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REVIEW GUIDE
FOR
FEDERAL AGENCY
ACCOUNTING SYSTEM DESIGNS:
ADP APPLICATION

UNITED STATES GENERAL ACCOUNTING OFFICE

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REVIEW GUIDE FOR FEDERAL AGENCY
ACCOUNTING SYSTEM DESIGNS: ADP

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REVIEW GUIDE FOR FEDERAL AGENCY
ACCOUNTING SYSTEM DESIGNS: ADP

INTRODUCTION

This review guide is designed to be used by the GAO Financial Management ADP Staff in its evaluation of the ADP aspects of accounting systems submitted by executive agencies for approval by the Comptroller General. This guide should be completed by agency personnel who are familiar with the ADP design and related documentation. All questions should be answered with a yes, no, or not applicable. References to the design documentation should be as specific as possible (e.g., page, section, paragraph). "No" and "Not Applicable" answers should be explained. Where additional space is needed, additional pages, cross-referenced to the question, may be attached to the guide. On the basis of the completed guide, GAO will determine the approach to be used in the evaluation process. The preparation of this guide also provides a checklist for the agency in determining whether adequate documentation has been provided for all system processes. Although not a prerequisite for systems approval, GAO encourages the use of FIPS PUB 38 for documentation standards.

Additional review guides have been developed for use in evaluating (1) statements of accounting principles and standards, (2) accounting aspects of an accounting system design, and (3) payroll systems.

OBJECTIVES

GAO's primary ADP objectives are to evaluate the adequacy of:

- the network of internal controls designed into the system,
- the audit trails,
- the maintenance of integrity of data in the files, and
- the incorporation of the accounting specifications in the ADP design.

DISCUSSION

Evaluating internal controls involves identifying the critical processing points where controls are necessary and then determining and evaluating the controls that are planned for these points. The audit trail in an accounting system provides the ability to trace any transaction back to the original source or forward to a final total and the ability to reconstruct transactions. Evaluating the maintenance of integrity of data in the files involves a study of the environmental controls for security measures in the data processing center. In evaluating the system, there are certain design aspects involved which do not relate directly to the primary objectives but are essential to gain an understanding of the system.

The procedure followed by GAO in evaluating the ADP design provisions of accounting systems is first to obtain an overall understanding of the system and its purposes and functions. Each process then is studied individually and in relationship to other processes. The evaluation includes an understanding of the system logic; however, a study of computer program logic usually is not necessary. A part of the evaluation is based on a review of the flow of data into and through the system. In this way, the location and functions of controls can be determined and evaluated and the audit trails can be identified.

Most financial systems interface with some other system(s). A few are integrated in the sense that data records are shared with other application areas and in some cases a single input will update financial as well as nonfinancial records in a common data base (file). In the

instance of interface, the system design documentation should cover processing of the data from the point of exit from the interfacing system to the point of entry into the financial system or from the point of exit from the financial system to the point of entry to the interfacing system, as applicable. It is not necessary to describe the internal controls, etc., of the system that is either providing or receiving the data.

Integrated systems are a different matter. Internal controls and audit trails in another application system (supply, personnel, etc.) or a data management system that are used and relied upon to ensure accuracy and validity of accounting data must be included in the system design documentation package. This makes it necessary to include references to other application areas or the data management system documentation and copies of the appropriate directives as part of the system design documentation package.

Beginning on page 18 is a discussion of internal controls and guidelines. Beginning on page 16 is an Automated Functions Appendix to the Checklist, in the form of a questionnaire. Completion by knowledgeable agency personnel is necessary to assure the GAO staff's understanding of the system's functional scope.

INTERNAL CONTROLS: GENERAL

The centralization of data processing activities and the concentration of data processing functions in ADP demand that increased emphasis be given in the review of internal controls to ascertain their effectiveness. The evaluation of internal controls must rest on a review of the system documentation to obtain knowledge of how the system is expected to operate. Furthermore, the evaluation should be based upon the effectiveness of the "system of controls," i.e., the location of specific controls within the system which will provide their most efficient utilization and in the most economical manner. Accordingly, efforts in this area should be to achieve a proper balance of system controls--one that equates the incremental cost of including certain controls with the risk of loss due to their omission. The adequacy of the network of internal control in ADP is the key element to be depended upon in determining the reliance to be placed upon the accuracy of the system. The basic points of interest are:

1. The consequences of an error (consideration should be given to each field in the input data).
2. The points in the data processing at which an error may be introduced into the data.
3. The adequacy of controls introduced for prevention, detection and correction of input errors.

Controls can generally be classified into (1) those involving manual operations, (2) those involving computer operations, and (3) those which

are built into the equipment. They can be further classified into controls which pertain to (1) external and off-line activities, (2) input, (3) processing and storage, and (4) output.

The recommended approach for use in evaluating internal controls involves studying the flow of data to identify the critical processing points where controls are necessary and then to determine what controls are planned for these points. Listed below are some general principles which should be considered in making the review.

1. Automated controls should originate as close to the source of the data as possible and feasible and not be duplicated further downstream in the data flow.
2. Necessary controls should be planned for and established during the design phase of the ADP system. Note also that only those controls which satisfy a need should be included.
3. Controls should be automated whenever it is feasible and they should be simple and easy to maintain to preclude disruption of the work flow.
4. A description of ADP control operations should be documented and assembled for reference and training purposes.

INTERNAL CONTROLS: GUIDELINES

External and Off-Line Activities

1. Functional responsibilities should be separated to provide for a separation between the duties of systems analysts, programmers, and computer operators.

2. Source Documents

- a. Time frames should be established for the processing of source documents from point of receipt to the input preparation operation.
- b. A transmittal document should be used to control the flow of documents from the originating source to the input preparation operation.
- c. Processing delays should be identified for management review and correction.
- d. A quality review of source documents should be provided for, especially when the documents will affect the files.
- e. Retention time periods for original source documents, unless specified by law or regulation, should allow sufficient time for the detection and correction of errors. Filing methods during this time period should provide for easy accessibility for research purposes.
- f. A suspense system should be established to control the document flow from the point of receipt until they are input. Uncleared suspense documents should be thoroughly researched and procedures should be established to provide for the disposition of uncleared suspense documents.
- g. Authority to initiate source documents must be limited.
- h. A number must be assigned each document for identification purposes.

3. When data transmission is used, controls must be established to assure that transmission is correct and no messages are lost. Some common types of controls include message counts, character counts, and dual transmission.

Input

1. Independent control must be established over data submitted for processing (through the use of batch totals, document counts, predetermined control and hash totals, sequential numbering, etc.) to detect loss or nonprocessing.
2. Controls over input preparation.
 - a. When practical, keypunch documents should be mechanically verified; alternatively they should be visually verified.
 - b. No further processing of source documents should be permitted following the input preparation operation.
 - c. Procedures should be established for the return to the originating source of illegible or incomplete source documents prior to input preparation. A record control over these rejected documents should be maintained to assure their reinput or cancellation.
 - d. Operators of the equipment for input preparation should be prohibited from altering data on source documents. They should also be denied access to computer programs.
3. Reversing entries.
 - a. A system of codes should be developed to identify and categorize by reason each reversing entry whether manually or computer initiated.

- b. The identification number of the reversing entry should be the same as the original transaction or should be cross-referenced thereto.
 - c. All reversals should be accumulated and summarized periodically, and the summaries provided to management for quality control utilization.
 - d. Reversals which affect data elements of interfacing systems should be properly controlled and promptly submitted to the affected systems.
 - e. Documents prepared as the basis for reversals should provide sufficient justification and contain proper authorization.
4. Management notices (exception reporting).
- a. A system of management review codes should be developed to identify those transactions which have been designated by management to warrant special review or attention. The number of items so coded should be held to a minimum to retain the effectiveness of the principle of exception reporting.
 - b. All transactions so coded should be suspended by the computer and a notice output and forwarded to the appropriate management level for review. Uncleared suspense items should be thoroughly researched and delinquency data accumulated and summarized for review by higher management levels.
 - c. For some transactions, preposting review may be required; in which case programmed controls should provide this insurance.

- d. Adequate controls should be provided to insure that only authorized actions are possible to clear suspended transactions.

5. Error corrections and rejects.

- a. All error corrections should be reviewed and approved by persons independent of the data processing department.
- b. A system of codes should be developed for error correction documents which would categorize error corrections by cause and a code number should be assigned each such transaction.
- c. Details on error correction and rejected transactions should be separately accumulated and made available for use by management.
- d. Procedures should be established for periodic summarizations of errors and rejects by cause and for furnishing the summaries for management corrective action.
- e. Error corrections which affect data elements of interfacing systems should be properly controlled and promptly submitted to the affected system.
- f. Documents used for initiating error corrections should contain adequate justification and proper authorization.
- g. If computerized suspense control file is planned, procedures should be established to summarize delinquent transactions by source for purposes of research and review.
- h. A cross-reference file should be maintained to identify the error correction transaction with the original transaction, where applicable.

6. Miscellaneous input control considerations.

- a. To reduce the possibility of error at the point of origin, specific operating instructions should be planned and simple standardized forms should be designed and prenumbered or pre-coded as applicable.
- b. Specific procedures for the communication of data from the point of origin to the data processing unit should be planned. Applicable controls over data movement such as batch controls, transaction counts, turn-around documents, suspense files, etc., should be considered.
- c. Procedures should be prescribed to preclude duplicate processing of input data.

Processing

1. General considerations.

- a. The data processing unit should maintain a schedule of anticipated input and controls should be established to insure that some transmission is received from all scheduled input sources. If there is no input from a source in a given time period, the source should be required to transmit a negative message.
- b. Procedures should be established to insure that all input is processed to the computer.
- c. A properly controlled library should be planned for the storage of tapes, disks, etc. The library should (1) provide limited access, (2) maintain a catalog and index of tapes and disks including blanks, (4) provide for maintenance of proper physical

conditions (temperature, humidity, etc.), (5) provide for adequate storage and control of classified data where applicable.

2. Programs

- a. Programmers, analysts, system managers, operators, etc., should be denied uncontrolled access to program tapes and disks.
- b. Procedures should be established to provide for off-site storage of duplicate program tapes, disks, and/or source or object decks.
- c. Plans should provide for the program changes or modifications to be documented and retained for management review and approval.
- d. Plans should provide for the console operator to be prohibited from modifying programs and to be denied access to manual records used to supplement or support the programs.

3. Edit Routines

Appropriate edit routines should be included in the system to detect data which are invalid, incompatible, unreasonable, inconsistent, or incomplete.

- a. Some common editing functions are listed below:
 - (1) Character checks: Checks each character for numeric, alphabetic, or blank.
 - (2) Field checks: Determines whether all required data is included in the input (completeness) and is in proper sequence within the transaction.
 - (3) Limit checks: Checks certain fields within a transaction to determine whether the data fall within a prescribed range.

- (4) Validity checks: Checks certain fields based on known limits, stored information, or computer results.
- (5) Sequence check: To check that incoming data records are in proper sequence.
- (6) Logical relationships (or consistency): to determine whether components of input data have a logical relationship among themselves or to a master file.
- (7) Reasonableness tests: To detect gross errors in calculation or a balance which exceeds a predetermined limit.
- (8) Comparing: To check data fields against each other to prove the accuracy of operations involving matching, merging, coding, balancing, reproducing, or record selection from the file.
- (9) Batch checks: To determine completeness of input batches. These could include:
 - (a) Record counts--number of records input.
 - (b) Control totals--summation of fields containing quantitative data.
 - (c) Hash totals--summation of fields containing identifying numerical data.

- b. Data should pass through all applicable edit routines prior to rejection and the reject notice should reflect all causes. In any case, procedures should be established to preclude the console operator from skipping an edit routine.
- c. Error corrections and input of rejected transactions should be subject to the same edit routines as initial transactions.

- d. Listings should be prepared for management of all edits which are performed on each type of transaction.
 - e. Where computer logic can correct an error disclosed by an edit routine, a separate record or tape should be made of the correction.
 - f. Edit routines should be compatible with the requirements of interfacing systems.
 - g. Edit rejects should be reported to the originating source for investigation and correction as applicable.
4. Processing runs.
- a. For updating of balances, a comparison should be made by the computer of the initial balance plus the current transaction with the after-posting balance.
 - b. When tapes are merged or sorted, control totals should be checked and the new totals recorded.
 - c. Provision should be made for a computer halt for those cases which present "impossible" situations and in all cases where errors or exceptions occur, management notices should be printed out and the record "flagged" accordingly.
 - d. For cases in which self-balancing figures (totals) are included in processing activities, provisions should be made for checking balances after each processing run.
 - e. Procedures should provide for the accumulation on separate tape of processing actions selected for management review to facilitate printing.

- f. When transactions lose their input identification, a new identification number should be developed and cross-referenced to the prior one.
 - g. Control totals or hash totals should be assigned whenever necessary to insure against the loss of data during processing.
5. Suspense routines.
- a. Suspense transactions should be assigned an identifying number to enable effective matching with subsequent input and data when they are suspended.
 - b. Summaries should be prepared for overdue suspended items.
 - c. Processing against suspense tapes should occur along with routine processing.
 - d. Procedures should be established to prevent the clearing of suspended transactions by the console operator.
6. Programmed controls.
- a. Appropriate programmed controls should be included in the various processing routines to avoid undetected errors caused by (1) omissions or inaccuracies in the programs, (2) failure of the console operator to perform properly, or (3) possible equipment malfunction.
 - b. Necessary control procedures should be adopted to insure against the loss of stored data.
 - c. Control procedures should be provided to insure against the accessing of wrong files in producing output products.

d. Plans should be made for programmed instructions to provide for recording of operator actions which affect in any way the data being processed.

7. Equipment.

a. The built-in controls should be ascertained to determine that they are not duplicated by programmed controls but are supplemented by them.

b. Plans should be made for providing operators with explicit instructions (console run books) for each computer run.

8. Storage.

a. Plans should provide for minimum access for records retrieval.

b. Planned procedures should provide for file reconstruction in case of emergency.

c. Plans should provide for security of the data files.

Output

1. Transaction registers should be required for all systems transactions.

It is not necessary, however, for these registers to be in a "hard copy" medium.

2. Routine output products should be limited to the products needed to meet particular requirements in accordance with the design criteria.

3. Provision should be made for error feedback from output recipients.

4. Provision should be made for control over output distribution.

5. Programmed edit routines of output may be desirable to test the reasonableness of the data or to make comparisons with independently maintained control figures.

Official Name of the System: _____

CHECK LIST

<u>Description</u>	<u>Answer</u>	<u>References</u>
1. Does the design documentation include a statement of objectives for the use of automation and the degree to which the system will be (is) automated? (Sec. 27.5, 6a(1))	_____	_____
2. Does the design documentation include an overall narrative description (overview) of the automated portion of the system?	_____	_____
a. Does the narrative describe the relationship of the automated portion of the accounting system with the other aspects of the system and the relationship of the system to the organizational structure, missions, functions, financial management needs, and the agencies total management information systems?	_____	_____
b. Does the narrative describe the resources used for development and implementation (contractor, in-house, etc.)?	_____	_____

	<u>Answer</u>	<u>References</u>
c. Does the narrative identify and describe any records produced which come under the provisions of the Privacy Act of 1974?	_____	_____
d. Does the narrative identify the major types of inputs, their source and the appropriate volumes? (Sec. 27.5, 6a(2))	_____	_____
3. Does the design documentation include a flowchart of the general flow of information through the ADP System?	_____	_____
a. Is the flowchart tied in with overall narrative descriptions?	_____	_____
b. Does the flowchart tie in with the general charts depicting the major accounting processes?	_____	_____
c. Does the flowchart depict all segments of the system and show their interrelationships?	_____	_____
d. Does the flowchart depict the major categories of inputs and outputs and indicate the general data flow?	_____	_____

	<u>Answer</u>	<u>References</u>
e. Does the flowchart depict the interfacing relationships with other systems? (Sec. 27.5, 6a(2))	_____	_____
4. Does the design documentation include a description of the equipment configuration that will be (is) used?	_____	_____
a. Does the description specify the capabilities and limitations of the equipment to handle the processing of data for the system?	_____	_____
b. Is the software (operating system, DBMS, generalized retrieval/application packages, data communications, etc.) which is planned for use (used) with the system identified?	_____	_____
c. Is (are) the computer language(s) that will be (is/are) used in programming the processing operations stated? (Sec. 27.5, 6a(3))	_____	_____

Systems Logic

1. Does the design documentation include flowcharts showing the logical data flow and the sequence of operations (to be) performed by each computer process (run or job)? (Sec. 27.5, 6b(1))	_____	_____
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	<u>Answer</u>	<u>References</u>
2. Does the design documentation include a narrative description of each major computer program that ties in with the flowcharts in 1 above? (Sec. 27.5, 6b(2))	_____	_____
3. Does the design documentation include for each process a description of processing frequencies and the relationship to cut-off dates (for input submission) and resulting reports or other output products? (Sec. 27.5, 6b(2))	_____	_____
4. Do the file and record descriptions:		
a. Identify all inputs and outputs and define their uses, specifications, contents, formats, and other characteristics as applicable (layouts, charts, listings) including the media (punched card, magnetic tape, etc.) used (or planned)?	_____	_____
b. Identify for each file the format, contents, and blocking factor? (Sec. 27.5, 6b(3))	_____	_____

Internal Controls

- | | | |
|--|-------|-------|
| 1. Does the design documentation provide a description of input controls including: | | |
| a. Controls over the submission of source documents where applicable? | _____ | _____ |
| b. Controls over data communications to assure accuracy and completeness? | _____ | _____ |
| c. Controls used for identification of individual transactions? | _____ | _____ |
| d. Controls to restrict access to remote input devices? | _____ | _____ |
| e. Controls over preparation or transcription of machine-readable media? | _____ | _____ |
| f. Controls over movement of and access to machine-readable media? | _____ | _____ |
| g. Types, purposes and criteria of edit and other validation routines?
(Sec. 27.5, 6b(4)(a)) | _____ | _____ |
| 2. Does the design documentation provide a description of controls over rejected and erroneous transactions including: | | |
| a. Suspense records maintained to assure reentry or cancellation of previously rejected transactions? | _____ | _____ |

	<u>Answer</u>	<u>References</u>
b. The media used for controlling rejected transactions and error corrections?	_____	_____
c. Procedures for reviewing and approving error corrections?	_____	_____
d. Editing and validation criteria for reentry of corrected transactions?	_____	_____
e. Action required to clear or purge reject or error control file? (Sec. 27.5, 6b(4)(a))	_____	_____
3. Does the design documentation provide a description of the processing controls including:		
a. The recording and checking of control totals, hash totals, record counts, etc.?	_____	_____
b. Controls over transfer of data from one medium to another?	_____	_____
c. Procedures for restart, recovery and reconstruction in case of processing interruptions or temporary shut down?	_____	_____
d. Controls over the use of manual intervention in the processing operations? (Sec. 27.5, 6b(4)(b))	_____	_____

	<u>Answer</u>	<u>References</u>
<p>4. Does the design documentation provide a description of error/reject listings and management notices produced and the procedures for handling them? (Sec. 27.5, 6b(4)(b))</p>	_____	_____
<p>5. Does the design documentation provide a description of the environmental controls including:</p>		
<p> a. Separation of duties and functional responsibilities of ADP personnel?</p>	_____	_____
<p> b. Safeguarding computer programs and program documentation?</p>	_____	_____
<p> c. Control of access to data files and records?</p>	_____	_____
<p> d. Plans for back-up or emergency operation?</p>	_____	_____
<p> e. Plans for reconstruction of the data files in case of catastrophe?</p>	_____	_____
<p> f. Plans for alternate site storage of programs to assure continuity of operations? (Sec. 27.5, 6b(4)(b) and (c))</p>	_____	_____

	<u>Answer</u>	<u>References</u>
6. Does the design documentation provide a description of procedures for authorization and approval of program changes or modifications, including testing, distribution and implementation? (Sec. 27.5, 6b(4)(b))	_____	_____
7. Does the design documentation provide a description of the controls over output products including:		
a. Procedures for reconciling pre-determined totals and processing totals?	_____	_____
b. Controls over product distribution? (Sec. 27.5, 6b(4)(d))	_____	_____

Audit Trails

1. Does the design documentation include a description of the means to:		
a. Trace any transaction forward to a final total?	_____	_____
b. Trace any transaction back to the original source document?	_____	_____
c. Trace any final total back to component transactions? (Sec. 27.5, 6b(5))	_____	_____

	<u>Answer</u>	<u>References</u>
2. Does the design documentation provide:		
a. A historical record (machine-readable or hard copy) of transaction activity?	_____	_____
b. A data retention schedule? (Sec. 27.5, 6b(5))	_____	_____
3. Does the design documentation describe the capability to:		
a. Prepare special listings as required?	_____	_____
b. Provide for the interrogation of every data element?	_____	_____
c. A periodic printout of a trial balance of the computer-based general ledger and subsidiary ledgers? (Sec. 27.5, 6b(5))	_____	_____
4. Does the design documentation require transactions to be entered into the system only once for all processing and reporting? (Sec. 27.5, 6b(5))	_____	_____
5. Does the design documentation describe the extent to which the internal auditors are being (were) consulted during the design phase? (Sec. 27.5, 7c)	_____	_____

Answer References

6. Does the design documentation provide a statement of the audit approach (to be) used in the ADP environment including:

a. The frequency and methods (to be) used by internal auditors?

b. The identification of specially prepared or general audit programs or packages? (Sec. 27.5, 7c)

Implementation Plans

1. Does the design documentation provide a plan for the proposed conversion process, including: (not applicable to designs that have been implemented)

a. Plans for training personnel under the new system?

b. A tentative schedule for implementation of major segments of the system? (Sec. 27.5, 8a)

2. Does the design documentation include a description of any significant revisions to be made which might affect system approval and the target dates for implementation of these revisions?

(Sec. 27.5, 8a)

Answer References

3. Does the design documentation include a description of the planned methods for testing the logic and reliability of the system? (Not applicable to designs that have been implemented.)
(Sec. 27.5, 8b)

Accounting Specifications

1. Does the design documentation describe how the established transaction codes will result in each transaction being recorded in the appropriate general ledger and subsidiary accounts in accordance with the accounting specifications?
2. Does the design documentation describe management reports designed to provide administrative control of funds?
3. Does the design documentation describe the reports produced from the automated general ledger?

AUTOMATED FUNCTIONS

Following is a comprehensive listing of traditional functions and products of Federal agency accounting systems. Identify, by checking in the space provided, those which will be (are) performed/produced by the automated system.

- | | |
|---|-------|
| 1. General ledger | _____ |
| 2. Accounts receivable analysis | _____ |
| 3. Invoice billing and customer | _____ |
| 4. Merchandise inventory analysis | _____ |
| 5. Fixed asset analysis | |
| a. Buildings, improvements,
and leaseholds | _____ |
| b. Machinery and equipment | _____ |
| c. Office furniture and
equipment | _____ |
| 6. Depreciation | _____ |
| 7. Journal entries | _____ |
| 8. Accounts payable | _____ |
| 9. Payroll and leave | |
| a. Timekeeping | _____ |
| b. Payroll checks and
register | _____ |
| c. Forms W-2 | _____ |
| d. FICA report | _____ |
| e. State unemployment reports | _____ |

- 10. Sales analysis _____
- 11. Cost analysis _____
- 12. Budget analysis
 - a. Appropriations _____
 - b. Contract authority _____
 - c. Limitations _____
 - d. Apportionments _____
 - e. Reimbursements _____
 - f. Obligations _____
 - g. Accrued expenditures _____
 - h. Disbursements _____
- 13. Financial statements
 - a. Balance sheet _____
 - b. Statement of income and
expense _____
 - c. Status of funds statement _____