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MIL-PRF-32029(MI)
30 June 1998

PERFORMANCE SPECIFICATION
Automated Configuration Management System (ACMS)

This specification is approved for use by the Department of the Army and is available for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers performance requirements for the U.S. Army's Automated Configuration Management System (ACMS). It defines the functional requirements for ACMS, interface characteristics, and the environment in which it must operate.

1.2 ACMS overview

1.2.1 ACMS purpose. The ACMS will provide the Army with a next-generation configuration management and product data management system. It will enable greater access to and sharing of enterprise product data¹ in support of Integrated Product Teams (IPTs); engineering change action processing; and procurement, operations, maintenance, and disposal activities. The primary enhancements ACMS will provide include the following:

- a. Storage and use. ACMS will extend the data types stored and managed, for example engineering models, simulations, and other forms of intelligent product data.
- b. Rapid retrieval. ACMS will enhance the user's ability to rapidly find, retrieve, and control access to product data.

¹ This performance specification uses the term "product data" to refer to all documents and metadata related to a product's requirements, design, implementation, and support. The term "document" has the same meaning as that used in MIL-STD-2549: A self-contained body of information or data which can be packaged for delivery on a single medium. Examples of documents include drawings, reports, standards, databases, application software, and engineering designs. "Metadata" are elements of information that describe data, such as document identifier, date, owner, release level, format, keywords, data location, approval authorizations, part identifier, and part name.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, U.S. Army Aviation and Missile Command, ATTN: AMSAM-RD-SE-TD-ST, Redstone Arsenal, AL 35898-5000, by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

- c. Process automation. ACMS will support automation of business processes such as baseline and release approval, engineering change processing, Technical Data Package (TDP) validation, and integrated product development as supported by IPTs.
- d. Year 2000 compliant. ACMS will provide the Army with a Year 2000 compliant configuration and product data management capability.

1.2.2 ACMS scope. ACMS will be the Army's enterprise configuration management and product data management system. The capabilities of ACMS will support traditional configuration management functions; product structure management; product data management; the assembly, review, validation, update, and dissemination of TDPs; and interfaces with the Joint Computer-aided Acquisition and Logistic Support (JCALS) Workflow Manager and multiple repository systems such as the Joint Engineering Data Management Information and Control System (JEDMICS) and Contractor Integrated Technical Information Service (CITIS) systems. ACMS will enable management of the Army's product data throughout the system life cycle -- from program development through production, sustainment, modification, and, ultimately, disposal.

1.2.3 ACMS vision. ACMS will provide the required data when it is needed and in a form that the user can apply to accomplish the mission. The required data consists of all the product data necessary to completely define an item for the intended purpose of specifying, designing, analyzing, manufacturing, maintaining, sustaining, testing, inspecting, packaging, and dispositioning that item over its entire life span. The ACMS also must operate in a diverse Army environment, integrate with other Army major subordinate command (MSC) business processes, and communicate with other MSC, government, and industry information management systems.

1.2.4 ACMS users, support agencies, and implementing sites. The Army Materiel Command (AMC) Engineering Data Management System (EDMS) Functional Coordinating Group (FCG) ACMS Task Force, as established by the AMC Deputy Chief of Staff for Research, Development and Acquisition, is responsible for defining ACMS and developing this performance specification, which describes the target ACMS.

The EDMS Program Management Office will monitor implementations and record differences. Potential implementation sites include all MSCs and their installations.

The ACMS user community includes, but is not limited to, program managers, configuration managers, design engineers, developers, testers, trainers, logisticians, materiel managers, packaging specialists, and manufacturers to include organic depots and arsenals. Potentially, anyone involved in an IPT, evaluating engineering change actions, or retrieving product data for any reason, is an ACMS user. These users may be located at the MSCs; the Research, Development and Engineering Centers (RDECs); the depots and arsenals; the Defense Logistics Agency (DLA) sites; and at Army product developer sites.

1.2.5 ACMS operation. ACMS will be a federated system of systems. It will be federated in the sense that local sites will manage their own data and support their site unique business processes. It is a system of systems in the sense that all sites will share metadata (see Appendix D - Glossary) that describe the managed product data and will possess capabilities that are common to the whole of ACMS.

As the Army's enterprise product data management system, ACMS will provide visibility into the identity and location of all controlled product data, to include configuration management data, whether the Army has change control authority or not.

ACMS represents a shift in the Army from document-centric data management to product-centric data management. Users will locate and retrieve data from a product structure perspective rather than from a document perspective. This change will enable users to identify desired product data by navigating product structures, searching for and through part families, as well as by traditional approaches such as querying data grouping or classification attributes. Product-centric data management also means that the product structure is a controlled item in addition to, or in place of, documents describing the product structure (for example, the Bill of Materials).

The target ACMS will provide a common set of Army-wide capabilities to include the following:

- a. Provide a single access and control point. ACMS will provide users with a single, common means of finding, accessing and controlling Army enterprise-level product data for which the Army has change control authority.
- b. Promote sharing of data. ACMS will provide users with concurrent access to product data where the data and the users may be geographically dispersed.
- c. Implement data standards. ACMS will read and write MIL-STD-2549 data information packets as a means for exchanging product configuration management metadata, product structure relationships, and documents with Product Data Management (PDM), Configuration Management (CM), authoring, CITIS, and repository systems.
- d. Manage multiple formats. ACMS will provide for the management of a wide variety of product data formats in accordance with international and industry standards, to include Computer Aided Design (CAD) model formats, so that government- and contractor-created data can be maintained, located, and used with no loss of data intelligence.
- e. Automate product data management. ACMS will automate Army product data management functions to include data capture, storage, location, retrieval, access control, and transmittal, as well as configuration management of data, quality control of data, and system administration.
- f. Manage Army-controlled product structures. ACMS will provide for creating, storing, maintaining, and managing changes to links (relationships) between elements of product structures (for example, parts, components, and assemblies) for which the Army is the Current Document Change Authority (CDCA).
- g. Access contractor-controlled product structures and product data. ACMS will provide the ability to find, copy, view, and print product structures and product data when the Army is not the CDCA.
- h. Associate product structure elements with appropriate product data. ACMS will provide for creating, storing, and controlling the associations between product

structure elements and the product data that describe those elements for which the Army is the CDCA. ACMS will provide the ability to find, copy, view, and print the associations for which the Army is not the CDCA.

- i. Manage workflow. ACMS will provide for work process definition, routing, status tracking, and performance analyses of modeled processes.
- j. Provide configuring capabilities. ACMS will be flexible and customizable in its ability to meet the unique information needs of individual MSCs. ACMS will provide system administrator-level tools for configuring ACMS to support information interchange within an Army site in accordance with each site's business processes and product data needs, while providing information to off-site users. These tools will permit configuring the system without writing source code or recompiling unaffected software modules.
- k. Provide customization and integration capabilities. ACMS will be flexible and customizable in its ability to meet the unique functional needs of individual MSCs and to interact with other data management systems. ACMS will provide customization and integration tools for tailoring ACMS to extend existing functionality, add new functions, provide new methods for interacting with users, and interface with other data management systems, data authoring systems, and viewing systems.

Specific applications of ACMS are discussed further in the appendices. Appendix A, ACMS Concept Overview, provides information relative to the nature and roles of the ACMS. Appendix B, ACMS Support of Army Products and Data Life Cycles, and Appendix C, ACMS Support to Selected Business Processes, provide information relative to the use of the ACMS.

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in Sections 3 and 4 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements documents cited in Sections 3 and 4 of this specification, whether or not they are listed.

2.2 Government documents

2.2.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement there to, cited in the solicitation (see 6.2).

DEPARTMENT OF DEFENSE STANDARDS

MIL-STD-2549 - Configuration Management Data Interface

DEPARTMENT OF DEFENSE HANDBOOKS

MIL-HDBK-881 - Work Breakdown Structures

(Unless otherwise indicated, copies of the above specifications, standards, and handbooks are available from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

2.3 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Operating requirements. This section describes the functional features of the ACMS as seen from a user's point of view. It communicates an ACMS in terms of the user needs it will fulfill, its relationship to existing systems or procedures, and the ways it will be used. A strategy for tailoring the following requirements to meet Army interoperability and unique environmental constraints and performance requirements is given in section 6.2.4.

3.1.1 Product data management requirements

3.1.1.1 Product data control requirements

3.1.1.1.1 Data storage requirements

3.1.1.1.1.1 Provide secure data storage. ACMS shall provide for secure storage of product data (see Appendix D) in accordance with defined access control permissions and rules (see Access Control Requirements and User Authorization and Management Requirements). Secure storage is defined as the ability to preclude stored information from being viewed, reused, updated, or deleted without invoking system rules.

3.1.1.1.1.2 Store product data. ACMS shall provide the ability to store both CM and non-CM controlled product data in a single and distributed vault.

3.1.1.1.1.3 Store CM-controlled product data. ACMS shall store configuration controlled product data in a vault that does not allow the user to overwrite data.

3.1.1.1.1.4 Store non-CM controlled product data. ACMS shall allow the user to choose whether to store non-configuration controlled product data in a vault that does not overwrite data or in a vault that does overwrite data.

3.1.1.1.2 Access control requirements

3.1.1.1.2.1 Check identity and authorizations. ACMS shall provide for checking the identity and authorizations of users and restrict access as defined by access control permissions and rules (see User Authorization and Management Requirements).

3.1.1.1.2.2 Suppress unauthorized functions. ACMS shall suppress functions not available to a user due to access restrictions. For example, an administrative menu tree may be accessible (that is, highlighted and active) only to users with administrator permission or the ability to modify a workflow may be suppressed for users who are not authorized to modify workflows.

3.1.1.1.2.3 Provide user feedback. ACMS shall provide a message box that notifies a user that the user has been denied access to controlled product data or to restricted functions.

3.1.1.1.2.4 Provide check-in capability. ACMS shall provide the capability to check-in data from a user's workspace to the vault in accordance with user or file permissions in such a way that created, modified, or promoted product data is placed under the security, access, change, and release control of ACMS.

3.1.1.1.2.5 Accept default destination. ACMS shall provide the capability to check product data into a default location (physical or logical) without requiring the user to specify a location. The system will automatically determine the proper location based upon one or more criteria such as the following: user identifier, client locations, project, data type, and/or server installation.

3.1.1.1.2.6 Permit path override. ACMS shall allow the user to override the system's default and specify a particular location for the check-in.

3.1.1.1.2.7 Lock checked-out product data. ACMS shall provide the capability to check-out product data such that it is locked and prevents multiple users from modifying the data simultaneously.

3.1.1.1.2.8 Permit copying checked-out product data. ACMS shall allow users to copy and modify product data which has been checked-out by another user. This would create a separate instance of the product data.

3.1.1.1.2.9 Identify check-out user. ACMS shall provide the ability to identify which user has checked-out product data from the vault.

3.1.1.1.2.10 Provide location-independent check-out. ACMS shall allow a user to check product data out from a location (physical or logical) without requiring the user to specify the data's location.

3.1.1.1.2.11 Cancel check-out. ACMS shall provide the capability to cancel a "check-out" without modifying the product data.

3.1.1.1.3 Data locating requirements

3.1.1.1.3.1 View product configuration. ACMS shall provide a means for viewing a product's configuration via the links established between product structure elements. This in turn is used to find a specific item within the product's configuration. In other words, navigation uses the links as a means to view a product configuration which in turn is used to find a specific item within the product's configuration.

3.1.1.1.3.2 Navigate host site product structures. ACMS shall provide the capability to locate product data stored at the user's host ACMS site by navigating product structures hierarchically through on-screen graphical representations.

3.1.1.1.3.3 Search host site product structures. ACMS shall provide the capability to locate product data stored at the user's host ACMS site by searching a product structure. Searching a product structure involves querying product structure element attributes.

3.1.1.1.3.4 Provide host site product data retrieval. ACMS shall provide the capability to retrieve and display product data stored at the user's host ACMS site that has been located by navigating or searching product structures.

3.1.1.1.3.5 Navigate non-host site product structures. ACMS shall provide the capability to locate product data stored at ACMS sites other than the user's host site by navigating product structures hierarchically through on-screen graphical representations.

3.1.1.1.3.6 Search non-host site product structures. ACMS shall provide the capability to locate product data stored at ACMS sites other than the user's host site by searching a product structure.

3.1.1.1.3.7 Provide non-host site product data retrieval. ACMS shall provide the capability to retrieve and display product data stored at ACMS sites other than the user's host site that have been located by navigating or searching product structures.

3.1.1.1.3.8 Locate where-used. ACMS shall provide the capability to find where a product structure element is used in all product structures.

3.1.1.1.3.9 Determine product structure elements used. ACMS shall provide the capability to determine what product structure elements are used in a given product structure.

3.1.1.1.3.10 Define valid relationship types. ACMS shall provide the capability to create, modify, and delete site-unique link types which describe relationships (for example, product data to product data, and product structure element to product data).

3.1.1.1.3.11 Relate product data. ACMS shall provide the capability to create, navigate, and maintain links (relationships) between product data. Example links include, but are not limited to, association of product data to its source data, earlier revisions, and approved change action documents.

3.1.1.1.3.12 Relate product structure elements and product data. ACMS shall provide the capability to apply links between product structure elements and product data.

3.1.1.1.3.13 Define valid relationship rules. ACMS shall provide the capability to implement rules which govern the behavior of link types (for example, types of product structure elements and product data which can be associated via a particular link type).

3.1.1.1.3.14 Create groupings. ACMS shall have the capability to group like product structure elements based on a minimum set of required attributes and attribute values. Each grouping will have a different set of required attributes and attribute values.

3.1.1.1.3.15 Arrange groupings. ACMS shall provide the ability for product structure element groupings to be arranged hierarchically.

3.1.1.1.3.16 Query product data. ACMS shall provide the ability to query product data, to include metadata, for specific attribute values, ranges of values, values within a percentage of a given value, and logical combinations using Boolean operations.

3.1.1.1.3.17 Support queries. ACMS shall allow for storing and retrieving queries and for creating ad-hoc queries.

3.1.1.1.3.18 Support various query methods. ACMS shall allow for fill-in-the-blank, wild card, and command line queries.

3.1.1.1.3.19 Retrieve based on query results. ACMS shall provide the capability to select and retrieve product data from the query results without additional navigation.

3.1.1.1.3.20 Track revision compatibility. ACMS shall automatically track and maintain proper revision compatibility for documents and document representations (see Appendix D) as product data files change.

3.1.1.1.4 Release and metadata management requirements

3.1.1.1.4.1 Support electronic approvals. ACMS shall provide for electronic indication of approval for product data release, along with the name of the approver and a date and time stamp.

3.1.1.1.4.2 Track revision and release status. ACMS shall maintain document and document representation revisions, document representation release status, document approval status, and date and time stamps for product data files.

3.1.1.1.4.3 Provide for metadata maintenance. ACMS shall provide the capability to update metadata.

3.1.1.1.5 Audit history requirements

3.1.1.1.5.1 Record audit history. ACMS shall provide an audit history of all adds, changes, deletes, and document transport transactions. All history records will have a date/time stamp and indicate the user performing the function. History records also will include full add information, the from and to conditions for changes, and full delete information. "Full add and delete information" implies the system captures a complete record of the record that changes. "From/to change information" implies the system only captures the from and to information for the fields that change and the values of the fields that are the record keys.

3.1.1.1.5.2 View audit history. ACMS shall provide the capability to view all audit history records.

3.1.1.2 Workflow management requirements

3.1.1.2.1 Workflow definition requirements

3.1.1.2.1.1 Create and save workflow templates. ACMS shall provide the capability to create, save, retrieve, and reuse pre-defined workflow templates that automate regular and repeatable processes.

3.1.1.2.1.2 Create ad hoc workflows. ACMS shall provide the ability to create ad hoc workflows that automate ad hoc processes.

3.1.1.2.1.3 Support workflow steps, timing, and dependencies. ACMS shall be capable of incorporating sequential, parallel, and conditional steps for both predefined and ad hoc workflows.

3.1.1.2.1.4 Specify workflow rules. ACMS shall provide the capability to establish voting and time-out rules for both predefined and ad hoc workflows.

3.1.1.2.1.5 Create action triggers. ACMS shall support creating action triggers for both predefined and ad hoc workflows.

3.1.1.2.1.6 Associate product data. ACMS shall provide the capability to associate product data with a workflow, save the association, retrieve the workflow and associated product data, and reuse the workflow and associated product data as a new instance of the workflow.

3.1.1.2.2 Workflow execution requirements

3.1.1.2.2.1 Monitor workload. ACMS shall provide the ability to determine the progress of a workflow and to monitor the workload of resources associated with multiple workflows.

3.1.1.2.2.2 Record workflow history. ACMS shall provide for capturing information on the performance of a workflow (for example, how long someone has had a folder, and how long the workflow took to execute) and to review the events and results associated with the workflow.

3.1.1.2.2.3 Generate event notifications. ACMS shall be capable of generating and disseminating event notifications for both predefined and ad hoc workflows.

3.1.1.2.2.4 Edit workflow. ACMS shall provide users with the ability to edit pre-defined or ad hoc workflows including during execution.

3.1.1.2.2.5 Route product data via workflow. ACMS shall provide the capability to execute a defined workflow.

3.1.1.2.2.6 Provide event-based triggers. ACMS shall provide for the initiation of a workflow step based upon the occurrence of a pre-defined event.

3.1.1.2.2.7 Send electronic messages. ACMS shall provide the capability to send system (including automatically generated event triggered messages) and user electronic messages to multiple recipients who may or may not be ACMS users.

3.1.1.2.2.8 Provide electronic sign-off. ACMS shall provide for electronic indication of approval or authorization through a mechanism that guarantees the authenticity of the approver such as a second-level password that must be entered for the sign-off to become valid. For example, this may be used to signify task completion, product sign-off, or engineering change action approval.

3.1.1.2.2.9 Record comments and votes. ACMS shall record comments and votes from the appropriate users.

3.1.1.3 Product structure management requirements

3.1.1.3.1 Product structure creation and maintenance requirements

3.1.1.3.1.1 Create and associate product structure elements. ACMS shall provide the capability to create and associate product structure elements.

3.1.1.3.1.2 Maintain product structure. ACMS shall provide the capability to add, delete, or replace specific product structure elements in a product structure.

3.1.1.3.1.3 Represent product structure hierarchically. Product structure representations within ACMS shall be hierarchical.

3.1.1.3.1.4 Maintain product structure element revisions. ACMS shall provide the capability to create and modify revisions of product structure elements. These revisions can be either released or non-released revisions.

3.1.1.3.1.5 Accommodate multiple revisions. ACMS shall accommodate multiple released revisions and non-released revisions of product structure elements.

3.1.1.3.1.6 Maintain product structure revisions. ACMS shall increment the product structure revision indicator based on defined rules such as when the product structure is changed by adding, modifying, or deleting particular product structure element revisions, effectivities, or options such as alternative or substitute parts.

3.1.1.3.1.7 Maintain effectivity. ACMS shall provide the capability to create and maintain information on when a product structure element revision is valid for use in assembling a particular configuration of a product.

3.1.1.3.1.8 Support multiple baseline effectivities. ACMS shall support multiple baselines within a particular product structure and be able to specify the effectivity of each baseline using various methods such as serial number, end item, lot, block, production date, product unit identification, and matched sets to support as-built and as-modified configurations.

3.1.1.3.1.9 Identify product structure element options. ACMS shall provide the capability to identify product structure element options such as alternate or substitute parts.

3.1.1.3.2 Viewing and reporting requirements

3.1.1.3.2.1 Provide multiple product structure views. ACMS shall provide the capability to create, display, and print various views of a product structure. Example views include a designer's view, a manufacturer's view, and a program manager's view or a view of Configuration Items (CIs – see Appendix D).

3.1.1.3.2.2 Provide various product structure reports. ACMS shall provide the capability to create, store, display, and print various product structure reports.

3.1.1.4 Program management requirements

3.1.1.4.1 Maintain WBS and relate product data to tasks. ACMS shall provide the capability to create and maintain a project work breakdown structure (WBS) as described in MIL-HDBK-881 and allow users to relate ACMS controlled product data and product structures to the WBS tasks.

3.1.1.5 Data translation requirements

3.1.1.5.1 Add translators. ACMS shall include the capability to incrementally add product data translators.

3.1.1.5.2 List available translators. ACMS shall provide a list of translators accessible via ACMS and the formats each translator accepts and creates.

3.1.1.5.3 Provide automatic translation services. ACMS shall provide the capability to automatically translate product data to pre-specified formats in response to event triggers or workflow prompts.

3.1.1.5.4 Provide default translation parameters. ACMS shall provide default translation parameters that may be modified by the user. Example parameters include product data destination, location, name, and format.

3.1.1.5.5 Translate product data. ACMS shall provide the capability to schedule and route product data to appropriate product data translators, apply default settings for translations, initiate the translation, and route the output to the user.

3.1.1.6 Imaging services requirements

3.1.1.6.1 Create and display viewable images. ACMS shall provide the capability to create and display viewable images.

3.1.1.6.2 Add viewer applications. ACMS shall support the integration of additional viewer applications beyond those originally specified.

3.1.1.6.3 Support viewable image review. ACMS shall provide the capability for multiple reviewers to red-line, mark-up, and provide annotations to viewable images.

3.1.1.6.4 Maintain distinct red-lines. ACMS shall ensure that individual reviewer red-lines and annotations are kept distinct.

3.1.1.6.5 Print viewable images and redlines. ACMS shall provide the capability to print viewable images and redlines.

3.1.1.7 System administration requirements

3.1.1.7.1 User authorization and management requirements

3.1.1.7.1.1 Create user information. ACMS shall provide the capability to create and modify user information and access permissions.

3.1.1.7.1.2 Limit user access. ACMS shall be a secure system accessible only by authorized users

3.1.1.7.1.3 Create and modify identities, roles, and groups. ACMS shall provide the capability to create and modify user identities, roles, and groups.

3.1.1.7.1.4 Assign permissions. ACMS shall provide the capability to assign access permissions to roles, groups, and users.

3.1.1.7.1.5 Assign roles to groups. ACMS shall provide the capability to assign roles to groups.

3.1.1.7.1.6 Assign users to roles within groups. ACMS shall provide the capability to assign users to roles within groups. This means a user's role assignment is only valid for the specified group or groups.

3.1.1.7.1.7 Tailor user's role and group permissions. ACMS shall provide the capability to tailor role and group permissions for a specific user.

3.1.1.7.1.8 Provide rule-based access control. ACMS shall provide the capability to establish rules based on user identity and defined needs, user group, user role, file type, or document release status.

3.1.1.7.1.9 Associate product structures and product data to groups. ACMS shall provide the capability to associate product structures and product data to groups. This can be used, for example, as the means for restricting access based on Army products, product structures, file type, or release status.

3.1.1.7.1.10 Limit access. ACMS shall limit a user's access to product structures and product data based on the most restrictive access permissions specified for the user, the role assigned to the user, or the group to which the user and role are assigned.

3.1.1.7.2 Distributed data environment management requirements

3.1.1.7.2.1 Manage distributed data environment. ACMS shall provide the capability to maintain, coordinate, and synchronize a distributed data environment for metadata and documents that includes multiple sites, multiple servers, multiple networks, and multiple repositories.

3.1.1.7.2.2 Manage multiple repositories and PDM vaults. ACMS shall provide the capability to maintain, coordinate, and synchronize multiple Product Data Management (PDM) systems.

3.1.1.7.3 Archive, backup, and restore management requirements

3.1.1.7.3.1 Archive and backup ACMS. ACMS shall provide the capability to create and maintain continuous transaction logs, backups, and archives.

3.1.1.7.3.2 Restore ACMS. ACMS shall provide the capability to restore the system using transaction logs and backups in support of normal data protection operations and Continuity of Operations Plans (COOPs).

3.1.1.7.3.3 Retrieve from archives. ACMS shall provide the capability to retrieve data from off-line archival storage to support COOPs.

3.1.1.7.4 Tailoring requirements

3.1.1.7.4.1 Create and modify metadata defaults. ACMS shall provide the system administrator with the ability to create and modify default values for metadata.

3.1.1.7.4.2 Customize user interface. ACMS shall provide the system administrator with the capability to customize the user interface.

3.1.1.7.4.3 Customize system messages and terminology. ACMS shall provide the system administrator with the capability to customize the system messages, terminology, and on-line help.

3.1.1.7.4.4 Add new functionality. ACMS shall provide the system administrator with the capability to add new functionality such as defining new metadata elements, associating them with product structures and product data, and defining queries and reports.

3.1.1.7.4.5 Create electronic forms. ACMS shall allow the system administrator to create electronic forms for ACMS users. Examples include data check-in, data release, and engineering change action electronic forms.

3.1.1.7.5 System security and monitoring requirements

3.1.1.7.5.1 Required security level. ACMS shall provide Confidentiality, Integrity, Identification and Authentication, and Audit capabilities to be certified at a C2 security level. Proper procedures and configuration requirements will be identified to adequately protect Sensitive But Unclassified (SBU) data as defined by the Department of Defense (DoD) and the Department of the Army.

3.1.1.7.5.2 Establish security controls. ACMS shall provide capabilities that enable the system administrator to establish security controls and monitor the system for security violations.

3.1.1.7.5.3 Provide virus checking. ACMS shall provide controls to protect the system and data from contamination by unauthorized computer programs or data such as viruses.

3.1.1.7.5.4 Record unauthorized access attempts. ACMS shall record unauthorized attempts to access ACMS data and shall deny ACMS use to users whose unauthorized attempts have reached the specified maximum threshold.

3.1.1.7.6 Performance monitoring requirements

3.1.1.7.6.1 Monitor system performance and usage. ACMS shall provide the system administrator the capability to monitor system performance and usage.

3.1.1.7.6.2 Provide rule-based performance controls. ACMS shall provide a method for the system administrator to configure system usage rules in order to maximize system performance.

3.1.2 Configuration management requirements

3.1.2.1 Configuration management data exchange requirements

3.1.2.1.1 Process data information packets. ACMS shall provide the capability to accept, create, validate, store, retrieve, modify, and archive data information packets as defined in MIL-STD-2549.

3.1.2.2 Configuration planning requirements

3.1.2.2.1 Manage program management documents. ACMS shall provide the capability to identify, store, retrieve, and display Program Management documents in a vault. Program Management documents include Acquisition Strategy, Configuration Management Plans, Audit Plans, Interface Control Agreements and other documents associated with the management and control of Army products and programs, assemblies, and components for the purpose of CM activity support.

3.1.2.2.2 Determine contract data requirements. ACMS shall provide the capability to determine, record, and display the types of MIL-STD-2549 data information packets required as contract deliverables.

3.1.2.2.3 Record CM activity management data. For each CM activity (see Appendix D), ACMS shall provide workflow capabilities to record, retrieve, reuse, and display CM activity data which may include the following: participants, reviewers, responsible activity name, location, Point of Contact, decision authority, phone numbers, action items, milestones, and related dates (for example, decision date, audit date, and review suspense dates).

3.1.2.2.4 Generate CM performance statistics. ACMS shall generate performance statistics for on-line display and in reports on CM activities (see Appendix D), for the purpose of continuous improvement. Performance statistics will provide data that identifies any backlog, bottleneck and errors.

3.1.2.3 Configuration identification requirements

3.1.2.3.1 Establish configuration items and their identifiers. ACMS shall provide the capability to assign, record, and display CI identifiers at all levels within the product structure.

3.1.2.3.2 Record metadata and assign unique identifiers. ACMS shall provide the capability to assign, record, and display metadata and unique identifiers for product structure elements and documents.

3.1.2.3.3 Create metadata elements. ACMS shall provide the capability to create, update, and delete metadata elements associated with product structure elements and documents.

3.1.2.3.4 Create relationships. ACMS shall provide the capability to create relationships between and record metadata about the relationship between items such as CIs, product structure elements and documents to include change and audit actions. Examples include CI to CI and CI to part.

3.1.2.3.5 Identify revisions. ACMS shall provide the capability to identify, record, and display the current and all previous document revision identifiers.

3.1.2.3.6 Support obsolescence review. ACMS shall provide the capability to assign, record and display metadata about obsolete parts and their replacements, and to establish a relationship between the obsolete parts, their replacements, and configuration management data.

3.1.2.4 Configuration audit requirements

3.1.2.4.1 Record configuration audit activities. ACMS shall support functional, physical, and incremental configuration audits by providing document support (see Appendix D); recording pre-audit schedule, agenda, rules, participation, comments, audit dates, facilities, and assignment of audit actions; tracking the status and results of audit actions; and recording the history of all audit activity.

3.1.2.5 Configuration control requirements

3.1.2.5.1 Store baselines. ACMS shall provide the capability to create, store, retrieve, and display configuration baselines (functional baseline, allocated baseline, product baseline, technical baselines, and incremental baselines).

3.1.2.5.2 Perform baseline compare. ACMS shall provide the capability to compare multiple views (for example, CIs, product structure elements, and documents) of baselined documents and identify differences both on-line and in reports.

3.1.2.5.3 Record and review engineering change actions. ACMS shall provide the capability to create, assign, record, retrieve, and display the metadata and unique identifiers of engineering change actions, and retrieve and display variances to the configuration documentation and hardware or software. Examples of engineering change action metadata include originators, disposition and date of disposition.

3.1.2.5.4 Review change history. ACMS shall provide the capability to retrieve and display the history of engineering change actions for a particular product structure element and document.

3.1.2.5.5 Provide CCB information. ACMS shall record, retrieve, and display Configuration Control Board (CCB) information such as membership; members of interfacing activities; CCB Directives; and descriptions of any action items.

3.1.2.6 Status accounting requirements

3.1.2.6.1 Record field configuration. ACMS shall provide the capability to record, retrieve, and display "as built" and "as modified" configurations resulting from the installation and removal of assemblies, components, parts, and material whether serialized or tracked by lot or batch.

3.1.2.6.2 Provide reports . ACMS shall provide reports essential for performing engineering/logistics analysis, configuration baselines, performing comparison analysis, and status of the system configuration throughout the life cycle.

3.1.3 Tech Loop requirements

3.1.3.1 Tech Loop creation and maintenance

3.1.3.1.1 Record Tech Loop activity. ACMS shall provide the capability to record information about Tech Loop activities including technical reviewers and electronic authorizations, responsible activity, milestones, action items, and related dates, allowing for multiple parallel processing.

3.1.3.1.2 Establish Tech Loop identifiers. ACMS shall provide the capability to assign, record, and display metadata and unique identifiers for each action routed through the Tech Loop review (for example, Procurement Request Order Number (PRON), top part number, type of procurement, Army product or program, first article requirements, serialization requirements, comments, procurement source information, documentation availability/status as it relates to procurement actions, and the Acquisition Method Code/Acquisition Method Suffix Code (AMC/AMSC), as well as other required attributes from the Procurement Work Directive (PWD)).

3.1.3.1.3 Record procurement history data. ACMS shall provide the capability to record, retrieve, reuse, and display the workflows and associated product data corresponding to the current and all previous Tech Loop actions.

3.1.3.1.4 Establish relationships. ACMS shall provide the capability to establish relationships and identify metadata about those relationships between Tech Loop actions and the results of the Tech Loop evaluation.

3.1.3.1.5 Attach documents to actions. ACMS shall provide the ability to attach documents to Tech Loop actions.

3.1.3.1.6 Identify and link similar procurement actions. ACMS shall have the ability to identify and automatically link current procurement requests that have the same part number and Government Furnished Equipment/Government Furnished Material (GFE/GFM) suppressions.

3.1.3.1.7 Bundle procurement requests. ACMS shall have the ability to search, group and process as a single procurement action, procurement requests, based on user defined attributes.

3.1.3.2 Support Tech Loop reviews

3.1.3.2.1 Compare baselines. ACMS shall provide the capability to compare baselines established as part of a Tech Loop review and identify differences (see Configuration Control Requirements "Store Baselines", see 3.1.2.5.1, and "Perform Baseline Compare", see 3.1.2.5.2).

3.1.3.2.2 Support DFARS Appendix E screening. ACMS shall provide an automated Defense Federal Acquisition Regulation Supplement (DFARS) Appendix E, “DoD Spare Parts Breakout Program”, screening questionnaire to be used during the Tech Loop review.

3.1.3.2.3 Support Hazardous Materials (HAZMAT) screening. ACMS shall provide the capability to assign, record, and display metadata and unique identifiers in support of the hazardous material screening during Tech Loop review (for example, electronic bulletin board, status forms, internal messaging, alternate solutions).

3.1.3.2.4 Establish HAZMAT relationships. ACMS shall provide the capability to establish relationships between hazardous material data and product data.

3.1.3.3 Generate Tech Loop reports

3.1.3.3.1 Generate reports. ACMS shall provide the reports essential for performing Tech Loop reviews including the capability for procurement specific suppressions/omissions.

3.2 Interface requirements. This section presents the following types of interface requirements:

- a. External interface requirements specify external systems with which ACMS must interact.
- b. Internal interface requirements define the interconnection of functions of functional areas within the system.
- c. User interface requirements specify or constrain content, formats, timing, and other factors associated with the interaction between ACMS and the user.

3.2.1 External interface requirements

3.2.1.1 Process data information packets. For requirements pertaining to exchanging MIL-STD-2549 Data Information Packets, see 3.1.2.1.

3.2.1.2 Send e-mail. ACMS shall use Simple Mail Transfer Protocol (SMTP) for interfaces with e-mail systems.

3.2.1.3 Provide generic API. ACMS shall provide a published and supported Application Program Interface (API) that allows external applications to invoke all ACMS functions.

3.2.1.4 Launch applications. ACMS shall provide the capability to launch user applications based on events, user actions, times, and/or file types. Applications that must be launched from ACMS include the following: readers, viewers, word processors, spreadsheets, and CAD packages.

3.2.1.5 Interface with MEARS. ACMS shall be capable of dynamic interface (see Appendix D) with the Multi-user Engineering Change Proposal Automated Review System (MEARS) to exchange engineering change actions and associated metadata.

3.2.1.6 Interface with ECALS. ACMS shall be capable of dynamic interface with the Engineering Changes at Light Speed (ECALS) system to exchange engineering change actions and associated metadata.

3.2.1.7 Interface with CARS. ACMS shall be capable of dynamic interface with the Computer Aided Requirements System (CARS) to exchange engineering change actions and associated metadata.

3.2.1.8 Interface with CCSS 404. ACMS shall be capable of batch loading data from the Commodity Command Standard System (CCSS)_ 404 application.

3.2.1.9 Interface with CCSS for DFARS Appendix E. ACMS shall be capable of batch loading data from CCSS for DFARS Appendix E Screening Questionnaire.

3.2.1.10 Interface with CCSS for Sector 2800. ACMS shall be capable of batch loading data to/from CCSS for Sector 2800.

3.2.1.11 Interface with CCSS for Competition Management. ACMS shall be capable of batch loading data from CCSS for Competition Management.

3.2.1.12 Interface with Flight Safety. ACMS shall be capable of batch loading data from the Flight Safety Parts database.

3.2.1.13 Interface with IHS. ACMS shall be capable of batch loading metadata from Information Handling Services (IHS).

3.2.1.14 Interface with DoDISS Assist. ACMS shall be capable of batch loading metadata from DoDISS Assist.

3.2.1.15 Interface with JCALS Workflow Manager. ACMS shall be capable of a dynamic interface with JCALS Workflow Manager.

3.2.1.16 Interface with JEDMICS. ACMS shall be capable of dynamic interface with JEDMICS.

3.2.1.17 Interface with Field Maintenance Systems. ACMS shall be capable of interfacing/batch loading field maintenance data systems/data. An example is the Aviation Maintenance Data Management System.

3.2.1.18 Interface with Depot Maintenance Systems. ACMS shall be capable of interfacing/batch loading depot maintenance data systems/data. An example is the Standard Depot System.

3.2.1.19 Update PASS. ACMS shall provide the capability to update the Procurement Aging and Staging System (PASS) at pre-determined processing points via a dynamic interface.

3.2.2 Internal interface requirements. No internal interface requirements have been specified for the ACMS. All internal interfaces are left to the design or to requirement specifications for ACMS components.

3.2.3 User interface requirements

3.2.3.1 Provide on-line help. The ACMS user interface shall provide context-sensitive, indexed, and searchable on-line help to users.

3.2.3.2 Provide on-line documentation. The ACMS user interface shall provide users the ability to view ACMS documentation on-line, such as, user and administrator manuals.

3.2.3.3 Include help table of contents, examples, and demonstrations. ACMS shall provide on-line help that includes a Table of Contents, Examples, and Demonstrations.

3.2.3.4 Provide graphical user interface. The predominate ACMS user interface shall be a graphical user interface.

3.2.3.5 Provide web-browser interface. ACMS shall provide a web-browser user interface with full ACMS functionality.

3.3 Ownership and support requirements. This section specifies user skill requirements, system training requirements, system maintenance requirements, and system performance requirements.

3.3.1 Require minimal basic training. Training of a basic ACMS user shall require no more than three work days. After training, the basic user should be able to sign on to the system, navigate product structures, locate and retrieve data, and execute tasks received from a workflow.

3.3.2 Require minimal administrative training. Training in administration of ACMS shall require no more than 10 work days. This training shall encompass all functionality available to administrative users.

3.3.3 Require on-line backup. ACMS shall have an on-line backup capability.

3.3.4 Require minimal restoration time. ACMS COOP restorations from backups shall take no longer than 40 hours given a database of 11 million records.

3.3.5 Meet performance goals. ACMS shall demonstrate the following performance characteristics on stored data that is isolated from the organization's general purpose wide area network:

- a. Product Structure Navigation - 1 second
- b. Internally retrieve/view simple documents - 5 seconds
- c. Internally retrieve/view raster drawings - 5 seconds
- d. Internally retrieve/view engineering models - 5 seconds
- e. Change data object attributes - 1 second
- f. System Navigation - 1 second
- g. Simple Queries - 1 second
- h. Complex Queries - 5 seconds.

3.3.6 Runtime performance for reports. ACMS shall demonstrate runtime performance for standard reports, AMC wide reports, and MSC unique reports as follows:

<u>Report Type</u>	<u>Number of documents/parts</u>		
	<u><250</u>	<u>251 - 1000</u>	<u>1001 - 5000</u>
Generation Breakdown List (GBL)	1 minute	3 minutes	2.5 hours
Procurement Technical Data Package List (TDPL)	1 minute	3 minutes	2.5 hours

CM TDPL	1 minute	3 minutes	2.5 hours
Engineering Data List (EDL)	1 minute	3 minutes	2.5 hours
Parts List	1 minute	1 minute	1 minute

3.3.7 Be Year 2000 compliant. ACMS shall be Year 2000 compliant.

3.4 Operating environment requirements. This section specifies requirements constraining the environment under which the ACMS will be expected to operate. The environmental constraints are organized into the following subsections: Client workstation requirements, Network requirements, and Server requirements. All of the following requirements must be tailored by the implementing command at the time of acquisition.

3.4.1 Client workstation requirements

3.4.1.1 Support client workstation: platform type. ACMS shall be capable of providing client functionality and performance as described in this specification on the following platforms:

- a. IBM compatible PCs running MS Windows 3.x, 95, and NT operating systems
- b. Silicon Graphics workstations running UNIX/IRIX
- c. Sun workstations running Solaris
- d. HP/Apollo workstations running HP-UX
- e. Macintosh
- f. Intergraph workstations running CLIX
- g. X-Terminals running under IRIX/UNIX/Solaris operating systems.

3.4.1.2 Support client workstation: minimum memory. ACMS shall be capable of providing client functionality and performance as described in this specification on platforms with at least 100 megabytes of disk storage and at least 32 megabytes of random access memory (RAM).

3.4.1.3 Support client workstation: minimum processor speed. ACMS shall be capable of providing client functionality and performance as described in this specification on platforms with processor speeds of at least 90 megahertz.

3.4.2 Network requirements

3.4.2.1 Support network protocols. ACMS shall be capable of operating in a client-server networked environment using TCP/IP, NFS, or IPX/SPX.

3.4.2.2 Support network operating systems. ACMS shall be capable of operating in a client-server Windows NT, Banyan Vines, or Novell networked environment.

3.4.2.3 Support maximum number of users. ACMS shall be capable of supporting up to 4,000 users total and up to 200 users simultaneously at any one implementation.

3.4.3 Server requirements

3.4.3.1 Support server: platform types. ACMS server software shall be capable of operating on platforms, that include, but are not limited to the following: Sun workstations running UNIX, Silicon Graphics workstations running UNIX, IBM Compatible Pentium PCs running Windows NT Server; or Hewlett Packard HP9000/800 K Series running HP-UX.

3.4.3.2 Support server: disk space. ACMS server software shall be capable of operating on platforms with disk storage of 240 gigabytes for system software and data file storage requirements.

3.4.3.3 Support server: RAM. ACMS server software shall be capable of operating on platforms with RAM of 2.1 gigabytes.

3.4.3.4 Support server: processor speed. ACMS server software shall be capable of operating on platforms with aggregate processing speeds of 800 megahertz.

4. VERIFICATION

This section specifies the types of verifications to be performed to determine that ACMS conforms to the Section 3 requirements.

4.1 Verification methods. Each requirement shall be verified. Methods used to verify ACMS requirements shall include test, evaluation, and analysis as described below.

4.1.1 Test (T). Verification by test involves confirming that a requirement is met by operating the system, or part of the system, using a specific set of conditions, observing the system's operation and recording the success or failure. The specific conditions may include specific scenarios that simulate real operational conditions using real data. Detailed test procedures shall be prepared to verify the ACMS requirements that use the Verification method – Test, as specified in Table I. Requirements may be combined into logical groupings to test multiple requirements in a single procedure. The last steps of the procedure may include evaluation of the output (or results) generated as part of the test procedure. This evaluation shall be procedure specific and not a combination of procedures.

4.1.2 Evaluation (E). Verification by evaluation involves review of documentation and a value assessment of training. Evaluation via document review includes examination of descriptive documents to ensure what is described is what is required. Descriptive documents can include, but are not limited to, requirements documents, design documents, concept of operation and scenario documents, and graphical, management and analysis outputs from Computer Assisted Software Engineering (CASE) tools. Evaluation of training shall include user feedback and tests of users to determine their level of expertise on the system.

4.1.3 Analysis (A). Verification by analysis is accomplished by processing accumulated data obtained during controlled operation of the system during other verification methods. Analysis includes conclusions drawn from quantitative results, modeling based on system design and performance, and the extension of test-produced data to untested conditions. Analysis results shall be compiled into a single comparative report.

4.2 Verification requirements. Table I indicates the verification method to be used for each ACMS requirement. The contractor shall develop detailed test procedures for each implementation site to verify that the requirements listed in Table I have been satisfied. All

contractor test procedures shall be subject to Government approval. The contractor shall allow and assist the Government in monitoring contractor testing.

TABLE I. ACMS verification requirements

Paragraph Number	Requirement Title	Verification Method
3.1.1.1.1.1	Provide secure data storage	T
3.1.1.1.1.2	Store product data	T
3.1.1.1.1.3	Store CM-controlled product data	T
3.1.1.1.1.4	Store non-CM controlled product data	T
3.1.1.1.2.1	Check identity and authorizations	T
3.1.1.1.2.2	Suppress unauthorized functions	T
3.1.1.1.2.3	Provide user feedback	T
3.1.1.1.2.4	Provide check-in capability	T
3.1.1.1.2.5	Accept default destination	T
3.1.1.1.2.6	Permit path override	T
3.1.1.1.2.7	Lock checked-out product data	T
3.1.1.1.2.8	Permit copying checked-out product data	T
3.1.1.1.2.9	Identify check-out user	T
3.1.1.1.2.10	Provide location-independent check-out	T
3.1.1.1.2.11	Cancel check-out	T
3.1.1.1.3.1	View product configuration	T
3.1.1.1.3.2	Navigate host site product structures	T
3.1.1.1.3.3	Search host site product structures	T
3.1.1.1.3.4	Provide host site product data retrieval	T
3.1.1.1.3.5	Navigate non-host site product structures	T
3.1.1.1.3.6	Search non-host site product structures	T
3.1.1.1.3.7	Provide non-host site product data retrieval	T
3.1.1.1.3.8	Locate where-used	T

TABLE I. ACMS verification requirements

Paragraph Number	Requirement Title	Verification Method
3.1.1.1.3.9	Determine product structure elements used	T
3.1.1.1.3.10	Define valid relationship types	T
3.1.1.1.3.11	Relate product data	T
3.1.1.1.3.12	Relate product structure elements and product data	T
3.1.1.1.3.13	Define valid relationship rules	T
3.1.1.1.3.14	Create groupings	T
3.1.1.1.3.15	Arrange groupings	T
3.1.1.1.3.16	Query product data	T
3.1.1.1.3.17	Support queries	T
3.1.1.1.3.18	Support various query methods	T
3.1.1.1.3.19	Retrieve based on query results	T
3.1.1.1.3.20	Track revision compatibility	T
3.1.1.1.4.1	Support electronic approvals	T
3.1.1.1.4.2	Track revision and release status	T
3.1.1.1.4.3	Provide for metadata maintenance	T
3.1.1.1.5.1	Record audit history	T
3.1.1.1.5.2	View audit history	T
3.1.1.2.1.1	Create and save workflow templates	T
3.1.1.2.1.2	Create ad hoc workflows	T
3.1.1.2.1.3	Support workflow steps, timing, and dependencies	T
3.1.1.2.1.4	Specify workflow rules	T
3.1.1.2.1.5	Create action triggers	T
3.1.1.2.1.6	Associate product data	T
3.1.1.2.2.1	Monitor workload	T
3.1.1.2.2.2	Record workflow history	T
3.1.1.2.2.3	Generate event notifications	T

TABLE I. ACMS verification requirements

Paragraph Number	Requirement Title	Verification Method
3.1.1.2.2.4	Edit workflow	T
3.1.1.2.2.5	Route product data via workflow	T
3.1.1.2.2.6	Provide event-based triggers	T
3.1.1.2.2.7	Send electronic messages	T
3.1.1.2.2.8	Provide electronic sign-off	T
3.1.1.2.2.9	Record comments and votes	T
3.1.1.3.1.1	Create and associate product structure elements	T
3.1.1.3.1.2	Maintain product structure	T
3.1.1.3.1.3	Represent product structure hierarchically	T
3.1.1.3.1.4	Maintain product structure element revisions	T
3.1.1.3.1.5	Accommodate multiple revisions	T
3.1.1.3.1.6	Maintain product structure revisions	T
3.1.1.3.1.7	Maintain effectivity	T
3.1.1.3.1.8	Support multiple baseline effectivities	T
3.1.1.3.1.9	Identify product structure element options	T
3.1.1.3.2.1	Provide multiple product structure views	T
3.1.1.3.2.2	Provide various product structure reports	T
3.1.1.4.1	Maintain WBS and relate product data to tasks	T
3.1.1.5.1	Add translators	T
3.1.1.5.2	List available translators	T
3.1.1.5.3	Provide automatic translation services	T
3.1.1.5.4	Provide default translation parameters	T
3.1.1.5.5	Translate product data	T
3.1.1.6.1	Create and display viewable images	T
3.1.1.6.2	Add viewer applications	T
3.1.1.6.3	Support viewable image review	T

TABLE I. ACMS verification requirements

Paragraph Number	Requirement Title	Verification Method
3.1.1.6.4	Maintain distinct red-lines	T
3.1.1.6.5	Print viewable images and redlines	T
3.1.1.7.1.1	Create user information	T
3.1.1.7.1.2	Limit User Access	T
3.1.1.7.1.3	Create and modify identities, roles, and groups	T
3.1.1.7.1.4	Assign permissions	T
3.1.1.7.1.5	Assign roles to groups	T
3.1.1.7.1.6	Assign users to roles within groups	T
3.1.1.7.1.7	Tailor user's role and group permissions	T
3.1.1.7.1.8	Provide rule-based access control	T
3.1.1.7.1.9	Associate product structures and product data to groups	T
3.1.1.7.1.10	Limit access	T
3.1.1.7.2.1	Manage distributed data environment	T
3.1.1.7.2.2	Manage multiple repositories and PDM vaults	T
3.1.1.7.3.1	Archive and backup ACMS	T
3.1.1.7.3.2	Restore ACMS	T
3.1.1.7.3.3	Retrieve from archives	T
3.1.1.7.4.1	Create and modify metadata defaults	T
3.1.1.11.4.2	Customize user interface	T
3.1.1.11.4.3	Customize system messages and terminology	T
3.1.1.7.4.4	Add new functionality	T
3.1.1.7.4.5	Create electronic forms	T
3.1.1.7.5.1	Required security level	T
3.1.1.7.5.2	Establish security controls	T
3.1.1.7.5.3	Provide virus checking	T
3.1.1.7.5.4	Record unauthorized access attempts	T

TABLE I. ACMS verification requirements

Paragraph Number	Requirement Title	Verification Method
3.1.1.7.6.1	Monitor system performance and usage	T
3.1.1.7.6.2	Provide rule-based performance controls	T
3.1.2.1.1	Process data information packets	T
3.1.2.2.1	Manage program management documents	T
3.1.2.2.2	Determine contract data requirements	T
3.1.2.2.3	Record CM activity management data	T
3.1.2.2.4	Generate CM performance statistics	T
3.1.2.3.1	Establish configuration items and their identifiers	T
3.1.2.3.2	Record metadata and assign unique identifiers	T
3.1.2.3.3	Create metadata elements	T
3.1.2.3.4	Create relationships	T
3.1.2.3.5	Identify revisions	T
3.1.2.3.6	Support obsolescence review	T
3.1.2.4.1	Record configuration audit activities	T
3.1.2.5.1	Store baselines	T
3.1.2.5.2	Perform baseline compare	T
3.1.2.5.3	Record and review engineering change actions	T
3.1.2.5.4	Review change history	T
3.1.2.5.5	Provide CCB information	T
3.1.2.6.1	Record field configuration	T
3.1.2.6.2	Provide reports	T, A
3.1.3.1.1	Record Tech Loop activity	T
3.1.3.1.2	Establish Tech Loop identifiers	T
3.1.3.1.3	Record procurement history data	T
3.1.3.1.4	Establish relationships	T
3.1.3.1.5	Attach documents to actions	T

TABLE I. ACMS verification requirements

Paragraph Number	Requirement Title	Verification Method
3.1.3.1.6	Identify and link similar procurement actions	T
3.1.3.1.7	Bundle procurement requests	T
3.1.3.2.1	Compare baselines	T
3.1.3.2.2	Support DFARS Appendix E screening	T
3.1.3.2.3	Support HAZMAT screening	T
3.1.3.2.4	Establish HAZMAT relationships	T
3.1.3.3.1	Generate reports	T, A
3.2.1.1	Process data information packets (see 3.1.2.1.1)	T
3.2.1.2	Send e-mail	T
3.2.1.3	Provide generic API	E
3.2.1.4	Launch applications	T
3.2.1.5	Interface with MEARS	T
3.2.1.6	Interface with ECALS	T
3.2.1.7	Interface with CARS	T
3.2.1.8	Interface with CCSS 404	T
3.2.1.9	Interface with CCSS for DFARS Appendix E	T
3.2.1.10	Interface with CCSS for Sector 2800	T
3.2.1.11	Interface with CCSS for Competition Management	T
3.2.1.12	Interface with Flight Safety	T
3.2.1.13	Interface with IHS	T
3.2.1.14	Interface with DoDISS Assist	T
3.2.1.15	Interface with JCALS Workflow Manager	T
3.2.1.16	Interface with JEDMICS	T
3.2.1.17	Interface with Field Maintenance Systems	T
3.2.1.18	Interface with Depot Maintenance Systems	T
3.2.1.19	Update PASS.	T

TABLE I. ACMS verification requirements

Paragraph Number	Requirement Title	Verification Method
3.2.3.1	Provide on-line help	E
3.2.3.2	Provide on-line documentation	E
3.2.3.3	Include help table of contents, examples, and demonstrations	E
3.2.3.4	Provide graphical user interface	T
3.2.3.5	Provide web-browser interface	T
3.3.1	Require minimal basic training	E
3.3.2	Require minimal administrative training	E
3.3.3	Require on-line backup	T
3.3.4	Require minimal restoration time	T
3.3.5	Meet performance goals	A
3.3.6	Runtime performance for reports	T
3.3.7	Be Year 2000 compliant	T
3.4.1.1	Support client workstation: platform type	T
3.4.1.2	Support client workstation: minimum memory	T
3.4.1.3	Support client workstation: minimum processor speed	T
3.4.2.1	Support network protocols	T
3.4.2.2	Support network operating systems	T
3.4.2.3	Support maximum number of users	T, A
3.4.3	Server requirements	T
3.4.3.1	Support server: platform types	T
3.4.3.2	Support server: disk space	T
3.4.3.3	Support server: RAM	T
3.4.3.4	Support server: processor speed	T

5. PACKAGING

This section is not applicable to this specification.

6. NOTES

This section contains information of a general or explanatory nature, which may be helpful, but is not mandatory.

6.1 Intended use. ACMS is a system of systems that provides configuration and product data management support for Army products and programs in a paper-free acquisition and logistics environment. Commercial-Off-The-Shelf (COTS) PDM products are intended to be the foundation of ACMS.

6.1.1 Uses of ACMS. Appendix A, ACMS Concept Overview, provides information relative to the nature and roles of the ACMS. Appendix B, ACMS Support of Army Products and Data Life Cycles, and Appendix C, ACMS Support to Selected Business Processes, provide information relative to the use of the ACMS.

6.1.2 Users of ACMS. ACMS system administrators will have competency in their target operating systems, database administration, and performance tuning. ACMS functional users will have basic PC skills, including familiarity with their target operating systems such as Windows or UNIX, will have attended ACMS training, and will have skills consistent with the role to which they are assigned. For example, a Configuration Management Specialist will be knowledgeable in Configuration Management theory.

6.2 Acquisition requirements

6.2.1 Acquisition document requirements. Acquisition documents must specify the following:

- a. Title, number, and date of the specification.
- b. Issue of DoDISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.2.1).
- c. Statements requiring that current technologies provide the basis for the initial ACMS implementation, that the vendor presents a strategy for integrating new and improved technologies, and that the vendor plans for technology refresh in future ACMS releases.
- d. Complete technical definitions of interfaces required under paragraph 3.2.1, External Interface Requirements, as tailored by the implementing organization. This includes technical definitions for interfaces with JEDMICS and JCALS Workflow Manager.
- e. Conditions under which the applications identified in requirement 3.2.1.4, as tailored by the implementing organization, can be launched.
- f. Site specific requirements for recovery from catastrophic failures.
- g. Complete technical definitions of reports required for the local implementation of ACMS.
- h. A Government Concept of Operations (GCO) at the time of solicitation which may need updating at the time of delivery and installation. The GCO must be used to tailor the Enterprise-unique and Command-unique Requirements listed in Table III.

- i. Site specific requirements and technical definitions for converting and loading legacy data into ACMS vault(s).

6.2.2 Implementation strategy. Industry can meet most of the capabilities and requirements in this document today, in the near term. Some of the capabilities and requirements in this document, however, are long term in nature and are capabilities that are not now available. Industry experts have indicated that the commercial PDM industry is heading in a direction that will meet those requirements on or before the year 2002.

Table II lists the ACMS requirements that are considered to be long-term requirements. These requirements may be deferred in the initial ACMS implementations. However, it is expected that these requirements will be satisfied by the year 2002 in order to meet Army digitization goals. A long-term requirement may be addressed as a separately priced option or via a technology refresh strategy.

TABLE II. Long-term ACMS requirements

Paragraph Number	Requirement Title
3.1.1.1.3.5	Navigate non-host site product structures
3.1.1.1.3.6	Search non-host site product structures
3.1.1.1.3.7	Provide non-host site product data retrieval
3.1.1.5.1	Add translators
3.1.1.5.3	Provide automatic translation services
3.1.1.5.4	Provide default translation parameters
3.1.1.5.5	Translate product data
3.1.1.7.2.2	Manage multiple PDM vaults
3.1.2.1.1	Process data information packets
3.2.1.1	Process data information packets
3.2.1.16	Interface with JCALS Workflow Manager

6.2.3 Implementation recommendations. It is recommended that acquisition organizations perform the following actions prior to acquiring their implementations of ACMS:

- a. Review the “state-of-the-art” and “state-of-the-industry” for electronic signatures prior to implementing requirement 3.1.1.1.4.1, Support electronic approvals, and 3.1.1.2.2.8, Provide electronic sign-off. This review should include any DoD approved or recognized Government, international, and industry electronic signature standards that are approved at the time of implementation.

- b. Determine whether launching third party COTS viewers and browsers, using embedded viewers and browsers, or both are acceptable means of satisfying requirements 3.1.1.6, Imaging services requirements.
- c. Coordinate with other commands to standardize interfaces, application launching conditions, reports specifications, and legacy data conversions and loading in the event that two or more commands select the same PDM product as the foundation for their local implementation of ACMS (see also paragraphs 6.2.1.d, e, g, and i).
- d. Investigate specific requirements in their implementations which may be needed to print images and redlines.

6.2.4 Tailoring strategy. In order for ACMS to meet specific needs dictated by site-unique business processes and interfaces, the ACMS Performance Specification may be tailored by individual implementing organizations. To meet the enterprise configuration and product data management needs of the Army as a whole, however, this tailoring must be restricted and controlled.

Table III indicates, for each of the ACMS requirements specified in Section 3 of this document, the degree to which tailoring is allowed. Any requirement designated as an enterprise-wide requirement must be satisfied as stated by all implementations of ACMS. Enterprise-unique requirements represent common requirements that must be tailored by individual implementing organizations by identifying specific capabilities, interfaces, or constraints that are applicable to the command. This tailoring allows the commands to pick and choose specific applications, interfaces, or features that conform to the enterprise-wide vision for ACMS while accommodating command unique business processes and interfaces. Command-unique requirements are requirements, generally interfaces, that apply only to specific commands. Tailoring of command-unique requirements involves adding or deleting those requirements from this ACMS Performance Specification, because a command does not use or interface with the system identified in the requirement or must interface with a system not specified in this ACMS Performance Specification.

Table III. ACMS requirements tailoring restrictions

Section 3 ACMS Requirements	Requirement Title	Enterprise- wide Requirements	Enterprise- unique Requirements	Command- unique Requirements
3.1.1.1.1.1	Provide secure data storage	X		
3.1.1.1.1.2	Store product data	X		
3.1.1.1.1.3	Store CM-controlled product data	X		
3.1.1.1.1.4	Store non-CM controlled product data	X		

Table III. ACMS requirements tailoring restrictions

Section 3 ACMS Requirements	Requirement Title	Enterprise- wide Requirements	Enterprise- unique Requirements	Command- unique Requirements
3.1.1.1.2.1	Check identity and authorizations	X		
3.1.1.1.2.2	Suppress unauthorized functions	X		
3.1.1.1.2.3	Provide user feedback	X		
3.1.1.1.2.4	Provide check-in capability	X		
3.1.1.1.2.5	Accept default destination	X		
3.1.1.1.2.6	Permit path override	X		
3.1.1.1.2.7	Lock checked-out product data	X		
3.1.1.1.2.8	Permit copying checked-out product data	X		
3.1.1.1.2.9	Identify check-out user	X		
3.1.1.1.2.10	Provide location-independent check-out	X		
3.1.1.1.2.11	Cancel check-out	X		
3.1.1.1.3.1	View product configuration	X		
3.1.1.1.3.2	Navigate host site product structures	X		
3.1.1.1.3.3	Search host site product structures	X		
3.1.1.1.3.4	Provide host site product data retrieval	X		
3.1.1.1.3.5	Navigate non-host site product structures	X		
3.1.1.1.3.6	Search non-host site product structures	X		
3.1.1.1.3.7	Provide non-host site product data retrieval	X		
3.1.1.1.3.8	Locate where-used	X		

Table III. ACMS requirements tailoring restrictions

Section 3 ACMS Requirements	Requirement Title	Enterprise- wide Requirements	Enterprise- unique Requirements	Command- unique Requirements
3.1.1.1.3.9	Determine product structure elements used	X		
3.1.1.1.3.10	Define valid relationship types	X		
3.1.1.1.3.11	Relate product data	X		
3.1.1.1.3.12	Relate product structure elements and product data	X		
3.1.1.1.3.13	Define valid relationship rules	X		
3.1.1.1.3.14	Create groupings	X		
3.1.1.1.3.15	Arrange groupings	X		
3.1.1.1.3.16	Query product data	X		
3.1.1.1.3.17	Support queries	X		
3.1.1.1.3.18	Support various query methods	X		
3.1.1.1.3.19	Retrieve based on query results	X		
3.1.1.1.3.20	Track revision compatibility	X		
3.1.1.1.4.1	Support electronic approvals	X		
3.1.1.1.4.2	Track revision and release status	X		
3.1.1.1.4.3	Provide for metadata maintenance	X		
3.1.1.1.5.1	Record audit history	X		
3.1.1.1.5.2	View audit history	X		
3.1.1.2.1.1	Create and save workflow templates	X		
3.1.1.2.1.2	Create ad hoc workflows	X		

Table III. ACMS requirements tailoring restrictions

Section 3 ACMS Requirements	Requirement Title	Enterprise- wide Requirements	Enterprise- unique Requirements	Command- unique Requirements
3.1.1.2.1.3	Support workflow steps, timing, and dependencies	X		
3.1.1.2.1.4	Specify workflow rules	X		
3.1.1.2.1.5	Create action triggers	X		
3.1.1.2.1.6	Associate product data	X		
3.1.1.2.2.1	Monitor workload	X		
3.1.1.2.2.2	Record workflow history	X		
3.1.1.2.2.3	Generate event notifications	X		
3.1.1.2.2.4	Edit workflow	X		
3.1.1.2.2.5	Route product data via workflow	X		
3.1.1.2.2.6	Provide event-based triggers	X		
3.1.1.2.2.7	Send electronic messages	X		
3.1.1.2.2.8	Provide electronic sign-off	X		
3.1.1.2.2.9	Record comments and votes	X		
3.1.1.3.1.1	Create and associate product structure elements	X		
3.1.1.3.1.2	Maintain product structure	X		
3.1.1.3.1.3	Represent product structure hierarchically	X		
3.1.1.3.1.4	Maintain product structure element revisions	X		
3.1.1.3.1.5	Accommodate multiple revisions	X		
3.1.1.3.1.6	Maintain product structure revisions	X		
3.1.1.3.1.7	Maintain effectivity	X		
3.1.1.3.1.8	Support multiple baseline effectivities	X		

Table III. ACMS requirements tailoring restrictions

Section 3 ACMS Requirements	Requirement Title	Enterprise- wide Requirements	Enterprise- unique Requirements	Command- unique Requirements
3.1.1.3.1.9	Identify product structure element options	X		
3.1.1.3.2.1	Provide multiple product structure views	X		
3.1.1.3.2.2	Provide various product structure reports	X		
3.1.1.4.1	Maintain WBS and relate product data to tasks	X		
3.1.1.5.1	Add translators	X		
3.1.1.5.2	List available translators	X		
3.1.1.5.3	Provide automatic translation services	X		
3.1.1.5.4	Provide default translation parameters	X		
3.1.1.5.5	Translate product data	X		
3.1.1.6.1	Create and display viewable images	X		
3.1.1.6.2	Add viewer applications	X		
3.1.1.6.3	Support viewable image review	X		
3.1.1.6.4	Maintain distinct red-lines	X		
3.1.1.6.5	Print viewable images and redlines	X		
3.1.1.7.1.1	Create user information	X		
3.1.1.7.1.2	Limit User Access	X		
3.1.1.7.1.3	Create and modify identities, roles, and groups	X		
3.1.1.7.1.4	Assign permissions	X		
3.1.1.7.1.5	Assign roles to groups	X		

Table III. ACMS requirements tailoring restrictions

Section 3 ACMS Requirements	Requirement Title	Enterprise- wide Requirements	Enterprise- unique Requirements	Command- unique Requirements
3.1.1.7.1.6	Assign users to roles within groups	X		
3.1.1.7.1.7	Tailor user's role and group permissions	X		
3.1.1.7.1.8	Provide rule-based access control	X		
3.1.1.7.1.9	Associate product structures and product data to groups	X		
3.1.1.7.1.10	Limit access	X		
3.1.1.7.2.1	Manage distributed data environment	X		
3.1.1.7.2.2	Manage multiple repositories and PDM vaults	X		
3.1.1.7.3.1	Archive and backup ACMS	X		
3.1.1.7.3.2	Restore ACMS	X		
3.1.1.7.3.3	Retrieve from archives	X		
3.1.1.7.4.1	Create and modify metadata defaults	X		
3.1.1.11.4.2	Customize user interface	X		
3.1.1.11.4.3	Customize system messages and terminology	X		
3.1.1.7.4.4	Add new functionality	X		
3.1.1.7.4.5	Create electronic forms	X		
3.1.1.7.5.1	Required security level	X		
3.1.1.7.5.2	Establish security controls	X		
3.1.1.7.5.3	Provide virus checking	X		
3.1.1.7.5.4	Record unauthorized access attempts	X		

Table III. ACMS requirements tailoring restrictions

Section 3 ACMS Requirements	Requirement Title	Enterprise- wide Requirements	Enterprise- unique Requirements	Command- unique Requirements
3.1.1.7.6.1	Monitor system performance and usage	X		
3.1.1.7.6.2	Provide rule-based performance controls	X		
3.1.2.1.1	Process data information packets	X		
3.1.2.2.1	Manage program management documents.	X		
3.1.2.2.2	Determine contract data requirements	X		
3.1.2.2.3	Record CM activity management data	X		
3.1.2.2.4	Generate CM performance statistics	X		
3.1.2.3.1	Establish configuration items and their identifiers	X		
3.1.2.3.2	Record metadata and assign unique identifiers	X		
3.1.2.3.3	Create metadata elements	X		
3.1.2.3.4	Create relationships	X		
3.1.2.3.5	Identify revisions	X		
3.1.2.3.6	Support obsolescence review	X		
3.1.2.4.1	Record configuration audit activities	X		
3.1.2.5.1	Store baselines	X		
3.1.2.5.2	Perform baseline compare	X		
3.1.2.5.3	Record and review engineering change actions.	X		
3.1.2.5.4	Review change history	X		
3.1.2.5.5	Provide CCB information	X		

Table III. ACMS requirements tailoring restrictions

Section 3 ACMS Requirements	Requirement Title	Enterprise- wide Requirements	Enterprise- unique Requirements	Command- unique Requirements
3.1.2.6.1	Record field configuration	X		
3.1.2.6.2	Provide reports		X	
3.1.3.1.1	Record Tech Loop activity	X		
3.1.3.1.2	Establish Tech Loop identifiers	X		
3.1.3.1.3	Record procurement history data	X		
3.1.3.1.4	Establish relationships	X		
3.1.3.1.5	Attach documents to actions	X		
3.1.3.1.6	Identify and link similar procurement actions	X		
3.1.3.1.7	Bundle procurement requests	X		
3.1.3.2.1	Compare baselines	X		
3.1.3.2.2	Support DFARS Appendix E screening	X		
3.1.3.2.3	Support HAZMAT screening	X		
3.1.3.2.4	Establish HAZMAT relationships	X		
3.1.3.3.1	Generate reports		X	
3.2.1.1	Process data information packets (see 3.1.2.1.1)	X		
3.2.1.2	Send e-mail	X		
3.2.1.3	Provide generic API	X		
3.2.1.4	Launch applications		X	
3.2.1.5	Interface with MEARS			X
3.2.1.6	Interface with ECALS			X
3.2.1.7	Interface with CARS			X
3.2.1.8	Interface with CCSS 404			X

Table III. ACMS requirements tailoring restrictions

Section 3 ACMS Requirements	Requirement Title	Enterprise- wide Requirements	Enterprise- unique Requirements	Command- unique Requirements
3.2.1.9	Interface with CCSS for DFARS Appendix E			X
3.2.1.10	Interface with CCSS for Sector 2800			X
3.2.1.11	Interface with CCSS for Competition Management			X
3.2.1.12	Interface with Flight Safety			X
3.2.1.13	Interface with IHS			X
3.2.1.14	Interface with DoDISS Assist			X
3.2.1.15	Interface with JCALS Workflow Manager	X		
3.2.1.16	Interface with JEDMICS	X		
3.2.1.17	Interface with Field Maintenance Systems			X
3.2.1.18	Interface with Depot Maintenance Systems		X	
3.2.1.19	Update PASS			X
3.2.3.1	Provide on-line help	X		
3.2.3.2	Provide on-line documentation	X		
3.2.3.3	Include help table of contents, examples, and demonstrations	X		
3.2.3.4	Provide graphical user interface	X		
3.2.3.5	Provide web-browser interface	X		
3.3.1	Require minimal basic training	X		

Table III. ACMS requirements tailoring restrictions

Section 3 ACMS Requirements	Requirement Title	Enterprise- wide Requirements	Enterprise- unique Requirements	Command- unique Requirements
3.3.2	Require minimal administrative training	X		
3.3.3	Require on-line backup	X		
3.3.4	Require minimal restoration time		X	
3.3.5	Meet performance goals		X	
3.3.6	Runtime performance for reports		X	
3.3.7	Be Year 2000 compliant	X		
3.4.1.1	Support client workstation: platform type			X
3.4.1.2	Support client workstation: minimum memory			X
3.4.1.3	Support client workstation: minimum processor speed			X
3.4.2.1	Support network protocols		X	
3.4.2.2	Support network operating systems		X	
3.4.2.3	Support maximum number of users		X	
3.4.3.1	Support server: platform types		X	
3.4.3.2	Support server: disk space		X	
3.4.3.3	Support server: RAM		X	
3.4.3.4	Support server: processor speed		X	

6.3 Definitions. Appendix D, Glossary, contains an alphabetical listing of the terms used in this specification. Appendix E, Acronyms, lists the acronyms.

6.4 Subject term (key word) listing. Subject terms (key words) which identify the principal subjects covered in this performance specification and which would allow identification of this performance specification during retrieval searches include the following:

- a. Configuration Management
- b. Engineering Data Management
- c. Product Data Management
- d. Tech Loop
- e. Workflow Management

APPENDIX A

ACMS CONCEPT OVERVIEW

A.1 SCOPE

A.1.1 Scope. This section describes the Army's long-term vision for ACMS. This appendix is not a mandatory part of the specification. The information contained herein is intended for guidance only.

A.1.2 Federated system of systems. ACMS will be the principal Army system for finding, retrieving, managing, and controlling access to Army product data. ACMS will be a federated system of systems. It will be federated in the sense that local sites will manage their own data and support their own site-unique business processes. It is a system of systems in the sense that all sites will share metadata (see Appendix D) that describe the managed product data and will possess capabilities that are common to the whole of ACMS. Within the ACMS federation, any authorized user will have visibility into controlled product structures, associated product data, and metadata.

A.1.3 Enterprise-level visibility. ACMS will be fielded into an environment where many data management, repository, and workflow systems already exist. Additionally, there will be individual sites within the ACMS federation with site-unique capabilities and data. As such, the ACMS concept must embrace all of these related systems by interfacing with them, subsuming them, or replacing them. In some cases, ACMS will be the only system providing configuration management, product data management, product structure management, process management, or data storage for a set of product data. In other cases, actual storage and direct control of the data and product structure will be performed by a data management system which is external to the ACMS federation. ACMS must interface with these external data management systems to share metadata. In all cases, ACMS must have visibility into Army product data in terms of its identity, status, and form. For product data managed within the ACMS federation, it must be possible for authorized ACMS users to not only locate, but also retrieve the controlled product data.

A.1.4 Standard set of data information packets. MIL-STD-2549, *Department of Defense Interface Standard, Configuration Management Data Interface*, defines the standard set of data information packets, that allow the sharing of product data within and outside the ACMS federation. The information packets describe the configuration management data needed to support the principles of configuration management in accordance with EIA/IS-649, *National Consensus Standard for Configuration Management*. These information packets and the relationships depicted in MIL-STD-2549 also provide the basis for exchanging rudimentary product structure information in the form of parts and Bill of Materials data.

A.2 APPLICABLE DOCUMENTS

(This section is not applicable to this appendix.)

A.3 SPECIFIC ROLES

A.3.1 Specific ACMS roles. ACMS will serve as the Army's enterprise configuration and product data management system, as the Army-wide product data provider, as an interface provider, as an Army-wide product structure manager, and as a process enabler.

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A.3.1.1 Army configuration and product data management system. ACMS users will be able to find, view, copy, and print Army product data, regardless of whether the Army has change control authority or not. To accomplish this, each member of the ACMS federation will need visibility into all product data that is controlled and digitally stored. As a result, systems within and external to the ACMS federation will need to exchange metadata about this product data and provide access to their product data. This is necessary so that the data, an enterprise resource, can be widely shared. ACMS will enable authorized users to create, find, manage, retrieve, view, redline, update as a new revision, save as new data, or make some other use of product data for which the Army is the change control authority. Individual ACMS sites will be able to configuration manage their own vaulted product data, as well as product data they own, but physically store that data in external repositories such as JEDMICS.

A.3.1.2 Single, comprehensive product data manager. In some instances, ACMS will function as the sole data management system and repository for a collection of product data. This includes directly providing for the physical storage and configuration management of the data, as well as the security for and controlled access to the data. Security and access control will include managing user authorizations, monitoring access, and providing for the check-in and check-out of data. In these cases, ACMS will be the only data manager for the data.

A.3.1.3 Shared product data manager. In other instances, ACMS will share data management responsibilities with other systems. Examples of other systems include unique PDM, CM, and CITIS systems owned and operated by individual programs, commands, or contractors. Data management features inherent in data authoring systems are another example of cases where ACMS will need to share data management responsibilities. Under these circumstances, ACMS will exchange and manage product metadata based on MIL-STD-2549 data information packets, while site specific PDM, CM, and/or CITIS systems will control the site's own engineering data (to include site unique metadata). Physical storage, configuration management, security, and access control of the data will be accomplished by the site's data management system(s). ACMS and the other data management system, however, will interface to exchange data and metadata (see paragraph A.1.4, Standard set of data information packets), so that ACMS can maintain enterprise-level visibility of Army product data.

A.3.1.4 Engineering repository manager. For Army product data contained in or destined for JEDMICS, ACMS will be the Army entry point for retrieving product data for modification and for loading the product data itself and related file index data (a subset of ACMS metadata). This ensures that ACMS and JEDMICS data remain synchronized. ACMS will also provide for the configuration management of this data.

A.3.2 Army-wide product data provider. With ACMS, it will be possible for any authorized user to identify and request any piece of digitally stored and controlled Army product data. ACMS will assist the user in identifying the desired product data, locate and request the product data for the user, and then present the product data to the user in a usable form. Key implications that result from this role include the following:

- a. **Visibility**. As the enterprise product data management system for the Army, ACMS will have visibility into the identity and location of all controlled product data, regardless of whether it is owned by the Army or another organization.

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- 1) ACMS federation's principal entry point. ACMS will be the Army's principal entry point into the Army's federation of configuration and product data management systems. This means that Army product data users will access and check-out Army-owned and controlled product data via ACMS. It also means that Army product data creators will use ACMS as the principal mechanism for placing Army product data under formal data management control.
 - 2) ACMS user's entry to external data management systems. When ACMS does not have direct physical control of desired data (vaulted elsewhere), ACMS will formulate a request for the product data, submit the request to the controlling system, receive the requested product data or response notice, and make the result (requested data or response notice) available to the user. As a result, Army product data users will be able to find, copy, view, and print Army product data via ACMS even when ACMS does not directly manage the product data.
- b. Product-centric data management. ACMS represents a shift in the Army from document-centric data management to product-centric data management. This change will enable users to identify desired product data by navigating product structures, searching for and through part families, as well as traditional approaches to finding product data via search queries on product data grouping or classification attributes. Product-centric data management also means that the product structure is a controlled item in addition to (or in place of) documents describing the product structure (for example, Bill of Materials).
- c. Web-based access. ACMS will include the ability to access controlled product data via commercially available web browsers. Users of the ACMS will be able to access ACMS via the browser, find desired product data via search queries or product structure navigation, request and receive product data for viewing, printing, or copying (as new product data), and mark-up or redline viewable images.

A.3.3 Interface provider. ACMS will be fielded into a diverse environment of legacy systems that need to interact with ACMS. Examples of these systems include JCALS Workflow Management System, CITIS configuration management systems, JEDMICS, PDM-based CITIS systems, and other CITIS and PDM systems. Furthermore, as a federated system of systems, ACMS itself will need to exchange product data within the federation. As a result, the ACMS architecture will need to be open and embrace interface standards for interfacing with other systems. Specifically, the ACMS will need to have a published API. It also will need to migrate towards the configuration management data interface standard (MIL-STD-2549) as the means for defining what metadata must be exchanged among ACMS and other PDM, CM, and CITIS systems.

A.3.4 Army-wide product structure manager. Product structure management is a new concept for managing Army-wide product data. It signifies a move away from document-centric data management philosophy to product- or part-centric product data management. ACMS will have visibility into the product structure and product data of any Army item, and configuration control of product data managed within the ACMS federation. Associated with the product structure, ACMS will provide visibility into the identity and location of all controlled, digital

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product data which describes elements of the product structure. Thus, users of Army-controlled product data may find the data by navigating the relevant product structure. Additionally, ACMS will support displaying multiple views of the product structure. For example, ACMS can present design views of the data which would show the design data associated with the product structure. A view by CI would aid program managers and their support staff. Another view would be a manufacturing view. In this view, some design information would be presented, but manufacturing process descriptions and simulations also might be included. Other views are possible as well.

A.3.5 Process enabler. ACMS will enable various Army business processes by making product data widely accessible and by providing workflow tools that facilitate the distribution of tasks and data, as well as the monitoring and management of the processes modeled by the workflows. Specifically, ACMS will improve the efficiency of Army IPTs, engineering change action processing, and reprourement Tech Loop activities by making it much easier to find and retrieve needed product data; by providing tools that enable users to view, mark-up, or comment on product data; by allowing concurrent access to product data; by distributing tasks, electronic forms, and notices of assigned tasks and product data availability via pre-defined and ad hoc workflows; and by supporting electronic sign-off on product data or tasks.

APPENDIX B

ACMS SUPPORT OF ARMY PRODUCTS AND DATA LIFE CYCLES

B.1 SCOPE

B.1.1 Scope. ACMS will provide support for the life cycle management of both Army products and their data. This appendix is not a mandatory part of the specification. The information contained herein is intended for guidance only.

B.2 APPLICABLE DOCUMENTS

(This section is not applicable to this appendix.)

B.3 PROCEDURES

B.3.1 ACMS support of the Army products life cycle. The envisioned scope of ACMS is to be the Army's enterprise configuration and product data management system throughout the life cycle of an Army product or program -- from development through production, operation, sustainment, modification, and ultimately disposal.

B.3.1.1 Development

B.3.1.1.1 Continuous, concurrent, and wide-spread access. ACMS will be the Army's primary mechanism for maintaining continuous and concurrent visibility into the content and status of developing product data for Army products and programs. ACMS will be a key tool used by the Army to support the execution of the Integrated Product and Process Management (IPPM) concepts for developing Army products. Under the IPPM concept, IPTs will be formed from all user communities who have responsibility for, use, or support the Army product at some point in its life cycle. By having ready access to developing product data, IPT members may influence the design early and avoid excessive life-cycle costs or expensive changes late in the product's development or manufacture. Examples of user communities include the following:

- a. Designers and engineers who develop the product,
- b. Testers who will test the Army product,
- c. Manufacturers who must build the product,
- d. Program managers who must manage the product's development,
- e. Trainers who will develop training courses,
- f. Operational users who must use the product in the field,
- g. Logisticians and maintenance personnel who must sustain and maintain the product,
- h. Item managers who will buy replacements and spares for the Army product,
- i. Operations planners, analysts, and modelers who will plan and study the best ways to employ the product, and
- j. Authors and subject matter experts who will write technical and operations manuals for the Army product.

B.3.1.1.2 ACMS-stored product data. When ACMS or JEDMICS is used as the repository, authorized IPT members who create product data will be able to save data in secure,

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access-controlled storage areas, promote product data through various release levels, baseline product structures and product data, and configuration control the product data. IPT members will have concurrent access to the product data, although ACMS will preclude multiple users from being able to simultaneously change the data. Note that in the context of ACMS, controlled product data will never be changed, but it may be revised and differentiated with a new revision identifier. ACMS will enable authorized IPT members who use, but do not create the product data, to find and retrieve product data they require; receive task notifications and accompanying product data via workflows and messaging capabilities contained within ACMS; view, comment on, and mark-up or redline product data using viewing tools provided by ACMS; and participate in design and engineering change evaluations even though individual IPT members are geographically and organizationally dispersed. ACMS also will enable users to perform where-used (or co-used) analyses to ensure proper coordination of engineering change actions.

B.3.1.1.3 Contractor-stored product data. When contractor data management systems store and manage the product data, ACMS will enable authorized IPT members who use, but do not create the product data, to find and retrieve product data they require; receive task notifications and accompanying product data via workflows and messaging capabilities contained within ACMS; view, comment on, and mark-up or redline product data using viewing tools provided by ACMS; and participate in design and engineering change evaluations even though individual IPT members are geographically and organizationally dispersed.

B.3.1.2 Production. By making design data accessible as it evolves, ACMS will enable the manufacturing community to be aware of and more readily influence the design of Army products. Additionally, during Army product manufacture, ACMS will enable authorized members of the manufacturing community to rapidly find and retrieve design, manufacture, test, and analysis data that affect the development of manufacturing processes, the acquisition or configuration of manufacturing equipment, and the procurement of manufacturing materials. This will facilitate early planning and evaluation of manufacturing alternatives. For example, manufacturing simulations can be prepared early on based on evolving product data. These simulations may reveal design problems from a manufacturer's perspective, and also will enable the manufacturer to begin planning the production process sooner. Additionally, manufacturers will be able to initiate engineering change actions or participate in change evaluations using ACMS' engineering change action electronic forms, workflows, and viewing and mark-up capabilities. ACMS will provide them with access to supporting product data, thus enhancing the quality of engineering change actions. ACMS also will enable a preparer of an engineering change action to determine if similar or related engineering change actions are in process, have been rejected, or have been approved. Additionally, ACMS will enable users to perform where-used (or co-used) analyses to ensure proper coordination of engineering change actions.

B.3.1.3 Operation. ACMS will provide authorized operational users of an Army product with rapid access to the product data they need to more efficiently plan the product's use, operate the product, and employ the product, as in the following examples:

- a. Operations analysts might use physical attributes of the product as input into an operational simulation. The simulation would indicate how well the product

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- performed in a specified scenario. In another example, force planners might use design and other forms of product data to determine interoperability between products.
- b. Deployment planners might use product data to determine or simulate transportation requirements for the Army product.
 - c. Survivability analysts could access design data that provides inputs to survivability models for predicting Army product survivability against certain threats in certain scenarios.

Like members of the manufacturing and other communities, authorized operational users will be able to initiate engineering change actions or participate in their evaluation using ACMS' engineering change action electronic forms, workflows, and viewing and mark-up capabilities. ACMS will provide them with access to supporting product data, thus enhancing the quality of engineering change actions. ACMS also will enable a preparer of an engineering change action to determine if similar or related engineering change actions are in process, have been rejected, or have been approved. Additionally, ACMS will enable users to perform where-used (or co-used) analyses to ensure proper coordination of engineering change actions.

B.3.1.4 Sustainment. Logisticians, maintenance personnel, and engineers will benefit from ACMS' ability to provide them with access to needed engineering and analytical data during the sustainment phase in the following ways:

- a. Logisticians could use design or analytical data to help them predict replacement and spares rates.
- b. Maintenance workers could access ACMS when servicing equipment in the field when a particularly unusual or difficult maintenance event occurs. Using ACMS, the maintenance community will be able to record field maintenance actions.
- c. Obsolescence is a significant issue for many commodities within the Army. Engineers often must reengineer obsolete parts. With ACMS, engineers would be able to locate supporting product data, store their reengineered data, and then find it again in the future, so it does not have to be reengineered a second time.

Selected logisticians, maintenance personnel, and engineers will be able to initiate engineering change actions or participate in their evaluation using ACMS' engineering change action electronic forms, workflows, and viewing and mark-up capabilities. ACMS will provide them with access to supporting product data, thus enhancing the quality of engineering change actions. ACMS also will enable an author of an engineering change action to determine if similar or related engineering change actions are in process, have been rejected, or have been approved. Additionally, ACMS will enable users to perform where-used (or co-used) analyses to ensure proper coordination of engineering change actions.

B.3.1.5 Disposal. Disposing, recycling, or salvaging retired Army products can benefit from ready access to product data via ACMS. With ACMS the individuals responsible for the disposal of an Army product will be able to better plan through access to product data on the various configurations that have been fielded. They also will be able to identify hazardous or precious materials that may be included in the system. If desired, the product data could include

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handling instructions for these materials. Like the other communities involved in the life cycle of an Army product, the disposal community will be able to develop, receive, and evaluate engineering change actions via ACMS. Additionally, ACMS will enable users to perform where-used (or co-used) analyses to ensure proper coordination of engineering change actions.

B.3.2 ACMS operation within product data life cycle. This section describes the support ACMS provides from the perspective of the product data's life cycle -- from its acquisition or creation, through its management and use.

B.3.2.1 Data acquisition

B.3.2.1.1 Overview. Product data acquisition involves the creation, revision, purchase, conversion, or any other method of obtaining new Army product data. The acquired product data may be authored by the Army, developed for the Army under contract, or purchased by the Army. Acquired product data also includes new revisions of existing data. The acquired product data may be physically retained by the Army or by a third party such as a contractor. The new product data includes actual engineering data representations of products (for example, drawings, models, software, and documents such as requirements and specifications), product structure representations, configuration control data, engineering change actions, mark-ups and redlines, relationships between product data, relationships between product data and product structure elements, and other data about the product data (metadata). All are types of product data captured and controlled by ACMS.

B.3.2.1.2 Operational concept. ACMS will support data acquisition primarily by providing the means to introduce acquired product data into the ACMS environment of managed data. With a few exceptions, as described later in this paragraph, the actual authoring of product data is outside the domain of ACMS. ACMS will support the introduction of acquired product data into the Army's environment of managed data, however, by providing the capability to capture and securely store authored product data via its data vaulting capabilities. ACMS also will provide mechanisms for obtaining product data, to include metadata, from contractors. These mechanisms will be based on standards such as STandard for the Exchange of Product (STEP) model data - ISO 10303, Continuous Acquisition and Life-Cycle Support (CALs), and MIL-STD-2549, along with an open and published API. In these cases the actual product data authoring is done external to ACMS. On the other hand, ACMS will support the direct creation of some product data by providing data authors with the capability to build product structures, assign relationships between instances of product data, and establish relationships between specific product data items and product structure elements. Using system administrator-configurable electronic forms and automated rules, ACMS also will enable product data authors to initialize configuration control data. This includes assigning configuration item identifiers, generating engineering change actions, and recording evaluations of engineering change actions by using ACMS electronic forms and viewing/mark-up tools. The following subparagraphs provide descriptions of specific ACMS operational capabilities that will support the acquisition of Army product data.

B.3.2.1.2.1 Secure product data storage. ACMS will provide for secure storage of acquired product data in accordance with defined access control permissions and rules. Secure

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storage is defined as the ability to preclude stored information from being viewed, reused, updated, or deleted in violation of ACMS access permissions and rules. Examples of the kinds of data ACMS will store and protect include product data files in native or standard formats, metadata associated with managed product data, administrative data, references to product data external to ACMS, and electronic forms such as engineering change actions.

B.3.2.1.2.2 Check-in product data. Checking product data into the ACMS is one means by which product data is entered into the ACMS environment of managed data. Upon initiation of the check-in function, ACMS will present an authorized product data author with an electronic form containing required ACMS metadata. The metadata fields on the electronic form will be empty or will contain existing or default values (existing values are for product data that is being revised; default values are for new product data that is being loaded for the first time). The user will enter, modify, or accept the metadata and proceed with the check-in operation. ACMS will then copy the product data, to include metadata, from the user's workspace into the ACMS vault assigned to the user. ACMS will notify the user as to the success of the transaction and will make the metadata available to all systems within the ACMS federation. The user may not need to know the actual physical location of the product data. If the product data had been checked out for revision, ACMS will release the check-out lock at this time. ACMS also will support batch loading of product data, to include metadata.

B.3.2.1.2.3 Populate JEDMICS and other external repositories. ACMS will be able to populate external repositories that store product data for which the Army has change control authority. JEDMICS is one example of such a repository. One way in which Army product data owners or authors will populate JEDMICS is by using ACMS check-in features. ACMS will present default values for required ACMS metadata to the user who will modify or accept the metadata. From this metadata, ACMS will prepare the associated JEDMICS file index data. The user will then initiate the JEDMICS load procedure. ACMS will copy the product data from the user's workspace and transmit both the file index data and product data to JEDMICS. JEDMICS will store the product data received from ACMS and populate the JEDMICS file index with the necessary metadata provided by ACMS. JEDMICS will then send back to ACMS any file index data that JEDMICS produces or revises (for example, file location). ACMS will then update its own metadata to keep the systems synchronized. If necessary, JEDMICS will send ACMS notices that indicate whether or not the transaction was successful. ACMS will present the notices to the user for his or her action if necessary. Using ACMS to load JEDMICS with new Army product data will preserve the integrity of ACMS metadata and ensure ACMS and JEDMICS are synchronized. ACMS also will support batch loading of external repositories such as JEDMICS.

B.3.2.1.2.4 Translate files. In the future, ACMS will include a set of file translators that produce STEP and CALS-compliant formats. In support of user requests for data, ACMS will schedule and route files to appropriate file translators, apply default settings for translations, initiate the translation, and route the output file to the user.

B.3.2.1.2.5 Build product structures. The creation of product structures is a form of product data authoring. ACMS will provide for the creation of new product structure elements such as assemblies, components, and parts. These parts may then be associated (i.e., related or

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linked) in a hierarchical manner to represent a newly defined product. ACMS will present the hierarchical product structures to users via a graphical display. Product structures may be revised and retained as new revisions. ACMS will provide for creating, recording, and maintaining multiple revisions for a given product structure element. ACMS also will provide the ability to specify and maintain product structure effectivity information on when a part revision is valid for use in assembling a particular revision of a product. ACMS also will be able to import product structure relationships authored elsewhere.

B.3.2.1.2.6 Author relationships. In addition to the product structure relationships described above, ACMS will allow for authoring the following kinds of relationship data: links between product data and product structure elements, links between two different pieces of product data, and the type of links themselves. The links between product data and product structure elements are the means by which product data is associated with particular product structure elements. These links will enable ACMS users to find product data by navigating product structures. The links between different product data are the means by which two pieces of product data are related to one another. The type of link defines the nature of the relationship. The link type itself can be created and defined, thus allowing product data authors to create new ways of describing the relationships. ACMS also will be able to import relationship data authored elsewhere. This includes the following kinds of relationship data: links between product data and product structure elements, links between two pieces of product data, and the type of links themselves.

B.3.2.1.2.7 Create, associate, and track engineering change actions. ACMS will enable users to create, associate, and track engineering change actions against product data. Once into ACMS, the change initiator will request a standard engineering change action electronic form. ACMS will present the electronic form, which may have been tailored by the local system administrator, to the change initiator who inspects the default data provided by ACMS and makes changes and additions as necessary. ACMS will automatically assign the next available unique engineering change action number. The change initiator will use the ACMS query/search and/or product structure navigation capabilities to find any product data that needs to be attached to the engineering change action electronic form and submit the engineering change action for consideration via a predefined engineering change action workflow.

B.3.2.1.2.8 Redline images. Redlined or marked-up viewable images are another kind of product data that is acquired using ACMS. ACMS will provide the ability for multiple reviewers to create redlines, mark-ups, or annotations to viewable images. This reviewer-created product data will be controlled and maintained in conjunction with the viewable image. ACMS will ensure, however, that individual reviewer redlines and annotations are kept distinct.

B.3.2.1.2.9 Web-based access. Product data authors with access to a web browser will be able to create and check product data into ACMS using the browser and the Internet. ACMS will provide a full-function, web-client interface for users who access ACMS using a web browser.

B.3.2.1.2.10 Acquire metadata. Metadata may be acquired via ACMS from both product data authors and external data management systems. When checking in product data, ACMS will

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present the author or owner with a predefined electronic form to be completed. Where default values exist, ACMS will populate the electronic form with those defaults for the author to modify or accept. ACMS will store and control access to the metadata for future use. Metadata also will be obtained by ACMS from external data management systems. At a minimum, ACMS will be capable of importing MIL-STD-2549 data information packets from external systems.

B.3.2.2 Data management

B.3.2.2.1 Overview. In the data management phase of product data's life cycle, the main objective is to control the product data in such a way that the data is protected without unnecessarily burdening the product data authors while facilitating authorized users in finding, retrieving, and working with the product data. The main activities under data management include storing product data, protecting product data by controlling access while making it easily accessible to authorized users, configuration managing product data, distributing product data in response to authorized requests, archiving and backing up product data, and recording the status of product data and changes in that status.

B.3.2.2.2 Operational concept. ACMS will provide visibility into all official Army digital product data. ACMS will provide configuration control of Army product data for which the Army is the CDCA. All ACMS sites will share metadata and access to Army product data. The individual sites of the ACMS federation, however, will exercise change and check-in/out control for product data that they store and manage locally. This means that while the individual ACMS sites will exercise physical control over the product data, any ACMS user will be able to find and retrieve any data maintained within the ACMS federation. The notion of shared product data access is further extended when ACMS exchanges metadata with external PDM, CM, or CITIS systems. This exchange will provide ACMS with visibility into what product data is available and where it is located. As the Army's primary mechanism for accessing product data, ACMS will interact with the external systems to request the product data when needed. The following subparagraphs describe specific ACMS operational capabilities that will support the management of Army product data.

B.3.2.2.2.1 Store and protect ACMS vaulted product data. ACMS will provide a product data vaulting capability. This capability is for storage of product data over and above that which is kept in repository systems such as JEDMICS. The ACMS vault will not only securely store traditional product data such as drawings, models, and documents, but it also will store and protect viewable images, redlines and mark-ups of viewable images, metadata associated with managed product data, administrative data, references to data external to ACMS, and electronic forms such as engineering change actions. ACMS will protect the product data by restricting access to the data in accordance with defined access control permissions and rules. ACMS will have the ability to vault product data under its control in distributed vaults. ACMS also will protect Army product data stored in JEDMICS, as well as product data for which the Army has change control authority and is stored in other external repositories, by serving as the Army's single entry point into these repositories for the purpose of both loading and retrieving product data.

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B.3.2.2.2.2 Locate product data within the ACMS federation. Users of ACMS will be able to locate and retrieve any product data managed under the ACMS federation of systems. An ACMS user will find product data by querying metadata or by navigating product structures. It may not be necessary for the user to know the specific location of the product data in the ACMS federation. The user will be prevented from querying metadata which he or she is not authorized to see. Similarly, the user will be precluded from navigating product structures for which he or she is not authorized to view.

B.3.2.2.2.3 Control access to product data when the Army has change control authority. Access control is the mechanism by which ACMS protects the integrity of product data and guards it from unauthorized identification and retrieval. ACMS will manage and monitor authorizations and restrictions to product data for which the Army has change control authority. This includes product data vaulted by ACMS and product data stored in JEDMICS or other external repositories storing product data for which the Army is the change control authority. ACMS also will protect the integrity of the product data through check-in and check-out functions.

B.3.2.2.2.3.1 Authorizations and restrictions. ACMS will provide for checking users' identities and authorizations and restricting their ability to see metadata, navigate product structures, and retrieve product data as defined by access control permissions and rules. These permissions and rules will enable system administrators to restrict access to ACMS by type of information, the status of the data (release level or specific baseline), data sensitivities and distribution limitations, and the roles assigned to a user or group. ACMS access rules will define the types of access allowed to users, groups, or roles (create, read, use, or delete). Attempts to access controlled product data will be monitored and users whose unsuccessful attempts exceed a system administrator-specified maximum threshold will be exited from the system and the unauthorized attempts to access product data will be recorded.

B.3.2.2.2.3.2 Check-in ACMS vaulted product data and populate JEDMICS. Product data check-in supports both the data acquisition and data management life-cycle phases. It is the means by which new or revised product data is brought under ACMS' control, hence the association with data acquisition. It also is a means of managing the integrity of controlled product data, hence the association with data management. The data acquisition section above discusses product data check-in -- see paragraph B.3.2.1.2.2, Check-in product data.

Populating JEDMICS is a special case of product data check-in. The data acquisition section above discusses populating JEDMICS -- see paragraph B.3.2.1.2.3, Populate JEDMICS and other external repositories.

B.3.2.2.2.3.3 Check-out ACMS vaulted product data. Once the desired product data is found, either as the result of a successful query or through product structure navigation, the user will initiate the ACMS check-out function. If the user is authorized to access the product data and the data is vaulted by ACMS, then ACMS will respond by copying the requested files or information (for example, drawing, model, or document) from the ACMS vault to the user's workspace. Upon check-out, ACMS will lock the requested files to prevent multiple users from attempting to modify the product data simultaneously. Other users will be allowed to view and

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copy the checked out product data (the copy would be treated as new data), but they would not be able to modify it or create new revisions until the check-out is released. ACMS will provide the ability to view which user has checked the product data out from the vault. If the user who has checked the product data out decides he or she no longer intends to modify the product data and only wants to view the data or work with a copy, then he or she may release the lock if so desired, thus freeing the check-out for other users.

B.3.2.2.2.3.4 Retrieve product data stored in external repositories. Army product data users will use ACMS to check product data out of external repositories which contain product data for which the Army has change control authority, to include JEDMICS. An ACMS user will find product data in these external repositories using queries or product structure navigation. The user will initiate the ACMS check-out function and ACMS will prepare and transmit request for the product data to the external repository. ACMS will receive the product data from the external repository and present it to the user. If necessary, the external repository will send ACMS notices that indicate whether or not the transaction was successful. By using ACMS to retrieve product data stored in external repositories such as JEDMICS, it will be possible to manage use of Army product data, make sure that users are receiving the correct product data, and facilitate concurrent engineering efforts. The same file locking and metadata update procedures described in the previous paragraph will apply for checking out product data stored in these external repositories.

B.3.2.2.2.4 Distribute product data. ACMS will provide for the routing and transport of product data in support of numerous operations and events. Specifically, ACMS will copy product data between a user's workspace and the ACMS data vault in response to check-in and check-out operations, pre-defined event triggers, or workflow prompts. ACMS also will support product data exchanges among the systems within the ACMS federation and with external repository, PDM, configuration management, and CITIS systems. ACMS will record information about the product data transport transaction. For example, ACMS should record the time, initiator, and recipient of the transaction.

B.3.2.2.2.5 Exchange product data when the Army does not have change control authority

B.3.2.2.2.5.1 Receiving product data from external data management systems. ACMS will be responsible for providing visibility into and access to all Army product data. When the Army does not have change control authority over the product data and it is controlled by and vaulted in data management systems external to the ACMS federation, ACMS will need to be capable of receiving both product data and data about this product data (metadata) from the external data management system. Examples of these external data management systems include PDM, CM, CITIS, or authoring systems. To accomplish this, ACMS will need to have a published API and will need to migrate towards the configuration management data interface standard (MIL-STD-2549) as the means for defining what metadata must be exchanged among ACMS and other PDM, CM, and CITIS systems. MIL-STD-2549, defines the standard set of data information packets, that allow the sharing of product data within and outside the ACMS federation. The data information packets describe the configuration management data needed to support the principles of configuration management specified in EIA/IS-649. These data information packets and the relationships depicted in MIL-STD-2549 also provide the basis for

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exchanging rudimentary product structure information in the form of parts and Bill of Materials data. Once ACMS determines that the desired product data is located in an external system and if the user requests the product data, then ACMS will formulate a request for the product data, initiate a session with the system that controls and stores the product data, submit the request, receive the requested product data or appropriate response notice, and present the results (product data or response notice) to the ACMS user. As a result, Army product data users will be able to find, view, copy, and print Army product data via ACMS even when ACMS does not directly manage the product data.

B.3.2.2.2.5.2 Providing product data to external data management systems. ACMS also needs to be capable of providing product data, to include metadata, to external systems when the Army provides product data to contractors or other government entities. As a result, ACMS will be capable of exporting MIL-STD-2549 data information packets for external systems.

B.3.2.2.2.5.3 Synchronizing with external data management systems. In some instances, ACMS will need to be kept synchronized with an external data management system. Depending on the level of integration between ACMS and the external data management system, this synchronization will either be done automatically or procedurally. The approach will be determined during implementation. An example of a procedural approach to synchronization between ACMS and an external data management system is when the owner or author of the product data assumes responsibility for logging into ACMS and updating ACMS as to the state of the controlled product data.

Automatic synchronization can occur several ways. One approach involves integrating ACMS into the external data management system, so that access to and control of the product data is through ACMS. Other methods of automatic synchronization include pushing metadata about changes to the product data from the external data management system to ACMS on a regular basis. Another approach involves ACMS pulling the state-change metadata from the external data management system by polling the external system at regular intervals. A third approach to automatic synchronization involves retrieving the metadata from the external system on a “when needed” basis and comparing the retrieved metadata with ACMS’ metadata to determine if changes have occurred.

B.3.2.2.2.6 Workflow capabilities. ACMS will include the ability to distribute tasks and product data via workflow capabilities. Specifically, ACMS will provide users the ability to build, participate, and monitor pre-defined and ad hoc workflows. ACMS will permit users to build, participate, and monitor ACMS workflows using a web browser across the Internet or via a regular ACMS client application. ACMS also will interface with the JCALS Workflow Manager.

B.3.2.2.2.6.1 Workflow builders. Authorized ACMS users will be able to build workflows. These workflows may be saved as templates or executed as ad hoc workflows. The creator of a workflow will be able to build sequential and concurrent tasks, and establish timed and event triggers.

B.3.2.2.2.6.2 Workflow participants. A participant in a workflow will receive notifications of workflow tasks. ACMS will enable participants to check their work queues, select a specific task on which to work, read any task messages or notifications that accompany

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the task, retrieve product data that has been associated with the task, and electronically sign-off on task completion or product data.

B.3.2.2.2.6.3 Workflow monitors. Selected ACMS users will be able to monitor the progress of tasks within the workflow. This includes being able to determine which tasks have been completed, which tasks are late, and the workloads of individuals participating in the workflow. Again this function may be performed either via a web browser or the ACMS client application.

B.3.2.2.2.7 Configuration manage product structures and product data. ACMS will configuration manage product structures and product data in accordance with the guidance provided in MIL-HDBK-61, *Configuration Management Guidance*, and MIL-STD-2549, *Configuration Management Data Interface*. Specifically, ACMS will enable users to record the following:

- a. Unique identifiers for CIs and their subordinate parts and assemblies ,
- b. The identifier of each CI's configuration control authority,
- c. The unique identifier of configuration baseline product data,
- d. The release and baseline status of any ACMS controlled product structure or data item,
- e. The correlation between product data and the product structure element it represents,
- f. Unique file identifiers (to include time/date stamp),
- g. Part numbers corresponding to CIs and subordinate parts and assemblies,
- h. Effectivity and release times and dates for product structures and product data,
- i. Identifiers and status of engineering change actions,
- j. Results of configuration audits, and
- k. Engineering change action and audit actions assigned to individuals.

B.3.2.2.2.8 Record and report on product data status. ACMS will record and present to authorized users the release, baseline, change, and audit status of product structures and product data. In particular, ACMS will provide authorized users with the capability to record the release levels of specific product structures and product data, when the product structure or product data was promoted to the indicated release level, and when the release became effective. Authorized users will be provided the ability to generate displays and reports containing the above release status data. ACMS also will enable authorized users to record the identity of a baselined product structure and related configuration data, along with when the baseline was approved and the effective date of the baseline. ACMS will also record and report on the status of engineering change actions, actions associated with the changes, and the implementation status of changes. As audits are performed, ACMS will record and report on the schedules, status, and results of configuration audits.

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B.3.2.2.2.9 Archive and backup product data. ACMS will provide system administrators with the tools necessary to establish and maintain archives and backups of product data kept in ACMS vaults. In the event of corruption or other damage to the ACMS data vault, ACMS will enable system administrators to restore the system from backups. Similarly, ACMS will provide system administrators with the tools needed to request and retrieve historical archives information from off-line archival storage. ACMS will provide for backup operations at remote sites for each site as part of the COOP for product data.

B.3.2.3 Data use

B.3.2.3.1 Overview. Use of product data within the data's life cycle involves all activities which require a direct interface with a consumer of the data, as opposed to an author or manager of data. Example activities performed by consumers include finding, requesting, receiving, viewing, analyzing, processing or manipulating, and printing product data. Sometimes copying and redlining product data are considered activities within the data use life-cycle phase, but for the purposes of this discussion, they are part of the data acquisition phase discussed earlier.

B.3.2.3.2 Operational concept. ACMS is a configuration and product data management system. Its support of the data use life-cycle phase is limited to assisting consumers of product data in finding, requesting, receiving, viewing, and printing product data. There are two categories of ACMS product data consumers: individuals and applications. Individuals typically will interact with ACMS via ACMS client software or across the Internet using a web-based browser. Individual consumers will find product data by navigating product structures or by querying metadata. Once product data is located, the individual consumer will initiate a request for the data which ACMS will retrieve and present to the consumer. After receiving the product data, the consumer will use ACMS or local viewing tools to view the product data and, if desired, print the image.

Applications which are consumers of Army product data will interact with ACMS by an open and published interface. The interface may involve exchanging product data, to include metadata, or it may involve the application invoking an ACMS feature.

The following subparagraphs provide descriptions of specific ACMS operational capabilities that will support the management of Army product data.

B.3.2.3.2.1 Navigate product structures. Users of ACMS will be able to locate and request product data managed under the ACMS federation of systems by navigating product structures. The user will only be able to navigate product structures for which he or she is authorized to view. Product structures may be navigated via ACMS' web-based browser capability or via ACMS client software. It will not be necessary for the user to know the specific location of the product data in the ACMS federation.

B.3.2.3.2.2 Search product data attributes. ACMS users also will be able to search for product data by constructing queries against product data attributes. ACMS will provide the ability to group product data which share a common set of required attributes. Once a user determines which group of product data they need, it will be possible for the user to build queries to locate particular instances of the group. The queries, which may be saved for later reuse, will provide the ability to search attributes associated with the particular grouping for specific values,

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ranges of values, and logical combinations using Boolean operations. Because the system administrator will have the ability to restrict a user's access to specific product data attributes, ACMS will also be able to restrict the types of queries users can create. Product data searches via queries may be created and initiated from ACMS' web-based browser capability or from the ACMS client software. As before, it may not be necessary for the user to know the specific location of the product data in the ACMS federation.

B.3.2.3.2.3 Request and retrieve product data. Once product data has been found within ACMS, either as the result of a successful search, through product structure navigation, or association with a workflow task, the user will initiate the ACMS check-out function. If the user is authorized to access the product data, ACMS will respond by checking out the requested product data from the ACMS vault and copying it to the user's workspace. ACMS will perform this operation regardless of whether the user has accessed ACMS via a web browser or via an ACMS client application. In some cases, the request for product data includes launching a viewing or authoring application. If the requested file requires translation prior to presentation to the user and an appropriate translator has been included as part of ACMS, then the request and receipt of the product data will trigger an automatic translation of the product data for the user.

B.3.2.3.2.4 View images. ACMS will provide a number of imaging services that enable a user to view and redline images. ACMS will provide for the launching of viewing and redlining software applications via file associations. When a file is checked out using ACMS and the file type is of a particular type, ACMS will launch the appropriate software to either view, redline, or, in some cases, first translate the file to a form that can be viewed or marked up. ACMS will control and protect the viewable and redlined images. ACMS also will ensure that individual reviewer redlines and annotations are kept distinct.

B.3.2.3.2.5 Print product data. As part of its support to the data use life-cycle phase, ACMS will provide users with the ability to print viewable images and redlines. Specifically, ACMS will provide established reports such as TDPLs, GBLs, and where-used reports. ACMS must also provide performance-based reporting and the ability to produce process information.

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ACMS SUPPORT TO SELECTED BUSINESS PROCESSES

C.1 SCOPE

C.1.1 Scope. This appendix presents examples of ACMS operational capabilities. This appendix is not a mandatory part of the specification. The information contained herein is intended for guidance only.

C.2 APPLICABLE DOCUMENTS

(This section is not applicable to this appendix.)

C.3 PROCEDURES

C.3.1 Introduction. The following paragraphs present examples of ACMS operational capabilities being applied in support of three business processes. This is done to tie the various operational capabilities described in Appendix B and illustrate their use in Army processes that require product data. The three processes presented are IPT information sharing, engineering change action processing, and TDP validation.

C.3.2 IPT information sharing. During system development, ACMS will provide authorized IPT members simultaneous access to current, relevant product data. IPT members are apt to be geographically dispersed and represent a variety of communities, each having different life-cycle responsibilities for the system. As such, they will work with the product data in different ways. All will require the ability to rapidly identify product data they need and to retrieve that product data in a form in which they can use.

C.3.2.1 Product data creation. Creators of product data on an IPT may use ACMS to create working and released product data. Both types of product data will be vaulted in a secure environment where access to the product data is strictly controlled via user, group, and file type permissions.

C.3.2.1.1 Working product data. Working product data represents work in-progress. Only product data creators may make changes to the data, but select members of the IPT may be given view or copy access to the product data. In the early stages of its life the product data is highly dynamic. It may be stored in a secure vault where other members of the design team and possibly other members of the IPT can access the product data, but the revision identifiers need not be updated. Product data creators are trusted to coordinate changes they make, but are not required to establish new revisions until the product data reaches an appropriate level of maturity. When a change is being made, the non-revisioned product data is checked out from ACMS. This locks the product data from changes by others, but does not preclude other users from copying or viewing the product data. When the product data is checked back in, the product data is released for check-out by others, but is not revisioned. As the product data matures, the design team may elect to move their working product data into a vault where the product data is revisioned. Once this happens, each time the product data is checked-out, revised, and then checked back in to the vault, a new revision is created. Eventually, as the data matures further, it will become time to formally release the data for access to a wider audience. ACMS will enable the current data change authority to have a workflow created for release review (or retrieve a saved workflow). The product data that is a candidate for release will be routed through the workflow along with a

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ACMS SUPPORT TO SELECTED BUSINESS PROCESSES

release review electronic form where comments and electronic sign-offs can be captured. Reviewers will retrieve the

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data using ACMS, mark-up or redline a viewable image, add comments to the electronic form, and either recommend the product data be reworked or add their electronic signatures to the sign-off. When the product data successfully progresses through the review, the product data will transition from working product data to released product data and will be subject to formal configuration control rules and processes

C.3.2.1.2 Released product data. Released product data represents data that is under formal configuration control. It may not be changed, but new revisions can be created via a formal engineering change process (see paragraph C.3.3). Released developmental data, delivered data, and baselined data can fall into this category of product data. Like working product data, released product data is vaulted and subject to access control rules. New revisions of released product data may be created, but it does not constitute a new release until after an engineering change action successfully passes through the formal engineering change process. A trusted data creator then checks out the current revision of the released product data, makes changes using an authoring application, and then saves (checks in) the revised product data as a new revision and a new release. Changes to baselined releases of product data are supported in a similar manner. The difference is that the change control process must go through a CCB prior to accepting the change and, both the release status attribute and the baseline status attributes of the product data will change

C.3.2.2 Concurrent access to product data. A key assumption in the use of IPTs is that members will have simultaneous access to current, relevant product data. Sometimes this required data will be working product data. In other cases, the data will be released and possibly baselined product data. In either case, ACMS will make the product data available to authorized IPT members. It also is desired that users access to the product data be based on their responsibilities and roles, not where they reside geographically or organizationally.

C.3.2.3 IPT member access to product data. ACMS will allow members of an IPT to access ACMS via ACMS client software or a commercial web browser. Based on the member's rights, ACMS will control the member's access to product data. The IPT member will be able to search or navigate ACMS for product data on a particular part, component, or product. Searches will be possible via query or search displays. These queries or searches will be performed against attributes of the product data contained in the set of metadata. The actual displays will be customizable by the ACMS system administrator. ACMS also will enable the IPT member to find product data by navigating product structures. Once desired product data is found, the IPT member will be able to request either a display of metadata, a viewable image of the product data, or the source product data (for example, CAD model). If the product data is checked out by someone else, ACMS will retrieve a copy of the requested product data. If the product data is available for check-out and the IPT member has check-out permissions, ACMS will check the product data out and present it to the IPT member. In some instances, ACMS will actually provide the tool necessary to view or translate the product data. In other instances, ACMS will launch a viewing or authoring application for the member. Displays of metadata will be customizable by an ACMS system administrator.

C.3.2.4 Data use as part of a workflow. Many IPT members will be users who do not create product data, but review, evaluate, or reference product data on a regular basis. This can

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be done as part of a specific task for which they are responsible, in preparation for a major milestone, or as part of a process such as obtaining approvals to release product data. In some of these cases, the IPT members will need to find, retrieve, and view product data just to understand the current state of the requirements, design, or manufacture. In other cases, they will be an active participant in a pre-defined or ad hoc workflow where they need to review product data purposes as part of an assigned task. The following paragraphs describe IPT use of ACMS in a workflow situation.

C.3.2.4.1 Workflow builder. Authorized members of an IPT will be able to build ACMS workflows. These workflows can be saved as templates or executed as ad hoc workflows. IPT members who build workflows will be able to build sequential and concurrent tasks, and establish timed and event triggers.

C.3.2.4.2 Workflow participant. As a participant in a workflow, an IPT member receives notifications of workflow tasks. ACMS will enable IPT members to check their work queues, select a specific task on which to work, read any tasking messages or notifications that accompany the tasking, retrieve product data that has been attached to the tasking, and electronically sign-off on tasks or product data.

C.3.2.4.3 Workflow monitor. Authorized IPT members will be able to use the web browser to monitor the progress of tasks within the workflow. This includes being able to determine which tasks have been completed, which tasks are late, and the workloads of individuals participating in the workflow.

C.3.3 Engineering change action processing. ACMS will support engineering change action processing using workflow management capabilities, predefined electronic forms, linking of change data to engineering change action documents, and voting and electronic sign-off capabilities. ACMS “where-used” product structure management capabilities and product structure element to product data associations also will enable ACMS to facilitate change impact analyses. Engineering change action processing involves creating an engineering change action document, routing the engineering change action document and attached product data to participants in the engineering change action evaluation process, performing change evaluations, capturing comments and mark-ups, approving proposed changes (voting and electronic sign-off), and initiating change implementation actions (work orders and instructions).

C.3.3.1 Creating an engineering change action. A change initiator requests a standard engineering change action electronic form from ACMS. ACMS presents the electronic form to the change initiator who inspects the default data provided by ACMS and makes changes and adds data as necessary. ACMS will automatically assign the next available unique engineering change action number or allow the initiator to assign a unique engineering change action number. The change initiator uses ACMS’ query/search and product structure navigation capabilities to find any product data that needs to be attached to the engineering change action electronic form. The engineering change action electronic form may be customized by the local system administrator.

C.3.3.2 Creating an engineering change action workflow. Depending on the engineering change action, local operational procedures, and local preferences, engineering change actions can

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be distributed via ACMS' predefined or ad hoc workflows. Engineering change action workflows can be built from sequential and concurrent tasks, and can have timed and event triggers.

C.3.3.3 Distributing an engineering change action and attached product data. A change initiator submits an engineering change action electronic form and attachments for distribution to change evaluators. Depending on command preferences, there are several options for initiating the distribution of an engineering change action. One option is to send the engineering change action and attachments to a change administrator who is then responsible for further distribution of the engineering change action (for example, invoking an appropriate workflow). A related option is to establish a "drop box" location in ACMS for candidate engineering change actions. The change administrator would periodically check the "drop box" and distribute new engineering change actions. A third option is to configure or customize ACMS to automatically route a new engineering change action in accordance with a predefined workflow, once the engineering change action is submitted by a change initiator. In this case, a new engineering change action triggers an automatic process within ACMS. Regardless of the option for initiating a distribution, participants in the workflow will be assigned, their roles established, and engineering change actions will be routed based on predefined or ad hoc workflows.

C.3.3.4 Performing change evaluations. Participants in an engineering change action workflow will be notified by e-mail of tasks. ACMS will provide workflow participants with a means to identify outstanding workflow tasks. Participants will select tasks on which to work and use ACMS to retrieve product data necessary to conduct the engineering change action evaluation. Product data attached to the engineering change action will be retrieved directly from ACMS' representation of the task. Any other product data that the evaluator deems necessary will be located and retrieved using ACMS' query/search, product structure navigation, and check-out capabilities. Additionally, evaluators will use ACMS' where-used capabilities and multiple views of product structures to facilitate the conduct of impact analyses. For example, a manufacturing view of the product structure will help identify manufacturing process data that may be impacted by a proposed change. Likewise, a testing view of the product structure might reveal the need to change test plans. The ACMS engineering change action electronic form will include the capability to attach evaluator comments and recommendations. In some cases, evaluators will use the mark-up or redline features of ACMS on viewable images to indicate concerns or recommendations. In other cases, an evaluator may retrieve a copy of product data from ACMS and use an authoring application to create an alternative to the proposed change. This would be saved as new product data, separately controlled, but attachable to the workflow. Upon completion of the evaluation, an evaluator will electronically indicate task completion using ACMS. This will trigger ACMS to move the engineering change action on through the workflow.

C.3.3.5 Approving proposed changes (voting and electronic sign-off). At some point in the engineering change action workflow, members of the CCB will be tasked to vote on the acceptability of the engineering change action. ACMS will provide the ability to record these votes and protect against unauthorized voting. ACMS also will tabulate the votes and present them to the individual responsible for formally approving the engineering change action. ACMS will record the electronic sign-off or rejection of the engineering change action.

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C.3.3.6 Initiating change implementation actions. As a result of a decision to make a change, it is necessary to initiate a series of change implementation actions. Depending on individual command preferences and policies, the change implementation actions can be initiated and managed via ACMS workflow capabilities. A change implementation workflow would start with a CCB directive which orders that the change be made. This directive would be submitted to an ACMS workflow with relevant contract, program management, and financial data as attachments. Contracts personnel will be tasked to negotiate contract modifications. Program managers or task leaders will then be tasked via the workflow to develop change instructions which in turn will be routed to engineers via the ACMS workflow capabilities. Engineers will design the directed changes using product data checked out from ACMS. The engineers will create new revisions of the product data, but that product data will not be released as the new, baselined revision of the product until after it has gone through a release review. The release review also will be supported by an ACMS workflow. Upon approval of the product data's release (captured electronically in ACMS), a "trusted user" will promote the appropriate revision of the product data to be the new baseline for the product. The "trusted user" also will enter effectivity information relevant to the new, baselined revision of the product data. ACMS will maintain an audit trail of changes. ACMS also will disseminate change notifications to individuals previously identified as needing to know about changes to a product's data.

C.3.4 Tech loop review. ACMS will support validation of TDPs by automatically responding to reprourement event triggers, assembling a TDPL, presenting links to the data referenced by the TDPL, and then initiating an appropriate TDP review workflow that culminates in approval and certification of the TDP via electronic sign-off. This process starts with the identification of a need for a part by an Item Manager. A PWD and a PRON are generated by the Item Manager's system in response to the need to procure spare or repair parts.

C.3.4.1 Initiate validation. An Item Manager, or an automated system supporting Inventory Management, will determine a need to procure spares or repair parts. This will result in a PWD with a unique PRON which is sent to the Tech Loop for review and validation. If the PRON and PWD were automatically generated and sent to ACMS, then ACMS will automatically respond to this event trigger by searching for the appropriate part, automatically assembling a TDP, and automatically initiating a TDP review workflow. In the event that the PRON and PWD are not received automatically, then the personnel in the initial Tech Loop processing point will need to access ACMS, find the part via search queries or product structure navigation, and initiate the assembly of the TDP. Once the TDP has been generated, an appropriate workflow will be initiated for review, validation, approval, and certification of the TDP.

C.3.4.2 Retrieve supporting product data. Upon notification of an outstanding task, the TDP reviewers will be provided with a means to identify outstanding workflow tasks. The reviewers will select a task on which to work and use ACMS to retrieve the data associated with the TDP. Product data attached to the workflow task will be retrieved directly from ACMS without requiring any additional querying or navigating. Any other product data that the reviewer deems necessary will be located and retrieved using ACMS' query/search, product structure navigation, and check-out capabilities. For example, the result of the query will identify product data by its drawing, document, or other product data identifier. This product data will include engineering drawings, models, simulations, specifications, standards, testing requirements, quality

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requirements required to manufacture an item, associated lists; process descriptions; and change action documentation. Other examples of product data include documents defining physical geometry, material composition, performance characteristics, manufacture, assembly, and acceptance test procedures.

C.3.4.3 Review and update TDP. ACMS will enable TDP reviewers to view and mark-up or redline images of the product data. Where the TDP is incomplete or requires modification, ACMS will enable the Configuration Manager to create, store, and control new product data or make revisions to the existing product data. Often, either of these activities will involve participating in a review of product data or an engineering change action workflow prior to releasing the product data.

C.3.4.4 Assemble and certify TDP. As part of the TDP Validation workflow within ACMS, the appropriate review personnel will be able to review and electronically sign-off or certify to the adequacy of the TDP. Once the review has been accomplished, ACMS will route the validated TDP to procurement, completing the TDP Validation workflow.

APPENDIX D

GLOSSARY

D.1 SCOPE

D.1.1 Scope. This appendix contains an alphabetical listing of the terms used in this specification. Definitions reference MIL-STD-2549 (Configuration Management Data Interface) and/or EIA/IS-649 (Standard for Configuration Management) where appropriate. This appendix is not a mandatory part of the specification. The information contained herein is intended for guidance only.

D.2 APPLICABLE DOCUMENTS

(This section is not applicable to this appendix.)

D.3 DEFINITIONS

Term	Definition
Access Rule	A criterion which determines access to specific data or metadata. Multiple access rules may be applied to a single item of product data or metadata.
Action Trigger	See Event Trigger and Timed Trigger.
Ad hoc Workflow	A modeled process which is automated and consists of a set of tasks and associated triggers, data, and executors that is assembled for a specific occurrence of a purpose or situation.
Allocated Baseline	The approved allocated configuration data (reference: MIL-STD-2549).
Application Program Interface	The public specification of functions which allow external applications to access the functionality of a particular application program.
Archive	A system administration operation that compresses one or more separate files into a single file on a removable magnetic or optical media for permanent long-term storage and data protection. The archival file also contains information to allow the compressed files to be extracted by a restoration program.
Audit Status	A category to inform users of the current stage of progress or development of an audit.
Authoring Systems	Application software for creating data/documents. Examples include word processing, spreadsheet, briefing, computer-aided design, and computer-aided engineering software.
Backup	A spare copy of a file or multiple files for use in the event of failure or loss of the original. The term is most commonly used to refer to a copy of all files on a computer's disks which is made periodically and kept on magnetic tape or other removable medium.

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Term	Definition
Baseline Product Structures	A hierarchical collection of all parts, components, and assemblies comprising a particular product at a particular point in time, including its structure and data.
Boolean Operations	Mechanisms for combining two or more conditions into a single statement whose result is TRUE or FALSE. Each component condition can be evaluated as TRUE or FALSE. The standard Boolean operations are AND, OR, NOR, XOR (exclusive or), and NOT.
Change Action	Modification of a product and the data and metadata related to the product. Change action examples include engineering change proposals and deviations.
CM Activity	Any process associated with establishing and maintaining consistency of a product's performance, functional, and physical attributes with its requirements, design and operational information throughout its life. As applied to digital documents, it is the application of configuration management principles to digital documents, their representations, and data files; and the correlation of digital documents to each other and to the products to which they apply. Examples include change processing, configuration auditing, baselining, determining contract requirements, product modifying, and data acceptance.
Command-unique Requirement	A requirement which is applicable to a particular site and is to be satisfied by the ACMS hardware and software implemented at that site.
Configuration Audits	See Functional Configuration Audit, Incremental Configuration Audit, and Physical Configuration Audit.
Configuration Item (CI)	A configuration item is any hardware, software, or combination of both that satisfies an end use function and is designated for separate configuration management. Configuration items are typically referred to by an alphanumeric identifier which also serves as the non-changing base for the assignment of serial numbers to uniquely identify individual units of the CI.
Current Document Change Authority	The authority currently responsible for the content of a drawing, specification, or other document and which is the sole authority for approval of changes to that document (reference: MIL-STD-2549).
Data Access	The ability to find and use data at a particular permission level.
Data Control	Capabilities which ensure that data and metadata access is limited to authorized users and to allowed permissions.
Data Item	A generic term to any kind of data. Example data items include models, documents, drawings, and metadata. Some readers may find it useful to think of a data item as an object whose type is data.

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Term	Definition
Data Vaulting Capabilities	System capabilities which provide for the storage of data and metadata and ensure that access to data is restricted to those with appropriate permissions, that data is updated by only one user at a time, and that updates to data are stored as independent revisions.
Document	A self-contained body of information or data which can be packaged for delivery on a single medium. Some examples of documents are: drawings, reports, standards, data bases, application software, and engineering designs (reference: MIL-STD-2549). Document is a form of Product Data.
Document Representation	A set of digital files which, when viewed or printed together, collectively represent the entire document (for example, a set of raster files or a set of CAD files). A document may have more than one document representation (reference: MIL-STD-2549).
Document Support	The identification, retrieval, and comparison of documents performed in support of configuration audit activities.
Document Transport Transaction	An action of ACMS in which a document is moved from one location to another. Examples include: <ul style="list-style-type: none"> a. Document check-in, b. Document check-out, c. Receiving from or sending documents to external systems (such as an external repository like JEDMICS), d. Sending documents to translators, e. Receiving from or sending documents to applications (such as an authoring application like Pro Engineer or MS Word), and f. Movement of a document due to an event trigger or workflow.
Dynamic Interface	A real-time exchange of data.
Effectivity	A designation defining the point in time, an event, or a product range (for example, serial, lot number, model, date) at which changes or variances to specific products are to be effected (reference: EIA/IS-649).
Electronic Form	A structured presentation of product data on a computer screen which is used to modify or enter that data.
Engineering Change	A change to the current approved configuration documentation (including product structure and product data) of a configuration item.
Engineering Change Action	A document defining modification of a product and/or documents and metadata related to the product.

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Term	Definition
Engineering Change Proposal	The documentation by which a proposed engineering change is described, justified, and submitted to the CDCA for approval.
Engineering Data	Documents and files such as engineering drawings, technical manuals, models, parts lists, wire lists, specifications, standards, reports, instructions, requirements, directives, engineering change action documents, diagrams, and schematics. Engineering data is a form of Document which is a type of Product Data
Engineering Data List	The Engineering Data List (EDL) consists of product drawings and associated lists used as an internal auditing tool for technical data configured against the item.
Engineering Data Management System	Hardware and software providing the mechanisms for storing, protecting, locating and retrieving, changing, and monitoring engineering data and for creating and using metadata describing and relating the engineering data. Provides mechanisms for change management of data and for controlled access to the data and metadata.
Enterprise-Level Product Data	Product data that is accessible for viewing, printing, and copying by all users, regardless of where that data is stored.
Enterprise-unique Requirement	An ACMS requirement which is to be satisfied at a particular site after modification unique to that site based on the direction provided by the acquisition requirements specified in Section 6.2 of this document.
Enterprise-wide Requirement	An ACMS requirement which is to be satisfied by all systems in the ACMS federated system of systems.
Event Triggers	An ACMS action that initiates a workflow, a workflow task, or another ACMS action. An example of an event may be an electronic sign-off.
Federated System of Systems	A collection of systems that operate in a collective manner while retaining local uniqueness where necessary. For ACMS, the federated systems will be able to share common data and possess common capabilities across the many sites. Each site, however, will have the ability to customize ACMS at an individual site with respect to its data and capabilities.
Functional Baseline	The approved functional configuration data (reference: MIL-STD-2549).
Functional Configuration Audit	The formal examination of functional characteristics of a configuration item or system prior to acceptance of the design capabilities, special tooling, or developmental testing, to verify that the item has achieved the requirements specified in its functional and/or allocated configuration data (reference: MIL-STD-2549).

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Term	Definition
Incremental Configuration Audit	A partial audit of a product due to (1) the existence of multiple development efforts in support of a single end item, (2) the product is completed incrementally by the developer, or (3) the development effort is simply too large for completion of a single audit.
Incremental Baseline	An approved release of configuration documentation on a given date that is not a functional baseline, allocated baseline, or product baseline. Typically these correspond to a configuration established for a re-procurement action.
Integration	The joining of two or more software applications such that the applications work together to perform one or more functions or exchange data. Typically, there are three levels of integration. (1) The lowest level of integration involves launching one application from another with the exchange of a data file that is processed by the launched application. Other than the exchange of the referenced data file, data does not flow dynamically between the two applications. The launched application is often referred to as an encapsulated application. (2) The middle level of integration involves incorporating data and/or function calls in at least one of the applications. A data call would result in the automatic data exchange of data. A function call would cause a function in the called application to be initiated. (3) The third and highest level of integration involves a tight coupling of the applications, so that both applications appear as one and all relevant types of data are shared directly.
Link	A user created element in ACMS which describes a relationship (see relationship) in ACMS. Relationships can be between product structure elements, between product structure elements and data items, or between data items. Synonym for Relationship.
Logical Location	A conceptual division of a data vault.
Messaging Capabilities	ACMS-generated notifications based on pre-defined event triggers such as workflow initiation, task completion, or data modification. Distribution of the notification may be by utilizing the current e-mail system.
Metadata	Elements of information that describe data, such as document identifier, date, owner, release level, format, keywords, data location, approval authorizations, part identifier, and part name. These elements help users locate and distinguish particular data stored in ACMS or interfacing systems. Metadata is a form of Product Data.
Metadata Default	A value set in ACMS by the system administrator which is applied as the value of the metadata element for a new element of data if the user does not replace it with a different value.

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Term	Definition
MIL-STD-2549 Data Information Packets	Information pertaining to drawings, specification, standards, software and software support documents, general documents, product/asset configuration, configuration change control, configuration management action item status, project management, engineering parts list, basic document protection, basic files, and basic document representation is broken into data information input packets. These data information packets define the data and metadata that can reside in the ACMS database. There are 10 packets.
Native Format	The file structure produced by the application which created the files.
Non-Revisioned Product Data	Electronic information which , when modified and saved, overwrites the file originally containing the information unless specifically instructed by the user to save to a new file.
Off-Line Archival Storage	Persistent maintenance of information on a machine removable media such as tape or compact disk.
Permission Level	Authorization to exercise particular functions on data and metadata, including create, read, update, and delete.
Physical Configuration Audit	The formal examination of the “as-built” configuration of a configuration item against its technical documentation to establish or verify the configuration item’s product baseline (reference: MIL-STD-2549).
Product Baseline	The approved product configuration data (reference: MIL-STD-2549).
Product Data	Documents, files, and metadata related to a product’s requirements, design, implementation, and support. Includes, but is not limited to, engineering, configuration management, administrative, financial, test and evaluation, and packaging information. Metadata includes data about documents and product structures. See also Metadata, Document, and Engineering Data.
Product Data Attributes	The characteristics of a product that can be used in a search or to describe the product.
Product Data Management	A Product Data Management System is used to organize, access, and control all data related to a product. A PDM system is a type of Engineering Data Management System.
Product Structure Elements	The assemblies, components, parts, and material which, when combined, make up a product. Includes the highest level element such as the weapon system or end item. A product structure element may be designated as a CI.

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Term	Definition
Product Structures	A hierarchical collection of parts, components, and assemblies. May include CIs and the highest level element such as the weapon system or end item and the lowest level element such as a part. A product structure often is represented as a graphical depiction of the relationships among product structure elements.
Promoted Product Data	Product data whose status has changed, such as from one release level to another or by designation as part of a particular baseline.
Relationship	An association between product structure elements, between a product structure element and data, or between one element of data and another. Examples include composition of a product from assemblies, description of a product by a specification, and composition of a document from chapters. Synonym for Link.
Release	The designation by the originating activity that data, a document representation, or software revision is approved by the appropriate authority and is subject to configuration change management procedures (reference: MIL-STD-2549).
Release Level	The state, status, or access level of product data at a point in time during its life cycle. Release levels are defined according to organizational business rules. Example level names are Preliminary Release, Prototype Release, and Production Release. Each Release Level has its own set of business rules that describe authorizations for access, use, and approval.
Release Status Attribute	An attribute assigned to data to support the business rules defining access, change management, and archiving of digital data documents. The current status of data being reviewed and released. Example values are submitted, pending release, rejected, approved.
Repository System	A legacy system that ACMS will interface with, such as JEDMICS, whose primary function is engineering data storage.
Required Attributes	Metadata that are necessary in order to search for data by groups.
Revision	An identified and tracked change to a product structure element, document, or document representation. The status of a particular revision may be released or working.
Role	A method of classifying users, usually based on their particular function on a project or project activity.
Secure Storage	The ability to preclude stored information from being viewed, reused, updated, or deleted without invoking system rules.
Support Document	A document which has a parent, that is, a document which, with other documents, makes up the parent document.

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Term	Definition
Synchronized Systems	Systems that store and manage the same data in such a way that a change/revision of data or metadata in one system will be reflected in the second system.
Task Notifications	Part of the workflow execution process, tasking, and instructions necessary for the user to accomplish the workflow assignment.
Technical Data Package	A technical description of an item adequate for supporting an acquisition strategy, production, engineering, and logistics support. The description defines the required design configuration and procedures required to ensure adequacy of item performance. It consists of all applicable technical data such as drawings and associated lists, specifications, standards, performance requirements, quality assurance provisions, and packaging details.
Tech Loop	The business processes comprising the assembly, review, validation, update (if any), and dissemination of a Technical Data Package.
Technical Baseline	The collection of documents which are associated with a particular project. Generally, they serve to document the analysis and the rationales which were used to authorize the project to proceed past various milestones.
Technical Data	Synonym for product data.
Timed Trigger	An ACMS action that is pre-defined and based on a certain time interval or date.
Time-out Rule	The description of a workflow action which will be taken during execution of a workflow when the time taken by one of the workflow participants to accomplish a workflow task exceeds a specified threshold. Because the action is normally escalation or notification to the workflow participant's supervisor regarding the lateness of the task, time-out rules are also known as escalation rules.
Transaction Log	An on-going set of records that updates every time a change is made in the database. It is saved externally to the system and contains sufficient information that the system may be restored from a backup or archive.
Vault	A logical computer data storage area, possibly distributed physically, and associated databases which maintain the integrity and security of stored data via controlled access through check-in and check-out features that restrict and track access in accordance with defined access permissions and rules.
Web-based Access	The ability to access and use ACMS through a commercial web browser.
Work Queue	An electronic listing of workflow tasks assigned to a particular user.

APPENDIX D

Term	Definition
Workflow	A pre-defined sequence (which may include both serial and parallel subsequences) of tasks and their associated product data and executors. During implementation of a workflow each task in the pre-defined sequence is executed by the specified executor(s), who are provided the product data needed to accomplish the task. At the conclusion of the task, the next task and executor in the sequence is notified until the sequence is completed.
Workflow Capabilities	Functionality associated with the creation, storage, implementation, modification, and monitoring of a pre-defined sequence of tasks and their associated product data and executors.

APPENDIX E

ACRONYMS

E.1 SCOPE

E.1.1 Scope. This appendix contains an alphabetical listing of the acronyms used in this specification. This appendix is not a mandatory part of the specification. The information contained herein is intended for guidance only.

E.2 APPLICABLE DOCUMENTS

(This section is not applicable to this appendix.)

E.3 ACRONYMS

Acronym	Definition
ACMS	Automated Configuration Management System
AMC	Army Materiel Command
AMC/AMSC	Acquisition Method Code/Acquisition Method Suffix Code
API	Application Program Interface
ARDEC	Army Research, Development, and Engineering Center
CAD	Computer Aided Design
CALS	Continuous Acquisition and Life-Cycle Support
CARS	Computer Aided Requirements System (formerly TDP Tracker)
CASE	Computer Assisted Software Engineering
CCB	Configuration Control Board
CCSS	Commodity Command Standard System
CDCA	Current Document Change Authority
CI	Configuration Item
CITIS	Contractor Integrated Technical Information Service
CM	Configuration Management
COOP	Continuity of Operations Plan
COTS	Commercial Off-The-Shelf
DFARS	Defense Federal Acquisition Regulation Supplement
DLA	Defense Logistics Agency
DoD	Department of Defense
DoDISS	Department of Defense Index of Specifications and Standards
ECALS	Engineering Changes at Light Speed

APPENDIX E

Acronym	Definition
EDL	Engineering Data List
EDMD	Engineering Data Management Directorate
EDMS	Engineering Data Management System
FCG	Functional Coordinating Group
FSC	Federal Supply Class
GBL	Generation Breakdown List
GFE/GFM	Government Furnished Equipment/Government Furnished Material
HAZMAT	Hazardous Material
IHS	Information Handling Services
IPPM	Integrated Product and Process Management
IPT	Integrated Product Team
JCALs	Joint Computer-aided Acquisition and Logistic Support
JEDMICS	Joint Engineering Data Management Information and Control System
MEARS	Multi-user Engineering Change Proposal Automated Review System
MSC	Major Subordinate Command
PASS	Procurement Aging and Staging System
PC-JEDMICS	Personal Computer-based Joint Engineering Data Management Information and Control System
PDM	Product Data Management
PRON	Procurement Request Order Number
PWD	Procurement Work Directive
RAM	Random Access Memory
SBU	Sensitive But Unclassified
SMTP	Simple Mail Transfer Protocol
STEP	Standard for the Exchange of Product model data - ISO 10303
TACOM	Tank-automotive and Armaments Command
TBD	To Be Determined
TDP	Technical Data Package
TDPL	Technical Data Package List
WBS	Work Breakdown Structure

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Custodians:

Army - MI

Preparing activity:

Army - MI

(Project Number 5963-A874)

Review activities:

Army - AR, AT, CR, GL, IE, PT, SY, TE

INSTRUCTIONS

1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.
2. The submitter of this form must complete blocks 4, 5, 6, and 7.
3. The preparing activity must provide a reply within 30 days from receipt of the form.

NOTE: This form may not be used to request copies of documents, nor to request waivers, or clarification of requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced documents(s) or to amend contractual requirements.

I RECOMMEND A CHANGE:	1. DOCUMENT NUMBER MIL-PRF-32029	2. DOCUMENT DATE (YYMMDD) 980630
3. DOCUMENT TITLE Automated Configuration Management System (ACMS) Performance Specification		
4. NATURE OF CHANGE (<i>Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.</i>)		
5. REASON FOR RECOMMENDATION		
6. SUBMITTER		
a. NAME (<i>Last, First, Middle Initial</i>)	b. ORGANIZATION	
c. ADDRESS (<i>Include Zip Code</i>)	d. TELEPHONE (<i>Include Area Code</i>) (1) Commercial (2) AUTOVON (<i>if applicable</i>)	7. DATE SUBMITTED (YYMMDD)
8. PREPARING ACTIVITY		
a. NAME U.S. Army Aviation and Missile Command	b. TELEPHONE (<i>Include Area Code</i>) (1) Commercial (2) AUTOVON (256) 876-6990 746-6990	
c. ADDRESS (<i>Include Zip Code</i>) Commander U.S. Army Aviation and Missile Command ATTN: AMSAM-RD-SE-TD-ST Redstone Arsenal, AL 35898-5000	IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT: Defense Quality and Standardization Office 5203 Leesburg Pike, Suite 1403, Falls Church, VA 22041-3466 Telephone (703) 756-2340 AUTOVON 289-2340	