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### **DEVELOPMENT OF THE CENTRAL DEPOSITORY COMPANY OF PAKISTAN TECHNICAL REPORTS**

SEGMENT I: Current Procedures & Structural Recommendations  
SEGMENT II: Structural Design & Implementation

#### **Technical Assistance in Private Enterprise (TAPE) Indefinite Quantity Contract**

Contractor: **Eccles Associates, Inc.**  
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PRICE WATERHOUSE  
OFFICE OF GOVERNMENT SERVICES  
WASHINGTON, DC 20006

15 December 1993

Mr. Arif Habib  
President  
Karachi Stock Exchange (Guarantee) Limited  
61-63, Stock Exchange Building  
Stock Exchange Road  
Karachi-74000, Pakistan

Dear Mr. Habib:

Attached is the final report from segment two of our engagement to assist the Karachi Stock Exchange in the development of the Central Depository Company of Pakistan, per the scope of work contained in the final report from segment one, chapter IV (p. 21), as agreed to by yourself and Mr. Husain A. Babur, Project Officer, USAID, at our 30 November meeting.

Contained in the report are a restatement of the structural design features of the depository (from segment one's report), the recommended sequence of implementing those features, and a preliminary outline of the issues that have to be addressed in the preparation of a full scale implementation plan. We recommend that development of this plan should be the subject of a future technical assistance project, as discussed in detail herein.

We have enjoyed working with you and your colleagues in the preparation of this report. We are optimistic that the initiative and drive displayed by the Pakistani financial community will lead to the successful development of your depository.

If we may be of any further assistance, please call on us.

Sincerely yours,

  
PRICE WATERHOUSE

cc: Chief, O/PEN, USAID (4)

**Final Report**

**The Development of the  
Central Depository Company  
of Pakistan**

**Karachi  
Pakistan**

**Price Waterhouse  
Office of Government Services  
15 December 1993**

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## Chapter 1: Structural Design Features

The Price Waterhouse report on the Development of the Central Depository Company of Pakistan, issued 18 November 1993, was the deliverable from segment one of the assignment for the Karachi Stock Exchange under the sponsorship of USAID. The recommended central depository system structural features contained in that report have been accepted and form the basis for the ongoing tasks of planning and implementing the system.

These various structural features are set out below. Appendix A of this report contains visual aids utilised in the presentation of these features to various members of the financial community of Pakistan. They are included in this report for reference purposes.

1. Concept. A securities depository changes ownership of securities by book entry on electronic ledgers without any physical movement of scrips or transfer deeds. An institution that accomplishes this meets the minimum requirement of a securities depository. It may include many desirable additional features, such as automatic payment for deliveries, the ability to hypothecate, automatic billing of participants for services rendered, and so forth, but they are not essential to qualify for being a depository. This definition should be kept in mind when considering our recommendations.
2. Fundamental Principle. All securities industry deliveries for a depository eligible security will be through the depository facility. Whatever technique is necessary to enforce this practice will be utilised; for example, stock exchange rule, CLA regulation, and so forth. This principle does not mean that if a father wants to give his sons some stock that the depository must be involved; it does mean that if he sells the stock through any stock exchange, (or over-the-counter market if one should develop in the future) the transfer in ownership will be through the depository. All institutional securities holders will likewise use the depository for all changes in ownership; that is, all mutual funds, banks, brokers, pension schemes, and insurance companies are included.
3. Automation Recommendation. All input should be in computer-readable form. We assume that the output of the stock exchanges' clearing systems will be automatically input to the depository system. We believe that by depository rule all other transactions from participants should be provided by them either through a computer terminal or on a diskette so as to minimise the need of the depository to handle paper. A workable, but in our view, less desirable alternative is for the depository to accept paper source documents and provide the keyboarding service to put them into machine-readable form.

4. The Operating Day. It is envisaged that the depository will be open to receive transactions several hours each working day. Many details need to be worked out concerning the operating schedule of the depository, but what will happen normally is that deliver orders from the previous clearing cycle will be input first thing in the morning, and that during the day deliver orders between brokers and their institutional customers will be submitted.
5. Basic Operations to be Performed by the Depository. The basic operations to be performed by the depository are the following:
  - a) Deposit--Existing Issues. These are the receipt into the depository system of physical scrip for already existing issues.
  - b) Deposit--New Issues. These are the recording of allotments directly from the issuer to the successful applicants through the depository system.
  - c) Free transfer. Book entry transfer without any associated cash movement.
  - d) Depository Settlement. Book entry transfer of ownership of a security in exchange for payment to settle a trading transaction.
  - e) Cash only movement. Movement of cash only from one depository participant to another without any associated securities movement.
  - f) Corporate Action. Bonus issues and any other action that changes the number of shares held in the records of the depository by participants without depositing or withdrawing shares to/from the depository system.
  - g) Withdrawal. Removing shares from the depository system in the form of physical scrip.
  - h) Pledge/Release. Placing a lien on securities in favor of a lender, which lien can be released only by the lender when the debt is repaid.
  - i) Stock Borrowing and Lending. Stock borrowing/lending through the mechanism of transfers with or without associated money movement through the depository system.
6. Depository Eligibility. Issues are entered for processing in the depository as the result of deposits made in those issues after the issues have been declared eligible for the depository. This permits an orderly phase-in of the functioning of the depository with minimum risk.
7. Participants and Users. We recommend membership (participation) in the depository be limited only to securities institutions such as brokers, banks, mutual funds, insurance companies, stock exchange clearing cells,

registrars, and so forth. We specifically do not recommend that the depository have individual public investors as direct participants inasmuch as to do so would considerably complicate depository operation without offsetting advantages. We normally recommend individual investor accounts in a central depository only in those cases where the reputation of the securities industry participants is so poor that not offering individual accounts would limit depository usage severely. We have seen little evidence of this kind of problem in Pakistan.

8. Account Structure. As implied by the restriction on participation discussed above, we recommend that the depository offer accounts only to securities industry participants and not individual investors. Within the participant accounts, however, the depository should offer sub-accounting for those participants who do not have or wish to use customer accounting systems. This will permit securities to be left within the depository identified with specific individuals, making withdrawals unnecessary for those willing to leave their securities with their broker or bank. For participants having customer accounting systems there will be no need to utilise this function of the depository; the detailed ownership records behind the participant's depository account will be in the participant's records outside the depository.

In connection with participants keeping customer accounts in their own customer accounting systems, we recommend that (1) minimum standards be established by the depository governing competence, content, and format of customer account record-keeping and (2) that as long as these standards are met, the organisation form of the participant (corporation, partnership, proprietorship) does not matter.

9. CDC--THE SCRIPLESS DEPOSITORY. A principal design feature of our recommendations is that CDC will operate on a completely scripless basis. It will not receive or send out scrip. These functions will be done by the registrars as is done today. This approach will keep costs to an absolute minimum: no vaults, no microfilming, less space, fewer personnel, no auditing of physical scrip inventory, lower insurance premiums, no counterfeiting or forgery problems for the depository, all of which costs are associated with those depositories operating on the old-fashioned "immobilisation" basis, rather than this modern "dematerialisation" basis. Essentially, the depository is a computer-driven service organisation rather than a paper processing facility. Note that the depository operating on a scripless basis does not mean that the public may not have scrips in their possession.

The way scrips will get into the depository, therefore, will be (for existing issues) for participants to send them to their registrars, who will cancel the scrips and notify the depository that the scrips are now registered to the depository for credit to the participant's account who submitted them. The registrar need not have a certificate for the depository's position, though for legal reasons, if necessary, the registrar could issue a "balance certificate" representing the entire quantity of the depository's position.

New issue processing would have to be changed somewhat to get maximum advantage of the depository. Issuers would credit the new issue to the depository through the registrar. Applicants would indicate the name (code number) of the depository participant on the application through which they would receive their allotments. The firm doing the balloting would notify the registrar of the winners and their associated depository participant after which the registrar would issue the deliver orders to the depository to credit the appropriate accounts. Individuals could then request scrips if they wanted them, but we feel that many will leave their allotments in the depository ready for immediate resale without having to deposit the scrip first as discussed above.

Withdrawals of physical scrip would be permitted, although we suggest that whether a given issue be permitted to be withdrawn be left up to the issuing company. The withdrawal request would be submitted by the participant on behalf of his client to the registrar who would notify the depository of the debit to its account and who the specific participant was. The registrar then issues the certificate (marketable lots are no longer necessary) either in the name of the beneficial owner or the participant, as agreed upon between the owner and the participant.

10. Delivery versus Payment (DVP). We recommend that the depository be designed to permit delivery versus payment within the depository system. While obviously not a requirement initially, as discussed above in Point 1, planning should include all inter-participant settlement being in the depository. This will make it possible for stock exchange clearing systems to utilise the money settlement facility of the depository. It will also eliminate check issuing between institutions and their brokers. This is a substantial simplification of today's processing.
11. Corporate Actions. Bonuses and any other recapitalisation actions that adjust the number of shares outstanding would be handled by the depository through its computer calculations for its own holdings upon notice by the registrar. A participant, for example, that owned one lakh shares at the time of a 20% bonus declaration would have his account

automatically credited for the additional 20,000 shares. Registrars would send scrip to physical scrip holders as they do today.

12. Cash Dividends/Rights Offerings. The approach we recommend for those actions requiring mailing of dividend checks, rights offerings, and any other similar situations is for the depository and its participants to supply the registrar with the names, addresses and holdings underlying the depository's positions, thereby permitting direct mailing from the registrar to the beneficial owners or their nominees. For the holders of physical scrip, the registrars will do exactly what they do today.
13. Pledge/Release (Hypothecation). We recommend a special system be developed that will permit hypothecation by "blocking" pledged shares within the account of the pledgor, thereby insuring that dividends and other entitlements are handled correctly. This "blocking" transaction would be tantamount to placing a lien on the pledged shares, because they could not be moved out of the account until a transaction had been submitted by the pledgee lender "unblocking" the pledged shares; that is, lifting the lien. Although a regular deliver transaction moving the shares from the pledgor to the pledgee could be used, to protect the pledgee's interests, it would result in the entitlements flowing to the wrong party.
14. Stock Borrowing and Lending. We recommend that for the foreseeable future, because volumes are low, that stock borrowing and lending be accomplished by regular deliver orders, even though this may result in claims for the misdirected dividends and other entitlements.
15. Position Reconciliation with Registrars. The recommended approach to a dematerialised depository with its reliance on registrars for handling depository deposits and withdrawals makes it absolutely necessary that the books of the registrar and the position accounting of the depository stay in synchronism at all times. We recommend that all issues from the date of depository eligibility be reconciled daily with the registrar for a period of at least one month so that all balancing procedures can be appropriately tested. If all goes well after the initial month, weekly reconciliation could be utilised.
16. Applicability of this Structure to All Securities Types. The depository design criteria recommended for CDC have the advantage of being applicable to all security types. If, for example, Pakistan ever wishes to trade in options, they could be handled in this depository with relatively little additional work. Note, however, that some procedural work and computer programming would undoubtedly be necessary; the key

point, however, is that the nature of the recommended approaches will minimise the preparatory work that might otherwise be required.

17. Pakistan as a Global Player. This depository design complies with all international standards and should make it relatively simple to interface with central securities depositories in other countries, thereby facilitating foreigners investing in Pakistan as well as the converse. Please, remember, however, that to fully comply with international standards it will be necessary to go to rolling settlement with a maximum time of three days after trade date.
18. Regional Neutrality. Our recommendations facilitate creation of a truly national depository serving the entire Pakistani securities industry. While obviously everyone realises the position of Karachi as the "financial capital" it is important that the financial communities of the other cities not perceive that the depository disadvantages them compared to the Karachi community. We recommend that management in its operating policies maintain strict regional neutrality so that there is no reason for other cities to want to build their own depositories with the resultant redundancies and excessive cost. Regional neutrality is particularly important in pricing depository services; for example, it should cost no more to process a transaction submitted from Islamabad than one submitted from Karachi.
19. Billing. The depository will need to establish a fair billing schedule for its services. This a major project in itself, inasmuch as some participants will have more transactions than others (typically brokers) while some will have greater positions (typically institutions) and varying the prices can adversely affect one group versus the other. We recommend that the billing system be automated and structured so that it can not only bill, but also model prospective billing rates, thereby helping the board set fair charges.
20. Risk Minimisation. It is essential that the depository be correctly perceived both by its participants and the investing public as safe. There are many schemes available which provide varying degrees of protection. We recommend the "full collateralisation" approach: This insures that the daily payment obligations of the net receivers of securities be fully collateralised against default. There are many approaches to full collateralisation, but the simplest is that the depository have cash, marketable securities, and letters of credit on file for the maximum exposure allowed a participant. As the depository grows, and especially if it makes eligible debt obligations, this feature will increase in importance.

21. Coding Schemes--Participants and Securities. We recommend, that with the increasing number of firms that do business in multiple marketplaces (hold cards on two exchanges, for example) and the almost universal multiple-exchange listing of stocks, that nation-wide coding schemes be developed for computerised identification of both participants and eligible securities. The depository, functioning as the "utility" of the securities industry, is the logical entity to establish and maintain these coding schemes, in the absence of any other party doing it. Care should be taken in the selection of the securities scheme that it complies with international standards in order to facilitate international depository interfacing.
22. Confidentiality. We believe that the approaches recommended provide a degree of confidentiality and privacy to the investing public equivalent to that available today with the certificate/transfer deed system. While the approach is different from today, close examination should show that through customer accounting systems of participants and the ability of securities to be registered in nominee name, there is no need for the depository to be aware of the beneficial owners of its holdings unless a participant wishes, at his option, to utilise the sub-accounting features discussed above.
23. Legal Framework. The recommended design of the depository will require a complete analysis of its compatibility with existing and proposed legislative and regulatory changes. This analysis is beyond the scope of this study, but below are highlighted some key areas where compatibility is essential:
  - (a) Book-entry settlement. Transfer of ownership by book-entry on the ledgers of the depository must be clearly recognised as equivalent to a delivery of physical scrip.
  - (b) Fungibility. All requirements that distinctive numbers be associated with depository holdings must be eliminated so there is true fungibility.
  - (c) Elimination of director's signature. The present requirement for a director's signature in order to effect transfer must likewise be eliminated.
  - (d) Beneficial Owner Rights. The law must clearly recognise the rights to entitlements of the beneficial owners for all depository holdings.
  - (e) Pledges/Releases. The law must recognise that the hypothecation of securities through the depository system is the equivalent of lenders taking physical possession of collateral; else, no lender will want to use the depository.

(f) Stamp Tax. We cannot comment on how the present stamp tax would be applied to the operation of the depository inasmuch as it is the transfer deed that is currently taxed and, by definition, transfer in the depository occurs without transfer deeds. We recommend however, that if possible, all taxes on the transfer of ownership of securities be eliminated as being inhibiting to the growth of capital markets. If, for reasons of public policy, that is not possible, the revenue effect of the new system must be analysed and any changes in the law resulting from that analysis potentially included in the computer programming specifications of the depository.

## Chapter 2 Structural Design Features Implementation Sequence

The features recommended for the Central Depository Company (CDC) of Pakistan should be implemented in phases to avoid attempting to do too much at once. The following is the recommended sequence of implementation of the structural features which have been identified as appropriate for the CDC (item numbers in parentheses refer to the numbered items in the preceding chapter).

### Phase 1.

On the start up date of CDC, the central depository system (CD~~S~~) should, at a minimum, have:

1. The broad support of the financial services industry which includes stock exchanges, stock exchange members, banks, institutional customers (mutual funds, insurance companies, pension schemes, etc.), listed companies, company registrars (both company departments and private), and government regulators. (item 7)
2. Rules which require book entry settlement between: stock exchange members for their member to member transactions, stock exchange members and their institutional customers for transactions made on the stock exchanges, and stock exchange members and their qualified private investors who trade in large volumes and who turn over their positions on a frequent basis. (items 1,2)
3. Legal authorisation that (1) protects the rights of all parties for bookentry settlement activity and (2) clarifies ownership of securities registered in the name of the depository for participants and their customers which are the beneficial owners. (item 23 a-g)
4. An operating capability to permit the establishment of eligible securities (issues) for which participants can (1) deposit scrip (certificates) for the establishment of positions (firm or investor owned) on an omnibus basis for their respective accounts or for positions in sub-accounts for their respective customers (investors), (2) make free bookentry transfers from these positions to the account of another participant, and (3) withdraw shares from a position and receive newly issued scrip (certificates) in the name of a specified owner. (items 4,5a,c,g,i,6,8,14)
5. Established coding schemes which identify (1) participants on a national basis and (2) individual securities (issues) in accordance with International Security Identification Numbering (ISIN) conventions. (item 21)
6. A statistical sub-system which will provide necessary management and audit control information as well as information needed for billing purposes to users and others if appropriate.

7. An operating capability which will permit use of the CDS by both Karachi-based and "up country" participants. (item 18)

8. An operating capability which requires input from participants via terminal or computer disk or from a third party (such as a service bureau or a stock exchange) for those participants unable to interface directly because of size, cost, or other reasons. (item 3)

9. An operating capability which utilises the registrar of an eligible security as the "custodian" of the shares registered in the name of the central depository and which provides for regular and automated reconciliation between the ledger of the registrar and the ledger of the CDS. (items 9,15)

#### Phase 2

Subsequent to the start up of the CDS, the next group of features to be implemented should include:

1. An operating capability which will permit the CDS to allocate bonus shares issued by a company to the individual accounts in the depository through a "cascade down" facility. Total shares distributed to the CDC as registered owner would be allocated to the individual accounts on a pro rata basis. (item 11)

2. An operating capability which will permit the CDS and its individual participants to indicate to the registrar the names, addresses, etc. of the beneficial owners of the shares registered in the name of the CDC for the purposes of distributing cash dividends, rights offerings or other communications, directly to the beneficial owner through a "roll up" facility. (item 12)

3. An operating capability to take delivery order instructions from the Stock Exchange clearing systems as direct input to the depository to facilitate settlement without re-keyboarding the data. (item 3)

4. Unless required by policy for phase 1 implementation, a billing sub-system which will permit automatic calculation of service charges based on whatever fee schedule is adopted by the Board of Directors. (item 19)

#### Phase 3

Additional features to be provided by the depository on a phased in approach should include:

1. An operating capability which would permit deliveries versus payment within the CDS with a net end of day pay or collect requirement by individual participants. Such capability should

include a fully collateralised system to minimise or eliminate risk to the depository or any participant due to the default of any other participant. (items 5d,10,20)

2. An operating capability which would permit participants to enter cash transactions which would permit one participant to debit its account for the credit to another participant. This would also include the ability for the depository and/or clearing houses and/or stock exchange to debit participants/members. (item 5e)

Phase 4.

Additional features which can be provided by the depository would include:

1. An operating capability which would permit a participant, or a customer of a participant, to use a security position as collateral to a pledgee bank in order to borrow cash. Such a system would block shares in an account for the benefit of the pledgee bank but continue to carry the participant, or the customer of the participant, as the beneficial owner. (items 5h,13)

2. The ability to facilitate distribution of new issues on a dematerialised basis to allotment winners. (items 5b,9)

3. An operating capability which would permit a broker and an institutional customer to pre-compare a trade for automatic book entry settlement on settlement date.

## Chapter 3 Implementation Planning Issues

### Outline

#### A. Introduction

#### B. Categories of Issues

1. Detailed functional design specifications
2. Data modeling/report design
3. Communication/logistics
4. Data processing philosophy
5. Hardware specification and selection
6. Software acquisition
7. Organisation structure/staffing/recruiting
8. Work flows/procedures development
9. Input forms
10. Training and education
11. Laws/regulation/rules/contracts
12. Space
13. Billing
14. Accounting system design/audits
15. Insurance
16. Financing

#### C. Next steps

## A. INTRODUCTION

### 1. Scope of This Chapter

This paper will identify the categories of issues that must be dealt with in order to build, in as efficient and low cost manner as possible, the depository possessing the structural features described in Chapter I, and implemented in the sequence described in Chapter II. Essentially, these issues comprise the specific categories of questions that must be answered prior to the actual operation of the depository.

There literally will be hundreds of questions to be answered; there is no way that they can all be identified in this report under each of the categories described. Some questions cannot even be anticipated until the answers to other questions are provided. The objective of listing each category of issues is to identify the general area that must be addressed, and by supplying examples (rather than an exhaustive list) of specific questions within each category, to give the reader some idea of the complexity of building the Central Depository System (CDS) to be operated by the Central Depository Company of Pakistan (CDC).

As will be discussed in greater detail under Section C below (NEXT STEPS) the categories of issues should next be organized into an overall plan for implementing the depository (henceforth called the Implementation Master Plan for the entire project). The objective of the Implementation Master Plan is not to answer all of the questions that must be decided, but rather to identify how much time, effort and money it will require (1) to answer these questions and then (2) to implement the answers. In this report we call the activity to develop the Implementation Master Plan "The Planning Exercise."

In the Implementation Master Plan to be developed, there is (1) a task for detailed planning of each major activity (that is, identifying the time, effort and money it will take to identify the specific questions and their answers for that activity) and (2) the tasks for implementing the answers (that is, identifying the time, effort and money it will take for actual implementation of that activity).

An example will perhaps clarify this: There is a category of issues called "Hardware Specification and Selection." Under

that category, we define what is meant by that category and cite examples of the questions to be answered (or issues to be resolved) in that category. This should give the reader an idea of the complexity involved. When the Implementation Master Plan is developed during The Planning Exercise, the planners will produce a document that will include an estimate of time, effort and money required in both (1) the detailed planning phase of hardware specification and selection activity, and (2) the time, effort and money that will be required to do the actual implementation (acquisition, site preparation, installation, and operation) of the hardware. The totals of time, effort and money of all the tasks for all the categories contained in the Implementation Master Plan, of course, identify the grand totals for building all the features of the functioning depository, as well as estimating the cost of operating the depository after implementation.

How much time, effort and money should be spent in developing the Implementation Master Plan? This question will be addressed in Section C below, but it is closely linked with the issue of why develop an Implementation Master Plan at all? Why not just start building the depository? After all, its features and the sequence of implementing those features have already been decided. Why spend time in The Planning Exercise to develop the Implementation Master Plan when construction could start now? The reader may be thinking, "Let's get moving--we were hoping to have the thing running by now."

The answer is that the Implementation Master Plan will be the guide of what to do and when to do it so that mistakes will be minimized and the net overall time and cost to complete the effort will be kept to the lowest possible. Not having the Implementation Master Plan available before doing the implementation tasks is like taking the blueprints for a house and trying to install the plumbing before the foundation is poured and the rooms framed. The Plan is the road map to get to the destination. One might get there without it, but he probably would not take the most direct route, and he might waste a lot of resources in the process. The principle involved is that the time, effort and money invested in developing an Implementation Master Plan save more of those resources that it costs to develop; it is, therefore, a good investment, one that we highly recommend doing.

There are other reasons for producing the Plan:

- (1) It gives the estimates of development and operating cost of the depository before the start of construction. What if it looks too expensive? Perhaps one would want to scale back on some of the functionality. Or perhaps exploring if there are cheaper ways to obtain the same functionality would be the option selected;

- (2) It serves as a communications tool with the depository Board of Directors and Participants, letting them understand what is involved in building the depository. There is apt to be less complaining and frustration if they know the magnitude of the project before it begins; and
- (3) It gives the Board a basis for measuring the employees and contractors involved in the implementation effort. Through periodic reporting of actual accomplishments versus the Plan it permits the Board to identify problem areas where corrective action may be necessary.

Now that the reader is, hopefully, persuaded as to the need for an Implementation Master Plan, let us get on with a discussion of the categories of issues to be addressed in the Plan.

## B. CATEGORIES OF ISSUES

### 1. Detailed functional design specifications

Detailed functional design relates to the step by step definition of how a particular service transaction is performed and considers how data flows, what data files it may interact with, what processing it might have to go through, and who and/or what is needed to perform any step along the way. When performing detailed functional design, flow charts are prepared along with detailed descriptions of the various steps along the way. The output of this effort is used in subsequent areas such as forms design, software programming, equipment selection, and staffing planning to name a few.

The work involves considerable analysis of each step and evaluation of the various alternatives available, if any, to accomplish a particular task. Many of the decisions have major impact on areas such as costs, service levels, timing, staffing, etc. The decisions made in this phase set the direction for much of the effort in the balance of the implementation effort.

The following are a some of the issues to be addressed in this category:

Coding schemes

How will participants be identified? What is the coding scheme? Who maintains it?

What information about a participant is needed and how will the account master file be established and maintained? Who has access to information in the master file?

For sub-accounts, what information is needed and how will it be established and maintained? Who has access to information in a participant account's sub-account?

How will securities made eligible for the depository be identified? What is the coding scheme? Who maintains it? Will issues trading on multiple exchanges have the same code number?

If participants have more than one account, how will the accounts be differentiated? If a participant is a member of more than one exchange, will the participant have different names?

## Deposits-Existing issues

When making a deposit, what information must be transmitted to a registrar along with the scrip and transfer deed? What information must the transfer deed contain? Is there a need for a transfer deed? What receipt will be given to the depositor by the registrar? Who, if anyone, can make physical deposits with the registrar other than a depository participant?

What steps are taken after receipt of a deposit by the registrar? If a deposit is accepted, what information is provided to the CDS? How is this information forwarded? What steps are taken after rejection of a deposit by the registrar? Can a partial deposit be rejected? What, if any, record of the deposit does the CDS have between delivery of the deposit to the registrar and acceptance or rejection of the deposit?

What happens to the scrip and transfer deeds of shares which have been accepted by the registrar and are now considered shares registered in the nominee name of the CDS?

After notification of a deposit from the registrar, what action does the CDS take? What communication is made to the participant?

What standard will be set for a registrar to process deposits so that time between physical delivery to the registrar and credit to the participant's account by the CDS is kept to a minimum? What penalties might be imposed on a registrar, or the issuer, which does not meet performance standards?

What will be the communication method between the registrar and the CDS? Will all registrars be required to meet the same standard procedure and timing? What action will be taken if a registrar cannot meet the standards imposed by the CDS?

## Free transfers

What is the information required to be given the CDS by a participant submitting a delivery instruction? How will this be submitted to the CDS and in what form? What audits of the information will be performed by the computer? Will there be any audit or checks performed by CDS staff? How will the instruction be processed to insure its authenticity? If signatures are required, how will they be maintained and authorised by participants?

How will a receiving participant be informed of a delivery made to its account? How quickly can it submit an instruction to redeliver that receipt?

If a participant submits a delivery instruction but has insufficient shares, what happens? Does the request cease to exist (drop)? Does it pend for subsequent automatic processing after a sufficient quantity of shares is deposited or delivered into the account?

#### Withdrawal requests

What information is required to be given an ADA by an investor withdrawing shares from the CDS? In what form will this be given? Will this include a transfer deed? How will this information be forwarded to the registrar and/or the CDS for subsequent processing? What procedures are followed by the registrar to re-register the shares from the name of the depository to the investor? How will the scrip be processed from the registrar to the investor? Will it need to be processed by the ADA as well? How does the registrar communicate the completed withdrawal to the CDS?

What options will the investor have as to the denominations of quantity for the new scrip?

Will scrip issued from the depository's position be any different from other scrip re-registered by a registrar? Can scrip withdrawn from the depository be sold to other investors and re-registered without being re-deposited into the depository?

What information is provided by the CDS to a participant after the completion of the withdrawal processing by the registrar?

#### Bonus Shares

How will issuers and/or registrars notify the CDS of a share bonus distribution? How will the CDS notify participants of an announced share distribution?

What procedures will be followed by the registrar to increase the position of the CDS on its ledger? How will this be communicated to the CDS? How will the CDS increase the positions of the participants? What procedures will be followed if there are fractional quantities of shares? How will the CDS advise participants of increases in their accounts and sub-accounts? How will participants communicate increases to their customers with or without sub-accounts?

Some corporate actions might involve the distribution of shares of subsidiary companies or some other distributions of other than the shares of the issue itself. (An example of this would be the distribution of shares in a rights offering.) The questions raised above will be applicable to these situations as well.

## Dividends/rights

How will issuers and/or registrars notify the CDS of a cash dividend or rights offering? How will the CDS notify participants of an announced cash dividend or rights offering? How will participants and the CDS provide the registrar with the necessary beneficial owner information so that dividends or rights information can be distributed directly to the investors? Will this information be communicated directly to the appropriate registrar by the participants for merger of data or routed through the CDS which will consolidate the data? Will there be a standard format for this information or will each registrar establish its specific formats?

Some corporate actions will require mandatory action on the part of the shareowner while others will be non-mandatory and rights provided shareowners will have some expiration period. How will the CDS handle these two different situations? If rights include payments, how will these be made? To the depository or to the issuer's agent?

Some corporate actions result in secondary trading of the rights. How will the CDS handle these issues? Will the depository establish a security code for the "right", permit depositing of rights letters to establish positions, and provide for bookentry settlement of the trades in such rights?

## Deposits-New issues

Will issuers permit distribution of new issues through the depository? Can applicants request shares and provide required information as to their ADA and ADA sub-account number, and, if so, what form must be utilised to do so? Assuming distribution of new shares through the CDS, how will balloting firms transmit the necessary information as to successful applicants? What information will be provided by the CDS to these applicants and how?

## Depository settlement transactions (Delivery vs payment)

What is the information required to be given the CDS by a participant submitting a delivery instruction for money? How will this be submitted to the CDS and in what form? What audits of the information will be performed by the computer? Will there be any audit or checks performed by CDS staff? How will the instruction be processed to insure its authenticity? If signatures are required, how will they be maintained and authorised by participants? What limits will be set as to the amount of the money in any delivery?

What form of collateral system will be used to eliminate or minimise risk to the CDS or contra participants in the event of an end of day non-payment by a participant?

What timing restrictions must be placed on DVP movements to insure an end-of-day cut off which will allow payment by participants to the CDS and payment by the CDS to participants? What limitations will be placed on participants as to which banks they can use? What minimum requirements will be placed on banks to make them eligible to be a "clearing bank" for a participant? What, if any, restrictions must be placed on the geographic location of a bank serving as a clearing bank for a participant?

When processing end-of-day pay and collect activity, how will participants be notified of their individual requirements? What detail will be provided to support this pay or collect activity in advance of the actual requirement to pay or collect?

Cash only movements

What types of cash only entries will be allowed for processing through the CDS? How will instructions be submitted to the CDS? How will participants being credited be advised of the details of the item? Will participants be allowed to debit only their own accounts or can they also debit the account of another participant?

Pledge/release

How will pledgee banks be authorised? How will the CDS be advised to block a position for a participant or a sub-account? From the pledgee bank or the ADA? How will the pledgee bank be advised of blocked shares? What type of periodic reports will be submitted by the CDS to the pledgee bank?

How will the pledgee bank advise the CDS of the release of shares from its account back to the pledgor?

Operating day

When will the operating day begin? When will it end? Will the day extend beyond a point necessary for a cut off for cash transactions? Will there be a fixed time when only reclamations (a return of an unauthorised delivery) are permitted at the end of the processing day?

## 2. Data modeling/report design

### Logical data modeling

In the previous category the focus was on the processing of data in the form of transactions such as "deposits--new issues" and "free transfers". This category of issues is involved with all aspects of the data recorded in the Central Depository System. It includes determining what data is to be recorded, what are the precise definitions of that data so that there is minimal possibility of confusion over meaning, what are the volumes of the different items of data that must concurrently be recorded, what are the logical relationships of one item of data to another (such as the relationship of Participant sub-accounts to the Participants' main accounts; may a Participant have a sub-account for his own trading positions, or must he have a separate main account, for example). Determining the information just described is called "logical data modeling".

### Physical data modeling

After the completion of logical data modeling, another activity called "physical data modeling" is needed. This activity is performed primarily by computer technical personnel. Physical data modeling answers the question what is the precise format in magnetic form of the data entered into the system. What are the precise organisation and format of the data recorded in magnetic form in the computer? What is the format of data stored magnetically in the computer after it has been transformed into new data by the operation of a transaction on the original data? An example of this last issue is how does a scrip position appear in the computer records after a pledge transaction has blocked (placed a lien on) the position so that a subsequent free transfer or depository settlement (DVP) transaction applied to that position was invalid until the position was unblocked.

### Report design

This activity includes the exact design of all reports (the displays of the data recorded) produced by the system. Most of the reports will be produced by the computer but there will likely be some manual reports as well. This phase of the Data modeling/report design activity answers questions like what reports are produced? Are they reports of transactions, positions, other things? Are they detailed reports giving specific information about each item of the subject matter (transactions, for example) or are they in summary form, giving only totals without details? What are the sequences of the reports? Are there conditions in the reports that will cause the next line to appear on a separate page (at the start of another customer, scrip, or type of transaction, for instance); exactly how is the report to be laid out (what information goes on the

left side and the right side of the report) and how many copies of the reports are to be produced? Who gets them? How are they obtained once produced (messenger, pickup, mail, telecommunication transmission)? Is each report to be produced on paper, displayed on a terminal monitor, or both?

### Data retention requirements

The last activity to be performed in this category of issues is determining data retention requirements, both for data recorded in magnetic form, output reports, and input forms as well (input forms are discussed in another category of issues; it makes no difference whether the retention requirements for them are determined as part of that activity or in this activity inasmuch as the work is the same.)

Retention requirements are a matter of business judgments based on what data is likely to be required to be accessed for some legitimate purpose after it is no longer current data. Complicating the issue is the question of requirements imposed on the depository by external sources, such as laws or government agencies (such as taxing authorities and the CLA), or the external auditors.

In addition to the question of what data is to be saved are the related issues of for what duration and in what form. With regard to the first issue, the requirement can range anywhere from one day to permanently. Often the retention duration is dependent on laws governing how long one is allowed in order to institute a lawsuit or arbitration proceeding after an alleged offense has been committed.

The form of retention for each report or file deals with the options of paper, magnetic medium (tape or disk), or microform (microfilm or microfiche). Issues involved include anticipated frequency of retrieval, cost of converting to the various forms, anticipated requirement of speed of retrieval from storage and conversion to a readable format, cost of storage, and cost of reconversion. Various "make vs buy" decisions may also be involved: Should CDC convert documents to microform itself or hire an outside service to do it? Is CDC going to archive data in its own space and employ the personnel to file and retrieve it, or is it going to utilise the services of an outside vendor of these services?

### 3. Communications/logistics

This category relates to the philosophy of what method of data transfer will be utilised between the CDC and its various types of participants and/or other elements of the CDS such as registrars and issuers. This can be further categorised as to input to the CDS or output from it.

The policy to prohibit paper input to the CDS assumes that all input to the CDS will be in computer readable form on computer diskette or direct computer connection (see Sec. 6, Data processing philosophy below). However, it is possible that not all potential participants will have the capability to meet this requirement. This then would require a third party to serve as agent for these participants by processing paper documents prepared by the participant and transmitting the data on to the depository.

What standards will the CDC impose on those participants performing this input function on behalf of others? What legal agreements have to be in effect protecting the CDC, the participant and the agent? Will this situation create competitive disadvantages for one group versus another? If so, is this acceptable to the CDC and/or any regulator?

As it is anticipated that participants will be potentially located in locations other than Karachi, standards of performance must be put in place which again do not disadvantage one participant versus another. Will communication capabilities limit how services are offered to one group of participants versus another? Can instructions, which are not in an automated format be processed via telephone, fax or other form to an agent without jeopardising security or confidentiality?

If computer diskettes are the form of input to the CDS, is there messenger or package forwarding capability which will permit non-Karachi participants to meet cut off time requirements?

Varicus CDS output reports will be generated during a processing day, week, month, etc. Some of these may lend themselves to an electronic format while others might be issued in a format better suited for long term record retrieval such as microfiche. Each of the individual output reports will have to be analysed to determine when and in what format they are best issued.

#### 4. Data processing philosophy

This category deals with technical computer issues that tend to have very large implications to the business-related activities of the depository. The issues, therefore, must typically be resolved with the advice of a combination of information technology specialists and personnel with operational experience, preferably within a depository environment.

##### Data entry methodology

The first issue to be resolved is the data entry methodology. The decision has already been made that the depository will receive its input in computer-readable form, whether prepared directly by the participant, or by some third-party such as a

stock exchange acting on his behalf. The question is, then, should that input be in batch format (diskette, typically), real-time format (terminal-keyed), or both? Some rapid opinions are likely to be formed that, given the size of Pakistan and the status of the telecommunications infrastructure, batch format is a necessity. But what about terminal entry? Are there large users who would want it? What are the cost considerations to provide it? Do the advantages outweigh the cost and complexity?

#### Transaction processing

Similar decisions must be made about transaction processing. Should it be batch only, real-time only, or a combination? It seems on the surface that the deliver orders (depository settlement transactions) coming out of the stock exchange clearing systems could be submitted and processed in batch format at the start of following operating day, but what about redeliveries to the receiving brokers' institutional customers? Should those be in real time? Or should there be periodic batch processing throughout the operating day? Or should there be only one processing cycle at the end of the operating day? What about pledge transactions? Can the borrower/bank wait for a subsequent batch process to place/lift the lien or is real-time processing essential from the business point of view? If real-time processing of pledge/releases is essential, does that imply that real-time data entry (the issue discussed in the preceding paragraph) is likewise?

#### Security

Another issue of data processing philosophy to be determined is the issue of security. "Security" is defined as the prevention of unauthorised access to data, whether accidental or deliberate. What are the methodologies/technologies that should be employed to make sure that Participant A does not look at Participant B's positions or transactions? What ensures that data represented as being submitted by Participant A is actually from Participant A and not someone else? A good example of this is how does the registrar know that a withdrawal transaction for physical scrip is bona fide? How does the depository prevent book-entry theft (a dishonest employee creating a bogus Participant account, transferring stock into it and then withdrawing it on his way out of the country)? If a decision is made to have real-time processing of any kind, what prevents a dishonest participant from tapping the telephone lines and intercepting competitive information, or even altering it en route to the depository's computer? What will prevent a disgruntled employee of either the depository or a participant from infecting the depository's computer with a so-called computer "virus"?

Computer security has been called a "specialty within a specialty"; that is, within the specialty of computer science, and it is essential that appropriate design for security be included within the system utilising specialists in this area.

(Please note that the type of security discussed under "Data Processing Philosophy" has nothing to do with physical security in the sense of facility guards, fire protection, and so forth.)

## Backup

The last issue of data processing philosophy to be considered is "backup". Backup is defined as redundant data and facilities sufficient to keep doing business in case of interruption to the normal doing business. Facilities backup planning is very complex. Acquiring backup capability can be very expensive. It is a subject, however, that the depository must deal with if it is to decide how much protection, if any, it wishes to procure against interruption of computer processing and related activities. Backup is analogous to insurance: the larger the premium, the more protection. Also, it is a cost that typically has little or no return (except perhaps for peace of mind) unless the interruption protected against actually occurs. The range of variables is huge, from doing nothing (no cost) to completely redundant facilities that can be switched to in a matter of minutes in case a disaster strikes (double or more cost-- completely redundant facilities, plus the cost of the switching mechanisms).

There are many questions to be answered in connection with backup. What activities specifically should be backed up? How long can the business go on without each of the specific activities? Must the activity to be backed up utilise exactly identical methodologies or is there a cheaper alternative that can be utilised? (Could real-time data entry, for example, be backed up by batch data entry so there need not be alternative telecommunications facilities?)

It is a characteristic of backup planning that typically more backup capability is desired than can be afforded and, therefore, the planning process tends to be iterative in nature, overly long, and expensive. Once a price tag is placed on a backup scenario the client often says that it is too expensive; go back and get us less coverage at a lower cost. This cycle can repeat itself several times. It would be preferable to keep this activity to a minimum during the development of the depository, but it should not be ignored, just controlled so that it does not disrupt the rest of the planning process.

## Off-site data storage

Related to both "backup" and "data retention" is the subject of off-site data storage. Copies of certain data files (in all formats, computer-readable or not, but particularly magnetic files) should be stored outside the computer facility to protect against fire and theft. Which files need to be kept off-site is the key question. The major consideration for storing these files is somewhat different from record retention for research and legal purposes. The emphasis here is more on speed of recovery in case of an interruption caused by the files in the computer room somehow becoming damaged. Questions include how far off-site should the data be stored? Is a different floor of the same building adequate or should at least some be in another building? Is the area subject to natural disasters like flooding or earthquakes that would require off-site storage across town or in another city? What facility? The depository's or rented? In a fireproof safe or just in a clean area with controlled access?

## 5. Hardware specification and selection

This category of issues is largely information technology oriented. There are four major classifications of hardware in this category, all of them related to the transaction and report processing functions of the depository: (1) central computer(s), (2) telecommunications, (3) participant premises equipment, and (4) related equipment to the report producing function. This category does not include "office equipment" such as typewriters, personal computers used for word processing and spread sheets, and telephone equipment used exclusively for voice traffic.

### Central Computer(s)

Specification and selection of the main processing computer is a sufficiently complex technical subject that entire books have been written about it. The main technical considerations have to do with processing power (speed), data storage capability in potentially several forms (such as tape and disk) and modularity (the potential for enlargement or reduction in size) in case business conditions, such as transaction volume changes, warrant a change in computer size. The selection of the central computer cannot be absolutely finalised until the detailed functional specification and data modeling are complete, as these supply the quantitative answers to determine capacity, the word used to describe the specific combination of processing power and storage capability a computer has in relation to the business applications (uses) to be processed. In addition to the technical considerations in acquiring a computer there are many other questions to consider, just as

there are in acquiring any other expensive piece of machinery. These questions are what is the reputation of the supplier/manufacturer? What is the price and how does this price compare to alternate computers? Are there other significant conditions of sale? Are extended payments available/desirable or rental with option to buy? What kind of maintenance is available when there is a breakdown, and how often, based on history, is it likely to do so? How fast will the maintenance personnel respond to a trouble call? Are spare parts available locally or must some of them come from out of town? Out of country? Can the computer be installed in normal office conditions or are there special site preparations involved, like extra electricity or air conditioning? If so, at what cost? Is there a tie-in with some other service the vendor is performing, such as the providing of some or all the application software (programs) that the depository requires? If so, will the vendor bid on the hardware and software separately to permit analysis of each bid component?

There is a policy issue involved in the central computer hardware selection: Does the depository wish to have its own computer or are there sufficient potential economies of scale to explore other alternatives, such as whether the Karachi Stock Exchange might be willing to share computers? If agreeable to both parties' Boards, what is a fair sharing of the cost and responsibilities?

#### Telecommunications

Telecommunications refers to the central computer equipment and telephone channels necessary to connect the central computer to terminals in the participants' offices (or their service bureaus).

By definition there must be telecommunications equipment if the data processing philosophy of the Central Depository System includes real-time data entry or real-time processing. It is also necessary if the depository wishes to offer the facility of transmitting batch files via telephone channels in order to enhance speed and/or reliability of delivery. An example of this might be that a participant in Lahore transmits his personal computer diskette at the end of day directly to the Karachi computer via telephone channel rather than giving it to a messenger or putting it on an airplane. If none of these considerations is true, there are no telecommunications facilities required.

Telephone channels come in the form of cable, microwaves, and satellites. Typically the channels can be leased for full time dedicated availability to the lessor or rented by the call (dial up service, just like when the reader makes a phone call) (Note--the authors have not had an opportunity to investigate

the variety of telephone services available in Pakistan so that some of the technologies mentioned may not yet be offered here.) Selecting the right one or combination requires that the telecommunications planner ask questions like how much data is being transmitted in total, and at peak times. What speed is needed? What are the reliability considerations of the alternatives? What are the cost tradeoffs? What is the forecast of future growth?

In addition to the telephone channels, special equipment must interface between the channels and central computer, and the channels and the participants' terminals. The considerations in specifying this equipment are similar to what is involved in specifying central computer equipment and telephone channels.

Participant premises equipment.

This classification, while usually not so complicated as the above, can still be a major piece of work. Some of the issues here center around the data processing philosophy. If there are no real-time aspects to the system, by definition there are no on-line terminals. If there are no batch aspects the participant needs only terminals and no computer. If both considerations are present and the participant elects to avail himself of both, either both a computer and terminal will be needed, or a piece of equipment that can function as both will be necessary.

Besides the data processing philosophy issues, there are many other questions to be answered. What type of equipment (manufactured by whom) will the central computer be capable of interfacing with? How will participants acquire this equipment--directly from vendors, or perhaps from the depository which might use its purchasing power to buy it with quantity discounts, thereby saving its participants money? Are there different billing implications from the depository to the participant depending on the nature of the participant's equipment and the nature of accessing the central computer (batch vs real-time)? In setting up operating procedures, if there appears to be a problem with the equipment, to whom does the participant turn--the depository, the equipment vendor, or (if telecommunications are involved) the channel vendor? Is it reasonable to be able to expect the participant to diagnose the problem sufficiently to decide whom to call?

Related equipment

The equipment referred to here is the report handling equipment related to paper report production. The depository will be producing reports for participants, its own staff, possibly government officials, and, for those participants using the sub-accounting feature for participants' customers.

Though the depository will be virtually input paper-free there will be a lot of output paper. Equipment that bursts (separates the continuous form pages), trims (removes the holes on the edges) and decollates (separates the plies) is available. Other machinery such as automatic envelope stuffers and postage meters (eliminating postage stamps) may also be considerations. Questions like what are the volumes and sizes and numbers of plies of the reports must be answered; then there is question of the cost tradeoff of doing some or all of these processes completely manually versus operators utilising this specialised equipment which must be answered. What are the relative space implications since some of this equipment is quite large? Are there firms that can more economically provide these services rather than the depository doing them itself?

## 6. Software acquisition

Software refers to computer programs that make the computer do various tasks. Technically there are two types of software: (1) system control programming (defined as operating systems, which control the physical aspects of the computer's functioning; data base management systems, which control the physical aspects of data storage; and telecommunications control programming, which controls the interaction of computers, telephone channels, and terminals) and (2) application programming, which controls the business functions the computer performs.

System control programming is closely related to the hardware selection and will be supplied or at least specified by the hardware vendor. Except for some possible staffing implications in the computer department it is usually of little direct importance in the planning process.

It is application programming, which does the book entry deliveries and all the other depository transaction processing, which is of vital interest to the depository and about which the depository must make critical decisions. It is application programming that the term "software" will be used to describe henceforth in this report.

### Initial decisions

The first decision to be made is whether or not to have an internal staff responsible for developing the software or to turn to an outside vendor. This decision is closely related to a "make vs buy" decision regarding software acquisition. In theory, if existing software (used by another depository, for

example) exactly fit CDC's needs there would be no software to develop, just a purchase or lease to negotiate. (This statement assumes the availability/affordability of the hardware it runs on in Karachi) Unfortunately, regardless of what any prospective vendors may represent, THERE IS NO SOFTWARE IN THE WORLD THAT EXACTLY MEETS CDC'S REQUIREMENTS. The real issue is does it make more sense from a cost and speed of availability point of view (1) to develop all software from scratch, or (2) to acquire some other organization's existing software and then to modify it to meet CDC's requirements, or (3) some combination of the two (for example, buying and modifying existing transaction processing software, but developing CDC's billing programs from scratch)?. How close the existing software is to meeting CDC's requirements, as well as normal business considerations such as price and terms, is usually the key factor in whether to buy or not. The reason that the "make vs buy" decision is closely related to whether to develop by in-house staff or a vendor is that the more it makes sense to buy, the more sense it is likely to make to retain the developers of the purchased software to make the modifications. Because they know the software, they are the ones who most likely can modify it fastest and cheapest. For software being developed from scratch, the decision centers around consideration of cost, availability of talent needed, especially securities industry experience as well as computer technical skills, the depository's approach to building up a large internal staff (what do they do after the project is over?), and speed of getting started. So the questions become does the depository make vs buy, develop from scratch, or a combination? Does the depository retain a vendor firm, hire its own staff, or a combination?

Future enhancements and program maintenance.

Related to the last question above is the issue of potential future enhancements to expand, extend, and improve the Central Depository System, plus changes to existing software that are required from time to time (including such things as fixing mistakes or "bugs" in the programming discovered after the initial development is complete). Future enhancements are largely optional and are dictated by changes in business conditions. An example follows: The authors have not recommended a special system to handle stock loans in the initial four-phase depository building plans because it is envisaged that normal free transfer processing will be adequate to handle the anticipated requirements for some time to come. If one were to assume that short sales would become a significant factor in the market's volume five years from now a special system to handle stock loans (one that had dividends going to the lender, rather than the borrower, perhaps automatic repayment on a specified date, money transfer, and so forth) might become highly desirable and cost-justified.

Maintenance, on the other hand, is usually defined as minor changes that improve the system, "bug" fixing, small changes that result from new regulatory requirements (a new report for the CLA) or new legal requirements (a change in tax rate, for example). The question is who does this maintenance? In-house staff or a vendor? If the system were developed largely by in-house staff, usually maintenance is performed by them as well. But what if the system is developed by a vendor (whether from scratch or by modifying purchased software)? There are several alternatives: retain the vendor on a long-term contract, have the vendor train the in-house staff to do the maintenance (a presumably much smaller in-house staff than if initial development were done internally), or a combination.

The important point is that these decisions affect the staffing and operating cost of the depository and the planners will have to make assumptions concerning the above options during The Planning Exercise. If during the actual implementation, there is significant deviation from the assumptions, there could be material cost/time differences (either favorable or unfavorable). Of course this is true about all assumptions used in making the Implementation Master Plan, but the software area is probably the most difficult area to forecast, and, therefore, to plan accurately. It is also the most likely, in the authors' opinion to suffer unfavorable variances from plan.

#### 7. Organisation structure/staffing/recruiting

After determining what resources are necessary to provide the functions anticipated within the CDS, it will be necessary to determine whether they can be provided by external personnel resources or if employee personnel need to be acquired. This will often require a typical make vs buy decision relative to certain services (software development employees vs contract programmers). It might also require a dedicated or shared services decision (use the accounting department of the KSE to do the accounting for the CDC of Pakistan).

In the areas where employee personnel will be necessary, individual job descriptions must be prepared so that some form of skill requirements can be determined and appropriate salary administration procedures determined. This will be necessary to assist in developing pro forma financial statements for the CDC which will be necessary when doing billing modeling.

After determining staffing requirements, job descriptions, and salaries, decisions must be made as to where these personnel resources can be acquired. Where can the required skills be found? What impact will there be on potential participants if the source of these skills might currently be in brokerage houses or banks or mutual fund organisations?

the training programs? What other training aids would be available?

As registrars will play a major role in the processing scheme of the CDS, what training will be conducted for registrar personnel? Who will be responsible for this?

Training programs must be designed in advance of the actual training exercise and must be timed so that they are not too early or too late relative to the implementation of the functional areas they address.

As the public will be indirect participants, they will not be dealing with the CDC staff. However, public confidence in the system must be developed. What programs need to be implemented to address public awareness? What support must be given to the participants to facilitate their training of their investor clients?

An impressive video has been prepared by the KSE to help educate persons with a need to have a general knowledge of the CDC. What additional education is needed to promote the planned implementation of a central depository? Who else needs to be sold on this concept?

#### 11. Laws/regulations/rules/contracts

There will be numerous legal and quasi-legal tasks to be performed prior to the start up of the CDS. They will fall into one of the sub-categories below.

##### Laws

A review of current laws will be necessary and opinions issued which relate to the operational concepts of the depository. Some of this work has already been started. However, the CDC board and its individual participants will have to be satisfied that there are no legal impediments to the successful use of the CDC.

Are the rights of owners fully protected when the underlying scrip, which is evidence of ownership, has been replaced by an entry in the computer? Is the transfer of ownership clearly defined when a bookentry delivery is made in the CDS? If a bookentry delivery is made for money, when does title transfer? What right does the depository have, or the deliverer have, if a receiver does not pay his end of day settlement? Are the rights of the CDC or the deliverer subordinated to any other third party? What rights do third parties have against share positions in the depository?

The registrars will play an important role in the operation of the CDS. Do the current laws permit the flow of registration into and out of the depository's nominee name as proposed? What problems, if any, will exist because of distinctive share numbering procedures? Will the transfer deed continue to create a problem for the efficient flow of scrip in and out of the depository?

Are there any laws which would prohibit the planned flow of bonus shares? Of dividends? Of rights? Any other corporate actions?

Is federal law the only applicable jurisdiction of concern to the CDC? Can local laws take precedence when the CDC is dealing with a participant? with a registrar?

#### Regulations

As discussed above for laws, a similar set of questions must be raised relating to any federal or other governmental regulations which might infringe on the operation of the depository.

#### Rules-Stock exchange/clearing house

A review should be undertaken of all current stock exchange and/or clearing house rules as they relate to clearance and settlement to insure they fully conform to the intent of bookentry capability of the CDC. Have rules relating to marketable lots been amended to conform with depository capabilities? Are there any rules which should be enacted which would require use of the system?

#### Rules-Depository

A detailed set of rules of the depository must be written which become a part of any contract between the depository and other organisations. These rules will relate to the operating procedures of the depository and also set out many of the specific definitions of the various services provided by the depository.

Rules should be subject to modification but only after certain requirements including publication to participants and possibly approval by the CLA before being effective.

Does CDC have access to rules adopted by other depositories which might be applicable to use in the Pakistan environment?

## Contracts

## Participants

There will be a need to develop a specific contract or standard agreement which each participant executes as a condition to using the depository. This agreement will spell out the various obligations of both parties and indicates to what degree of responsibility the depository is being held.

## Registrar

Because of the role played in the depository by the share registrars, a standard agreement must be developed which will spell out the various obligations of both parties. This agreement would be executed by the registrar or the listed company.

## 12. Space

Space refers to all real property occupied by the depository regardless of function or location. Included are office space, special computer space, storage facilities, garages, and so forth.

Included in the space category are all improvements to the space, such as partitioning, heating, ventilation, air conditioning, raised floors (needed sometimes for computer rooms).

Also included are furnishings, such as desks, chairs, tables, cabinets, carpeting, and all sorts of miscellaneous supplies needed when establishing new facilities (examples, waste baskets, desk furnishings--ash trays, letter openers, and so forth). This category is usually not forecasted in detail, but estimates of gross cost are made.

Last, office machines and telephone equipment are included in this category. Personal computers for office use (not input/output devices for the Central Depository System), typewriters, calculators, telephones, telephone switches for voice traffic, speakerphones, dictating and transcribing equipment--all fall into this classification.

## Locations

The primary question to ask is in which cities/locations should the depository have a physical presence and for what purposes? Is the expense worth the benefits? As a national institution should there be offices to relate to the public in every major city? Should there be offices only where there are stock

exchanges to relate to the financial community in those cities? Will some form of transportation service be operated in those cities, such as collecting diskettes from participants, combining them into one package and carrying them to the CDS computer facility, carrying output reports to the participants on the return trip? Or does the CDS telecommunications system make that idea moot? Should there be a CDC presence in Karachi only? If so, should there be at least two locations in Karachi so there is some degree of protection against fire or other disasters (see the discussion of off-site storage above)? Is there enough available space in the location desired (perhaps the KSE building) to avoid overflowing to another building?

Please notice the dependency of this activity on organisation structure, function definition, and staffing considerations, as well as hardware selection. After all, how much space per manager must be provided? For the chief executive? For clerks? How big is the computer? Does it require extra electricity or air conditioning? Will the depository provide a motor generator to keep the computer running in case of power failure? If so, where will it be housed?

Make vs buy

Once the locations, their size and functions are determined, it is possible to determine whether to acquire or build the facilities needed. If it decided to acquire, the method must be determined; that is, will the depository buy or lease the facilities? The assumption is usually made that rental of available space is the preferred route; if there are reasons not to use that assumption (such as a shortage of desirable office space in the locations planned) a more likely assumption should be used for planning.

Other considerations.

After the facilities and their method of acquisition are determined it is possible to determine the answers to the questions implied by the other classifications above, such as what type of telephone system should the depository install? What grade of office furniture should be obtained? Will secretaries use typewriters or word processors? Will other employees require personal computers? Will partitioning be used, permanent walls, or the "open-style" of office? How many desks, swivel chairs, regular chairs, and so forth will be needed?

### 13. Billing

The primary source of revenue to the depository will be the billing to participants for services. One of the first issues to be addressed in billing is the establishment of billing

determinants (or what are participants to be billed for). Examples of a determinant would be an account, a deposit, a security position, a share position, a bookentry delivery or receipt.

When constructing a billing system, determinants are established with a billing rate. Within a billing cycle, the number of items for a specific determinant times the billing rate establishes the charge for that determinant. If for example, the determinant is bookentry delivery, the billing rate Rs. 10, and the quantity for the billing period 10,000, then the charge for that month's bookentry deliveries totals Rs. 100,000.

Billing can be weighted in various ways depending on the overall strategy to be employed by the board. Individual services can be priced to cover specific costs for these services, or the overall costs of the depository can be covered by a generalised revenue stream. In some cases, services can be priced to influence behaviour such as imposing a high cost on withdrawals to discourage them.

#### Vested Interests.

In general, the billing system to be used can be transaction oriented, position oriented, or a combination of the two. The choice will usually impact one class of participants versus another. When establishing billing determinants and rates, the individual vested interests of the participants will make this a complex issue.

An example of this follows:

#### Scheme 1

Part A	1000 deliveries @ 10	20 positions @ 100	=12000
Part B	100 @ 10	500 @ 100.	= <u>51000</u>
			63000

#### Scheme 2

Part A	1000 deliveries @ 53	20 positions @ 10	=53200
Part B	100 @ 53	500 @ 10	= <u>10300</u>
			63500

In the above example, total revenue is approximately the same but there is a great difference in what is paid by the two participants.

In general, a system which emphasises transaction charges will tend to place more of the revenue load on brokers (Participant A in the above example) who will have a greater number of individual settlements within the depository than banks and institutional participants (Participant B in the above example). A system which emphasises position charges will tend

to place more of the load on banks and institutional participants than brokers.

#### Modeling system.

A modeling system provides the opportunity to establish a group of determinants and the flexibility of utilising different volume and rate assumptions to determine revenues under various schemes. This provides management and the board with the ability to make judgment decisions when establishing a billing scheme.

In order to assist in the decision making process for a CDC billing scheme, a billing model program will need to be built which will permit revenues to be projected based on assumptions of volume and various rates resulting from the depository's projected operations. This can be a PC based program which should permit rapid and flexible capability to the CDC management.

#### Geographic price mutualisation.

Another billing issue to be addressed relates to the concept of price mutualisation. This concept, simply stated, bills all participants at the same rates regardless of their distance from Karachi. This mutualises costs associated with services provided to participants geographically dispersed from the headquarters of the depository. Under this concept, local participants would pay rates equal to those of other participants but at a somewhat higher rate than they might otherwise in order to cover the incremental costs of providing services to those participants outside of Karachi. Examples of these incremental costs are long distance phone service; terminal line costs, and shipping of output reports (paper or computer disks).

What policy will be established for the CDC of Pakistan? Which geographically variable cost will be associated with which determinants in order to bill them?

#### Selection of determinants

What determinants to use for billing must be established after analysis of the individual services being offered. Some of these determinants can be on a fixed basis while others can be on a variable or volume discount basis.

Examples of fixed fees might be a monthly service fee per account, a fee per issue per month regardless of the number of shares held, and a fee for sub-account capability.

Examples of volume discount fees might be a bookentry settlement fee which decreased as volume increased in a given billing period or a share quantity fee which decreased as total shares on deposit increased. These types of variable fees would benefit larger participants versus smaller ones.

What policy will be established for the CDC of Pakistan?

#### 14. Accounting system design/audits

##### Chart of accounts

To assist in modeling financial projections for the depository, a chart of accounts must be established which sets out revenue and expense classifications as well as organisation classifications, such as operations, marketing, administration, etc. These various accounts should be established with a view of what management will need to run the depository as well what might be needed to insure proper costing of services (a cost accounting system).

##### Audits

Audits of the CDC will fall into two general categories, the first being financial audits required for certification of financial statements, tax purposes, regulatory purposes, investor purposes, etc. These audits will be of the financial reports prepared and issued by management.

What organisations will be entitled to receive CDC financial reports as well as audit reports?

The second category will be operational or responsibility audits which will address the reports prepared and issued by the operation of the depository. These would relate to positions held in the depository by issue and by participant account as well as held for the depository by the registrar. These audits serve a useful service to management and are necessary as they cover areas of responsibility not covered by the regular financial audits as the positions held for participants are not assets of the corporation and therefore not included in the balance sheet of CDC.

What organisations will be entitled to receive CDC operational audit reports?

Who will be the independent auditor for CDC?

## Reconciliation requirements

In addition to the depository rules which should set out a requirement for participants to reconcile their individual reports on a periodic basis (usually daily), the depository should require some type of a positive confirmation of participant positions to its auditor on a periodic basis. It should also require some type of a positive confirmation of registrar positions to its auditor on a periodic basis.

What will be the reconciliation requirements established by CDC for participants and registrars? Will these be submitted to CDC's outside independent auditor and/or to an internal audit function within the CDC organisation?

## 15. Insurance

### Depository

There are a number of risks which the depository will have which should be addressed by adequate insurance. These would include risk of property loss from fire, water, or some other act of nature.

There is also the risk caused by some improper act of an employee through theft, fraud, etc. There is also the risk caused by business interruption due to damage to facilities including power disruption to the computer operation.

Because of the recommended structure of the depository, there is potential risk to the depository caused by actions or situations affecting the registrars. Insurance policies for the depository might also include riders which might cover the registrars acting as an agent of the depository.

There are some risks which cannot be covered by insurance. Therefore, the CDC will have to self-insure these risks and protect itself with some other assets. An example of this type of risk is a default in end of day payment. Risk exposure in this area may have to be addressed by a participants fund under which participants assume some of the systemic risk if the full collateralisation scheme is inadequate.

An issue to be addressed will be the determination if adequate insurance can be obtained for identified risks and whether or not expertise in risk analysis for a depository organisation is available locally.

### Participants

Insurance carried by individual participants might also be designed to carry over to the depository as it relates to

certain risks. As an example, insurance carried by a broker, covering acts of its employees, might also cover acts of the depository employees thereby reducing individual insurance needs of the depository.

If there is currently insurance coverage for brokers relating to loss of certificates or acts of employees, the presence of the depository might result in reduced premiums to the brokers because of the reduction in risks which the depository provides.

Is there broker or bank blanket (all risk) indemnification insurance available in Pakistan and is it applicable for use for depository supplemental coverage?

Public investors

Increased confidence in the depository might be obtained if there were some form of coverage which protected individual investors who maintained their shares with their broker or bank which utilised the services of the depository. This coverage should include loss of shares caused by some action of the depository and, if obtainable, improper action on the part of the broker or bank participant.

16. Financing

The organisation plan calls for equity capitalisation of Rs. 50,000,000. Until the Implementation Master Plan is completed and an estimate is made as to the one-time costs of start up during the several phases along with ongoing income and expenses, it is not known if this amount (five crore) will be sufficient to cover the cash flow required for the planning and implementation tasks. What are the plans for obtaining interim financing, if found necessary, until the CDC is operating on a positive cash flow basis? What considerations have been given to assessing potential participants for a portion of the development costs during this start up period?

It is anticipated that the depository will provide significant savings to those brokers and their customers who are heavily involved in paper processing under the current clearing and settlement system. Because of the requirement of re-registration on book closing dates, registrars and the companies they service incur considerable operating costs which are projected to be reduced after the implementation of the depository and the initial deposit of a large percentage of outstanding scrip. What consideration has been given to imposing a depository charge on either the registrar or its issuer company?

### C. NEXT STEPS

Assuming the decision by the depository's Board of Directors is to proceed with The Planning Exercise, then we recommend before doing so that a Chief Coordinator representing the Board of Directors should be appointed to relate to the planners. We have coined the term Chief Coordinator only to be a shorthand method of identifying functions and characteristics of this position that we recommend be established; it should not be inferred, in other words, that we are suggesting a specific title.

The primary functions of the Chief Coordinator would be to (1) assist the Board of Directors in selecting the planners (discussed below) and then (2) to assist the Board and planners in relating to the stock exchanges, participants, potential vendors, government officials; and so forth, as will be necessary in conducting The Planning Exercise.

The experience gained by the Chief Coordinator during The Planning Exercise is potentially extremely useful in the post-planning implementation activity, as well as in a post-implementation executive position in the depository so that we recommend selecting him with an eye on his long-term potential availability and usefulness to the depository.

The characteristics, as we see them, of an effective Chief Coordinator include the following:

- (1) By nature and experience, he must be a good coordinator and manager with strong inter-personal skills;
- (2) He should be a Pakastani citizen. It is likely that one or more key implementation personnel involved in the project will need to be foreigners in order to have the requisite previous depository experience. The Chief Coordinator position, with its major external interface responsibilities discussed above, therefore, should demonstrate to the financial community that the project is a Pakistani project, utilising foreigners only for their project-related experience. Further, the Chief Coordinator, can potentially prevent foreigners from making mistakes that their unfamiliarity with Pakistani culture and institutions could otherwise lead to;
- (3) If possible, he should be a man of stature in the financial community, so that his presence lends credibility to the project; and
- (4) If possible, his background should be directly relevant to the subject matter of the project, such as a broker or banker, since these categories will be the most numerous

participants, or a lawyer, given the large legislative, legal, and regulatory implications of the project.

We suggest that in selecting the planners, that directly relevant experience is the most important characteristic. The firm/persons selected should have had prior depository experience, specifically in planning and implementing a new depository, not simply working for one.

All of the other characteristics of a vendor that normally apply of course are applicable here as well: good reputation, reasonable cost, and so forth.

In selecting a planning vendor, there is a complicating factor. In an ideal situation, the planning vendor should also be the key implementation vendor. If the personnel that develop the Implementation Master Plan are not the personnel primarily responsible for execution of that Plan, there is a risk that they will not feel bound to perform to its estimates of time, effort and expense. In many cases, potential key implementation personnel may actually insist on re-doing The Planning Exercise, at least in part, before accepting responsibility for managing the implementation. This is not an unreasonable position for the implementation vendor to take; how does he know that the plan he is to be measured against is any good? A related consideration is that the knowledge gained through the research conducted in The Planning Exercise is useful in the implementation activity; switching vendors loses that knowledge.

We recommend, therefore, that an important ingredient in the selection of a planning vendor be the prospect of using that vendor as a key implementation vendor. If, for any reason, it is not possible to follow that advice, be prepared for the implementation vendor to insist on revalidating the Implementation Master Plan before accepting the assignment. In the Introduction above, we suggested that there was a question of how much time, effort and money it was appropriate to expend in The Planning Exercise in order to produce The Implementation Master Plan. Unfortunately there is no single "right" answer to this question because, given the competence of the planners as described above, the variable is the degree of certainty the Board wants in the Plan. The longer the planning takes, the more detail the planners can involve themselves in, and, therefore, the more accurate the results are likely to be. In the last analysis it is a judgment call to strike the right balance between not enough and too much planning. All we can do, therefore, is suggest what would be a reasonable effort in our judgment for what planners, with equivalent backgrounds as the authors of this report have (including our exposure to Pakistan and several of the key players in the securities industry here), would require to

develop a reasonably realistic plan as defined herein: approximately five to eight elapsed six-day weeks (that is, 60-96 man-days) plus travel time. In addition, there would need to be some support activity, such as assistance in preparing the formal deliverable timing chart, as discussed below.

What should the Implementation Master Plan be comprised of?

It is important to define the deliverable so that the Chief Coordinator/Board of Directors understand what they will be getting from the planning vendor. This is particularly true if they wish to consider proposals from more than one prospective vendor, so the proposals can be on an equivalent basis.

The Implementation Master Plan should be comprised of

- (1) a timing chart of all the significant activities involved in the detailed planning and implementation, in time sequenced format that recognises the four phases of implementation discussed in Chapter II, and shows dependency relationships; that is, what tasks' starting is dependent on completion of a prior task. Normally, this requires a chart developed by Critical Path Method (CPM);
- (2) a schedule of estimated physical resources by a reasonable classification of function, both for implementation activity and on-going operation. "Physical resources" is defined as quantities of manpower by skill classification, equipment, materials, and space including furniture and fixtures; and
- (3) a schedule of the costs associated with the physical resources identified in item (2).

It should be clear that, when associating the issues described in the previous section with timing, physical resources, and cost, the planners will need to do a large amount of research, assisted by the Chief Coordinator. Example, what do computer operators, lawyers, and auditors earn in Karachi? What do specific models of computers cost? Does CDC want to set up customer service offices in Lahore and Islamabad? What's the cost of renting space near the stock exchanges per square metre? Are salary scales "up country" significantly different from Karachi?

Please remember that all planning is imprecise; no one can foretell the future with absolute certainty. The plan, however, is essential in order to operate in a controlled manner. If, for whatever reason there is a significant

deviation from the plan (an unanticipated legislative change, for example), there is also a starting point for re-planning and measuring the effect of the deviation.

We strongly advise mounting the effort to begin the development of the Implementation Master Plan as rapidly as possible.

Before closing, however, we wish to offer some alternative approaches in proceeding with the Implementation Master Plan development and the implementation activity itself. The depository Board could act as its own general contractor, hiring the planning firm, and then hiring various firms to supply the expertise needed (such as information technology, law, and accounting) to implement. This approach should be considered only if an Implementation Manager (not to be confused with the Chief Coordinator) is retained who is experienced and capable of integrating all the disciplines and activities involved, potentially utilizing several different vendors, along with having prior experience in building depositories. If such an individual is available to be the Implementation Manager, who thereby would effectively be the chief executive of building the depository, regardless of title, this is a perfectly valid way to proceed.

Another valid approach is to retain an experienced systems integration firm which would be responsible for the planning and implementation effort. This approach requires that the systems integration firm be able to supply an Integration Manager with similar characteristics and experience to the depository's retaining him directly; the advantage would be that in case of non-performance of the Integration Manager (for whatever reason, ill health, for example) the firm would be obligated to provide a replacement Integration Manager with similar background. Another advantage is that the firm may have available from within several of the skills needed, such as information technology, accounting, and law, thereby keeping the number of vendors down and minimizing coordination problems. If this approach is chosen, the depository Board should satisfy itself that the Integration Manager as well as all other key personnel have the requisite depository experience and reserve to itself the right of: initial acceptance and subsequent rejection, if necessary, equivalent to what it would require in directly retaining the Implementation Manager and others. A good reputation is not enough--the specific people are what matter for a successful project!

Obviously another approach is to hire the Implementation Master Planning firm and then later either the Implementation Manager directly or the systems integration firm to implement the project. This has the drawbacks discussed above, (the implementation manager/firm needing to revalidate the Plan),

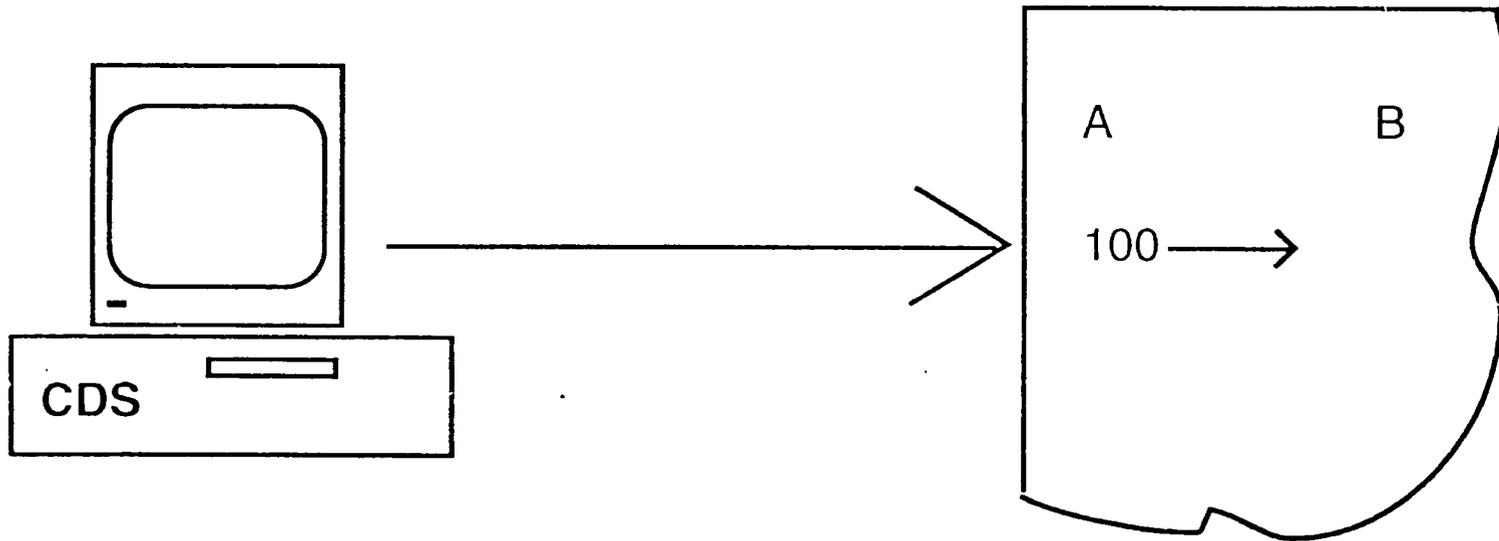
but there is an offsetting advantage that might be relevant. The advantage is avoiding entering into a long-term contract for implementation before the approximate duration, effort, and cost of implementation are identified. This would help in negotiating the terms and conditions of implementation contracts, particularly if retaining a systems integration firm were involved.

Hopefully the description of the above approaches will be of use in determining next steps.

Appendix A Central Depository System Structural Design  
Features (Transparencies)

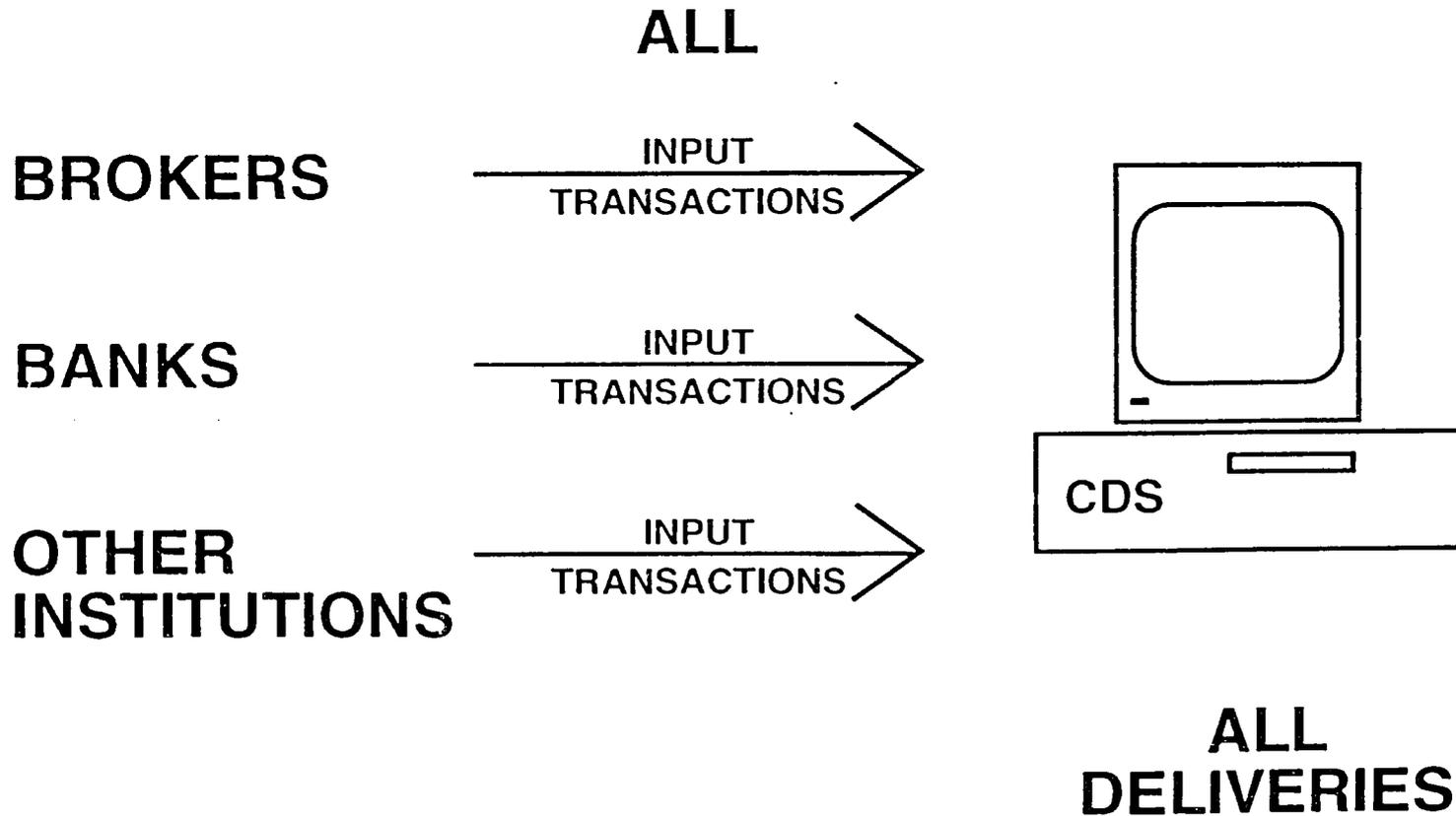
# CDS STRUCTURE

## 1. CONCEPT



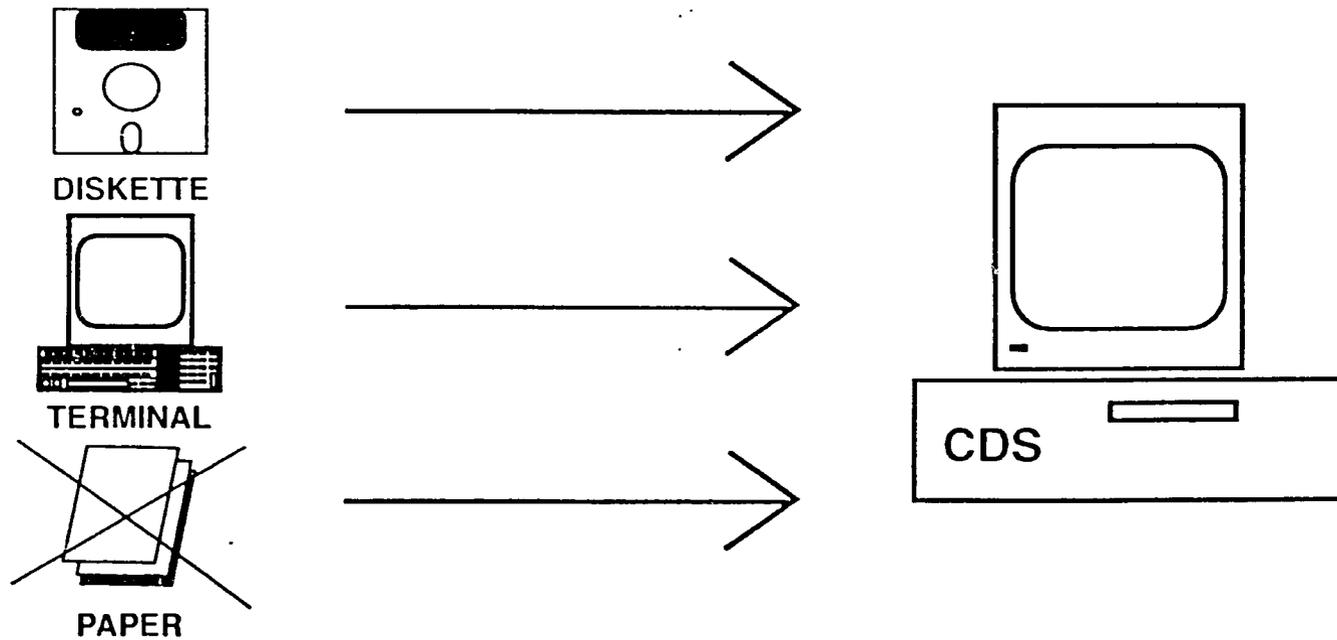
# CDS STRUCTURE

## 2. FUNDAMENTAL PRINCIPLE



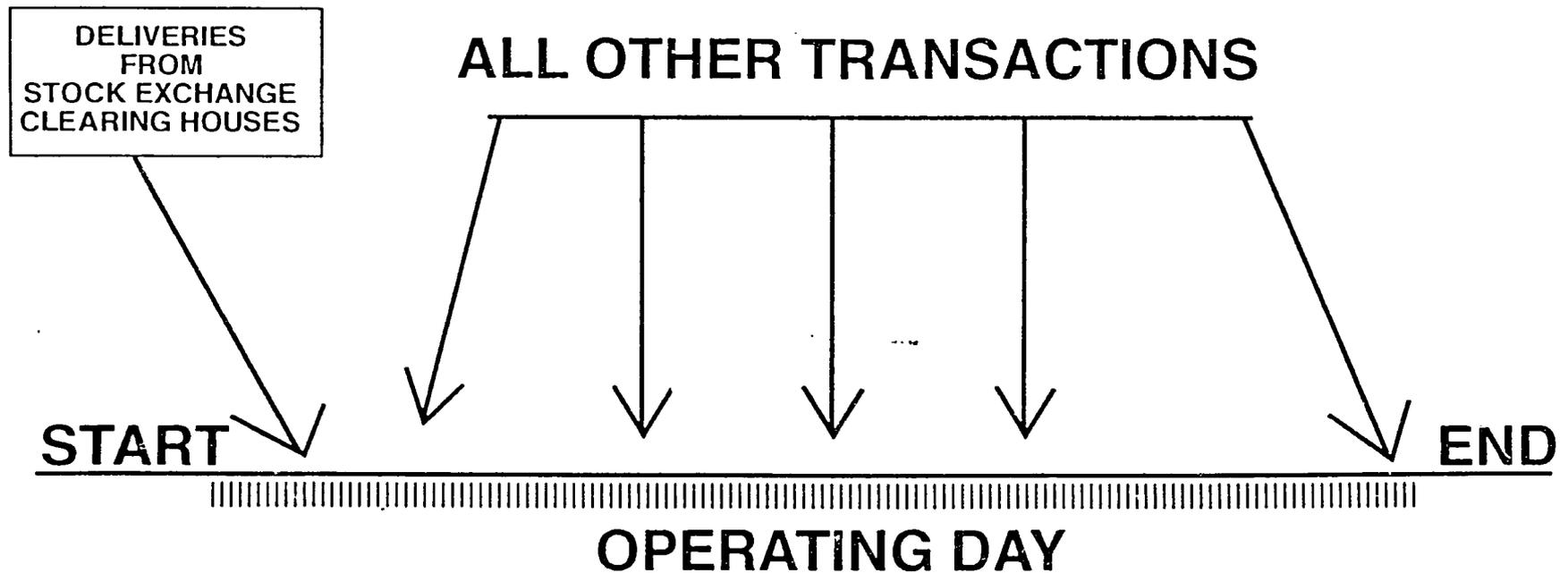
## CDS STRUCTURE

### *3. AUTOMATION RECOMMENDATION*



## CDS STRUCTURE

# 4. OPERATING DAY



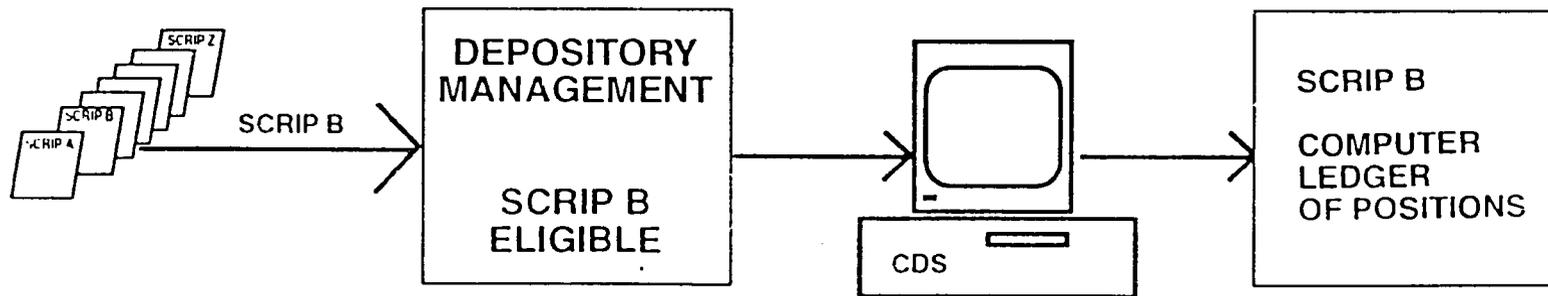
## CDS STRUCTURE

# ***5. BASIC OPERATIONS TO BE PERFORMED BY THE DEPOSITORY***

- a) DEPOSIT— EXISTING ISSUES
- b) DEPOSIT— NEW ISSUES
- c) FREE TRANSFER
- d) DEPOSITORY SETTLEMENT (DVP)
- e) CASH ONLY MOVEMENT
- f) CORPORATE ACTION
- g) WITHDRAWAL
- h) PLEDGE/RELEASE
- i) STOCK BORROWING AND LENDING

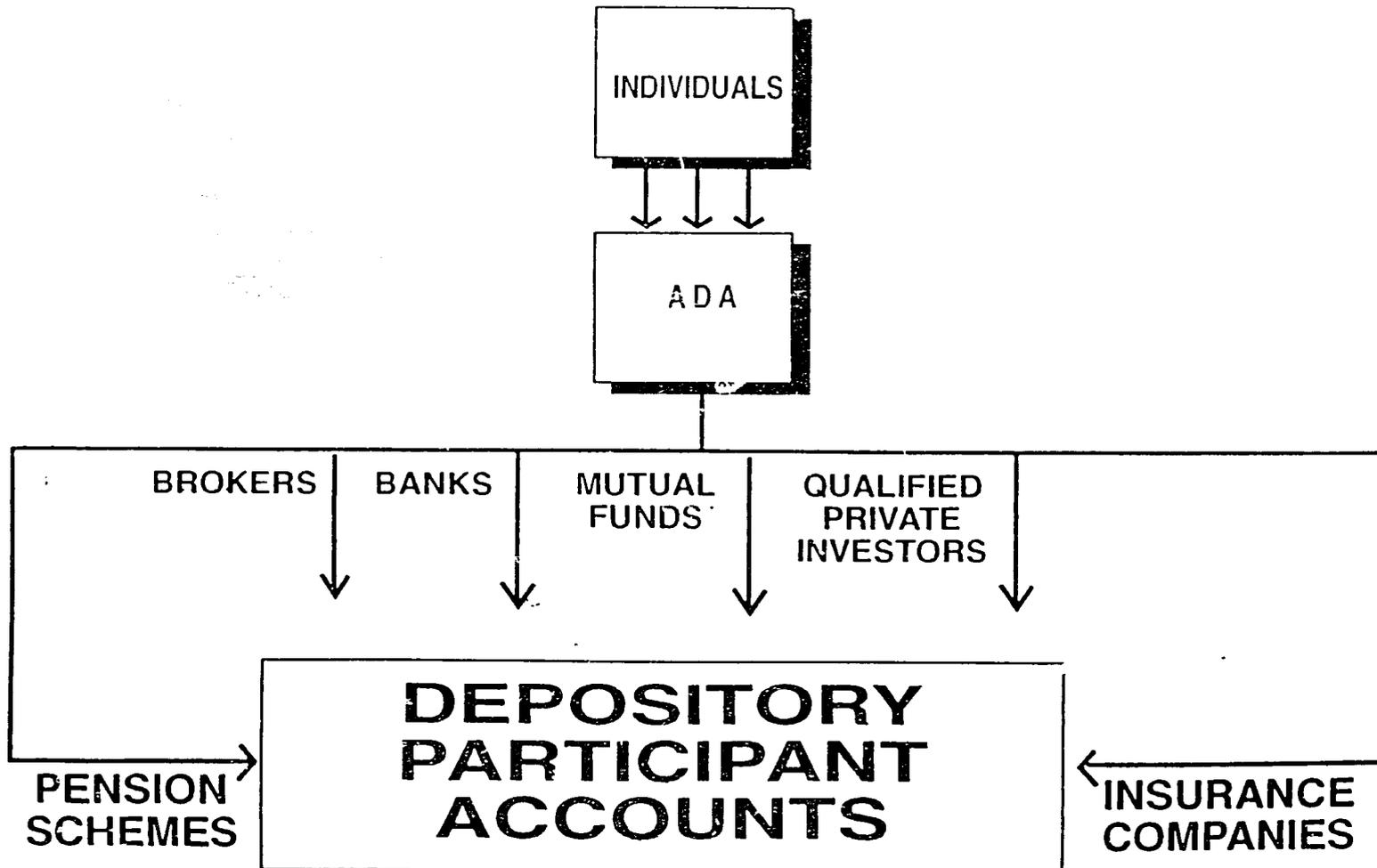
# CDS STRUCTURE

## 6. DEPOSITORY ELIGIBILITY



## CDS STRUCTURE

# 7. PARTICIPANTS AND USERS



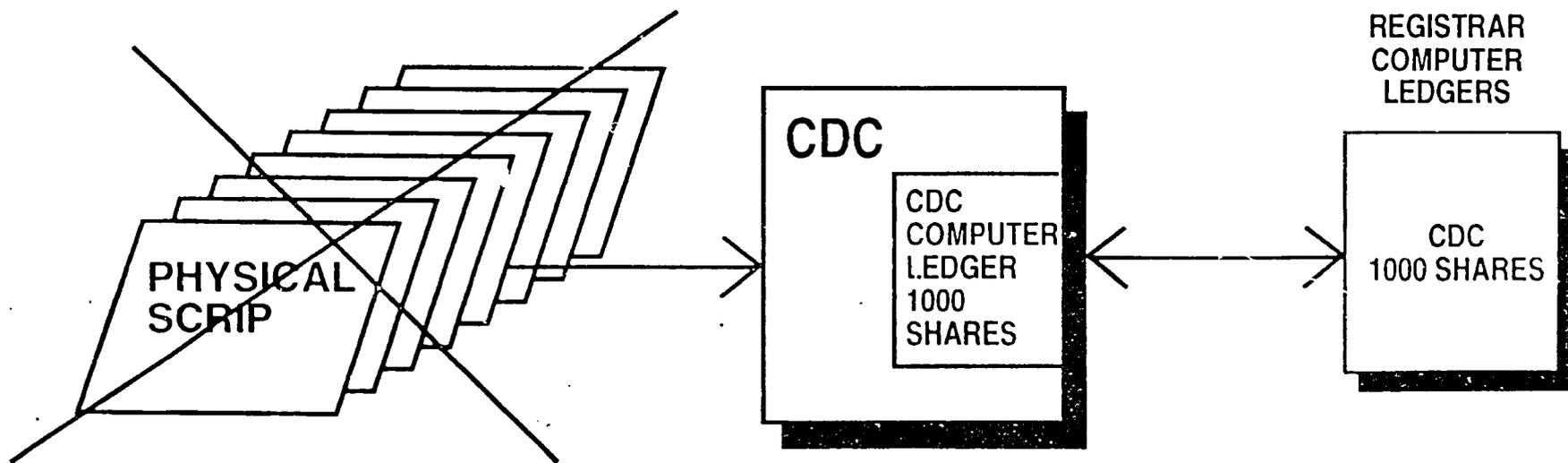
# CDS STRUCTURE

## 8. CDS ACCOUNT STRUCTURE

BROKERS	BROKERS W/ SUB ACCTS	BANKS	NIT	ICP	INSURANCE	TOTAL
SCRIP A-500	A-600 <i>SA1-300</i> <i>SA2-200</i> <i>SA4-100</i>	A-50000	A-100000	A-500000	A-300000	951100
SCRIP B-1000	B-5000 <i>SA1-2000</i> <i>SA4-1000</i> <i>SA6-2000</i>	B-100000	B-500000	B-100000	B-0	706000
SCRIP C-0	C-10000 <i>SA5-1000</i> <i>SA6-7000</i> <i>SA7-2000</i>	C-80000	C-750000	C-200000	C-800000	1840000
SCRIP D-750	D-3000 <i>SA1-3000</i> <i>SA4-0</i> <i>SA7-0</i>	D-20000	D-600000	D-1000000	D-350000	1973750
<hr/> 2250	<hr/> 18600	<hr/> 250000	<hr/> 1950000	<hr/> 1800000	<hr/> 1450000	<hr/> 5470850

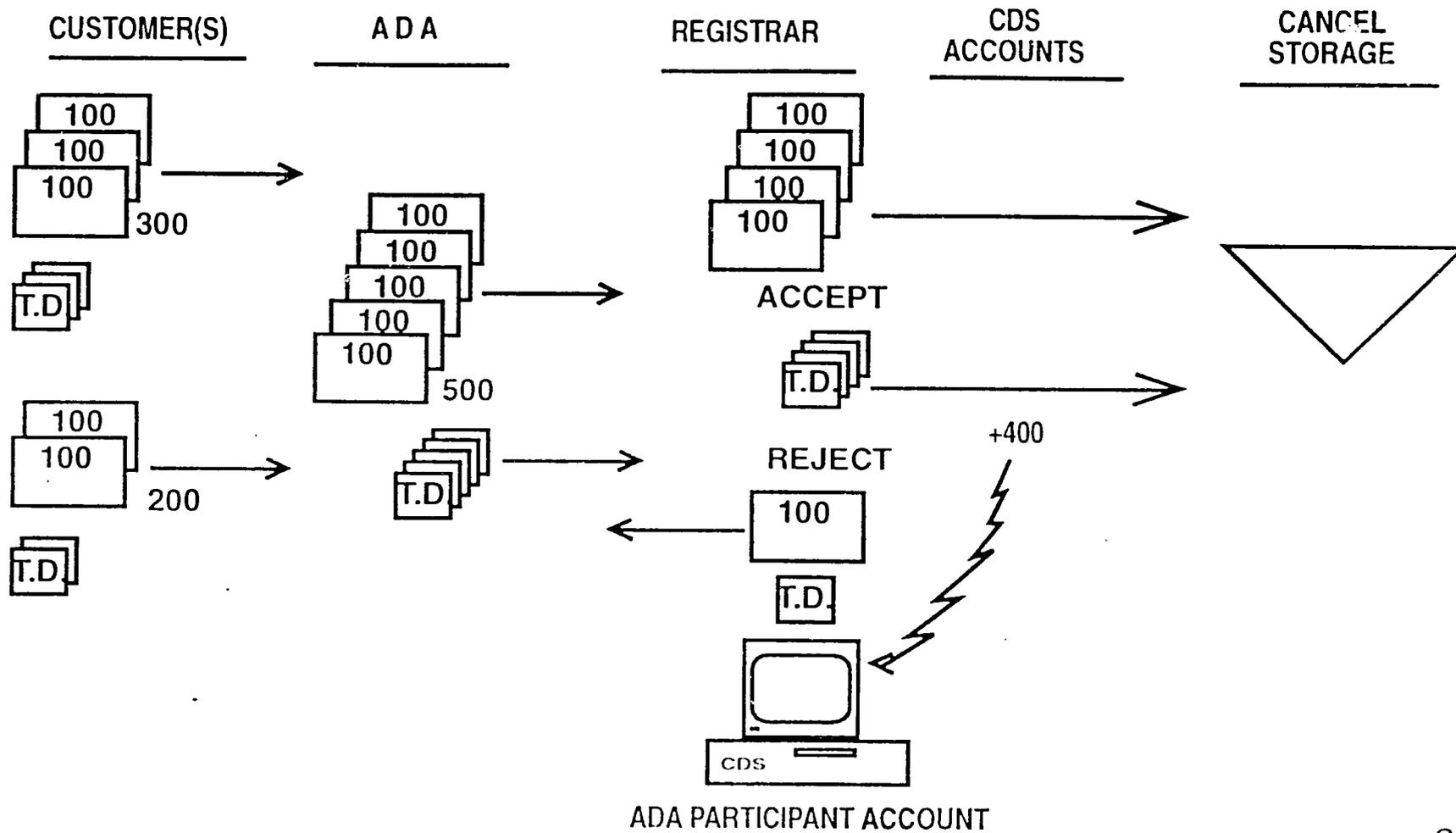
# CDS STRUCTURE

## 9. CDC—THE SCRIPLESS DEPOSITORY



# CDS STRUCTURE

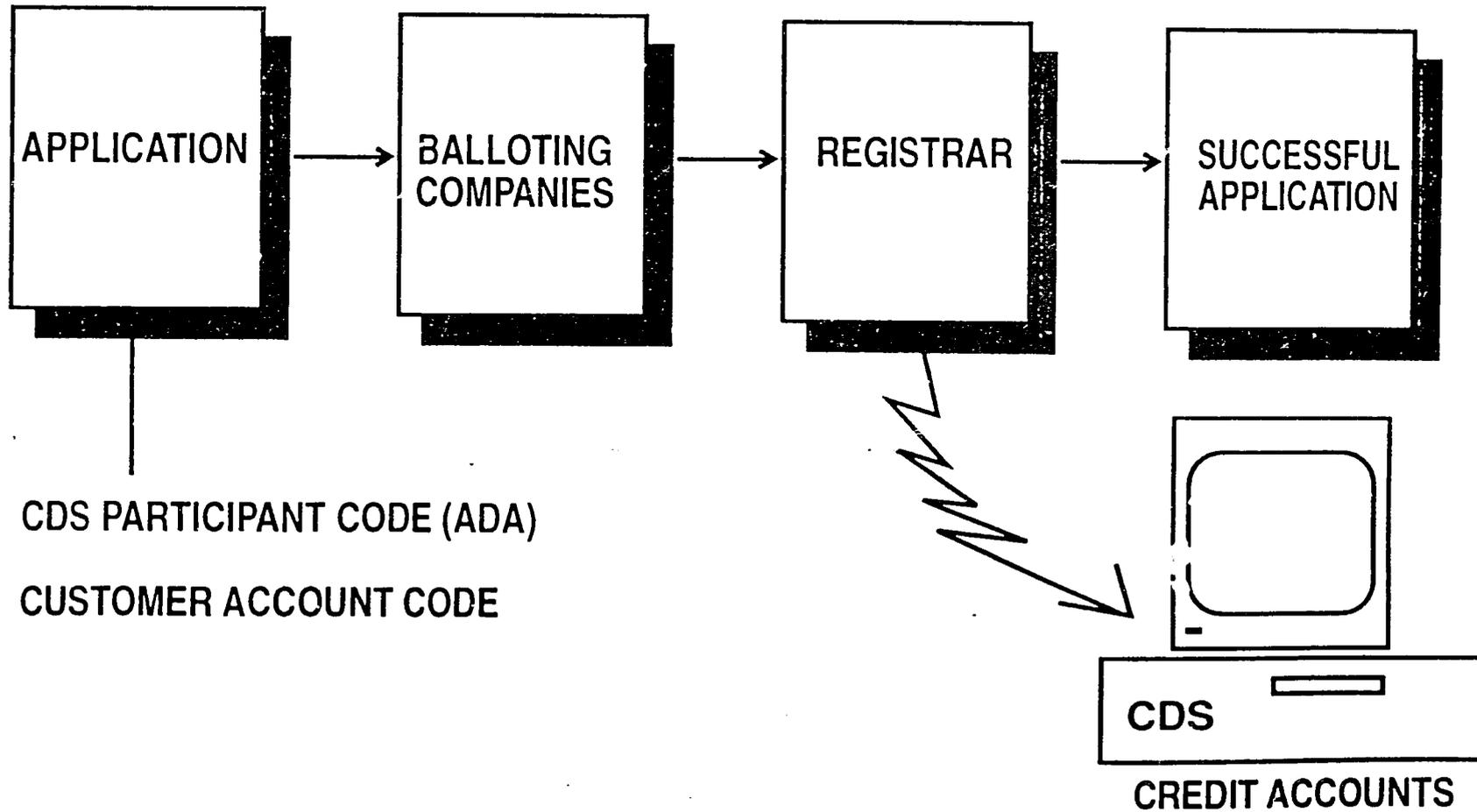
## *DEPOSIT EXISTING ISSUES*



ADA PARTICIPANT ACCOUNT

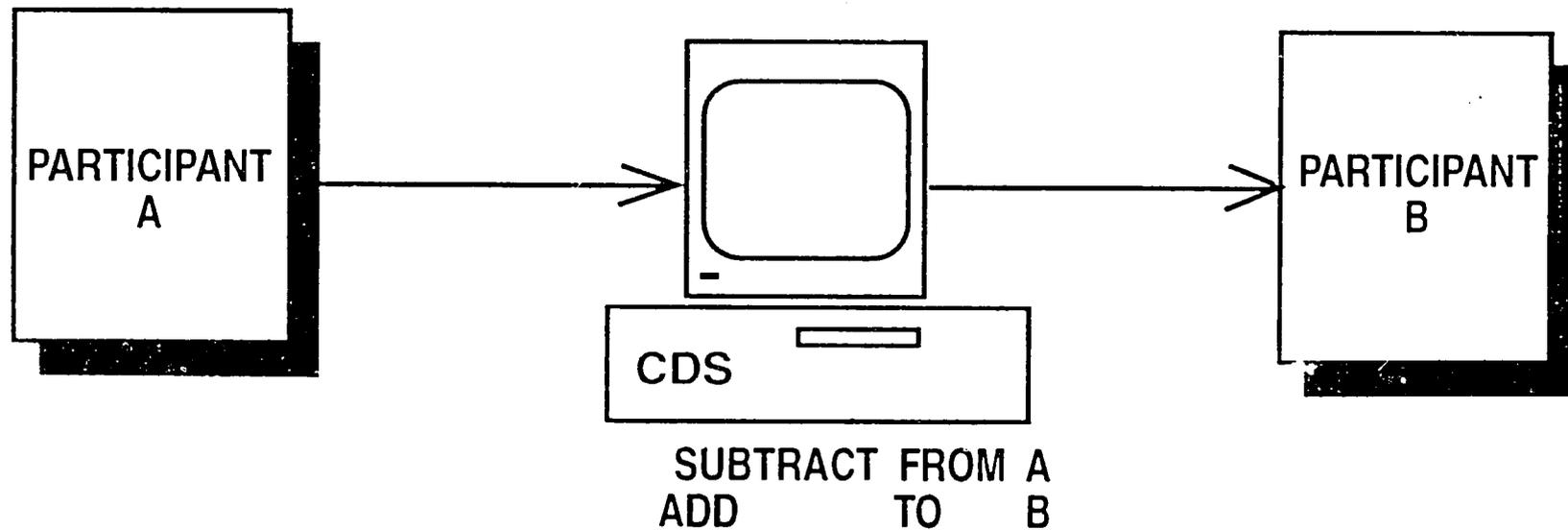
# CDS STRUCTURE

## *DEPOSIT NEW ISSUES*



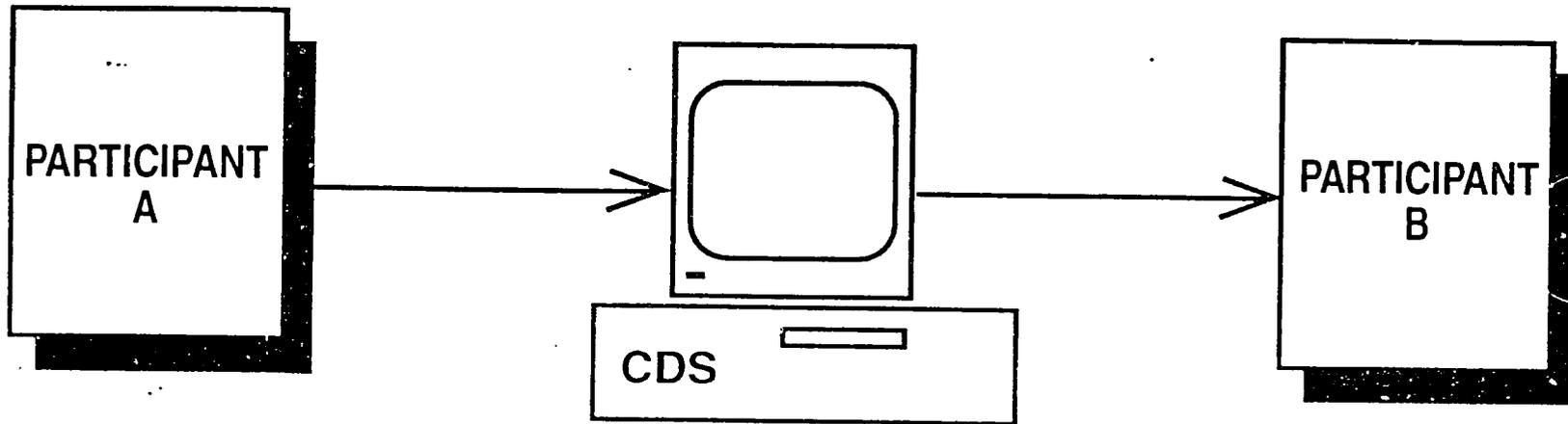
# CDS STRUCTURE

## *FREE TRANSFER PROCESS*



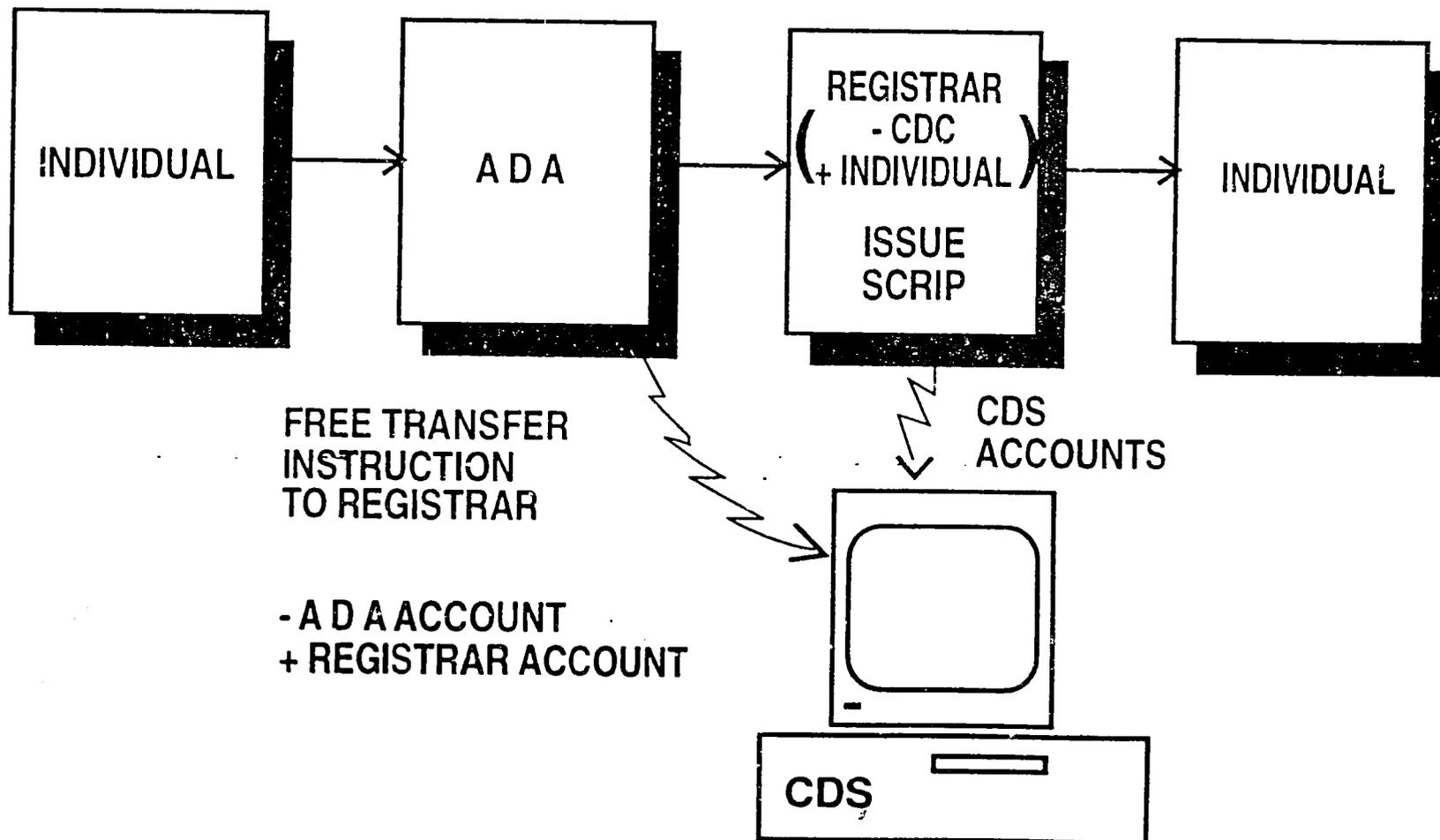
# CDS STRUCTURE

## *CASH ONLY MOVEMENT*

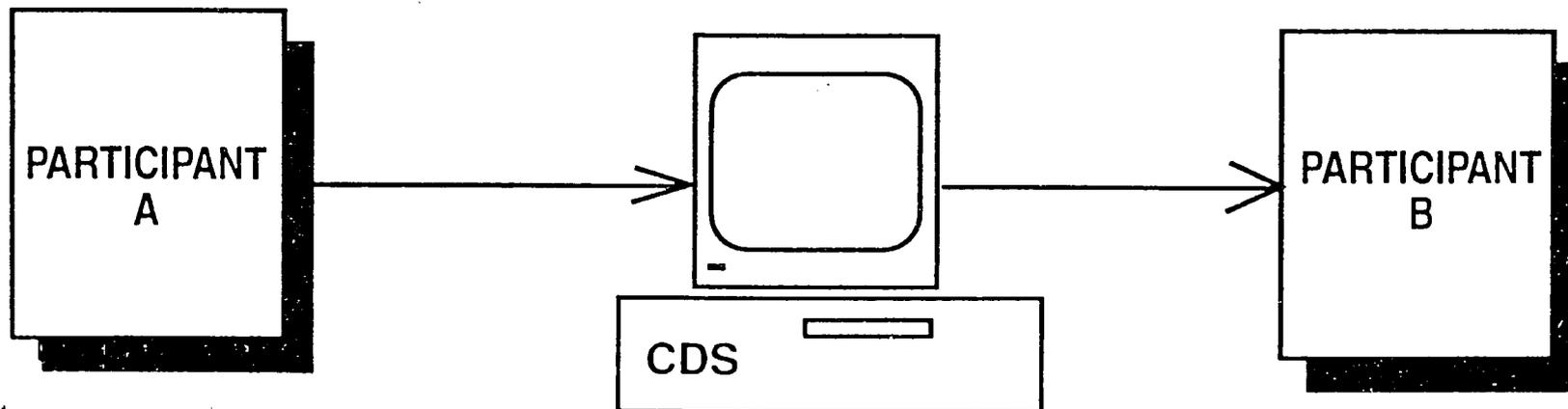


DEBIT RS. PARTICIPANT A  
CREDIT RS. PARTICIPANT B

# CDS STRUCTURE *WITHDRAWAL*



**CDS STRUCTURE**  
***DEPOSITORY SETTLEMENT***  
***DELIVERY VS PAYMENT***

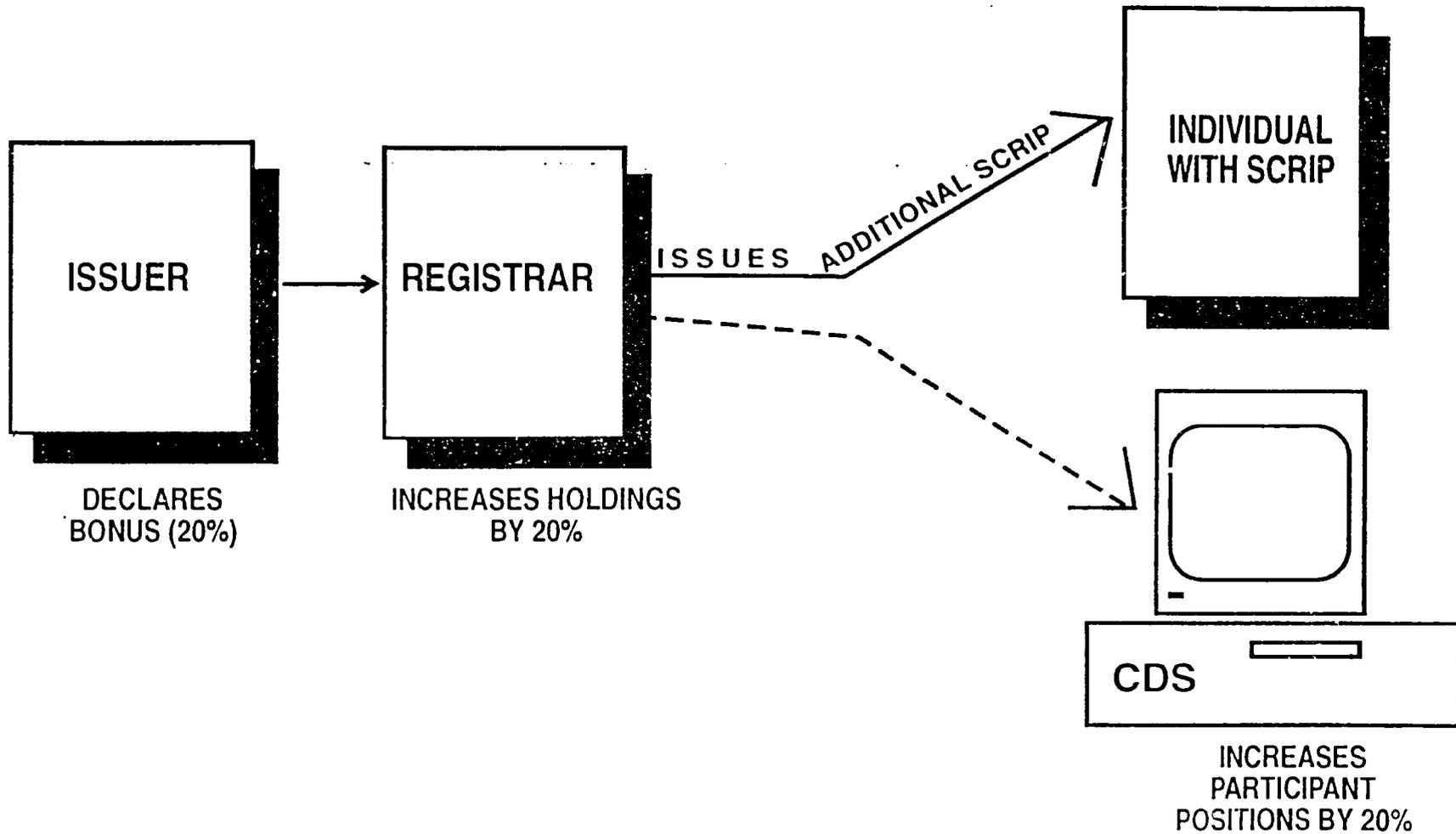


SUBTRACT SHARES-ACCOUNT A  
ADD SHARES-ACCOUNT B

DEBIT RS. - ACCOUNT B  
CREDIT RS. - ACCOUNT A

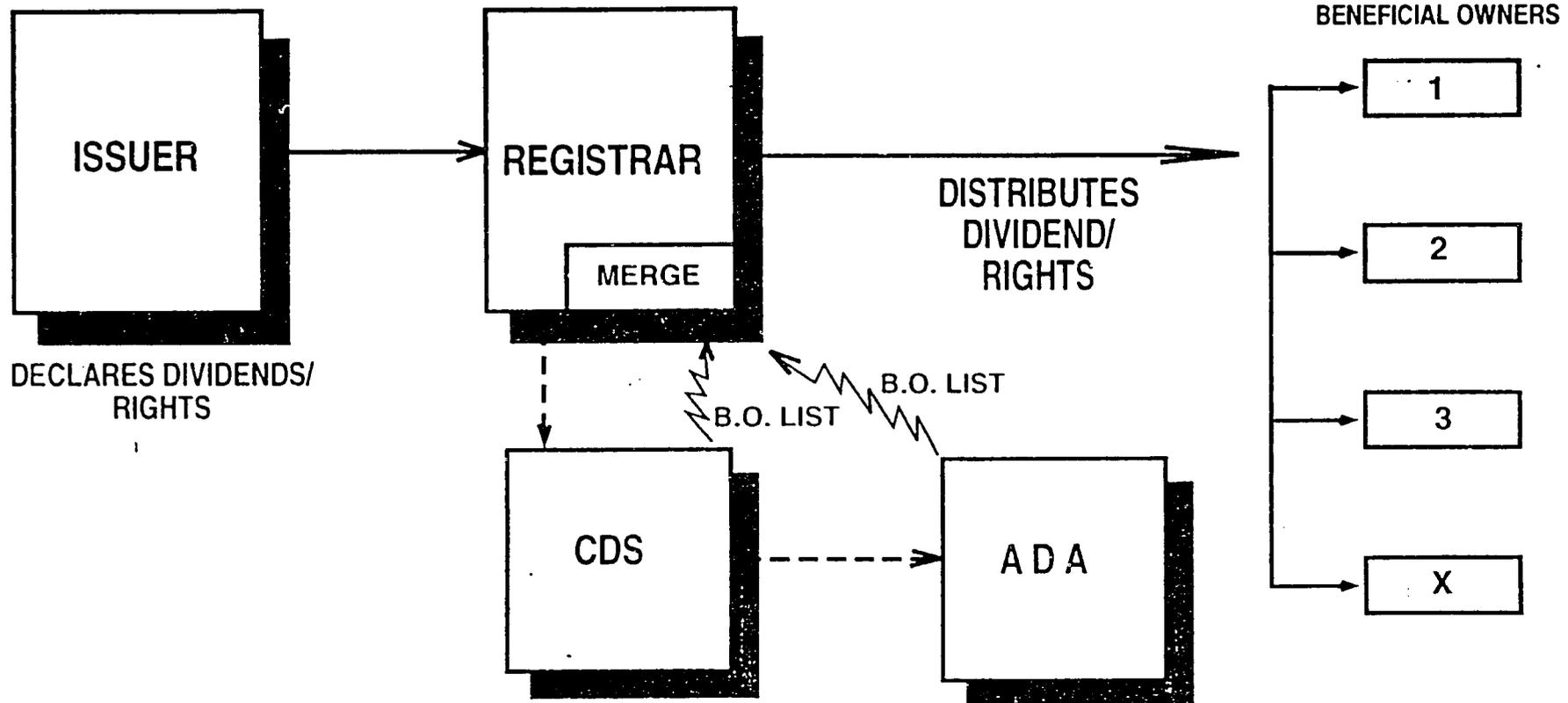
# CDS STRUCTURE

## *CORPORATE ACTION*



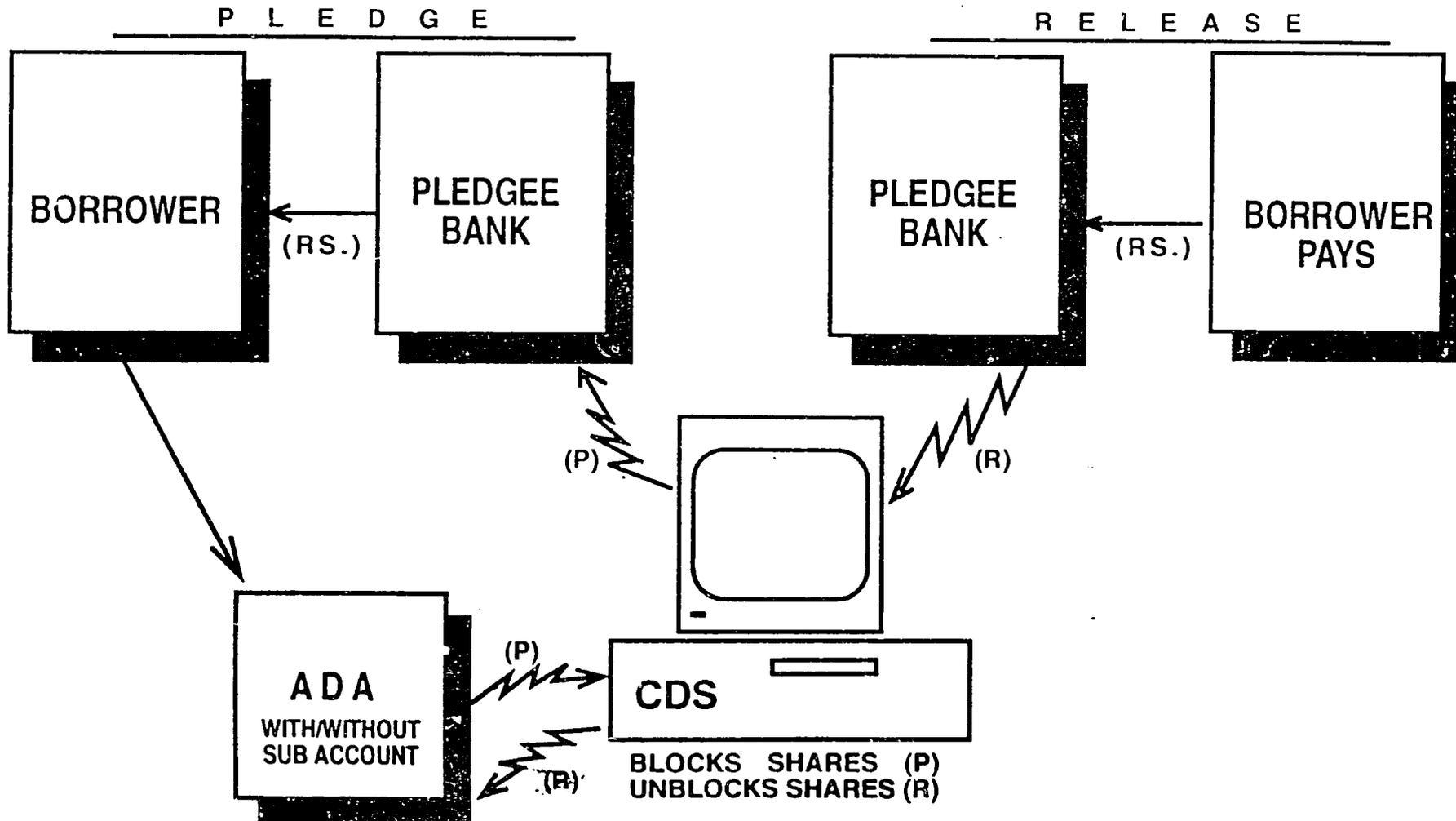
# CDS STRUCTURE

## *CASH DIVIDENDS/RIGHT OFFERING*



# CDS STRUCTURE

## *PLEDGE/RELEASE (HYPOTHECATION)*



DESIGNED BY JAVED IOBAL

# CDS STRUCTURE

## *POSITION RECONCILIATION WITH REGISTRARS*

ISSUE	REGISTRAR X	REGISTRAR Y	REGISTRAR Z
A-951100	951100		
B-706000		706000	
C-1840000			1840000
D-1973750		1973750	
<hr/>	<hr/>	<hr/>	<hr/>
	951100	2679750	1840000
<hr/>	<hr/>	<hr/>	<hr/>
5470850		5470850	

FORM 1042-B BY JAVED O BOBA

PRICE WATERHOUSE  
OFFICE OF GOVERNMENT SERVICES  
WASHINGTON, DC 20006

18 November 1993

Mr. Arif Habib  
President  
Karachi Stock Exchange (Guarantee) Limited  
61-63, Stock Exchange Building  
Stock Exchange Road  
Karachi-74000, Pakistan

Dear Mr. Habib:

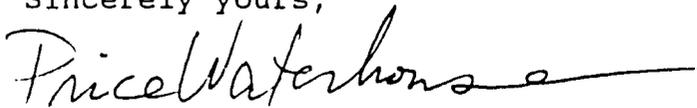
Attached is the final report from segment one of our engagement to assist the Karachi Stock Exchange in the development of the Central Depository Company of Pakistan, per the scope of work issued by USAID.

Contained in the report is our recommendation for a revised scope of work for segment two as we discussed at our meeting of 15 November. This revision has been tentatively agreed to by Mr. Husain A. Babur, Project Officer, USAID, subject to a final meeting of KSE, USAID, and Price Waterhouse at the start of segment two. This meeting has been scheduled for 30 November, 3:00 p.m. at the KSE offices, subject to confirmation.

It has been a pleasure working with you and your colleagues in the preparation of this report. Your enthusiastic cooperation bodes well for the success of segment two and the ultimate success of the Central Depository Company.

Thank you very much.

Sincerely yours,

  
PRICE WATERHOUSE

cc: Chief, O/PEN, USAID (4)

The Development  
of the  
Central Depository Company  
of Pakistan

Karachi  
Pakistan

Price Waterhouse  
Office of Government Services  
18 November 1993

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## I. INTRODUCTION

This document has been prepared under the scope of work approved by the United States Agency for International Development (USAID) in response to a request of the Karachi Stock Exchange (Pakistan) for Technical Assistance in its effort to establish the Central Depository Company, an institution essential to the growth of the equity markets in Pakistan.

To obtain basic insights as to the Pakistan equity markets and to the problems currently experienced by the markets, which would be reduced or eliminated by the establishment of a central depository, a series of interviews was conducted with a number of representatives of organisations which are integral to the operation of the equity markets. These included representatives from each of the three stock exchanges (Karachi, Islamabad, and Lahore), custody banks, brokers, transfer agent/registrars, institutional investors, the Corporate Law Authority, (a unit of the Pakistan Ministry of Finance), and the State Bank of Pakistan.

The scope of work for the project was divided into two segments with the first segment having assignments to (1) review and evaluate clearance, settlement and safekeeping procedures and operations currently in place and (2) to prepare recommendations regarding possible systems and technology for the automation of the clearance, settlement and safekeeping process. Implicit in these assignments was the objective of establishing guidelines for the development of a central depository.

This memorandum report is the deliverable for segment one of the project.

## II. FINDINGS

### A. Observations of Current Procedures

In order to prepare to recommend guidelines for the development of the central depository, it was determined that it was necessary to review and evaluate clearance, settlement and safekeeping procedures and operations currently in place. This would include the review of trade comparison procedures, securities movement arrangements, custody and vault management procedures, settlement fail protection mechanisms and penalty arrangements, and credit and risk control procedures.

Through a series of interviews and the review of a number of documents, a basic understanding of the current procedures utilized by brokers, the exchanges, the clearing houses, banks, and transfer agents, was obtained. We will not attempt to detail these in this document. However, there are a number of comments which can be usefully made regarding some of these.

Exchange trading on all three exchanges can be described as "active" from the standpoint of interaction between traders. As a result, it is difficult to get accurate information at the time of the trade. The Karachi Stock Exchange (KSE) claims that only half of the trades get reported to the KSE at execution time during the trading day, but that they do get subsequently reported to the Clearing House. Although the current systems can be improved, and the KSE is working on a new two-sided trade comparison system which could be implemented soon, the comparison process for broker activity is not perceived to be a major problem. The current level of comparison errors, due to bad broker input or Clearing House processing error, is under 1%.

There appears to be no formal comparison system involving brokers and their institutional customers which is a growing segment of the business.

The trade clearance system utilized by the three exchanges is the same. Trades are made over a seven day accounting period, Tuesday through Monday (except Friday and Saturday), with settlement the following Monday (or Tuesday). All trades made during the period are netted to a total buy or sell, receive or deliver, position on an issue (scrip) basis. Brokers must pay the Clearing House for their net buys by prescribed cut off times or must make deliveries to the contra buying broker, or some other broker as assigned by the Clearing House, and show evidence of delivery (the resulting receipts) to the Clearing House to receive payment. Deliveries to or from clients (retail and institutional) are made away from the Clearing House.

This type of clearance system appears to be adequate at the present time for the Pakistani markets and does not in itself appear to be a detriment to growth of the capital market system. However, the system permits trading over time without capital commitment, thus increasing the potential risk to one or more members of the exchange as well as to investors. The current system also fails to conform with the Group of 30 recommendations for a "T+3 settlement" and a "rolling settlement" system; in other words, a system where trades made today settle three working days later.

The cash settlement systems utilised by the clearing houses require members to utilize certain banks which can permit settlement intra-day for the net payments to and from the Clearing House. It also appears that brokers and their major clients have the capability of moving money within Pakistan fairly efficiently and that the banking system is not perceived to be a detriment in the clearance and settlement process.

Some utilization of certificates as collateral for bank-generated loans is involved. Significant financing is also provided by the "badla" system between the brokers themselves.

Little formal "safekeeping" is performed in Pakistan although it is becoming a fast growing service for several of the foreign banks. Individual investors hold their own securities registered in their names, the names of others (who may or not be real persons; that is, "benami") or, in some cases, in "negotiable" form (that is, registered in the name of a previous owner with an executed transfer deed, with name of transferee blank, attached). The latter is done by those individuals desiring anonymity who will either forfeit the rights they may have to any corporate action or sell the positions prior to "book closing" (record date for entitlements).

Many brokers will safekeep or hold certificates on behalf of certain clients, in registered form or negotiable form, within their offices which are in general under less than safe conditions. This is especially true around settlement and closing dates.

Certificates requiring re-registration require a number of clerical tasks to be undertaken and, as a result, are the major problem in the post trading area of the capital markets system. Much of these tasks involve the "transfer deed" (a leftover from the British legal system) which is an integral part of the system used in Pakistan. This factor, along with the Exchange rule that certificates delivered by a seller must be in marketable lots of, typically, 100 shares (a requirement of the type of clearance system used), is the cause of the tremendous clerical load placed on the brokers, banks, and others to achieve settlement.

The members of the Pakistani financial community are well aware that the implementation of the central depository system is the most important action they can take to alleviate the problems associated with the high, and increasing, level of trading activity.

B. Potential Market Risks and Inefficiencies  
in the Existing Operations with Recommendations.

As a result of the information received during the brief fact gathering phase of this project, it is believed that the Pakistani stock exchange community is well aware of the various risks and inefficiencies associated with trading and settlement under the current procedures. Several reports have been prepared which identify these and as a result projects, such as a two-sided trade comparison system and an automatic execution system, are under way to address many of them. We will not attempt to comment on any of these in this report other than to indicate that they all appear to be appropriate and that their objectives are clear.

There are several areas, in addition to the central depository, where we have recommendations which address risk or inefficiencies. These are as follows:

1. Actions in the event of the default of a member.

Potential risk exists when any trade is still open. In the Pakistani system, this includes the risk associated with each trade made by a member during the accounting period as well as the risk associated with the net delivery or receive orders and net cash due the Clearing House as a result of the netting system. Although the subject was understood by the several individuals at the KSE with whom we discussed the subject, we were unable to review a clearly written document which sets out the specific responsibilities of the defaulting member, the contra member, the Stock Exchange, and/or the Clearing House (a department of the Exchange).

In the case of the KSE, a project is under way which is developing a tracking mechanism using the data base of open trades, to quantify exposure to any given member because of market fluctuation from the open contracts or because of undue concentration in a given scrip which would also impact the amount of risk from the position in the event of forced liquidation. In addition, proposed rules, relating to member exposure and rights under claims against assets in the event of member default, have been submitted by the KSE to the CLA for action.

We believe this new tracking system will be a very valuable

surveillance tool. However, it will not serve its purpose unless it is utilised on a daily basis and appropriate action is taken promptly.

RECOMMENDATION: The Board of the KSE should insure that, when this surveillance tool is in operation, appropriate management staff is in place to monitor this system and that they have sufficient authority to take immediate action under written procedures established by the Board. There may not be time to delay action seeking approval from an ad hoc committee of the Board as currently planned.

RECOMMENDATION: A study should be undertaken by the Boards of each exchange which will review the status of documented procedures to be followed in the event of the default of a member with open contracts regardless of how or when the default takes place, and procedures implemented which will insure that all members understand their individual responsibilities and risks as a result of the default of a fellow member.

RECOMMENDATION: The Boards of each exchange should review the assets available to the Exchange and/or the Clearing House to cover the exposure of losses due to the default of a member with open trades to other members as well as to his clients. An Exchange Guarantee Fund and/or a Clearing House Fund should be established and funded under some equitable plan from the existing membership.

2. Issuance of settlement day checks to the Clearing House.

On Settlement day, the Clearing House receives individual checks, prepared by members owing the Clearing House. These are then deposited in one of the Clearing House's banks depending upon which bank the check has been drawn. In addition, the Clearing House prepares checks for issuance to members after they have demonstrated delivery to the receiving brokers.

Although this was not reported to be a problem, some efficiencies could accrue to the Clearing House and to the members if the Clearing House prepared "drafts" against the members who owe the Clearing House at the same time it was preparing "checks" for the members whom the Clearing House owes. A "draft" is a payment order, prepared by the party owed funds and executed under a power of attorney agreement, in this case an agreement between the member, bank, and Clearing House. These drafts would be presented to the banks for collection in the same way the checks are deposited today.

RECOMMENDATION: The Clearing House should consider the issuance of drafts drawn on members owing the Clearing House in lieu of handling individual checks prepared by members and delivered to the Clearing House for subsequent deposit into the appropriate bank.

### 3. Clearing of Inter-exchange Trades.

At the present time, a significant number of trades are executed by brokers "up country" (defined as outside of Karachi) through KSE members. As a result, there is a large amount of settlement activity between these brokers and those brokers in Karachi. This results in physical movement of scrip and transfer deeds inter-city, adding to the inefficiencies of settlement. Even without a depository, there are ways that this volume could be reduced. This would involve the creation of an inter-clearing house service which would provide for the recording of trades between a broker in Clearing House A and a broker in Clearing House B in both Clearing Houses.

This service would result in a quantity of trades being netted in each Clearing House (CH) with a resulting delivery being made from one or more brokers in CH A delivering to CH B (in lieu of deliveries to individual brokers) which in turn would make re-deliveries (as CH A) to the individual brokers in CH B. Because of the alleged volume of inter-market trades, the resulting netting could provide significant reductions in physical movements between cities with resulting savings in costs to the brokers involved.

Such a system would require cooperation of each Clearing House as well as a clear agreement on any risk issues in the event of a default of a member. Such a system would provide revenue opportunities to the Clearing Houses as well as increased inter-market trading because of improved efficiency in settlement.

RECOMMENDATION: The respective exchanges or their CH's should establish a joint committee to explore such a service to determine the potential savings to members and the impact on volumes at the individual exchanges.

### 4. Other areas.

Subsequent to the implementation of the CDC system, there are several additional areas where action should be undertaken to improve the overall efficiencies of and/or reduce risk in the market. These include the following:

1. Reduce the time between the end of a trading accounting

period and settlement. Currently this is seven days. With book-entry settlement and the current clearing system, this could be on the following Thursday rather than waiting until Monday. Such a change would reduce exposure for market loss due to failed settlements. This assumes that the current clearance system would generate deliver orders which would be satisfied by book entry movements in the depository.

2. Develop a clearance system which permitted settlement on Trade Date +3. This could be a trade-for-trade system or some form of a netting system. This could be the current systems at the three clearing houses with modifications which provide an inter-connection with the Central Depository system.

3. Develop a system of trade comparison between brokers and institutional clients which would provide pre-settlement day confirmation and automatic settlement in the depository on a standard T+3 basis.

### III. RECOMMENDATIONS REGARDING THE CENTRAL DEPOSITORY COMPANY

#### A. Ownership/Financing

The CDC of Pakistan is being created by a joint effort of the various major participants in the market. This effort also has the strong support of the government through the Corporate Law Authority, a division of the Ministry of Finance. This fact is a very positive situation and eliminates many of the problems faced by other countries developing such a system.

The CDC is to be owned by some of these major participants in various percentages. We believe it is appropriate to comment on this ownership structure because it will have both a short-term and a long-term impact on the operations of the depository.

The concept of a central depository, in most countries, is one of an industry utility which brings efficiencies to the operations of securities markets. It is a co-operative effort to address common problems. In most of these organizations, the ownership is unimportant as long as control, vested with the Board of Directors, is perceived by the users as serving the broad interests of all the participants and that the different types of participants are fairly represented. The Board must insure that the rules and procedures of the depository do not discriminate among participants providing unfair competitive advantages to one group versus another.

We recommend, therefore, that financing of the creation and initial development of the depository should be in the form of debt, not equity, capital with a minimum but fair rate of return. To do otherwise creates the potential for real or perceived situations of an un-level playing field for participants. A bank participant owner, receiving a dividend, has a perceived advantage on a net cost basis over a bank which is not an owner. This perception could be expanded to one exchange versus another, or one financial institution versus another.

The perception of possible financial gain through dividends to owners will create problems in the relationships of participants. The financial objective of the depository should be clear to all

users who should feel that they are getting equal consideration for their participation in the depository, especially since it will be impossible to participate in the markets without depository participation.

RECOMMENDATION: The CDC should be operated by its Board and Management as a profit-making organisation in order to generate excess revenues over expenses to be used to (1) make ongoing enhancements to the services, (2) develop new services, and (3) retire any indebtedness of the company. It should not provide a return to its shareholders and a shareholder agreement should provide for procedures which will elect a Board of Directors which will fairly represent the cross section of participants.

The responsibility for the setting of the policies and direction of the CDC rests with its Board of Directors. These directors should be elected by the collective shareholders of the CDC to insure that they fairly represent a cross section of the participants of the depository. Therefore, the rules of the depository should provide for such nominations that insure fair representation and election of nominated persons by the shareholder. Board members should be elected for their expected contribution to the overall management of the CDC and should sit as directors for such period of time which would permit understanding of the various issues which affect the CDC.

RECOMMENDATION: The Board of the CDC should be elected by the CDC shareholders from a slate of nominees which will insure fair representation of the various types of participants. Members should serve three year terms with one-third of the Board turning over each year. An individual could serve a second term but, except for one or more CDC management directors, they should not serve more than two consecutive terms.

## B. Structure

In this section we will describe our recommendations for the Central Depository Company when it is in full operation. It is important to understand that a phase-in of functionality is assumed; that is, all the recommendations need not be in operation to begin getting the benefits of the central depository. To try simultaneous implementation of every feature would, in our opinion, represent an imprudent overreach. The optimum sequence of implementation is beyond the scope of this paper, and really is a project that should be done in consultation with depository participants. The key point to consider at this time is that a decision should be made on each feature of our recommendations so that a blueprint of what the ultimate depository looks like is available before detailed implementation planning begins. After all, you would not build the foundation of a house without knowing whether it was to be one or two storeys, how many rooms it was to have, and so forth. Currently, we are in the process of designing a depository, and we should have consensus of participants on the basic features before we pour the foundation; otherwise, the house may collapse before it is finished.

Following are our comments and recommendations on the functional structure of the depository:

1. Concept. A securities depository changes ownership of securities by book entry on electronic ledgers without any physical movement of scrips or transfer deeds. An institution that accomplishes this meets the minimum requirement of a securities depository. It may include many desirable additional features, such as automatic payment for deliveries, the ability to hypothecate, automatic billing of participants for services rendered, and so forth, but they are not essential to qualify for being a depository. This definition should be kept in mind when considering our recommendations.
2. Fundamental Principle. All securities industry deliveries for a depository eligible security will be through the depository facility. Whatever technique is necessary to enforce this practice will be utilised; for example, stock exchange rule, CLA regulation, and so forth. This principle does not mean that if a father wants to give his sons some stock that the depository must be involved; it does mean that if he sells the stock through any stock exchange, (or over-the-counter market if one should develop in the future) the transfer in ownership will be through the depository. All institutional securities holders will likewise use the

depository for all changes in ownership; that is, all mutual funds, banks, brokers, pension schemes, and insurance companies are included.

3. Automation Recommendation. All input should be in computer-readable form. We assume that the output of the stock exchanges' clearing systems will be automatically input to the depository system. We believe that by depository rule all other transactions from participants should be provided by them either through a computer terminal or on a diskette so as to minimise the need of the depository to handle paper. A workable, but in our view, less desirable alternative is for the depository to accept paper source documents and provide the keyboarding service to put them into machine-readable form.
4. The Operating Day. It is envisaged that the depository will be open to receive transactions several hours each working day. Many details need to be worked out concerning the operating schedule of the depository, but what will happen normally is that deliver orders from the previous clearing cycle will be input first thing in the morning, and that during the day deliver orders between brokers and their institutional customers will be submitted.
5. Basic Operations to be Performed by the Depository. The basic operations to be performed by the depository are the following:
  - a) Deposit--Existing Issues. These are the receipt into the depository system of physical scrip for already existing issues.
  - b) Deposit--New Issues. These are the recording of allotments directly from the issuer to the successful applicants through the depository system.
  - c) Free transfer. Book entry transfer without any associated cash movement
  - d) Depository Settlement. Book entry transfer of ownership of a security in exchange for payment to settle a trading transaction.
  - e) Cash only movement. Movement of cash only from one depository participant to another without any associated securities movement.
  - f) Corporate Action. Bonus issues and any other action that changes the number of shares held in the records of the depository by participants without depositing or withdrawing shares to/from the depository system.

- g) Withdrawal. Removing shares from the depository system in the form of physical scrip.
  - h) Pledge/Release. Placing a lien on securities in favor of a lender, which lien can be released only by the lender when the debt is repaid.
  - i) Stock Borrowing and Lending. Stock borrowing/lending through the mechanism of transfers with or without associated money movement through the depository system.
6. Depository Eligibility. Issues are entered for processing in the depository as the result of deposits made in those issues after the issues have been declared eligible for the depository. This permits an orderly phase-in of the functioning of the depository with minimum risk.
7. Participants and Users. We recommend membership (participation) in the depository be limited only to securities institutions such as brokers, banks, mutual funds, insurance companies, stock exchange clearing cells, registrars, and so forth. We specifically do not recommend that the depository have individual public investors as direct participants inasmuch as to do so would considerably complicate depository operation without offsetting advantages. We normally recommend individual investor accounts in a central depository only in those cases where the reputation of the securities industry participants is so poor that not offering individual accounts would limit depository usage severely. We have seen little evidence of this kind of problem in Pakistan.
8. Account Structure. As implied by the restriction on participation discussed above, we recommend that the depository offer accounts only to securities industry participants and not individual investors. Within the participant accounts, however, the depository should offer sub-accounting for those participants who do not have or wish to use customer accounting systems. This will permit securities to be left within the depository identified with specific individuals, making withdrawals unnecessary for those willing to leave their securities with their broker or bank. For participants having customer accounting systems there will be no need to utilise this function of the depository; the detailed ownership records behind the participant's depository account will be in the participant's records outside the depository.

In connection with participants keeping customer accounts

in their own customer accounting systems, we recommend that (1) minimum standards be established by the depository governing competence, content, and format of customer account record-keeping and (2) that as long as these standards are met, the organisation form of the participant (corporation, partnership, proprietorship) does not matter.

9. CDC--THE SCRIPLESS DEPOSITORY. A principal design feature of our recommendations is that CDC will operate on a completely scripless basis. It will not receive or send out scrip. These functions will be done by the registrars as is done today. This approach will keep costs to an absolute minimum: no vaults, no microfilming, less space, fewer personnel, no auditing of physical scrip inventory, lower insurance premiums, no counterfeiting or forgery problems for the depository, all of which costs are associated with those depositories operating on the old-fashioned "immobilisation" basis, rather than this modern "dematerialisation" basis. Essentially, the depository is a computer-driven service organisation rather than a paper processing facility. Note that the depository operating on a scripless basis does not mean that the public may not have scrips in their possession.

The way scrips will get into the depository, therefore, will be (for existing issues) for participants to send them to their registrars, who will cancel the scrips and notify the depository that the scrips are now registered to the depository for credit to the participant's account who submitted them. The registrar need not have a certificate for the depository's position, though for legal reasons, if necessary, the registrar could issue a "balance certificate" representing the entire quantity of the depository's position.

New issue processing would have to be changed somewhat to get maximum advantage of the depository. Issuers would credit the new issue to the depository through the registrar. Applicants would indicate the name (code number) of the depository participant on the application through which they would receive their allotments. The firm doing the balloting would notify the registrar of the winners and their associated depository participant after which the registrar would issue the deliver orders to the depository to credit the appropriate accounts. Individuals could then request scrips if they wanted them, but we feel that many will leave their allotments in the depository ready for immediate resale without having to deposit the scrip first as discussed above.

Withdrawals of physical scrip would be permitted, although we suggest that whether a given issue be permitted to be withdrawn be left up to the issuing company. The withdrawal request would be submitted by the participant on behalf of his client to the registrar who would notify the depository of the debit to its account and who the specific participant was. The registrar then issues the certificate (marketable lots are no longer necessary) either in the name of the beneficial owner or the participant, as agreed upon between the owner and the participant.

10. Delivery versus Payment (DVP). We recommend that the depository be designed to permit delivery versus payment within the depository system. While obviously not a requirement initially, as discussed above in Point 1, planning should include all inter-participant settlement being in the depository. This will make it possible for stock exchange clearing systems to utilise the money settlement facility of the depository. It will also eliminate check issuing between institutions and their brokers. This is a substantial simplification of today's processing.
11. Corporate Actions. Bonuses and any other recapitalisation actions that adjust the number of shares outstanding would be handled by the depository through its computer calculations for its own holdings upon notice by the registrar. A participant, for example, that owned one lakh shares at the time of a 20% bonus declaration would have his account automatically credited for the additional 20,000 shares. Registrars would send scrip to physical scrip holders as they do today.
12. Cash Dividends/Rights Offerings. The approach we recommend for those actions requiring mailing of dividend checks, rights offerings, and any other similar situations is for the depository and its participants to supply the registrar with the names, addresses and holdings underlying the depository's positions, thereby permitting direct mailing from the registrar to the beneficial owners or their nominees. For the holders of physical scrip, the registrars will do exactly what they do today.
13. Pledge/Release (Hypothecation). We recommend a special system be developed that will permit hypothecation by "blocking" pledged shares within the account of the pledgor, thereby insuring that dividends and other entitlements are handled correctly. This "blocking"

transaction would be tantamount to placing a lien on the pledged shares, because they could not be moved out of the account until a transaction had been submitted by the pledgee lender "unblocking" the pledged shares; that is, lifting the lien. Although a regular deliver transaction moving the shares from the pledgor to the pledgee could be used, to protect the pledgee's interests, it would result in the entitlements flowing to the wrong party.

14. Stock Borrowing and Lending. We recommend that for the foreseeable future, because volumes are low, that stock borrowing and lending be accomplished by regular deliver orders, even though this may result in claims for the misdirected dividends and other entitlements.
15. Position Reconciliation with Registrars. The recommended approach to a dematerialised depository with its reliance on registrars for handling depository deposits and withdrawals makes it absolutely necessary that the books of the registrar and the position accounting of the depository stay in synchronism at all times. We recommend that all issues from the date of depository eligibility be reconciled daily with the registrar for a period of at least one month so that all balancing procedures can be appropriately tested. If all goes well after the initial month, weekly reconciliation could be utilised.
16. Applicability of this Structure to All Securities Types. The depository design criteria recommended for CDC have the advantage of being applicable to all security types. If, for example, Pakistan ever wishes to trade in options, they could be handled in this depository with relatively little additional work. Note, however, that some procedural work and computer programming would undoubtedly be necessary; the key point, however, is that the nature of the recommended approaches will minimise the preparatory work that might otherwise be required.
17. Pakistan as a Global Player. This depository design complies with all international standards and should make it relatively simple to interface with central securities depositories in other countries, thereby facilitating foreigners investing in Pakistan as well as the converse. Please, remember, however, that to fully comply with international standards it will be necessary to go to rolling settlement with a maximum time of three days after trade date.

18. Regional Neutrality. Our recommendations facilitate creation of a truly national depository serving the entire Pakistani securities industry. While obviously everyone realises the position of Karachi as the "financial capital" it is important that the financial communities of the other cities not perceive that the depository disadvantages them compared to the Karachi community. We recommend that management in its operating policies maintain strict regional neutrality so that there is no reason for other cities to want to build their own depositories with the resultant redundancies and excessive cost. Regional neutrality is particularly important in pricing depository services; for example, it should cost no more to process a transaction submitted from Islamabad than one submitted from Karachi.
19. Billing. The depository will need to establish a fair billing schedule for its services. This a major project in itself, inasmuch as some participants will have more transactions than others (typically brokers) while some will have greater positions (typically institutions) and varying the prices can adversely affect one group versus the other. We recommend that the billing system be automated and structured so that it can not only bill, but also model prospective billing rates, thereby helping the board set fair charges.
20. Risk Minimisation. It is essential that the depository be correctly perceived both by its participants and the investing public as safe. There are many schemes available which provide varying degrees of protection. We recommend the "full collateralisation" approach: This insures that the daily payment obligations of the net receivers of securities be fully collateralised against default. There are many approaches to full collateralisation, but the simplest is that the depository have cash, marketable securities, and letters of credit on file for the maximum exposure allowed a participant. As the depository grows, and especially if it makes eligible debt obligations, this feature will increase in importance.
21. Coding Schemes--Participants and Securities. We recommend, that with the increasing number of firms that do business in multiple marketplaces (hold cards on two exchanges, for example) and the almost universal multiple-exchange listing of stocks, that nation-wide coding schemes be developed for computerised identification of both participants and eligible securities. The depository, functioning as the

"utility" of the securities industry, is the logical entity to establish and maintain these coding schemes, in the absence of any other party doing it. Care should be taken in the selection of the securities scheme that it complies with international standards in order to facilitate international depository interfacing.

22. Confidentiality. We believe that the approaches recommended provide a degree of confidentiality and privacy to the investing public equivalent to that available today with the certificate/transfer deed system. While the approach is different from today, close examination should show that through customer accounting systems of participants and the ability of securities to be registered in nominee name, there is no need for the depository to be aware of the beneficial owners of its holdings unless a participant wishes, at his option, to utilise the sub-accounting features discussed above.

23. Legal Framework. The recommended design of the depository will require a complete analysis of its compatibility with existing and proposed legislative and regulatory changes. This analysis is beyond the scope of this study, but below are highlighted some key areas where compatibility is essential:

(a) Book-entry settlement. Transfer of ownership by book-entry on the ledgers of the depository must be clearly recognised as equivalent to a delivery of physical scrip.

(b) Fungibility. All requirements that distinctive numbers be associated with depository holdings must be eliminated so there is true fungibility.

(c) Elimination of director's signature. The present requirement for a director's signature in order to effect transfer must likewise be eliminated.

(d) Beneficial Owner Rights. The law must clearly recognise the rights to entitlements of the beneficial owners for all depository holdings.

(e) Pledges/Releases. The law must recognise that the hypothecation of securities through the depository system is the equivalent of lenders taking physical possession of collateral; else, no lender will want to use the depository.

(f) Stamp Tax. We cannot comment on how the present

stamp tax would be applied to the operation of the depository inasmuch as it is the transfer deed that is currently taxed and, by definition, transfer in the depository occurs without transfer deeds. We recommend however, that if possible, all taxes on the transfer of ownership of securities be eliminated as being inhibiting to the growth of capital markets. If, for reasons of public policy, that is not possible, the revenue effect of the new system must be analysed and any changes in the law resulting from that analysis potentially included in the computer programming specifications of the depository.

#### C. Need for Prompt Decision

The chances for the successful implementation of the Central Depository Company are greatly increased due to the apparent support of the several segments of the Pakistan equity markets. Much has been accomplished in getting to this point. However, it is imperative that the structure, as recommended above, be finalised as soon as possible as any work begun without total agreement as to what exactly the central depository is going to do creates the risk of additional work and wasted effort. We recommend that the structure discussed in this report be the subject of immediate serious discussion by appropriate parties. To the extent that there are items which are not clear as to meaning, questions should be developed so that they can be addressed by the consultants during the second segment of the project.

#### D. Experience Needed for Implementation

After determining the final structure needed for the depository to support the equity markets of Pakistan, we believe the next key task is the selection of a Chief Operating Officer or Project Manager who can provide day to day management of the implementation project. This individual should have excellent management skills and experience developing equity clearance, settlement, and safekeeping functions. In addition, any consultants/vendors selected to assist in implementation should have had practical hands-on experience with depository development. Technical assistance with specific experience in the area being addressed is mandatory for success.

#### IV. RECOMMENDED TASKS FOR SEGMENT TWO

Based on the findings during segment one, it is recommended that the scope of work for segment two be modified as indicated below. The work would continue to be conducted under the time frames and cost originally approved by USAID.

Task 1-- Assist the CDC Board by conducting one or more informational seminars for the purpose of familiarising key equity markets participants with the proposed Central Depository Company's structural features.

Task 2-- Based on input received from Task 1, assist the CDC Board in finalising the depository's structural features including a sequence of feature implementation and availability phases.

Task 3-- If the Board is able to finalise the structural features, produce a memorandum documenting each of these structural features, the desired implementation sequence, and a preliminary outline of the issues that have to be addressed in the preparation of a full scale implementation plan. This plan should be the subject of a future technical assistance project. These areas would include but not be limited to subjects such as the following:

- Detailed design specifications
- Software selection
- Hardware selection
- Computer Programming
- Forms design
- Work flow diagrams
- Procedure writing
- Preparation of Rules
- Operating infrastructure, including space, locations, staff support (personnel, accounting, purchasing), and so forth.
- Operating staff acquisition and training
- Participant training
- Public education
- Identification of accounting system and cost centers
- Parameters for billing

It is recommended that USAID and the KSE review this proposed change and advise the consultants as soon as possible so that plans can be made for the finalisation of segment two.

V. APPENDIX A-- ORGANISATIONS INTERVIEWED

F.A.Cassim Company  
Central Depository Company of Pakistan, Limited  
Citibank, N.A.  
Corporate Law Authority, Ministry of Finance  
A.F. Ferguson & Co.  
Golden Arrow Selected Stocks Fund Limited  
Investment Corporation of Pakistan  
Islamabad Stock Exchange (Guarantee) Ltd.  
Karachi Stock Exchange (Guarantee) Ltd.  
KPMG Tasser Hadi Khalid & Co.  
Lahore Stock Exchange (Guarantee) Ltd.  
Muslim Commercial Bank Ltd.  
National Investment Trust Ltd.  
Saudi Pak Industrial & Agricultural Investment  
Company (Pvt) Ltd.  
State Bank of Pakistan  
United States Agency for International Development