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FINAL REPORT

STUDY OF AUTOMATED SYSTEMS FOR
AGENCY-WIDE PROCESSING
(PROJECT ASAP)

Agency for International Development

Washington, D.C.

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Subject: IQC No. AID/otr-C-1689—Task 9 Deliverable: Final Report

Dear Mr. McMahon:

Booz, Allen & Hamilton is pleased to submit this Final Report of our work under the referenced contract to prepare a near-term Agency office automation plan and a longer-term automation strategy covering the next five budget years. This Final Report presents major study results including findings, conclusions and options for AID management's consideration. The report is organized in five chapters, as follows:

- . Introduction—Background information on the purpose of the study and the approach
- . AID's Operating Environment—A description of the current organizational structure, staff resources, automation support and office automation management practices of the Agency
- . Opportunities for Office Automation—A discussion of areas where office automation could improve the work of the study processes
- . Overall Conclusions—Principal study conclusions based on study results
- . Alternative Strategies—A discussion of three alternative approaches to expand office automation and the risks and benefits of each.

The automation plan, developed within the framework of the strategic alternative chosen by AID from the conceptual alternatives, is presented under separate cover. The Executive Summary, bound as part of this document, summarizes the Final Report and the automation plan.

Mr. James T. McMahon
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We wish to express our appreciation for the cooperation and assistance of Agency staff in Washington, Cairo and Nairobi who contributed to this study. In particular, we want to thank the SER/DM staff who actively participated in study activities and guided the study team's efforts. We look forward to answering any questions you and your staff may have and to presenting the results of the study to AID senior management. Please let us know if we can be of further assistance.

Very truly yours,

Booy, Allen F Hamilton Inc

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EXECUTIVE SUMMARY

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EXECUTIVE SUMMARY

STUDY OF AUTOMATED SYSTEMS FOR AGENCY-WIDE PROCESSING

(PROJECT ASAP)

AID requires large amounts of information and generates massive amounts of paper to plan, program, finance, and implement assistance programs throughout the world. Present methods of handling this large volume of information and paper are largely antiquated and consume major amounts of staff time. When professional staff must spend inordinate amounts of time proofreading and correcting typed products, when secretaries must retype the same document many times, and when project teams and review teams are delayed because information and reports are tied up in transmission or reproduction, the work of the Agency suffers.

These problems can be solved by office automation technology and they must be solved if the Agency is to be able to manage increases in program appropriations with no additional or even fewer staff. For these reasons, Project ASAP was formed.

This document summarizes two reports developed under this project. The first is a Final Report that presents the study's findings, conclusions and recommendations. The

second is a five-year, strategic plan for expanding the use of office automation throughout the Agency.

I. AID INFORMATION PROCESSING NEEDS WERE ANALYZED

1. FIVE AGENCY PROCESSES WERE SELECTED FOR STUDY BY PROJECT ASAP

Five processes, involving the majority of AID/W offices and almost all USAIDs, were selected for study. They are:

- . Project Identification Document/Project Paper process
- . Annual Budget Submission process
- . Congressional Presentation process
- . Project Implementation Order process for technical services and commodities
- . Non-project assistance process.

These processes were analyzed to determine the extent to which office automation technology could be utilized and would make significant improvements in efficiency or effectiveness. The analyses focused on aspects of the processes that were characterized by:

- . High work load volume
- . Repetitive work steps
- . Need for information
- . Time constraints.

Over 100 staff members from offices in Washington, Cairo and Nairobi participated in study interviews.

Other processes, e.g., those associated with administrative and management activities, were briefly reviewed to provide an overview of Agency-wide automation requirements. Findings and conclusions, however, are limited to the selected study processes.

2. THERE IS A WIDE RANGE OF TECHNOLOGIES AND EQUIPMENT AVAILABLE TO AID

Automation technology available to support office processes are diverse and rapidly proliferating. Usually, the equipment is classified into the following categories:

- . Word processing
- . Data processing
- . Telecommunications.

Attachment A of this summary contains the definitions of the categories that were used throughout the study.

3. OFFICE AUTOMATION WILL IMPROVE PRODUCTIVITY IN THE PROCESSES STUDIED

In each of the five processes examined, work activities and information handling can be improved through the use of office automation technology. Specifically, by applying automation AID can:

- . Increase staff productivity with word-processing. Experience indicates that AID can look forward to the following typical productivity increases through the use of word processing equipment:
 - 30-50 percent for clerical staff
 - 5-10 percent for professional staff.
- . Reduce information processing and document production delays.
- . Increase efficiency and work quality.
- . Increase staff effectiveness by permitting direct communication and coordination among multiple offices.
- . Increase responsiveness of USAIDs and AID/W to information and action requests.

Exhibit 1, following this page, summarizes a few of the specific benefits that office automation will create for each of the five processes studied.

In Attachment B, the PID/PP process is used to illustrate more fully the benefits that will be derived from office automation.

4. ONLY A WELL-PLANNED PROGRAM CAN ENSURE THAT THE BENEFITS ARE FULLY REALIZED

The analysis confirmed that office automation presents an opportunity for AID to obtain major productivity and communications benefits. In order to fully realize these benefits, the Agency should take the following actions:

- . Implement automation simultaneously in AID/W and the field; not one before the other

EXHIBIT 1 (1)

Major Areas Where Office Automation Can Improve the Study Processes

PROCESS	MAJOR AREAS OF IMPROVEMENT	BENEFITS FROM AUTOMATION
CDSS	Annual update and revision of the CDSS is time-consuming for professional and clerical staff in the mission.	<p>Word processing equipment which stores the CDSS will:</p> <ul style="list-style-type: none"> . Reduce the time professionals devote to revision and update . Reduce the amount of clerical labor devoted to retyping original and revised text. <p>Compatible word processing equipment in the missions and AID/W offices permits the missions to send only revisions to AID/W where they may be incorporated into the stored text for production of the complete revised CDSS</p>
ABS	The transmission of hard copy ABS material from the missions to AID/W and the reproduction and distribution of the Country ABS in AID/W can involve substantial time delays which reduce available review time in AID/W.	<p>More time can be devoted to review of Country ABSs with more efficient reproduction and distribution capabilities in AID/W.</p> <p>Data processing applications can provide rapid data manipulation and scenario-testing to support budgetary decision making.</p> <p>Word processing will:</p> <ul style="list-style-type: none"> . Reduce the amount of clerical labor devoted to completely retyping draft budgets . Produce more efficiently error-free final copy. <p>ABS data stored in electronic form can be efficiently used as a basis for an Agency-wide operating year budget system and for preparation of ABS briefing and supporting documents.</p>
CP	<p>Project activity sheets are prepared as fresh copy in the missions, although the information is similar to that in the ABS process.</p> <p>Frequent, time-consuming revisions of the main volume and annexes of the CP are made by multiple review offices.</p>	<p>Mission work time in preparing CP inputs can be reduced through access to stored and easily retrievable background information.</p> <p>Word processing equipment will reduce professional and clerical time in AID/W in preparing CP drafts and their revisions.</p> <p>Interconnected word processing units and other communications devices will rapidly transmit draft CP copies among reviewing offices.</p>
PID/PP	<p>Preparation of PIDs and PPs requires access to information which is not always readily available to design teams in the field.</p> <p>Multiple drafts are time-consuming for support staff, involve major proofreading time by professionals, and can result in error-filled products.</p> <p>Transmission of PIDs and PP from the mission to AID/W and their reproduction and distribution in AID/W can involve substantial time delays which reduce available review time.</p>	<p>Ready access to data bases could ease project design, reduce time searching for supporting information, and reduce time for staff to gain familiarity with a program or country requirements.</p> <p>Word processing equipment will significantly reduce the professional and clerical labor absorbed by multiple drafts of the PIDs, PPs and their supporting documents.</p> <p>A longer range benefit of telecommunications support is an ability to achieve same day transmission of the PIDs and PPs, as well as comments and revisions between AID/W and the field, thus reducing delays in review and response to inquiries.</p>

EXHIBIT 1 (2)

Major Areas Where Office Automation Can Improve the Study Processes

PROCESS	MAJOR AREAS OF IMPROVEMENT	BENEFITS FROM AUTOMATION
PIO/T & C	<p>Transmissions of PIO materials from the missions to AID/W can involve delays.</p> <p>The missions and regional and central bureaus cannot easily monitor the status of processing activities.</p>	<p>Word processing units with contract writing programs in SER/COM and SER/CM will quickly produce error-free standard contracts.</p> <p>Data processing mini-computers will provide extensive scheduling, monitoring and problem identification capabilities in the field and in AID/W.</p> <p>Telecommunications could make the process more effective by permitting the missions to review and comment upon proposals and contracts before the AID/W offices make final determinations.</p>
Non-Project Assistance	<p>This process involves a large volume of information which must be:</p> <ul style="list-style-type: none"> . Rapidly exchanged not only among AID offices but other parties in host countries and the United States . Monitored and updated frequently. 	<p>Data processing applications can provide monitoring capability.</p> <p>Telecommunications equipment will rapidly transmit the information and documents and increase the responsiveness of AID offices.</p>

- . Establish equipment compatibility standards to make sure that the equipment can be interconnected
- . Become actively involved in the State Department's telecommunications enhancement efforts and consider evaluating several commercial vendors from a cost/benefit perspective
- . Implement management controls to ensure that the office automation plan is well executed and that the equipment is well utilized.

The latter action is discussed more fully below.

(1) Clear Objectives Governing the Use of Automation Should Be Developed

As staff productivity increases to allow the same amount of work to be done in less time, some individuals may choose to spend their newly-freed time improving product quality or generating additional information requirements of marginal utility. To achieve the best use of the technology, the Agency must clearly define office automation objectives and develop a plan to capture the desired benefits. In some cases, quality improvement will be an appropriate use of the available time. In other instances, more benefit would accrue if staff turned their attention to other tasks. AID can decide to use the technology to:

- . Hold current workload constant and reduce number of staff assigned to a process

- . Hold current workload constant and improve product quality
- . Hold staffing levels constant and increase workload.

No matter which objectives (or combinations of objectives) are chosen, AID managers need to establish a central authority to guide technology use. Guidelines and controls will help assure that the implementation is well planned and well executed and that the anticipated benefits are realized.

(2) Orientation and Follow-Up Training Are Necessary

Office automation technology affects more than typing—its capabilities mandate changes in office workflow and procedures. Clerical staff need training in the equipment's capabilities and use if productivity gains are going to be realized.

To do this, AID must establish formal internal training programs. These can be a combination of vendor-provided and internally-generated programs. The ultimate goal of the training should be to produce thoroughly-versed equipment operators who feel comfortable with the system and can take full advantage of its features. The professional staff also need training on the equipment's capabilities, and on how work procedures must change in order to maximize its benefits.

The training program will be a critical element in the success of office automation in AID. It represents a commitment to staff training heretofore not undertaken by the Agency. Without comprehensive and continued training to keep clerical and professional staff abreast of new equipment and enhanced features, the AID office automation program will risk not achieving its full potential and under-utilizing its productivity capabilities.

(3) During the Transition, Disruptions in Office Procedures Will Occur

Good planning can smooth the transition from manual to automated offices, but some disruption while new procedures are implemented is probably inevitable. Careful supervision from AID management, good training and technical assistance can minimize disruptions and prevent disruptions from lasting beyond the introductory period.

(4) New Procedures Must Be Designed to Guide Coordinated Equipment Use

Equipment installation alone will not realize automation's benefits. AID managers must develop methods and procedures to coordinate information flows among offices. For example, in the CP process, the regional bureau managers must determine which

offices will receive field inputs on word processing units, how many draft copies will be distributed to which staff, and which word processing unit will store draft CP materials forwarded to LEG for review.

Office automation technology is one of several techniques AID managers can use to improve operational efficiency and effectiveness. The introduction of the technology offers AID management an opportunity to critically examine information requirements, work loads and procedures used in program processes.

A summary of major findings and conclusions is presented in Exhibit 2, following this page.

II. A FIVE-YEAR, MODULAR IMPLEMENTATION PLAN ALLOWS CONTROLLED TECHNOLOGY INTRODUCTION

A technology-implementation plan is laid out in the second Project ASAP document which provides a carefully designed means of introducing the office automation equipment, procedures and training.

During the information gathering and analysis phase described in the Final Report, the Booz, Allen team presented AID with three implementation strategies. One of these, as described in the section below, served as the basis for the Five-Year Office Automation Plan.

Major Findings and Overall Conclusions

FINDINGS	OVERALL CONCLUSIONS
<p>1. AID's processing requirements and work flow meet generally used criteria for identifying opportunities for office automation</p>	<p>Application of expanded office automation support in AID can be expected to:</p> <ul style="list-style-type: none"> . Increase staff productivity . Reduce delays in processing . Permit direct communication . Increase responsiveness
<p>2. Previous experience with office automation in other agencies has resulted in immediate improvements in paper handling capabilities.</p>	<p>There is potential for substantial near-term improvement in clerical productivity and communications and longer-term increases in professional productivity.</p>
<p>3. The Agency's current experience with the full range of office automation technology and its attendant benefits is limited.</p>	<p>The introduction of expanded office automation capabilities will result in:</p> <ul style="list-style-type: none"> . Additional staff training requirements . Disruption in routine office activities . Changes in clerical staff mix
<p>4. The development of an extensive network of interconnected equipment is an essential prerequisite to increasing the efficiency and the effectiveness of the study process.</p>	<p>The Agency must develop and enforce equipment compatibility standards.</p> <p>Office automation must be introduced simultaneously in Washington and field locations if maximum benefits are to be achieved. AID must continue to actively consider and respond to State's expanded programs in telecommunications and cable distribution.</p> <p>AID can experiment with additional telecommunications support from commercial vendors to test its feasibility and costs.</p>
<p>5. AID/W offices and USAIDs are expanding their use and reliance upon office automation technology.</p>	<p>AID managers must control the expanded use of office automation to minimize disruptions and to assure that this new resource is well-utilized and that its potential benefits are realized.</p>
<p>6. Current responsibilities over office automation support activities are shared by SER/DM and SER/MO.</p>	<p>The introduction of expanded automation requires a single management group to exercise central leadership and a single point for coordination.</p>

1. AID CHOSE THE STRATEGIC ALTERNATIVE THAT INCLUDES RAPID IMPLEMENTATION OF A LARGE-SCALE INTEGRATED OFFICE AUTOMATION SYSTEM

As described fully in the Final Report, the implementation strategy chosen will:

- . Provide a system configuration to support the Agency-wide Plan
- . Recommend a major investment in equipment which will be rapidly installed in appropriate Agency locations
- . Provide flexibility by allowing individual offices to determine needs and justify equipment requests
- . Require a strong central management group (to be located in SER) to supervise the large-scale investment and to:
 - Establish and implement the Agency-wide Plan
 - Support and guide local office users of automation technology
- . Provide procedures for collection and analysis of performance data by both the users and the central management group, established to:
 - Monitor equipment and personnel problems for correction
 - Provide equipment and configuration advice
 - Evaluate office automation results.

This is a bold and aggressive approach to office automation implementation. The greatest benefits of this strategy are that AID will rapidly derive major improvements in productivity, work flow and coordination. These benefits are a direct consequence of the scale of the system configuration.

If fully implemented, the system will connect all major offices in an integrated network. Of course, careful management of the Plan's implementation is required, as a consequence of the Plan's scale and short time-frame.

2. THE PLAN IS DIVIDED INTO TWO STAGES

The office automation implementation plan is divided into the following stages:

- . Plan A—Improvement of clerical productivity by building a core network of office automation equipment satisfying the immediate word processing and communications needs of many USAID and AID/W organizational units. This stage includes the following steps:
 - Equipment acquisition
 - Process and systems evaluation
 - .. Procedural reviews
 - .. New procedure design
 - .. Workload and staffing adjustments
 - Personnel training.

Plan A is planned for the first two years of the implementation period.

- . Plan B—Expansion of the breadth and depth of the network coverage to include more processes and more organizational units. The network's capabilities would be expanded, and the emphasis would shift from improving clerical to improving professional productivity. Plan B is planned to cover the last three years of the implementation period.

Plan A is developed in detail to permit immediate implementation. Plan B provides broad direction and guidance for implementation and a cost projection base. The implementation costs for the plans should be approximately:

- . \$5,500,000 for Plan A, including some 28 person-years of effort (of which 2/3 will be contract service) directly associated with the plan
- . \$11,300,000 for Plan B (in 1979 dollars), including 45 person-years of effort (of which 30 will be contract service).

3. THE SYSTEM USES A VARIETY OF COMPATIBLE TECHNOLOGIES TO PROVIDE ADEQUATE INFORMATION PROCESSING CAPABILITIES AT REASONABLE COSTS

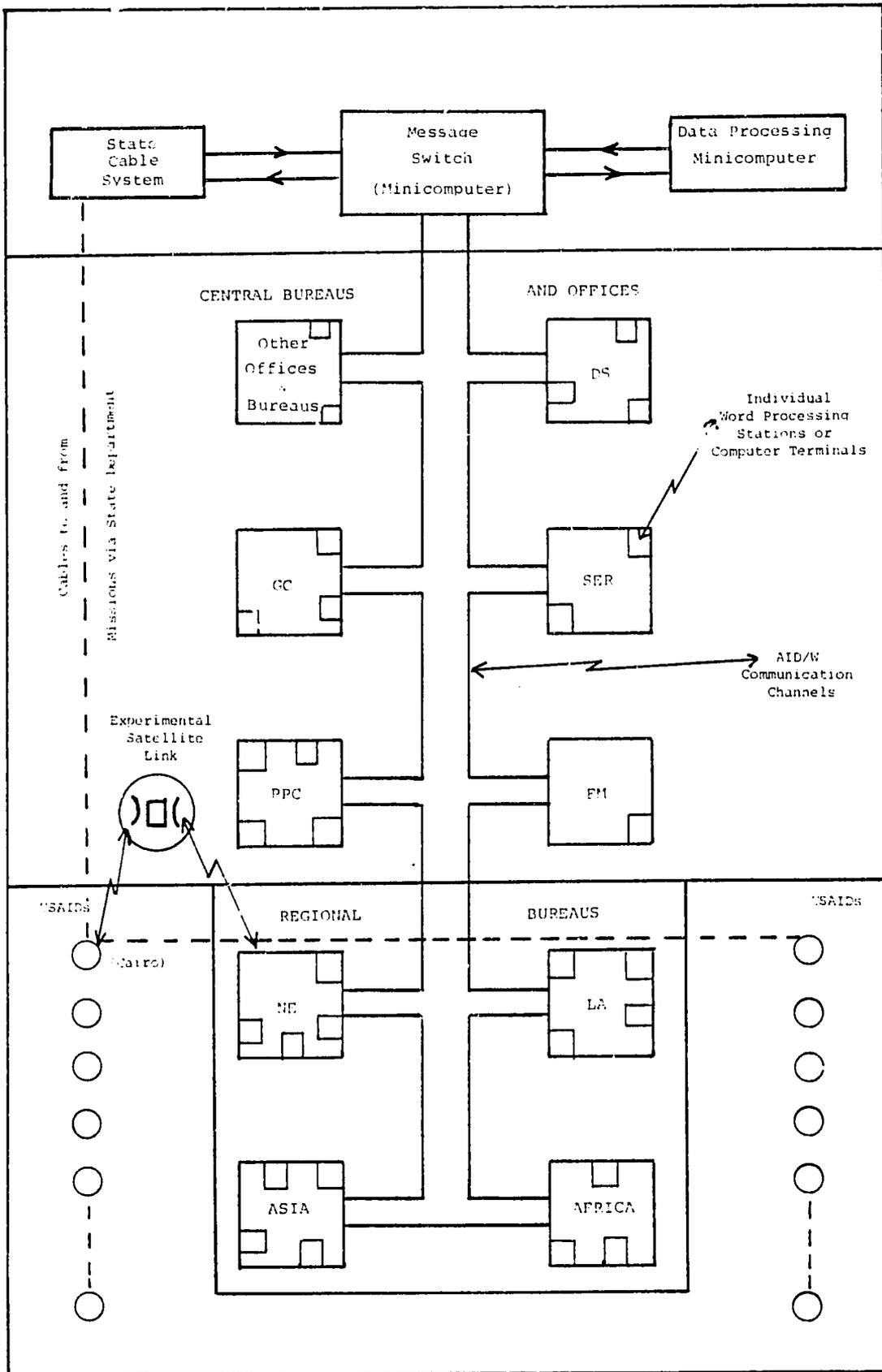
The system design describes an integrated network of information processing and communications equipment. Exhibit 3, following this page, graphically illustrates the information channels which would be used among the missions and offices at AID/W. The system consists of:

- . A central telecommunications network interconnecting all participating elements of AID/W
- . Separate word processor units in individual offices
- . A data processing system that permits broad access to files and documents
- . Optical character recognition scanners and electric typewriters with OCR fonts to link even remote sites with AID/W.

The plan uses a modular approach, allowing AID to quickly build the system in those missions and regional

EXHIBIT 3

Conceptual Office Automation System



bureaus in which the need is greatest and there is commitment to the system. Those offices where the need is not as great or which do not make commitments to the system could be added later during the implementation phase.

4. A CENTRAL AUTHORITY IN SER WOULD MANAGE THE SYSTEM IMPLEMENTATION

A strong management structure is vital to the plan's success. A central authority located in SER is suggested which would be responsible for:

- . Monitoring all aspects of the plan's implementation
- . Ensuring adherence to established compatibility standards
- . Assisting AID Office of Personnel in classification and training activities
- . Providing assistance to requesting AID offices on such issues as equipment usage, training plans, and new work procedures
- . Assisting in the cost analysis and justification for procurement of equipment.

5. IMPLEMENTATION OF THE PLAN WILL SIGNIFICANTLY BENEFIT AID

The careful implementation of the office automation plan will provide AID with increased communications capabilities, reduce duplication of effort and increase staff productivity. These benefits will come at a time when staff resources will not be augmented and may even be reduced and program appropriations will be increased. The

plan outlines a process for implementing a system which is fully cost-justified, for training staff to use it properly and for maintaining equipment compatibility and usage.

The Agency spends an estimated \$62 million annually on the CDSS, PID/PP, ABS, and CP processes alone. By way of comparison, the automation plan will cost an average \$3.4 million annually. Clearly, an improvement in clerical and professional productivity of the magnitude typically obtained through office automation will fully justify this expenditure.

TYPES OF OFFICE AUTOMATION EQUIPMENT

This attachment identifies the three categories of office automation equipment used in the plan and provides brief definitions of each.

WORD PROCESSING

Word processing equipment is a sophisticated version of the electric typewriter. All word processing units have memory capabilities which allow the storage of typed information in electronic form. This stored information can be readily retrieved and printed to produce a typed, hard copy document. The memory capability also allows new information or revisions to be quickly and easily incorporated into the prepared text, without extensive retyping.

Additional equipment features may include:

- . Visual display screens
- . Text editing
- . Copying units.

Word processors can be used as standalone equipment (i.e., separate units in individual offices) or can be connected to other office automation equipment to send or receive data through a communications network.

DATA PROCESSING

Data processing equipment includes large mainframe computers, remote terminals, minicomputers and certain sophisticated word processing devices. A common feature in all data processing equipment is an ability to store, organize, and manipulate large volumes of data rapidly. This data can be textual (e.g., words or written narrative) or numeric (e.g., tabular, budgetary, statistical).

Data processing equipment can be programmed to arrange, re-group, compute, print or manipulate stored data. This equipment provides organized data in files and can be used to improve and expedite:

- . Reporting, e.g., accounting and personnel
- . Statistical analysis, e.g., economic data bases

- . Modeling, e.g., disaster assistance scenarios under a variety of circumstances
- . Monitoring, e.g., commodities shipment schedules.

Individual offices can obtain data processing assistance directly from equipment located in the office (i.e., mini-computers), from equipment kept in a remote geographic location (i.e., remote terminals linked to a mainframe computer) or indirectly from hard copy documents produced at another location on a mainframe or minicomputer.

TELECOMMUNICATIONS

Telecommunications technology makes it possible to transmit data instantly by electronic means using land (telephone) lines, satellite channels and/or radio waves. Equipment that support this data transmission includes communicating word processors, computer networks, facsimile transmission (telefax) equipment, message switching computers and more common devices like the telephone, telegram, telex, radio and television. These devices greatly reduce the time required to send and receive information. High speed digital data transmission (computer networks, telex, telefax) using land lines, satellite channels or radio waves can be especially useful for rapid transmission of long documents as well as shorter cables and memos. Offices linked through telecommunications network have direct access to one another, which can permit more responsiveness and better coordination.

IMPROVEMENTS IN THE PID/PP PROCESS THAT WILL
BE ACHIEVED THROUGH OFFICE AUTOMATION

The PID/PP process was one of five processes that were studied. This attachment identifies, in some detail, the office automation applications that can be made in the PID/PP process and the benefits that would result.

The project development cycle typically begins in a USAID where a design team prepares a Project Identification Document (PID). The PID outlines the project concept and implementation strategy. The PID is transmitted to AID/W where both regional bureau and central bureau offices review and comment on the design. If the PID is approved by AID/W, the design team expands the project concept into a more detailed document, the Project Paper (PP). Like the PID, the PP is also transmitted to AID/W for review and approval unless the mission has been delegated authority to approve the PP in the field without processing in AID/W.

The elapsed time of this cycle of events could be greatly reduced through the expanded use of office automation equipment. Further, both professional and clerical resources required to staff the PID/PP process would also be significantly reduced, as described below.

(1) Preparation of the PID and PP

By expanding its use of automation, AID can substantially expand its data bases and improve dramatically its ability to transmit rapidly the data to wherever it is needed.

Some of the larger USAIDs could be provided with large scale, rapid telecommunications capabilities to access information maintained in AID/W (in the DIS, ESDB, and other locations) and frequently required by design teams in the field. The information which might be useful to design teams includes:

- . An index and synopsis of approved and active projects in similar or related areas. This data might identify project ideas, strategies and solutions which have been explored in previous project design efforts.

- . An index and synopsis of background and information, statistics and other baseline data from previous work which supports the project under development.

The ability to rapidly access such information can improve the quality of a project design and reduce the professional labor required to produce the PIDs, PPs and their supporting documentation. With this kind of information:

- . It would take less time for contractor or new Agency staff to learn how AID develops a project
- . Experienced staff could quickly become well-versed in a new program area or a host country's requirements
- . Previous feasibility studies, survey results or other background information can be incorporated into the current design work, thus preventing the need to re-do previous work to develop the project.

(2) Typing and Revising the PID and PP

As design documents, both the PID and the PP go through many drafts before they are approved by the USAID and forwarded to AID/W. This drafting, proof-reading, revision and retyping process is time consuming for both clerical and professional staff. Where word processing equipment is available, mission staff would reduce the amount of time devoted to the multiple drafts of the PID and PP:

- . While the original project design must be completely typed, clerical staff need only retype those sections of the PID and PP that are changed, thus eliminating the need to retype entire sections of the document
- . Professional staff would save some proof-reading time, as only the revised sections must be checked for errors

- . Because revisions would be easily and quickly incorporated into the text, professional staff need not hesitate to add to or revise the text
- . Finally, the word processing equipment would produce an attractive, error-free final copy of the document, and if it is equipped with a copier, could produce several original typed copies of the PID and PP.

In summary, word processing equipment would speed the work flow in the preparation of these documents and permit the preparation of a high quality final product.

(3) Transmission and Distribution in AID/W

There are devices that can improve the transmission and distribution of PIDs and PPs from both major missions with word processing equipment and other missions with OCR equipped electric typewriters.

Missions that can maintain word processing equipment will not have to submit multiple hard copies of the PID and PP to AID/W. If a satellite link is available, the data can be transmitted directly to AID/W in electronic form. If one is not available, the disk or tape from the mission's word processing equipment (which stores the document in electronic form) can be hand carried to Washington or sent by mail (pouch).

Upon receipt in AID/W, the disk or tape would be put into a compatible word processing unit in AID/W (probably one of the offices in a geographic bureau) without retyping. The documents would be quickly reproduced in the receiving AID/W office, and the PID or PP would be electronically distributed to all reviewing offices in the regional bureau and participating central offices, if the equipment in these offices is linked by a message switching device into an AID telecommunications network.

USAIDs without word processing equipment would also benefit from a network in AID/W. While the lack of word processing and high volume telecommunications equipment would prevent the mission from transmitting the PIDs and PPs to AID/W in electronic form, electric typewriters in the mission would be equipped

to prepare text which can be converted into electronic form in Washington through use of an optical character recognition (OCR) type font. The original copy typed with OCR fonts in a USAID would be sent to AID/W where offices equipped with optical character readers scan the document, convert it into electronic form and store the data on a tape or disk. Thus, the USAID generated hard copy PID or PP document would be entered into the AID/W word processing system without retyping.

(4) Review and Approval

The capacity to quickly reproduce and distribute the PIDs and PPs in Washington reduces delays in the PID/PP review process. A longer review period, extended by rapid document distribution, can contribute to the development of higher quality documents and programs. Word processing equipment would also facilitate rapid incorporation of revisions to PID and PP documents during the review process in AID/W. With the electronic storage of original documents, AID/W offices can easily re-arrange text, add information and revise text to facilitate preparation of an approved PID and PP.

If substantial changes to the document are required for AID/W approval, word processing equipment would facilitate the production of the revised document. Missions need only prepare and submit the required revisions to AID/W, where they would be incorporated into the original document. This process will save both time and labor in USAIDs, particularly when a critical PP needs some re-working to obtain AID/W approval.

(5) Overall PID/PP Savings

Exhibit A, following this page, has been developed to illustrate the various steps involved in the PID/PP process and the impacts of automation.

- . The PID process begins ① in a USAID, where the document is originally prepared. Assuming that this is a mission to be equipped with word processing, e.g., Cairo, then the full advantages of ease of text preparation and revision are available.

Improvements in typing productivity of the order of thirty percent are realized across all of the aspects of text preparation. Since a typical PID can go through at least three, and as many as eight typed versions, it is apparent that word processing can save many days of work time in its preparation.

- . During the preparation of the PID, the PD and Tech offices of the regional bureau often help the USAID ② . Improved communications available in Washington via the message switching network will allow expedited handling of requests. The easy flow of cables via the message switch to action desks will support this process.

- . When the PID is approved for transmission to AID/W, it is sent ③ in the form of electrical storage discs (via pouch or messenger), and accepted into the word processing system in the Regional Bureau ④ . Once in the word processing system in Washington, the document can be:
 - Transmitted to all interested parties in the central bureaus for their review ⑤ and comment back to the regional bureau ⑥ .
 - Revised in accordance with text changes introduced after the review process is complete ⑦ , without retyping the whole text.
 - While the document is circulating in Washington, tentative revisions can be prepared at any office involved in the review process by additions or deletions via word processing.
 - Revisions involving budgetary considerations, or existence of supporting facts are aided by data processing assistance available at terminals in central and regional bureaus ⑧ .

The advantages of supporting the PID/PP process with office automation technology are clear. The elapsed calendar time now required to produce, transmit and distribute the documents can be reduced significantly. As a result, the quality of the programs and supporting documentation can be improved because of the additional time that can be made available for program design and review. Further, the labor necessary for typing (clerical), proofreading (professional and clerical), and document production and distribution (clerical) will be reduced substantially by automation. Those savings in productivity can be translated into an increased ability to perform more work or to reduce the staff necessary to conduct the same amount of work.

All target processes would similarly benefit. The same applications of automation are planned, and similar benefits would be obtained.

I. INTRODUCTION

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I. INTRODUCTION

The United States Agency for International Development (AID) contracted with Booz, Allen & Hamilton Inc. to examine the information processing and paperwork requirements associated with the Agency's programming process. The purpose of the study, conducted over a three-month period, was to develop a broad strategy to assist the Agency's efforts over the next five years in realizing the potential benefits of office automation.

The basic mission of the Agency is to implement "assistance programs designed to help the people of certain less developed countries develop their human and economic resources, increase productive capacities, and improve the quality of human life, as well as to promote economic or political stability in friendly countries (AID HANDBOOK 17: 1-2)." To fulfill its mission the Agency must:

- . Identify and assess possible projects
- . Determine how its limited resources are best used among the vast array of alternatives
- . Make certain that the approved projects are well-planned, utilize needed expertise, and executed within schedule and budget.

This work of the Agency creates a large demand for information. The information is processed by multiple offices

both in Washington and the field and requires timely response and prompt action. The pressures created by the vast amount of information have led the Agency to explore how office automation technology could contribute to more efficient and effective processing of the Agency's work.

1. THE PURPOSE OF PROJECT ASAP IS TO DEVELOP AN OFFICE AUTOMATION STRATEGY FOR AID

The Bureau for Program and Management Services (SER) established the study of Automated Systems for Agency-wide Processing (Project ASAP) in response to the problems associated with the Agency's needs for information and paper processing. The purpose of Project ASAP is to explore opportunities where office automation systems could improve the Agency's efficiency and effectiveness and to develop an office automation strategy.

Office automation technology is a relatively new resource available to managers to enhance the effectiveness of their operations. Like other federal agencies, AID has made some initial investment in office automation technology. With an office automation strategy, AID managers hope to systematically harness the potential benefits of automation to the work requirements of the Agency.

2. THE USE OF OFFICE AUTOMATION EQUIPMENT IN THE FEDERAL SECTOR IS EXPANDING AND THE REQUIREMENTS FOR JUSTIFYING ITS ACQUISITION ARE BECOMING MORE STRUCTURED

Until recently, few Federal agencies had established a central office automation plan or conducted evaluations of the results of introducing automation to the Federal office. The Office of Management and Budget (OMB) and the General Services Administration (GSA) in particular have become actively involved in approaches to office automation. These agencies, and others with related interests in Federal sector productivity and effectiveness, are preparing new guidelines structuring the use of automation in Federal agencies. OMB requires Federal agencies to review periodically their office automation requirements and develop long-range plans. The GSA has prepared new regulations for the purchase and lease of office automation equipment which became effective on October 1, 1979. In addition, Federal agencies are expected to provide more rigorous justification of word and data processing equipment to meet the evolving requirements of auditing and oversight organizations such as the General Accounting Office (GAO).

To help AID maximize the benefits it receives from the use of automated office equipment and to effectively meet the emerging Federal requirements, this study was designed to address several key questions:

- . What are appropriate investments in automation technology for AID?
- . How can the Agency use office automation resources most effectively in the near-term (the next two budget years) and the long-term (the next five budget years)?
- . What strategic alternatives can the Agency employ to effectively utilize office automation in the USAIDs and in AID/W?

This final report presents the general findings and conclusions of the study and discusses several options for the introduction of expanded automation throughout AID. In effect, it summarizes the work that led to the selection of a specific strategy for AID and to the development of the office automation plan. The office automation plan, presented under separate cover, presents the objectives, action steps and order of magnitude cost estimates for implementing an integrated office automation system throughout the Agency.

3. FIVE KEY PROGRAM PROCESSES WERE STUDIED IN AID/W AND THE FIELD TO IDENTIFY AREAS WHERE EXPANDED OFFICE AUTOMATION WOULD BE BENEFICIAL

AID managers selected five program processes for inclusion in the scope of this study. The information processing activities of the following processes were examined:

- . Project identification document/project paper process
- . Annual budget submission process
- . Congressional presentation process

- . Project implementation order processes for technical services and commodities
- . Non-project assistance process.

Other major processes were briefly examined to obtain an overview perspective on Agency-wide operations. These other significant processes, i.e., accounting, property management, personnel and administration, were explored in interviews with Agency staff, but were not subject to detailed investigation of office automation needs and opportunities. They are not included, therefore, in the discussions that follow.

Office automation, for the purposes of this study, is defined in its broadest sense to include a wide range of information management technology. The technology is generally grouped into three major categories:

- . Word processing
- . Data processing
- . Telecommunications.

Although some of the latest technological developments tend to blur the distinctions among these categories (i.e., some word processing units can be interconnected to provide communications linkages and can be enhanced with data processing capabilities), these three groupings are still

useful for describing the kinds of equipment an office requires or may effectively utilize.

4. THE STUDY METHODOLOGY WAS DESIGNED TO IDENTIFY AREAS IN THE FIVE STUDY PROCESSES WHICH ARE MORE PROBLEMATIC IN TERMS OF INFORMATION PROCESSING AND ATTENDANT WORK FLOW

Documentation of the five processes available in AID Handbooks, guidance materials, sample documents and policy and procedures analysis memoranda was analyzed to develop a working knowledge of each process. Each process was examined to identify the:

- . Key documents produced in the process
- . Offices handling the information and documents generated in the process, distinguishing between offices which:
 - Prepared the document (wrote, typed and reproduced the information)
 - Revised the document (re-wrote, re-typed and reproduced the corrected information)
 - Reviewed or cleared the document (verbal as well as written communication)
- . Number and volume of key documents
- . Time frame and sequence of clerical and professional work tasks.

Interviews were then conducted with over 100 AID staff members whose selection was coordinated by SER/DM. The interviewing rationale was to speak with the manager of each major organizational unit in AID/W and the two selected

field sites. In several offices, more than one office representative was interviewed. A total of 46 offices in AID/W, 13 offices in the Cairo USAID and 16 offices in the USAID and REDSO organizations in Nairobi were included in the study interviews.

Study participants were asked to describe their offices' work in the five study processes in terms of six criteria:

- . Labor intensity
- . High usage rate of information
- . Large volume of information
- . Large number of revisions
- . Timeliness
- . Continuity.

Work flow sketches were utilized to facilitate identification and discussions of processing problems.

* * * * *

This final report is organized in five chapters. The preceding chapter presented an overview of the study's purpose and approach. Chapter II presents study findings on AID's operating environment. Chapter III presents conclusions on opportunities for office automation in the study processes. Major conclusions addressing study questions

about the introduction of expanded automation Agency-wide are presented in Chapter IV. The last chapter discusses the risks and benefits of several office automation implementation options available to AID management.

II. AID'S OPERATING ENVIRONMENT

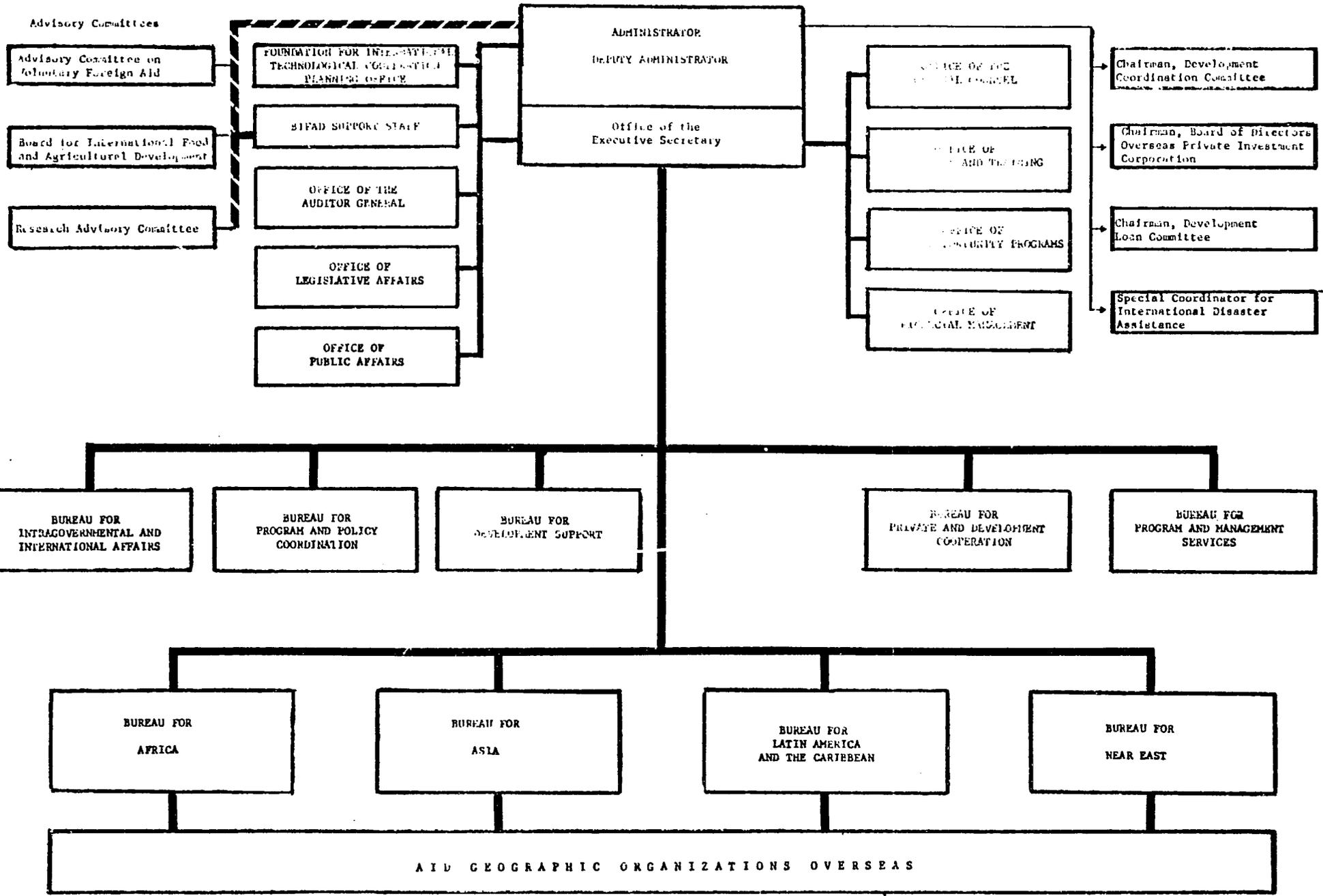
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II. AID'S OPERATING ENVIRONMENT

One of the major factors contributing to AID management's investigation of office automation options is the prospect of an increasing program budget with no additional staff resources. The Agency currently handles a high volume, steady flow of information not only among AID/W offices but between AID/W and the field. In addition, like many Federal agencies, AID managers are concerned about increasing the productivity of their clerical support. These and other aspects of AID's operating environment which must be considered in developing office automation alternatives are discussed below.

1. THERE IS A HIGH VOLUME, STEADY FLOW OF INFORMATION AMONG AID'S ORGANIZATIONAL UNITS, WHICH ARE GEOGRAPHICALLY DISBURSED IN WASHINGTON AND IN FOUR GEOGRAPHIC REGIONS

The Agency for International Development is organized into a Washington headquarters operation and a network of program operations offices throughout the world. The most recent organizational chart (effective 8-1-78) is presented in Exhibit I, following this page. The Washington headquarters operation is organized into nine program offices assisted by ten administrative and support offices. The approximately 2,100 AID employees in the headquarters staff



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Effective Date: 8-1-78 (TM 17:171)

Organization Chart

Exhibit I

are located in eight buildings scattered throughout the Washington, D.C. metropolitan area. Office staffs are also geographically dispersed, for example:

- . The Bureau for Asia is located in two buildings, the State Department in Washington and an office building in Arlington, Virginia.
- . The bureau for Program Management Services is located in eight buildings, three in Washington, four in Rosslyn, and one in Alexandria.

Furthermore, office staffs located in the same office building may be housed on separate floors, thus adding to the dispersion of Washington staff.

AID operates approximately 71 overseas organizations which range from regional offices with comptroller and audit functions to individual field missions and project site offices. These overseas operations provide a mixture of project implementation, planning, and administration services in four geographic regions:

- . Africa
- . Asia
- . Latin America and the Caribbean
- . Near East.

Field operations are coordinated through four regional bureaus and central bureaus administering world-wide programs.

Communications within AID necessary to support AID/W and the field operations are constant and high volume. A recent internal AID study showed an average of 1,350 cables transmitted each day. The readership of those 1,350 daily cables (ranging from one paragraph to several pages in length) results in the production of 25,000 to 30,000 cable copies daily. The rapid transmission of cable data is supplemented by slower but more voluminous mail pouched and expedited at an average of 16,000 pieces daily.

While the volume of cable and mail traffic (which is supplemented by increasingly regular phone communication between the field and AID/W) is high, active communications are a necessity. Almost all mission activities require AID/W approval. Programs are conceptualized and developed in the field. Budgets are prepared in the field. Projects are created in the field. Contracts originate in the field. With few exceptions, all require AID/W review and approval, thus forging the communications link between AID/W and the field.

2. AID ANTICIPATES AN EXPANDING PROGRAM BUDGET AND INCREASING WORK LOAD WITHOUT ADDITIONAL STAFF RESOURCES

AID's work load is increasing in dollar terms, and in the view of professionals interviewed, in the number of projects and supporting documents processed. On the other hand, AID has experienced a dramatic reduction in staff

over recent years. Although the staff total has stabilized at approximately 5,600 positions, there are some indications that the Agency may incur further staff reductions.

The current level of clerical support may be measured in several ways. The Agency's Office of Personnel Management (PM) has developed the following professional to clerical ratios:

- . 6:1 professionals/secretaries and typists
- . 4:1 professionals/secretaries, typists, and clerks
- . 3:1 professionals/all non-professionals.

Like other Federal agencies, AID has been concerned about the level of clerical productivity, having experienced both high clerical turnover and unfilled clerical positions.

- . PM recently conducted an internal study which found a 20% clerical turnover rate.
- . The study attributed 36% of the turnover to delays in security clearance of provisional employees who sought other positions.

The high turnover affects clerical productivity in two ways. Offices may be faced with approved but unfilled clerical slots or they may be supported by new employees whose lack of AID-specific experience and sensitivity reduces their productivity.

Field operations also experience some difficulties with clerical productivity. Staff interviewed in the three field locations commented on the:

- . Mixed quality of local secretarial support
- . Reliance on limited American support
- . Loss of flexibility with hiring ceilings on Personal Services Contracts (PSCs).

The study team's interviews left the impression that established missions with long-term foreign national employees and missions operating in countries with a supply of well-trained secretaries and administrative staff are not faced with serious clerical support problems. New missions operating in countries without a supply of experienced office workers, however, are faced with limited clerical support resources.

Professional staff in both AID/W and the field expressed concerns over the quality of clerical performance. These concerns, which are common to the Federal office environment, included:

- . Support staff lack training in technical skills and in AID-specific knowledge
- . Support staff type what they see on a page, without looking for or correcting obvious errors.

- . High performers are promoted up and out of their clerical responsibilities.

As a result of the current range in quality of clerical support provided to the Agency, professional staff are performing a variety of more clerical tasks, e.g.:

- . Proofreading for typing errors
- . Document reproduction
- . Hand carrying documents or messages
- . Filing and retrieval
- . Scheduling meetings, appointments
- . Making travel arrangements.

In the interviews, AID professionals reported devoting anywhere from 15% to 40% of their time to such tasks, thus detracting from their other work responsibilities.

3. CURRENTLY, THERE IS SOME OFFICE AUTOMATION IN 18 OF THE 19 AID ORGANIZATIONAL UNITS

Exhibit II, following this page, presents the current inventory of word processing units, automated data processing systems and computer terminals in use throughout AID/W. As the exhibit shows, some level of office automation has been introduced into every AID/W organizational unit except the Office of the Auditor General.

(1) Word Processing Units From a Variety of Manufacturers are Dispersed Throughout AID/W

There are currently 66 word processing units in 17 AID/W offices. The installations are generally

EXHIBIT II

Inventory of Office
Automation Equipment

<u>OFFICE</u>	<u>WORD PROCESSING UNITS</u>	<u>ADP SYSTEMS</u>	<u>COMPUTER TERMINALS</u>
A/AID	1		
ES	1		
BIFAD	1		
LEG	1		
OPA		1	2
GC	5		
PM	5	2	7
EOP	1	1	1
FM	8	15	9
AG			
11A	2	1	1
PPC	4	2	14
DS	7	4	11
PDC	8	6	5
SER	12	6	6
ADR	2	1	1
ASIA	2	1	2
LAC	4	1	4
NE	2	1	1
	<hr/>	<hr/>	<hr/>
TOTAL	66	44	64

used for standalone applications to meet the work requirements of local operations. Most of this existing word processing is first-generation equipment which no longer represents the state-of-the-art. As a result, the equipment is incapable of providing AID with the benefits normally associated with contemporary word processing technology.

Existing word processing equipment has been acquired by individual offices to meet their specific needs. Purchased from a variety of vendors, the units are not compatible; that is to say, they cannot be connected as communicating units among the offices. Although all word processing expenditures must be centrally approved, current word processing equipment procurement policies differ little from typewriter procurement procedures.

At the initiation of this study, there were approximately 20 additional equipment requests outstanding.

(2) Data Processing in AID/W is Supported by a Central Computer Facility Operated and Maintained by SER/DM

An IBM 370/158 mainframe is operated by SER/DM for Agency-wide use. The Agency currently has over 44

major software application systems in operation. The Office of Financial Management is the Agency's largest single user of data processing with 15 systems in use and a \$6 million integrated financial management system (General Accounting System) under development. At least twelve additional AID offices have access to the Agency mainframe through computer terminals.

(3) State's Telecommunications System, Which is Currently Used to Handle Only Cable Traffic, Supports AID

AID is, for the most part, reliant on the State Department for telecommunications support in AID/W and among field missions. Cable traffic between AID/W and field missions is provided by the State cable network. Currently, select field locations are serviced by the TERP system, using a combination of optical character recognition (OCR) data entry terminals and automatic encoding for cable distribution. TERP will be installed in all embassy/mission communication centers over the next five years. It requires cables to be typed using a specified OCR typewriter font style so that they need not be rekeyed for entry into the system.

In addition to TERP, State is upgrading cable distribution in Washington with the installation of ARCS, an automated cable routing and distribution

system. AID is scheduled to receive ARCS equipment in the fall of 1979. The equipment will route all AID cables directly to a central distribution center where the cables will be analyzed and sorted for distribution to appropriate offices. The actual distribution of hard copy cables will remain a manual process.

AID is beginning to explore joint ventures with State in the areas of minicomputer, word processing and telecommunications. State is planning to install minicomputers in field offices worldwide, and AID has initially agreed to piggyback field mission computer use with State. Similar discussions are underway in regard to joint word processing procurements in the field.

(4) Office Automation Can Be Found In Select USAIDs On An Exception or Experimental Use Basis

AID has not extensively expanded office automation technology to USAIDs except for telecommunications. Word processing equipment has been used in Thailand for several years. This application is a notable exception to the norm of both manual and electric typewriters. Two additional visible experiments in the field are underway and are being supported by SER/DM. The Manila mission is installing a minicomputer for financial applications, and the Cairo

mission is installing equipment that provides data processing and word processing capability to support its information processing needs.

4. THE BUREAU FOR PROGRAM AND MANAGEMENT SERVICES (SER) MANAGES AID'S WORD AND DATA PROCESSING RESOURCES AND MAINTAINS LIAISON WITH THE STATE DEPARTMENT'S COMMUNICATIONS CENTER

AID office automation responsibilities are divided among the Office of Data Management (SER/DM) and the Office of Management Operations (SER/MO). SER/DM manages the central computer facility and provides the following kinds of data processing services:

- . Systems design
- . Systems update and maintenance
- . Training
- . Supervision of data entry contractors.

SER/MO is responsible for:

- . Approving and authorizing word processing equipment
Managing reproduction services and the distribution network
- . Maintaining liaison with State Communications Center.

As a result of the shared responsibilities for office automation, no one office maintains an overview perspective

of AID's policies, procedures and investments in office automation technology. Further, little direct technical assistance in office automation technology is available to the AID/W offices and the field organizations interested in exploring comprehensive automation systems.

AID currently has neither centralized office automation planning nor a single organizational unit responsible for applying office automation technology to Agency problems. Office automation has grown in response to individual office requests and has been guided through use of procurement policies rather than a comprehensive plan.

III. OPPORTUNITIES FOR OFFICE AUTOMATION

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III. OPPORTUNITIES FOR OFFICE AUTOMATION

This chapter discusses the current flow of work in the program processes selected by AID for inclusion in this study and identifies how office automation will contribute to the efficiency and effectiveness of these operations.

Each study process is described in a work flow exhibit which shows key participants, major activities, and products of the process. For clarity of presentation, both the discussions and the exhibits are presented from the point of view of the regional bureaus. It should be noted, however, that the operation of these programmatic processes in the Development Support Bureau (DSB) and other AID/W offices which manage centrally-funded programs parallel those in the regional bureaus. In most cases, if the reader applies the description of USAID activities to the technical offices in central bureaus and of AID/W regional bureau activities to the program offices in central bureaus, a fairly accurate portrayal of the work steps and work content of the central bureaus will emerge.

A description of how office automation will improve information and paper handling in the study processes follows each work flow discussion. Office automation refers

to the wide range of equipment and procedures which assist professional and clerical staff in carrying out their work activities. Three major types of office automation equipment were examined in this study:

- . Word processing
- . Data processing
- . Telecommunications.

To facilitate the discussion of how office automation will improve the Agency's operations, the basic capabilities of each are described below.

Word processing equipment expands the capabilities of the electric typewriter. All word processing units have a type of memory that stores information typed into the system. The stored information can be readily retrieved and new information or revisions can be quickly and easily incorporated into the prepared text. Additional features of the equipment include:

- . Visual display screens
- . Text editing
- . Copying units.

Word processors can serve as separate units in individual offices, or, depending upon the specific equipment, can be

connected to other office automation equipment to send and receive information in a communicating network.

Data processing equipment includes large mainframe computers and their remote terminals, minicomputers and some sophisticated word processing devices. The common feature in all data processing equipment is an ability to store, organize, analyze and manipulate a large volume of data rapidly. The data can be textual, e.g., written narrative or words, or numeric, e.g., tabular data, budget figures, statistics, etc. The equipment is programmed to arrange, re-group and manipulate the stored information. Data processing provides organized information for reports (e.g., accounting and personnel reports), statistical analyses, (e.g., social and economic data bases), inventories (e.g., property management), and models (e.g., scenarios for providing disaster assistance under a variety of circumstances).

Telecommunications equipment rapidly transmits information from one point to another through telephone lines, satellite channels and radio waves. Transmission and reception equipments can include word processors, optical character

readers (OCR), facsimile machines, and message switching computers. These devices greatly reduce the time required to send and receive information.

1. THE COUNTRY DEVELOPMENT STRATEGY STATEMENTS (CDSSs)
CAN BE STORED ELECTRONICALLY TO PROVIDE READY ACCESS
AND TO PERMIT EASIER REVISION AND UPDATE

Although the CDSS process was not included in the scope of this study, some discussion of it is warranted. A new program process in AID (it was implemented in fiscal year 1979), the CDSS is defined as a strategic planning document, whose five-year forward perspective is to be updated annually. The process provides the strategic objectives for a country or central program which specific projects are targeted to achieve. The CDSS process is thus considered the initial decision-making step which provides the framework for both budget and project development activities. Exhibit III, following this page, presents the work flow in the CDSS process.

(1) The CDSS is a Five-Year Rolling Plan

The process begins with the preparation of the CDSS document in the missions and the CPSS (Central Program Strategy Statement) in the offices of central bureaus. The CDSS is most typically a 60-page narrative document which is revised as many as four times in the USAID before submission to AID/W. In addition,

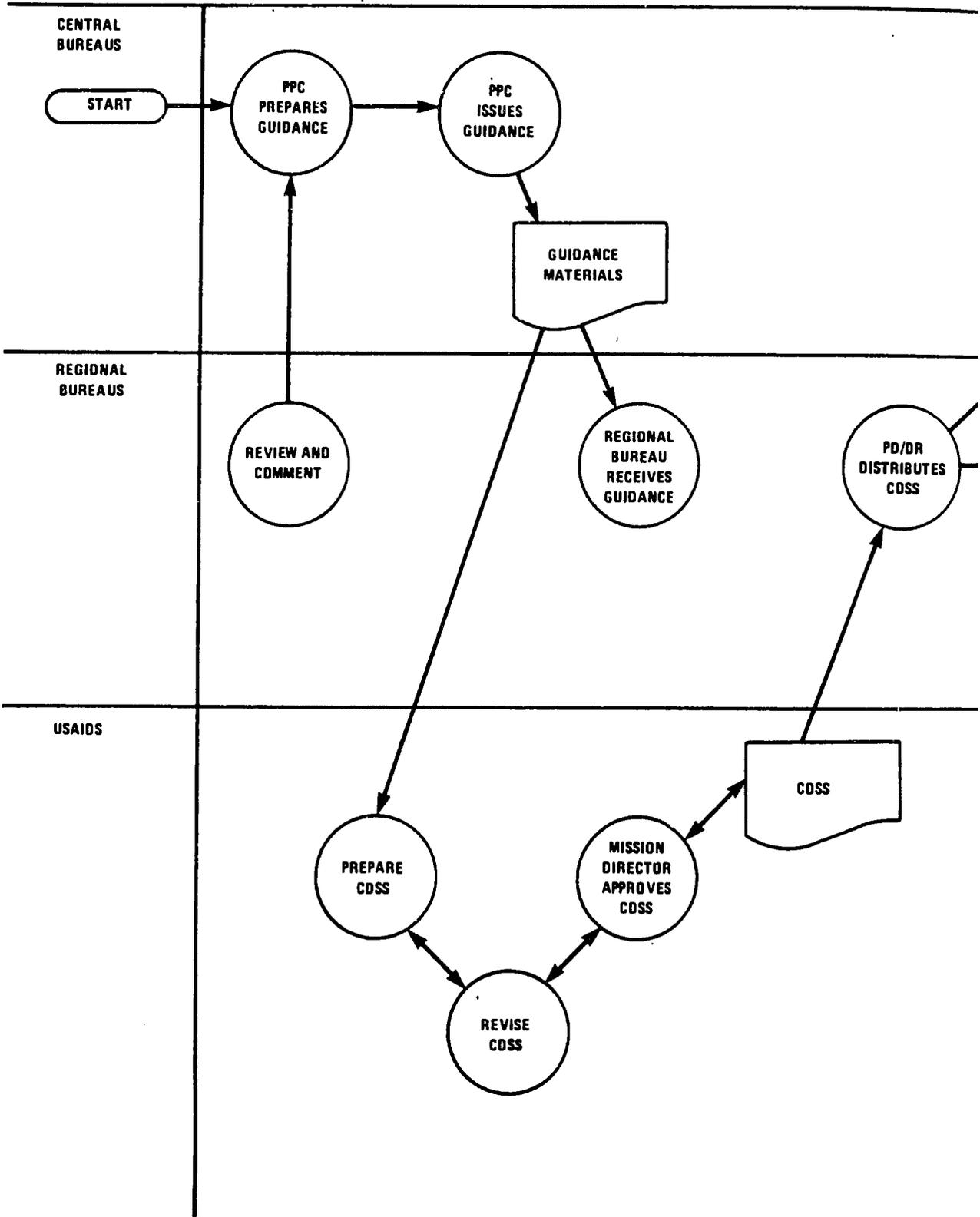
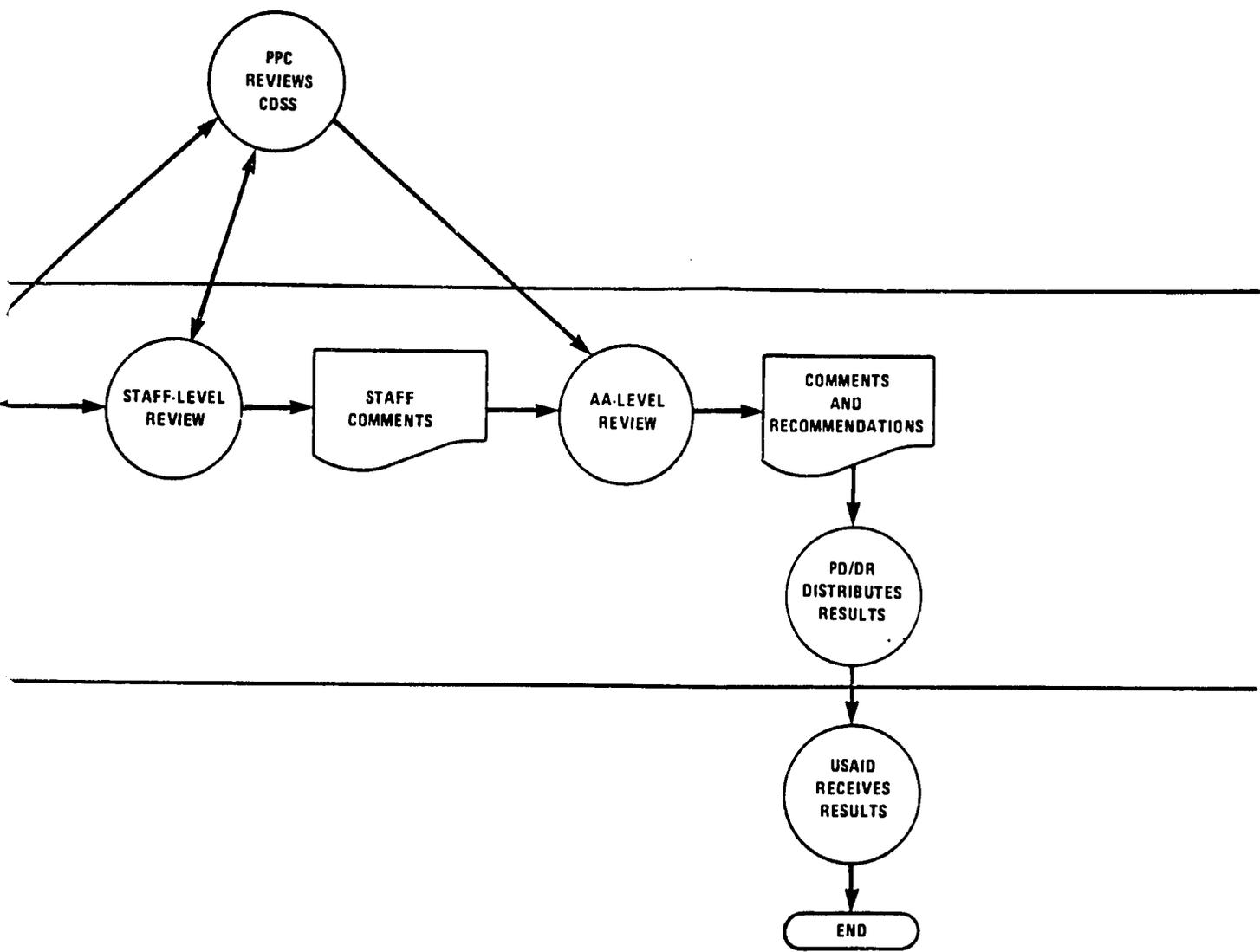


EXHIBIT III

Work Flow in the CDSS Process



the field interviews found that several USAID technical offices had prepared separate documents with detailed strategy statements for their program area which were also submitted to AID/W for review and comment.

The CDSS document is reviewed by the program and technical offices in the regional bureaus as well as by the Program and Policy Coordination Bureau (PPC). Comments and suggestions for revision of the CDSS are prepared by the reviewing office and forwarded to the USAID. AID/W approval of the CDSS results in establishment of an Approved Assistance Planning Level (AAPL) for the mission. The AAPL sets the upper budgetary limits on the USAID's ABS submission and is the mechanism which links strategic program plans to budget years.

(2) Word Processing Equipment Can Be Utilized to Facilitate Preparation of the Document From Year to Year

The most significant contribution of office automation technology to this process is an ability to reduce the amount of original typing and retyping associated with the production of the CPSS and the CDSS. In addition, the review and comment process in AID/W will be improved with equipment which reproduces and distributes the documents more quickly, thus making the document more readily available to reviewing offices.

The annual update and revision of the CDSS is time-consuming for professionals and clerical staff in the missions. Staff interviewed in the field indicated that they devoted five to seven weeks to preparing the 1979 CDSS. They did not anticipate the need to revise basic sections of the CDSS for next year's submission, but expected to prepare new program sections and annexes to reflect sector analyses and refinements in program strategies.

Word processing equipment will expedite the annual revision of the CDSS in the following ways:

- . Reduce the time professionals devote to revision through use of equipment which stores the CDSS and provides ready access to the text
- . Reduce the time clerical staff devote to typing by allowing the original copy to be revised on word processors.

This equipment can also make it possible for missions to transmit only revised sections and new annexes (rather than a completely revised CDSS) to AID/W. If Washington offices are equipped with word processing equipment compatible with that in the field, the regional bureau can store the CDSS and add the update information. The full text of the revised CDSS could then be prepared and reproduced in Washington, thus

eliminating the need for the mission to produce a complete, revised document for submission.

This process can be followed for missions without word processing equipment if electric typewriters in the field are equipped with an optical character recognition (OCR) type font. These missions can produce hard copies of the CDSS and its updates and transmit them to AID/W where optical character recognition processing equipment can read the hard copy and transform it into electronic form for storage and use by AID/W word processing equipment.

In the CDSS process as well as the other program processes studied, the reproduction and distribution of copies in AID/W can involve substantial time delays. These delays not only create frustration for staff who need ready access to the information but can reduce available review time. These delays in AID/W will be reduced with the use of word processing equipment with copying devices, communicating word processors, and other communications devices. In addition, where missions are linked to AID/W with telecommunications lines, it is possible to achieve same day transmission of the CDSS and other documents from the field to Washington. This capability may not be achieved by

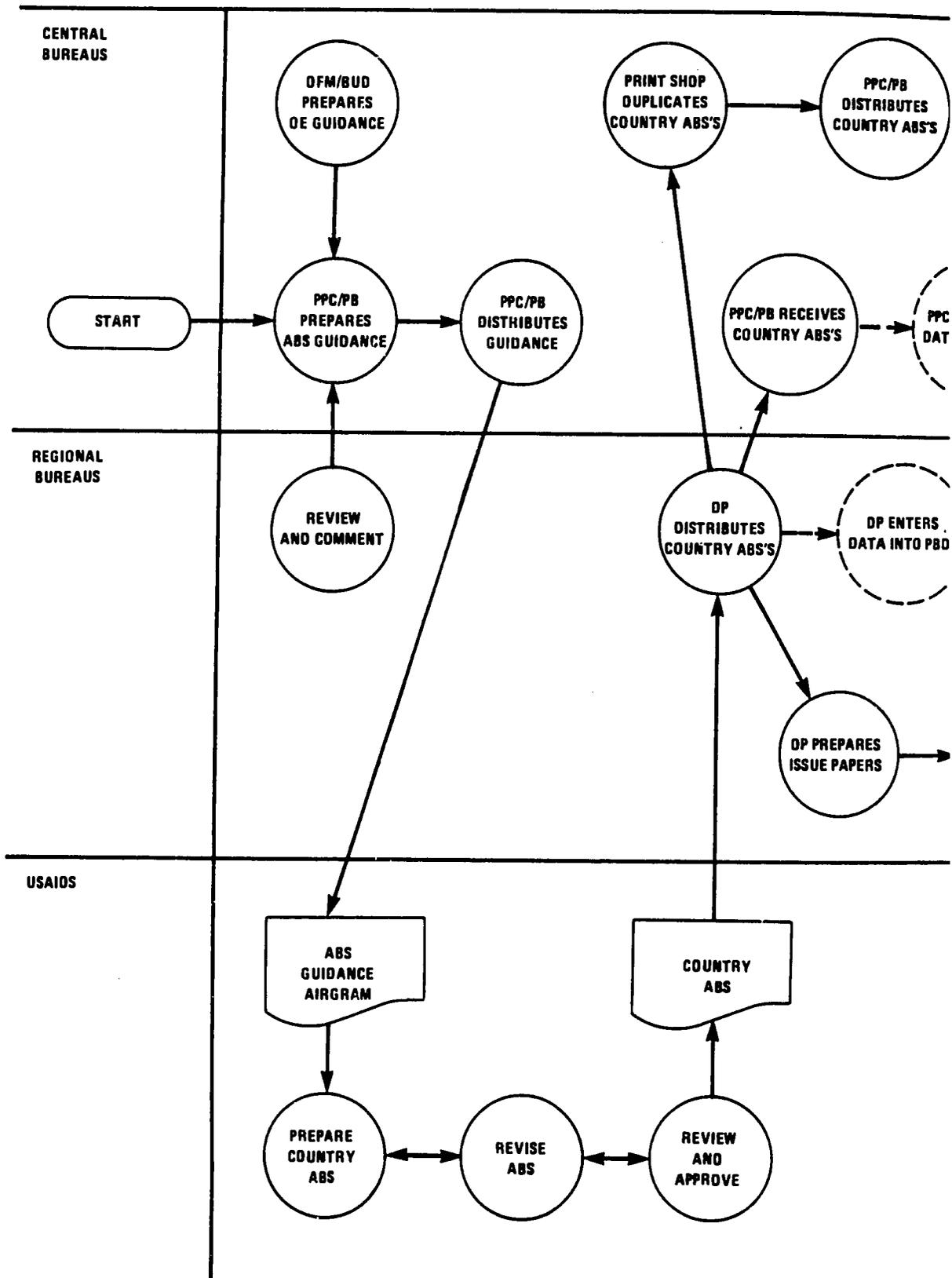
the Agency in the near-term, but it would greatly reduce processing delays resulting from the length of mail service delivery time between Washington and some field locations.

2. OFFICE AUTOMATION CAN SAVE STAFF TIME IN THE ANNUAL BUDGET SUBMISSION (ABS) PROCESS AND INCREASE THE QUALITY OF STAFF WORK

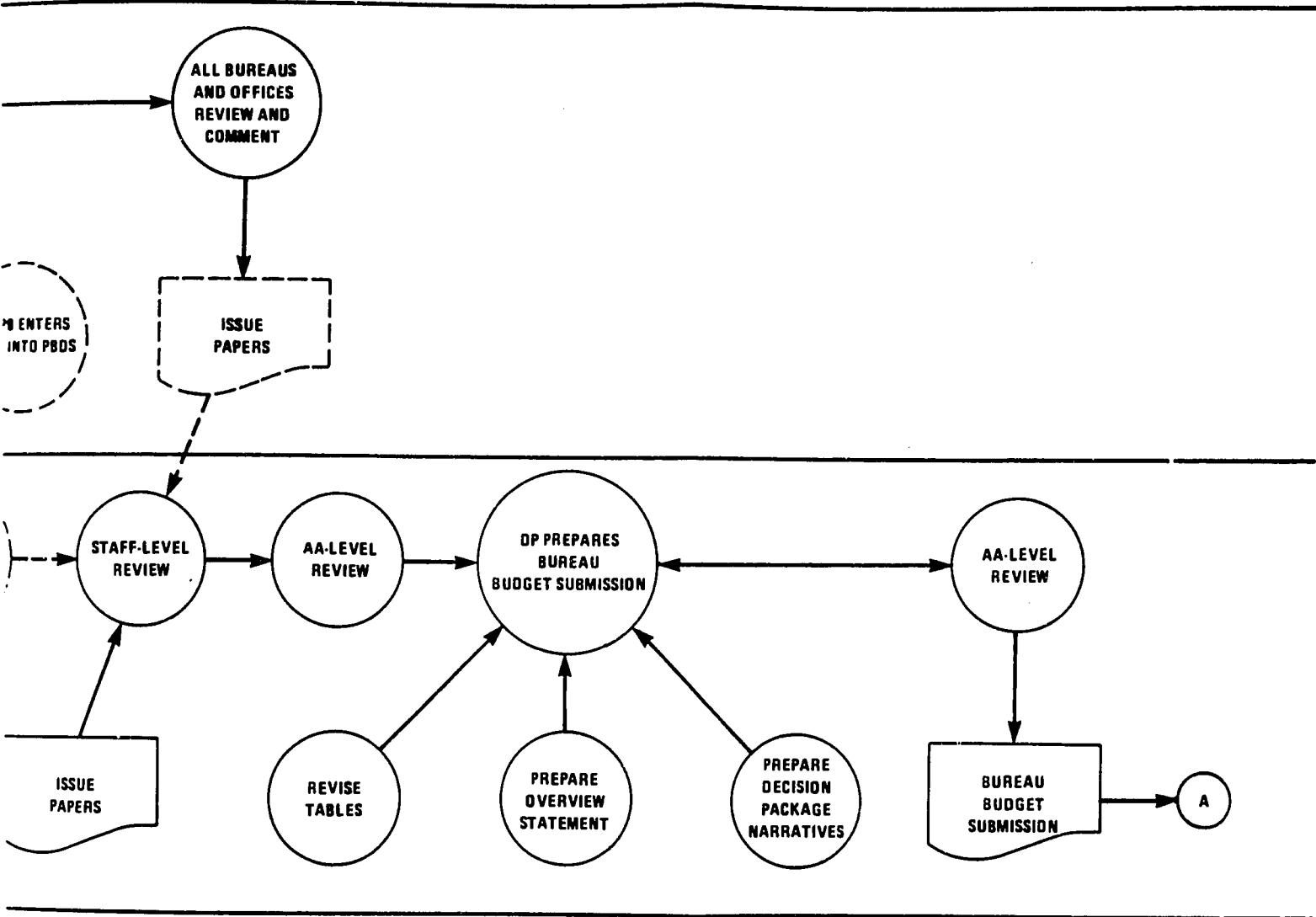
The Office of Planning and Budgeting in PPC (PPC/PB) is responsible for coordinating the development of the program budget while the Budget Division of the Office of Financial Management (OFM/BUD) has the responsibility for coordinating the operating expense budget. Every AID organizational unit becomes involved in the preparation of data for the ABS. The focus of this study, however, is directed to the offices and bureaus which have a major role in developing both program and operating expense budgets. The flow of work in the ABS process is depicted in Exhibit IV, on the following two pages.

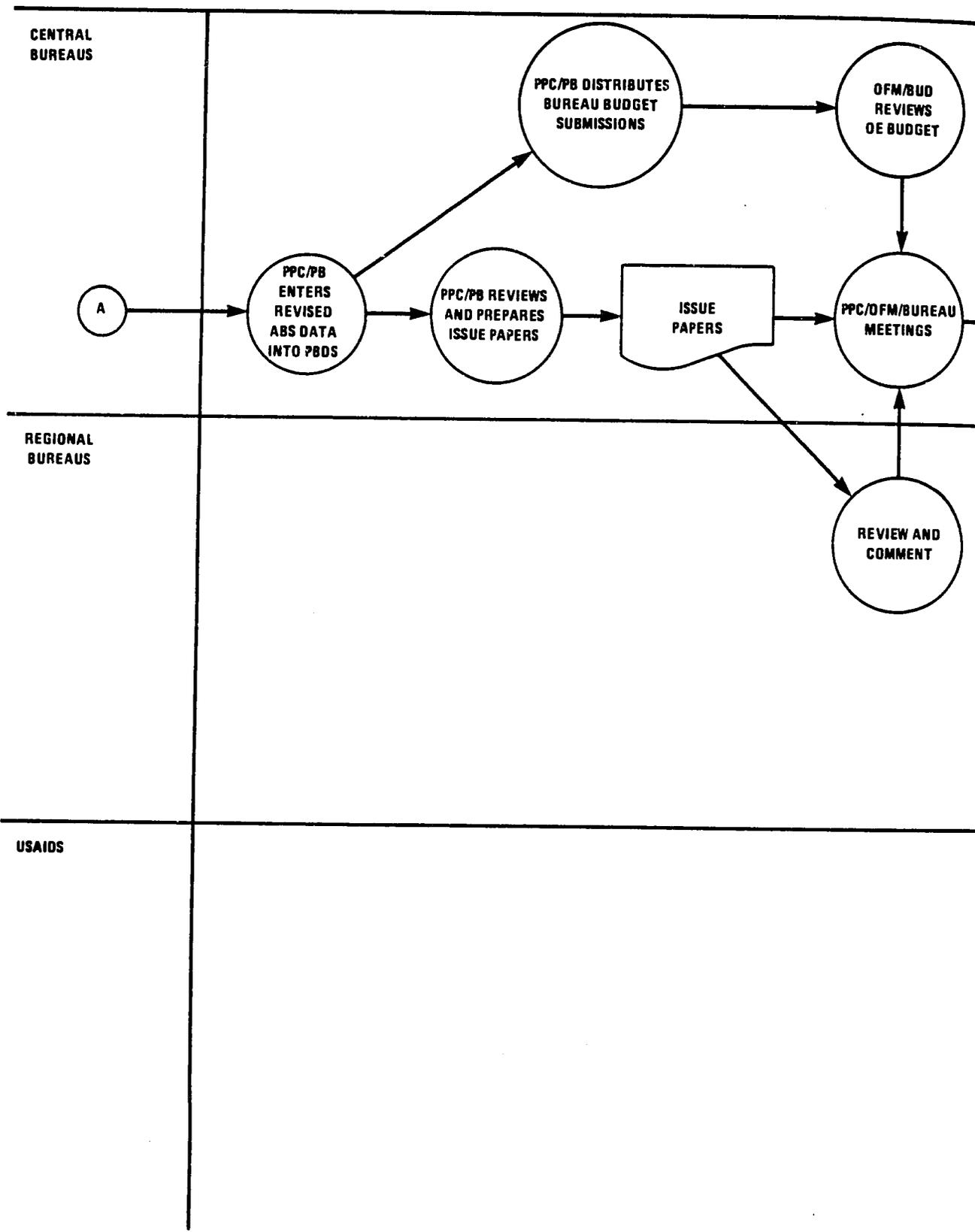
(1) The ABS Serves as the Agency's Zero-Based Budget Request for Program and Operating Expenses

Each AID mission prepares an annual Country ABS. The documents submitted in spring 1979 ranged from 3 to 103 pages in length and averaged 44 pages. The key budgetary data are provided in 10 pre-printed tables and include both program and operating expense budgets.

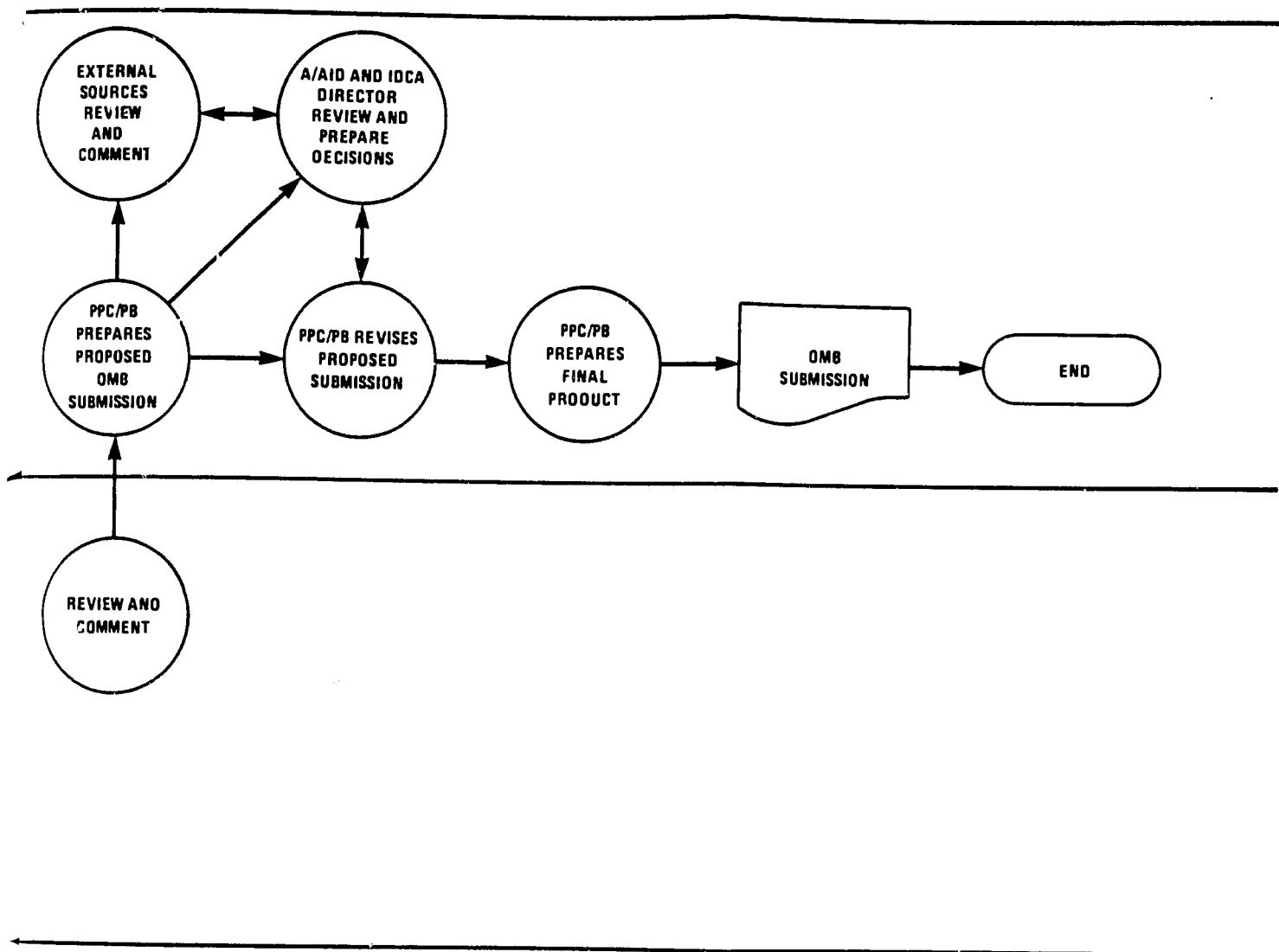


Work Flow in the ABS Process





Work Flow in the ABS Process



The documents also include one-page project sheets on all projects with a new or a modified funding request. The program office in the USAID manages the preparation of the document and supervises the revisions to both narrative and tabular sections of the ABS. Upon the approval of the mission director, at least three copies of the Country ABS are either sent by pouch or hand-carried to AID/W.

At the regional bureau level, the ABS process is managed by the Office of Development Planning (DP) in the Bureaus for Africa (AFR), Asia (ASIA) and Near East (NE) and by the Office of Development Programs (DP) in the Bureau for Latin America and the Caribbean (LAC). These offices:

- . Arrange the review meeting for each Country ABS
- . Prepare Issue Papers of two to three pages to frame review meeting discussion
- . Enter the tabular budget data from each Country ABS into the automated systems, Planning Budget Data System (PBDS) and Management Operating Budget (MOB), which support budget analysis and consolidation.

PPC/PB coordinates the review of the Country ABSs by handling the printing and distribution of copies and by entering the budget data into the automated systems for those regional bureaus which do not chose to enter it themselves.

The Country ABSs provide the base data for the development of the regional budgets. DP analysts prepare alternative decision packages for the regional budget and determine the impact of reductions and increases by project, country and budget allotments. Each modification of the budget data in the tables is entered into the PBDS or MOB, retyped and reproduced for distribution to other offices participating in the budget process. Each regional bureau concludes its budgetary process by submitting a request to PPC and FM.

Having participated in bureau reviews and monitored the development of their budget requests, PPC and FM conduct reviews of the bureau budget submissions, and assemble the Agency's Budget Submission. Following review and comment by the AID/A, the Director of IDCA and other responsible authorities, PPC/PB prepares final revisions and submits the final copy of the ABS to OMB.

(2) Word Processing and Communications Equipment Will Reduce Time Delays, and Data Processing Applications Can Provide Decision Making Support

There are several areas for improvement through increased office automation in the ABS process. Major areas include:

- . The transmission of hard copy ABS materials from the missions to AID/W and the reproduction and distribution of the Country ABS in AID/W can involve substantial time delays which reduce available review time.
- . The process of arriving at a final ABS requires multiple budget iterations and frequent retyping of draft budgets in AID/W offices.
- . Communications of activities and decisions during the ABS process are inefficient and frustrating for staff.

These processing difficulties present quality as well as savings issues for the Agency.

Office automation equipment will provide budget analysts and decision makers with more time and more information as they construct their budget and assess its implications.

- . More time can be devoted to the review of Country ABSs with more efficient reproduction and distribution equipment in AID/W.
- . Data processing applications can provide rapid data manipulation and scenario testing to support budgetary decision making at both the bureau and Agency level of analysis.

Error-free draft and final copy can be more efficiently produced on word processing units. This would relieve professional staff of some time devoted to extensive proofreading of large sheets of tabular budget data. It can also relieve some aggravation encountered when

incorrect revisions are found on tables which have undergone several revisions. A system of interconnected word processing equipment will permit a rapid exchange of the most current draft of a bureau budget among the DP office, the technical and program offices, and the AA's office to facilitate communication of the latest budget decisions.

Savings in the amount of clerical and professional staff time devoted to the ABS can also be realized. While the original text must still be typed into word processing equipment, only the new or revised information must be typed as additional drafts of the budget are prepared. Clerical labor currently used to retype untouched original copy can be reduced using word processing equipment. Savings in professional labor can come from data processing applications which rapidly perform budget data calculations currently performed manually. The savings in professional time could be used in several ways. For example, fewer staff could be used in the process or the same number of staff, released from some work activities, could devote more time to budget review, thus increasing the quality of ABS activities and decisions.

A further advantage of office automation is the ability to store and use ABS data for additional purposes. ABS information stored in electronic form is easily retrievable and can be used as the basis for preparing ABS briefing and supporting documents. More important, the tabular budget data can form the basis for an operating year budget data base available to all Agency offices.

3. OFFICE AUTOMATION WILL REDUCE THE TIME NEEDED FOR AND EASE THE REVISION OF MULTIPLE CONGRESSIONAL PRESENTATION DRAFTS

Congressional presentation activities overlap with those of the ABS process and complete the Agency's annual budget exercise. The process is managed by the Office of Legislative Affairs (LEG) and, like the ABS, requires the participation of the missions and almost all AID/W organizational units. Work flow in the CP process is presented in Exhibit V, following this page.

(1) The CP is a Detailed Line Item Budget Request Prepared Annually by AID

LEG initiates the process with the preparation of coordinating materials. These include a guidance package to the field transmitted as a cable or airgram and guidance to AID/W on final preparation of the main volume and annexes of the CP. The USAIDs provide basic inputs for the process. The program office manages

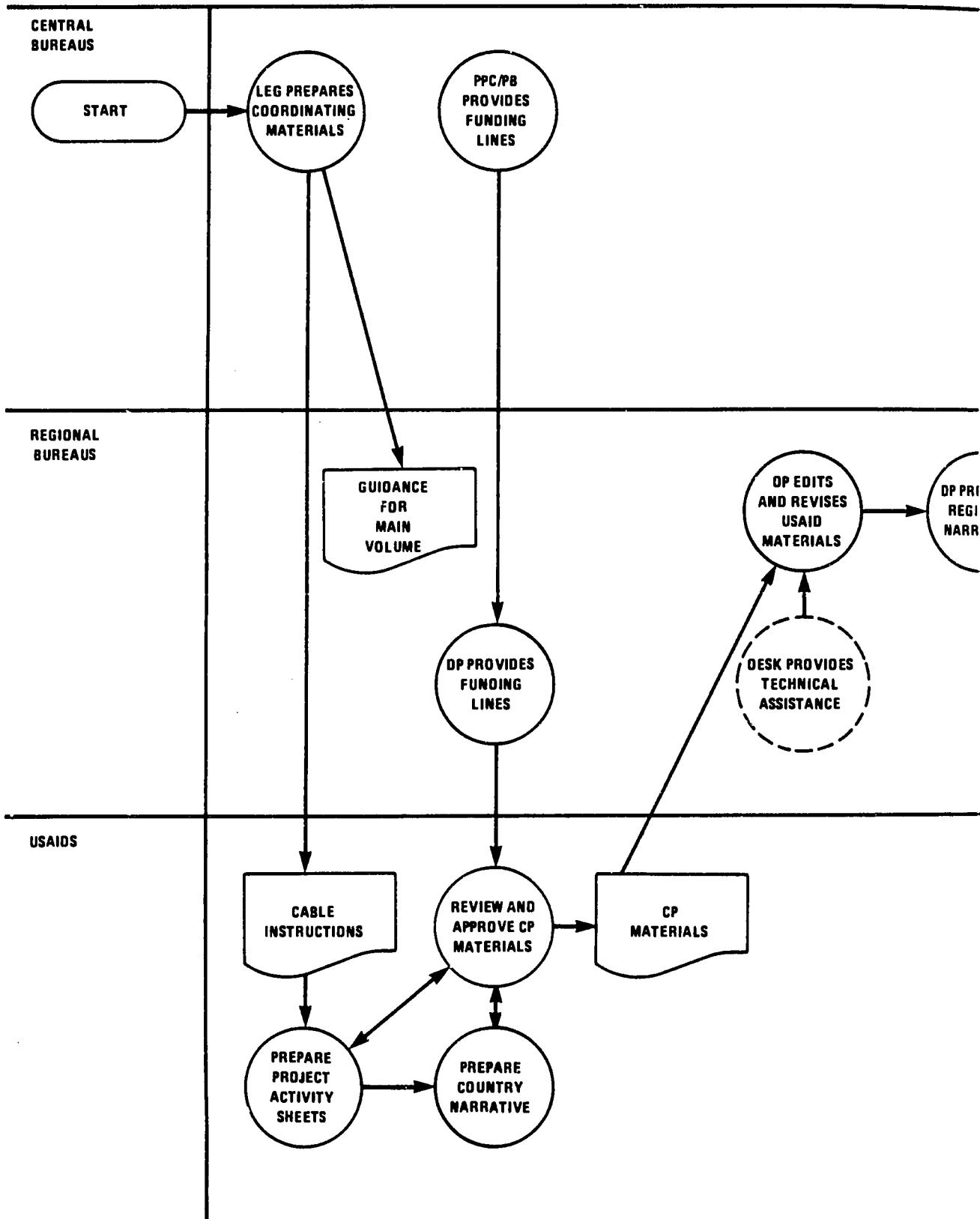
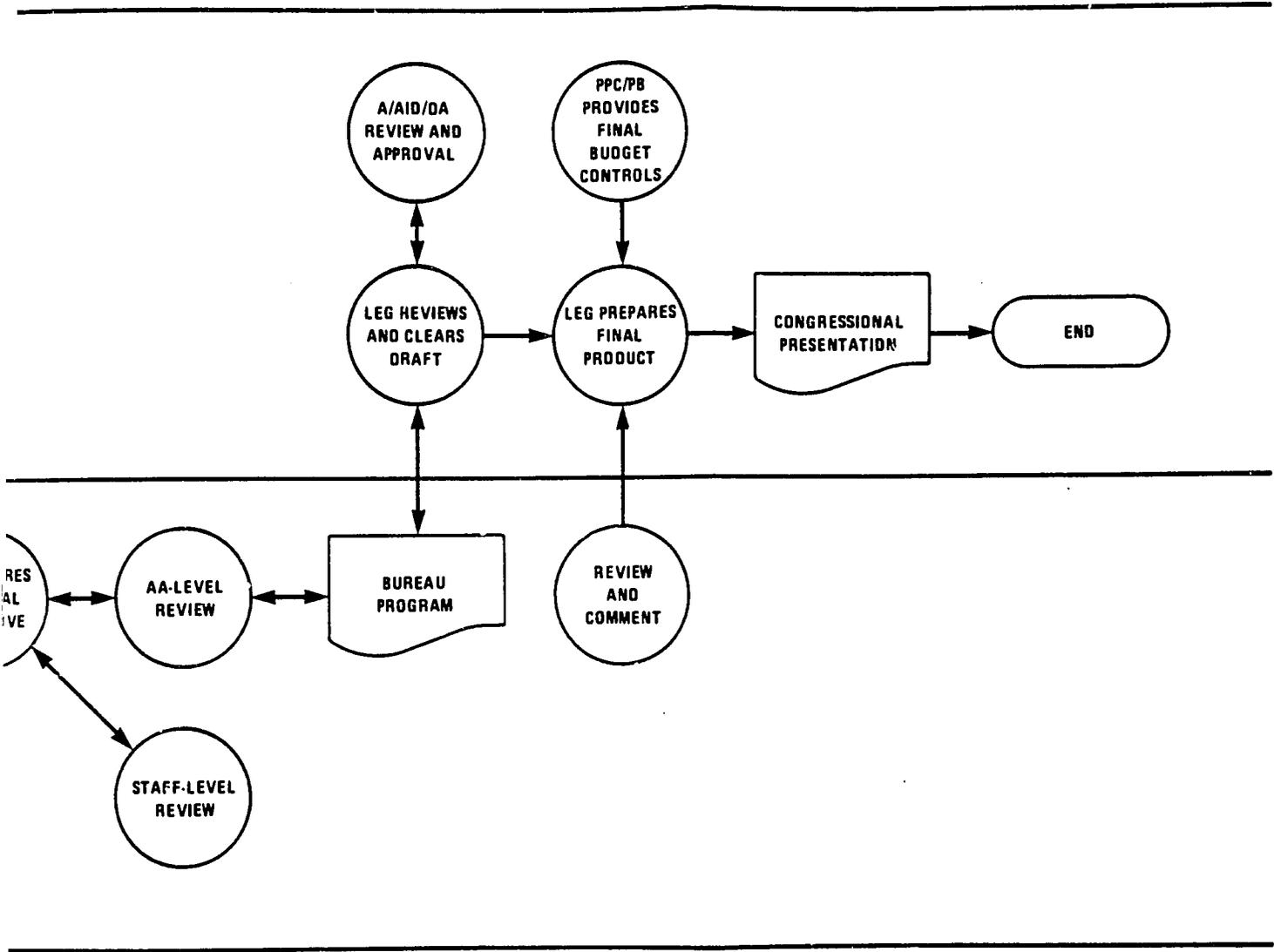


EXHIBIT V

Work Flow in the CP Process



mission efforts to prepare a country program and budget overview narrative and a series of one-page project sheets for each country project with a new or modified funding request.

The DP offices in the regional bureaus also have a lead responsibility in the CP process with the full support and assistance of the project and technical offices as well as the country desks. The regional bureaus have several weeks after the submission of the ABS to prepare their CP assignments. The project sheets from the missions are revised and regional overviews are produced. Given the criticality of the CP document, it is subjected to intense review by several management levels. Some AID/W staff observed that sections of the CP went through as many as six revisions in Washington before becoming final copy.

The CP document is large. The main volume which summarizes Agency programs and accomplishments totals about 150 pages. The five annexes on the four regional programs and centrally funded programs bring the total number of pages up to approximately 1600. The document can go final when PPC receives notification from OMB on approved budget marks. The final copy of the CP is completed on word processing equipment in LEG.

(2) Communicating Word Processing Equipment Will Improve the Preparation of CP Drafts Within the Compressed Time Schedule

An examination of the flow of work in the CP process shows the following opportunities for improvement:

- . Project activity sheets are prepared as fresh copy in the missions, although the information is similar to that in the ABS process.
- . The missions transmit reproducible copies of the project activity sheets to Washington, where review offices can make substantial revisions which create a large volume of typing.
- . Frequent, time-consuming revisions of the main volume and annexes of the CP are made by multiple review offices.
- . Inefficient distribution of drafts of the CP involves delays in processing.

Using the same procedures described for the CDSS process, mission work time in preparing CP inputs will be reduced through access to stored and easily retrievable background materials. If project activity sheets were kept in the memory unit of word processing equipment, usable copy would not have to be retyped, and revisions could be easily incorporated into the already typed text. Some word processors, in addition, can be programmed to store the format of the project

activity sheets. This feature could save clerical time by reducing the time it takes to align and type information on pre-printed, standardized forms.

Continuing to follow procedures outlined for increased efficiency in revising the CDSS, it will be possible for the missions to reduce the amount of information they have to send to Washington. Only revisions to usable project activity sheets would need to be sent to AID/W.

In Washington offices, the following benefits will be realized:

- . Word processing equipment can reduce the amount of professional and clerical time devoted to the preparation of CP drafts and their revisions.
- . Interconnected word processing units and other communications devices will rapidly transmit draft CP copies to reviewing offices.

As in the ABS process, office automation will improve the quality of CP processing. It will permit faster preparation and distribution of CP drafts which allows more time for review and consideration of improvements in the document. In addition, because word processing equipment simplifies clerical document revision, the equipment will reduce the hesitation some professional

staff experience when they would like to make a change but do not want to unnecessarily burden their clerical staff.

4. THE EFFECTIVENESS OF THE PROJECT DEVELOPMENT PROCESS WILL BE ENHANCED SIGNIFICANTLY WITH OFFICE AUTOMATION AND INEFFICIENCIES IN THE AID/W REVIEW AND APPROVAL PROCESS WILL BE REDUCED

Project development is a major Agency endeavor and approximately 600 Project Identification Documents (PIDs) and Project Papers (PPs) are prepared annually by the missions and AID/W offices. Exhibit VI, on the following two pages, presents the PID/PP work flow. The project development cycle begins with the development of a PID which, if approved, is expanded into a PP. Design activities for a PP are time-consuming and intensive and result in the creation of a substantial document for AID/W review and approval. If approved, a Project Agreement is prepared in final form for negotiation and signature with the host country. Project implementation activities for mission projects can be initiated only with a signed Project Agreement.

(1) The Agency's Projects are Designed, Reviewed, and Approved in the PID/PP Process

As noted above, the PP is substantially larger than the PID. The purpose of the PID is to outline the project concept and delineate its requirements for

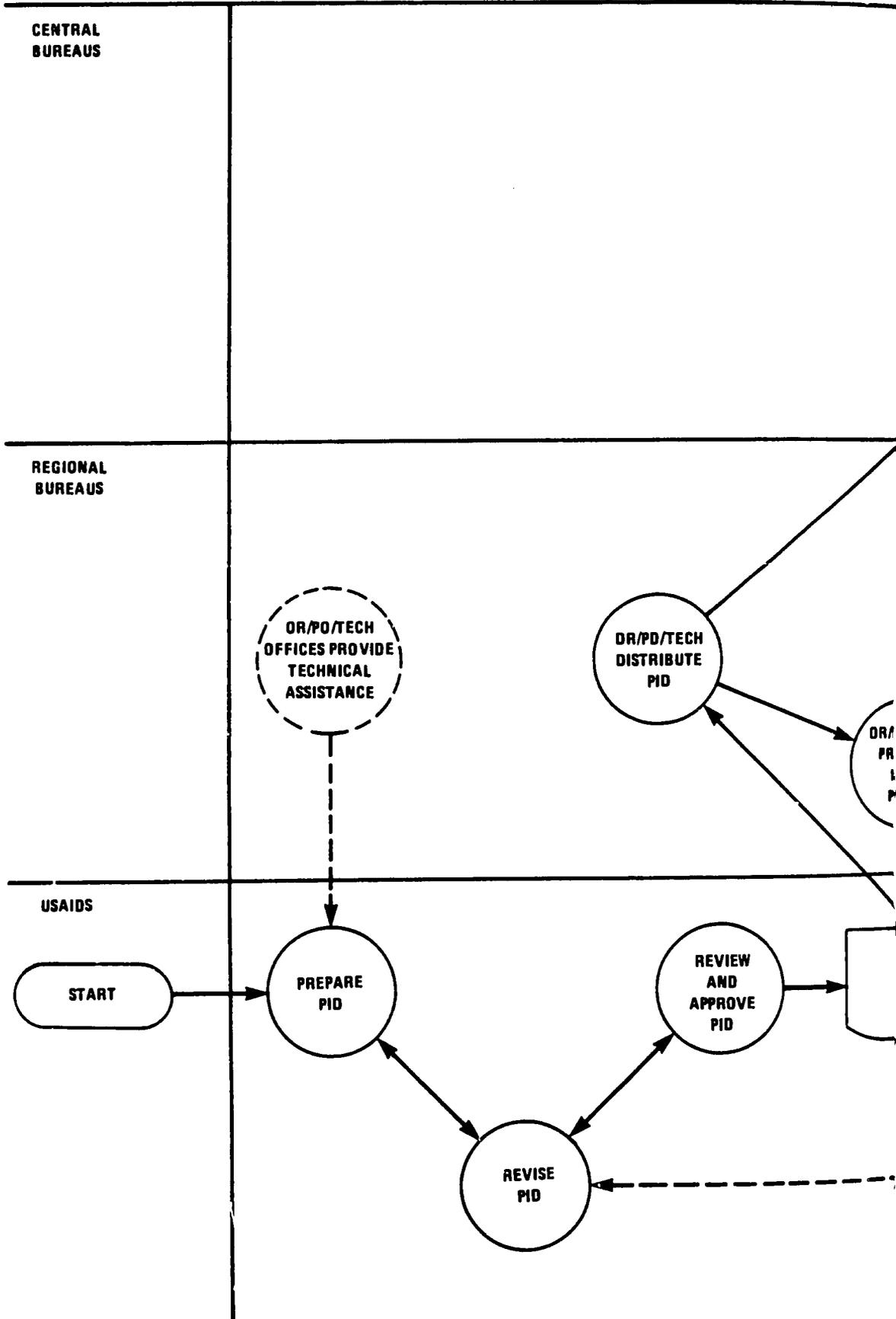
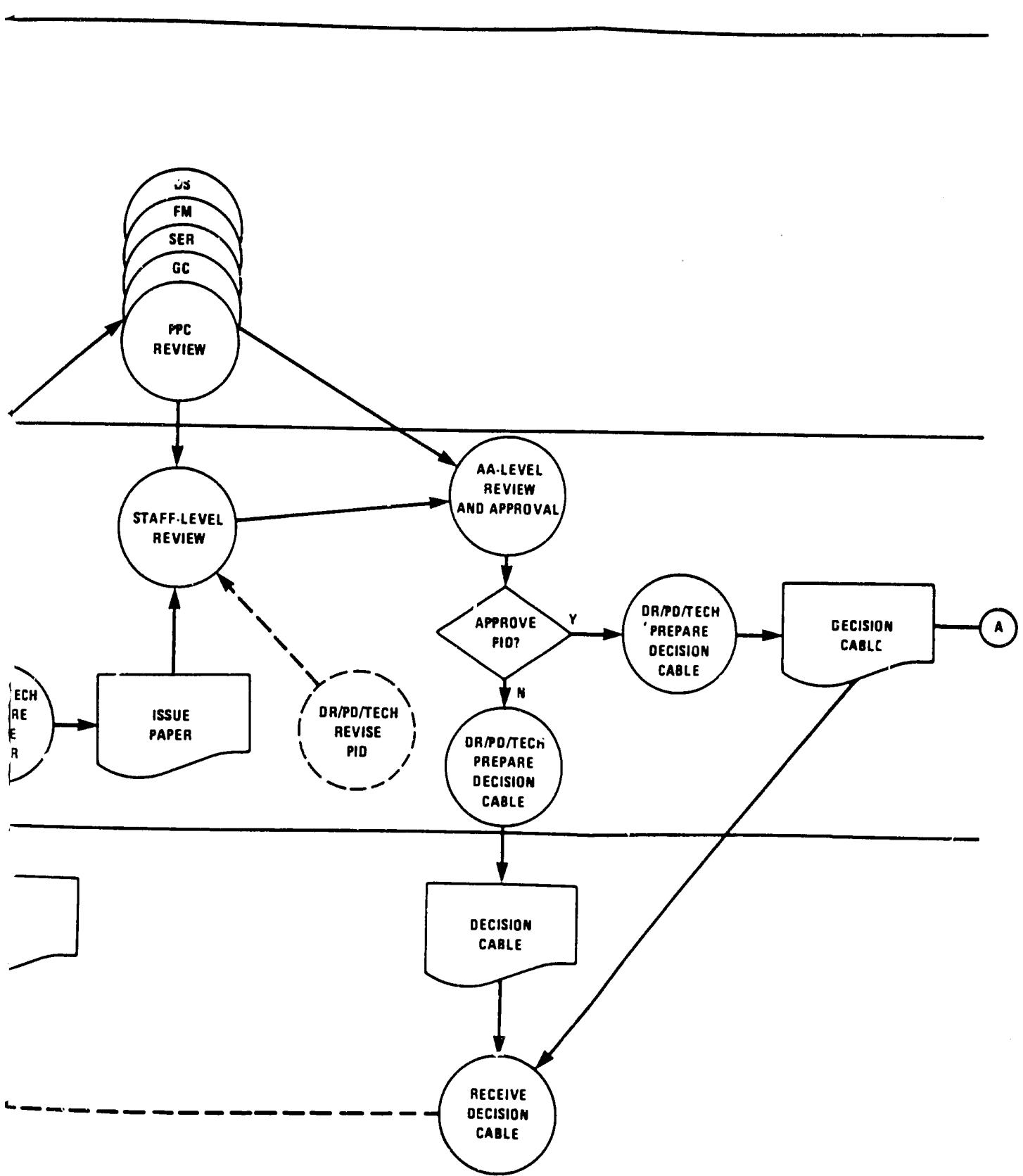


EXHIBIT VI(1)

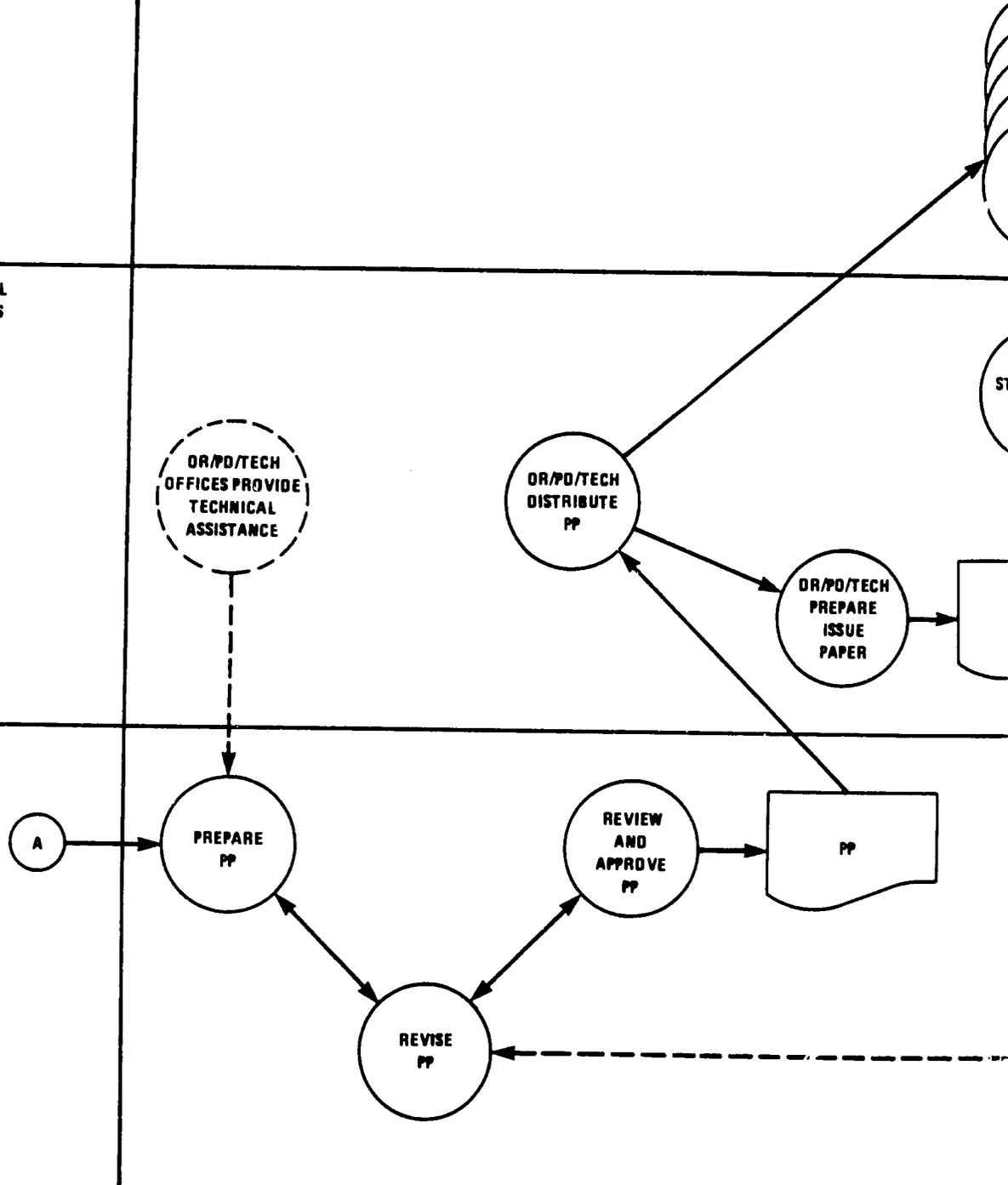
Work Flow in the PID/PP Process



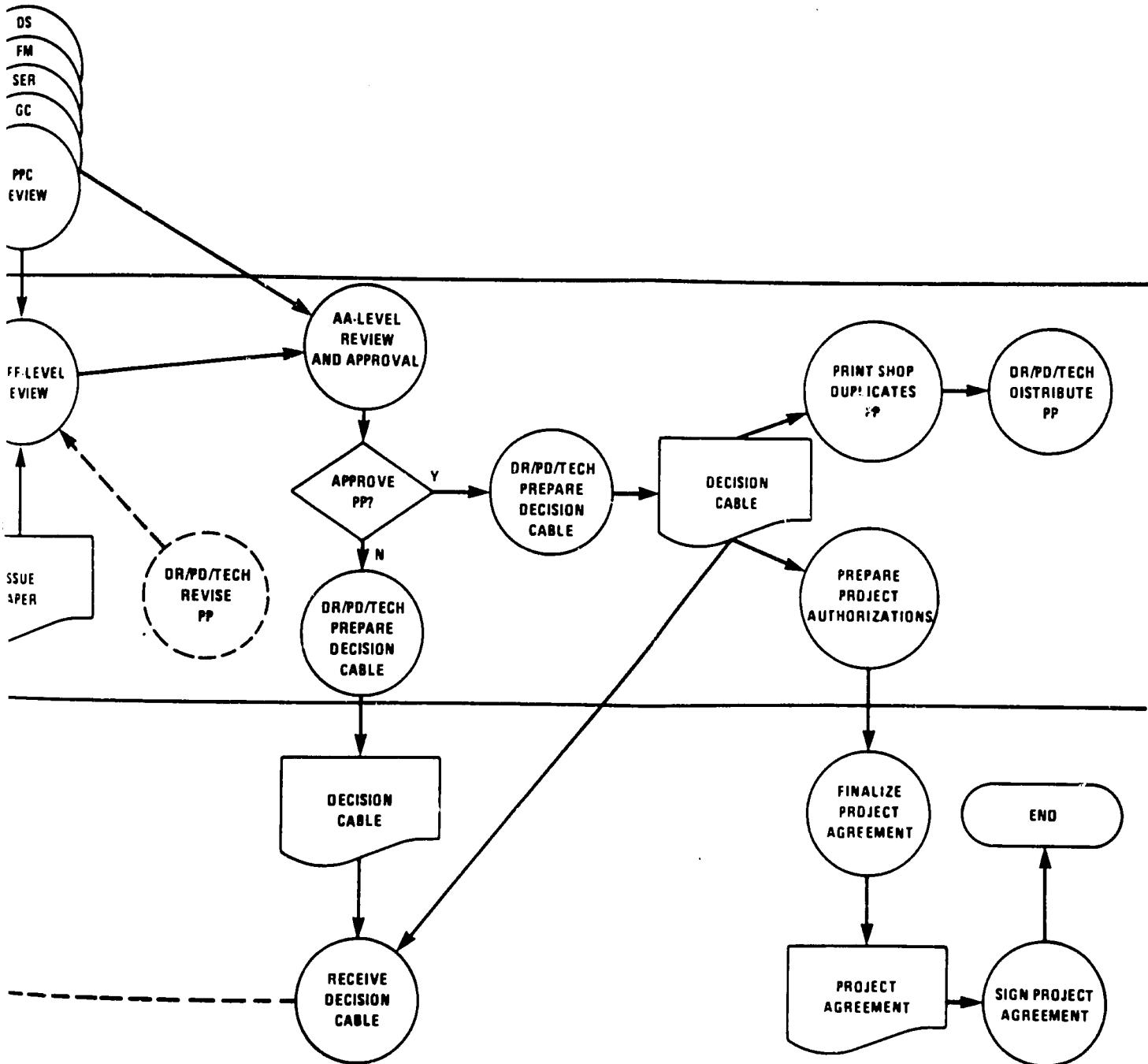
CENTRAL BUREAUS

REGIONAL BUREAUS

USAIDS



Work Flow in the PID/PP Process



consideration before a major level of effort is devoted to project design activities. Although most recent guidelines have specified that the PID should be presented as a 15-page document, interviews discovered several PIDs which were considerably larger. Several examples reviewed were about 60 pages long.* The PP ranges from 60 pages to more than 150 pages, excluding annexes. Serving as the foundation for implementation activities over several years, the PP provides more detail in project methodology, implementation strategy and budget.

As design documents, both the PID and the PP go through at least three (first and second drafts as well as final) and as many as eight typed versions. Technical offices in the missions are generally responsible for production of these documents, as well as the set of supporting documents and annexes. One professional interviewed in the field observed, "The increase in paperwork in AID has not necessarily been in the volume

* The current decision to delegate project approval authority to the field may also affect the size of the document. The Near East Bureau, for example, has requested missions to provide detailed project information in PIDs for those projects where the mission requests permission to exercise delegated approval authority. The rationale is that a more substantial and complete project description is needed by NE/PD if its review of the PID is the only look AID/W has before approving further consideration by the field.

and repetitiveness of the work; it's more in the secondary and supporting documents we now have to prepare." With all supporting studies, correspondence, and draft implementation materials attached, the PIDs and PPs are large documents that present major transmission problems.

The missions submit two or more copies of the PID and PP to Washington. The documents are frequently hand-carried by a USAID representative or visitor to avoid waiting for pouch delivery. (Interviews in Africa indicated that pouch delivery can take up to six weeks, for unknown reasons.) If the USAID has not submitted sufficient copies, the regional bureau will have copies made for distribution to all potential review committee participants.

The technical offices (TECH) in each of the regional bureaus support the project review activities in conjunction with the Offices of Development Resources (DR) in Africa and Latin America and the Offices of Project Development (PD) in Asia and the Near East. Issue papers of two to three pages are prepared on each PID and PP and are distributed to all AID/W offices with potential interest in the project prior to the review committee meeting. To facilitate the review and approval process, the project document may

be revised in AID/W to incorporate review committee comments. The results of the bureau review are submitted to the USAIDs in a decision cable. If a PID or PP is not approved, the mission may revise the proposal to resolve AID/W concerns and issues, especially at the PP stage.

Missions submit PIDs and PPs on a continuous basis, but interviews suggested an end of fiscal year peak in PP processing.

Centrally-funded projects developed in Washington are reviewed and approved in essentially the same manner as mission projects. For example, the Office of Population in DSB submits a PID and, upon approval, a PP to the Program Office (DSB/PO). Similarly to the DR and TECH offices in the geographic bureaus, DSB/PO distributes the documents for review and comment, prepares issue papers and coordinates the review committee meetings which approve the proposals.

(2) Significant Improvements to the Project Development Process Will Be Obtained From Office Automation

The most essential and time-consuming activities of the PID/PP process are those devoted to the design of projects in the field. There are two important areas for improvement in this key stage of the process.

- . Preparation of the PIDs and PPs requires access to information which is not always available to design teams in the field.
- . Preparation of multiple drafts are time-consuming for support staff, involve major proofreading time by professionals, and can result in error-filled products.

The development and preparation of project ideas and proposals, as well as supporting documentation, will be improved by access to a variety of data bases and to word processing equipment.

Although a variety of useful information is maintained in the Development Information Service (DIS) and the Economic and Social Data Bank (ESDB), design teams in the missions do not have ready access to this information. In addition, design teams can benefit from access to additional information not included in these systems. The kinds of data which can be included in expanded data bases are those which are frequently referred to in PIDs and PPs or those which provide the guidance of past and current Agency experience. For example, project design teams could:

- . Review approved and active projects in similar or related areas to explore ideas, strategies, and solutions which have been tried in the past
- . Utilize existing narrative text or previous studies which support the project under development.

One of the major benefits of access to previous work and related studies and statistics would be to more rapidly familiarize the team with available and necessary background information. This will impact greatly the amount of time contractor staff or new AID staff members require to gain understanding of how the Agency develops a project and the amount of time experienced project design staff need to become well versed in a new program area or host country's requirements.

Word processing and communications support will ease the production and revision of the PID and PP and eliminate some of the inefficiencies in the AID/W review and approval cycle.

- . In the missions or AID/W offices preparing PIDs and PPs, word processing equipment will:
 - Reduce the volume of original typing
 - Ease the incorporation of revisions
 - Reduce the time devoted to proofreading for typing errors
 - Produce the PID and PP in a form which can be entered into word processing equipment in AID/W, thus reducing the number of hard copies the originating office must submit for review
- . AID/W offices participating in the PID/PP review can avoid some delays which cut into review time with equipment which reduces document reproduction and distribution time.

- . Coordination in the review process will be enhanced by more ready access to the PIDs, PPs and supporting documentation as well as through communications devices which more directly link approval and clearance offices, e.g.:
 - Facsimile machines can be used to distribute copies of the PID and PP and other information, such as Issue Papers, to offices who are not connected by communicating word processors.
 - Answering service devices can be used to transmit messages, i.e., about schedules, attendance at review meetings, or clearances, when one of the parties is absent from the office.
- . Storage of the PID or PP in word processing equipment in AID/W eases the incorporation of revisions made during the review process and produces attractive final copy for printing and distribution.

Office automation will also permit better management of the project development process. Data processing applications can be designed to monitor the status of PID/PP activities, check scheduled submission dates and provide information on the status of post-approval activities, i.e., final clearances and signing of the Project Agreement.

5. ADDITIONAL AUTOMATED MONITORING SYSTEMS AND CONTRACT WRITING EQUIPMENT CAN EXPEDITE THE PIO/T AND PIO/C PROCESSES

As the organization directly responsible for implementation of approved projects, the mission most typically prepares the statement of work and other specifications in the PIO/T and PIO/C. However, procedures for developing the PIO packages can vary greatly as indicated in Exhibit VII, following this page. The exhibit shows that PIO materials may be initiated in the mission, the regional, or central bureau or in the two SER offices responsible for PIOs:

- . PIO/Ts are handled by the Office of Contract Management (SER/CM)
- . PIO/Cs are handled by the Office of Commodity Management (SER/COM).

The regional bureaus may review PIO/Ts and PIO/Cs prepared in the field or prepare the PIO as requested. The Technical Office in the Bureau for Near East, for example, reports that the PIOs it reviews and revises from the field constitute about half of the annual volume of PIOs in the bureau. The Technical Office itself assumes full responsibility for preparing the PIO package in the other half.

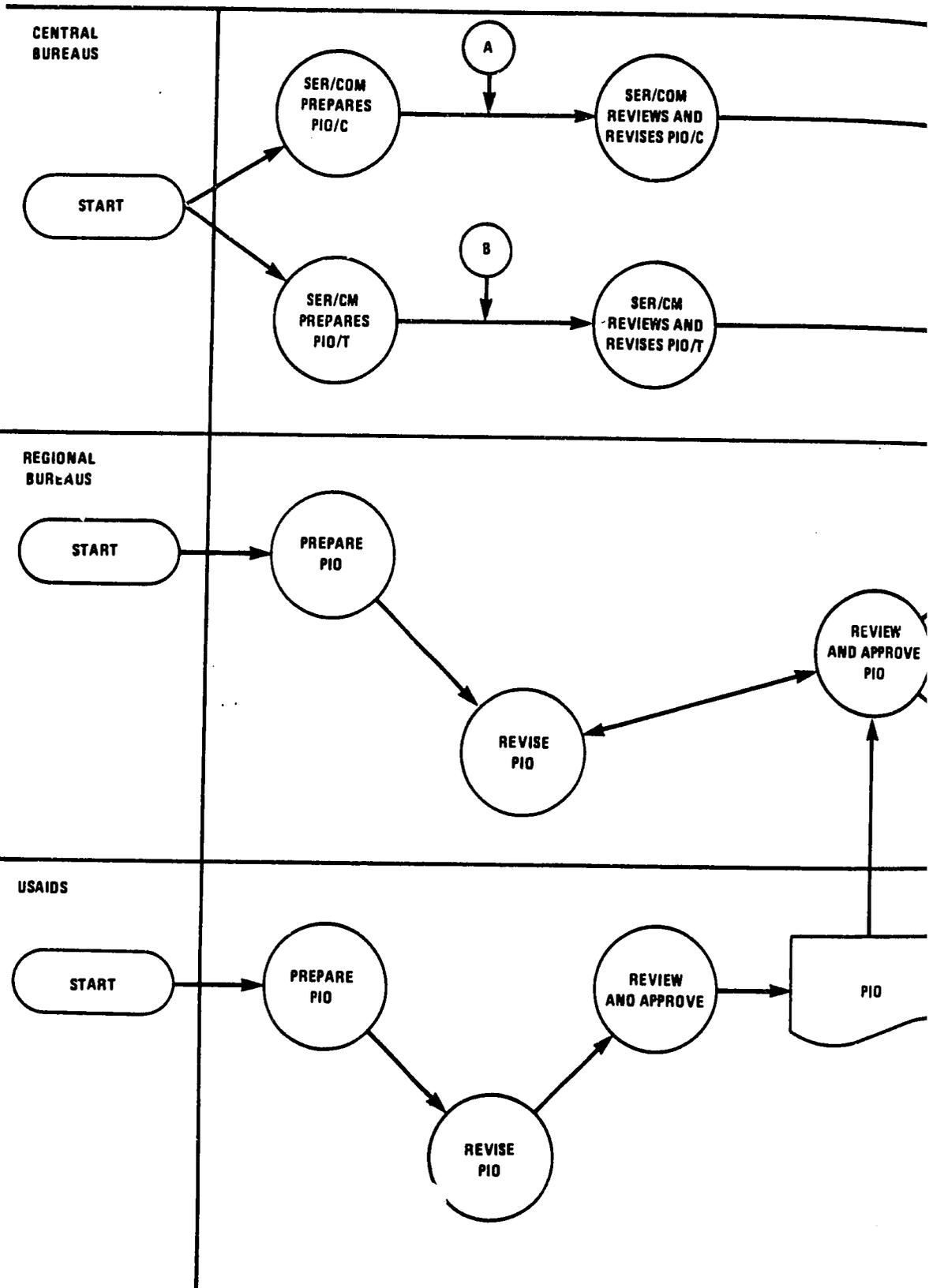
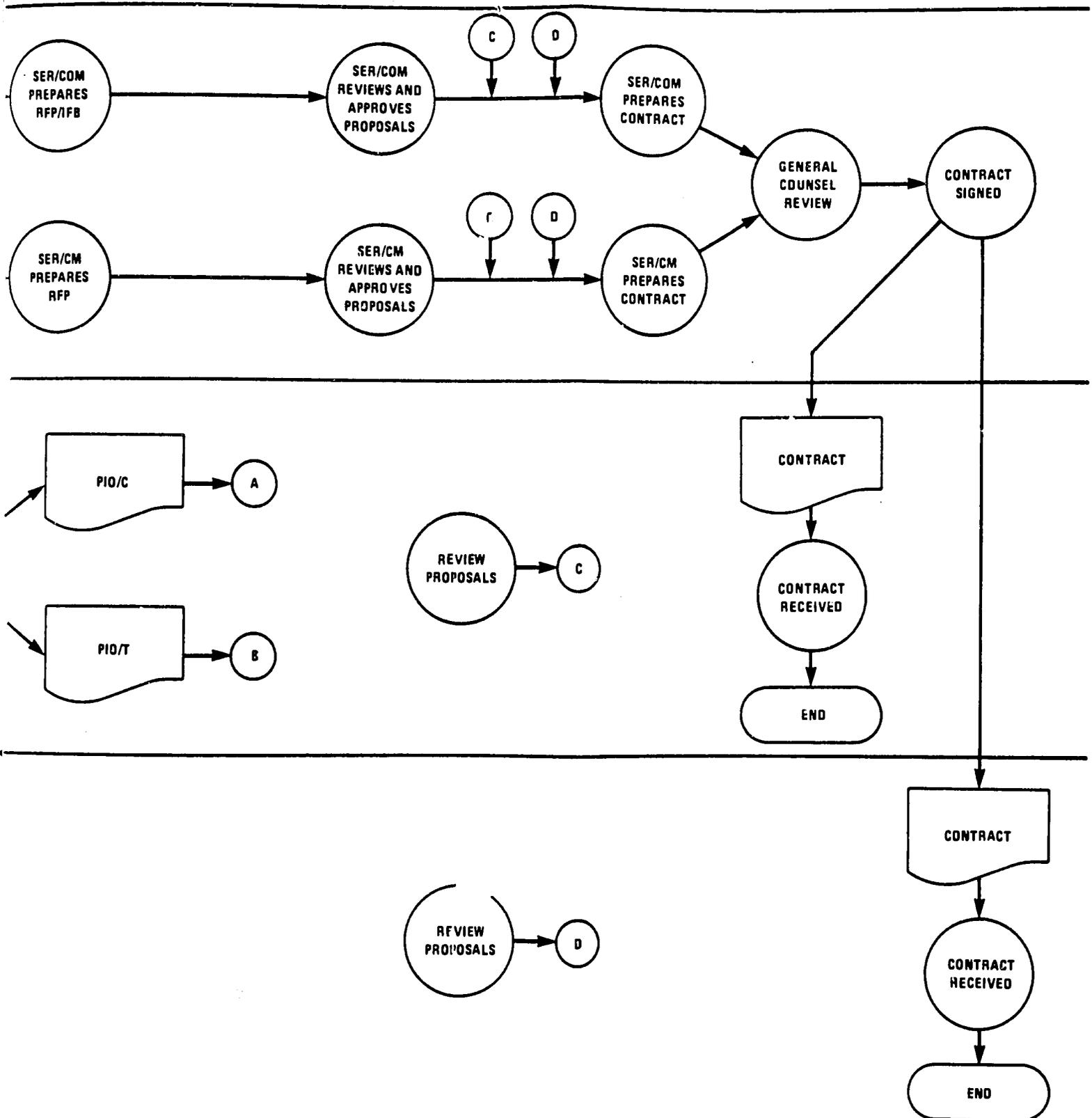


EXHIBIT VII

Work Flow in the PIO/C
and PIO/T Process



PIOs are relatively brief (7-15 pages) and straight-forward documents to prepare since:

- . Both the PIO/T and the PIO/C use standard and some pre-printed narrative in the annexes.
- . The statement of work is the primary section which undergoes significant revision in the mission or in the AID/W reviewing and handling process.

SER/COM and SER/CM review the PIO and follow government contracting regulations in advertising and awarding the contract. These two SER offices may be in frequent cable or telephone contact with the mission or office initiating the PIO to clarify questions and ensure that project requirements are being met in the contracting process.

There are several manual and automated information management systems used by SER/CM, SER/COM, regional, and central bureaus, and the missions to monitor and facilitate the PIO/T and PIO/C processes. Interviews with AID/W and mission staff indicated, however, that:

- . The status of processing activities cannot be easily monitored.
- . Better communications between AID/W and the field would make the process more effective.

Office automation can alleviate these problems. For example:

- . Minicomputers can provide extensive scheduling, monitoring and problem identification capabilities for the field and AID/W.
- . In a long-range perspective, telecommunications equipment could rapidly transmit PIOs from the mission to AID/W and permit the missions to review and comment on proposals, contractor qualifications and contracts.

The processing time of approved proposals in AID/W can be reduced by the use of word processing equipment, in SER/COM and SER/CM, with contract writing programs, because these devices can quickly produce error-free standard contracts.

6. TELECOMMUNICATIONS SUPPORT WOULD BE PARTICULARLY BENEFICIAL TO THE NON-PROJECT ASSISTANCE PROCESS

In addition to project loans and grants, AID may provide non-project assistance funds to countries of special concern. The Commodities Import Program (CIP) in Cairo is a significant example of non-project assistance.

The process for development, review, and approval of non-project assistance activities is analogous to that for project development described earlier. In place of a PID or PP, the mission prepares a Project Assistance Approval

Document (PAAD) which is reviewed and approved by the regional bureau in AID/W. Unlike the PID or PP, however, the PAAD is a relatively brief document.

Implementation of an approved PAAD is a complex and time-consuming process. In part, the complexity is caused by the number of parties included in the activities, not only in the United States but also in the host country. A series of documents and agreements are developed and exchanged between the mission and SER/COM in the implementation process. Cairo is currently developing an automated data processing system to support the CIP with more current implementation monitoring information.

Office automation can facilitate the handling of the large volume of information which is generated in the non-project assistance process.

- . As the Cairo mission is currently exploring, data processing applications can provide a monitoring capability to maintain current status information on the implementation activities which require frequent updating.
- . Telecommunications can provide a direct and readily accessible link between the field and AID/W, thus increasing the timely exchange of key information and the responsiveness of AID offices.

Timely reply to requests and questions as well as ready accessibility to rapidly changing information is essential

to effective performance in this process. Telecommunications equipment, in particular, can provide this capability to the Agency.

7. IN SUMMARY, OFFICE AUTOMATION WILL IMPROVE THE EFFICIENCY AND EFFECTIVENESS OF INFORMATION AND PAPER HANDLING IN ALL THE STUDY PROCESSES

The study processes have characteristics which make them prime candidates for the application of automation technology. There is a heavy clerical content in the processes, which is evidenced by the multiple revisions and retyping of documents. Bottlenecks occur in the reproduction and distribution of key information and documents, which can reduce the amount of available review time. Communication among a large number of offices in the field and Washington is essential for timely completion of work and coordinated management and decision making.

Office automation will provide the following improvements to the Agency's work in the program processes:

- . Increase the productivity of staff through application of word processing equipment. Experience in the private sector and limited experience in the government sector indicate that the following order of magnitude increases can be achieved:
 - For clerical staff, typically 30-50 percent
 - For professional staff, typically 5-10 percent

- . Reduce delays in processing with attendant increases in efficiency and quality of work
- . Permit direct communication and coordination among professional staff of multiple offices, thus making them more effective
- . Increase responsiveness of the field and AID/W to requests for information and action.

Clearly the agency can obtain substantial benefits from expanded use of office automation.

* * *

This chapter has discussed the opportunities for expanded use of office automation in selected program processes. The next chapter presents overall conclusions on the introduction of additional word processing, data processing, and communications support to the Agency.

IV. OVERALL CONCLUSIONS

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IV. OVERALL CONCLUSIONS

The previous chapters have described how specific AID activities will receive substantial benefits from the installation of additional office automation systems. This chapter presents additional, overall conclusions which emerge from the study's findings and specific conclusions. It discusses several issues AID managers will face with expanded word processing, data processing, and telecommunications capability. These issues include:

- . A determination of how to use increased staff productivity
- . The need to guard against a proliferation of additional marginally useful information requirements that will be facilitated by the expanded capacity to produce information
- . The need for additional training to orient both professional and clerical staff to the use of office automation in their daily work activities
- . The potential for disruption in routine office activities during the initial implementation phase and for a change in the type and mix of clerical support staff in the Agency
- . The need to develop systems and procedures to guide coordinated use of office automation.

This chapter also addresses the key questions raised by the Agency related to the introduction of an integrated office automation system.

1. THE INCREASES IN EFFICIENCY WHICH CAN BE EXPECTED FROM OFFICE AUTOMATION CAN INCREASE THE QUALITY OF WORK AND PROVIDE SAVINGS IN THE WORKFORCE

Office automation technology is a relatively new resource available to managers. Although there are relatively few public sector agencies which have fully implemented an office automation network, the private sector provides examples of extensive use of office automation. This experience has demonstrated significant increases in staff productivity as a result of office automation. Word processing equipment alone, for example, is typically expected to produce a 30 to 50 percent increase in clerical productivity and a 5 to 10 percent increase in professional productivity.

(1) The Agency Can Expect to Receive Near-Term Improvements in Clerical Productivity and Product Quality and Longer-Term Improvements In Professional Productivity

The most immediate results of office automation are visible in increased capabilities to produce, review, revise, and distribute information and documents.

While word processing equipment does not speed the initial typing of a unique document, it can reduce the time required to produce similar (repetitive)

documents, letters or forms. By storing a standard format, a list of names and addresses, or even standard paragraphs that can be reused on several occasions, word processing equipment eliminates the redundant typing of standard information on routine documents. The production of routine documents, standard forms or repetitive memos can, therefore, be improved by reducing the amount of initial typing normally performed by AID clerical staff. This machine-generated copy is guaranteed to be error-free (the original copy stored electronically by the equipment has been proofed and corrected and is printed without changes), thus reducing proofreading and error correction time.

Word processing equipment also provides for increased clerical productivity on lengthy reports undergoing several draft revisions. By typing the initial draft only once, all subsequent revisions can be made electronically. This process permits the cumulative use of sections of the draft document which remain unchanged. Typists need only retype those sections of the report that were changed,

thus eliminating the need to retype entire sections of any given document. In addition, the equipment can allow typists to:

- . Shift paragraphs from one page to another
- . Automatically renumber pages
- . Make other consistent changes to the entire document without retyping.

As a result, retyping draft documents requires less initial typing and proofreading time and less clerical involvement overall.

The use of word processing equipment with copy devices and of communication devices provides faster reproduction and distribution of documents.

These capabilities provide near-term improvements in the level of clerical productivity and product quality. Near-term effects on professional productivity are primarily the result of faster access to information and of a release from some clerical tasks, such as proofreading and document distribution. The greatest direct increase in professional productivity results from access to computer stored data bases and executive workstations which permit professionals to prepare and edit their own reports. These capabilities take a

longer time to develop and implement, so that higher levels of professional productivity are a long-term rather than a near-term benefit of office automation.

(2) AID Managers Must Establish Objectives For Use of the Benefits of Automation

As staff gain an ability to do the same amount of work in less time, the tendency will be to expend extra time to improve the quality of the work or to add information requirements of marginal utility to the current work load. To achieve the best use of office automation and the best application of its benefits, the Agency must establish its office automation objectives and a plan for realizing them. AID can use office automation to achieve multiple objectives:

- . The current work load can be held constant, and the number of staff devoted to the process can be reduced
- . The current work load can be held constant, and the quality of work can be improved
- . The savings can be used to take on a larger work load without additional staff.

Regardless of the objectives selected or the priority assigned to them, AID managers must establish

central management responsibility to guide the expanded use of office automation. Guidelines and controls are necessary to assure that the automation effort is well-planned and well-executed and that the desired benefits are achieved.

2. DURING THE INSTALLATION PERIOD, THE SYSTEM WILL CREATE ADDITIONAL STAFF TRAINING REQUIREMENTS, DISRUPTIONS IN OFFICE ACTIVITIES AND CHANGES IN THE MIX OF CLERICAL STAFF POSITIONS

The installation of an office automation network in Washington and in the field will affect substantially the AID workforce. While the introduction of the equipment will clearly increase the clerical productivity of report production and distribution, it will also:

- . Require additional staff training
- . Cause significant disruption in routine activities during the initial implementation period
- . Result in some reduction in clerical staff
- . Change the clerical staff mix.

(1) The Provision of Orientation and Follow-up Training is Essential to the Successful Introduction of Office Automation

While office automation technology is being designed for simple operation by non-technicians, it is, none the less, new technology. To make full use of the features provided by word processing equipment,

for example, clerical staff must receive training in the equipment's capabilities, operations and use, and office procedures must be adjusted to make sure the equipment is fully utilized. These changes are essential because, without them, clerical productivity could actually decrease if inefficient equipment use habits are allowed to develop.

Formal training programs within AID must be established. The training can consist of a combination of vendor-provided training and Agency-sponsored training. The ultimate goal of the training must be to produce thoroughly versed equipment operators who can and want to use the equipment, and to provide professional staff with an understanding of the kinds of office procedures that will produce the maximum benefits. The training program must include all personnel who will be exposed to and use the equipment. Under no circumstances should an untrained clerical staff member be assigned to an office without training on the specific equipment (manufacturer and model) used by that office.

The training program will be a critical element in the success of office automation in AID. It

represents a commitment to staff training heretofore not undertaken by the Agency. Without comprehensive and continued training to constantly keep clerical and professional staff abreast of new equipment and enhanced features, the AID office automation program risks not achieving its full potential and underutilizing its productivity capabilities.

(2) A Change in the Level and Mix of Clerical Staff Will Be Required

Office automation requires different skills of clerical personnel at the support and supervisory levels. As clerical productivity increases, fewer clerical staff will be needed to maintain the work load, and some reductions in clerical staff could be realized. More production typists and fewer secretaries may be needed as responsibilities shift from multiple clerical tasks to production typing. There may also be a need for some highly-trained staff as use of certain pieces of specialized equipment requires technical skills that are the product of advanced training that can demand higher compensation on the open market. Finally, there may be a need for supervisory staff to manage the new mix of clerical positions needed to operate office automation technology. Overall,

the composition of support staff will change in response to the introduction of office technology and the expected increases in clerical productivity.

(3) Office Managers Must be Prepared to Handle Some Disruptions in Routine Office Activities

If the training and clerical staff restructuring efforts are undertaken expeditiously, the levels of office disruption associated with the introduction of office automation technology can be minimized. Without a full recognition of the potential disruptions, however, the implementation of office automation can become costly and time-consuming.

The disruptions will occur as daily office procedures change. Intrinsic fear of technology ("no machine will ever replace me") will also contribute to disruption, and the initial difficulty of adapting to office automation will create frustrations ("this never happened using the old equipment"). Without appropriate responses from AID management, including careful supervision, adequate training and technical assistance, these disruptions can continue to plague the efficiency of office automation support long beyond the initial introductory period.

3. AUTOMATION SHOULD BE IMPLEMENTED SIMULTANEOUSLY IN AID/W AND THE FIELD

AID should undertake the introduction of office automation simultaneously in AID/W and the field because it is the link between the two that creates many of the problems that have been noted. One of the major obstacles to efficient processing is the flow of a large volume of information between Washington and the field. Both ends of the information network must be automated if the flow is to be substantially improved. The limitations on obtaining and using office automation equipment in AID/W are primarily the ability of the given AID office to justify the equipment expenditure and to adhere to Agency equipment compatibility standards. The installation of office automation equipment for AID missions is burdened by a third constraint—the availability of services to support and maintain the equipment in working order. .

To achieve the full benefits of office automation, the Agency must develop an integrated network of office automation devices. By ensuring the compatibility of AID field and AID/W office automation equipment, document production and distribution productivity can be dramatically increased. While the necessary equipment, service, and operators to construct this type of network are readily

available in the United States to AID/W, field missions will have a decidedly more difficult time maintaining this equipment. As a result, it may be difficult to develop office automation in AID/W and the field missions at equal levels.

By coordinating mission plans for office automation with the State Department, it may be possible to obtain support services from hardware vendors that would otherwise be unavailable to either State or AID in a foreign location. Further, close coordination between field missions and regional bureaus is necessary to ensure equipment and process compatibility. Finally, missions in developed urban areas of select LDC's may be able to maintain office automation equipment more readily than those missions in remote LDC's, thus becoming prime candidates as a result of their locations and not necessarily the priority of their need.

4. AID'S REQUIREMENTS FOR HIGH LEVELS OF INTERNAL COORDINATION EMPHASIZE THE NEED FOR AN INTERACTIVE NETWORK OF EQUIPMENT

The program processes require extensive interactions among field missions, regional bureau offices, and central bureau offices. Programs, budgets, and projects are the result of "two way streets"—either originating in the

field or AID/W and developed according to parameters established by all parties, including host country constraints, Congressional budget considerations, mission resources, AID/W policies and others. As a result, constant communication and written interaction is necessary.

Equipment compatibility and linkages are therefore a necessary requirement for Agency-wide office automation. AID's current inventory of non-compatible equipment has been a motivation for and a major concern of this study. To achieve compatibility, the Agency must:

- . Guide and manage a system of office automation support which replaces the current approach of relying upon the initiatives and equipment decisions made by individual offices
- . Develop and enforce minimum standards for equipment to assure compatibility.

The requirement for compatibility does not mean that all equipment must be selected from a single vendor. Equipment from several vendors can now be interconnected. This means that the outputs of one device can be accepted as inputs into the equipment of another vendor. This ability to connect several pieces of equipment is key to achieving the Agency's goal of enhancing work flow and improving processing efficiency with Agency-wide automation.

5. AID SHOULD CONSIDER USING COMMERCIAL TELECOMMUNICATIONS VENDORS WHILE CONTINUING TO FOLLOW THE DEVELOPMENT OF STATE TELECOMMUNICATIONS EFFORTS

Current AID telecommunications support is provided by the State Department network. It is primarily used for cable transmission. State has plans to expand its telecommunications capabilities over the next five years although these plans are being developed somewhat independently of AID and ICA. It is therefore unclear whether State will be able to adequately support the message and data transmission requirements of a full AID office automation plan. Clearly, the Agency should work with the State Department to ensure that future State telecommunications facilities can meet AID requirements.

At the same time, AID should explore the use of alternative international telecommunications facilities available from private commercial vendors. For use with AID missions, select telecommunications networks (government agencies, private firms) could be used on an experimental basis. Data transmission linking AID office automation equipment does not have to wait for State Department plans but rather can proceed on a trial basis to test the feasibility and costs of commercial services and to explore the capabilities of the equipment as a possible enhancement of services from the State Department's network.

6. AID MANAGERS WILL NEED TO DEVELOP NEW SYSTEMS AND PROCEDURES TO GUIDE THE COORDINATED USE OF EQUIPMENT AS THE STUDY PROCESSES ARE AUTOMATED

The introduction of an office automation network will pose two important operational questions for AID managers:

- . In what sequence should the equipment be introduced to the study processes?
- . How will the work of individual offices be coordinated to permit the flow of work through compatible equipment?

As discussed in a previous section of this chapter, it is expected that AID will experience the most significant near-term improvements from word processing and communications equipment. One approach to determining the priority in which the study processes should receive support from office automation is to examine:

- . Which processes stand to benefit the most from word processing
- . Which processes require the greatest exchange of information and the largest number of meetings to effect coordination.

The discussion of areas for improving the paper and information handling capabilities in the study processes presented in Chapter IIIJ indicated that all of the study processes will benefit from increased use of word processing and communications equipment. These improvements, however,

are seen as most critical for the Agency's three major budgeting and programming processes—the ABS, the CP, and the FID/PP processes. These processes offer the greatest payoff in improving overall Agency effectiveness because the key decisions made in these processes affect the rest of the Agency's work, and because a significant level of staff time and effort is devoted to them. These characteristics also mean that the introduction of office automation support to the ABS, CP, and FID/PP processes will be as difficult and complex as the processes themselves.

The benefits of office automation will not be realized just by the installation of equipment in offices participating in these processes. AID managers must develop methods and procedures to guide the coordinated use of office automation equipment among the multiple offices handling information and documents. For example, in the CP process, the regional bureaus must determine which offices will receive the inputs from the field into a word processing unit, how many copies of the CP drafts will be made for distribution to which staff members, and which word processing unit will store draft CP materials forwarded to LEG for review.

It should be remembered that office automation technology is one of several tools AID managers have at their disposal as they examine ways to improve the effectiveness of their operations. A significant resource, office automation is best used in concert with other management tools. The introduction of expanded office automation support offers AID management the opportunity to critically re-examine the information requirements, work load, and procedures currently used in the program processes.

* * * * *

The next chapter presents three alternative strategies for introducing office automation Agency-wide, based on the conclusions presented in this chapter. These conclusions are applicable, in varying degrees, to each alternative and can be viewed independently of the selected implementation approach.

V. ALTERNATIVE STRATEGIES

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V. ALTERNATIVE STRATEGIES

This chapter provides a discussion of alternative strategies for introducing the expanded use of office automation technology into AID. The strategies have been formulated around alternative answers to such questions as:

- . How rapidly should automation be introduced into the Agency?
- . What kinds of controls should be placed on the effort to automate?
- . How should the effort be managed?

Specifically, three alternatives are formulated and compared in terms of their anticipated costs, risks and benefits, to provide AID with a basis for choosing the strategy it wants reflected in its five-year office automation plan.

An overview of the alternatives is presented in Exhibit VIII, following this page. The alternatives may be distinguished by several key characteristics:

- . Pace of Implementation—Should equipment be placed rapidly at all appropriate locations, or should implementation proceed more deliberately with a phased installation strategy?

Exhibit VIII

Overview of Conceptual
Alternatives for Office
Automation

	<u>ALTERNATIVES</u>		
	I	II	III
<u>PACE OF IMPLEMENTATION</u>			
. Rapid	X	X	
. Phased			X
<u>SELECTION OF PARTICIPANTS</u>			
. Voluntary	X	X	
. Designated			X
<u>SYSTEM INTEGRATION</u>			
. Ad hoc	X		
. Planned		X	X
<u>CENTRAL MANAGEMENT</u>			
. Moderate	X		
. Strong		X	X
<u>MEASUREMENT OF RESULTS</u>			
. Suggested	X		
. Required		X	X

- . Selection of participants—Do bureaus, missions, and individual offices volunteer for automation support or are they designated by a central managing group?
- . System integration—Does the goal of an Agency-wide integrated automation system require a carefully followed master plan, or can the goal be achieved through a more ad hoc approach?
- . Central Management—While some central management of this major agency investment is needed, is this central management group to be vested with the more moderate authority to review requests for compatibility and offer technical assistance to local users or the stronger authority to implement an automation plan by coordinating all local user activities?
- . Measurement of results—How much emphasis is to be placed on the collection and analysis of performance and cost data which can identify equipment and performance problems for correction and can test the achievement of the benefits of office automation?

The description of each alternative which follows is framed around these issues and options for AID decision makers.

1. THE FIRST CONCEPTUAL ALTERNATIVE REPRESENTS AN EXPANSION OF THE CURRENT APPROACH

Under this alternative, each office or bureau would decide what kinds of equipment it would install (if any), what applications would be made, and when installation would occur. As a result, implementation would proceed on an ad hoc basis. A greatly expanded budget for equipment purchases would be made available, and the SER Bureau would provide limited assistance to other offices and

would enforce minimum Agency-wide requirements. The rationale for this strategy is based on the dual assumptions that, first, the Agency's current approach to automation is feasible for managing additional equipment installations, and secondly, that more central control over implementation efforts is not likely to be well received within the Agency. By continuing the current approach to automation, a proponent of this approach would argue, the Agency would install word processing equipment rapidly and would receive its benefits sooner.

(1) This Alternative is Immediately Responsive to the Numerous Current Requests for Additional Office Automation

Representing more the pieces of an unconnected system rather than an integrated network, this alternative may be characterized as the most free-form of the options. The system configuration is not guided by an Agency-wide plan but rather emerges as individual offices and missions determine their own needs and install and connect pieces of office automation equipment.

This conceptual alternative is immediately responsive to the current situation in AID in which numerous offices are requesting office automation. It provides no limits on who or how many offices may

participate except those imposed by budgetary constraints. This conceptual alternative permits rapid installation of a large amount of equipment throughout the Agency. It could result in a substantial investment in office automation.

While this alternative does not require significant near-term attention to integrating the various installations which will arise, a central management group is needed to provide guidance and supporting assistance and to assure that minimum requirements are met. At a minimum, offices requesting automation must:

- . Demonstrate that they will meet minimum justification standards (e.g., GSA and NARS justification standards)
- . Meet equipment standards developed by the central management group to maintain equipment compatibility essential for future integration of local installations.

One of the primary responsibilities of the central management group, therefore, is the development and enforcement of equipment compatibility guidelines. New equipment from a variety of vendors can now be interconnected, thus freeing the Agency from concerns about the difficulties of securing compatibility through a large single-vendor purchase.

Individual offices should be encouraged to collect and analyze equipment performance data. In this way, local managers will be able to monitor and control installations in their offices. Central management should be informed of equipment, personnel and related problems, as well as effective solutions, to provide better guidance and technical assistance to all Agency users of office automation.

One of the major disadvantages of this alternative is the inability to justify benefits in a total systems context. Individual offices must demonstrate their own office's achievements and cannot rely upon measurements of their contribution to overall system or process performance to demonstrate the continued need for or benefits from their local automation support.

(2) An Expansion of the Current Agency Approach to Office Automation Should Cost Approximately \$9,700,000 Over the Next Five Years

The first alternative utilizes the existing office automation management and operations structure of AID to proliferate equipment and technology support. As a result, almost 63 percent of the overall five-year expenditure is devoted to word processing equipment, obtained to meet individual office needs (see Exhibit XX, following this page). This expenditure of almost

EXHIBIT IX
Estimated Costs of the
First Alternative

	<u>FYs 80-81</u> (<u>\$000's</u>)	<u>FYs 82-84</u> (<u>\$000's</u>)	<u>Total</u> (<u>\$000's</u>)
<u>Word Processing</u>			
CRT word processors	1,187 ¹	4,500 ²	5,687
Memory typewriters	-	-	-
Combined WP/DP units	-	-	-
OCR scanners	240	-	240
Photo compositions	25	-	25
Protocol translators	144	-	144
Copying (intelligent, communicating)	-----	-----	-----
	1,596	4,500	6,096
 <u>Telecommunications</u>			
Facsimile	78	-	78
Satellite channels	100	-	100
Leased lines	120	-	120
Message switching terminals	-	250	250
Telephone answering service	-	-	-
Voice message services	-	-	-
Teleconferencing	-	-	-
	-----	-----	-----
	298	250	548
 <u>Data Processing</u>			
Minicomputers	250	-	250
Terminals	-	250	250
Graphics	-	-	-
Programs	250	350	600
	-----	-----	-----
	500	600	1,100
 <u>Personnel</u> ³			
Contractor	756	710	1,466
AID staff	141	360	501
	-----	-----	-----
	897	1,070	1,967
<u>Total</u>	\$3,291	\$6,420	\$9,711

- NOTES: 1. Includes \$200,000 set aside for installation of word processing equipment at USAIDs.
2. Includes \$250,000 set aside for installation of word processing equipment at USAIDs.
3. Excludes operating personnel and training staff. FY 80-81 estimated at 9½ contractor person-years and 4.7 AID person years.

\$6.1 million will provide AID with approximately 54 units installed in the first 2 years of the plan and approximately that many per year for each of the next 3 years. This equipment will be supplemented by a photocomposer* (\$25,000), 12 OCR readers** (\$240,000), and 18 protocol translators*** (\$144,000) procured over the 5-year life of the plan. The alternative also includes the installation of word processing equipment at about 20 selected USAIDs (\$450,000).

Data processing expenditures of \$1.1 million over 5 years account for the second largest budget item in the first alternative. Under the direction of SER, an automatic message switching network that interconnects separate data terminals will be developed for use in AID/W. The network would consist of a minicomputer purchased for \$250,000 during the first 2 years of the plan. Over the 5-year period, SER would spend approximately \$600,000 to develop message switching software to operate the network which would also link about 25

*A photocomposer is a machine that produces high quality photo-ready mats for printing. The machine accepts electronic inputs from other equipment, or text and exhibits can be directly typed into it.

**An optical character recognition (OCR) device automatically reads text typed in OCR font style and translates it into electronic form for transmission.

***A protocol translator is a device that permits some types of dissimilar automated equipment to communicate with each other.

separate data terminals, costing about \$10,000 per terminal.

The telecommunications component of the alternative is the most inexpensive, costing approximately \$548,000 over 5 years. About 52 facsimile transmission devices (telecopiers) will be placed in AID/W offices at a cost of \$78,000. A satellite channel (\$100,000) would be leased for about six months to test the value of high speed international data transmission. The U.S. satellite terminal would be connected to a set of leased lines in AID/W for about \$120,000. The experiment would be conducted in the first 2 years, while the major single telecommunications procurement of \$250,000 will not occur until the later part of the plan. Once the message switching system is complete, about 25 dedicated message terminals* will be installed at a cost of \$10,000 each.

Finally, almost 20 percent of this alternative's budget is allocated for personnel (both contractor and AID/SER). While staff expenditures are high during the first two years, they gradually taper off. These

*A message terminal is a device that receives and displays information sent through an information transmission system.

cost figures and the hardware/software costs are more fully described in Exhibit IX.

2. THE SECOND ALTERNATIVE CALLS FOR A CENTRALLY-GUIDED RAPID EXPANSION OF AUTOMATION SUPPORT THROUGHOUT AID

In this alternative AID would centrally design an integrated office automation system, would plan for a rapid installation of that system, and would centrally guide its implementation. This strategic alternative assumes that while an aggressive effort is needed to quickly reap the benefits of automation, there is also a need for central management to oversee the effort. Because the major benefits of automation require an integrated system, it is seen as necessary to centrally plan and guide automation expansion in the Agency.

(1) This Alternative Requires Voluntary Participation In a Well-Defined Agency-Wide Automation Plan

This alternative requires a well-defined Agency-wide plan under the leadership of a stronger central management group. Like the previous option, this alternative can result in rapid installation of office automation equipment throughout AID, provided that the offices fall within the system guidelines and objectives defined in the plan.

All bureaus, offices, and missions are invited to participate in this integrated system design. The

limitations on system participants are few and essentially depend upon their willingness to be part of an overall automation plan and their ability to utilize automation support.

Equipment interconnections among participating offices are controlled by an overall system design. The plan identifies the core offices for inclusion in the system, specifies the kinds of equipment required at each installation, and specifies communication linkages. Equipment compatibility requirements are incorporated into the specifications of the overall system design. Although a flexible document amenable to change, the plan is a blueprint which illustrates the total system configuration and the relationship among the equipment locations. The plan defines a large-scale, major investment in office automation. Over time, as offices are encouraged to participate in the system and as the full range of equipment is purchased and put on-line, the system will expand to more closely fit the complete blueprint design.

This alternative requires a stronger central authority than the first conceptual alternative because of the additional administrative and management responsibilities. These additional central management responsibilities include:

- . Establish an Agency-wide plan for an integrated office automation system
- . Develop procedures for selecting system participants from volunteers and for encouraging other critical offices to participate
- . Enforce the integrity of the system configuration and the compatibility requirements in equipment installations
- . Develop and implement a methodology for measuring the benefits resulting from office automation and for the achievement of system objectives.

Designed and implemented as an integrated system, this option can be assessed by the overall system improvement it provides. All participating offices can utilize the methodology established by the central management group to monitor and control operational problems and to maintain a central record on achievements. In addition to data on enhanced performance in individual offices or bureaus or missions, information on overall productivity improvement in the Agency can be collected and analyzed. These overall system effectiveness measures could include:

- . Standard measures of office productivity
 - Number and volume of outputs
 - Quality of outputs
 - New outputs prepared

- . Total clerical and professional hours devoted to key documents or to the accomplishment of major program processes
- . Total elapsed time required to complete a work process or significant work transaction (i.e., total elapsed time for cable preparation, transmission, duplication and distribution to designated offices)
- . Indicators of staff morale
 - Turnover rate
 - Absenteeism rate
 - Lateral transfer rate.

The introduction of office automation into the Federal sector is being closely monitored by a variety of interested agencies. AID's efforts to introduce a large-scale integrated system as proposed in the second alternative will certainly be subject to careful examination by external agencies such as the GAO and the GSA. The ability to monitor the results of office automation with a variety of indicators of improvements beyond increases in individual office productivity offers a significant advantage to AID management.

(2) The 5-Year Costs for Alternative II Are Estimated at \$16,800,000

Exhibit X, following this page, shows that the second alternative requires a large investment by AID in office automation. The estimated costs exceed the first alternative by about \$7,089,000.

EXHIBIT X
Estimated Costs of the
Second Alternative

	<u>FYs 80-81</u> ((\$000's))	<u>FYs 82-84</u> ((\$000's))	<u>Total</u> ((\$000's))
<u>Word Processing</u>			
CRT word processors	1,187 ¹	3,370 ²	4,557
Memory typewriters	112	-	112
Combined WP/DP units	-	780	780
OCR scanners	240	385	625
Photo compositions	25	79	104
Protocol translators	144	-	144
Copying (intelligent, communicating)	-	1,230	1,230
	-----	-----	-----
	1,708	5,844	7,552
<u>Telecommunications</u>			
Facsimile	78	240 ³	318
Satellite channels	264	331	595
Leased lines	240	360	600
Message switching terminals	-	170	170
Telephone answering service	-	70	70
Voice message services	-	185	185
Teleconferencing	-	645	645
	-----	-----	-----
	582	2,001	2,583
<u>Data Processing</u>			
Minicomputers	500	-	500
Terminals	40	330	370
Graphics	-	130	130
Programs	824	-	824
	-----	-----	-----
	1,364	460	1,824
<u>Personnel</u> ⁴			
Contractor	1,512	2,280	3,792
AID staff	282	745	1,027
	-----	-----	-----
	1,794	3,025	4,819
<u>Total</u>	\$5,448	\$11,330	\$16,778

- Notes:
1. Includes \$200,000 set aside for installation of word processing equipment at USAIDs.
 2. Includes \$450,000 set aside for installation of word processing equipment at USAIDs.
 3. Includes five digital high-speed units.
 4. Estimated at 19 person-years of contractor effort and 9½ person-years of AID/SER effort. This excludes operating personnel and training staff.

By overlaying a central authority on individual office requests for office automation equipment, the second alternative would spread expenditures out over a series of equipment categories to best meet specific office needs. Word processing equipment procurement in the first two years, for example, is representative of the diversity. About \$1,708,000 is budgeted to obtain about 54 word processing units in AID/W and 8 in USAIDs; 14 memory typewriters; 12 OCR readers; 18 protocol translators and 1 photocomposer. In the last 3 years of the plan, the total word processing expenditure is almost 3-1/2 times greater than the preceding 2 years. For about \$5,844,000, the alternative affords the installation of another 130 word processors in AID/W and 16 units in USAIDs; 25 combined data and word processing terminals; 15 additional OCR readers; 3 additional photocomposers and 20 intelligent, communicating copiers.

Data processing expenditures in the second alternative are focused differently. Expenditures for the first 2 years of the plan are budgeted at an estimated \$1,364,000 compared to the 3-year component of the plan with a budget estimate of only \$460,000. In the first 2 years AID will acquire a message switching mini-computer (\$250,000) and support software (\$600,000).

The use of this equipment will be coordinated by the central management authority to interface with a second minicomputer (\$250,000) and 4 intelligent terminals (\$10,000 each) with application programming support for data base work (\$224,000). Subsequent data processing expenditures in the last 3 years, totaling \$460,000, were directed at terminal acquisition (about 80 over 3 years) and graphics terminals acquisition (about 20 over 3 years).

Telecommunications support increases substantially in this alternative, allocating about \$2,583,000 for the 5-year life of the plan. Early acquisitions include facsimile transmission equipment (52 installations in AID/W totalling \$78,000), a moderate leased line system (\$240,000), and an experiment with a leased satellite channel (\$264,000). The major telecommunications acquisitions occur in later years and include a major expenditure for facsimile equipment (\$240,000); a continuation of the satellite channel experiment (\$331,000); a continued leased line system (\$360,000); a series of dedicated message switching terminals (\$170,000); a telephone answering service (\$70,000); a voice message switching service (\$185,000); and a teleconferencing line item, including both a software and hardware allocation (\$45,000).

Contractor and AID staff costs reflect a greater need than in the first alternative for staff with specialty skills. During the first two years, approximately 28 person-years of AID and contractor staff will be required. In each of the following three years, the total effort will be approximately 17, 15, and 13 person-years respectively. These estimates do not include operator or training personnel requirements.

3. THE THIRD ALTERNATIVE CONSISTS OF A TWO-YEAR PROTOTYPE EXPERIMENT FOLLOWED BY A MORE RAPID EXPANSION THROUGH THE AGENCY

This alternative is presented because the Agency has not had extensive experience with office automation. There are many uncertainties about its effects on AID, and the risks of a fast-paced installation plan may be high. A carefully controlled and evaluated experiment prior to the expansion of automation throughout AID is therefore a more cautious course of action.

(1) The Knowledge Gained in the Controlled Experiment Is Needed to Design and Implement Future Expansion

The most limited in scope, this option is designed initially as a controlled experiment. The purpose of the experiment is to test a range of equipment and system configurations and select those with the

highest performance potential for widespread implementation throughout AID.

System implementation would occur only in designated experimental offices for selected work processes. This is not to say that all excluded offices would not be permitted to secure office automation support. Offices not included in the prototype experiment would operate under many of the circumstances specified in the first alternative. That is to say that they may install pieces of compatible equipment but would not be included in the integrated office automation system.

The experimental design specifies the integration among participating offices. As the experiment develops, it is conceivable that non-participants could be linked to the original system network. This permits phased expansion of the system design throughout the Agency, but it is only possible if equipment compatibility requirements are strictly enforced.

As with the second conceptual alternative, implementation of this option involves a strong central management group. The experimental nature of alternative three requires rigorous testing. All designated participants in the prototype system must conduct

pre- and post-installation measurements to provide the quantitative data base for demonstrating the system's effectiveness. Such rigorous testing can best be managed by a single central office with clear responsibility for designing, implementing and evaluating the experiment's results.

(2) The Implementation of the Third Alternative Should Cost AID About \$12,298,000 Over a 5-Year Period

The prototype alternative offers the Agency a relatively inexpensive, diverse, and tightly controlled five-year plan. Exhibit XI, following this page, presents other detailed anticipated expenditures which total \$2,500,000 for the first 2 years and \$9,798,000 for the last 3 years.

Word processing expenditures of \$416,000 are primarily devoted to memory typewriters, word processors, OCR readers, photocomposers, and protocol translators during the first 2 years. The last 3 years of the plan are devoted to word processing equipment acquisition at a rate 4-1/2 times faster than the first phase acquisition. Although the bulk of the \$1,917,000 went for word processing equipment, substantial investments were also made in combined data and word processing units and OCR readers.

EXHIBIT XI
Estimated Costs of the Third
Alternative

	<u>FYs 80-81</u> (\$000's)	<u>FYs 82-84</u> (\$000's)	<u>Total</u> (\$000's)
<u>Word Processing</u>			
CRT word processors	263 ¹	1,392 ²	1,655
Memory typewriters	40	40	80
Combined WP/DP units	-	180	180
OCR scanners	40	200	240
Photo compositions	25	25	50
Protocol translators	48	80	128
Copying (intelligent, communicating)	-	-	-
	-----	-----	-----
	416	1,917	2,333
<u>Telecommunications</u>			
Facsimile	18	35	53
Satellite channels	-	741	741
Leased lines	120	360	480
Message switching terminals	-	200	200
Telephone answering service	-	-	-
Voice message services	-	-	-
Teleconferencing	-	600	600
	-----	-----	-----
	138	1,936	2,074
<u>Data Processing</u>			
Minicomputers	250	250 ³	500
Terminals	-	2,400 ³	2,400
Graphics	-	-	-
Programs	500	725	1,225
	-----	-----	-----
	750	3,375	4,125
<u>Personnel</u> ⁴			
Contractor	1,008	1,940	2,948
AID staff	188	630	818
	-----	-----	-----
	1,196	2,570	3,766
<u>Total</u>	\$2,500	\$9,798	\$12,298

- Notes:
1. Includes \$35,000 set aside for installation of word processing equipment at USAIDs.
 2. Includes \$300,000 set aside for installation of word processing equipment at USAIDs.
 3. Separate executive work station terminals for AID professionals.
 4. FYs 80-81 estimated at 6½ person-years of AID effort and 12½ person-years of contractor effort.

Prototype data processing support is concentrated in the first 2 years on acquiring a message switching minicomputer and alternate software for \$750,000. However, the last 3 years of the plan have \$975,000 budgeted to acquire an applications minicomputer (\$250,000) and \$725,000 of applications software development. This approach is consistent with a \$2,400,000 investment in about 80 executive work stations, designed to increase professional productivity. The introduction and cost of the work stations is the potential result of a well managed prototype.

Telecommunications costs of about \$2,074,000 over 5 years are the result of a limited telecommunications program. Facsimile equipment will not be widely spread among AID/W offices, and the leased line network will be of moderate complexity to create a comprehensive 2-year budget of \$138,000. Assuming a successful prototype, about \$1,936,000 will be spent in the last three years of the plan to increase capabilities with leased lines, satellite channels, and message switching.

Personnel costs will total about \$3,766,000 over 5 years. The 2-year aspect of the plan requires \$1,196,000 to meet all staff obligations. The following

3 years will require only a little more than double the amount of the first commitment (\$2,570,000).

4. THE FIRST ALTERNATIVE HAS THE HIGHEST LEVEL OF RISK, WHILE THE SECOND AND THIRD ALTERNATIVES OFFER A BETTER BALANCE OF BENEFITS AND RISKS

The three strategic alternatives presented above offer the Agency different levels and types of benefits and risks. This section presents a summary assessment of the alternatives.

The first alternative (the expansion of the current approach) is the easier strategy to implement because it requires very few changes in AID's current approach to office automation. It offers the most rapid implementation of additional automation support throughout the Agency, although that support is expected to be limited, for the most part, to word processing equipment. The benefits that will be achieved from this strategy will be captured quickly, but will be confined to increases in clerical productivity and will ultimately be more limited than the benefits of other approaches.

The lack of central controls implies that this alternative is least likely to achieve the full benefits of automation:

- . There will be little expansion of data processing and communications capabilities.
- . The equipment will not be interconnected into an integrated network which links the flow of information among AID offices.
- . Staff may not receive the kind of training and support needed to take full advantage of new equipment installed in their offices.

The overall result of this alternative is likely to be underutilized equipment.

The second alternative (a centrally-guided rapid expansion of automation) provides for quick development of equipment following the guidelines and controls imposed by a central plan and a central management group. This alternative:

- . Permits substantial discretion in office participation
- . Should achieve high payoffs quickly due to the size and rapid pace of implementation.

The second strategy must be well-planned and well-executed to receive the full benefits of automation and to minimize risks.

There is a risk of making potentially costly errors in design and implementation of this approach to office automation. Strong central leadership is needed to monitor problems, quickly assess corrective action and more decisively

make needed changes in the plan, specific equipment choices, and personnel decisions.

The controlled prototype experiment presented as the third alternative minimizes risks yet puts the Agency on the path of high payoff from its investment in office automation equipment. The major disadvantage of this strategy, however, is that it has a minimal effect on most of the Agency during the first two years of the plan. Although rapid expansion should follow the two-year prototype, the pressure from other offices for expanded office automation while the design is being tested will be difficult for the Agency to manage.

* * * * *

Following a review and consideration of the three strategic alternatives, AID has selected one as the basis for the five-year office automation plan. The second strategic alternative, which calls for voluntary office participation in an Agency-wide plan, was selected for further development and specification. If the selected alternative is fully implemented, the Agency will realize both work force savings and quality improvements.

This alternative could result in an incremental expenditure of approximately \$17 million over 5 years (an average

annual expenditure of \$3.4 million) to purchase the required hardware and to develop the necessary software. However, it has been estimated that AID spends \$62 million annually on the CDSS, PID/PP, ABS and CP processes alone. Clearly, an improvement in clerical and professional productivity of the magnitude typically obtained in other environments would fully justify the new expenditures.