

DOE 1330.1D  
5-18-92

THIS PAGE MUST BE KEPT WITH DOE 1330.1D, COMPUTER SOFTWARE MANAGEMENT.

DOE 1330.1D, COMPUTER SOFTWARE MANAGEMENT, HAS REVISED DOE 1330.1C TO REFLECT ORGANIZATIONAL TITLE, ROUTING SYMBOL, AND OTHER EDITORIAL REVISIONS TO INCORPORATE CHANGES REQUIRED BY SEN-6. NO SUBSTANTIVE CHANGES HAVE BEEN MADE. DUE TO THE NUMBER OF PAGES AFFECTED BY THE REVISIONS, THE ORDER HAS BEEN ISSUED AS A REVISION.

**U.S. Department of Energy**  
**Washington, D.C.**

**ORDER**

**DOE 1330.1D**

5-18-92

SUBJECT: COMPUTER SOFTWARE MANAGEMENT

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1. PURPOSE. To establish policies and responsibilities for computer software management.
  2. CANCELLATION. DOE 1330.1C, COMPUTER SOFTWARE MANAGEMENT, of 1-12-90.
  3. SCOPE. The provisions of this Order apply to all 1 Departmental Elements and to all management and operating (M&O) contracts, and those other contracts which call for the acquisition, development, modification, and/or maintenance of computer software, as provided by law and/or contract and as implemented by the appropriate contracting officer.
  4. COVERAGE. Software Proposed for use, under development, and being maintained and used, whether that software was developed in-house, licensed from a commercial vendor, obtained from another organization, or otherwise acquired, including, but not necessarily limited to:
    - a. Administrative/business-oriented software, including:
      - (1) Administrative functions, such as payroll, accounting, and financial-oriented application software; and
      - (2) Business management-oriented software, such as inventory, ordering, scheduling, transportation, and materials management-related software, program management support-oriented software, such as project management applications, and automated office support systems.
    - b. System software, including:
      - (1) Utility packages and/or systems, including sets of mathematical routines, sorts, merges, and graphics software;
      - (2) Operating systems;
      - (3) Compilers;
      - (4) Program libraries;
      - (5) Data base management systems;
      - (6) Data dictionaries, directories, and/or encyclopedia; and

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DISTRIBUTION:  
All Departmental Elements

INITIATED BY:  
Office of Information  
Resources Management

- (7) Programming productivity enhancement tools, including report and code generators.
  - c. Scientific/engineering software, including:
    - (1) Scientific-oriented technical, experimental, and modeling software;
    - (2) Engineering development and analysis software; and
    - (3) Control systems (scientific/engineering/research oriented);
  - d. Manufacturing-oriented software, including:
    - (1) Computer-integrated manufacturing (CIM);
    - (2) Computer-aided design/computer-aided manufacturing (CAD/CAM); and
    - (3) Control systems (manufacturing oriented).
5. EXCLUSIONS. At the discretion of each site manager, certain software may be exempt from the local software management program. The rationale for such exemptions will be included in the documentation describing the overall software management program. Examples of software which may be exempted from coverage are:
- a. The software which is acquired and used with general purpose automatic data processing (ADP) equipment that is integrally embedded within the instrumentation associated with an experiment or device. An example of this is equipment and associated software embedded within a weapons system.
  - b. The software which is acquired and used with general purpose ADP equipment that is not integrally embedded but is acquired as part of a larger non-ADP turnkey system provided under one contract and in which the selection or supplier of the software chosen is not at the discretion of the Department or contractor. An example of this is software acquired as part of a fire alarm system or other physical security or environmental monitoring system. Departmental Elements should not use this exclusion to avoid severing acquisitions of software from larger procurement, in accordance with Federal Information Resources Management Regulation (FIRMR) 201-1.0002-2, when it is operationally feasible to do so and when such action will promote economy and efficiency.
  - c. The software which is acquired and used as an integral part of the power transmission systems of the power marketing administrations, including the software which is used for power system control.

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- d. The National Energy Information System, developed, maintained, and operated by the Energy Information Administration.
- e. Software being developed and utilized in support of research projects which is developed internally and used in scientific applications which are undergoing a continuing state of change. An example of this is scientific software that is being used in the rapid prototyping of devices and/or instruments which are in the direct support of Department authorized scientific programs.
- f. Systems software used to support those applications indicated in paragraph 5e above. For example, systems software developed internally which is used to support prototype device and instrumentation applications and is unique to the site, regardless whether it has general utility or not.

## 6. REFERENCES.

- a. DOE 1324.6, AUTOMATED OFFICE ELECTRONIC RECORDKEEPING, of 7-8-87, which provides requirements for managing electronic records, those records created, stored, or transmitted using personal computers, word processors, or associated electronic office equipment.
- b. DOE 1360.1A, ACQUISITION AND MANAGEMENT OF COMPUTING RESOURCES, of 5-30-86, which establishes Departmental policies and procedures for the acquisition and management of computing resources.
- c. DOE 1360.2B, UNCLASSIFIED COMPUTER SECURITY PROGRAM, of 5-18-92, which establishes requirements, policies, responsibilities, and procedures for developing, implementing, and sustaining a Department of Energy unclassified computer security program.
- d. DOE 1360.3B, AUTOMATIC DATA PROCESSING STANDARDS, of 11-15-90, which establishes responsibilities and policies for the implementation of Governmentwide ADP standards and for the development and implementation of Departmentwide ADP standards.
- e. DOE 1360.4B, SCIENTIFIC AND TECHNICAL COMPUTER SOFTWARE, of 12-31-91, which establishes Departmental policies and procedures pertaining to unclassified scientific, technical, and technology-related computer software programs developed for or on behalf of DOE.
- f. DOE 1450.1C, ACQUISITION, UTILIZATION, AND ADMINISTRATION OF TELEPROCESSING SERVICES, of 9-3-86, which sets forth the policies and procedures for acquiring and utilizing teleprocessing services from commercial sources.

- g. DOE 5637.1, CLASSIFIED COMPUTER SECURITY PROGRAM, of 1-29-88, which establishes uniform requirements, policies, responsibilities, and procedures for the development and implementation of a DOE classified computer security program to ensure the security of classified information in ADP systems.
- h. OMB Circular A-127, "Financial Management Systems, of 12-19-84, which prescribes the policies and procedures to be followed by executive departments and agencies in developing, operating, evaluating, and reporting on financial management systems.
- i. OMB Circular A-130, "Management of Federal Information Resources," of 12-12-85, which establishes policy for the management of Federal information resources.
- j. FIRM, Title 41, Code of Federal Regulations (CFR) Chapter 201, which is the primary regulation for use by Federal executive agencies, as applicable, in their management, acquisition, and use of certain Federal information processing resources.

## 7. DEFINITIONS.

- a. Auditable. Established in such a way that the controls necessary for review are available and so that a methodical examination and review of computer software, including data security and integrity, can be easily accomplished.
- b. Configuration Management. The process of identifying and defining the aggregation of hardware/software, or any of its discrete portions, controlling the release and change of those items throughout the system life cycle, recording and reporting the status of those items and associated change requests, and verifying the completeness and correctness of that documentation.
- c. External Impact. The burden (which includes all associated costs and personnel time) imposed on one or more Departmental Elements or contractors by the data reporting and/or processing requirements and/or products associated with a computer software application initiated by another Departmental Element or contractor. The burden imposed by a field element on those contractors under its direct managerial cognizance would not be considered to be external burden.
- d. Implementation. The installation and demonstration of complete operability of a computer program on a given hardware/software configuration.

- e. Quality Assurance. A planned and systematic pattern of all actions necessary to provide adequate confidence that the item or product conforms to established operational, functional, and technical requirements.
- f. Quality Control. An evaluation to ensure that a final product conforms to established operational, functional, and technical requirements.
- g. Site. For purposes of this Order, a site is defined to be a Departmental field element, including DOE Field Offices, power marketing administrations, and energy technology centers, a management and operating contractor, and/or Headquarters (with the Energy Information Administration considered to be a separate site).
- h. Software. Computer programs, procedures, rules, and any associated documentation developed for the operation of a software product, as defined in FIRM 201-4,001.
- i. Software Engineering. The systematic approach to the development, operation, maintenance, and retirement of software.
- j. Software Management Methodology. The body of methods, rules, and procedures employed to accomplish the individual steps needed to properly manage software.
- k. Software Product. A software entity designated for final delivery, including the computer code, procedures necessary to run the code, and all of the documentation required to fully utilize and maintain the code.
- l. Software Product Life Cycle. The period of time that starts when it is decided that the need for certain functionality can best be met by the use of a software product and ends when that product is retired from use.
- m. Validation. The process of evaluating software at the end of the entire development process to ensure compliance with software requirements.
- n. Verification. The process of determining whether or not the products of a given phase of the software development cycle fulfill the requirements established during the previous phase.

## 8. POLICY

- a. Software is a valuable information technology resource and one in which the Department, as a whole, has a considerable investment. As such, it must be appropriately managed as would anything else of such high value and importance to the operation of the Department.

- b. Software initiatives and expenditures should be undertaken to support program missions, strategic objectives, and management priorities. A site specific strategic planning process that drives the related expenditures in a closely organized and controlled manner, with direct involvement by upper level management, should be utilized.
- c. Each site will establish and operate its own software management program. Each program will consist of software management-related policies, procedures, and conventions tailored to local site needs. Each program will treat software initiatives appropriately, commensurate with their size, complexity, cost, degree of external impact, degree of customization, functions performed, criticality, and other factors important to the site's management. Sites are assumed to be the best judge of the level of management effort required in any given project and will establish their software management program policies accordingly.
- d. Each software management program will include the use of one or more software management methodologies and the concepts of software quality assurance and software quality control.
- e. The software management methodologies used should be software product life cycle based, auditable, and consistently applied. They should be selected and tailored for the needs of each particular site but, once adopted, should be enforced by the site management in order to obtain the benefits ascribed to their implementation. The adequacy of selected methodologies, as well as their enforcement, is each individual site's responsibility. More than one methodology may be needed to treat differences in management philosophy for different types of software. The methodology(ies) chosen should reflect the unique needs of the site and its programs and serve as an integrating mechanism, blending all of the other elements of the software management program into a unified concept. Attachment 1 provides a set of elements which a good software management methodology should include.
- f. The use of information technology to automate elements of the software management methodology(ies) selected is encouraged wherever it is found to be effective.
- g. Each site will have procedures in place which discourage the abuse or misuse of the software operated at the site or any of the data associated with that software. Custom-developed software will have safeguards against abuse or misuse identified and incorporated into the software as early in the development process as possible.
- h. Each site will conduct systematic reviews to determine the need to update its own software management methodologies, policies, procedures, and conventions, including those related to the safeguarding of the software and its associated data from misuse. These reviews will assure that the

appropriate computer security. controls are in place and that they are effective and reflect currently accepted industry practices.

- i. Prior to the development of custom software, an examination should be conducted and documented which will determine the availability of existing software which could satisfy the users' needs, or such a percentage of the users' needs, as to make it cost-effective to obtain, modify, and use. At a minimum, this examination will include the contacting of any applicable centralized software facility maintained by the Department. If such an examination is not appropriate in certain cases, it should be supported by the site's policies or documentation in appropriate files.
- j. The sharing of experiences with and evaluations of specific software products among DOE and contractor sites is strongly encouraged.
- k. The need for software acquisitions, developments, and/or enhancements will be identified, documented, and reviewed through an established long-range planning process.
- l. The maintenance and operation of software performing the same functions as software being maintained and operated by another DOE organization or site is discouraged, since it is usually not cost-effective. Those organizations involved are encouraged to study ways to share the application software being used in the most efficient way possible, subject to any applicable license restrictions. Sites operating and maintaining software for another site must take that other site's needs into account when deciding on the need to change or retire the software.
- m. Sites are encouraged to adopt those computer hardware and system software standards which will facilitate the transportability of application software.
- n. DOE Elements will support the objectives of OMB Circular A-127, "Financial Management Systems," by working toward the establishment and maintenance of a single, integrated financial management system and the one time only entry of data into that system.
- o. All of the terms and conditions of the license or other agreement, under which copyrighted or proprietary computer software is obtained, will be followed. The unauthorized reproduction or use of copyrighted or proprietary computer software and/or manuals may constitute copyright infringement under the United States Copyright Law and may constitute unauthorized disclosure of proprietary data as well as resulting in both civil and criminal liability.



## 9. RESPONSIBILITIES AND AUTHORITIES.

a. Director of Administration and Human Resources Management (AD-1, through the Director of Information Resources Management (AD-20), shall:

- (1) Establish policies, principles, and procedures relating to the acquisition and management of computer software as set forth in this Order.
- (2) Issue an annual Call for the preparation and submission of Information Resources Management Long-Range Site Plans, and publish the Departmental Information Resources Management Long-Range Plan.
- (3) Approve or disapprove the acquisition or development of software, including significant enhancements to existing software, which:
  - (a) Is categorized as administrative or manufacturing-oriented software which will have external impact;

or

- (b) Will cost more than \$1,000,000 to implement;

and

Will be categorized as failing in either the administrative or manufacturing-oriented software category;

and

Will be entirely custom developed by the site or will involve a significant amount of customization by the site to acquired or existing software.

See Attachment 2 for descriptions of these criteria.

- (4) Based on the results of the Office of Information Resources Management Policy, Plans, and Oversight (AD-24) and/or field element conducted reviews of a site's software management program and the quality of the site's software project documentation, and the recommendations resulting from those reviews, may modify the criteria cited in paragraph 9a(3) above for a specific site.
  - (5) Selectively review and approve or disapprove other software acquisitions, developments, or enhancements as deemed necessary because of their scope, complexity, sensitivity, impact, and/or cost.

b. Director of Information Resources Management (AD-20) through the:

(1) Director of Information Resources Management Policy, Plans, and Oversight (AD-24) shall:

- (a) Develop and implement policies, principles, procedures, and guidelines relating to the acquisition and management of software as set forth in this Order.
- (b) Ensure that procedures are developed with each Lead Program Secretarial Officer which describes the process for interface and, communicating with their DOE Field Office.
- (c) Perform periodic program evaluations of the effectiveness and efficiency of the software management programs being carried out by the field elements, the Headquarters Energy Information Computing Center, the Headquarters Administrative Computing Center, and those sites not reporting to a DOE Field Office. As part of this responsibility, provide field elements with guidelines for reviewing those sites for which they have oversight responsibility.
- (d) As part of the Departmentwide long-range planning process, develop the software-related portions of the Departmental Information Management Resources Long-Range Plan Call and Long-Range Plan. The Departmental Information Resources Management Long-Range Plan Call may include the reporting of identified requirements for all four categories of software described in paragraph 4, "Coverage," and Attachment 2, paragraph 1, of this Order, including, for example, the in-house development of operating system software by sites.
- (e) Establish criteria for the review of the information system part of each site's Information Resources Management Long-Range Plan, and review that portion of each plan against those criteria. After reviewing the planned software acquisitions, developments, and/or enhancements included in the plans, provide the appropriate Headquarters program office(s), site, and the Director of Administration and Human Resource Management with the review results and recommended actions (as appropriate).
- (f) Review and recommend the approval/disapproval of software acquisitions, developments, and enhancements which are required to be sent to AD-1 as described in paragraph 9a(3). Those sites which do not report to a DOE Field Office need only request approval on those software initiatives described in

that paragraph, unless notified otherwise by AD-24. Any changes to this requirement will be based on the evaluations of the sites' software management programs conducted periodically by AD-24.

- (g) Maintain an inventory of software being planned for acquisition, under development, being procured, or being operated and maintained by the organizations to which this Order pertains. The inventory will include only that software which is of general interest and/or costly enough to justify its inclusion.
- (h) Provide staff advice and assistance on software management matters to DOE Elements and contractors through the appropriate field element.
- (i) Provide overall guidance in the application and use of standards concerned with software management.
- (j) Maintain liaison with the Office of Management and Budget (OMB), the General Services Administration (GSA), the National Institute of Standards and Technology (NIST), and other Federal agencies concerning software management matters as they relate to the responsibilities defined in this Order. Review, evaluate, interpret, and inform Departmental components of directives, regulations, and policies from those organizations belated to software management.
- (k) Periodically review the major software systems (as identified to the OMB) operated and maintained by the Department. Report the findings and recommendations of these reviews to the Director of Administration and Human Resource Management.
- (l) Perform reviews, as appropriate, of computer software operated and maintained by the Department or whose acquisition is being planned for or which is being developed for future use by a Departmental component. The purpose of these reviews will be to determine potential redundancies, overlap, or duplication; to identify candidates for possible elimination or exportation to other locations; and/or to assess the security requirements, procedures, and contingency plans developed for the software. Inherent with this responsibility is the requirement to determine which software could be used throughout the Department.
- (m) Maintain general cognizance of software management activities throughout the Department. As part of this activity, determine which software management programs are functioning well in

order to facilitate the adoption by other sites of appropriate parts of the most successful programs and to promote software sharing as much as possible through the use of existing facilities among DOE components and/or contractor organizations.

- (2) Director of Scientific and Technical Information (AD-21) shall manage the Department's scientific and technical computer software pursuant to DOE 1360.4B, "SCIENTIFIC AND TECHNICAL COMPUTER SOFTWARE," of 12-31-91.
- (3) Director of Information Technology Services and Operations (AD-25), in addition to the requirements described in paragraph 10, below, shall:
  - (a) Manage the acquisition of teleprocessing-related software from commercial sources pursuant to DOE 1450.1C.
  - (b) Distribute the software-related portions of the annual call for Information Resources Management Long-Range Plans to Headquarter's elements (except the Energy Information Administration), as amended to satisfy AD-25 needs, and prepare and submit a consolidated Headquarters Information Resources Management Long-Range Plan to the Office of Information Resources Management Policy, Plans, and Oversight (AD-24). The consolidated Plan will include all software supporting Headquarter's elements, whether it is being developed, operated, and/or maintained at Headquarters or not.
  - (c) In accordance with Headquarters-developed criteria, review and approve/disapprove or delegate approval of software developments, acquisitions, and/or enhancements, whether required internally or by other Departmental Elements, which are not required to be sent to AD-1 as described in paragraph 9a(3), above. Delegation of approval authority to Departmental Elements should be based on the success of the Element's software planning process as directly observed by AD-24 and the cost of the proposed development, acquisition, and/or enhancement.
- c. Office of Chief Financial Officer (CR-1) shall manage financial management systems (FMS) activities pursuant to DOE 2200.12A, "FINANCIAL MANAGEMENT SYSTEMS," of 5-14-92.
- d. General Counsel (GC-1) shall, through the Assistant General Counsel for Procurement and Finance (GC-34) and Assistant General Counsel for Intellectual Property (GC-42), provide legal advice and assistance

relating to the acquisition, management, and use of software to assure Departmental compliance with the Federal Acquisition Regulations, the Federal Information Resources Management Regulations, and other regulatory and legal requirements.

e. Heads of Headquarters Elements having Programmatic Responsibility shall:

- (1) Review the software-related portions of the Information Resources Management Long-Range Plans from sites under their cognizance, and verify that the requirements of the software acquisitions/developments described are valid and directly in support of program missions and strategic objectives.
- (2) Respond completely to the software-related portions of the annual Headquarters Call for Information Resources Management Long-Range Plans, as amended to satisfy the Office of Information Technology Services and Operation's (AD-25) needs. The plan will include all software supporting the Headquarters organization, whether it is being developed, operated, and/or maintained at Headquarters or not.
- (3) Provide program strategic planning and priority information to sites and AD-1, as appropriate.
- (4) Designate an individual to serve as a point of contact concerning software-related activities funded by the organization. The name of the person selected is to be provided to AD-24.
- (5) Encourage the joint procurement of commercially-available software, or the joint development of custom software, by DOE and/or contractor sites, where such actions would be advantageous to the Federal Government and is not precluded by other Departmental policy or Federal regulation.
- (6) Provide the cognizant contracting officer with all necessary materials to allow the appropriate implementation of this Order in all applicable contracts.

f. Heads of Field Elements, in addition to the responsibilities described in paragraph 10, below, shall:

- (1) Conduct formal evaluations of the software management programs at the sites under their cognizance as part of the Field Installation Evaluation Program, as described in DOE 1360.1A, of 5-30-86. The primary purposes of these reviews are to assess compliance with this Order, especially Attachment 1, "Elements of a Software Management Methodology," and the effectiveness and comprehensiveness of each site's software management program.

- (2) In accordance with site-developed criteria, review and approve/disapprove or delegate approval of software developments, acquisitions, and/or enhancements at their own site or by sites under their cognizance which are not required to be sent to AD-1, as described in paragraph 9a(3), above. Delegation of approval authority to other sites should be based on evaluations of the effectiveness of the site's software management program conducted periodically by the field element.
- (3) Ensure that, through the contracting officer, the provisions of this Order are appropriately implemented in all applicable contracts so that all contractors covered by this Order are required to comply with its provisions by identifying such a requirement in the Statement of Work of the contract.
- (4) Provide advice and assistance concerning software management to sites under their cognizance.
- (5) Review and submit appropriate comments to Headquarters Elements concerning the software plans of sites under their cognizance, as described in the Information Resources Management Long-Range Plan prepared by each site.

#### 10. REQUIREMENTS.

Each site (both DOE and contractor) Manager, including Heads of Field Elements, (the senior ranking DOE official at a DOE office location) through the contracting officer, Administrator, Energy Information Administration, for the Headquarters Energy Information Computing Center), and the Director of Information Technology Services and Operations (for the Headquarters Administrative Computing Center), shall:

- a. Establish a software management program which addresses all four categories of software described in paragraph 4, above, of this Order. The program will include the use of at least one software management methodology, will maximize the use of automated tools for carrying out the procedures of the methodology(ies), and will include the use of software quality assurance and quality control principles. Specific policies, procedures, and conventions for managing software and incorporating the concepts described in paragraph 8, above, of this Order for each of the categories of software in use at the site will also be part of the program.
- b. Conduct evaluations of the software management program at their site in order to determine its effectiveness, to assure that only appropriate software has been excluded, and to identify possible improvements to the program.

- c. For operational software being run on the site's computing resources and not being reviewed by another organization, conduct periodic reviews to assure that it continues to meet its intended objectives. These reviews will assess the software's efficiency and cost-effectiveness, as appropriate, and assure that appropriate computer security controls are in place. A report of the findings and recommendations documenting the results of each review will be prepared and retained for local use.
- d. Satisfy the reporting requirements included in the Departmental Call for Information Resources Management Long-Range Plans through the reporting channel appropriate for the particular organization.
- e. Request the approval of AD-1 for software developments, acquisitions, or enhancements which meet the criteria described in paragraph 9a(3), above. Approval will be requested following the finalization of user and operational requirements. The approval request will consist of the documentation prepared for the software as called for by the site's software management methodology, including documentation of the unavailability of existing software which meets user and operational requirements.
- f. Promote transfer of software-related technology and sharing of information concerning specific software products among other DOE and/or contractor sites, using existing mechanisms to the maximum extent possible, and subject to all license and Federal procurement regulation restrictions.
- g. Ensure that an analysis of benefits and costs (ABC) is accomplished for those software acquisition, development, and/or enhancement activities for which one is required by the site's own ABC program.
- h. Encourage the joint procurement of commercially-available software and/or the joint development of custom-developed software by DOE and contractor sites, where such action would be advantageous to the Federal Government and is not precluded by other Departmental policy or Federal regulation.
- i. Ensure all appropriate security activities are carried out to the satisfaction of the Computer Protection Program Manager (CPPM) or Computer Security Site Manager (CSSM) for the site where the software is processed (as those requirements are described in DOE 1360.2B and 5637.1).
- j. Prohibit the unauthorized duplication and use of copyrighted or proprietary computer software. Inform employees and contractor personnel that unauthorized reproduction or use of copyrighted or proprietary computer software, without proper authorization, is an infringement and that willful copying is unlawful and may be subject to both civil and criminal sanctions.

- k. When a site plans to develop an application system utilizing a licensed software package, and the system will be required for use by multiple sites, the developing site is responsible for obtaining the required software licenses for each site.

BY ORDER OF THE SECRETARY OF ENERGY:



DONALD W. PEARMAN, JR  
Acting Director  
Administration and Human  
Resource Management



ELEMENTS OF A SOFTWARE MANAGEMENT METHODOLOGY

1. PROGRAM MANAGEMENT GUIDELINES.

- a. A plan for establishing and documenting the strategy, authority, and responsibilities of the software management program.
- b. Procedures for planning and authorizing software initiatives, including varying levels of specificity for short- and long-term time frames, and guidelines on developing justifications of software needs, setting priorities for software-initiatives, and performing analyses of benefits and costs.
- c. Resource estimating guidelines.
- d. Software project management procedures.
- e. Software quality assurance and quality control procedures
- f. Methodology compliance assurance steps, including guidelines for maintenance and review.
- g. Technology transfer provisions, if applicable

2. SOFTWARE DEVELOPMENT GUIDELINES.

- a. Personnel utilization guidelines (team building, assignments, etc.).
- b. Procedures for developing software requirements.
- c. Guidelines on making and documenting the "make versus buy" decision.
- d. Guidance on using prototyping and other techniques shown to be effective in accelerating and improving the quality of software development.
- e. Procedures for the high-level and detailed design of software.
- f. Procedures to assure security of software.
- g. Programming management procedures.
- h. Software reuse guidelines.
- i. Verification and validation procedures for both acquired and developed software.

- j. Guidelines for documenting the entire software product (including requirements and design).
- k. Guidance on initial and ongoing training of software developers and users.
- l. Production acceptance procedures.
- m. Identification of local conventions governing software development.
- n. Data resource management guidelines (access to data, integration, use of data base management systems and data handling languages, etc.)
- o. Telecommunications guidelines (networking).

3. POST-IMPLEMENTATION GUIDELINES

- a. Operation and maintenance procedures.
- b. Guidelines for change control and configuration management practices.
- c. Periodic review of operational software:
  - o retirement of software
  - o Redevelopment of software
  - o Enhancement of software

## SOFTWARE CATEGORIES

### 1. FUNCTION PERFORMED.

#### a. Administrative.

- o Support functions, e.g., payroll, accounting, finance

#### b. System Software.

- o Utility packages, e.g., sort, merge, graphics
- o Operating systems
- o Compilers
- o Program libraries
- o Data dictionaries/directories/encyclopedias
- o Database management systems
- o Programming productivity enhancement tools, e.g., computer-assisted software engineering tools

#### c. Scientific/engineering.

- o Scientific/technical
- o Scientific/modeling
- o Embedded
- o Systems/data acquisition
- o Computer-aided engineering (CAE)
- o Control systems (scientific/engineering/research oriented)

#### d. Manufacturing.

- o CIM
- o CAD/CAM
- o Control systems (manufacturing oriented)

### 2. DEGREE OF CUSTOMIZATION.

- a. No changes made to the commercial software package or pre-existing (shared) program being used.
- b. Commercial software package or pre-existing (shared) program being used, but some changes are needed in order to satisfy users' requirements.
- c. Completely a custom development, not using any commercial package or pre-existing (shared) program.
- d. Experimental software, intended to be used only once and then discarded.

3. COST. Software would be put into one of the following groupings based on the estimate of the implementing organization of what it will cost to implement the software.
  - a. up to \$50,000
  - b. From \$50,001 to \$250,000
  - c. From \$250,001 to \$1,000,000
  - d. More than \$1,000,000
4. DEGREE OF EXTERNAL IMPACT.
  - a. Any software which will require input from or which will provide output to one or more organizations besides the one actually responsible for its implementation.
  - b. Any software which will not require any input from or provide output to any organization besides the one responsible for its implementation.