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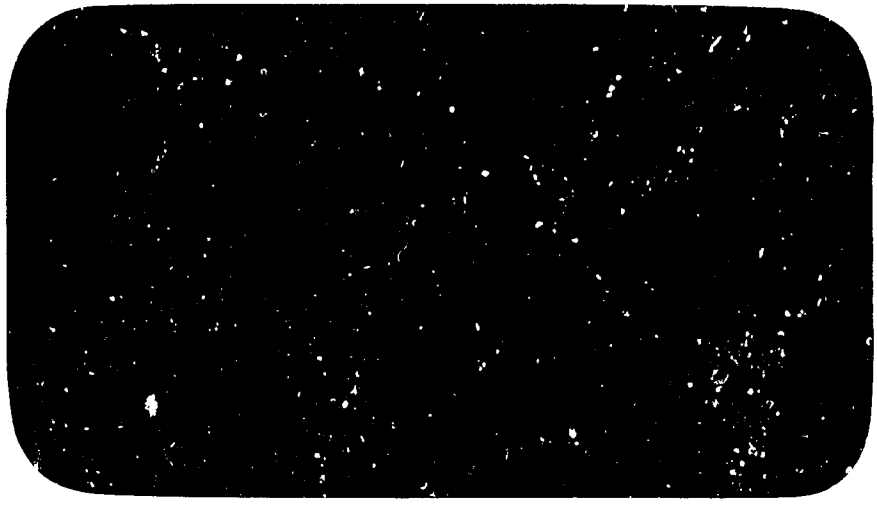

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✳ **ACTION . . .**

SPECIFICATIONS FOR COMPUTER HARDWARE/ FIRMWARE AND SYSTEM SOFTWARE TO SUPPORT MANAGEMENT INFORMATION SYSTEM APPLICATION SFOR THE MINISTRY OF SOCIAL INSURANCE, ARAB REPUBLIC OF EGYPT

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Prepared for:

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PART I

FUNCTIONAL AND PERFORMANCE SPECIFICATIONS

1.0 GENERAL

This section contains functional and performance specifications for hardware and software as related to this acquisition. These requirements, as stated, are the minimum requirements. Bidders shall respond not only to minimum requirements, but shall also demonstrate the means for proposal systems to grow to meet the workload anticipated by the projected applications.

The mandatory hardware requirements set forth in this section are divided into five major paragraphs. 1.0 describes the mission of the Ministry of Social Insurance, and objectives of this acquisition. 2.0 lists references of all applicable documents. 3.0 describes the requirements for the computer system including central processing units, main memory, operator consoles, I/O channels, high-speed printers, data entry, data communications subsystems, peripheral storage including direct access storage, magnetic tape storage, and all supporting software. 4.0 lists applicable standards to which proposed equipment and software must conform. 5.0 describes the performance validation requirements.

1.1 MINISTRY OF SOCIAL INSURANCE MISSION

The Ministry of Social Insurance is responsible for administering the social insurance laws of the Arab Republic of Egypt. These laws attempt to provide for the financial security of all Egyptian workers and their families during retirement years and in the event of the death or disability of wage earners. In administering these laws, the Ministry carries out programs to collect contributions from workers and employers, to pay benefits to pensioners and dependents, and to manage the resulting pension and insurance funds in an efficient way. These programs represent a major source of saving and capital investment for the Egyptian economy.

They form a major part of the Government's equity policy, and in applying to every working household in the country, they are a highly visible indication of the Government's commitment to progressive social policy.

The management and administrative tasks of the Ministry have increased nearly fourfold over the past five years as social insurance coverage has expanded from 25 percent to virtually the entire population. Given scarce administrative and technical support resources, the Ministry has done a remarkable job in handling some of this increased workload. However, the Ministry has recognized that efficient collection of contribution and payment of benefits require an overall restructuring in the way it collects, processes, and uses information to operate its programs.

The Ministry of Social Insurance is structured in two parallel and autonomous functional sub-units concerned with the delivery of social services. The Pension and Insurance Organization, (PIO) is concerned with administering pensions and other benefits to government workers under coverage provided by Law 79 of 1975. PIO presently serves approximately 1 million pensioners and 2.5 million insured government workers. The Social Insurance Organization, (SIO) provides similar kinds of programs to the private sector, public (i.e. government owned or sponsored businesses) sector, employers and the self employed, casual workers, and Egyptian workers abroad. Services are provided under Law 79 of 1975, Law 108 of 1976, Law 50 of 1978, and Law 112 of 1980. SIO presently serves approximately 2.5 Million pensioners and 10.0 Million insured persons.

PIO and SIO have, individually, Regional Offices in each of the 27 governments of the country. Here the parallels stop.

The PIO relies on administrative offices of each government ministry to keep records on individual government workers. Only when a worker becomes a pensioner is PIO informed of the particular person in order that the monthly pension may be processed and issued. Even here there

are exceptions: approximately 0.5 million persons who retired from government service before 1975 are paid pensions directly by the Ministry for which they worked.

SIO, on the other hand, maintains an organization of approximately 350 District offices reporting to its 27 Regional offices. These District offices establish and maintain records on individuals and employers, and are concerned with the collection of funds and the distribution of benefits.

Current operations in both organizations are essentially manual and extremely labor intensive although each organization does employ a dedicated batch-oriented computer system for record-keeping purposes. PIO employs an ICL 1902T computer with 32K words, (96K bytes), two 60M byte disk drives, eight magnetic tape drives, one card reader, two 1000LPM printers and sixteen key edit stations. SIO employs an IBM 370/135 (DOS/VS) with 192K bytes, four 70M disk drives, six magnetic tape units, one card punch/reader, two 1000LPM printers, ten MDS work stations, nineteen IBM dual station diskette entry units. All data systems are in use approximately 16 hours per day, 6 days a week, with heavy reliance on printed output.

1.2 OBJECTIVES OF THIS ACQUISITION

With the assistance of USAID, this acquisition is intended to provide the Ministry of Social Insurance with two computer systems which can support the goals of both PIO and SIO to establish individually unified data systems which will:

- Register pensioners, insured workers, and contributing employees
- Calculate and track the collection of monthly contributions

- o Calculate benefits and provide funds disbursement registers to local banks and post offices, and

- o Provide administrative, actuarial, and management tools and reports.

This acquisition will provide separate computer systems for PIO and SIO. Each system will be employed in a shared batch/interactive mode initially. While the two systems may be sized uniquely, they must have the capability to serve as back-up for the other.

1.3 CONCEPT OF OPERATIONS

A phased employment of these resources is envisaged and must be considered by the bidder so that the best interests of MSI are served. In the installation and development phases, application software currently employed on the ICL and IBM systems will be converted for two purposes: first, the enhanced capability of the systems to be acquired will enable those applications to run faster, and second, the experience of conversion will provide an effective period of familiarization for the existing MSI data systems staff. Concurrently, new applications software described elsewhere in this document, will be developed in a data base management system environment and brought into operation.

To complete this phase, a physically co-located district office will be selected in a pilot program to provide interactive services to MSI staff and through them to insured persons and pensioners.

Subsequently the Ministry intends to evolve to a system of totally distributed terminals access for the capture of information and the delivery or services for both PIO and SIO. In this phase, each system will require as many as 750 remote terminals to serve district and regional offices, major employers and government organizations.

2.0 APPLICABLE DOCUMENTS

The following listed documents specify federal and other standards for data processing and telecommunication systems acquired by the Federal Government and are incorporated by reference. The proposed system shall meet the requirements of 4.0 with respect to standards.

1. Privacy Act of 1974 (P.L 93-579, 5 U.S.C. 5522).

2 Federal Property Management Regulations (FPMR).

FPMR 101-35	ADP and Telecommunications Management Policy
FPMR 101-36	ADP Management

3 Federal Information Processing Standard Publications (FIPS PUB).

FIPS PUB 1	Code for Information Interchange
FIPS PUB 7	Implementation of Code for Information Interchange
FIPS PUB 16-1	Bit Sequencing of the Code for Information Interchange in Serial-By-Bit Data Transmission
FIPS PUB 17-1	Character Structure and Character Parity Sense for Serial-By-Bit Data Communications in the American National Standard Code for Information Interchange
FIPS PUB 18-1	Character Structure and Character Parity Sense for Parallel-by-Bit Data Communications in the Code for Information Interchange

FIPS PUB 21-1,	Common Business Oriented Language (COBOL) 1974
FIPS PUB 22-1	Synchronous Signaling Rates Between Data Terminal and Data Communications Equipment
FIPS PUB 25	Recorded Magnetic Tape for Information Interchange (1600 CPI, Phase Encoded)
FIPS PUB 37	Synchronous High-Speed Data Signaling Rate Between Data Terminal Equipment and Data Communications Equipment
FIPS PUB 43	Aids for Program COBOL Conversion
FIPS PUB 50	Recorded Magnetic Tape for Information Interchange (6250 CPI, Group Coded Recording)
FIPS PUB 60-1	Input/Output - Channel Interface Equipment
FIPS PUB 61	Channel Level Power - Control Interface
FIPS PUB 62	Operational Specification for Magnetic Tape Subsystems
FIPS PUB 63	Operational Specifications for Rotating Mass Storage Subsystems
FIPS PUB 79	Magnetic Tape Labels and File Structure or Information Interchange (ANSI X3.27-1978)

3.0 SYSTEM REQUIREMENTS

The computer system(s) which are acquired as a result of this specification shall comply with the hardware and software requirements as described in subsequent sections.

3.1 PROCESSING PERFORMANCE

The measures of processing performance shall be satisfactorily demonstrated in the live test demonstration. (Reference 5.0)

The proposed hardware and software shall operate in an environment which includes the following types of concurrent processes:

1. Programmers interactively utilizing COBOL, compilers and native assemblers.

2. Programmers and analysts utilizing text editor software to manipulate data and program files.

3. A complex mix of batch jobs which utilize both disk and tape files and output reports to the system printers. The majority of batch jobs will include COBOL application programs, data base accesses, and sorts.

4. A mix of interactive data base accesses, fetch displays, inputs, computes and updates

5. Performance measurement software executing concurrently with the above processes.

3.1.1 Fault Detection, Diagnosis, and Location for the System

The Bidder shall provide a package of on-line concurrent maintenance software, which can be run in parallel with normal processing jobs. This software shall provide, as a minimum, error detection, error analysis, and isolation and identification of failed components. The test routines shall be executable from the maintenance console. The test routines shall not compromise the integrity of data files and data security shall be maintained and protected. The maintenance software shall be current with each release of operating system software.

3.2 HARDWARE REQUIREMENTS

This section functionally describes the minimum characteristics required of the proposed hardware components for each of the computer subsystems. Any additional components required shall be provided in addition to those specified in this section. The equipment proposed to meet this requirement shall be new, currently manufactured, and supported equipment which utilizes modern technology. Used, refurbished, or remanufactured equipment is not acceptable. The system life cycle of the proposed equipment will be at least ten years.

3.2.1 Central Processing Units (CPU's)

To provide high reliability, flexibility of configuration, and full redundancy, the proposed configuration shall consist of at least two independent, stand-alone CPUs. The CPU's must have the ability to be coupled through interfaces, and each must have the ability to perform as a back-up to the other subsystem.

Each proposed CPU shall meet the following minimum requirements:

1. Each CPU shall provide parity checking for all data transfers. If a parity error occurs and cannot be corrected automatically, the operator must be notified at the time of failure so corrective action may be taken.

2. Arithmetic units shall provide handling fixed point single precision, and single and double precision floating point.

3. There shall be an interval clock and time of day clock. Interval clock shall initiate appropriate interrupts. Time of day clock shall be accessible under program control.

4. A read/write protect feature shall be provided to protect the integrity of data.

3.2.2 Main Memory

Each proposed subsystem shall contain main memory of the following characteristics:

1. Memory shall be modular and reconfigurable so that a failing module in the non-control program area shall be logically deleted automatically from the system configuration without impairing the remaining memory or disrupting other operations.

2. Memory protection shall inhibit any attempt to write into and/or read from protected and privileged areas. Any attempt to read or write from protected areas must be disclosed at the operator console. This function must protect programs and data concurrently residing in memory from each other as well as protection of unauthorized access to the operating software.

3. Memory shall provide automatic error detection and correction for single bit errors. Detection of multiple bit errors within each storage location must be reported. All memory errors shall be recorded in a system history file.

4. The SIO subsystem has a minimum initial requirement of four megabytes of main memory and the PIO subsystem has a minimum initial requirement of two megabytes. These are both expandable at a rate of approximately 10% per year.

3.2.3 Operator Console Terminals

Each proposed subsystem shall be equipped with two operator consoles which are on-line and dedicated to operator/computer communications. Other requirements are as follows:

1. Enable the operator to monitor the status of the central site system components and all work being performed by the system

2. Capable of displaying system data continuously or on demand.

3. Able to retrieve and redirect the information recorded on the console log including directing this information to an alternative display device.

4. Permit display of the day's console logging activity by either a hardcopy printer associated with the keyboard or one full-screen CRT rollback capability. In the latter case, there must be the capability to produce a hardcopy of the console logging activity on the system printer.

5. The capability to designate an alternate display device as the operator console.

3.2.4 Input-Output Channels

Regardless of the architecture used to interface the peripheral units with the system's main memory storage facility and other I/O related components of the system, the proposed IOC shall provide a failure independent duplication of paths for each magnetic medium handling device. Offerors shall propose data channels with a

transfer rate of at least 0.5 megabytes per second for interfacing unit record devices and data channels with a transfer rate of at least 2 megabytes for interfacing mass storage devices

No peripheral unit data path shall suffer a degradation of transfer rate regardless of the size of the data block transferred or the content of the data. Any translation, transposition, and interpretation of data that may be performed by the IOC and associated components, which may be necessary to interface a peripheral unit to the system's main memory storage facility, shall not impede the transfer rate on any path.

3.2.5 Peripheral Storage

The initial storage requirements include on-line data bases, production program source and object code files, production data files, and program development work space.

3.2.5.1 Direct Access Storage (DAS)

Direct access storage devices of sufficient quantity to contain 9000 megabytes of user accessable data for the SIO subsystem and 3000 megabytes of the PIO subsystem shall be proposed. Minimum requirements follow:

1. Each device shall be accessable through two control units.

2. The DAS subsystem shall be configured in such a manner as to provide a minimum of two failure independent paths to each system's main memory storage facility.

3. Facilities providing error detection, reporting, and correction shall exist in the DAS control units. Automatic retry of correctable errors and overruns shall be accomplished within the DAS subsystem.

4. Each DAS control unit shall perform maintenance and diagnostic routines necessary for the mechanical and electrical alignment and functionally operational verification of each device with which the control unit communicates.

5. The DAS subsystem shall transfer data on any available path at a rate not less than the rate of the proposed DAS device regardless of any components that may be needed to translate, interpret, and transpose data and device command signals for interfacing the DAS device to the control unit and the control unit to the IOC.

6. Each DAS subsystem must be expandable by 10% per year over the system life.

3.2.5.2 Magnetic Tape Subsystem

A major usage of the magnetic tape subsystem shall be to process the batch files and perform printer spooling requirements.

3.2.5.2.1 Magnetic Tape Devices

Each magnetic tape device shall operate in a phase-encoded (PE) 1600 bpi mode and group coded recording (GCR) 6250 bpi mode. The following features are the minimum requirements of the tape devices:

1. Devices shall read, record and erase nine tracks of data and parity channels.

2. Tape devices shall move tape at a minimum of 125 inches per second.

3. Recording densities shall be selectable under program control.

4. The tape devices shall be self loading and not require removal of self loading tape retaining straps designed for this specific purpose.

5. Tape device windows shall raise and lower automatically as tapes are loaded and unloaded.

6. Each subsystem must have a minimum of two tape devices.

7. A complement of tape devices per subsystem shall be proposed to enable backing up of the entire DAS files in less than 30 minutes. This capability must be expandable through the system life cycle.

3.2.5.2.2 Tape Subsystem Controllers

All tape devices shall have a minimum of two paths between the main memory facility and the tape device. The controllers shall contain maintenance and diagnostic features which enable off-line testing and alignment of devices accessed by it. When the maintenance and diagnostic feature is utilized, the remaining devices and controllers shall perform their normal functions. The data transfer rate of each path shall not be less than the transfer rate of the device accessed through the path.

3.2.6 Printers

3.2.6.1 Line Printers

Each proposed subsystem shall initially include no more than six (6) high speed impact printers with stackers. Each printing subsystem shall be expandable to handle a 50% increase in the workload specified. The printers shall meet or exceed the following requirements:

1. Operate in on-line mode.

2. Print the Arabic character sub-set.

3. Print at 6000 lines per minute (aggregate) for the SIO sub-system and 3600 lines per minute (aggregate) for the PIO sub-system.

4. Provide data buffers holding one (1) line of data equal to the total number of character positions permitted on a line.

5. Check parity on all transfers.

6. Permit adjustable tractor feeds to accomodate various form widths and a form adjustment for vertical tension.

7. Print on standard fanfold edge-punched printer paper in widths from 4.0 to 18.0 inches, and distances between folds of 3.0 to 14.0 inches.

8. Provide a forms thickness control.

9. Provide for initial manual alignment of the top of form and left hand margin for pre-printed forms.

10. Provide a form length control feature such that information about a form is input by an operator and stored by the printer electronically for control of the form.

11. Print one (1) original and up to five (5) legible carbon copies on 18 to 20 pound paper.

12. Provide for operator selectable vertical line print densities of six (6) lines per inch and eight (8) lines per inch.

13. Under program control, provide for single and double space printing, page ejection before and after printing a line, and multiple line skipping.

14. Sound deadening cabinet for low noise operation.

15. Provide a means to interchange character sets with the other proposed impact printer(s).

16. Ribbon motion shall be automatically monitored for skew, azimuth, and tracking and shall be automatically corrected when alignment deviates for the Bidder's specifications.

17. Control indicators shall be clearly labeled, logically organized and conveniently located for operator accessibility.

18. Provides an audible and visual alarm alerting the operator of forms depletion and paper jams.

19. Are equipped with adjustable automatic stacking devices for the refolding and stacking of printed output.

20. Print 132 characters per line, 10 characters per inch horizontally.

3.2.6.2 Character Printer

Each proposed subsystem will require local, low-speed input/output character printer for interactive users. Back subsystem should have an initial minimum of 32 devices. They should have the following characteristics.

1. Minimum speed of 30 characters per second printing 132 characters per line using the Arabic character subset on each line.

2. Print six lines per vertical inch.

3. Print 10 characters per horizontal inch.

4. Use fan-fold type paper which shall be sprocket-fed.

5. Function as a stand-alone printer and as a slave printer to a Keyboard Video Display Terminal (KVDT).

6. Operate from a table or desk top.

7. End of form detection with automatic halt of printing at the end of the paper supply.

3.2.7 Data Communications Subsystem

The communications subsystem must support a variety of functions related to specific terminals, prospective terminals, existing data communication circuits, planned data communication networks, public and commercial network interfaces. In addition, the interface must be modifiable to accommodate phased implementation and re-configuration of circuits supporting user terminals. Its sizing must support existing workload, planned growth of telecommunications, and new programs requiring ADP support in remote sites. These requirements are to be satisfied by the vendors utilizing an optimum balance of hardware and software implementation.

The proposed systems must support the requirements set forth in this section, however, the need is for the future, with the wide spread terminal network being planned.

3.2.7.1 Hardware Interface Requirements

Standard physical interfaces are required to accommodate vendor supplied data terminals and data circuits. These quantities must

be modifiable and expandable to accommodate the growth indicated over the system life. Hardware is required to support the following modes of line operation:

3.2.7.1.1 Asynchronous, start-stop, half-duplex communications at the data rates from 110 BPS (ten characters per second) through 1200 BPS (120 characters per second).

3.2.7.1.2 Synchronous Data Communications. Full-duplex and half duplex mode is required at data rates from 2,000 bits per second to 9.6 kilobits per second.

1. Dedicated channel data circuits over four wire voice grade telephone facilities at data rates to 9600 bits per second full-duplex.

2. Dedicated channel data circuits over full-duplex digital facilities of specialized carriers form 2400 bits per second.

3. Dedicated data channel interconnection utilizing half or full-duplex data transmission protocols in bit and byte oriented environments.

3.2.8 Video Display Terminals (VDT)

Forty (40) video display terminals capable of operating in clustered mode or as stand-alone devices shall be proposed per subsystem which meet or exceed the following requirements:

3.2.8.1 Self Diagnostic

Features to identify failure via self-generated test procedures. Failures shall be indicated by displayed test patterns, indicator lights or screen messages.

3.2.8.2 Display Attributes

1. Fifteen (15) inch diagonal, high-resolution, anti-glare, and flicker-free screen.

2. Operator-adjustable brightness control.

3. Screen capacity: 24 data lines by 80 characters.

4. Displayable Arabic subset plus the feature to recognize and generate control characters necessary for proper operation.

5. Field Attributes

   Any field on the screen shall have any combination of the following attributes:

   a. Protected Format

      Protect data fields while unprotected fields are filled, transmitted, cleared and refilled.

   b. Partial Screen Transmit only keyed data, fixed format remains displayed and keyed data areas are blanked for next entry.

   c. Variable Video Display Field

      Reverse video display or two level intensity display.

   d. Blinking Display Field

      Contents of field blink on and off.

6. Scrolling - Move all displayed lines of data up or down by one (1) line as a new line is added and an existing one removed.

7. Non-destructive blinking underline cursor character. Addressable and readable cursor.

3.2.8.3 Editing Features

Editing shall include:

1. Insert Character

   Insert a character or character string into an existing line of displayed text; remaining characters shift to the right to accommodate the added character(s).

2. Delete Character
   Delete a character from an existing line of displayed text; remaining text shifts to the left (closes up).

3. Insert Line

   Add a line of text between existing lines of text.

4. Delete Line

   Delete a line of text from existing text; remaining lines move up to close display.

5. Clear All

   Clear all fields, both protected and non-protected.

6. Clear Non-Protected

   Clear all non-protected fields.

3.2.8.4 Keyboard Requirements

1. Standard office typewriter layout including shift, shift lock, upper and lower case and return.

2. High reliability, capacitive keys.

3. All keys except for clear, break, local, send, print, page, function key, home, clear, unprotected, and insert character to be repeated at a rate of 15 repetitions per second or at the transmission rate, whichever is slower.

4. Audio feedback from key strokes will not be acceptable.

5. Cursor control cluster

   a. Up - moves the cursor to the same position on the line immediately above.

   b. Down - moves the cursor to the same position on the line immediately below.
   c. Left - moves the cursor one position to the left.
   d. Right - moves the cursor one positon to the right.
   e. Home - moves the cursor to the first position of the top or the page.
   f. Wrap-around feature shall be provided for a, b, c, and d above.
   g. Key pad shall be arranged in a separate cluster.

6. Separate cluster of numeric keys.

7. Tab Control

   a. Set tab - store operator-set or program-set tab positions.

   b. Clear tabs - clear all stored tab positions.

   c. Tab - move cursor forward to next tab stop.

8. Edit Feature Keys

   a. Insert character;

   b. Delete character;

   c. Insert line;

   d. Delete line;

   e. Clear all; and

   f. Clear non-protected

3.2.8.5 Mode Controls

1. Upper Case Only - Inhibit lower case.

2. Break - The means to transmit a signal to terminate output.

3. Send Key - Transmit data in block format.

4. Feature to program the send key to:

   a. Send all data

   b. Send only unprotected data

3.3 SYSTEM SOFTWARE REQUIREMENTS

The system software described in this section shall be provided by the Bidder and shall satisfy the minimum requirements as defined within each section. The Bidder shall provide both source code and object code files for all proposed software. The software proposed shall be indentical for each computer sub-system. The system shall also meet the following requirements:

1. The proposed software shall be used in the live test demonstrations.

2. The proposed software shall be maintained and fully supported by the Bidder for the system life.

3. The proposed software shall only be modified in accordance with requirements specified in Section 7.0 of Part II.

4. Complete documentation of all proposed system software shall be delivered in compliance with Section 6.0 of Part II.

3.3.1 Operating System

The Bidder shall provide an operating system (O/S) with the following minimum features:

3.3.1.1 System Control

The O/S shall control all hardware and software, all system I/O functions, all interfaces with the local peripherals, and all interfaces with data communications channels.

3.3.1.1.1 Concurrent Processing

The O/S shall concurrently support all types of processing (e.g., batch, transaction and interactive) in a multiprogramming and multiprocessing mode, in any mix.

3.3.1.1.2 Automatic Error Detection and Correction

The O/S shall perform automatic error detection and recovery, including automatic trial of alternate paths, where alternate paths are provided. Complete data shall be recorded on all errors and on the method of recovery from errors. Information shall be provided to an operator immediately when an unrecoverable error is detected. All errors shall be recorded in a system history log file.

3.3.1.1.3 Restart and Reconfiguration

The O/S shall provide the following restart and reconfiguration features:

1. Orderly shut down system operations without the loss of work, data, or job queue entries in the event of a failure of the system or a component due to causes other than a power failure.

2. Logically remove any unallocated peripheral device from the operating configuration and reassign any peripheral, by operator command, without disrupting the continuity of the operation.

3.3.1.1.4 Job Control Language

A job control language shall be provided for batch processing. The O/S shall handle jobs which consist of any number of tasks. The job control language shall provide a means to control the sequence in which job tasks are to be performed.

The job control language shall provide a means to programatically determine whether or not a just-completed task abnormally terminated, and if so, what caused the task to abnormally terminate. The job control language shall provide a means of programatically branching forwards and backwards. The job control language shall provide a means to specify which steps of a job must be rerun upon system halt and restart.

3.3.1.1.5 The O/S shall manage files (program and data) to maintain their integrity. The O/S shall provide controls to selectively prevent concurrent file accesses. All files shall be accessible by any task and interactive session. The O/S shall provide controls necessary to protect all systems software, applications programs and data files from unauthorized access or accidental destruction.

3.3.1.1.6 Magnetic Tape

The operating system shall support multifile magnetic tape reels, multireel magnetic tapes. Support shall be provided for a magnetic tape label system, including automatic checking of labels. Also, support shall be provided for magnetic tapes without labels. The O/S shall not permit any non-expired tape volume to be allocated as an ouput tape unless the task requests the tape by volume number or the operator intervenes. Any tape volume that has expired and has an inserted write ring shall be treated as a scratch tape by the O/S; that is, any task requesting an output tape volume may allocate it without operator intervention.

3.3.1.1.7 Date and Time

The O/S shall, upon request, provide the following information to user programs:

1. Current date, using year, month and day of month, based on Gregorian calendar, e.g., yymmdd.

2. Time of day in one second increments commencing with 00 hours, 00 minutes, and 00 seconds and ending with 23 hours, 59 minutes and 59 seconds, e.g., hhmmss.

3.3.1.2 Job Management and Resource Allocation

The following job management and resource allocation functions shall be provided, as a minimum.

3.3.1.2.1 Job Scheduling

The O/S shall provide a job scheduling function which has the following features:

1. Jobs shall be placed in scheduling queues based upon operator specification, or in the case where the queue has not been specified, based upon job resource requirements. There shall be a default queue for jobs that specify neither queue nor resource requirements.

2. Jobs residing in queues shall be selected for execution based upon the priority of the queue, the priority of the job and a user specified job initiation time (the job shall not be selected before the specified time). There shall be a means to limit the number of active jobs from any queue.

3. The operator shall be able to initiate or terminate any job and change the priority of any job in a queue.

4. There shall be at least fifteen scheduling queues.

5. There shall be a means of restricting which users may use any given queue.

3.3.1.2.2 Job Priorities

The O/S shall provide a priority relationship between tasks which satisfies the following requirements:

1. There shall be a means to make interactive tasks run at a different priority than batch tasks.

2. High priority tasks shall not exclude other tasks from receiving CPU time.

3. The system console operator shall be able to dynamically modify task priorities.

4. There shall be a means of automatically enforcing a maximum task priority for any given user.

3.3.1.2.3 Resource Allocation

The O/S shall provide automatic allocation of hardware resources, with the function for operator override of peripheral device assignments. The O/S shall automatically assign tape drives with pre-mounted input volumes to the task requesting that tape volume. The O/S shall automatically assign tape drives with pre-mounted scratch tape volumes to tasks requesting output tape volumes.

3.3.1.2.4 Batch Processing Support

The O/S shall provide, as a minimum, the following features in support of batch processing:

1. Provide a means for the entry of batch jobs from card readers, batch terminals, interactive terminals, executing batch jobs and executing user programs.

2. Provide a means for the routing of job output to any batch terminal, any interactive terminal, or a user file, regardless of the job's origin.

3.3.1.2.5 Special Forms Output

The O/S shall provide the means to generate output requiring special forms, such as mailing labels social security cards, mailing notices or multi-part forms. The O/S shall allocate a central site printer and inform their console operator of the need for forms change.

3.3.1.2.6 Job Suspension

If a system resource which is required by a task is not available, the O/S shall hold that task and the remainder of the job in abeyance and shall notify the operator of the condition. This action shall not inhibit the processing of work not requiring the unavailable resources. When the resource becomes available, the task shall automatically be resumed by the O/S. An input or output DAS file is considered to be a system resource in this context.

3.3.1.2.7 Dynamic File Allocation

The O/S shall provide for any task to dynamically allocate and deallocate system resources as the task executes; i.e., the O/S shall not require the task to specify in advance of initiation the system resources that it will require, and it shall provide for the task to deallocate system resources prior to task termination.

3.3.1.2.8 File Directory Requirements

The O/S shall provide and maintain a DAS file directory which will provide the user a means to access his DAS files solely by a user-specified file name; i.e., the user will not be required to know system-defined parameters such as DAS volume name. The DAS file directory, which shall be protected automatically maintain at least the following information about each file:

1. Date of creation

2. Date of last access

3. Date and time of last modification

4. Block size

5. Record size

6. Security specification

7. Size

8. Cycle and version

9. Type of file (e.g. COBOL source, data, etc.)

3.3.1.3 Job Accounting

The O/S shall record in a DAS file statistical information on all tasks and jobs processed. The following minimum features shall be provided.

3.3.1.3.1 Logging

1. The following information shall be recorded for each batch task and job:

   a. Date and time of initiation, to nearest second.

   b. Name of task object code file.

   c. Execution priority.

   d. Origin.

   e. Date and time of job/task termination, to nearest second.

   f. CPU time and I/O time used, to nearest millisecond.

   g. Main memory used.

   h. Date and time that the job entered the scheduling queue, and the name of the queue that it entered.

   i. The security access code associated with the task.

   j. Termination condition.

2. The following information shall be logged for data file accesses:

   a. Date and time of file open, to nearest second.

   b. Date and time of file close, to nearest second.

   c. Name of file that is internal to the program.

d. Actual (external) title of file.

e. Device kind (DAS, tape, etc.).

f. Unit number.

g. Creation date of file if DAS or tape.

h. File size if DAS.

i. Block size.

j. Record size.

k. Cycle and version.

l. Number of logical and physical I/O's performed on the file.

3. The following information shall be logged for interactive sessions:

a. Date and time of session initiation, to nearest second.

b. Date an time of session termination, to nearest second.

c. Access code.

d. Station number or name.

e. CPU time used, to nearest millisecond.

f. I/O time used, to nearest millisecond.

4. The following miscellaneous events shall be logged:

a. Operator commands that change the state of the system.

b. Software faults.

c. Hardware failures, both recoverable and nonrecoverable. All recoverable memory errors shall be logged.

d. Program message displays.

e. O/S messages that inform the operator that a system resources is to be made available.

f. When a system resource (that caused a task to wait) actually became available.

g. System initializations.

h. Security violations.

3.3.1.3.2 Reporting

A job accounting report shall be included in the printout of each job. This report shall include all logged information pertaining to the job, in addition to the O/S name and version. A feature shall be provided to request reports on any accounting data which is logged.

3.3.1.4 Error Control

The following O/S error-control features are required as a minimum. All errors, both hardware and software, which require intervention, shall be logged. A feature shall be provided to request a report on all logged errors pertaining to any given peripheral unit or group of units.

3.3.1.4.1 Equipment Faults

The O/S shall perform the following functions in dealing with equipment faults:

1. Detect equipment failures and respond to hardware detected equipment failures.

2. Log the occurrence of the failure. Include information such as identity of the hardware component, date and time of fault, and identity of the path.

3. Initiate automatic error recovery procedure. If automatic recovery fails, the system console operator shall be notified and failure messages shall be reported on the maintenance log.

4. Provide the operator intervention to remove faulty equipment from the operating configuration, with minimal disruption to normal operations.

5. Notify the operator immediately upon compliance with the course of action selected by the operator.

6. Provide on-line diagnostics to monitor the performance of hardware components while they are operating on-line. The monitoring shall be performed in a manner that will not interfere with normal operations.

3.3.1.4.2 Software Errors

The O/S shall perform the following functions in dealing with software failures:

1. Log software errors, with as much information as is available concerning the errors.

2. Terminate an offending task upon detection or receipt of a report on the following user task violations:

   a. An attempt to access any memory area outside the task's memory allocation.

   b. An attempt to execute a construct that the task is not privileged to execute.

   c. An attempt to access any file that the task is not privileged to access.

3.3.1.5 Operator Interface

The O/S shall provide, as a minimum, the following system operator functions.

3.3.1.5.1 Operator Status Inquiry

The following information shall be displayed on the operator console, upon request of the operator:

1. The status of a single job and the status of all jobs in the scheduling queue.

2. The status of a state of execution.

3. The status of all jobs that are in a waiting state, and the reason that they are waiting.

4. The status of all terminated jobs that are printing or are waiting to print.

5. The status of any peripheral or processor that is attached to the system.

6. The degree of utilization of the CPU by user tasks and the amount of overhead (memory management and task control) expressed as a percentage of CPU resources consumed.

7. The amount of CPU time and elapsed time that an active task has accumulated so far.

8. The amount of memory that an active task has allocated.

9. The total amount of memory available on the system.

3.3.1.5.2 Automatic Status Display

The following information shall be automatically displayed on the operator console at operator-specified time intervals:

1. The status of all jobs in a state of execution.

2. The status of all jobs that are in a waiting state, and the reason that they are waiting

3.3.1.5.3 Operator Control

The following control functions shall be provided to the operator:

1. Display, hold, change priorities, release and cancel jobs in the scheduling queue.

2. Terminate an active job and terminate an active task.

3. Temporarily stop an active job and temporarily stop an active task.

4. Specify the maximum number of active interactive tasks and the maximum number of active batch tasks.

5. Logically remove individual peripheral devices, paths to peripheral devices, memory modules, central processors, etc., from the operating configuration without affecting normal operation, other than reduced capacity caused by the removal.

6. Enable and disable communications ports.

7. Send and receive messages to and from remote batch and interactive terminal operators individually and collectively.

8. Redirect print output from any device to any other device which is configured to handle the output. Discontinue the delivery of print output to any device and the restart output delivery without loss of data.

9. Purge a mounted tape volume.

3.3.1.6 Tape Inventory System

The O/S shall provide, as a minimum, the following features with regard to a tape inventory system.

3.3.1.6.1 Automatic Tape Inventory

The O/S shall maintain a DAS file with information on all tape

volumes whose serial numbers have previously been entered into the inventory system by the system operator. The information recorded for a tape volume shall be updated whenever the tape is purged and rewritten. The information recorded for each tape shall include at least the following information.

1. Volume name.

2. Volume creation date and expiration date.

3. If this tape volume is part of a multi-reel tape set, then the serial numbers of the other reels of the tape set.

3.3.1.6.2 Automatic Tape Retrieval

The O/S shall provide the means for a task to automatically identify a tape volume by specifying tape volume name and the generation desired; that is, the user need not supply the serial number of the desired tape volume, because the O/S shall determine the serial number for the volume name and generation and inform the operator of this serial number. A generation of zero (0) means the most recent tape volume created with the given name; a generation of one (1) means the second most recent, and so forth. A total of five (5) generations shall be possible for any tape volume name.

3.3.1.7 Checkpoint/Restart Facility

The O/S shall permit a task to programmatically take a checkpoint (the exact state of a task is written to direct access storage) so that, in the case of a task failure or system failure, the task may be automatically or manually restarted via operator command.

3.3.1.8 The O/S shall provide the means for a program to programmatically determine the names of all tasks that are in execution on the system.

3.3.2 Text Editor

A general purpose text editor shall be provided for use in creating and editing source program and data files and for use in aiding program development. The text editor shall provide, as a minimum, the following features:

1. It shall provide a means for addition, deletion, and replacement of lines, characters, and strings of characters. It shall provide a means to change all occurences of a given string to another string, where the string lengths can be different.

2. It shall provide a means for adding/deleting lines to/from existing files and resequencing segments of files where a segment is defined as a contiguous set of lines.

3. All editing performed on any file shall be on a copy of the orginal file. The orginal unedited file must remain intact so that in the event of a hardware/software failure or incorrect set on input commands by the user, the orginal file shall still exist and be available for re-editing. Once a file has been completely edited and closed out, the new updated version shall replace the original file and shall be similarly protected during any subsequent editing when the file is reopened.

4. The text editor shall provide for copying segments of text to other locations of the same file or to another file.

5. The text editor shall provide the means to edit files in a "full screen" mode, where the terminal represents a "window" on the user's file; the user simply modifies the lines displayed

on the terminal and transmits it back to the text editor.

6. The text editor shall provide for sequences of commands to be collectively invoked by the user, i.e., "macro" capability.

7. The text editor shall provide a means to create, delete and re-title files.

8. The text editor shall provide a means for a user to execute user-developed programs, system utilities and compilers.

9. The text editor shall provide a means to initiate batch jobs and to determine what batch jobs are in progress and what batch jobs are still in the job scheduling queues.

10. The text editor shall provide a means to initiate a memory dump of any active task that was initiated by the user.

11. The text editor shall provide users with English Language replies to all commands that require a response, including commands that are in error.

12. The text editor shall provide for display of all the files that belong to the user.

13. The text editor shall provide for terminal-to-terminal and terminal-to-operator-console communications between users.

14. In the event of system failure and subsequent reinitialization, the text editor shall restore any files that were being edited, with no more than ten lost records.

15. The text editor shall provide a means for a user to switch control from the text editor to the transaction processor software.

3.3.3 High Level Language Compilers

The language processors specified below shall produce system compatible, relocatable object code which can be linked or bound with other object code produced by the same and other language processors. All programs developed and compiled in a batch mode shall yield results identical to programs compiled remotely. No subsets or deviations from standards shall be acceptable. Vendor extensions to programming languages and language processor options shall be documented.

3.3.3.1 ANSI COBOL

A COBOL compiler shall be provided which complies with FIPS PUB 21-1, specifiying the American National Standard COBOL, X3.23-1974 as the federal standard for COBOL.

If the requirement of this contract are supported via language extensions to COBOL, these language extensions shall be fully documented.

3.3.3.2 Native Assembler

Vendors should provide an assembly language which is native to the equipment being proposed.

3.3.3.3 Common Program/Table Link

Users shall provide a means to link common programs and common tables.

3.3.4 Transaction Processor (TP) Software

The Bidder shall provide a transaction processor software package which includes but is not limited to the following features:

1. Shall be interfaced with the COBOL application program so as to be transparent to the application programmer. Program should be able to read its transactions and write its responses from and to various terminal types as though it were reading and writing to tape or disk.

2. A transaction control language which may be coded and compiled to establish the transaction processing environment and configuration at the Ministry facility.

   a. Definition of transaction processing application program characteristics.

   b. Definition of access control.

3. Input and output message formatting which provides device independence at the application program level. Thus an application programmer is not required to know hardware control codes. The programmer must only be concerned with data strings when sending or receiving massages.

4. Feature for multiple copies of the same program to be executed simultaneously when transaction queues for that program exceed a pre-defined threshhold.

5. Logging of all message traffic for statistical reporting, to include:

   a. A system generated message number which is unique to each input and associated output messages.

   b. Date and time stamp when input message was received and date and time stamp when output message was sent.

   c. User program identification of servicing program.

d. Message text including transaction key.

6. Full interface functon with the DBMS software proposed in 3.3.5 including fully synchronized recovery.

7. Shall operate in batch mode.

3.3.5 Data Base Management System (DBMS)

A data base management system is required in which incorporates data file management techniques and interfaces with the operating system software. It shall relieve the applications programmer of concern for the overall organization, security, structure, system events, bit manipulation, error recovery, and maintenance of the data base.

3.3.5.1 DBMS Functions

3.3.5.1.1 Data Base Size

The proposed data base for the Ministry shall be large enough to handle 9000 megabytes for the SIO subsystem and 3000 megabytes for the PIO subsystem, and will grow at least 10% per year.

3.3.5.1.2 Data Base System Interfaces

The data base system shall interface with the O/S and with the following software:

1. Transaction processor software - to facilitate at a minimum, synchronized recovery of the data base(s). (REF. 3.3.4.)

2. Report writer software - providing the feature to generate reports from the data base(s). (REF. 3.3.9.)

3. User application software - providing data base definition and description and identifying data base access mechanism(s) available to applications software.

4. Utility software - providing the means to perform maintenance and library processes in the data base(s).

5. Host languages - as specified in 3.3.5.6.

3.3.5.1.3 Data Base System Functions (General)

The data base system shall provide the following functions:

1. Create, initialize and load the data base according to defined structures.

2. Organize, access and control the data physically stored in the data base.

3. Access the data under constraints imposed in the logical structure.

4. Perform logical-to-physical-to-logical translation and delivery of the formatted and translated data to application program.

5. Associated the data description with the actual data value recorded.

6. Scan the schema, defined by the Data Definition Language (DDL), for the corresponding record description and necessary logical relationships.

7. Scan the physical data base descriptions and identify the physical record to be retrieved.

8. Accept the physical record in a buffer, relate the record to the data description in the schema and subschema, perform translation into subschema-specified format, if required, and provide access to the record and any status information in the work area.

9. Provide a means for the Data Base Administrator (DBA) to establish both single and multiple logical data bases and the physical organization of the data base. Also provide a means for the DBA to define the data content criteria, data relationships, record placement and access mechanism(s).

10. Support selection, projection and joining operators, or their functional equivalent in a relational context.

    Selection - selecting from an existing table rows which meet a condition(s).

    Projection - creation of a new table from elements in an existing table.

    Joining - creation of a new table by merging in the basis of a common element in two or more tables.

11. Support logical record ordering strategies, including ascending sort, and descending sort order.

12. Support relationships defined between separate sets of data.

13. Provide a means for altering the physical organization of the data base(s) without having to alter the logical organization.

14. Provide a test mode feature which permits the testing of newly developed system and software.

15. Support two dimensional tables, each of which contains only one type of record, with each record being unique, duplicates prevented, and maintained in no predetermined sequence with no predefined access path.

3.3.5.2 Data Base Access Function

The DBMS shall:

1. Support sequential and random access to common data bases under any mode of processing. The feature shall be provided to access multiple files and for multiple application to access the same file.

2. Support the access to a file on non-unique valued key data elements.

3. Support the access to a file utilizing single, multiple files using a single command.

4. Permit applications to access multiple files using a single command.

5. Permit the direct access to a logical record by a specified key or, alternatively, be a specified access path.

6. Support consecutive accessing to logical records in a logical grouping or set in both ascending and descending sequence.

7. Permit the definition of alphanumeric and numeric data elements.

8. Support sequential processing with the feature to access next record and to access previous record from any point in the file.

9. Support indexed sequential and non-sequential including multilevel indexing.

10. Support the following addressing methods:

    - value inversion
    - text inversion
    - range inversion
    - qualifications
    - indexed
    - rootword

11. Search by keyword, textual as well as simple and compound value searches using logical operators and boolean operators.

12. Provide mechanism to detect "deadlock" (or deadly embrace) at the record level. Shall provide resolution in such manner as to minimize restricted access to the data base(s).

3.3.5.3 Processing Modes

The DBMS shall execute updates and retrievals in interactive and batch concurrently.

3.3.5.4 Data Base Structure

1. The DBMS shall support sequential access and at least two of the following data structures; indexed sequential, hierarchical, inverted list, multi-key directory and network.

2. If a hierarchical data structure is proposed, then the DBMS shall provide for multiple record types within each level of a hierarchy. It shall provide for a variable number of records of each type, including none, within an occurrence of a hierarchical group.

3. Support physical continuity, relations based on calculations, views, relation records and variable length records.

4. Support natural data relationships of one-to-one, one-to-many, many-to-one, and many-to-many.

3.3.5.5 Data Independence

Data independence shall be provided by relieving the application programs of concern for overall organization, structure, and maintenance of the data base(s) and thereby permit restructuring of the data base(s) without changing the logic of application programs. There are two aspects of data independence, physical and logical.

3.3.5.5.1 Physical Data Independence

The application programs shall be insulated from equipment differences among storage devices, with the exception that magnetic tape, if used, need support only sequential data and enable reallocation of available random access storage, such that a given data base could reside on any storage device without impact on application programs. Application programs must remain unaffected except for performance by changes made to the physical storage structure. Examples of the changes that may be made are:

1. Placement of disk packs or other storage media.

2. Placement of data on storage media.

3. Blocking factor of data.

4. The amount and utilization of storage space available to the data base.

3.3.5.5.2 Logical Data Independence

The DBMS shall provide the feature to support different logical viewpoints of the same data base structure both schema and subschema. Modifications to the schema shall occur without impacting existing applications which do not reference the modified records. These modifications shall include:

1. Add new data elements to record types.

2. Add new associations (sets, relations) between records.

3. Add new records types.

4. Rearrange data elements within a record with changes necessary only to the data definition and the affected subsections.

5. Delete fields from records.

3.3.5.5.3 Data Defintion

There shall be a facility in the DBMS to support the definition of data to the DBMS and to change the data definition, as necessary. The data definitions shall be maintainable in their source form. The required minimal features are:

1. Assign symbolic names to data bases, data elements, and groups of data elements. Uniquely identify data element

names up to 30 characters (COBOL application elements only) in length.

2. Specify each data element's attributes such as size, type (alphabetic, numeric, alphanumeric etc.) and number of occurrences.

3. List data definitions with diagnostics.

4. Automatically provide these definitions in a form acceptable to an application program's host language.

3.3.5.6 Host Languages

The Bidder shall provide a DBMS interface function to support applications both batch and interactive, for the high-order mandatory languages, COBOL, and the proposed block structured language. The interface may operate through language extensions or through call statements. The host language shall be required to handle symbolic names only. The host program shall be able to request the DBMS to:

1. Select logical records utilizing the access methods provided in 3.3.5.2 above. Provide status information to the host program indicating success, failure, end of search, etc.

2. Change the values for any combination of key and non-key data elements in a logical record.

3. Replace any logical record with an updated version automatically compensating for any changes in the record's size and in its relationship to other records.

4. Insert and delete logical records.

3.3.5.7 Data Dictionary

An automated data dictionary shall be provided to aid in documentation and control of data base applications. The data dictionary software shall be able to perform the following functions:

1. Generate a data dictionary which contains information about a data base system on higher level of abstraction than the schema. This dictionary should be derived primarily from the source code of the schema, subschema, and application programs.

2. Provide routines to validate and process inputs and produce reports. The following documentation shall be provided based on information contained in the data dictionary:

   a. A detailed report in alphabetic order, by name, of all types of data and their various properties.

   b. A report of all data relationships by entity name, with details of the relationship.

   c. Details of redundancy in data storage for that redundancy can be monitored.

   d. A cross reference of data used by each application or program and by programs or reports which use type of data.

   e. A detailed report of all editing and validation criteria, including tables of acceptable values, selectable by data element, subschema and schema.

3. Define the entries by using a data definition language, i.e., retrieve, insert, delete, and modify entries by using a data manipulation language in both an interactive mode and batch mode.

3.3.5.8 Query Language

The DBMS query language shall support multiple users in an on-line environment and in a batch environment. The query language will be used for interrogation of data base(s), extracting data and displaying data either in a display device or on the printer. A "query language" means an English-like command language that is provided by the DBMS itself; it does not mean a programming language. The query language will be non-programmer user-oriented and will provide the following features:

1. Provide data elements addressable by their symbolic name. Data can be extracted form both key and non-key data elements.

2. Select records or groups of records for processing. The selection criteria will be specified as logical expressions which can reference both key and non-key data elements and may involve several logical records.

3. Selection clause of a query language command shall provide for compound logical expressions containing relational operators, boolean connectives, and range.

4. Extract one or more data elements from a logical record.

5. Termination of a command in execution without compromising the integrity of the data base must be supported.

6. A set of diagnostics to explain an incomplete or improperly constructed query command to the user.

7. Access of multiple files with one command.

8. Creation and formatting of ad hoc reports on-line.

9. User-specific selection of output media and format specification for output text, headings, stubs and columns.

10. Invoke predefined or catalogued user queries and to pass arguments to invoke queries.

11. Modify data via arithmetic functions of add, subtract, multiply, and divide.

12. Override field formatting data definitions for each specific output of the query, without changing the field definition.

13. Provide update of data elements, create completely new records, and delete complete records. These actions shall be bound by the same restrictions as activities of the same type being accomplished in batch or on-line batch or on-line mode by application programs.

3.3.5.9 Data Base Maintenance

The DBMS shall provide the following maintenance features:

1. Insert, delete and update records in a data base without necessitating its reloading or recreation if the data base, and to change key and non-key data element values.

2. Reorganize data bases to resolve logical relationships after initial loading and to permit physical reorganization of data bases, as appropriate.

3. Add new data bases without requiring reorganization of existing data.

4. Recover free space resulting from deletions.

5. Resolve conflict between two or more processes seeking to update the same record.

6. Increase physical mass storage addressable by data base, without requiring data base interruption update or reorganization.

3.3.5.10 Security and Privacy

The following security and privacy features shall be provided by the DBMS:

1. Specify data security requirements and apply them to all attempts to access or update the data base.

2. Security at the data element, record and data base file levels.

3. When a user or program encounters a security violation, the DBMS must furnish an error indication to the requestor.

4. Insulation of application programmers from the data base structure, so that (1) the user cannot alter the format of data records or data elements and cannot change the contents of indexes, pointers, or internal structural data and (2) these internal structural data are altered automatically as appropriate on record insertion, modification, and deletion.

5. All DBMS security protection features shall apply to both interactive and batch processing.

6. Query-only facilities for designated users, automatic rejection and operator notification of attempts from any source to access unauthorized data, and logging of all entries or attempted entries into the data base(s).

7. Limit the users to the subset to records in a data base they are authorized to access.

8. Limit the user to executing only those transactions he is authorized to execute against those records to which he has access.

9. Limit access to certain attributes of records to which user(s) otherwise have access.

10. Restrict access to the basic tables defining the data base to the DBA and those he has delegated access. The following must be restricted:

    a. Definitions of domains, attributes, relations and views.

    b. Definitions of the physical file structure underlying the data base.

    c. Associations of users, views, and elementary transactions.

    d. The association of users with transactions, reports and application programs.

11. Provide a log of errors, indicating requests for illegal or nonexistent data base activities, issued by users of the DBMS.

12. Provide control mechanisms such that user(s) of the data base access only authorized: fields, records, sets of relations, files, and subsets.

13. Specify "read only" access and "read write" access for global data base data by access code.

14. Insulation of the data base(s) from uncontrolled access by the TPS and other non-DBMS software systems.

3.3.5.11 Data Integrity

Provisions shall be included to ensure data integrity. As a minimum, the following features shall be incorporated:

1. Prevent simultaneous updates to the same data by concurrently executing programs. Provide an "update lockout" feature to permit concurrent access to the data without permitting the data to be changed.

2. Provide for "backout" in case a data base transaction cannot be completed. All changes will be restored and resources will be released.

3. Provide a "read and hold" command for updating, with a "release-hold" feature to prevent a lock-up or "deadly embrace".

4. Prevent data synchronization errors.

5. Provide diagnostics for all data transactions. The diagnostics reports shall be sent to the application program.

6. Within the subset if the data base which the user, "may update" integrity shall be protected by several mechanisms:

   a. Edit validity checking of individual fields.

   b. Retention of before and after images of each update on the transaction log. This permits the restoration of any records which have been incorrectly modified.

c. Protection from applications programs.

Each interactive program is run by a user and DBMS shall not give the program any more access than the user is permitted.

If the user does not have the authorization to update a particular logical record or field within the record, the user shall not be able to use the program to perform that transaction.

Data base access control is centralized in the DBMS under DBA control and is not dispersed to the application program level.

3.3.5.12 Data Base Recovery

The following data base recovery features shall be provided by the DBMS:

1. A means to recover from a system failure or program abnormal termination with the removal of all "partial" updates resulting from interdependent transactions. This shall all be accomplished automatically. Copying the data base or part of the data base before execution of a program and using this copy to restore the data base with loss of all transaction, does not satisfy the requirement.

2. A means of checkpointing the data base and a means to restore the data base, to its state at the time of the checkpoint shall be provided. Dumping the data base and restoring from the dump will not satisfy this requirement.

3. In the event of failure, the data base system shall prevent any further updates until the data base integrity is validated.

4. A method for validating the data base and detecting broken links and damaged key tables.

5. A tool for correcting a data base file when number 4 above occurs without requiring a new initial load or reload of the data base. This does not have to be data base software. Any system software which provides the means of satifying the requirement will be acceptable.

6. Query and update of any other file which is not being saved or restored during a recovery process.

7. Provide for recovery of the data base(s) from a system, application, or device failure after maintenance has been applied to the data base(s).

8. Provide a journal file (log) of data base activity from which it is possible to reconstruct the data base(s) starting from an earlier restored copy (dump).

9. Suspension of data base maintenance during periods of recovery, restoration or internal maintenance.

10. Provide a mechanism for detection of discrepancies such as physical file construction errors, logical file construction errors, and incomplete updates.

11. Provide a feature for backing out the results of an incomplete update.

12. Provide mechanism and techniques to identify and non-destructively process data base overflow.

13. Provide rollout feature for data base or data set(s) when it is discovered that bad data has been applied against the data base(s).

14. Total recovery of a data base of at least 2 billion characters in not more than three hours elapsed time. Total recovery shall include the reading of all back-up media as well as the application of all journal file(s) and shall not be completed until the recovered data base is available to accessing by on-line terminal users.

15. Maintain logical interfaces with TPS to assure continuity of on-line data base(s) and support of synchronized recovery.

16. Provide the means of maximizing data base restoration using data base backup file by performing simultaneous read operations from a minimum of 4 backup files being processed concurrently.

3.3.5.13 DBMS Activity Statistics

The function of maintaining DBMS activity statistics shall be provided.

1. The DBMS activity statistics function shall include a detailed account of updates, queries, deletions, counts of accesses, counts of use of data base relations, size location and remaining data base capacity, average number of sets per access, and error messages.

2. Usage statistics shall be optionally generated during data base operations for subsequent use in determining and evaluating DBMS performance. This feature shall be used for "fine tuning" of the DBMS. Fine tuning shall include assessing performance of the data base(s), recognizing bottlenecks and inefficient structures, recognizing inefficient and error-prone usage patterns, identifying users and usage patterns, identifying users and usage, and notification when significant errors occur. The data base administrator shall select to generate

usage statistics at his option via input of an on-line command at any time during data base operations.

3. To capture, accumulate and report the following shall be provided:

   a. Number of logical records retrieved form a data base(s) using each defined view.

   b. Log of queries issued so that the activity associated with different index list structures can be estimated.

4. For each mass storage area containing relation and indices:

   a. Reports listing the relations

   b. Indices contained in the area

5. For each relation and for each index contained in the mass storage area:

   a. The number of entries in the relation and index

   b. The amount of mass storage consumed

6. The amount of free space left in any area containing auxiliary table associated with the data base.

3.3.5.14 DBMS Utilities

The DBMS shall provide a utility for performing diagnostics of the data base files to determine if reorganization is needed.

Provide features for the DBA to:

1. Vary in trial model, the definition of the logical data base.

2. Vary in trial mode, the definition of the physical data base.

3. See the effect of the variation on the logical definitions.

4. See the effect of the variation on the physical definitions.

File partitioning, assigning parts of a relation to different physical devices under DBA control, is needed to permit restoration of damaged files in a timely manner.

Utilities are required for:

1. Checkpointing the data base files regularly.

2. Recording the transaction log on an independent device that shall not be subject to any failures affecting the primary copy of the data.

3. Backing out transactions that were incomplete at the time of a system failure based on the transaction log.

3.3.5.15 DBMS Function Extension

A feature shall be provided to extend DBMS functions without changing or recompiling existing programs. Specifically, it shall be possible to add functions to the DBMS user language or to the programming language interface. The addition of these functions shall be transparent to any existing routined that have been written in the DBMS user language or to any existing host language program.

3.3.6 Utility Support Software

The Bidder shall provide the following utilities for the purpose of supporting the operation of the system:

3.3.6.1 File Management Utility

The file management utility shall have the following features:

1. Copy all files residing in a given DAS medium to tape.

2. Copy a subset of files residing on a given DAS medium to tape, where the selection criteria is based on whether a file was updated after a user-specified date and time.

3. Copy any subset of files residing on tape created by this utility to a DAS medium. After each file has been copied to the DAS medium, it shall appear just as it did on DAS before it was copied to tape.

3.3.6.2 Log Reporting Utility

The log reporting utility shall have the following feature:

1. Recreate the job summary (e.g. beginning and ending times for jobs and tasks, files opens, file closes, job-related messages, etc.) for any completed job.

2. Report on all hardware failures that occured on any given unit or class of units over a specified period of time.

3. Report, in chronological order, all entries in the log.

4. Provide summaries of selectable events such as tape mounts, halts/loads, and access retries for internal control reporting.

3.3.6.3 User ID Management Utility

The user ID management utility, which shall control the set of user IDs that identify the batch and interactive users to the O/S and other system software, shall have the following features:

1. Create and delete user IDs.

2. Assign or remove system privileges for any given user ID.

3.3.6.4 DAS File Directory Utility

The DAS file directory utility shall produce a directory of all of the files residing on a given DAS medium, with the following minimum information given for each file:

1. File name.

2. Date of creation.

3. Date of last access.

4. Size.

5. Type of file (e.g. COBOL source, data, etc.).

3.3.6.5 Tape Inventory Utility

The tape inventory utility shall provide report on all tape volumes in the automatic tape inventory system, yielding all information that is stored on each tape volume. The utility shall provide at least a report on tape volume names, sorted by tape volume name, and a report indicating which tape volumes have expired.

3.3.7 Applications Support Software

The following paragraphs describe the minimum requirements of the applications support utility programs to be supplied with the system software. The support utilities shall be current with the operating system software and maintained as such as new releases of the operating system are made available. The support utility programs shall be user-patchable, source program code shall be provided by the Bidder, compilers shall be provided for the application and implementation of the patches. The application support software utilities provided shall contain as a minimum the requested features; however, the capabilities provided are not limited to those requested.

3.3.7.1 File Transfer and Manipulation

A utility program shall be provided which will enable the user to transfer a named file from any input media to any output media. The utility shall by default transfer the entire file, making no alterations to the file structure and content during the transfer. The file structure is defined as the blocking characteristics, the unit format in words, bytes, or other, and the character set in BCD, EBCDIC, ASCII, or other.

Through parameter interpretation the utility shall be capable of performing the following minimum functions:

1. Transfer a user specified portion of a file.

2. Reblock a file to user specifications.

3. Bypass a user-specified number of tapemarks on standard labeled and unlabeled tape(s) before transferring a file.

4. "Raw" dump records to a file with the alphabetic representation on one line followed by and aligned with the numeric or a machine code representation on the next line.

5. Format a file into records and list the records in a printer.

6. Use in combination all of the functions of the utility.

The proposed utility shall be executeable in both a batch and an interactive environment and shall perform the same functions with the same results in both environments.

3.3.7.2 Sort and Merge Facility

A general purpose sort and merge facility shall be provided as a subroutine and shall be accessible to programs of all high level languages including, but not limited to COBOL, and the proposed block structured language. The sort and merge facility shall have no restrictions on the number of records to be handled, the record format, the record content of the structure or the input and output files. The sort and merge facility shall handle both fixed and variable length records; however, a limitation of one of the record types per invocation of the facility is acceptable. The sort merge facility shall provide to the user the ability to select a record sequence through at least twelve key fields. The order of each key filed shall be user selectable as optionally ascending or descending. Each key field shall permit user specification of the key location and length within a record, and the key type such as alphabetic, numeric, and signed binary data. The sort facility shall provide a means for the user to designate the sort work media as tape, DAS, or main memory, or any combination of the three. The sort and merge facility shall provide checkpointing during execution and subsequent restart at the last checkpoint. The checkpoint feature shall provide a means for the user to optionally invoke its

use and provide a means for the user to choose the checkpoint at which restart will occur. The restart feature shall interface with the operating system where necessary to insure that file allocation, file security, user access, user security, and data, user, and system integrity are maintained.

3.3.7.3 Analytical Software Routines

For mathematical analysis a library of mathematical and statistical routines shall be provided. The following capabilities are the minimum requirements for the mathematical and statistical routines:

1. Multiple and non-linear regression analysis.

2. Analysis of variance such as mean, variance, standard deviation, chi-square tests and confidence interval tests.

3. Standard probability distribution functions

4. Time series analysis

5. Interpolation

6. Random number genration

7. Matrix manipulation and arithmetic

8. Differential equations solution, numerical integration, and numerical differentiation.

3.3.8 Performance Measurement Software

The Bidder shall provide a utility or utilities with the following features for measuring system performance:

1. CPU Utilization

2. DAS Performance

3. Memory Utilization

4. Process Analysis

5. Hardware Error Analysis

3.3.9 Report Writer Software

The Bidder shall provide report writer software which is designed for use by personnel who possess basic knowledge in ADP concepts and programming techniques. The report writer software shall permit users to generate management reports from data stored on tape or disk.

The following features shall be included as minimum requirements:

1. Shall accept data input from magnetic tape and standard structures disk files. Shall also interface with and accept data input from DBMS files which are described in 3.3.5. Shall produce both output reports and output files.

2. Shall access multiple data sets within a DBMS file.

3. Shall provide matching and selecting data records based on simple to complex selection criteria and regardless of data field format. Data fields specified for selection may be formatted in display format, in computational format and binary format.

4. Provide security against unauthorized access to sensitive data through use of an access code system.

5. Shall sort records in any combination of ascending and descending order in multiple keys.

6. Define pages, including headings, footings, page size, number of lines per page, page numbering, page breaks, up to three levels of control breaks and page ejection.

7. Define report structure, including section headings for each group and sub-groups.

8. Define total and sub-total lines, with stubs for each with at least 5 levels of totals.

9. Define print formats for detail lines, including multiple lines for each data record.

10. Specify actions to be taken upon changes in the values of key data elements.

11. Perform arithmetic and data reduction operations on specified data elements, including sum, average, maximum value, minimum value, and percentage.

12. Store report definitions in direct access files for use in generating standard reports, and to invoke these definitions and to supply arguments to them.

13. The report writer software shall operate in both batch and online modes.

3.3.10 Testing and Debugging Aids

A facility shall be provided which provides a means for users to interactively debug programs. The facility shall provide a means of inserting unconditional and conditional breakpoints in pro-

grams. It shall also provide a means for the user to observe program variable names and values selected for viewing at breakpoints. The user shall change the values of selected variables. The facility shall display the value of computer logical comparisons selected by the user. The facility shall display the labels of performed paragraphs, called and processed subroutines, and the destinations of a GO-TO. The facility shall display the value of selected arithmetic variables at breakpoints. It shall also provide for stopping at selected labels, proceeding from that label, and proceeding from a different label at the users option.

All options of the facility shall be provided with user friendly characteristics and shall support all ANSI standard constructs of the COBOL language.

3.4 Security Requirements

Security measures shall be provided to control access to and utilization of system facilities. The purpose of these measures is to prevent accidental or intentional disclosure of data to unauthorized personnel, and to prevent the unauthorized modification or destruction of data residing on magnetic tape, and DAS devices which are designated by the user to be protected media. Security requirements shall be satisfied by the operating system, data management software, utility support software, communications software and hardware, or any combination thereof.

3.4.1 System Security

A program in execution shall have the memory space it occupies, its file buffer space, and any other space occupied as a result of the programs existence, protected from unexpected intrusions into its memory space by other executing program.

3.4.2 Code File Security

Jobs, tasks, and sign-on procedures which fail to pass system access validation successfully shall be terminated and an appropriate message shall be written to the job execution summary.

3.4.3 Data File Security

Unauthorized access attempts shall cause termination of the offending task and a appropriate message shall be written to the task execution summary.

3.4.4 Security Supervisory Control

The system console shall perform access to any file and shall perform altering the security of any file. A utility program shall be provided with the system software which established a structured access code file and of maintaining the file. Maintenance functions shall include additions, deletions, changes to elements within a record in the file, and report generation on the file. The utility shall run in a batch and interactive mode and all functions shall be executable in either environment. The system console shall perform creation of an access code with special authorization providing for access to the above described utility. No access code without such special authorization shall run the utility. The access code file shall be recognized and used by the operating system for validation of accesses.

3.4.5 Security Violations Logging and Reporting

All unauthorized attempts at file manipulation, security changes, and memory accesses shall be written to a system history file by the operating system. The history file record shall include as a minimum the date and time of occurence, job and task identification or name, input device identification from where the job or task

emanated, and a clear test image of the offending code. A facility such as a utility program shall be provided with the sytem software which will extract, format, and print the history file violation records.

4.0 System Standards

Proposed equipment and software shall conform to the current specifications contained in relevant Federal Information Processing Standard Publication (FIPS PUB), Electronic Industries Association (EIA) Standards, and American National Standards Institute (ANSI) Publications as listed below.

4.1 ASCII System Requirements

The system, upon receiving a hardware or software command, shall accept data on magnetic tape or any other input media covered by an approved Federal Information Processing Standards Publication (FIPS PUB) in ASCII Code and collating sequence prescribed in FIPS PUB 1 and in the format prescribed in FIPS PUB 2, 3 or other applicable FIPS PUBS. Such data may be translated, if necessary, into a form upon which the proposed equipment can internally process: "provided" that, upon receiving a hardware or software command, the output of the processed data to magnetic tape or other output media will be in the ASCII code and collating sequence prescribed in FIPS PUB 1, and in the format prescribed in FIPS PUB 2, 3 or other applicable FIPS PUBS.

4.2 Recorded Magnetic Tape for Information Interchange

4.2.1 Magnetic Tape with 1600 CPI, Phased Encoded FPMR 101-36.1308-8, FIPS PUB 25

4.2.2 Magnetic Tape with 6250 CPI (246 CPMM) Group Coded Recording, FPMR 101-36.1304-16, FIPS PUB 50

All applicable digital magnetic tape recording and reproducing equipment which results form this contract and employs one-half inch wide (12.7 mm) magnetic computer tape at the recording density of 6250 characters per inch (246 characters per millimeter) group-coded recording, including associated programs, shall provide the feature to accept and generate recorded tape in compliance with the requirements set forth in FIPS 50.

4.2.3 FIPS PUB 79 Tape Labeling

The information processing system, and nine-track tape drives and new tape label processing facilities that will be part of an information processing system, offered as a result of this contract shall be capable of generating and processing tape labels and file structure that conform to one of the four levels of FIPS PUB 79 if the information processing system either generates or accepts magnetic tapes for information interchange. Bidders shall specify the level of conformance and certify that a copy of the current users manual is on file with the National Bureau of Standards as required by FIPS PUB 79.

4.3 Bit sequencing of the Code for Information Interchange in Serial-by-Bit Transmission

All applicable equipment or services that may result form this contract, transmitting in a serial-by-character mode, shall be capable of bit sequencing as prescribed in FIPS PUB 16-1/FED-STD 1010. The transmission of the Standard code for information interchange, FIPS PUB 1, at the interface between data terminal equipment and data communications equipment.

4.4 Character Structure and Character Parity Sense for Parallel-by-Bit Data Communication in the Code for Information Interchange.

All applicable equipment that may result from this contract transmitting in a serial-by-bit, serial-by-character synchronous or asynchronous mode shall transmit the character structure and sense of character parity prescribed in FIPS PUB 17-1/FED-STD 1011 for the transmission of the

Standard Code for Information Interchange, FIPS PUB 1, at the interface between data terminal equipment and data communication equipment.

4.5 Character Structure and Character Parity Sense for Parallel-by-Bit Data Communications in the Code for Information Interchange.

All applicable equipment that may result from this contract transmitting in a paralled-by-bit, serial-by-character mode shall transmit the character structure and sense of character parity prescribed in FIPS PUB 18 for the transmission of the code for information interchange, FIPS PUB 1, or an approved character subset (FIPS PUB 15) at the interface between data terminal equipment and data communication equipment.

4.6 Synchronous Signaling Rates Between Data Terminal and Data Communications Equipment

All applicable equipment or services resulting from this contract that are employed in conjunction with synchronous data communications equipment designed to operate on binary encoded information in either serial or parallel fashion over voice grade communication channels of nominal 4KHZ bandwidth shall comply with FIPS PUB 22-1/FED-STD 1013

4.7 FIPS PUB 37/FED-STD 1001, Synchronous High Speed Data Signaling Rates Between Data Terminal Equipment and Data Communication Equipmen

All applicable equipment or services resulting from this contract that are employed with synchronous data communication equipment designed to operate on binary coded information over sideband communication channels must comply with FIPS PUB 37/Fed-STD 1001.

4.8 FIPS PUB 18-1/FED-STD 1012, Character Structure and Character Parity Sense for Parallel-by-Bit Data Communication in the Code for Information Interchange.

All applicable equipment or services that may result from this contract, transmitting in a parallel-by-bit, serial-by-character mode, must be capable of transmitting the character structure and sene of character parity prescribed in FIPS PUB 18-1/FED-STD 1012, when transmitting the Standard code for Information Interchange, FIPS PUB 1, or an approved Federal subset (FIPS PUB 15) at the interface between data terminal equipment and data communication equipment.

4.9 Flowchart Symbols and Their Usage in Information Procesing

All new information processing system documentation involving the use of flowcharts that may result from this contract document shall comply with FIPS PUB 24.

4.10 Software Summary for Describing Computer Programs and Automated Data Systems

All documentation of computer programs and/or automated data systems that results from this contract shall include completed SF-185 summaries as described by FIPS PUB 30.

4.11 Validation of COBOL Compilers

4.11.1 Acquisition of COBOL Compilers

COBOL compilers offered as a result of the requirements set forth in this contract will be identified as implementing all of the language elements of at least one of the levels of Federal Standard COBOL as specified in FIPS PUB 21-1. Implementation shall provide a facility for the user to optionally specify a level of Federal Standard COBOL for monitoring the source program at compile time. Monitoring may be specified for any level at or below the highest level for which a compiler is implemented and will consist of an analysis of the syntax used in a source program aginst the syntax included in the level specified for monitoring. Any syntax not conforming to the specified level will be identified through a

diagnostic message in the source program listing. The diagnostic message will contain at least the identification of the source program line number for each nonconforming syntax and identify the level of federal Standard COBOL that supports the syntax or indicate that the syntax is nonstandard COBOL.

4.11.2 Acquisition of COBOL Programs and/or Programming Services

Business-oriented computer application Programs (i.e., those applications or programs that emphasize the manipulation of characters, files, and input/output as contrasted with those concerned primarily with computation of numeric values) offered or prepared as result of the requirements set forth in this contract will be written using one of the levels of Federal Standard COBOL as defined in FIPS PUB 21-1 including optional language element, if any, as specified herein.

4.11.3 Validation of COBOL Compilers

In addition to the specified mandatory COBOL compiler rquirements stated in the specification portion of this contract and those compilers used to develop programs when providing services, all COBOL compilers brought into the Federal Inventory as a result of this contract, the most recent release of which has not been previously tested, shall be tested using the Official COBOL Compiler Validation system (CCVS). Validation shall be in accordance with Federal Property Management Regulation (FPMR 101-36.1305-1(C)). The results of the validation shall be used to confirm that the compiler meets the specified requirements of the designated level FIPS PUB acceptable, the Bidder shall:

1. Certify in the proposal that all COBOL compiler. offered in response to this contract have been submitted for validation as set forth in FPMR 101-36.1304-1(C).

2. Agree to correct all deviations from the standard reflected in the Validation Summary Report (VSR) not previously covered by a waiver. All deviations shall be corrected within 12 Months from the date of contract award unless a shorter period is specified eleswhere in this contract. If an interpretation of the standard is required that will invoke the procedures set forth in FIPS PUB 29, such request for interpretations will be made within 30 calendar days after contract award.

Any corrections that are required as a result of decisions made under the procedures of FIPS PUB 29 will be completed within 12 months of the date of formal notification of the interpretation to the Bidder. Failure to make required corrections within the time provisions set forth above shall be deemed a failure to deliver required software. The liquidated damages as specified for failure to deliver either operating system or other software shall apply. In addition, such failure falls within the purview of the default clause. If the required corrections are not made within the time provisions specified above, subsequent proposals submitted to the Government offering the deficient COBOL compilers or subsequent uncorrected versions thereto shall be considered unacceptable.

4.12 Interface for Computer Peripheral Equipment

4.12.1 Unless otherwise excuted as specified in FIPS PUB 60, or unless a waiver is granted following the waiver procedures specified in FIPS PUB 60, ADP systems and peripheral subsystems that may result from this contract, and for which operational specification FIPS PUBS (such as FIPS PUBS 62 and 63) have been issued and are in effect, must conform to FIPS PUB 60. The correct operation of these systems' conforming interfaces must be verified before the acceptance of all applicble ADP equipment in accordance with FPMR 101-36.1304-20(C). Arrangements for verification may be made according to procedures issued by the National Bureau of Stand-

ards. These procedures may be otained by writing the Director, Institute for Computer Sciences and Technology, National Bureau of Standards, Washington, D.C 20234, Attention: Verification of I/O Channel Level Interface Standards. The Government may, at its option, apply instrumentation and test equipment at any interface required to conform with FIPS PUB 60 before the acceptance of these ADP systems to ensure conformance with FIPS PUB 60. Waivers applicable to the requirements of this contract are identified elsewhere in this contract document.

4.12.2 Unless otherwise excluded as specified in FIPS PUB 61 by reference to FIPS PUB 60 or unless a waiver is granted following the waiver procedures specified in FIPS PUB 61, ADP systems and peripheral subsystems that may result from this contract, and for which operational specifications FIPS PUBS (such as FIPS PUBS 62 and 63) have been issued and are in effect, must conform to FIPS PUB 61. The correct operation of these systems' conforming interfaces must be verified before the acceptance of all applicable ADP equipment in accordance with FPMR 101-36.1304-21(b)k. Arrangements for verifications may be made according to procedures issued by NBS. These procedures may be obtained by writing the Director, Institute of Computer Sciences and Technology, National Bureau of Standards, Washington, D.C. 20234, Attention: Verification of I/O Channel Level Interface Standards. The Government may, at its option, apply instrumentation and test equipment at any interface required to conform to FIPS PUB 61 before the acceptance of these ADP systems to ensure conformance with FIPS PUB 61. Waivers applicable to the requirements of this contract are identified elsewhere in this contract document.

4.12.3 Unless otherwise excluded as specified in FIPS PUB 62 by reference to FIPS PUB 60 or unless a waiver is granted following the procedures specified in FIPS PUB 62 ADP systems and magnetic tape subsystems that may result form this contract must conform to FIPS PUB 62. The correct operation of these systems conforming inter-

faces must be verified before the acceptance of all applicable ADP Equipment in accordance with FPMR 101-36.1304-22(b). Arrangement for verification may be made according to procedures issued by NBS. These procedures may be obtained by writing the Director, Institute for Computer Sciences and Technology, National Bureau of Standards, Washington, D.C 20234, Attention: Verification of I/O Channel Level Interface Standards. The Government may, at its option, apply instrumentation and test equipment at any interface required to conform to FIPS PUB 61 before the acceptance of these ADP systems to ensure conformance with FIPS PUB 62. Waivers applicable to the requirements of this contract are identified elsewhere in this contract document.

4.12.4 Unless otherwise excluded as specified in FIPS PUB 63 be reference to FIPS PUB 60 or unless a waiver is granted following the waiver procedures specified in FIPS PUB 63, ADP systems and rotating mass storage subsystems that may result from this contract must conform to FIPS PUB 63. The correct operation of these system conforing interfaces must be verified beform the acceptance of all applicable ADP equipment in accordance with FPMR 101-36.1304-23(b). Arrangements for verification may be made according to precedures issued by NBS. These procedures may be obtained by writing the Director, Institute for Computer Sciences and Technology, Natioal Bureau of Standards, Washington, D.C. 20234, Attention: Verification of Operational Specifications for Rotating Mass Storage Subsystems. The Government may, at its option, apply instrumentation and test equipment at any interface required to conform to FIPS PUB 63 before the acceptance of these ADP systems to ensure conformance with FIPS PUB 63. Waivers applicable to the requirements of this contract are identified elsewhere in this contract document.

4.13 Communications Interface

The interfaces between data terminal equipment (DTE) and data circuit termination equipment (DCE) at the ADP center and remote terminal locations shall comply with the following standards:

1. EIA Standard RS-232-C "Interface Between Data Terminal Equipment and Data Communications Equipment Employing Serial Binary Interchange".

2. EIA Standard RS-449 (FED-STD 1031) "Interface for Data Terminal Equipment and Data Circuit-Terminating Equipment Employing Serial Binary Data Interchange", dated November 1977. It is not required that there be interoperation with equipment conforming to MIL-STD-188C or MIL-STD-188/100. Synchronous high speed data signaling rates between DTE and DCE shall meet the specifications outlined in FIPS PUB 37.

3. The Bidder shall be able to provide the necessary equipment for interconnection between interface ciruits using RS-449 and RS-232C as specified in EIA Bulletin 12-1977.

4. EIA Standard RS-442 (FED-STD 1020) "Electrical Characteristics of Balanced Voltage Digital Interface Circuits", dated November 1977.

5. EIA Standard RS-423 (FED-STD 1030) "Electrical Characteristics of Balanced Voltage Digital Interface Circuits", dated November 1977.

6. Exchange of serial binary data signals and timing signals across the interface between DTD and synchronous DCE and defined in RS-449 shall meet the timing relationship outlined in EIA Standard RS-334 1968.

5.0 Performance Validation

Each Bidder shall demonstrate that the proposed equipment and software meets the requirements specified in the RFP. Bidders offering equipment and software to meet the requirements shall complete a live test demonstration (LTD) and a functional demonstration. Each contractor shall satisfactorily perform the LTD requirements using only the equipment and software proposed. The quantity of input/output and DAS devices may be limited to the quantity necessary to satisfactorily perform the LTD. However, the components must interface to the system in a manner identical to that proposed. The elimination of other than input/output or DAS devices from the LTD will not be acceptable. Bidders desiring consideration for a waiver from this requirement shall submit specific requests in writing to the Contracting Officer no later than the proposal submission date. The functional demonstrations will be scheduled by the Contracting Officer at least 30 calendar days prior to the official demonstration.

PART II

DELIVERY, INSTALLATION
SERVICE AND SUPPORT
SPECIFICATIONS

1.0 Facilities

The planned installation site of the proposed system is Cairo, Egypt. The Bidder shall state his site and environmental requirements in the applicable section of his proposal.

1.1 Floor Area

The Bidder shall state his floor area requirements to accomodate the proposed system.

1.2 Access Door

The Bidder shall specify the required dimensions of the access door needed to install and remove the equipment

2.0 Transportation and Installation of Equipment.

2.1 Transportation

2.1.1 All shipments to and from Ministry's site shall be made at the Bidder's expense. The Bidder shall make all arrangements to insure that, upon arrival or departure, all equipment is promptly moved between the loading area and the Ministry's site, (i.e., the room where the equipment is to be installed) or a storage area designated by the Ministry. The Bidder shall pay all transportation, rigging and drayage charges when the equipment is moved for mechanical replacement purposes.

2.2 Packing, Unpacking, Movement, and Relocation

2.2.1 Installation/Relocation

The Bidder shall be responsible for packing, unpacking, disposition of packing material, placement (tiedown) and movement

of any equipment acquired under this contract, at its designated location on site, as prescribed by the equipment environmental specifications. Any relocation of the equipment after acceptance, to meet the Ministry's requirements, shall be at the expense of the Ministry. If the movement or relocation is the result of installation of additional equipment (i.e., augmentation or additional quantities acquired under this contract) or its failure to meet the specified effectiveness level, then all costs associated with movement/relocation of the hardware in the possession of the Ministry shall be at the Bidder's expense.

2.2.2 Function Supervision

Supervision of the functions listed in 2.2.1 above shall be the responsiblity of the Bidder without additional charge to the Ministry. The Bidder shall be responsible for any damages to Ministry property which occurs during movement and installation of hardware and supplies where such damage occurs through negligence on the part of the Bidder.

2.3 Installation

2.3.1 Installation Schedule

The Bidder shall deliver and install, ready for use, the hardware and software set forth in the proposal in accordance with the following installation schedule:

Event	Date
Equipment Environmental Specifications	(With Proposal)
Bidder Site Survey	As scheduled
Date of Contract Award	To Be Determined
Ministry Scheduled Site Inspection Date	DOA + 30 days
Pre-Installation Test Facility Available	DOA + 60 days
Software Support Personnel Availability	DOA + 60 days
Installation	DOA + 180 days

2.3.2 Site Preparation

2.3.2.1 Environmental Specifications

Equipment environmental specifications shall be furnished in writing by the Bidder in the applicable section of the proposal. These specifications shall be in such detail as to insure that the equipment to be installed shall operate efficiently from the point of view of its environment.

2.3.2.2 Site Preparation

2.3.2.2.1 The Ministry shall prepare the site at its own expense and in accordance with the equipment environmental specification furnished by the Bidder. The Ministry shall provide power and air conditioning, as required to install the equipment.

2.3.2.2.2 The Bidder shall provide and install all logic/signal cabling and internal power distribution cabling as required for his equipment. The Bidder shall provide all male power connectors, plus any required frequency conversion equipment.

2.3.2.2.3 The Ministry shall install Bidder-provided frequency conversion equipment and all female power connectors. The Ministry and Bidder shall mutually establish delivery schedules after contract award for Bidder-provided item necessary for installation prior to site preparation.

2.3.2.2.4 Any alteration or modifications in the site preparation which are attributed to incomplete or erroneous equipment environmental specification provided by the Bidder which would involve additional expense the Ministry shall be made at the expense of the Bidder.

2.3.2.2.5 Any such site alterations or modifications, as specified above, which cause a delay in the installation date shall result in liquidated damages for equipment.

2.3.2.3 Site Alteration/Modification

Any alterations or modifications in site preparation which are directly attributed to incomplete or erroneous equipment environmental specifications provided by the Bidder shall be made at the expense of the Bidder.

2.3.2.4 Delay of Installation Date

Any such site alterations or modifications as specified in 2.3.2.3 above which cause a delay in the installation date will also result in liquidated damages for equipment.

2.3.2.5 Physical Layout

The equipment environmental specifications shall include the physical layout of the initial quantities and increases in quantities which are required under the contract, to include: electrical distribution panels, circuit breakers, and connections; environmental equipment; hole cut-outs for conditioned air, cables, etc.; power and signal grounding specifications; special cooling requirements, if any; prestaging required; and other appropriate physical planning.

2.3.2.6 Site Survey

The Bidder has the right to physically survey the site prior to the proposal due date, and to physically inspect the site preparation prior to the installation date.

2.3.2.7 Environmental Support Equipment

The bidder shall include in his specifications, requirements/ recommendations for uninterruptable power supplies, (power stabilization equipment, air conditioning, etc). The bidder may propose to provide and install such equipment as part of the system provided.

Otherwise, the Ministry will provide environmental supporting equipment so identified in this contract. The Ministry will be responsible for site modifications required by this special equipment. Any delays in the delivery of any Bidder-furnished special equipment will be treated as specified in 2.3.2.4 above.

2.3.2.8 Electrical Power Support

The Ministry will provide the power panels, with required circuit breakers, to the computer room and will be responsible for making the electrical connection or hook-up between the provided power panels and the Bidder-provided equipment.

2.3.2.9 Electrical Drawings

The Bidder shall provide drawings and other information with the proposal describing the electrical power and signal grounding system if required. The information shall identify the support required from the Ministry for the installation and hook-up of the grounding system (if required).

2.3.2.10 Communications Media Support

Unless otherwise specified in the contract, arrangements for procurement, installation and maintenance of non-Bidder communications media necessary for the remote transmission of computer

programs and data are the responsibility of the Ministry. Any charges for such media in connection with the installation, operation or maintenance of the machines will be borne by the Ministry.

2.3.2.11 Site Inspection

The Bidder shall inspect the site within seven (7) days from receipt of written notice from the Ministry that the site is ready for inspection and shall notify the Ministry in writing, within fifteen (15) days from the date of inspection, of any site deficiencies requiring corrective action. Such inspection shall not be construed to be acceptance of environmental facilities.

2.3.3 Delivery Requirements and Options

2.3.3.1 Installation Date Delay Reservation

The Ministry reserves the right to delay the initial system installation by up to 180 days, at no additional cost to the Ministry, provided that:

1. The Bidder shall receive written notice thirty (30) days prior to the scheduled installation date.

2. Any installation delays beyond 180 days shall be mutually agreed to by the Bidder and the Ministry.

2.3.3.1.1 Equipment Certification

If the equipment is certified to be ready for use prior to the installation date, the Ministry, at its option, may elect to use the equipment.

2.3.3.2 Ministry Responsibilities for Site Availability

The Ministry agrees to have the site available thirty (30) days prior to the scheduled date unless a shorter period of time is mutually agreed to in writing. The Bidder, at its option, may commence equipment installation on or after this date.

2.3.3.3 Bidder Installation Schedule

The Bidder shall specify in the proposal the time required to install the equipment.

2.4 Delivery of Options and Evaluated Optional Features Ordered

The Bidder shall deliver and install the optional equipment specified elsewhere in this contract within ninety (90) days after issuance of the exercise of such option. Evaluated optional features ordered at the time of contract award shall be delivered with the initial system equipment as appropriate.

3.0 Contractor Support Services

3.1 Contractor Personnel Support

The Bidder's technical support personnel shall each have a minimum of two years of experience on the configuration proposed or a like configuration and shall be thoroughly trained in the Bidder's proposed hardware, language processors, operating system, and all other software provided by the Bidder.

The technical support personnel who are assigned shall be adequately trained and have experience necessary for them to function within their assigned duties.

The Bidder shall furnish the Minsitry with, a certified resume,

specifying the pertinent training and experience for each person to be assigned to the support function before the actual assignment takes place. The Ministry reserves the right to reject the assignment of personnel who do not fit the qualifications considered necessary to do the job.

Whenever for any reason, one or more of the Bidder-provided personnel are unavailable for performance under this contract, the Bidder shall replace such individual(s) with individual(s) of equal or better abilities and qualifications to allow for a 10 working day overlap. The requirements described herein also shall apply to all replacement and new personnel.

The use of these personnel by the Ministry does not negate the Bidder's responsibility to provide full and total software support from the customer engineering organization for the life of the contract. The Ministry may discontinue any or all support personnel after giving the Bidder 30 days prior written notice of discontinuance or a shorter notice when agreed to by the Bidder.

Bidder personnel shall be available during the period beginning sixty (60) days after DOA and ending 180 days after installation of the proposed system. Bidder personnel shall have experience in maintaining system software and in programming in the COBOL language. Approximately twenty staff months of Contractor personnel support is required (rate of usage shall be controlled by the Ministry). Two (2) persons are required to be on-site at the same time. Bidder personnel shall be available at either test facility and shall provide assistance in the following areas:

3.1.1 System Software Support

Assist software specialists to accomplish the following:

a Generation of O/S Software

b Creation of software libraries

c Optimization of the utilization of DAS for system and user files.

d Development of specialized assembly language (or equivalent) subroutines.

e Problem resolution through the use of memory dumps and other associated debugging aids

f Development of system backup methods to insure against loss of data and programs.

3.1.2 COBOL Conversion and Programming

Assist applications programmers to accomplish the following:

a Translation of source programs through use of conversion aids (if available).

b Application of debugging aids.

c Application of extensions to the COBOL language.

d Optimization of DAS for all file structures.

3.1.3 Other Support

Additional assistance may be required in the following areas:

a JCL preparation.

b Tape and DAS data file conversion.

c Use of Bidder supplied utilities.

d System/Subsystem testing.

3.1.4 Support to On-Site Bidder Personnel

3.2 Pre-Installation Test Facility (PTF)

The Ministry requires a Bidder-provided PTF for the development of new programs and applications systems. With 30 days notice, the Ministry may discontinue the use of the PTF. The PTF must be at a location that is convinient to the Ministry

3.2.3 Software

The minimum software support packages required at the PTF shall be functionally identical to the operating system and other software to be provided by the Bidder for the contracted system.

3.2.4 Workload

The interactive response time for the PTF shall average 5 seconds or less. Job submissions with a CPU execution time of less than 30 seconds shall be turned around in not more than on-half hour; jobs with a CPU execution time greater than 30 seconds but less than 60 seconds shall be turned around in not more than two hours. Jobs with a CPU execution time over 60 seconds shall be turned around in not more than 8 hours.

3.2.5 PTF Peripheral Requirements

The PTF, at the minimum, shall provide to the Ministry two (2) PE 1600 BPI tape drives and 25% of the proposed on-line DAS storage.

4.0 Maintenance

4.1 Responsibilities of the Bidder

The Bidder shall provide maintenance such as labor, tools, test equipment, parts, and other such expenses at the prices shown in the proposal and shall keep the equipment in good operating condition throughout the life of the system. This includes the expeditious installation of all Bidder-sponsored modifications upon approval of the Ministry. Maintenance service shall not include electrical work external to the equipment, the furnishing of office supplies, and the addition or removal of accessories, attachments or other devices. It shall not include repair of damage resulting form accident, transportation between Ministry sites, neglect, misuse, air-conditioning or humidity control, or causes other than ordinary use.

4.2 Responsibilities of the Ministry

4.2.1 Maintenance by Ministry Personnel

Ministry personnel shall not perform maintenance or attempt repairs to equipment while such equipment is under the purview of this contract unless agreed to by the Bidder.

4.2.2 Security Access

Subject to security regulations, the Ministry shall permit access to the equipment and software which is to be maintained.

4.2.3 Spare Parts Storage

The Ministry shall provide adequate storage for spare parts, and adequate working space, including heat, light, ventilation, 115 volt electrical current and outlets and telephones for local calls

for the use of maintenance personnel. These facilities shall be within a reasonable distance of the equipment to be serviced and shall be provided at no charge to the Bidder.

4.2.4 Time for Modification

The Ministry shall determine acceptability and, if appropriate, provide time for Bidder-sponsored modifications within a reasonable time after being notified by the Bidder that the modification is ready to be made. The time required to make the modification shall be outside the normal preventive maintenance hours and at the convenience of the Ministry.

4.2.5 Site Maintenance

The Ministry shall maintain the site in accordance with the dictates of the Ministry needs.

4.2.6 Operation of Equipment

The Ministry shall be responsible for the operation of the system and equipment beginning at the start of the acceptance test period.

4.3 On-Site Maintenance Option

4.3.1 On-Site Maintenance

On-site maintenance shall be provided if the Ministry exercises this option as follows:

1. Commencement Date: At the beginning of the acceptance period.

2. Coverage for principle period of maintenance: 8:00 AM through 5:00 PM, Monday through Friday.

At least two (2) qualified and experienced Bidder hardware maintenance technicians shall be on-site during all schedule system operations and maintenance during this principle period of maintenance.

4.3.2 On-Call Maintenance

In addition to on-site maintenance service during the stated principal period of maintenance and extensions thereof, on-call maintenance and software support services shall be provided outside the principal period maintenance. A response time of two (2) hours or less is required for on-call maintenance.

4.3.3 Back-Up Maintenance During Principal Period of Maintenance

Back-up maintenance and software support shall be provided during the principal period of maintenance or extensions thereof, whenever the maintenance of software support requirements exceed the capabilities of on-site maintenance personnel. The Bidder on-site personnel shall be required to summon on-call Bidder maintenance or software support personnel, commencing at the start of the acceptance test period, on any single occurrence where the system, or any portion thereof, fails to operate properly for a period of one hundred twenty (120) consecutive minutes during a twenty (24) hour period, unless agreement is reached with the responsible on-site Ministry maintenance supervisor to waive or extend the 120 or 180 minute periods. A one (1) hour response time shall be required for this back-up maintenance. Charges for back-up maintenance during the principal period of maintenance or extension thereof, shall be included as part of the on-site maintenance charges.

4.4 Two Hour On-Call Maintenance Option

The Bidder shall provide, if the Ministry exercises this option, on-call maintenance or software support (as appropriate) service with two (2) hours response time, during the principal period of maintenance.

Should the Ministry require maintenance or software support service outside the designated principal period of maintenance of extension thereof on an on-call basis, a response time of two (2) hours is required.

4.5 Maintenance Options Required

The Ministry, by giving fifteen (15) days written notice to the Bidder, has the option to extend the maintenance coverage outside of the principal period of maintenance, on-site or on-call, as appropriate, accordance with the following.

1. Extended maintenance period option I - Extends the principal period of maintenance to Saturday through Thursday or 7 days per week.

2. Extended maintenance period option II - extends the principal period of maintenance to cover 12 consecutive hours.

3. Extended maintenance period option III - Extends the principal period of maintenance of 16 consecutive hours.

4. Extended Maintenance period option IV - Extends the principal period of maintenance to 20 consecutive hours.

5. Extended Maintenance period option V - Extends the principal period of maintenance to 24 consecutive hours.

The Ministry has the option to require the Bidder to provide either on-site or on-call maintenance during the principal period of maintenance, or extensions thereof. The Ministry, upon 30 days written notice to the Bidder, has the option to change the type of maintenance provided such as on-site or on-call at any time during the system life.

4.6 Response Time

The Bidder's on-call maintenance personnel shall arrive at the designated point within the response time specified in 4.3.2., or 4.4 as applicable, from the time that the ministry notifies the Bidder that remedial maintenance is required, If qualified maintenance personnel fully capable of fixing the problem fail to arrive at the installation within the designated response time, the Bidder shall grant a credit to the response time, the Bidder shall grant a credit to the Ministry in excess of the specified response time and up to actual arrival time. The amount of creditable hours shall be accumulated for the month and adjusted to the nearest hour. The amount of credit for each hour in excess of the specified response time shall be computed at the rate of $500 per hour or the Bidder's highest hourly per call maintenance rate per year, whichever is higher. The total credit during any month shall not exceed the total monthly charge.

4.7 Component Replacement

If a component becomes inoperative due to component failure, and the total number of such inoperative hours exceeds twenty-four (24) hours during each of two (2) consecutive calendar months, the Bidder shall, at the option of the Ministry:

1. Provide an on-site back-up component at no additional cost; or

2. Provide expert on-site technical support personnel at no additional cost; or

3. Replace within thirty (30) days, the malfunctioning component with a functionally equivalent component in good operating condition at no additional cost to the Ministry, with accrued purchase option credits transferred to the replacement machine.

4.8 Non-Chargeable Maintenance Items

There shall be no charges for:

1. Replacement parts unless such parts are required due to the fault or negligence of the Ministry.

2. Preventive maintenance, regardless of when performed;

3. Remedial maintenance, regardless of when performed;

4. Travel time or time spent by maintenance personnel after arrival at the site awaiting the arrival of additional maintenance personnel and/or delivery of parts, etc., after a service call has commenced;

5. Remedial maintenance required on any component when the scheduled preventive maintenance for that component preceding the malfunction had not been performed unless preventive maintenance was omitted at the Minsitry request or the Bidder was denied access to the equipment;

6. Remedial maintenance required within a 48-hour period due to a recurrence of the same malfunction;

7. Installation of Bidder-sponsored modifications.

4.9 Preventive Maintenance

Preventive Maintenance shall normally be performed during the principal period of maintenance and extension thereof or periods contiguous thereto. The Bidder shall specify in writing the frequency and duration of the preventive maintenance required for the equipment. The actual schedule as to when preventive maintenance is to be performed shall be established by mutual agreement. If a mutually agreed upon schedule cannot be established, the Ministry reserves the right to specify the schedule for performance of preventive maintenance.

4.10 Remedial Maintenance

Remedial maintenance shall be performed after notification that either equipment or operating software is inoperative. The Bidder shall provide the Ministry with a designated point of contact and make arrangements to enable its maintenance representative to receive such notification 24 hours per day, seven (7) days per week providing an answering service or other continuous telephone coverage to permit the Ministry to make such contact.

4.11 Malfunction Reports

The Bidder shall furnish a signed malfunction incident report to the installation upon completion of each maintenance action and a quarterly summary of failure by component and by software package. The report shall include, as a minimum, the following:

1. Date and time notified.

2. Name of Ministry personnel who made request.

3. Nature of problem as described by the Ministry personnel.

4. Date and time of arrival of on-call maintenance personnel.

5. Type, serial number, and model number(s) of machine(s) or software packages.

6. Time spent on repair.

7. Description of malfunction.

8. Description of action taken to investigate and correct malfunction.

9. List of part(s) replaced.

The Ministry will record the date and time the Bidder is notified of a malfunction and the date and time the system and/or equipment and/or software is returned to the Ministry in operational status.

4.12 Special Provisions for Maintenance

The maintenance prices listed in this contract include cost of labor and parts and such other expenses as are necessary to keep the equipment in good operating condition.

4.12.1 Reconditioning

All costs associated with reconditioning/refurbishment of hardware required during the life of this contract shall be borne by the Bidder, unless such reconditioning/refurbishment is required due to catastrophe or fault or negligence of the Ministry of its agents.

4.12.2 Maintenance Coverage

4.12.2.1 Honoring of Maintenance Orders

The Bidder shall honor orders for maintenance under any of the maintenance option set forth in this Section at the prices shown in the proposal. All equipment which is a part of the system delivered under this contract shall be covered by the same maintenance provisions.

4.12.2.2 Maintenance Order Format

The effective date of maintenance service shall be specified in this contract or modifications hereto. The effective date of maintenance service, the type and model number(s) of the equipment and applicable charges shall be specified on the order.

4.12.2.3 Provisions

All provisions included in this section are applicable.

4.12.3 Discontinuance Notice

The Ministry shall give the Bidder thirty (30) days prior written notice of discontinuance of maintenance services or a shorter notice when agreed to by the Bidder.

4.12.4 Responsibilities of the Bidder

4.12.4.1 Replacement Part Standards

Only new standard part or parts equal or better in performance to new parts shall be used in effecting repairs. Parts which have been replaced shall become the property of the Bidder. The Bidder shall maintain an on-site spare parts inventory level consistent

with maintaining the requirements stated herein, and at a level that is maintained, through experience, at other like installations to properly maintain the equipment. The on-site spare parts shall be delivered prior to equipment installation. The Bidder shall also establish and maintain on-site inventory records to insure that resupply is timely and adequate to meet service and availability requirements.

4.12.4.2 Equipment Alterations by the Ministry

Should the Ministry make alterations or install attachments to purchased equipment which affect the maintenance of the equipment, the continuation of maintenance service on this equipment shall be subject to mutual agreement. Should the alterations or attachment increase the maintenance costs to the Bidder, additional maintenance charges shall be made on an individual installation basis upon written agreement of the Contracting Officer. If such alterations or attachments create a hazard, the Bidder may discontinue maintenance service on the hazardous equipment.

4.12.4.3 Equipment Alterations by Bidder

Bidder sponsored alterations or attachments to equipment shall be made with the prior consent of the Ministry. Appropriate modifications of the contract shall be negotiated for each such alteration which decreases the overall maintenance cost.

4.12.5 Movement of Equipment

4.12.5.1 Site Relocation

In the event that the system being maintained under the terms and conditions of this contract is moved to another location within the same geographical service area, as designated by the Bidder, the terms and conditions of this contract shall continue to apply.

If the system shall be moved outside the Bidder's designated service area, then the continued applicability of this contract shall be subject ot mutual agreement, or, at the option of the Ministry, service may be redirected by the changes clause.

4.12.5.2 Notice of Intent to Move Equipment

The Ministry shall give at least sixty (60) days written notice of the Bidder of its intention to move the equipment, except in emergencies.

4.12.5.3 Suspension of Maintenance Charge

Maintenance charges shall be suspended on the day the dismantling of the equipment in preparation for shipment is started. Maintenance charges shall be reinstated on the day that the Bidder completes reassembling of the equipment. The Ministry shall be charged for disassembly at the Bidder's then current standard rates, provided that the rates do not exceed the amounts the Bidder charges its commercial customers for such services.

4.12.5.4 Equipment Shipment to New Site

Shipment to the new installation site shall be at the Ministry's expense by appropriately padded van for electronic equipment or air freight. The Ministry by common carrier, or at its option, provide the Bidder with an authorization to ship by commercial carrier on a prepaid basis. In which case the Ministry shall be invoiced for transportation, rigging, and drayage costs.

4.12.5.5 Additional Equipment Expense

If relocation of equipment is the result of installation of additional equipment acquired under this contract by augmentation, or

additional purchases, then placement of the equipment in the possession of the Ministry will be at the Bidder's expense.

4.12.6 Liquidated Damages or Temporary Replacement

If during the specified system life, a machine purchased and maintained under this contract is inoperative due to machine failure and the total number of inoperative hours exceed twenty-four (24) hours during each of three (3) consecutive calendar months, the Bidder shall pay to the Ministry as fixed and agreed liquidated damages at a rate of one percent (1%) per hour over twenty-four (24) hours of the total monthly charge for that machine for each month where the above level of performance is not achieved beginning with the first calendar month. Liquidated damages shall cease effective with the first month wherein the effectiveness level specified for acceptance testing is achieved. If the Bidder furnishes a functionally equivalent machine in good operation while the defective machine is being repaired, liquidated damages shall not apply.

4.13 Maintenance Invoice and Payment Provisions

4.13.1 Invoices for Full Month

The Bidder shall render invoices (3 copies) for basic monthly charges at the end of the month for which the charges accrue. Invoices are payable when received by the designated Contracting Officer's Technical Representative (COTR). Invoices shall provide as a minimum:

1. Type, serial number and description of equipment.

2. Basic monthly charge for each type of equipment.

3. Total charges and prompt payment discount, if applicable.

4.13.2 Invoices for Partial Month

Payment for maintenance services of less than one month's duration shall be prorated at 1/30 of the basic monthly charges for each calendar day.

4.13.3 Credits

Any credits due the Ministry may be applied against Bidder's invoices with appropriate documentation attached.

5.0 Training

5.1 Schedule for Training

The Bidder shall provide training outlined below. Scheduling of courses for the training will be subject to mutual agreement between the Bidder and the Ministry. All instructors will be experienced technically and as instructors and training will be geared to the Bidder's system and not to basic concepts. The Ministry reserves the right to approve assigned instructors. The attendees will be provided with all appropriate manuals, text material, computer time and course outlines necessary for the specified training. Any training cost to the Ministry will be entered in the proposal.

5.1.1 General Training Requirements

The training program shall qualify Ministry personnel for productive interaction on the use and operation of the equipment and software to be delivered. The Bidder shall submit with the proposal a recommended training plan which complies with the requirements and guidelines of this section. Training courses will be divided into pre-installation and post-installation time periods.

Pre-installation training will qualify a sufficient number of personnel to develop productive applications and assume operation of the system on the installation date. Training shall be conducted in the designated training area, and shall be provided at either a Bidder-provided facilty or Ministry provided facility at the Ministry's option except as otherwise noted. The Bidder shall furnish all audio-visual equipment and textual materials required for training including self-study materials. An evaluation of each student's performance shall be provided. Students attending these courses, unless otherwise specified, will have prior experience in using, operating, and maintaining or programming computer application system. The primary language used for applications programming is ANSI COBOL.

Self-study and other programmed instruction-type courses shall be made available. Such materials, at least one copy of each, shall remain with the Ministry. The Ministry reserves the right to video tape any or all courses conducted.

5.2 Review and Approval

The training course curriculum and credentials of the instructors shall be subject to review and approval by the Ministry. The schedule of training and number of personnel to be trained may be revised by the Ministry, provided the Ministry notifies the Bidder, in writing, of the changes at least thirty (30) days prior to commencement of the specific training, and provided the total number of personnel to be trained does not exceed the requirements shown in 5.9.1.

5.3 Training Courses

General requirements for the training courses to be provided by the Bidder are described below. The Bidder shall propose courses

which are at least equivalent to Bidder commercial course offerings, in quality, coverage, duration and experiece of instruction. A summary of the pre-installation and post-installation training courses including the number of students per class and the number of classes required are provided in 5.9.1 The Bidder shall include in his proposed training program an appropriate combination of formal classroom training, seminars, workshops, and hands-on experience. These may be augmented by self-study courses, programmed instructions, or audio-visual packages which permit prerequisites, to be met. Prior to installation, the Bidder shall furnish computer time in support of training courses requiring students use of the system. Post-installation training shall take place on the delivered equipment as installed in the facility.

5.3.1 System Overview Course

This training is designed to provide managers with an orientation on the system. The overall configuration of the system shall be presented, with emphasis on the purpose and capability of the various functional components, and on the interfacing, maintenance, reliability, and operating considerations. Information shall also be presented on the software provided by the Bidder, its purpose, capabilities, system security provisions, and its use for both batch and interactive processing. The support the Bidder expects to provide on the software and equipment maintenance and training shall be included. This course shall be designed for about 1 day duration.

5.3.2 System Concepts and Facilities Course

This training is designed to give technical managers in the ADP and user organizations an overview of the system to enable them to effectively direct its use and operation and for technical super-

vision of their staffs. This training shall include, as a minimum, instructions on systems concepts and facilities, how the operating system is designed, how it operates, what software is available, and how to effectively manage the use of its capabilities. The training shall also cover a discussion of the facilities provided by the operating system for the compter resource accounting, performance monitoring aspects of the system. Course shall be designed for about 2 days in duration.

5.3.3 Operator Training Course

This training is designed to provide the system operators with the capabilities to independently handle all aspects of the operation of the system, including system malfunction diagnostics. The training will be completed after the operators have demonstrated their ability to independently perform all aspects of the operation of the system. Two pre-installation courses shall be given at a site on Bidder-provided equipment prior to installation. Additional classes as indicated in 5.9.1 are to be given at the Ministry site on the shifts determined appropriate. The class size will not exceed 8 students. The training shall include instruction on:

1. General systems concepts and facilities.

2. Use of all system hardware.

3. Operating the sytem control language, support software (utility) and other packaged programs.

4. Identifying and handling of system malfunctions, including system startup and restart procedures.

5. System monitoring techniques, resource accounting, and error logging formats and procedures.

6. File processing and file management.

Course shall be designed for about 10 days in duration.

5.3.4 General Support Software Course

Instruction shall be given on Bidder-provided support software packages and programs and an overview of the operating system. The instruction shall be oriented toward applications programmers and other users for program development and for the day-to-day use of the system. The instruction should include how the sytem is designed, how it operates, what software is available, and how to effectively utilize the system capabilities. Specifically, it will cover:

1. Operating system overview. Instruction shall be given on the full operating system (O/S) presented on an advanced level. The O/S topics shall include job control language, magnetic tape, and other storage devices, labeling, terminal message support, remote job status query, system security, job priorities, program requests and like subjects.

2. Support software. Instruction shall be given in the use of Bidder-provided support software, to include file management, sort/merge, program libraries, text editor, document processing, program dump, error reporting and like capabilities.

3. Other software packages. Instructions shall be given in the availability and use of the analytical software packages for statistical and mathematical routines.

Course shall be designed for about 9 days duration.

5.3.5 Programming Language Training Courses

This training is designed to give the applications programmers the skill required to make full and effective use of the programming languages. This will include, as a minimum, advanced techniques for writing, compiling, testing, and maintaining computer programs for the system. The general support software training course described in 5.3.4 above shall be given to the applications programmers just prior to the programming language training.

Courses are required to train the COBOL programmers. The training shall be directed to ANSI COBOL programming. The COBOL training will not include the language itself, but will emphasize use and any unique extensions available to the users; and should be designed for about 4 to 5 days duration.

Instruction in the Bidder-provided block-structured language shall include the language itself, its use and its extensions if applicable; and shall be designed for about 10 days duration.

5.3.6 Operating System and Supporting Software Training Course

This training shall provide the skill to establish and operate the system. The training will be extensive enough to allow Ministry personnel to isolate and identify problem areas to the Bidder for resolution. It shall include the topics that are described in 5.3.4. Training in the following areas is required as a minimum:

1. Operating System

    a. Hardware characteristics and principles of operation.

b. System hierarchy and software components, including the operating system communication software interfaces.

c. Data structures, queues and internal tables of the O/S.

d. Problem definition and resolution, e.g., dump analysis.

e. Diagnostic software utilization.

f. System generation and implementation of new software releases.

g. Communications processing, including protocol, software design, interfaces.

h. Security system, including management considerations, controls, procedures and software design.

2. Support Software

a. This includes training in design, operation and interfaces of support software, and like software to allow Ministry personnel to diagnose problems and report them to the Bidder for resolution.

3. Bidder Languages

a. This includes training in the assembler language or other languages used by the Bidder to develop software provided with the PTO system. PTO personnel

will use the language(s) in writing computer programs required for cross-referencing and for effecting emergency software error corrections.

5.3.7 Reserved.

5.3.8 DBMS Concepts and Facilities Course

This training shall be prerequisite to the two following courses for DBMS systems and DBMS applications programming. It shall include the overall concepts of DBMS concerning its use for data definition, data base updating, and data retrieval and report writing. The intructions shall include how the various DBMS capabilities can be used independently and in a combined way for both interactive and batch processing, and how data integrity and data base security are provided. The interfacing facility shall also be covered to include, as an example, the interfacing with the operating sytem, job control language, supporting software such as sort/merge programs, and the host languages provided with the system. Course shall be designed for about 4 days in duration.

5.3.9 DBMS Systems Training Course

This training shall provide the skill to establish and operate the DBMS, including procedures for defining and administering data bases. The training shall be extensive enough to allow personnel to isolate and identify problem areas to the Bidder for resolution, to implement interfaces between DBMS and special program packages, and to effect correction of errors in emergency cases. Course shall be designed for about 10 days duration.

5.3.10 DBMS Application Programming Course

This training shall provide the skill for implementing applications for information processing. DBMS instruction shall include

how DBMS may be used for both interactive and batch processing. Interfacing features and procedures for DBMS processing and their relationship with all other system software will also be included. Course shall be designed for 5 days in duration.

5.3.11 Maintenance Managers Training Course

Specialized training is required for maintenance managers to qualify them to monitor equipment installation, certify the acceptance testing process, and to prepare them for monitoring of the Bidder's performance during the contract maintenance period following acceptance of the equipment. Emphasis should be given to the maintenance monitoring systems, peformance measurements, system architecture and diagnostic software. This training may be preceded by one of the other training courses as a cost savings measure. All training for the maintenance manager should be completed by 15 days prior to the beginning of the equipment installation period. Course shall be designed for about 2 days in duration.

5.3.12 Other Application Software

This training covers software acquired by the Ministry as features proposed in response to this solicitation, provided by the Bidder, but not specified in other courses outlined in this paragraph, or provided by the Bidder as "bundled" with other applications software proposed. Courses on such software should be similar in scope to DBMS application programming course 5.3.10. The number of courses required to provide training on such software is the Bidder's option.

5.4 Cost of Training

All pre-installation and post-installation training shall be priced in the Bidder's proposal on a "per session" basis for each course. Price quotations shall be provided in the same fashion for the recommended continuing training 5.9.2 to be provided during the years subsequent to the post-installation training period.

5.5 Continuing Training

The Bidder shall provide continuing education covering the subjects identified in 5.9.2 for the life of the system, as required, and should describe the instructional staff and facilities available for this purpose. The Bidder shall make available a full educational program for new as well as experienced Ministry personnel.

5.6 Discontinuance of Training

The Ministry reserves the right to discontinue any or all training services without incurring the cost of the discontinued services by giving the Bidder thirty (30) days written notice of its intention to do so or shorter notice when agreed to by the Bidder. The Ministry also retains the right to stop any class if the instruction is determined inadequate.

5.7 Delivery of Training Material

The Bidder shall maintain one up-to-date set of all training manuals, aids, publications or other material used in the training courses and provided as self study or programmed instruction type courses for delivery to the Ministry, on a one-time basis, within thirty (30) days after receipt of a request. These training materials shall be delivered in reproducible form. Black and white

hard copies of any slides, photographs, view-graphs, or other transparencies will be acceptable. Films or television video tapes reproducible on normally available commercial equipment are also acceptable.

5.8 Training Plan

The Bidder shall deliver with his proposal a training plan indicating how he plans to comply with the requirements of this section. Recommendations may be made by the Bidder for other training that is appropriate for the proposed system. The plan should specify, among other things, the number of hours proposed for each course, classroom versus hands-on training, and a detailed outline of each curriculum with the number of hours assigned to each course phase. Instructor resumes are not required, however a statement of the minimum qualifications of the instructor for each course is required. The proposed training manuals and related training material for each course may be indicated but shall not be submitted with the proposal, but a copy of the table of contents for each manual and related training material shall be submitted with the proposal. The location of the Bidder-provided training site and a brief description of the equipment to be used, and its similarities and differences with the proposed equipment, are required in the training plan. The plan shall also specify the number of hours and time-of-day of equipment time to be provided at that location for "hands-on" training.

6.0 Manuals and Publications

6.1 Delivery of Documentation

The Bidder shall furnish user's manuals and publications for all Bidder software and equipment provided under this contract. Any cost to the Ministry for these materials will be entered in the proposal. Section 6.3 provides a summary of the types of documen-

tation and quantities which shall be delivered to the Ministry under the contract, and their delivery dates. The Bidder may propose sets of documentation which may differ from that shown in 6.3 to avoid costly rewriting and republication of existing documentation. In so doing, however, the Bidder shall show that the requirements stated herein shall be met.

6.1.1 General Guidance for Documentation

The intent of 6.3 is not to indicate or imply that large and bulky documentation is to be provided, but rather, only those manuals and handbooks needed to receive adequate training and make efficient use of the system. However, the documents shown under the column, "Operation and Maintenance" in 6.3, to be delivered soon after contract award, shall include the detailed information needed for technical management, operations, and use of the system. Some of these documents will be kept at a centralized location for the common use of the PTO staff. Manuals, as appropriate, will be available to students before training sessions begin and the number of manuals provided directly to students shall be included in the total requirements.

6.2 Types of Documentation

6.2.1 Operator Manuals

These manuals shall provide instructions for the equipment operators (computer and peripheral) to perform all system operating functions, and to monitor the system in all its functioning aspects and performance.

6.2.2 Systems Programmers Manuals

These manuals shall describe the operating system, including communications software, and its use, complete with error diagnos-

tics, on-line monitoring, etc. Insufficient details to allow Ministry personnel to monitor all operating and communication systems and report problems to the Bidder that may arise during operations. Similar documentation shall be included for language compilers, support software, and the data base management system provided by the system manager for maintaining and controlling the system security procedures.

6.2.3 Job Control Language Manual

A manual describing all job control language capabilities and operations shall be provided. The manual shall cover all systems control statements as well as systems diagnostics or error messages encountered by day-to-day system users.

6.2.4 Job Control Handbook

A handbook or summary manual covering the job control language shall be provided for ready reference by the users.

6.2.5 Applications Programmer Reference Manual

The applications programmer reference manual shall be provided covering the system and its associated software. This documention shall be used by the applications programmer for the development and maintenance of computer applications for supporting the PTO mission. The documentation shall include instructions in the use of high order programming languages, support software, analytical software packages, and other software supplied by the Bidder for computer programming and applications development.

6.2.6 Interactive User's Guide

An interactive user's guide shall be provided covering remote use of the system, analytical and support software, and facilities.

The guide shall also include methods for the use of the software aids such as sort/merge and other support software since this manual will be used by Ministry personnel of widely varying disciplines, it should be written and maintained at a technical user level.

6.2.7 Programming Language Manuals

Programming language manuals shall be provided covering all programming languages to include COBOL, a Block-Structured Language and Assembler or other language provided by the Bidder. Flagging of extensions and Bidder-unique options to establish standards for languages shall be made in accordance with the software requirements in Part I of this RFP.

6.2.8 Data Base Management System (DBMS) Manual

The DBMS manual shall include complete instructions on the generation and user of DBMS for PTO data processing. The manual should cover its use for interactive, and remote and local batch processing users.

6.2.9 Hardware Maintenance Manual and Drawings

The Bidder shall provide a complete set of procedural capabilities and use of diagnostic software and maintenance monitoring as well as a description of maintenance procedures. A complete set of schematics and drawings for the equipment shall also be provided. Configuration probe point descriptions shall be provided as a part of the hardware maintenance documentation. This is to properly identify signals available at test points in the host system and peripheral components for attachment of hardware monitor probes. This shall include a description of the signal locations, or pin addresses of the test point connectors, voltage, and active and inactive levels.

6.2.10 Spare Parts, Tools, and Test Equipment Lists

The Bidder shall maintain at the PTO site a current listing (catalog) of recommended spare parts, tools, and test equipment required for hardware maintenance and support of the system. The listing of tools and test equipment shall indicate those which are common and special. This documentation shall be available on site at the beginning of the installation period.

6.2.11 Training documentation

The Bidder shall provide to the the Ministry copies of all manuals, training aids, transparencies, slides, tapes, films, and other training material applicable to the system. In addition, each person attending a training class shall receive a complete set of manuals appropriate for the class. Updates to these materials shall likewise be made by the Bidder for the system life. The count of these manuals provided in training courses are to be included in the total number of manuals as per section 6.3.

6.2.12 Site Preparation/Installation Planning Manual

The Bidder shall provide to the Ministry copies of manual(s) which will provide system installation specifications. Minimum specification requirements to be included are primary power, air conditioning, equipment physical characteritics, physical facility requirements and other general equipment and site-related specifications.

6.2.13 Other Manuals

In addition to the above documentation requirements, the Bidder may provide any other manuals and program descriptions which the Bidder considers helpful to the user.

6.2.14 Updated Versions

The Bidder shall notify the Ministry as soon as updated versions of the above documentation items become available. The Ministry will specify its requirements, if any, for such updates in numbers not to exceed the initial requirements stated above. Requirements for each update shall be satisified promptly. This requirement shall apply throughout the expected sytem life. Updated versions shall be provided at no additional cost to the Ministry.

6.2.15 Reproduction of Documentation

The Ministry shall have the right to reproduce or have copies made for internal use of all manuals, publications, and documentation, unless otherwise specified by the Bidder.

6.2.16 Additional Documentation

Additional copies of manuals, publications and documentation shall be made available by the Bidder through the expected system life. Additional documentation provided after the initial distribution has been compteted will be at the expense of the Ministry. Costs of the additional documentation shall be no more than charges made by the Bidder to their commercial customers. The Ministry may make additional purchases though the use of an open purchase order on an annual basis with dollar limitation.

6.3 Documentation Delivery Requirement Summary

Document Title	Delivery Date
Site Preparation/Installation Planning Manual	Submit with Proposal
Operations Manual	DOA + 30 days
System Programmers Manual	DOA + 30 days
Job Control Language Manual	DOA + 30 days
Application Programmers Ref. Manual	DOA + 30 days
Interactive Users Guide	DOA + 30 days

Programming Language Manuals

1. COBOL DOA + 30 days

Data Base Management System Manuals

1.	Concepts and Facilities	DOA + 30 days
2.	Definition and Administration	DOA + 30 days
3.	Application Programming (HOST)	DOA + 30 days
General Purpose Simulation System Manual		DOA + 30 days

Transaction Processing System Manual

1.	Concepts and Facilities	DOA + 30 days
2.	Definition and Administration	DOA + 30 days
3.	Application Programming/Interface (HOST)	DOA + 30 days
Hardware Maintenance Manual and Drawings		DOA + 30 days

7.0 Software Support

7.1 Software Furnished

The Bidder shall provide the software listed in Section F as well as evaluated optional features set forth in Section H that are proposed and accepted by the Ministry. The Bidder shall support such software, including any Bidder sponsored modifications or

revisions thereof, at no additional cost for the duration of this contract, including renewal thereof. The support provided will consist of correction of error, provision of Bidder sponsored modifications, improvements, and revisions.

7.2 Modifications and Revisions

The Ministry shall be provided with full documentation of all Bidder changes and/or modifications to the software provided to meet the Ministry's requirements. In the case of new software level releases, the Ministry may elect to accept the later versions of the software, and if accepted, software support will be provided at no additional cost during the period of this contract, including renewals thereof. Any reprogramming or additional equipment required to accommodate such later versions will be at the Ministry's expense. If the Ministry elects not to accept such later versions, the Bidder shall continue to correct any latent defects of operating software supplied under this contract. However, such obligation to correct latent defects shall be limited to that necessary to permit the Ministry to process the workload identified in the specification.

7.3 Operating Software

The operating software required to make use of the equipment acquired under this contract will be provided and supported by the Bidder. Operating software refers to those routines that interface directly with hardware peripheral devices, the computer operations, applications and utility programs.

7.4 Software Performance

The software furnished shall confirm to and perfom in accordance with the Bidder's functional description and data requirements as

set forth in Section F of this proposal and shall meet all the other requirements stated in the contract.

7.5 Availability of Additional Software

Any other software which the Bidder announces, improves or may develop for general use with the type of equipment supplied under this contract, shall be made available to the Ministry on a same or better basis as such software is provided to its commercial customers. The delivery date shall be mutually agreed upon by the Bidder and the Ministry. The contract liquidated damages provision do not apply to software furnished under this paragraph.

7.6 Software Media Requirements

For all software that the Ministry shall maintain, have access to, or apply Bidder supplied modifications to, the source statement and executable code of all software shall be provided to the Ministry in both printed listing (2 copies) and machine-readable format.

PART III

PROPOSAL GUIDELINES
AND
ADDITIONAL INFORMATION

1.0 APPLICATION SOFTWARE ENVIRONMENT

The applications software environment that will support the Ministry in its functions are described in further detail in this section. This information is intended to provide bidders sufficient familiarity with the planned system to allow them to determine hardware and software components necessary to respond to this solicitation.

There are four categories of applications software or subsystems required to support the MSI mission and operations previously described. These are:

- o Registration Subsystem: To register pensioners, insured workers, contributing employers.

- o Collections Subsystem: To calculate monthly contributions due for every insured worker and from every employer.

- o Benefit Subsystem: To calculate periodic pensions and maintain records for lump-sum benefits

- o Management Subsystem: To provide administrative, actuarial, and management tools and reports.

Each subsystem is described further.

1.1 REGISTRATION SUBSYSTEM:

The registration subsystem will provide a unique identification for each insured individual, pensioner, and employer. All pertinent data required for individuals and employers will be recorded in a manner that facilitates automated search and sort.

For individuals, the registration subsystem will establish a universal identifier. While initially serving some 12 million insured persons and 3 million pensioners, the universe must be expected to grow at 10% per year, and

the system must be adequate to handle the entire population of Egypt (estimated at 45 million for 1982).

The registration system will provide certain data for benefit calculation. Since the parameters of the several social insurance laws are different, and individuals may move from coverage under one law to coverage under another, registration data will include all that may be required under any law. The extent of data required has yet to be specified. It does however include:

Name
Address
District No.
Date of Birth
Place of Birth
Dependents
Beneficiary(s)
Law Providing Coverage

MSI plans to issue identification cards with the registration number. While embossed plastic cards with magnetic coding, are attractive in principle, cost makes them prohibitive at this time. A paper card is likely.

A unique card is required for casual workers. Because these individuals have no designated employer, their contributions to Social Insurance take the form of stamps purchased monthly at the local post office. Cards for casual workers therefore, must contain space to hold 3 years worth of stamps. When the card is filled, the individual will turn it in for a new card (at that time, the collection subsystem will be credited with his 3 year contributions).

The registration system must also capture information about employers. An employer number will be assigned and data recorded will include location including district and number of employees (the number of employees and salaries in January determines the monthly contribution for the year). In addition, data relating the employees to all branches of the firm is also required.

The software contractor will be required to examine the data requirements for both individuals and employers as a consequence of the several laws. The contractor will further examine systems in place in other countries. As a result of these studies, the software contractor and MSI will select and specify the form and content of registration for both individuals and firms.

(MSI has employed a Police Identification Number for some 3.5 million individuals. Because of duplications, it has been determined that the Ministry must take the initiative to assign numbers under its own control).

1.2 COLLECTIONS SUBSYSTEM:

The collections subsystem will calculate the monthly contributions due from every insured person and his employer, and will invoice each employer monthly. The collections subsystem will record receipt of monthly payments and monitor the status of each account. Because the rules of contribution and the mechanisms of collection vary, the Collections Subsystem must be constructed modularly by the several social insurance laws and by the categories of employer (private sector, public sector, government sector).

Annually, private sector employers are required to provide employee lists and wages. The collections subsystem will provide a baseline report of this information from its data base and the employer will be tasked to validate and update the information. Updated information will then be provided to the collections subsystem.

The social insurance laws also provide for loans to insured persons under certain situations. The collections subsystem will calculate the repayment schedule and interest charges (and penalties, if any) and will bill for these sums and monitor repayment.

1.3 BENEFIT SUBSYSTEM:

As with the collections subsystem, the benefit subsystem must be constructed modularly with respect to the several Social Insurance laws and categories of insured persons within each law. (In fact, the design of the registration system should not be finalized until this level of study of the benefit structure is well understood by the software contractor). The benefit subsystem will calculate periodic pensions for persons about to be, or newly retired. (since retirement is compulsory at age 60, the benefit subsystem can anticipate this milestone and perform the calculation in advance so that the pension may be in effect when retirement occurs). As with any funds disbursement program, exceptional care must be taken with data validity tests, calculation tests, and security measures to provide assurances that the benefit subsystem is not being abused. Unusual, exceptional, and special cases must be examined to determine if automated calculation may be employed or if manual intervention is a more appropriate means of determining benefits.

The calculation of lump sum benefits will remain a manual process in the local office. However, the benefit subsystem will produce summary sheets containing the pertinent data regarding each insured person. From these summary sheets, the calculation of lump sum benefits will be a straightforward process. (In this way, all permanent paper files which are frequently voluminous may be removed from the local office. Once the appropriate data is entered into the computer system and properly validated, the paper records may be archived).

In its implementation, benefits computation must be managed and administered at the central PIO and SIO facilities. During this phase the benefit subsystem will likely be most effectively employed in batches which group about-to-be pensioners in accordance with the applicable law and the responsible geographic unit. Once this approach is proven, a pilot implementation might consider an interactive approach with the immediate Cairo local office. Subsequently, this concept may be deployed as resources support a more distributed technology.

1.4 MANAGEMENT SUBSYSTEM:

The management subsystem will provide all functionality not described elsewhere. This includes certain financial and administrative processes, actuarial analyses, payroll and personnel functions, and report generation (including reports which the contractor might prefer to consider within the structure of the registration, collections, and benefits subsystems. They are described here only for convenience).

- o Payroll:

  PIO and SIO require a system to track and manage payroll within their two organization. The requirements for this payroll system must be researched and analyzed, however it should be considered a model appropriate for utilization by other government agencies. Presumably it will track and manage time allocations and time charges, rates of pay, holiday and vacation time, other benefits, gross salary computation, deduction computation, and net salary computation (these on a pay period and accrual basis).

- o Personnel Administration:

  A system is required to monitor and track employees by category, skills and training, job assignments, etc. Both statistical reports as well as selective searches will be required.

- o Budgeting and Accounting:

  A system must be available to prepare annual budgets of projected collections vs benefits plus expenses (payroll plus other direct costs). Actual performance against the budget must also be maintained with actual and potential short falls identified.

o Actuarial Studies:

As a basis for both short and long term planning MSI requires the capability to analyze its data base and benefit history on an actuarial basis. A search of standard actuarial systems will permit an analysis of requirement and definition of need.

o Report Generator:

A flexible and adaptable report generator must be available to support ad-hoc requirements.

o Benefit Reports:

- Summary report per insured person provided to local office to accomodate lump sum benefit calculation.

- Monthly pension lists to banks and post offices to provide for issuance of pension payments.

- Monthly reports advising of unclaimed benefits.

- Periodic reports to individuals showing work history, contribution, etc. (every 2-3 years)

o Collections Reports:

- Monthly bill to employer for contributions due.

- Annual report to employer with current records requesting update.

o Registration Reports:

- I.D Card to Subscribers
- Stamp book to casual workers.
- Summary of registration to local office.
- Employees summary of registration data to local office.
- Employer lists to local office to support field inspections.

2.0 PROPOSAL GUIDELINES AND REQUIREMENTS

This section describes some proposal guidelines and additional requirements that will assist bidders in preparing their response to this solicitation.

2.1 FORMAT

Bidders must prepare their proposals using a clear, well-structured format that allows the Ministry to easily identify the capability of each proposed item. Cost information must be submitted as a separately bound document from the technical and management information. Each item proposed in response to the hardware/software and support requirements must be priced individually on a line item basis and with sufficient flexibility so that quantities may be varied by MSI Bidders should utilize some type of unique feature number scheme for easy cross-referencing of line items between their cost and technical proposals.

2.2 CONTENTS

Technical proposals must contain a separate section for each of the following:

1. Understanding of the Ministry's planned system

2. Proposed Hardware/Software Features

3. Proposed Support Features

4. Optional Features

Cost information must not appear any place in the technical proposal.

The Section for understanding of the Ministry's planned system must provide a discussion of the bidders conceptualization of the system. This will include how the applications will be processed, interfaces to the DBMS, input requirements and potential output products. The bidders will assess the functional requirements described in this solicitation and correlate these requirements and the data base size to their proposed hardware/software. For discussion purposes, bidders should assume transaction volume and type are typical to a pension benefits registration, collection and payments system of this magnitude. Specific assumptions used by bidders in their assessments must be included in their discussions.

The Proposed Hardware/Software Features section must describe specifically how the proposed components comply with the requirements in Part I of this solicitation. Bidders must reference each paragraph and provide a corresponding paragraph in their proposal. References to pages in supporting technical documentation or manuals (to be provide with the proposal) should also be included.

The section for Proposed Support Features must contain responses presented in the same manner as in the Proposed Hardware/Software Features section (i.e. each requirement referenced and responded to individually in the proposal). This section must address every paragraph in Part II of this solicitation document.

The Optional Features section should contain any additional hardware/software components not specfically required but the bidders feel would be beneficial to the Ministry's planned system. Any optional features proposed should include a description of the product and a cost to the Ministry. Optional features will not be evaluated as part of the bidders overall proposal.

Cost proposals, bound separately from the technical responses, should include a separate line item for each component of the proposed system. Bidders should not propose packaged systems or bundled software as single line items. Bidders must identify the cost for all proposed hardware/software, support equipment, cabling, maintenance, training, documentation, expansion requirements, etc. for the life of the system. Bidders must submit their cost for a purchase plan having a ten year life cycle. Thus support prices in Egyptian pounds over the system life cycle can have a significant effect on life cycle costs.

2.3 NUMBER OF COPIES

Bidders should submit one (1) signed original and four (4) copies of their technical proposals. Five (5) copies of the cost proposal, bound under separate cover, should be submitted.

Bidders should also submit two (2) complete sets of all referenced technical manuals and supporting documentation. This should include specifications sheets for all proposed hardware and software.

2.4 ALTERNATE PROPOSALS

Bidders may submit alternate proposals in response to any or all categories of hardware/software requested in this solicitation. Alternate proposals must comply with the format, content and number of copies specified in this part of the solicitation document.

2.5 ADDITIONAL INFORMATION

As part of the section for Proposed Support in the proposals, bidders are required to include a subsection which specifically addresses the following items:

a. Complete equipment list of all proposed hardware with type and model numbers.

b. Complete list of all proposed software with release dates and version numbers.

c. Identification of proposed hardware and software that is currently installed at other locations in Egypt. Specify customer name and installation date.

d. Identify all field service locations currently in Egypt and distance from Cairo.

e. Identify number and location of field service/support personnel in Egypt.

f. Describe spare parts distribution system supporting the Cairo area.

g. Describe escalation procedures for both hardware and software problems.

h. Describe the frequency and means by which software patches, fixes and updates are currently provided to users in Egypt.

i. Describe the procedures for hardware field modifications/upgrades.

2.6 GENERAL INFORMATION

The items presented in this subsection are of a general nature intended to inform bidders of the relationships to be established as a result of this solicitation.

2.6.1 Proposal Selection and Award

Proposals submitted in response to this solicitation must meet all the requirements for the category of components proposed. The Ministry, however, reserves the right to award to a bidder on less than the total requirements and further, to obtain individual system components from other than the selected system bidder.

2.6.2 Procurement Funds

Bidders are to be aware of the fact that funds for the initial purchase of hardware and software components is being provided with U.S. dollars. The funds for on-going support and maintenance will be provided by the Ministry in Egyptian pounds.