S. and abroad represents actual storage and processing costs to an agency which operates on a profitless, cost-recovery basis. Project subsidies to help establish local marketing agencies bring the information cost to project countries down even further. The value of a piece of appropriate technological information considered against its actual cost to the LDC (and the original cost of the U.S. R&D that produced it) provides an indication of the potentially favorable cost/benefit ratio to the LDCs of this form of technology transfer.

Part IV Implementation Arrangements

A. Analysis of Recipient's and AID's Administrative Arrangements

1. Recipient

There are two categories of recipients in the project:

- the 14 LDC cooperating agencies whose coordination with NTIS is the subject of bilateral agreement and administrative arrangement.
- the large and growing number of technical information end users who normally will look to the cooperating institution as their intermediary.

NTIS intends to continue to devote much executive time to project management. This will include overall supervision by Director, Mr. William Knox, and direct supervision by Mr. Terrence Lindemann, Special Assistant to the Director. Two other NTIS officers (Mr. Shonyo and Ms. Dowd) and a secretary will devote practically full time to the project.

During the project period NTIS intends, to the extent possible, to impose tight management controls over the agents. The controls are needed if the agents are to emerge self-confident and self-sufficient by the end of the project period. NTIS management of the

agents is complicated by the diversity of agent capabilities and their differing rates of growth of responsibility. Constant re-adjustment of the NTIS-agency relationship requires field visits by NTIS officers which will be carried out with increasing frequency. Among other things, visits to the agents are expected to:

- Better orient them to project purposes and AID objectives.
- Improve local direct sales promotion techniques including use of audio-visual aids where advisable.
- Help establish basic bibliographic services and set up responsive reference libraries at those LDC agencies which seek to provide more comprehensive information services.
- Expand training of agent personnel in information storage, retrieval and dissemination. Develop agent capability to prepare own announcement bulletin.
- Evaluate individual agent programs and help solve distribution problems on the spot. Through the medium of in-country seminars, promote the agent in his own environment thereby building local confidence in him while boosting his own self-confidence.

The success of the expanded agent system will depend on the agent's coordination with NTIS on the one hand, and his customers on the other. Although NTIS will continue to accept direct orders, even after establishment of a country agency, NTIS will refer the customer to the agent for his future orders. The agent thus stands truly in the middle. With postage frequently costing the user more than the documents themselves, the agent will need to draw on the NTIS supplied reference materials, his experience and NTIS training to coordinate the customer's need with document availability.

During the later stage of the project period, NTIS will attempt to assemble agents in regional meetings so that they can exchange techniques and lay the groundwork for eventual regional networking of technical information.

2. A.I.D.

OST will manage the project for AID and will be responsible for monitoring and evaluation. Coordination through OST with Regional Bureaus and AID Missions will be required for NTIS field visits.

NTIS will be held responsible for keeping Missions informed of the project's progress and seek Mission assistance in development and use of the local representative. The latter will also wherever possible, be used as a channel for the provision of technical information required for other in-country AID projects. The collateral interests of TA/PPU/EUI (the TA information unit) in the project will be recognized by consultation on important project developments.

B. Implementation Plan

The nature of NTIS inputs for project implementation has been indicated in the project description above. Annex ~~E~~^H provides a Proposed Marketing and Promotional Implementation Plan with a month-by-month schedule of NTIS actions covering the project year FY 1977. The schedule is typical. It has not been possible to maintain the full schedule for FY 1977 because delays in project processing have created a funding gap. NTIS, however, has not hesitated to carry on basic program activities such as publication of AMTID and field visits by NTIS officers. NTIS has done so because it has invested too much of its own budget, energy and prestige to let the pilot program run down and then try to start it again. Annex ~~K~~^F is an NTIS training Agenda which is illustrative of the program of Washington workshops on U.S. technical information programs for key personnel of the agencies sent to Washington for that purpose.

A key feature of NTIS project implementation not described elsewhere, and one illustrative of NTIS' particular efforts on behalf of the project, is the special handling accorded by NTIS to orders received from project countries. Agent mail is captured and removed from the highly systemized NTIS order handling system. The capture prevents the rejection which would automatically occur if the orders were improperly executed. The agent order then receives individual staff attention including possible referral to other sources should the NTIS data base not contain the material requested. Before the agent's order is dispatched it receives a pre-mailing review to double check its responsiveness. The special services provided, which are not accorded to other customers, involve NTIS in the high cost of a non-standard operation.

Project implementation does not require host country actions, and no difficulties have been placed in the project's way by the LDC governments. Agents contribute office space, staff and rudimentary equipment to project implementation.

A notable milestone in implementation (Annex C - Milestones) is that requiring the signing of all new bilateral agreements by the

end of FY 1978 so that sufficient project time will remain for agent training. Prior establishment of the agents is also important for the regional conferences suggested as a forerunner to regional networking.

Implementation of the project will be condensed in the last quarter of the current (FY 77) fiscal year, because project approval will provide for a sudden surge of activity. Pending new project approval, and in order to maintain the agency system beyond the period of the predecessor project, NTIS has been letting the project continue with minimum maintenance and with much of the maintenance cost funded by NTIS.

C. Evaluation Arrangements for the Project

The project will be evaluated annually in terms of its efficiency, effectiveness, and significance in contributing to the accomplishment of project objectives. Informal evaluations will be conducted at the end of each year. In addition, a more complete and comprehensive formal evaluation will be conducted during early CY 1979.

The informal evaluations will be performed, as in the past, by a small panel consisting of four to five persons representing various AID/W bureaus and offices and chaired by OST. If practical, an LDC user will be represented. The panel meets with NTIS to review all aspects of NTIS performance and project accomplishments in terms of expectations based upon the logical framework. A written progress report containing a description of accomplishments, appropriate statistical data for measuring progress, and results of case studies reporting performance, utilization, and benefits will be submitted by NTIS at least one month prior to the evaluation to supplement oral presentations to the panel. Subsequently, a PAR will be prepared, distributed and submitted with the next annual program/budget submission.

In addition to theseⁿ formal evaluations, AID will be kept informed frequently of the project's progress and problems by informal contact with NTIS in Washington. *and the formal evaluation early in (CY 79)*

Despite the gratifying high level of customer acceptance and its evidence of the viability of the project design, very little is actually known about the appropriateness and the utilization of project information. NTIS will be accumulating case studies in this regard. NTIS will also compile information on the frequency

with which various types of technical information are ordered, including more detailed information on the identity of end users to which the information is put.

Finally NTIS will assist in the evaluation of the technical information transfer system by obtaining information on the agent's cost of maintaining the technical information function.

The views of AID Missions on project performance and value in their host countries will also be sought in relation to planning for future technical information transfer programs.

It is expected that the precedent established by AID's LA Bureau in regionalizing the technical information transfer program will be followed by other bureaus if the present multi-regional project is followed by others of the same nature. Additional LDCs could be given the advantage of a technical information transfer program.

931-1114

Annex A

EVALUATION OF NATIONAL TECHNICAL
INFORMATION SERVICE (NTIS) CONTRACT

for a

"TECHNICAL INFORMATION NETWORK"
March 1976

THIS EVALUATES PROJECT 5980572;
COPY OF THIS DOC PLACED IN THAT FOLDER,
ABSTRACTED AS 5980572 001701

PREFACE

During the period October 15, 1975 through November 5, 1975, a three-member team consisting of Mr. Richard Johnston, Economic Development Laboratory, International Development Data Center, Georgia Institute of Technology; Mr. Thomas Donnelly, TA/PPU/EUI, Agency for International Development, and Dr. Morton V. Malin, Institute for Scientific Information, conducted an evaluation of a project contracted by the TA/OST with the National Technical Information Service (NTIS) entitled, "Technical Information Network." The evaluation was conducted under Contract #A1670 between AID and IDD. The report which follows represents the findings of the group based on materials provided to them by NTIS and AID, interviews with NTIS personnel and with NTIS agents and clients of these agents in Brazil, Ecuador and Colombia.

SUMMARY OF RESULTS, CONCLUSIONS AND RECOMMENDATIONS

In the following sections of this report, detailed discussion of the teams findings, its interpretation of the results, its conclusions and recommendations are presented. This section provides a brief summary of findings of the team stated primarily as a set of conclusions and recommendations without elaboration.

As an introduction to these conclusions and recommendations, it must be stated that the team was in full agreement with the basic objectives of AID in contracting with NTIS to undertake the project, "Technical Information Network". In its discussions with agent representatives and users of technical information in the countries visited, the importance of technical information as one of the mechanisms for transfer of technology from highly developed countries to less developed countries was made clear time and time again. Thus, criticisms of the current project are based not on any beliefs that the basic idea is invalid, but on the idea that improvements could be made both in AID's total approach to the problem and in NTIS' administration of the current project.

Furthermore, note must also be made of the fact that the results of the team's evaluation and their interpretation specifically refer only to the information obtained in the three countries visited. The NTIS responsibilities under the current project cover a wider range of countries, and conditions in these may differ from those found in Brazil, Ecuador, and Colombia.

EVALUATION PROJECT 961 TECHNICAL INFORMATION NETWORK

CHARTER I: INTRODUCTION

This report presents the findings of a three-member team organized to evaluate an AID project implemented by the National Technical Information Service (NTIS) whose objective was the establishment of a system for transferring U.S. government sponsored research results to LDC's. The detailed project description is contained in the PASA agreement, Appendix I.

The NTIS is a Department of Commerce Agency whose mission is to search for, collect, classify, coordinate, integrate, record and catalog information from whatever sources, foreign and domestic, that may be available, and to make such information available to industry and business, to state and local governments, to other agencies of the Federal Government and to the general public.

The project provided for subsidization of a program which would enable NTIS to promote the dissemination of U.S. Government Reports to LDC's as a means for more effective transfer of U.S. technical information to these countries. AID's purpose in establishing the relationship with NTIS was to further its objectives of helping the LDC's in their technological and industrial development.

The aspect of the AID/NTIS relationship evaluated by the team was the agent system which NTIS began to develop in calendar year 1974. The FY 1975 funding provided for NTIS to initiate cooperative agreements with existing agencies in the LDCs, one aspect of which involves the marketing of technical reports and other information products and services which have been generated as a result of U.S. Government-funded research.

The type of NTIS Agency relationship that has been established is described in the sample Letter of Agreement, as shown in Appendix II.

The Evaluation Team's responsibilities including obtaining information from NTIS, Washington, D.C. concerning the operations of the agency in connection with its LDC-Agent activities. The Evaluation Team also was required to visit organizations in Brazil, Ecuador and Colombia with which NTIS had established agency agreements. The agreements in Colombia and Ecuador are subsidized by U.S. AID; the agreements in Brazil is strictly a commercial arrangement between NTIS and

a private-sector firm in that country but using the AID financed publications, AMTID and AMTID Jr., as promotional literature and other AID sponsored activities of NTIS.

The methodology used by the Team in its study and activities is outlined below:

1. Visit NTIS, Washington, D.C. to talk with personnel directly responsible for the operation of the program to obtain information concerning:

a. The organizations with which agency relationships had been established.

b. The manner in which NTIS provides service and support to the agents.

c. Problems encountered by NTIS or the agents in connection with the operations of the agency agreements.

d. The procedures established by NTIS for control and management of the activity.

e. Statistical data which would provide information for analyzing the program's effectiveness.

2. Visits to the Agencies established in Brazil, Ecuador and Colombia to obtain information concerning:

a. Views on the effectiveness of their relationship with NTIS.

b. Local problems encountered in acting as transfer agents for NTIS reports.

c. Statistics on sales.

d. The importance of NTIS reports in transferring technical information and the impact of the information on technological and industrial development.

e. Promotional activities of the agents in their countries.

f. Recommendations for more effective operation of the NTIS-Agent relationship.

g. Recommendations concerning additional activities AID could undertake to provide more effective transfer of technological information to LDC's.

3. Visits to actual users of NTIS reports in the three countries, with emphasis on visits to small and medium industrial organizations, to obtain information concerning:

a. The importance of the U.S. Government report literature to them.

b. How the reports are used and what information is most valuable.

c. Actual cases where information contained in a report led to expanded activities in a user's organization such as increased sales or employment.

d. Problems encountered in obtaining and using reports.

e. Recommendations for more effective contributions by AID to the transfer of technological information.

In all interviews both with NTIS, Washington, D.C. and with agents and users in Brazil, Ecuador and Colombia, the primary aim of the evaluation team was to obtain information to measure achievement both of output indicators as detailed in the PASA Agreement and to determine if AID (mission) objectives are being achieved. The team attempted to obtain information which would indicate whether or not at the end of the project the following conditions could be expected as listed in Section B, Paragraph 2 of Revision 1, July 16, 1973 of PROP - Technical Information Network:

1. Increased awareness in developing countries of the value to them of research and development activities in the United States;

2. Wider application of U.S. research and development results to problem solving in developing countries;

3. Better channels for communication and technical exchange between developing country R&D institutions and U.S. counterparts; and

4. Greater LDC demand for U.S. technological products and services. See Appendix I, "Section B-2. Conditions Expected at End of Project."

Finally, it was the purpose of the evaluation team to attempt to obtain quantitative and qualitative information concerning the outputs and output indicators intended for the project. See Section C. Statement of Project Outputs (Appendix I) for a description of Outputs and Output Indicators.

CHAPTER II: PROJECT ELEMENTS - INPUTS AND OUTPUTS

The NTIS as a depository of the research report literature produced by cooperating U.S. government agencies and their contractors provides a broad range of products and services across the spectrum of science and technology. In addition to the U.S. Government reports and those of contractors, NTIS also obtains, through other government agencies, reports of R&D results and technological developments of other countries. It markets the products and services of 40 U.S. government-sponsored information analysis centers.

Additionally, NTIS has arrangements with U.S. government and non-governmental agencies for provision of commercially exploitable U.S. technology, as well as access to government and non-government bibliographic files. In carrying out its mission, it has developed effective methods for retrieval and dissemination of the scientific and technological information which it collects and stores.

AID's purposes in developing the Technical Information Network Project, which was started in FY 1972 and projected to be completed in FY 1977, were to provide demonstration of an improved procedure for:

1. Facilitating transfer of relevant U.S. scientific and technical information to LDC's for development purposes.
2. Establishing linkages between the U.S. National Technical Information Service and LDC scientific and technical information services; and
3. Strengthening of these local services. See Appendix I, "B. Statement of Project Purpose."

A. Inputs

NTIS activities during the four years of its agreement with AID have been divided into two phases. Phase I covering FY's 1972 and the first half of 1973 called for NTIS to provide the following inputs to the program.

1. Quarterly preparation of abstracts of selected U.S. government reports relevant to industrial development of LDC's.
2. Dissemination of those abstracts to research institutions, universities, technical and industrial libraries, and Ministry of Works,

Industry and Commerce in LDC's.

Phase II started in calendar year 1974 and is planned for continuation through FY 1977. This Phase of the project was introduced as a result of agreement between AID and NTIS to modify the original program. The inputs of Phase II as understood by the evaluating team are:

1. Negotiation of cooperating agency agreements with local information organizations in the LDC's to promote the use of U.S. technology through the promotion, sale and distribution of the products and services of NTIS.
2. To support these cooperating agencies with training at NTIS, supplies of NTIS promotional literature, and priority handling at NTIS of all incoming LDC orders.
3. Promote the use of U.S. Government technology worldwide through the use of a catalog of new research available from NTIS.

B. Outputs

The change in direction of the program in calendar year 1974 resulted from recognition that the output indicators projected under the original AID-NTIS agreement were not being achieved and that conditions expected at the end of the project might also not be achieved. The outputs of the program remain basically unchanged even though there has been a change in the inputs as noted above (A). The outputs for the period FY 1972 and first half of 1973 were:

1. NTIS reproduction and mailing reports requested and purchased by LDC institutions.
2. Provision of statistical data indicating the number and types of purchases.
3. Responses to questionnaires sent to recipients of NTIS reports in LDC's.
4. On-site visits to selected recipients.

For the period starting with calendar year 1974, the expected outputs were:

1. Demonstration of a more effective approach to the transfer of U.S. Government R&D results to LDC's.

2. Establishment of a pilot network for information transfer to and within LDC's.

3. Increased utilization of NTIS products and services by LDC user organizations.

The team's responsibility primarily encompassed evaluation of Phase II of the AID-NTIS program. These activities included:

1. Establishment of agency relationships in the LDC.

An agency relationship is defined as an agreement between NTIS and an organization in a developing country in which the organization undertakes, with the advice and support from NTIS, the establishment of a program to promote the sale and use of U.S. government reports to institutions in its country.

2. Development of an effective promotional tool to substitute for the one used during Phase I of the program.

3. Establishment of a mechanism for distribution of the announcement bulletin.

4. Establishment of a training program for personnel of agent organizations to develop a competence in promotion and sale of NTIS reports and in encouragement of their use by understanding the nature and utility of U.S. government reports and the NTIS system, and handling and processing orders for NTIS reports.

To accomplish its aim NTIS has:

1. Developed a new announcement bulletin which is distributed monthly to LDC agents for redistribution in their countries.

2. Provided mailing lists of current and potential users of NTIS reports to agents.

3. Established a training course at NTIS, Washington, D.C.

4. Made visits to agents to discuss problems.

5. Maintained liaison with agents.

To date AID expenditures for this project, including funding during FY 1975, have been \$470,000. There has been no direct monetary contribution by NTIS, but it estimates a contribution of approximately

\$30,000 in FY 1975 in support of the project. These costs were incurred through manpower contribution not funded by the project, mailing costs, subject analysis costs, and subsidization of agents discounts. This contribution covers all the LDC's involved in the project.

Although the agents in the countries visited (except Brazil where the agent is a private commercial firm) have made no direct monetary contribution to the program, NTIS estimates that a contribution of \$150,000 annually by all agents currently involved in the program.

CHAPTER III: OBJECTIVES - ISSUES

The immediate goal of this experimental project, as envisioned by AID, is to improve the capabilities of developing countries to make effective technological choices through expansion of their ability to access and utilize U.S. scientific and technological information. The program is designed to improve the coupling of science and technology to development and to establish mechanisms for transfer of technological and scientific information.

An evaluation of projects concerned with technology transfer for development must consider whether the establishment of an effective mechanism for transfer will, in fact, enhance the industrial development of a country and lead to the enhancement of the economic and social status of its citizens. It must also consider the very important question of whether technological information available from the U.S. will aid in goal achievement.

A. Issues

1. Does the utilization of scientific and technical information aid in industrial development?

Scientific and technological progress is dependent on information. The evidence to support this basic conclusion exists in reports of studies that have been made of introduction of innovations in America industry. These have shown that information is a necessary ingredient in the innovation process. In the interviews conducted in Brazil, Ecuador, and Colombia, examples were provided which showed clearly that U.S. technical information was helping in the development of ideas for new products and in one case actually led to the development of a new product which its developer is certain will lead to increased sales and expansion of the company.

The great difficulty in assessing the true impact and effectiveness in furthering industrial development in LDC's of technical information is the fact that true economic indicators to show the effect are lacking at least the evaluation team could not obtain such indicators in the countries visited for the purpose of this evaluation. This is not surprising since the same condition exists in developed countries.

It is important also to note three salient features of the reactions of individuals interviewed in Brazil, Ecuador, and Colombia concerning the importance of information for furthering development. The first was that the technical information received from U.S. government reports was primarily useful in stimulating ideas for new business ventures; second that in societies that are information poor, all and any kind of technical information is important; and third, that the

need is greatest for older U.S. technology rather than for current more sophisticated technology.

2. What kinds of technical information are most important in aiding technological and industrial development?

The evidence that information is an important element in development in the LDC's is irrefutable. As indicated above, no one interviewed disputed this fact. It was not difficult, however, to discern a pattern of information needs which indicated that in the industrial sphere, particularly in small and medium industry, U.S. government reports do not fully satisfy needs. The types of information required were: design specifications, product specifications, how-to-manuals, machinery catalogues, and other similar types. This type of information was considered to be of much greater importance than research reports.

For small and medium industry, theoretical or even applied research results do not provide the kinds of information that can immediately be applied to the technical problem at hand. Most often in these situations the plant manager or engineer needs a "quick fix" type of solution to the problem, such

as the actual design and specifications for a device or system. Other types of information required are the names of manufacturers of products or devices or problem-solving information that may not be in published form, but exists only in the minds of experienced technical personnel. Evidence of the important requirement for such types of information was presented by interviewees who asked where such information could be found either in published or unpublished form, or who indicated that when the need for such information arose they traveled to the US or other countries to obtain it.

3. Is the NTIS agent program achieving the objectives of the Technology Network Project?

The end of project status or, as interpreted by the evaluation team, the objectives of the project were to produce:

- a. Increased awareness in developing countries of the value to them of U.S. research and development activities.
- b. Increased and strengthened linkages between developing country institution and U.S. counterparts.
- c. Application of research results to industrial development.
- d. Greater overseas demand for U.S. technological products and services.

The answer to this issue lies perhaps in the observation that NTIS reports would be sold and used in developing countries even if the agent program did not exist. The agent program does have the effect of providing a better means for promotion of U.S. technology through NTIS services. Individuals and organizations in these countries are aware of the value of U.S. research and development activities to their own development and

are eager to exploit U.S. R&D results for their own benefit. The Agent program has succeeded in helping to increase the sale of U.S. government reports during calendar years 1974 and 1975 in LDCs which we visited as compared to sales figure in FY 1972 and the first half of 1973. Using this as a criterion, it must be concluded that the program has resulted in an increased awareness of the value of U.S. R&D. This conclusion must be tempered with the observation that NTIS reports represent only a small fraction of the totality of published information on U.S. R&D and there is no data which can be used to measure the total increase in awareness.

The question of strengthened linkages between developing country institutions and U.S. counterparts is almost impossible to measure with the output indicators available from the current project. The agency relationship and training of agent personnel at NTIS has had an effect on strengthening the relationship between the agent organization and NTIS. It can be inferred also that as users of NTIS reports become aware of the institutions in the U.S. at which the reported research was performed which can lead to increased ties with these institutions.

A phenomenon that impinges on this issue is that although an idea may be generated through the use of an NTIS report, subsequent follow-up of the idea may be made with an organization entirely different from the one which prepared the report. A specific case existed in Ecuador in which a cocoa processor obtained an NTIS report dealing with chip-board production and was influenced to consider the possibility of

starting a chipboard processing plant. However, he sent one of his engineers to Germany to follow up on the idea rather than to the U.S. The action taken was influenced by two factors: first, the fact that the company manager and the engineer had both received their educational training in Germany, and second, their contention that chipboard processing techniques were more advanced in Germany than in the U.S.

The evidence points to countervailing trends as far as the effect of the program on increased linkages between U.S. and developing country institutions are concerned. One must conclude that users of U.S. information will establish ties with the suppliers, both U.S. and non U.S., that will best meet their needs.

Application of research results is a major factor in industrial development. The examples to prove the case are numerous and well known in the industrialist world. The issue is whether U.S. R&D results transmitted to developing countries are being applied to such development. The evidence derived from this evaluation is inconclusive. One case in which such direct application resulted was found. The mechanism for applying research results exists in the countries visited. What is lacking is evidence of its occurrence.

Demand for U.S. technological products and services is widespread in the countries visited and this question does not seem to influence the basic issue. Whether the use of U.S. technological information will result in increased demand is problematic because it must be realized that proper use of U.S. technological information could increase the

capabilities of these countries to develop products and services competitive with those of the U.S. In fact, in Brazil, examples were given which showed how technological information received from the U.S. was used to develop capabilities which lessen dependence on U.S. products or services.

4. Is the project consistent with AID policy?

The AID objective of providing mechanisms for transfer of technology to aid the development of small and medium industry could be met by an effective program of technological information transfer. The level of sophistication of the kind of information being transferred is critical in meeting the objective. Results of technological and scientific research often have no direct bearing on the immediate technical information needs of small and medium industry. Such research results are more apt to have significance in furthering research capabilities of scientists and engineers in developing countries and in training and educational activities than in helping to solve immediate problems. In the long run, benefits will accrue from the utilization of this higher level information and it can be expected that there will be fallout to potential users on the lower levels of industry. The issue is yet to be fully tested, and it is yet too soon to tell if the project will be successful in meeting AID long-term goals.

However, the project is consistent with AID policy in that the AID/NTIS program does provide a mechanism for transfer of technology

to aid the development of small and medium industry. Most of the NPIS information is not applicable but some is highly relevant and immediately applicable to small and medium industry.

CHAPTER IV: PURPOSES - ISSUES

The purposes assigned to the Technological Information Network were:

1. To facilitate transfer of the most relevant U.S. scientific and technical information to the LDC's for development purposes; and
2. To establish linkages between NTIS and LDC scientific and technical information services and to begin to strengthen institutions in selected countries.

It is most difficult to evaluate the achievement of purposes such as established for this project for several reasons. It is difficult to establish the type of output indicators needed to measure success, and the indications cannot be expected to surface in short measurable periods of time. Substantive indicators of success cannot always be determined in advance and even those which do seem initially to be important, may in the long-run not be relevant. In the present project one of the suggested indicators is increased sales of NTIS reports, but does this actually show that transfer of the most relevant information has been achieved?

The design of the experiment leaves something to be desired because of the possible non-related objectives of NTIS and AID. NTIS is concerned with increased sales of U.S. Government research reports, AID with improved economic and social conditions in developing countries. Does increased sales of reports indicate that AID objectives are being

achieved? It would seem that the measure of effectiveness is not quantity, but quality in the sense that two reports which have direct influence in helping development of an industry have more relevance to the issues than sales of thousands which have no impact.

The project had been in operation since FY 1972, but except for records of sales of reports which have shown an increase, no other substantive information has been presented by AID or NTIS to indicate that an impact has been made. Neither organization has presented evidence in the form of case studies or other information to show that the project purposes are being met. Perhaps it is too soon to expect results, but at the very least, information should have been collected to provide some basis to begin to evaluate the project in these terms.

Will transfer of the most relevant U.S. scientific and technical information be facilitated by the NTIS project?

Without good quantitative or qualitative information one can only hypothesize concerning success. The NTIS project should facilitate information transfer to the LDC's. The NTIS information services provide only part of the information available from the U.S. A great deal of the technical information relevant to industrial development is available only from sources other than NTIS. The initial program activities, by admission of both NTIS and AID, were not successful in meeting objectives and purposes. The current developing country agent program appears to be more successful in obtaining wider dissemination

of NTIS reports. The transfer of the results of U.S. research is being facilitated, but, unfortunately, there is no basis on which to comment on the relevancy of the information.

Is the NTIS agency project relevant?

In respect to the basic aims of AID, the current project has relevancy but in a broader sense than that illustrative by the current PROP. The agent program has potential both to build institutions in the LDC's and in improving the potential for transfer of U.S. research information to those countries and its subsequent use. From AID's point of view, the program may be too narrow in scope. The discussion with agents in the LDC's and users in the countries visited indicated that:

NTIS reports, although useful, were not necessarily the best resources for their needs.

The program is restrictive in that it places the agent in the position of primarily being a sales organization for NTIS reports.

These circumstances raise the question of appropriateness and relevancy of the current project in the larger sense. In the narrow sense the agency program is successful. NTIS can only provide the services which it has available to provide.

Is the AID support essential?

The basic questions here is whether U.S. technical information would be transferred to the LDC's whether or not AID support were available, and whether the U.S. Government report literature would be

obtained in the LDC's. Also to be considered is whether AID support is necessary to help establish linkages between NTIS and LDC scientific and technical information services. NTIS is only one of many organizations in the U.S. that are potential sources of technical information.

NTIS information is available through existing NTIS channels, from local library and information centers, and from those organizations supporting FID/CLA/II.

Can Linkages between NTIS and LDC information service strengthen institutions in LDC's?

Technical information services in LDC's are in a developing stage. They require help to strengthen their capabilities. Many of these organizations have established relationships with each other in Latin America and with counterpart organizations, in other countries such as Canada, England and Denmark to name several. To a great extent, organizations in these countries are more closely related in their activities to the LDC technical information services than in NTIS. It must be remembered that NTIS is primarily a document collection, control and dissemination service. It does not provide complete information services of the kind performed by the organization in the LDC's and in Canada, England, and Denmark; however, the NTIS information service is of such a nature that linkages between NTIS and LDC's can strengthen institutions in LDC's.

Chapter V Analysis

A. NTIS

The NTIS and its activities in connection with the Technology Information Network since FY 1979 are described in an NTIS briefing book done expressly for the evaluation team in order to give them background of the project, an understanding of the project, and a feeling for the problems in implementing the project.

AID support to NTIS from FY 1972 through FY 1975 will have amounted to \$470,000. The original estimated budget for FY 1977 was \$120,000, the same level of funding as in FY 1975 but a new NTIS proposal requests an increase of \$187,610 over the original estimate. The additional funding was requested to provide additional site visits, agent training, and promotion support, none of which was anticipated as necessary when the experimental project was begun.

The program is currently administered by three individuals, one of whom devotes full-time to the project and the other two are only part-time. In addition, some supporting staff are also paid by the project.

NTIS inputs are described both in the report and in the Project Budget Analysis Matrices for each FY. Output indicators are as discussed in previous sections. Included in the report are data reflecting: (1) Dollar value of document sale in the forty project countries, by quarter, for FY '75; (2) Value of document sales in each of the forty countries for FY '74 and FY '75; (3) Percent change in value of document sales in each country FY '74-FY '75; (4) Quarterly value of sales in countries with agents in all forty countries; (5) Value of sales of each agent from the time that the first agent was established in April 1974 through June 1975; (6) Percent of sales in each agent country attributable to the agent April 1974 through June 1975; and (7) Number of documents sold through AMTID from Nov. 1972, when the first sales were recorded through August 1974.

NTIS also collects monthly data on the number of items sold and the titles of documents sold. A sampling of titles selling multiple copies during one month period is indicated in the report. Revenue figures are often used in preference to number of items because the latter serves to emphasize the relative value placed on NTIS information products in the LDCs. A close estimate of the number can be obtained by dividing a given value by \$4.45, the average price per item. The briefing document contains some data on sales of NTIS

reports for FY 1974, and FY 1975 but no data for previous years. Sales figures are given in dollars and not in number of documents sold. These data are not necessarily the best because NTIS report prices vary considerably and percentage increases in revenue are probably not a good indicator of impact or effectiveness of the program as percentage increases in the number of documents sold. Furthermore, since an agent agreement was not signed with an organization in Brazil until April 1975 it is only possible to analyze sales information for Ecuador and Colombia from the report. In both countries there was a significant increase in dollar value of sales after the agent agreement went into effect. According to NTIS figures, value of sales in Ecuador increased from \$81.00 in FY 1974 to \$1,272 in FY 1975 and from \$314 in FY 1974 to \$881 in FY 1975 in Colombia.

NTIS - Washington

The Team was briefed by the NTIS staff in Washington prior to departure. This consisted of a tour of the NTIS operations in Springfield, Virginia, and a question and answer period with Mr. David Shonyo, Information Specialist. Afterwards the Team met with William Knox, Director of NTIS, Terrance Lindemann, Chief, Promotion Division, Project Manager and Vietta Dowd, Special Assistant. The briefing document had been distributed in the Team, but several questions remained unanswered. The session provided a good opportunity to answer these questions. One area which was never adequately answered, either at NTIS, or in the field was that of sales figures per client, and NTIS contacts in countries to be visited. This information would have been very useful to the Team.

During the briefings the team also tried to determine the exact liaison relationships that had been established and the nature of the training program for agent representatives sent to Washington, D.C. In addition to sales figures attempted to determine whether data had been obtained by NTIS on the value of the reports in the three countries to be visited and whether any case studies existed indicating that the NTIS technical information had resulted in new products, increased employment or any other tangible results. NTIS could not supply us with any information of this kind.

The only other evaluative data that can be presented concerning the NTIS program is a comparison of the cost to AID of dollar sales of NTIS reports in FY 1974 and FY 1975 for the total program in forty LDC's. In FY 1974 dollar value of sales was \$20,989, the cost of the program to AID was \$150,000. This represents a cost to AID of approximately \$7 per dollar of sales. In FY 1975 the cost to AID was \$2 per dollar of sales. These figures must be looked at with great caution

however, because \$62,000 of sales or 82% of the total sales to the forty LDC's were to countries in which no agent program existed.

It is most unfortunate that the type of statistics kept by NTIS on the agent program activity and those which it obtains from agent countries do not permit a thorough quantitative analysis of the program. Also sketchy are data concerning the number of contacts between NTIS and the agents in the LDC's, the nature of the contacts, NTIS feedback on the promotional activities of the agents, number of contacts by the agents with potential customers, and for accumulation of data to enable NTIS to comply with the report features required by the AID PROP.

B. Brazil

The NTIS agent in Brazil is Barroslearn, a division of Paes de Barros, Sao Paulo, Brazil. Barroslearn is a consulting firm specializing in management consulting activities. Barroslearn is a newly organized division oriented to providing consulting in educational activities. The firm operates nationwide, but its major efforts are concentrated in the State of Sao Paulo. Barroslearn does not benefit from subsidies provided to cooperating agencies under the AID support project.

The activities of Barroslearn in connection with its agency relationship with NTIS consist of distribution of the NTIS generated AMTID Bulletins and direct contacts with research institutions, government entities and private industry by Mr. Glendall R. Harper who has prime responsibility for the agency activity. The original AMTID and the new AMTID bulletins have been the main tool used by Harper in promoting the sale of NTIS reports.

One hundred copies of the AMTID bulletin are received by Barroslearn and are distributed to current and potential customers. Barroslearn has a present list of 44 customers; 23 individuals, 2 federal government entities, 5 Sao Paulo government agencies, and 14 private firms. Of the 44 customers, 29 are in Sao Paulo City, 4 in the State of Sao Paulo and 11 in the rest of Brazil, mainly Rio de Janeiro. The total billings of the Agency from October 1974, through September 1975, have been \$3,989.00 nearly 1/3 of which occurred during the period October to December 1974.

NTIS statistics show total sales in Brazil of \$6,686.00 in FY 1974 and \$10,438 in FY 1975. Despite the difference in periods used in recording by Barroslearn and NTIS, the difference in sales figures is significant. The greater sales figures shown by NTIS result from

direct sales efforts by NTIS in Brazil which distributes its own announcement bulletin in the country.

It is difficult to determine whether the activities of Barroslearn are contributing to significant increase in sales in Brazil or not, and whether the \$ \$ \$ increase in sales between FY 1974 and FY-1975 reported by NTIS would have occurred without establishing any relationship in Brazil. It was not possible to obtain information from Barroslearn concerning the cost to them of their current activities. However, we did obtain views concerning problems in connection with the promotion and sales of NTIS reports and views on the potential market.

The major problem faced by the agent in Brazil relates to currency restrictions now in effect. Barroslearn and its clients have great difficulty in obtaining government approval for transfer of dollars for payment for reports and maintaining a deposit account with NTIS for purchases. The deposit account is a condition of the NTIS/agency agreement. The currency problem is a deterrent to increased sales and has resulted in a virtual cessation of orders to the agency and by the agency to NTIS. However, a possible solution to the problem is being investigated by Barroslearn, which would take the form of a request by Barroslearn to the Federal Government for currency exchange to purchase a large volume of imports.

Other problems faced by the agent include, delays in delivery of reports caused by the Brazilian government customs and censorship regulations which, added to the time it takes to order a report and have it shipped by NTIS, often results in a 3 to 6 month delay in a customer's receipt of his order. The customs and censorship delays are difficult, if not impossible, of solution, but the estimated delay in receiving shipments from NTIS of from one to two months should not be too difficult to solve.

Promotional activities by Barroslearn have left much to be desired. Mr. Harper, who is in charge of this activity had been hospitalized for several months shortly after the agreement went into effect and no substitute was available. In addition, no one, including Harper from Barroslearn has yet taken the NTIS training course because Barroslearn is not operating under an AID subsidy. However, NTIS has invited Barroslearn to send a participant at its own expense.

According to Harper, there is a conflict in promotional activities by NTIS. He felt AMTID was not a good selling tool because it was too complicated. Customers are confused because they receive both the new AMTID and regular direct NTIS promotional makings through the NTIS

Customer Memo. This result in double coverage of many clients and two sales prices. Barroslearn feels that the NTIS reports are undervalued and underpriced in comparison with other sources. General feeling is that the Brazilian market can bear a much higher pricing structure.

Customer satisfaction with NTIS reports is high and this illustrates the phenomenon that any information is important in an information poor society. Dr. Jose L. Junguerra, Instituto Pesquisas Tecnologicas - October, 1975. "In a country dreadfully deficient in technical and current information all information is important." Meetings with users elicited similar comments; no one felt that the information contained in the NTIS reports was not of value. This observation must be qualified, however, with the note that all except one user were researchers and engineers connected with research organizations. Harper was unable to schedule visits with individuals in industry except in two cases. One firm was a very large construction company and the other a small company that is developing filtering equipment for use as anti-pollution devices.

NTIS reports are a value as an information transfer device of U.S. technology, but we were unable to determine whether they have resulted in any significant economic impact as could be evidenced by increased earnings, new jobs, more sales, etc. The engineer in the filter company did indicate that an NTIS report had helped it in developing a new filtering system which had potential to increase sales for the company, but no specific sales increase had occurred as yet.

C. Ecuador

The NTIS agent in Ecuador is CENDES an autonomous government agent originally established with AID support whose mission is to assist in the industrial development of Ecuador. CENDES was established in 1962. The Technical Information Division of CENDES headed by Dr. Victor Martinez, is the NTIS agent in Ecuador. The division has a budget of \$110,000 per year and its responsibilities include maintaining a technical information center to provide literature searching and reference services, document reproduction and direct technical information services to Ecuadorian industry.

In addition to its agency agreement with NTIS, the center also maintains relationships with technical information centers in various countries of the world. CENDES is required to and does exploit all types of information services and resources local, foreign, government and private necessary for accomplishing its mission of providing technical information to Ecuadorian industry.

Dr. Martinez and his staff carryout an aggressive promotional campaign to make the nation's industry aware of CENDES' services and to help them in the use of technical information. They have been as aggressive in promoting NTIS reports as they have all other services they provide. The center produces and mails a monthly current awareness bulletin announcing relevant technical literature, including reports selected from the NTIS bulletins. At present 900 copies of the bulletin, Notas Tecnicas, are mailed monthly. In addition, Dr. Martinez's technical staff makes door-to-door visits to industrial organizations in Ecuador to explain the work of the Technical Information Division and to bring to the attention of these organizations relevant NTIS and other reports. Currently CENDES receives 400 copies of the new AMTID for distribution and has developed a mailing list of users and potential users. Practically all NTIS documents in Ecuador are sold through CENDES and sales have increased from \$81.00 in FY 1974 to \$1277,000 in FY 1975. Of the three agents visited, CENDES is undoubtedly the best organized, and aggressive and currently most successful.

Dr. Martinez has visited NTIS in Washington and his assistant Mr. Johnny J. Carchi has attended the NTIS training course. They are well versed in NTIS operations and the ordering procedures. Mr. Carchi's reaction to the course was favorable but he felt that less emphasis could be put on the theoretical aspects of the training and that it should be extended to provide more opportunity to learn about other information centers and resources in the U.S.

Dr. Martinez and Mr. Carchi arranged for visits to industrial purchasers of NTIS reports in Guayaquil and Quito and only in Ecuador did the team have the real opportunity to visit and interview a significant cross-section of industrial users of NTIS reports. These visits demonstrated that NTIS reports were particularly useful to Ecuadorian industry in helping to identify technical problem areas, stimulating new ideas and concepts, suggesting routes for solution of problems, and suggestions for new industrial activities.

No evidence was available to indicate direct impact on the economy in the nature of increased earnings, more jobs, useful products, etc. We believe, however, that it is much too soon in the operations of the program to expect to see such results. The utilization of technical information and resultant benefits are a long term affair. Such results should be looked for perhaps five to ten years after the program has started.

The major issues concerning the NTIS report literature and the AID/NTIS/Agency arrangement raised by people at CENDES related to

relevancy of NTIS documents and to other approaches by AID to help in technical information transfer. Dr. Martinez commented that the NTIS reports, as all technical literature, must be examined and called to obtain those documents most relevant to the industrial needs of the country. All the selected NTIS reports are not relevant and the new AMTID because it is a title announcement service has only marginal utility to CENDES since there is no way of telling how useful a report will be without ordering it. Only about 20% of the reports, he estimated, were relevant. Martinez also comments on the fact that Ecuador needs older U.S. technology and a tool to obtain older NTIS literature. This would be more useful than AMTID which announces current research results.

Dr. Martinez made an especially eloquent plea for additional programs by AID to help in a technological information transfer program. He suggested AID provide support for (1) Obtaining surplus older books, journals and documents from the U.S. through the U.S. Book Exchange and, (2) Establishment of core technical libraries in different specialties in various Latin American countries, each country developing a library most closely related to its particular technical competence with a network arrangement for interchange of the documents in the core libraries.

Finally, Dr. Martinez noted that any future AID support contain a provision for monetary contributions from the LDC's. He made this point very emphatically, justifying it by saying, information is a commodity and its value will not be appreciated in the LDC's until users and countries begin to pay for it.

D. Colombia

The NTIS agent in Colombia is COLCIENCIAS, a government organization which acts as the Natural Research Council of the country. It is primarily a policy making and planning organization which does not consider programs operations as a major part of its function. Within COLCIENCIAS the NTIS/agency relationship is managed by Mrs. Balbina de Montanes, Librarian and NTIS coordinator. In addition, COLC. has a Director for the National Information System and a Chief for the Documentation System. The exact organizational relationships among the three entities was never quite clarified.

COLCIENCIAS overall approach to the technical information problem is to establish a National Technical Information System with discipline-oriented subsystems, one of which would be the subsystem for the industrial sector. It was indicated that the Technical Research Institute of Colombia, a private non-profit organization would become the industrial information subsystem.

COLCIENCIAS is currently involved in planning, and the development of a promotion and delivery system for NTIS reports is bogged down while the planning goes on. No clear-cut plan for an announcement or delivery systems has been developed and current activities are primarily tied to sending out announcements of NTIS reports to research institutes and government agencies. Although Mrs. Montanes has attended the NTIS training course, it appears that she primarily learned how to process orders but received no training or did not absorb any of the training dealing with promotion or the sale of reports.

There seems to be a general lack of leadership in connection with the NTIS/agency relationship and no evidence of any concerted effort to promote, either by advertising or other means, NTIS reports has been undertaken. Current purchases of reports are primarily research institutes, libraries or COLCIENCIAS staff. Only three industrial users were identified, who we were unable to visit because arrangements could not be made for visits.

Mrs. Montanes did not attend the NTIS training course until February 1975 and the agency operation did not actually begin until April 1975. From April 1975 to the present, 105 NTIS reports were ordered, more than half for COLCIENCIAS proper. The remainder have been ordered principally by university libraries and research institutes and only three from industrial organizations. The vast majority of the reports have been of the research type rather than ones which would be used to provide technical information in an industrial setting.

Problems in Colombia in connection with the NTIS/Agency arrangement are both real and imagined. A very real problem is the cost of the NTIS reports. They are considered expensive and actual cases of refusal to buy because of price were pointed out. In fact, the general consensus is that the reports should be provided free or at most, prices should be minimal. The problem of price is exacerbated by the fact that COLCIENCIAS has other sources of information including NTIS information which do not charge for their services. In the Colombian reality information is not viewed as a commodity.

An imagined problem raised by Mrs. Montanes was the long delay in receiving reports from NTIS. At one time, there were delays of as much as six months but a careful examination of the records showed that delivery time between order and receipt of a report is now between fifteen and thirty days.

The real problem in Colombia is to be found in the fact that COLCIENCIAS is simply not geared to act as an agent for NTIS and the

subsystem idea may very well cause more problems that it solves. The individual entities in the subsystem may have objectives in conflict with those of COLCIENCIAS and consequently overall objectives, Colombian, AID, NTIS may have to take a back seat to the objectives of the organization running the subsystem. Additionally, COLCIENCIAS works at a level too far removed from the industrial user to really appreciate the needs of the user and methods that must be instituted to support these needs.

The NTIS information is valuable to the user in Colombia. To date, most of the reports have been used in planning activities rather than in direct industrial application. However, it must be realized that research reports are important to developing countries and eventually the results could trickle down to the industrial section. Planning for new industrial activities is also important and NTIS reports do contribute to development of plans and policies.

Although the current performance in Colombia is poor, it is the opinion of the Team that without AID support Colombia's capabilities to develop a complete system for technical information transfer would suffer greatly. The COLCIENCIAS staff believes that more AID support is necessary to reduce costs of the reports in order to increase sales.

While COLCIENCIAS has been functioning as an NTIS agent for only seven months, its performance, given the level of development of Colombia, and the potential market, has been poor. It is not an implementing agent. It is doubtful that the subsystems being established will be effective implementing agencies. In other words, to provide the type of service that Colombia needs means extensive AID work with COLCIENCIAS developing implementing activities within appropriate Colombian groups, such as ANDE and FICITEC.

CHAPTER VI: CONCLUSIONS

In this section, conclusions concerning the AID/NTIS programs and general conclusions concerning the use of technical information as a mechanism for technology transfer are presented. These conclusions are based on the considered findings of the evaluation team and are derived from the previous sections of this report in which we have discussed the activities of agents, our interviews with them and with NTIS.

I. AID/NTIS Program

- A. Both AID and NTIS management and control of the current project is less than adequate.
 1. NTIS information concerning management of the project could be improved.
 - a. Sales statistics do not clearly identify results obtained under the agent program.
 - b. No case studies collected to show impact of program.
 - c. No information collected on agent activities (i.e. promotional efforts - number of personal visits to potential clients, etc.)
 2. NTIS has not devoted adequate staff time for field visits to agents, to help in solving on-site and other problems.
 3. No evidence that NTIS adequately briefed agents on AID purposes and goals in connection with AID support of the program.
 4. AID's demand for reporting from the contractor were not sufficiently adequate in terms of frequency, depth, and scope of feedback, to permit continual evaluation of contractor performance.
- B. NTIS had not worked closely enough with agents to determine mechanisms for achieving AID/NTIS objectives under this program.
 1. The announcement system devised by NTIS is not optional for the information dissemination problem of the countries surveyed.

- a. Instructions in announcement media not in language of user.
 - b. Instructions for ordering reports too complicated.
 - c. Existence of two identical bulletins with two separate titles.
 - d. NTIS reports are announced by title. This information is not sufficient for potential users to determine the importance of the contents of the report.
2. NTIS has not provided sufficient training of agents in promotion of the U.S. Government report literature.
 3. The NTIS (AMTID, Jr.) bulletin is the only sales tool used to announce selected reports - other media should also be used.
- C. NTIS is responsive to most problems encountered by agents.
1. NTIS has recognized effect of currency problem in Brazil and has extended some credit to Paes de Barros.
 2. NTIS helps agents solve ordering and processing problems when called upon to do so.

II. General

- A. U.S. Technological and scientific information is a valuable mechanism in technology transfer.
 1. Such information provides tools for:
 - a. obtaining new ideas to products and services;
 - b. helping industrial organizations to develop new products and system;
 - c. encouraging technological and scientific research;
 - d. improving management methods and techniques.
 2. Such information introduces an awareness of the value of U.S. R&D to the LDC's.
 3. Such information may contribute to linkages with U.S. institutions.

4. Such information can contribute to improved educational programs in science and technology.
- B. AID should continue to develop and support programs to facilitate transfer of technical information the LDC's.
- C. NTIS is not necessarily the most effective organization for providing the mechanism for transferring U.S. technological and scientific information to the LDC's.
1. There is a vast amount of literature produced in universities, research institutes and private organizations which cannot be accessed through NTIS.
 2. There are organizations which are more experienced than NTIS in providing full range of information services as:
 - a. literature searching
 - b. analytical reports
 - c. document services
 - d. on-demand research to answer specific questions.
- D. In the future, AID should develop better measures of effectiveness for evaluating the success of its programs in information transfer.
1. Volume of sales of documents does not necessarily indicate their importance or impact.
 2. Impact of such a program is long-term and evaluation should come only after there has been sufficient time for the program to operate.
 3. Case study information probably provides more significant data on program effectiveness.
- E. The current project with NTIS should be continued through FY 1977, but at the same level of financing as in FY 1976.
1. The agent program is really just beginning to operate effectively.
 2. No interruption in an AID information transfer program

should occur while new and more comprehensive approaches are being developed.

3. Although NTIS reports do not satisfy the full range of technical information needs in the LDC's, they are valuable.
- F. AID should develop an approach to provide comprehensive technical information transfer services to LDC's, both AID and AID graduate countries.

CHAPTER VII: RECOMMENDATIONS

Introduction:

As with their conclusions, the recommendations are divided into two sections; the first deals with recommendations concerning AID/NTIS Program and the second, with general observations concerning technical information as a technology transfer mechanism.

I. AID/NTIS Program

A. Management and control of the present project could be improved by:

1. NTIS instituting a system of reports providing
 - a. Statistical information on its promotional and liaison activities with agents, such as number of promotional pieces mailed, number and type of contracts with agents;
 - b. Time series statistics to indicate accomplishments of each agent in sales of reports, promotion activities, number of visits to potential customers pieces of advertising mailed, etc. - reports should be quarterly.
2. NTIS collecting case study information from agents which shows impact of the program.
3. More frequent visits to agents by NTIS staff to evaluate local situation and to help in solving problems.
4. Better orientation of agents in purposes of the project and AID objectives for the program.

B. NTIS should restructure its activities to:

1. Develop in conjunction with agents, a better announcement system of its own and help the agents develop their own capabilities in this area.
 - a. Encourage agents to prepare promotion material in local language.

- b. Simplify instructions for ordering reports
 - c. Prepare only one bulletin for distribution in countries with agent relationships, dissemination to be carried out exclusively by the agent.
 - d. Enrich titles of reports being announced, add abstracts to AMPID, Jr.
2. Improve training of the agents in promotion of U.S. government report literature.
 3. Develop in conjunction with agents additional sales, strategics such as audio-visual aids, encouragement of direct sales efforts.

II. General

- A. AID should undertake an internal study to determine a program plan that could be developed, which would provide a mechanism for facilitating the transfer of technical information to the LDC's - the elements of this study should be:
 1. What kinds of information do the LDC's need for development.
 2. What organizations in the U.S.A. provide information to satisfy these needs.
 3. Determine the best comprehensive mechanism for transit of technical information.
 4. Determine how long a support program must last.
 5. Determine the proper management and control system for continuous evaluation of the program.
- B. At the same time that internal study is being undertaken AID, a program should be undertaken to provide funding to agents for the following:
 1. To purchase microfiche reader-printers so that the agent can reproduce copies of NTIS reports when more than one copy is needed for local sales.

2. To develop an arrangement to reimburse NTIS for local copying.
 3. To help improve reference libraries at those agencies which provide comprehensive information services in the LDC's.
 4. To provide additional training to agents in information retrieval and dissemination sources and methods.
- C. Continue the current project with NTIS through FY 1977 at the same level of financing as in FY 1976 with the following changes.
1. Provide a flexible system of discounts, offering substantial discounts in countries such as Colombia and others where the price of reports is a problem, and eliminate them to countries, such as Brazil and Ecuador, where price is no problem.
 2. Transfer funds to provide for more on-site visits.
 3. Introduce changes in promotional activities and material as indicated in previous recommendations.
 4. During on-site visits up-date and expand training of agents.

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project:
From FY _____ to FY 19____
Total U.S. Funding \$ 660,000
Date Prepared: June 23/77

Project Title & Number: S&T Information Transfer

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS								
<p>Program or Sector Goal: The broader objective to which this project contributes: To increase LDC capabilities for effective selection, transfer and adaptation of technology by improving access to US scientific and technological information and patents.</p>	<p>Measures of Goal Achievement:</p> <ol style="list-style-type: none"> 1. Wider application of U.S. R&D results to problem solving in cooperating countries. 2. New and improved channels for exchange between technical institutions and professionals and U.S. counterparts. 3. Greater LDC demand for U.S. technological products and services. 	<ol style="list-style-type: none"> 1. LDC government statements on the extent to which progress is being achieved in the selection and transfer of technology attributable to "freest and fullest possible access" to technologies not in private hands. 2. Reports of cooperating agencies. 3. Reports of national and industrial research institutes. 4. Professional papers. 	<p>Assumptions for achieving goal targets:</p> <ol style="list-style-type: none"> 1. Technological information is necessary part of technology transfer. 2. Significant and increasing share of R&D generates information of value to national problem solving in developing countries. 3. Countries will acquire and utilize technological information nationally if a system exists to facilitate its transfer and use. 								
<p>Project Purpose: To expand the S&T information transfer network in Asia, Africa and the Near East from 5 to 14 countries and to strengthen local service of cooperating agencies.</p>	<p>Conditions that will indicate purpose has been achieved: End of project status.</p> <ol style="list-style-type: none"> 1. An operating network of 14 LDC agencies cooperating through bilateral agreements with NTIS to increase access to US science and technology. 2. A three fold increase in flow of S&T information products and services to cooperating countries over 3 years. 	<ol style="list-style-type: none"> 1. Reports and related material from cooperating agencies. 2. Bilateral agreements between NTIS and LDC agencies. 3. Sales of S&T information products and services to cooperating countries. 4. Growth in demand and effective utilization of S&T information and patents. 	<p>Assumptions for achieving purpose:</p> <ol style="list-style-type: none"> 1. No important impediment will arise in broadening the NTIS information transfer network through bilateral agreements with cooperating agencies in additional countries. 2. LDC demand for S&T information products and services will continue to increase. 3. NTIS data base represents largest and most accessible collection of U.S. S&T information. 								
<p>Outputs:</p> <ol style="list-style-type: none"> 1. Nine new cooperating agency agreements activated in 9 LDCs. 2. Nine cooperating agencies oriented and providing local service to improve access to U.S. S&T information. 3. Five cooperating agencies provided additional training and support for promotion and operations. 	<p>Magnitude of Outputs:</p> <ol style="list-style-type: none"> 1. Four bilateral agreements signed in FY 1977, 5 in FY 1978. 2. Ten in-country training seminars conducted over life-of-project. 3. Nine training courses conducted at NTIS over life-of-project. 	<p>NTIS bimonthly reports to AID and a special progress report at the time of each annual project evaluation.</p>	<p>Assumptions for achieving outputs:</p> <ol style="list-style-type: none"> 1. LDCs will continue to seek cooperative agreements with NTIS. 2. LDCs will fully support local costs of in-country seminars and continue to seek participation in training courses at NTIS. 								
<p>Inputs:</p> <ol style="list-style-type: none"> 1. Preparation and transfer of information products and services using NTIS data base. 2. Training in-country and at NTIS. 3. Marketing and promotion services through NTIS. 4. U.S. technical advisory services and selected case studies for evaluation. 5. Information handling equipment. 	<p>Implementation Target (Type and Quantity)</p> <table border="0"> <tr> <td>FY 1977</td> <td>120,000</td> </tr> <tr> <td>FY 1978</td> <td>200,000</td> </tr> <tr> <td>FY 1979</td> <td><u>200,000</u></td> </tr> <tr> <td>Total</td> <td>\$520,000</td> </tr> </table>	FY 1977	120,000	FY 1978	200,000	FY 1979	<u>200,000</u>	Total	\$520,000	<ol style="list-style-type: none"> 1. Signed PASAs 2. Periodic reports from NTIS as noted. 	<p>Assumptions for providing inputs: None</p>
FY 1977	120,000										
FY 1978	200,000										
FY 1979	<u>200,000</u>										
Total	\$520,000										

THE NTIS INFORMATION COLLECTION

NTIS historically has been identified as mainly a source of information from the U.S. Government and even more narrowly, from the Department of Defense. However, in the past five years, NTIS has dramatically moved away from this identification and is valued by its users for:

- 1) its comprehensive collection of information generated by some 400 U.S. Government operating units and their contractors. This coverage includes the Environmental Protection Agency; Energy Research and Development Administration as well as the Federal Energy Agency; the National Science Foundation; Commerce' Business and Economic Administration; NASA; and the National Institute of Health.
- 2) The increasing comprehensiveness of the collection as it has begun to actively seek information from private sector sources.

One of the largest private sector collections available from NTIS is from Engineering Index, Inc. The EI computerized data base contains more than 850,000 items making it one of the world's largest bodies of practical engineering information.

NTIS also maintains cooperative contacts with many private industry sources such as Dvorkowitz and Associates, Inc., and Control Data Cooperation's Technonet--two organizations specializing in patent data.

It is NTIS' Congressional mandate to seek out technical information of national interest from whatever source. And so NTIS continually adds new Government and private, national

and international organizations to its list of source clients. This list is a sample of non-USG organizations that register information with NTIS on a regular basis.

BUSINESS

Control Data Corporation
Mitsubishi Research Institute
Ford Motor Company

NON-PROFIT ORGANIZATIONS

American Institute of Physics
American Public Transit Association
Asphalt Institute
Electric Power Research Institute
Federation of American Societies
for Experimental Biology
Foreign Broadcast Information Service
International City Management Association
International Council for Building Research
& Documentation
Motor Vehicles Manufacturers Association
Northern Great Plains Resources Program
Non-Destructive Testing Information Center
Transit Development Corporation
Urban Institute
Water Resources Council

UNIVERSITIES

Dartmouth College; Systems Dynamics Group
Harvard University, Program on Information
Technologies and Public Policy
Iahigh University, Fritz Engineering Laboratory
Michigan State University, Institute of Water Research
Penn State University, Transportation Institute
University of California, Lawrence Berkeley Laboratory
BART Program
University of Colorado, Department of Computer Science
University of Kentucky, Institute for Mining and Minerals
Research
University of Michigan, Highway Safety Research Institute
Virginia Polytechnic Institute and State University,
College of Engineering

STATE AND LOCAL GOVERNMENTS

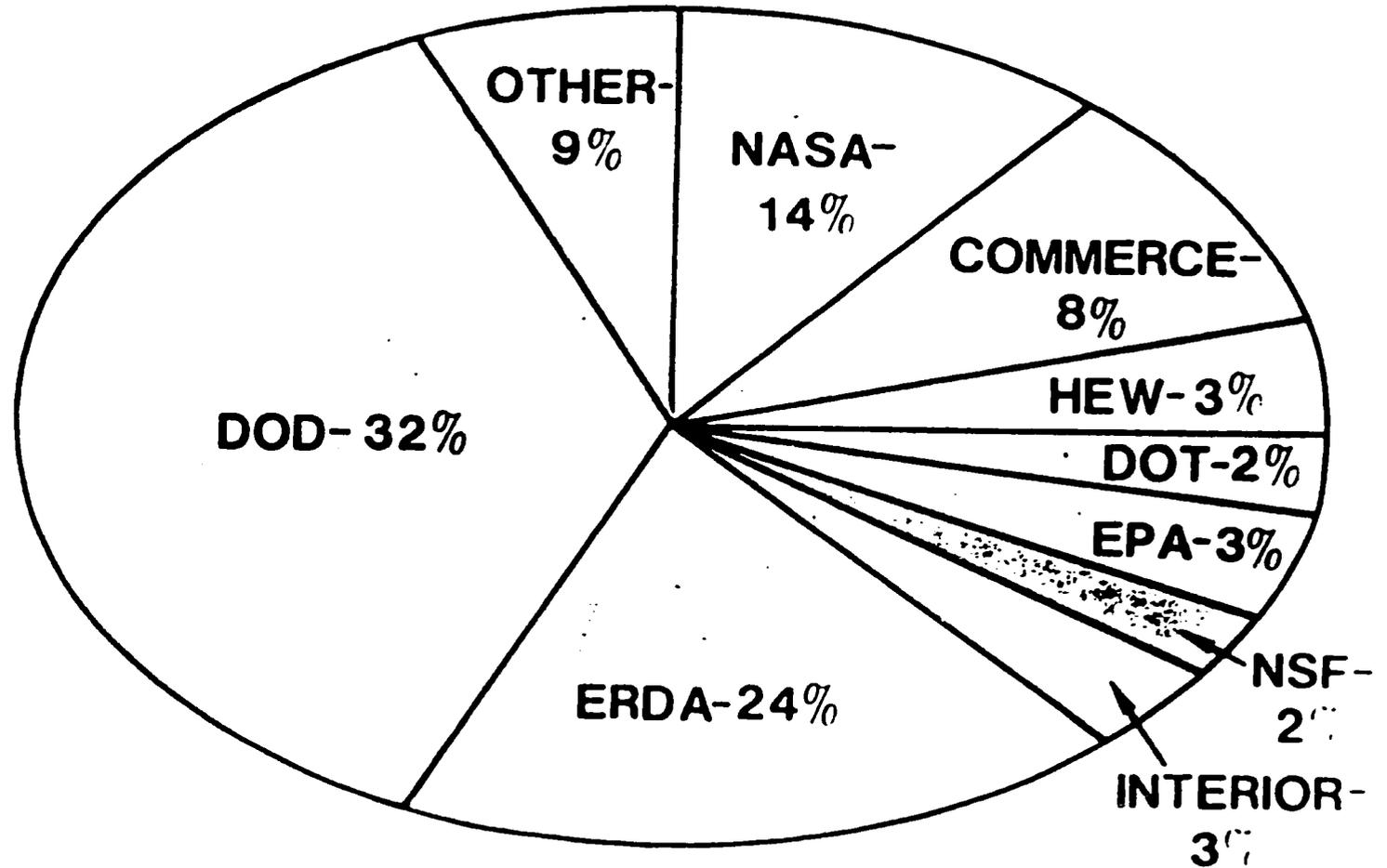
Air Resources Board (State of California)
Appalachian Regional Commission
Center for Independent Living (New York Infirmary)
City of Los Angeles, Department of City Planning

Illinois Institute for Environmental Quality
Massachusetts General Hospital
Metropolitan Washington Council of Governments
Minnesota Energy Agency
Washington Metropolitan Area Transit Authority

NON-US SOURCES

British Standards Institute
Engineering Sciences Data Unit (Great Britain)
Forestry Products Laboratories, Canada
Swedish Building Research Institute

CONTRIBUTORS TO NTIS COLLECTION



ANNEX F

NTIS INFORMATION SYSTEM TRAINING AND ORIENTATION

First Week:

9:30 a.m. April 26, 1977, 425 - 13th Street, N.W., Washington, D.C.

- a. Introductory Remarks and Welcome - Director, NTIS, Mr. Knox.
- b. Special briefing by NTIS/AID Program Liaison Officer, Mr. David Shonyo.
- c. General Overview Briefing of NTIS Operations, Products and Services, Joyce Kronstedt.
- d. AID Program Presentation. Mr. Eilers.
- e. Visitors present briefing on current and planned situations in their countries and discuss any recognized or particular problem areas.

April 27, 1977, Springfield, Va. - Processing of Incoming Documents

- a. Presentations by NTIS Product Managers.
- b. Discuss standard report format, standard bibliographic data sheet. Demonstrate usefulness of report format and other standards and extrapolate usefulness of such standards in the information systems in attendee's country.
- c. Discuss unique report numbers and accession numbers to include differences of and need for each and how and why such numbers are assigned and used. Demonstrate ease of cross-reference and other uses.
- d. Discuss various details of review of incoming documents, e.g., page numbers, missing pages, reproducibility, half-tones, page-size, foldouts, graphics and charts, computer printout and camera reduction parameters.

- e. Discuss descriptive cataloging standards and applications using documents currently being processed. Demonstrate entry of standard cataloging information on NTIS document processing worksheets and document traveller form. Use AD-641 092, Standard for Descriptive Cataloging and OB-198 275, Corporate Author Headings as study and reference materials. Discuss philosophy and logic of cataloging standards.
- f. Discussion on basic philosophies of subject analysis and various indexing systems. Demonstrate using documents currently being processed, the various thesauri and subject category lists. Illustrate subject indexing, key word indexing and SRIM.

April 28, 1977, Springfield, Va.

- a. Demonstrate NTISearch (Published and Custom) and illustrate interface of subject indexing with NTISearch retrieval procedures and strategies.
- b. Assign search problems to attendees and monitor progress.

April 29, 1976, Springfield, Va.

- a. Discussion on manual information retrieval using GRA&I.
- b. Assign search problems to attendees and monitor progress.

Second Week:

May 2, 1977, Springfield, Va.

- a. Principles of Marketing.
- b. Discuss direct mail marketing, advertising, procedures and strategy, copy hints, reasons.
- c. Newsletters - how to design and publish.

May 3, 1977, 425 - 13th Street, N.W. Washington, D.C.

- a. Discuss market potential and possible marketing methods or strategies available in visitors' countries.
- b. Discuss how to design, develop, and implement a marketing and promotion plan.
- c. Discuss how to test and evaluate various marketing programs.
- d. Other advertising media - exhibits, slides, space ads, seminars, radio, TV, news stories.
- e. Assign homework to each for May 6 presentation.

May 4, 1977, Springfield, Va.

- a. Order Processing and Accounting Procedures.
 - (1) An overview presentation of the NTIS Order Processing System.
 - (2) Walk through demonstration of order control and pre-processing functions. Discuss customer caused problem areas and demonstrate good ordering procedures.
 - (3) Discuss and demonstrate identification and cross-reference functions.
 - (4) Tour warehouse and discuss and demonstrate procedures and operations in storing and retrieving documents in paper and microfiche.
 - (5) Special discussion on agent order forms, problems, etc.
 - (6) Discuss and demonstrate NTIS deposit account procedures both as a simplified manual system and an EDP system.

May 5, 1977, Springfield, Va.

- a. Principles of Marketing
- b. Presentation by President of the Information Industry Association.
- c. Special individual attention in any functional or particular problem area.

May 6, 1977, 425 - 13th St., Washington, D.C.

- a. Review of marketing and promotion.
- b. Presentation of attendees' marketing plans followed by critique and discussion.
- c. Review of previous technical information sessions and discussions.

May 9-10, 1977

Visits and tours to various information centers and sources in the Washington, D.C. area.

ANNEX F - NOTE:

THIS ANNEX - APPLICATION OF MODERN TECHNOLOGY IN
DEVELOPMENT (AMTID) IS ATTACHED AT THE END OF THE
ANNEX SECTION AS AN ADDITIONAL ANNEX.

ANNEX G

GUIDELINES FOR SELECTING NTIS

SALES AGENTS IN LESSER DEVELOPED COUNTRIES

1. Is there a market for U.S. technical information? Determined by: current sales resulting with a minimal promotion; the number and type of potential users --- libraries, documentation centers, government agencies, business, industry including multinational, professional technicians, consulting firms, universities.
2. Have local currency exchange and import regulations combined with shipping delays made it difficult and unattractive to order from U.S. sources?
3. Has NTIS not sufficiently covered the market before either by intent or by lack of prospect names?
4. Is the national economy capable of producing future increases in the demand for technical information?
5. Has an organization expressed interest in representing NTIS?
6. Is there a major buyer with an organization which could represent NTIS?
7. Does the National government have an agency which serves as a focus for information policy, for scientific R&D, or for technology transfer:

If so, has it sufficient staff and budget to be an aggressive national force? What is its current pace of activity? What services and functions does it perform? What user community does it serve? Does it have capabilities of reaching provincial customers as well as those in the capital or business center?

What is the character, ability, and potential of the personnel at the working level? What is their educational background? Does the director or his assistant speak and read English?

What is the status and quality of its information collection? What is its acquisition policy?

How has the organization grown and why?

What technological resources exist (computer hardware, microfiche equipment, telex)?

What is its relationship with other U.S. Government agencies (in-country, in U.S.), U.S. businesses, universities, international and regional organizations?

What interest have they shown and do they express in NTIS?

How bureaucratic is the organization?

Does the candidate understand the NTIS cost recovery philosophy and does he accept it?

BENEFITS FOR NTIS COOPERATING AGENCIES
OF THE
AID SUPPORTED INFORMATION NETWORK

Information Operations

Improved access to U.S. technical information and licensing opportunities.

Central point of contact in the U.S. for technical information referrals and backstopping.

On-site visits by NTIS staff for operating and marketing consultation.

Opportunity to exchange experiences with NTIS and other cooperating agencies through regional networking, meetings, seminars, workshops and a quarterly newsletter.

Tuition-free attendance at NTIS' 3-week Information Systems Workshop with possible travel, per diem subsidy.

International recognition for national R&D by adding reports to the NTIS bibliographic data file.

Priority handling of requests on receipt at NTIS.

Information Resources

Addition of NTIS bibliographic data file to national problem-solving ability.

Sets of back-issue Government Reports Annual Index as a reference tool to performing literature searches.

Published (or custom) NTISearch bibliographies selected by agent to serve as specific guides to portions of the total NTIS bibliographic data file. And as product samples.

100 reports - on microfiche - selected by agent to provide nucleus collection of NTIS reports. And as samples of microfiche.

Kodak Extalite microfiche readers to use in agencies reference room to demonstrate microfiche.

Marketing and Promotion Support

Computer print-out of names and addresses of NTIS' local customers.

NTIS promotional support through U.S. - based solicitations.

Bulk quantities of NTIS generated promotional literature for

distribution to agent's customer list, particularly AMTID.

International publicity through AMTID.

Financial Incentives

Availability of products at U.S. prices instead of 100% higher foreign price.

25% commission on all transactions.

Initial AIRMAIL shipment of orders at no extra cost.

A marketing grant of \$1,000 credited to the agencies deposit account when certain specific agreement stipulations are fulfilled.

LETTER OF AGREEMENT

Between

National Technical Information Service
U. S. Department of Commerce
5285 Port Royal Road
Springfield, Virginia 22161
U. S. A.

and

Your Organization

for the
Transfer of U. S. Technical Information
through the
Promotion, Demonstration and Sale of
NTIS Products and Services

By Authority Granted Under
the Terms of NTIS Enabling Legislation,
15 U. S. Code 1151-1157 and 1525-1527.

Letter of Agreement Number XXXXXXXXXXX

This document constitutes an agreement between your organization (hereinafter referred to as you), and the National Technical Information Service (hereinafter referred to as NTIS) for the transfer of U. S. technical information to you through the promotion, demonstration, and sale of NTIS products and services.

1. NTIS Responsibilities

- a. NTIS will furnish you with a list and price schedule of products and services to be offered for sale under this agreement.
- b. NTIS will provide sets of the GRA Annual Indexes to you to serve as a reference base for reports in the NTIS inventory. In addition, five combination SSIE/NTISearches will be offered you on a free basis to familiarize users with the service.
- c. NTIS will provide marketing assistance to you. The assistance will take three forms:
 - (1) Orientation concerning the products and services to be offered will be provided. This will include training in the various marketing techniques employed in the United States information industry. This training and orientation will take place in the United States. Travel and subsistence expenses associated with this training program will be the responsibility of you. NTIS may, in special situations, subsidize attendance of an representative.
 - (2) NTIS will provide follow-up training and review of your marketing programs in (country) as needed.
 - (3) NTIS will offer assistance and guidance with respect to seminars, exhibits, congresses, and similar events designed to promote awareness and use of NTIS products and services.
- d. NTIS will provide copies of sales promotion literature to you on a monthly basis listing NTIS documents selected as having special sales potential.

2. your Responsibilities

- a. Develop and implement a marketing plan, including initial and periodic review by NTIS marketing staff.

- b. Provide NTIS with current and projected interests of the market served by you .
- c. Charge customers according to the NTIS price schedule and act as a representative of NTIS for forwarding and receiving customer orders.
- d. You agree to restrict its marketing and sales activity to you.

3. Order Transmittal

Orders for documents and services may be transmitted to NTIS via airmail, surface carriers, or by cable. Orders submitted by airmail and surface carrier will be on a form designed by NTIS, a supply of which will be provided upon execution of this agreement. Cable orders will contain all information designated in the regular order form, to include your complete mailing address and deposit account number. The NTIS Telex number is 89-9405. Orders transmitted by mail should be sent to the following address:

National Technical Information Service
U. S. Department of Commerce
ATTN: D. Shonyo
5285 Port Royal Road
Springfield, Virginia 22161
U. S. A.

4. Shipment of Orders

Normally orders for documents for which there is shelf stock will be shipped to you within ten days of receipt at NTIS. Out-of-print documents may require a longer delivery period, but notification to you of any such delay will be automatic.

Pricing and Discount Arrangements

- a. The NTIS will offer the products and services covered by this agreement to you at a twenty-five percent discount off list price. Documents and services may be purchased at the prices listed on the price schedule provided by the NTIS and in the catalogs supplied.
- b. You will honor the NTIS list price as a minimum selling price for these products and services. However, you may offer these products and services at a higher selling price. Materials will be ordered by you at the full list price. The NTIS will develop, maintain records, and provide monthly accounting to you on sales of NTIS products and services to customers in (country). This accounting will be in the form of a

monthly statement for which the twenty-five percent discount will be computed on orders received during that month. A credit in the amount of the twenty-five percent computed discount will then be made to the *your* account.

- c. The NTIS reserves the right to adjust the selling prices for all its products and services. Thirty days' advance notice will normally be provided.

6. Deposit Account Responsibilities

- a. Deposit Account number XXXX has been established by the NTIS for *your* use in ordering. It will be the responsibility of *you* to assign a minimum of \$2,000.00 in United States currency to its deposit account upon execution of this agreement. *You* may submit this deposit in monthly installments. However, *you* will insure that at no time will the value of NTIS products ordered exceed the balance in *your* deposit account. When the entire \$2,000.00 has been forwarded and upon receipt and approval of *your* promotion plan, credits of \$1,000.00 will also be entered in *your* account by NTIS. These credits are provided to assist *you* in developing in-country marketing programs and must be matched by *you* on a two-to-one basis (\$2,000.00 or equivalent on the part of *you* and \$1,000.00 on the part of NTIS.) The United States credit of \$1,000.00 will be in force during the period of this agreement. (See paragraph 7, below.) The method of payment of the United States credit will be in the form of one-to-one credits for orders placed by *you* until the credit is exhausted.
- b. *You* will specify its account number when initiating transactions with the NTIS.

7. Time Period and Termination of Agreement

This agreement will become effective approximately (*month*) 1976, and will continue on an experimental basis until (*month*) xx, 19XX. At the end of two years, the effectiveness of the program will be evaluated.

8. Liaison Personnel and Organization Addresses

The following representatives named will serve in a liaison capacity to facilitate communication and operations between the participating organizations:

International Projects Branch
Value of Ad Hoc Document Purchases for 28 countries in the
International Technical Information Network

Country	Transitional Quarter	1st QTR 1977	FY 76
<u>Near East</u>			
+India	\$12,686	\$25,489	\$30,133
*Thailand	1,912	635	6,020
*Pakistan	292	68	2,501
++Sri-Lanka	-----	-----	-----
<u>Far East</u>			
*Korea	1,066	1,289	4,015
*Philippines	1,811	906	3,874
+Indonesia	590	254	1,356
<u>Sub-Saharan Africa</u>			
*Nigeria ¹	-----	407	-----
+Tanzania	71	0	333
+Kenya	34	24	255
+Zaire	20	-----	125
+Zambia	-----	63	97
+Ghana	23	8	73
+Liberia	-----	-----	70
++Sudan	-----	-----	-----
++Chad	-----	-----	-----
++Mali	-----	-----	-----
++Upper Volta	-----	-----	-----
++Cameroon	-----	-----	-----
++Niger	-----	-----	-----
++Senegal	-----	-----	-----
<u>North Africa and the Mediterranean</u>			
+Turkey	635	390	1,767
+Egypt	-----	-----	213
Jordan	4	35	108
+Tunisia	0	12	60
Morocco	-----	-----	28
++Portugal	-----	-----	-----
++Syria	-----	-----	-----
AL 28 countries	\$19,144	\$29,580	\$59,384

- * Countries with cooperating agencies
+ Countries where cooperating agencies will be sought.
++ Countries not previously involved in pilot project.
1/ Reflects inability to replenish deposit account with currency conversion.

International Projects Branch

Value of Ad Hoc Document Purchases for 21 countries in the International Technical Information Network

Country	TQ	1st QTR	FY 76
<u>Mexico</u>	\$5,341	\$ 4,326	\$21,799
<u>Central America</u>			
*Costa Rica	145	48	1,565
*El Salvador	497	167	----- 1/
*Guatemala	223	1,416	983
*Honduras	113	536	688
*Nicaragua	271	221	715
+Panama	112	166	870
<u>Caribbean</u>			
+Dominican Republic	66	18	247
+Haiti	46	-----	268
+Jamaica	-----	-----	-----
<u>South America</u>			
+Argentina	-----	-----	-----
*Bolivia	13	-----	-----
*Brazil	4,759	6,589	1,216
*Chile	3,543	1,031	14,596
*Colombia	392	479	3,379
*Ecuador	1,117	527	2,444
+Guayana	-----	-----	1,817
+Paraguay	37	-----	-----
*Peru	1,807	233	129
*Venezuela	1,863	555	2,182
+Uruguay	61	2,455	5,870
		63	318
<hr/>	<hr/>	<hr/>	<hr/>
TAL. 21 countries	\$20,406	\$18,830	\$59,086

* Countries with cooperating agencies

+ Countries where cooperating agencies will be sought

! Countries not previously involved in pilot project

1/ Sales in FY 76 were inadvertently included under Guatemala because of an accounting procedure imposed by Icati for which the Salvadorian agency is a sub-agent.

NUMBER OF TECHNICAL REPORTS IN 40 LDCs THROUGH AID/NTIS PROGRAM*

<u>MONTH.</u>	<u>NUMBER</u>	
July 75	646	}
Aug 75	794	
SEP 75	804	
Oct 75	652	
Nov 75	759	
Dec 75	718	
		4,373
JAN 76	857	}
FEB 76	902	
MAR 76	1412	
Apr 76	1180	
May 76	912	
JUN 76	1316	
		6,579
JUL 76	1081	}
AUG 76	1582	
SEP 76	1478	
Oct 76	958	
Nov 76	2564	
Dec 76	1573	
		9,236

* DOES NOT INCLUDE SUBSCRIPTION ITEMS, STANDING ORDER

NUMBER OF DOCUMENTS
SOLD IN
KOREA
THROUGH AID/NTIS
PROGRAM

(DOES NOT INCLUDE
SUBSCRIPTION ITEMS,
STANDING ORDERS, OR
COMPUTER SOFTWARE)

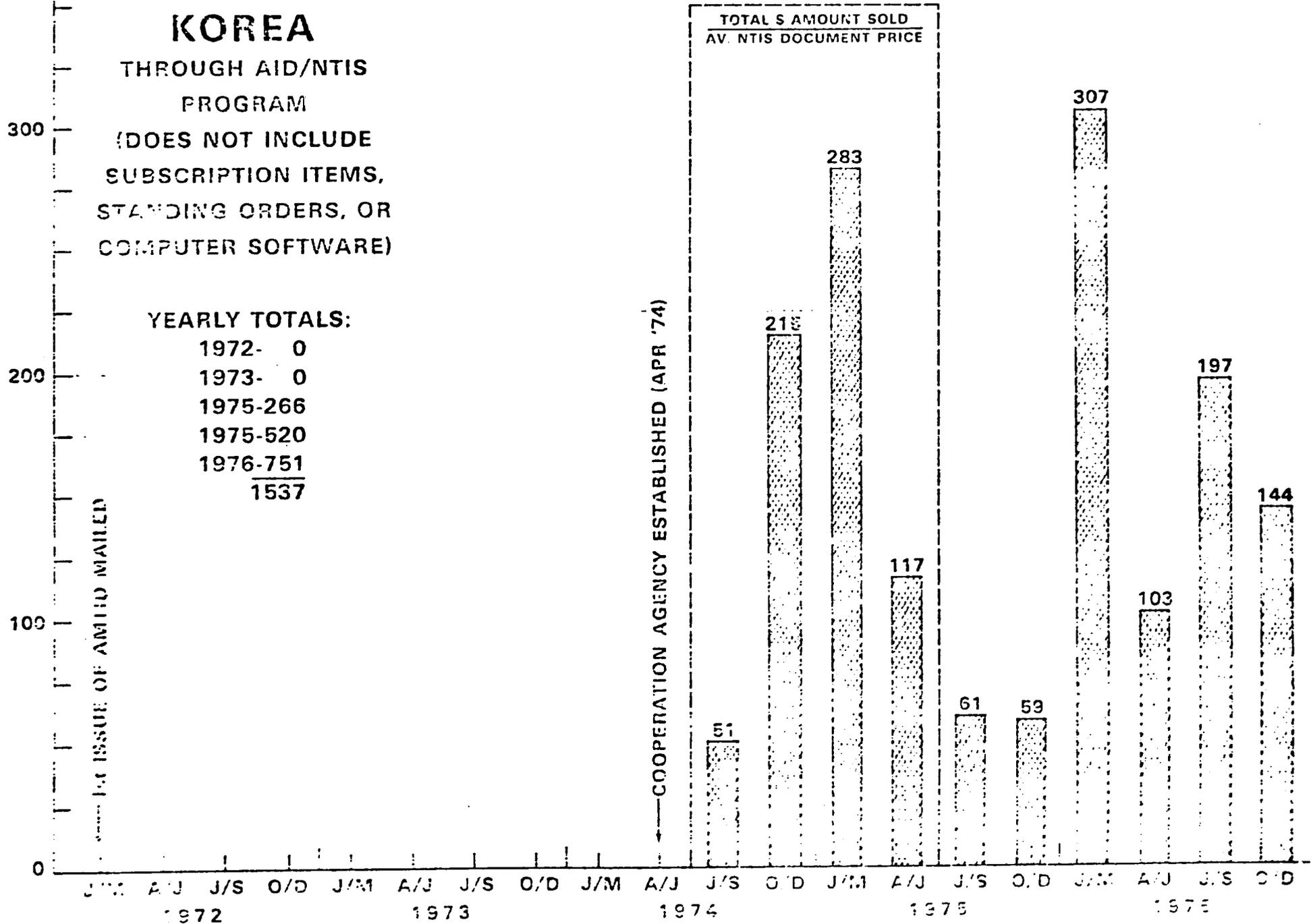
YEARLY TOTALS:

1972- 0
1973- 0
1975-266
1975-520
1976-751
1537

100% ISSUE OF AID/NTIS MAILED

ESTIMATED

TOTAL \$ AMOUNT SOLD
AV. NTIS DOCUMENT PRICE



NUMBER OF DOCUMENTS
SOLD IN
THE PHILIPPINES

THROUGH AID/NTIS
PROGRAM

(DOES NOT INCLUDE
SUBSCRIPTION ITEMS,
STANDING ORDERS, OR
COMPUTER SOFTWARE)

YEARLY TOTALS:

1972- 56

1973- 13

1974-297

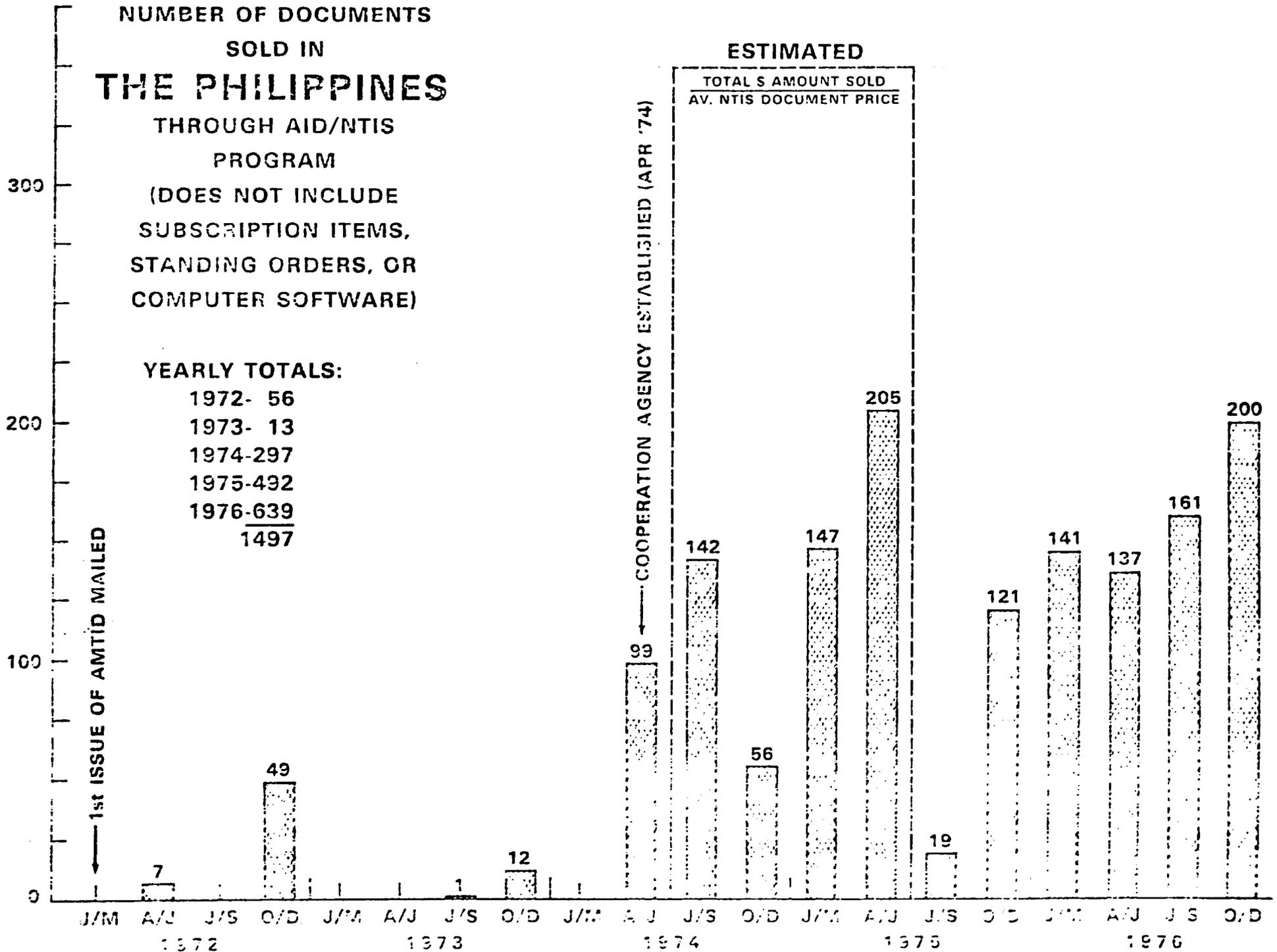
1975-492

1976-639

1497

ESTIMATED

TOTAL \$ AMOUNT SOLD
AV. NTIS DOCUMENT PRICE



ANNEX L S & T INFORMATION AND "THE POOREST OF THE POOR"

The proposed NTIS program is aimed at a professional audience rather than the great mass of humanity characterized by aid as the "poorest of the poor."

The two main reasons for this are:

- (1) The written word is far from the best way to transfer technical information directly to individuals low on the socio-economic scale; and
- (2) The technical sophistication of the information involved is largely, but not exclusively, unsuitable for direct application to the problems of the economically disadvantaged.

Any program that acts to improve the general state of economic development of a country can also be expected to improve the lot of many of its poorest inhabitants. This is a long-term process that is very difficult to quantify.

The NTIS program will probably have the effect mentioned above; experience has shown that a program of this type can have a considerably more immediate effect on the poor.

First of all, it has been shown that information obtained from NTIS has directly influenced decisions to expand industries and, consequently, increase employment opportunities.

Some examples of this kind of expansion are:

- (1) A bottle factory in El Salvador purchased two documents on waste glass utilization. As a result the factory is now expanding its operations to include a line of tiles and other products derived from crushed waste glass.
- (2) In Ecuador, a decision was made to establish a particle board factory on the basis of information obtained from NTIS.
- (3) A foundry in Korea purchased a large number of documents from NTIS on steel alloy composition, casting techniques, and heat treatment. As a result, the factory was able to improve its line of high-strength locomotive and railroad car wheels to the extent that it now exports on a very competitive basis throughout the world. Even more important in terms of increased employment, the foundry received a large government contract to produce high-strength castings to be made into gun tubes.

Industries in the LDC's are very reluctant to supply quantitative data to support examples such as the above. The proposed project has a component ("case studies") which will seek to document the effects of technical information on employment and other economic indicators.

There is another broad area in which information transferred through the proposed program can be expected to impact on the lower socio-economic levels.

This is the "quality of life" area; especially "quality of life" as affected by the living environment. It can be argued that an adverse living environment, particularly an adverse urban environment, affects the poor to a proportionately greater extent than it does other socio-economic levels. Therefore, the people who tend to benefit the most from any improvement in environmental quality are the poor.

In view of this, it is interesting that among the categories of NTIS information most in demand in the LDC's are "urban planning" and "pollution control." And there is evidence that this information is being put to good use. Here is a case in point:

The city San Salvador suffers from a particularly noxious, irritating smog-like air pollution. Major contributors to this problem are the numerous smoke-belching buses. When the City decided to attack this problem, they consulted with CENAP, which acts as the NTIS representative in El Salvador. As a result the City purchased a number of relevant technical reports from NTIS. On the basis of information contained in these reports (and undoubtedly other considerations as well) the City will install a more efficient urban transportation system based on the use of electric trolley buses. The benefits will be: cleaner air, cheaper urban transportation (since electricity is considerably cheaper than petroleum in El Salvador), and a better system of routes and schedules. The poor, of course, are among the chief beneficiaries.

The NTIS collection now contains a certain amount of information dealing with low- and intermediate-level technology subjects which may be of immediate use to the poor. For example, one of our best selling documents in the LDC's has been Handbook for Building Homes of Earth. Furthermore, NTIS is in the process of acquiring many additional titles, of a basic how-to-do-it type, from the Peace Corps. During the proposed project, an effort will be made to collect and make available additional documents of this type, from both U.S. and LDC sources.

Written technical information, even at the low-technology level, is not generally very useful to the poor. It must somehow be translated into action, and this translation must be done by some intermediary organization working with the poor. NTIS currently supplies

information to many such organizations. Other organizations of this kind will be added to the NTIS mailing list as they come to our attention.

To summarize:

- (1) The proposed program impacts on the poor by providing information which will help:
 - (a) create new job opportunities, and
 - (b) improve the quality of the living environment;
- (2) Some low- and intermediate-technology is now available from NTIS and more will be sought out and added;
- (3) Much information will be supplied to organizations which work with the poor and which can translate the written word into useful action.

ANNEX M

Customer Sample

As was pointed out in the text the affiliations of the beneficiaries of the NTIS/AID program can be roughly categorized as follows: Business/Industry/Professional, 79%; Government, 7%; Individuals, 5%; Libraries, 4%; Universities, 4%; Others, 1%. The accompanying segment of the users list will provide a clearer idea of the exact nature of the existing user base. There are 4,099 names on the list not counting in-country distribution by cooperating agencies. Only 1/4 of these are in Project Countries. The remainder are in Latin America. All are considered active users.

Suez Canal Authority Cairo, Egypt	Trans Asia Engineering Assoc. Inc. Jakarta, Indonesia
Bank of Ghana Accra, Ghana	Bangdung Institute of Technology Bangdung, Indonesia
Director Industrial Research Inst. Accra, Ghana	Training Officer Bali Regional Housing Ctr. Ministry of Public Works Bali, Indonesia
Ghana Rubber Estates Ltd. Accra, Ghana	Head, Commercial Dept. Perum Angkasa Pura Jakarta, Indonesia
Avon Cycles Ltd. Punjab, India	Jordan Phosphate Mines Amman, Jordan
Auto Products of India, Ltd. Bombay, India	Field Research Services Nairobi, Kenya
Baharat Carbon & Ribbon Mfg. Co. Ltd. Delhi, India	Kenya Pipeline Co. Ltd. Nairobi, Kenya
Binani Metal Works Ltd. West Bengal, India	

Bevede Industries St
Tangier, Morocco

Plastique Le Societe
Casablanca, Morocco

Dean, Engineering
Ahmadu Bello Univ.
Zaria, Nigeria

Indus Trading Co.
Kotri, Pakistan

West Pakistan Industrial
Dev. Corp.
Karachi, Pakistan

Benquet Electric Coop. Inc.
Baguio City, Philippines

First Farmers Milling & Marketing
Coop. Assn. Inc.
Bacod City, Philippines

Small Industries
Development Organ.
Dar Es Salaam, Tanzania

Dept. of Public Health
Bangkok, Thailand

T. Sanpanich Ltd. Partnership
Bangkok, Thailand

Turkiye Is Bankasi
Ankara, Turkey

Nchanga Consolidated Copper Mines, Ltd.
Kitne, Zambia

Office National de la Recherche
Et Du Development
Kinshasa, Zaire Republic

IMPLEMENTATION PLAN VIII
Fiscal '77

The following activity calendar does not include items which are dependent on negotiations of new agreements, other donor action, or dependent on field visits. These include:

- . Organization of in-between shows at U.S. trade centers and Commercial Offices, displays and participation in scheduled U.S. trade fairs and catalog shows.
- . Commodities and resource materials delivered to new cooperating agencies.
- . Installation of VSMF in countries where appropriate and where other donor funds are used.
- . Identification, acquisition by NTIS, bibliographic processing, announcement and dissemination of approximately 10 reports from LDCs.
- . NTIS performance evaluation by AID/W.

The project team issues a quarterly activities report which will update this calendar as necessary.

First Month

- . AMTID. No special activity pending TA/OST funding.

Second Month

- . AMTID. Published and distributed to approximately 2,000 in 28 countries.
- . Priority fulfillment of approximately 700 requests from 28 countries (Postal subsidization for orders from 28 countries).*
- . Referral of requests for information not available from NTIS to other U.S. sources.

Third Month

- . Network Newsletter produced and distributed to 5 cooperating agencies in 5 countries.

*Four countries (India, Korea, the Philippines, Nigeria) are prospects for dropping the postal subsidy during FY 77 and their bilateral agreements will be written to reflect this.

- . AMTID. Published and distributed to approximately 2,000 in 28 countries.
- . Priority fulfillment of approximately 700 requests from 28 countries (Postal subsidization for orders from 28 countries).
- . Referral of requests for information not available from NTIS to other U.S. sources.

Fourth Month

- . Field visits to provide user education and other management consultation to Nigeria.
- . Field visits to identify potential cooperating agencies in Tanzania, Kenya, and Egypt.
- . AMTID. Published and distributed to approximately 2,500 in 28 countries.
- . Priority fulfillment of approximately 700 requests from 28 countries (Postal subsidization for orders from 28 countries).
- . Referral of requests for information not available from NTIS to other U.S. sources.

Fifth Month

- . In-country Seminar in Philippines. Tentatively on food and agriculture.
- . Concurrent exhibit on food and agriculture to be featured at U.S. Commercial Offices.
- . Site visit to provide user education and other management consultation in Thailand and Pakistan.
- . Promotional mailing to new prospects in Asia and Africa.
- . AMTID. Published and distributed to approximately 2,500 in 28 countries.

- Priority fulfillment of approximately 700 requests from 28 countries (Postal subsidization for orders from 28 countries).
- Referral of requests for information not available from NTIS to other U.S. sources.

Sixth Month

- Advertising series begins in regional publications.
- Video-taping of selected segments of NTIS training workshops and translation into
- AMTID. Published and distributed to approximately 3,000 in 28 countries.
- Priority fulfillment of approximately 700 requests from 28 countries (Postal subsidization for orders from 28 countries).
- Referral of requests for information not available from NTIS to other U.S. sources.

Seventh Month

- Network Newsletter produced and distributed to 5 cooperating agencies in 5 countries.
- U.S. Information Industry Trade Mission to Turkey, Pakistan, India, and Egypt.
- NTIS Information Systems Workshop with option for additional training at Georgia Tech in technology transfer implementation.
- Field visit to identify potential cooperating agencies in Jordan, Tunisia, Morocco, Syria and Portugal.
- AMTID. Published and distributed to approximately 3,500 in 28 countries.
- Priority fulfillment of approximately 700 requests from 28 countries (Postal subsidization for orders from 28 countries).
- Referral of requests for information not available from NTIS to other U.S. sources.

Eighth Month

- In-country Seminar in Pakistan. Topic to be decided.
- Field visit to provide user education and other management consultation to Korea and Thailand.
- AMTID. Published and distributed to approximately 4,000 in 28 countries.
- Priority fulfillment of approximately 700 requests from 28 countries (Postal subsidization for orders from 24 countries).
- Referral of requests for information not available from NTIS to other U.S. sources.

Ninth Month

- Cooperating Agency Meeting in Washington. One-week session for persons who have attended previous three-week session.
- Completion of renewal of expired agreements with cooperating agencies.
- AMTID. Published and distributed to approximately 4,000 in 28 countries.
- Priority fulfillment of approximately 700 requests from 28 countries (Postal subsidization for orders from 24 countries).
- Referral of requests for information not available from NTIS to other U.S. sources.

Tenth Month

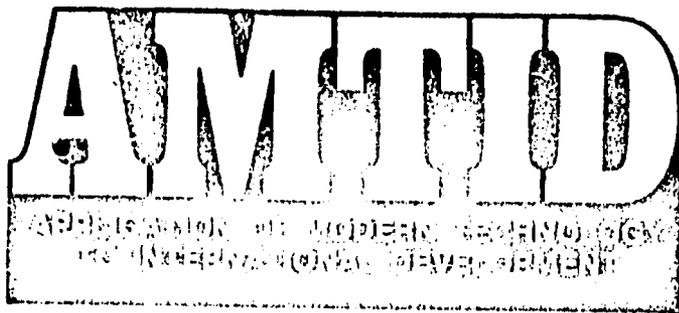
- Network Newsletter produced and distributed to 6 cooperating agencies in 6 countries.
- AMTID. Published and distributed to approximately 4,000 in 28 countries.
- Priority fulfillment of approximately 700 requests from 28 countries (Postal subsidization for orders from 24 countries).
- Referral of requests for information not available from NTIS to other U.S. sources.

Eleventh Month

- . Inauguration of first regional on-line retrieval capability using NTIS data base and other data files.
- . AMTID. Published and distributed to approximately 4,500 in 28 countries.
- . Priority fulfillment of approximately 700 requests from 28 countries (Postal subsidization for orders from 24 countries).
- . Referral of requests for information not available from NTIS to other U.S. sources.

Twelfth Month

- . Network Newsletter produced and distributed to 7 cooperating agencies in 7 countries.
- . In-country Seminar in Egypt. Topic to be selected.
- . Field visit to provide user education and other management consultation in Turkey.
- . AMTID. Published and distributed to approximately 5,000 in 28 countries.
- . Priority fulfillment of approximately 700 requests from 28 countries (Postal subsidization for orders from 24 countries).
- . Referral of requests for information not available from NTIS to other U.S. sources.



AGENCY FOR INTERNATIONAL DEVELOPMENT
Office of Science and Technology
Washington, D.C.

AID-OST-77-6

Administration

Managing Organization Vitality
G. P. Chandler, Jr.
National Aeronautics and Space Administration, Washington,
D.C. Jun 76, 125p
N76-32043/1GID PCS5.50/MF\$3.00

Agriculture and Food

Food Information Systems: Summary and Analysis
Office of Technology Assessment, Washington, D.C. Aug 76,
102p
PB-258 172/6GID PCS5.50/MF\$3.00

Behavior and Society

Nurse Practitioner and Physician Assistant Training and
Development Study
System Sciences, Inc., Bethesda, Md. Sep 76, 613p Also
available in set of 2 reports as PB-259 025-SET,
PCS19.25/MF\$6.00.
PB-259 026/3GID PCS16.25/MF\$3.00

Drug Use and Crime: Report of the Panel on Drug Use and
Criminal Behavior
Research Triangle Inst., Research Triangle Park, N.C. Sep
76, 553p
PB-259 167/5GID PCS13.50/MF\$3.00

Biomedical Technology and Engineering

Considerations in Developing Test Methods for Protective
Headgear
Robert E. Berger.
National Bureau of Standards, Washington, D.C. Product
Safety Engineering Section. Aug 76, 54p
PB-258 322/7GID PCS4.50/MF\$3.00

Building Technology

Fire Alarms and Fire Detectors (Citations from the NTIS Data
Base)
Guy E. Habercorn, Jr.
National Technical Information Service, Springfield, Va.
Nov 76, 162p
NTIS/PS-76/0873/0GID PCS25.00/MF\$25.00

Business and Economics

Minerals in the U.S. Economy: Ten-Year Supply-Demand
Profiles for Mineral and Fuel Commodities (1965-74)
Bureau of Mines, Washington, D.C. Aug 76, 105p
PB-258 072/8GID PCS5.50/MF\$3.00

Chemistry

Fire Resistance of Fibers and Textiles (Citations from the NTIS
Data Base)
Diane M. Cavagnaro, and Edward J. Lehmann.
National Technical Information Service, Springfield, Va.
Nov 76, 269p
NTIS/PS-76/0864/9GID PCS25.00/MF\$25.00

Operation of a Sulfuric Acid Plant Using Blended Copper
Smelter Gases
Ben H. Carpenter.
Research Triangle Inst., Research Triangle Park, N.C. Jul 76,
53p
PB-258 649/3GID PCS4.50/MF\$3.00

EPA Alkali Scrubbing Test Facility: Advanced Program
Harlan N. Head.
Bechtel Corp., San Francisco, Calif. Sep 76, 379p
PB-258 783/6GID PCS10.75/MF\$3.00

Civil and Structural Engineering

Preformed Elastomeric Joint Sealers for Bridges. Phase I.
Summary and Implementation Guide
George S. Kozlov, and Bruce Cosaboom.
New Jersey Dept. of Transportation, Trenton. Bureau of
Structures and Materials. Apr 76, 53p
PB-258 998/4GID PCS4.50/MF\$3.00

Field Evaluation of Various Bridge Deck Joint Sealing Systems
Gregory J. Mehalchick, and George S. Kozlov.
New Jersey Dept. of Transportation, Trenton. Bureau of
Structures and Materials. Mar 76, 43p
PB-258 999/2GID PCS4.00/MF\$3.00



Speed Delivery—Order by Number

DEST SELLERS

- An Inexpensive Economical Solar Heating System for Homes**
N76-27671/ GID 59 p. PC \$4.50/MF \$3.00
- Medical Subject Headings, Annotated Alphabetic List, 1977**
PB-255 932/ GID 671 p. PC \$16.25/MF \$3.00
- Permuted Medical Subject Headings, 1977**
PB-259 021/ GID 300 p. PC \$9.25/MF \$3.00
- Nuclear Power Plant Design Analysis**
TID-26241/ GID 497 p. PC \$10.60/MF \$3.00
- Medical Subject Headings, Tree Structures, 1977**
PB-255 933/ GID 464 p. PC \$12.00/MF \$3.00
- Federal Information Processing Standards Register: Guidelines For Documentation of Computer Programs and Automated Data Systems. Category: Software. Subcategory: Documentation.**
FIP SPUB 93/ GID 55p. PC \$4.50/MF \$2.00
- Solar Heating of Buildings and Domestic Hot Water**
ADA-021 662/ GID 90 p. PC \$5.00/MF \$3.00
- Energy Efficiency and Electric Motors**
PB-259 129/ GID 186 p. PC \$7.50/MF \$3.00
- Research and Technology Objectives and Plans**
N77-12925/ GID 189 p. PC \$7.50/MF \$3.00
- OSHA Safety and Health Training Guidelines for General Industry, Volume I.**
PB-209 910/ GID 117 p. PC \$5.50/MF \$3.00
- Handbook on Aerosols**
TID-26608/ GID 149 p. PC \$6.00/MF \$3.00
- Medical Subject Headings: Tree Annotations 1977. MEDLARS Indexing Instructions**
PB-257 939/ GID 119 p. PC \$5.50/MF \$3.00
- Mineral Cycling in Southeastern Ecosystems. Proceedings of a Symposium Held at Augusta, Georgia May 1-3, 1974.**
CONF-740 513/ GID 920 p. PC \$23.75/MF \$3.00
- Natural Gas from Unconventional Geologic Sources**
FE-227 1-1/ GID 249 p. PC \$8.00/MF \$3.00
- Vascular Plants of the Nevada Test Site and Central-Southern Nevada**
TID-268 81/ GID 315 p. PC \$9.75/MF \$3.00

Computers

- On Combining Pseudorandom Number Generators**
Mark Brown, and Herbert Solomon.
Stanford Univ Calif Dept of Statistics Jul 76, 11p
AD-A030 693/6GID PCS3.50/MF\$3.00
- Review of Developments in Computer Output Microfilm (COM) and Micrographic Technology, Present and Future**
Advisory Group for Aerospace Research and Development
Paris (France) Sep 76, 66p
AD-A031 156/3GID PCS4.50/MF\$3.00
- Effects of Producing a Multics Security Kernel**
N. Adleman.
Honeywell Information Systems Inc Mclean Va Federal Systems Operations Oct 75, 32p
AD-A031 220/7GID PCS4.00/MF\$3.00
- Comparison of the AMDAHL 476V/6 and the IBM 370/195 Using Benchmarks**
D. R. Snider, J. L. Midlock, A. R. Hinds, and D. E. Engert.
Argonne National Lab., Ill. Mar 76, 130p
ANL-76-50/GID PCS6.00/MF\$3.00
- Assembling Microprocessor Software with Minicomputers**
T. A. Seim.
Battelle Pacific Northwest Labs., Richland, Wash. Mar 76, 13p
BNAVL-SA-5701/GID PCS3.50/MF\$3.00
- Petri Net as a Modeling Tool**
P. B. Thomas.
Union Carbide Corp., Oak Ridge, Tenn. Computer Sciences Div. 1976, 10p
K/CSD/INF-76/3GID PCS3.50/MF\$3.00
- Data Base Directions. The Next Steps**
John L. Berg.
National Bureau of Standards, Washington, D.C. Systems and Software Div. Sep 76, 177p
PB-258 163/1GID PCS7.50/MF\$3.00
- Design of a Graphics Processor**
M. Holmes, and A. R. Thorne.
Science Research Council, Chilton (UK). Rutherford Lab. Dec 75, 33p U.S. Sales Only.
RL-75-190/GID PCS4.00/MF\$3.00
- System for Large Structure Graphics**
B. W. Pollack.
Stanford Linear Accelerator Center, Calif. Aug 75, 190p
SLAC-187/GID PCS7.75/MF\$3.00
- Introduction to the Theory of Machines and Languages**
P. P. Weidhaas.
California Univ., Livermore. Lawrence Livermore Lab. Apr 76, 123p
UCID-17045/GID PCS5.50/MF\$3.00
- Microcomputer Publication Reference List**
C. W. Jensen.
California Univ., Livermore. Lawrence Livermore Lab. Jun 75, 6p
UCID-17128/GID PCS3.50/MF\$3.00

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

Speed Delivery—Order by Number

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

Electrotechnology

The Effects of Substrate Composition on Thick Film Circuit Reliability

R. W. Vest.

Purdue Univ Lafayette Ind Aug 76, 26p
AD-A030 424/6GID PCS4.00/MF\$3.00

SAW Devices: Description and Computer Models

D. W. Palmer.

Sandia Labs., Albuquerque, N.Mex. Mar 76, 48p
SAND-76-0017/GID PCS4.00/MF\$3.00

Energy

Design Concepts for Flash Steam Systems for Use with Medium Temperature Geothermal Water

J. E. Whitbeck.

Idaho National Engineering Lab., Idaho Falls. Jul 75, 43p
ANCR-1210/GID PCS4.50/MF\$3.00

Energy Awareness. Proceedings of a Symposium for Public Awareness on Energy, 1976, Held February 27, 1976 in Knoxville, Tennessee

Oak Ridge National Lab., Tenn. Mar 76, 260p
CONF-760205-/GID PCS9.00/MF\$3.00

Development of High Efficiency Collector Plates. Final Report

T. Santala, and R. Sabol.

Texas Instruments, Inc., Attleboro, Mass. Feb 76, 104p
COO-2600/76/3GID PCS5.50/MF\$3.00

Natural Gas from Unconventional Geologic Sources

National Academy of Sciences - National Research Council, Washington, D.C. Board on Mineral Resources. 1976, 255p
FE-2271-1/GID PCS9.00/MF\$3.00

Power Plant Siting (A Bibliography with Abstracts)

Andrey S. Hundemann.

National Technical Information Service, Springfield, Va. Nov 76, 178p
NTIS/PS-76/0853/2GID PCS25.00/MF\$25.00

Optical Coatings for Solar Cells and Solar Collectors (A Bibliography with Abstracts)

Mona F. Smith.

National Technical Information Service, Springfield, Va. Nov 76, 167p
NTIS/PS-76/0855/7GID PCS25.00/MF\$25.00

Environment

Atmosphere-Surface Exchange of Particulate and Gaseous Pollutants (1974). Proceedings of a Symposium, Richland, Washington, September 4--6, 1974

Battelle Pacific Northwest Labs., Richland, Wash. 1976, 1000p
CONF-740921-/GID PCS13.60/MF\$3.00

Bioindicators of Pollution (A Bibliography with Abstracts)

Elizabeth A. Harrison.

NEW IDEAS FOR THE HOUSING SPECIALIST

Feasibility Test of an Approach and Prototype for Ultra Low Cost Housing

Charles H. Goodspeed, and Volkter H. Hartkopf
Carnegie Mellon Univ., Pittsburgh, Pa. Nov 75. 101 p
PB-251 471/GID PCS5.50/MF\$3.00

Provides facts about an "A" frame modular housing system that can be constructed from local materials and is inexpensive, labor intensive, easily erected, and resistant to damage by wind and flood. Gives design and construction details for a bamboo and thatch variant of the design. Describes construction and field testing of communities of the structures under the economic, environmental, and social conditions of Bangladesh refugee camps.

National Technical Information Service, Springfield, Va. Nov 76, 194p

NTIS/PS-76/0868/0GID PCS25.00/MF\$25.00

Human Responses to Dry, Humidified and Intermittently Humidified Air in Large Office Buildings

L. O. Anderson, P. Frisk, B. Løefstedt, and D. P. Wyon.
Swedish Council for Building Research, Stockholm. 1976, 69p

PB-257 903/5GID PCS4.50/MF\$3.00

The Health Implications of Photochemical Oxidant Air Pollution to Your Community

Environmental Protection Agency, Research Triangle Park, N.C. Office of Air Quality Planning and Standards. Aug 76, 23p

PB-258 490/2GID PCS3.50/MF\$3.00

Control of Particulate Matter from Oil Burners and Boilers

G. R. Offen, J. P. Kesselring, K. Lee, G. Poe, and K. J. Wolfe.

Acurex Corp., Mountain View, Calif. Aerotherm Div. Apr 76, 293p

PB-258 495/1GID PCS9.25/MF\$3.00

Energy and Economic Impacts of Mandatory Deposits.

Executive Summary

Research Triangle Inst., Research Triangle Park, N.C. Sep 76, 18p

PB-258 637/8GID PCS3.50/MF\$3.00

Energy and Economic Impacts of Mandatory Deposits

Research Triangle Inst., Research Triangle Park, N.C. Sep 76, 752p

PB-258 638/6GID PCS18.75/MF\$3.00

Water Chemistry

George R. Seidel.

Delaware State Coll., Dover. Dept. of Chemistry. 1976, 338p

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