

Previous Section

2.0 -- CALS Implementation

2.1 -- Background

In December of last year, the Sample Program Office conducted an internal study of the Sample programs to characterize the existing operational situation and to identify opportunities for streamlining these operations. This study revealed that:

- Most administration and program management actions are done in hard copy,
- CALS initiatives exist for these programs but are disjointed and not integrated,
- Engineering drawings and program data range from paper to digitized, and
- Joint Computer-aided Acquisition and Logistics Support (JCALS) and Joint Engineering Data Management and Information Control System (JEDMICS) are scheduled to be received at the Sample Program Office late next year.

As a result of these findings, the Sample Program Office has initiated efforts that will result in a more consistent approach to CALS implementation.

2.2 -- Objectives

The overall objective of the CALS implementation effort is to design, implement, and use an IDE across the entire Sample organization to include essential linkages to the prime contractors and other participating Government organizations. The basic tenet of the IDE project is to utilize DoD and commercial standard products (including COTS software) and systems to the maximum extent possible. The Sample program will also leverage in-place computer and communications resources to the maximum extent possible to support IDE implementation and operations. The CALS/IDE objectives are:

Implement a baseline architecture for dissemination of information in electronic format to authorized users and applicable standard Automated Information Systems (AISs) such as Joint Engineering Data Management and Information Control System (JEDMICS), Configuration Management Information System (CMIS), etc.

Create an integrated communications and project management capability to allow paperless project management.

To develop a standard, distributed open system data processing environment which makes maximum use of existing hardware and software, as well as existing/planned standard AISs (e.g., JEDMICS).

Establish digital change management processes for all data (e.g., legacy data, drawings, documents, TM, cost and schedule) within and among programs which share the same data.

Convert (where cost-effective) and provide legacy data through the IDE (Drawings, TM data).

Develop Electronic Technical Manuals (ETMs) and Interactive Electronic Technical Manuals (IETMs) for each system for which they would be beneficial and cost effective.

Take advantage of the opportunities presented by evolving information technologies to improve acquisition and life cycle support processes.

2.3 -- CALS Implementation Phasing

The Sample program will implement CALS in the following phases.

2.3.1 -- Phase I

An initial capability will be established within 6 months of contract award that provides connectivity between the Sample Program Office and its prime contractors, a fundamental set of workflows common to all Sample programs, and Sample business management functions.

2.3.2 -- Phase II

The full Sample IDE capability will be established within 12 months of contract award and will include the linkages to remote government users of Sample data. Technical data, drawings, and associated documentation will be stored, managed, and used in a data repository. Workflows and Global Data Management Services supporting production-related business processes will be developed and incorporated into the full IDE capability.

2.4 -- Implementation Planning

Key to the success of the CALS implementation effort is the development and implementation of programs and plans to support the seamless transfer of systems and configuration management responsibility to the program manager and supporting activities. It is incumbent upon each Sample program manager to conduct CALS implementation planning not only to support the goals and objectives of their individual programs, but to support the goals, objectives and concept of operations set forth in this GCO and other project plans. Program managers will also consider coordinating their IDE efforts with any on-going contractor efforts.

2.5 -- Contractor IDE Planning

The Sample program contractors have an important role in planning and execution of the IDE. The Sample program will require each contractor to provide both a Contractor's Approach to CALS (CAC) and either a CALS Implementation Plan (CALSIP) or other similar plan (e.g., an IDE Implementation Plan, Program Data Integration Plan, etc.). These documents are used to describe the contractor's approach to CALS and their plan to implement CALS in accordance with this GCO.

2.5.1 -- Contractors Approach to CALS

The CAC is provided in response to the RFP, and describes the contractor's approach, experiences, and successes in the creation, management, use, and exchange of digital information. Information in the CAC

is used to gauge the risk associated with the contractor's ability to provide the digital data products and services required by the RFP. After contract award, the CAC should be used as the basis for subsequent planning documents.

As a minimum, the CAC should include:

The contractor's approach and experiences in the management, use, and exchange of digital information. This description should include, at a minimum, a discussion concerning the delivery of digital data products.

CALS program management, including program objectives and strategy, program management responsibilities, and program management approach.

Information system description, including source and destination systems, and relationship with Government receiving systems as depicted in the CALS GCO.

Data protection and integrity, including risk assessment and system security certification.

2.5.2 -- CALS Implementation Plan

The CALSIP should address capabilities for automating the access and retrieval of technical data, and provide for digital exchange and integration between engineering, manufacturing, logistics and other functional areas. The CALSIP should not be a static document, but should be revised to reflect the reality of changing Sample program requirements, technology, and improved processes.

Program managers may choose to develop CDRL, CLIN, or exhibit language that identifies each required plan deliverable and the method(s) of delivery required. The program manager may also choose to accept alternative approaches to identifying and providing data deliverables that do not require the rigidity of the formal CDRL process.

3.0 -- Data Requirements

All Sample program management and technical data shall be generated and made available to authorized users in digital form only. This applies to both contractor and Government generated data. The digital data shall be standardized to agreed upon formats to facilitate data sharing. This goal will be achieved through orderly steps where the type, mode, and frequency of each deliverable is evaluated for intended use, frequency of use, and infrastructure of the users.

3.1 -- Data Categories

There are three primary categories of data that will be available within the IDE: legacy product data provided by the Government to the prime contractor, new product data provided by the prime contractor to the Government, and business management data originating from both Government and prime contractor sources.

3.1.1 -- Legacy Product Data

Legacy data is technical data (logistics data, engineering drawings, technical manuals, etc.) that was developed and archived before the implementation of CALS initiatives. Depending on its anticipated use, legacy data can be retained in its original native format (typically paper or aperture cards), scanned in and stored in raster or neutral data format (e.g., Portable Document Format [PDF]), or recreated as a processable file. The decision to convert any existing technical data item (manual, drawing, etc.) will be based on factors such as current life-cycle stage, volume of data, economic feasibility of conversion, data usage, and frequency of change. The Statement of Work (SOW) will specify any legacy technical data items that will be required to be converted for access through the IDE.

3.1.2 -- New Product Data

New product data are defined as those data provided to the Government by the prime contractor in accordance with the terms and conditions stipulated within the Contract Data Requirements Lists (CDRLs) associated with each weapon system. These CDRL requirements provide the contractual means by which weapon system data, in digital formats or otherwise, are delivered to the Government. To receive new product data in digital formats, each Sample program manager must clearly identify the data content, structure, format, and delivery media. The preferred formats for digital data delivery are outlined in paragraph 3.5.

3.1.3 -- Business Management Data

Business management data are those data that are generally created by the Government and the contractor and used to assess program status. Examples include requirements documents, program plans, schedules, cost performance reports, financial data, notifications, requests and general communications. These types of data should conform to the program's EDI requirements instead of CALS requirements wherever applicable.

3.2 -- Data Users

Table 3-1 lists the primary Government users of Sample data, their location, support function, and data requirements. This list has been derived from the CDRL addressees associated with the Sample programs.

Activity	Location	Function	Data Requirements
PMA-999	Washington, DC	Program Management	Management Reports
		Progress Reports	
		Configuration Mgmt.	Communications
		CSAR ECP/RFD/SCN/NOR/ACSN	CM Data
NAVAIR	Washington, DC	Training	
		Training Planning Data	
		Manpower Rqmts. Data	
		Training Materials	
		Engineering Reports/Plans	R&M Data
		Engineering Data	
		Engineering Drawings	
		Performance Monitoring	

		Cost Analysis	Contractor Cost Data Reports Cost Performance Reports Cost/Schedule Status Reports Contractor Funds Status	
NAWC-WD	Pt. Mugu, CA	Logistics Support	Logistics Data Reports/Plans	Tech Pubs
		Design Agent (Systems Engineering)	Engineering Data R&M Data Reports/Plans	Engineering Drawings
AF Materiel Command	WP AFB Dayton, OH		Logistics	Logistics Data Tech Pubs
			Reports/Plans R&M Data Provisioning Data	
NAWC-AD	Lakehurst, NJ (Safety & Ship Interface)		Engineering Support R&M Data Reports/Plans	Engineering Data Engineering Drawings
Army Materiel Command	Alexandria, VA		Component Depot Analysis Tech Pubs Maintenance Data	Logistics Data
Aviation Army Systems Command	St. Louis, MO		Logistics Support Tech Pubs Reports/Plans	Logistics Data
		Hazard Analysis	Safety Data	

Table 3-1. -- Data Users Associated with XXX Programs

3.3 -- Data Use Requirements

Data use requirements are the ways in which the specific data types may be processed. The Sample IDE will support the five typical methods of data processing as described below.

3.3.1 -- View Only (V)

The IDE will provide controlled, on-line access to specific data products to authorized individuals/organizations. The end user will be provided electronic access to data products for the purposes of viewing and local printing of the data. This includes viewing selected portions of one or several documents as well as side-by-side comparisons of documents. The user will not have the ability to modify the data. Provisions will exist to provide additional users with view only access upon request.

3.3.2 -- Comment/Annotate (C)

The IDE will provide users with the ability to evaluate and highlight for future reference or to make annotations, approvals, and comments without the ability to change the original file. Annotations will be associated with a specific item or location within a document such that the annotations are displayed whenever that point or area of the document is displayed.

3.3.3 -- Extract/Process/Transform (E)

The IDE will provide authorized users the ability to extract and modify the format, composition, and structure of all or a portion of the data into another usable form without affecting the original content or format.

3.3.4 -- Update/Maintain (U)

The IDE will provide authorized users with the ability to change data either directly or through controlling software, in the active files on the host computer.

3.3.5 -- Archive (A)

The concept of archiving involves the placing of data into a repository to preserve it for future use. Once Sample assumes configuration management responsibility, long-lived data such as engineering drawings and technical publications should be delivered in accordance with the appropriate digital exchange standard. These items will be archived for long-term storage and protection for future developmental changes and support purposes. Prior to Sample assuming configuration management responsibility, the record copy of most product data will remain with the prime contractor. Frequently used business management and product data comments will be archived locally using existing computing resources.

Table 3-2 provides a summary of the data use requirements of Sample program data users and depicts how the data is intended to be used. Note that this list is not intended to be all inclusive; rather it leads to a decision point for the format and delivery mode of the data deliverables. The numbers found in the 'V', 'C', 'E', 'U', 'A', and '2' columns indicate how many of the Activities supporting this program use the CDRL data item in the manner indicated.

Note: Two or more methods may be required by a single user, the methods are not mutually exclusive.

<u>Data Description</u>	<u>Item Identifier</u>	<u>V</u>	<u>C</u>	<u>E</u>	<u>U</u>	<u>A</u>	<u>2</u>
Engineering Drawings and Associated Lists	A001	3	3	2	2	2	0
Configuration Management Plan	A002	2	1	1	0	1	0
Request for Deviations	A003	1	0	0	0	1	0
Engineering Change Proposals	A004	4	1	2	1	1	0
Continuous Acquisition and Life-cycle Support Implementation Plan (CALSIP)	A005	1	1	0	0	0	0
Airborne/Structureborne Noise Test	A006	3	0	0	0	0	0
Builder's Trial Agenda	A007	4	1	0	0	1	0
Initial Inventory Document	A008	1	1	0	0	0	0
System Safety Engineering Report	1	0	0	0	1	0	
Procurement Plan	1	1	1	0	1	1	

V = View Only; C = Comment/Annotate; E = Extract/Process/Transform; U = Update/Maintain; A = Archive; 2 = Secondary Distribution

Table 3-2. -- Data Use Requirements Summary for the XXX Program.

3.4 -- Data Format Requirements

While several military, commercial, and International standards and specifications currently address

formats for data creation, storage, and interchange, many of the military standards are being eliminated under the current Acquisition Reform effort, and others are being transitioned to performance (MIL-PRF) specifications. The performance specifications define what the DoD needs in terms of form, fit, and function rather than of how to build an item. Standards set boundaries for data acquisition and management. However, to achieve "best value" in data as well as in weapon systems, IDE data standards must be neither restrictive nor prescriptive. They must be driven by existing and emerging commercial standards as well as by programmatic business needs. Where applicable and more advantageous, Sample will adopt into its weapon system programs, commercial product data creation, storage, and interchange standards to meet its business needs.

Specific data formats and delivery media shall be stated on individual DD Form 1423 CDRL items, CLINs, or Exhibits. Proper safeguards will be used for classified information (DoD 5520.22M). When discrepancies occur between this GCO and the CDRL/CLIN/Exhibit, the CDRL/CLIN/Exhibit shall take precedence. In general, the formats and delivery media listed in paragraph 3.5 are recommended for each data type.

3.5 -- Data Format Recommendations

Within each of the three major IDE data categories discussed in Section 3.1, one or more of the following data types will be digitally developed, delivered, and maintained within the Sample IDE. The following sub-sections describe these data types and provide Sample's recommendations for format. On-line delivery/access is recommended for all data types. However, very large data files that would overburden the network are still recommended for delivery via physical media (e.g., magnetic tape) in accordance with MIL-STD-1840.

3.5.1 -- Management and Administrative Data

Management and administrative data include program plans, budgets, and schedules, cost performance reports, program financial execution data, engineering management plans, general communications, procurement data, etc.

All Sample management and administrative data will be available via on-line access/delivery. On-line management status data will be analogous to that available to contractor program managers. This data should be developed in Mutually Agreeable Commercial Software (MACS) formats.

Where the Government is the originator of data, Sample will electronically deliver Government Furnished Information (GFI) data into the IDE for both Government and contractor use.

3.5.2 -- Product Description Data

Product description data include information related to design, manufacturing, analysis, test and inspection; information typically included in the technical data package (TDP), such as engineering drawings and associated lists; and product description data required for reprourement of spares and manufacturing support.

Product description data should be provided in MACS formats appropriate for the intended use. If drawing

data will be further processed by the government, it should be provided in native CAD format. If it will only be viewed, raster or neutral format may be preferred. As digital format and delivery standards become more mature and widespread, CDRL delivery requirements may be modified appropriately. Of particular interest in the future will be Product Data Exchange Using STEP/Standard for the Exchange of Product Model Data (PDES/STEP), ISO 10303.

3.5.3 -- Operations and Support Data

Operations and Support (O&S) data include analysis, trade studies, plans and reports, such as, configuration management plans, reliability and maintainability data, packaging data, provisioning data, etc. Text-based documents should be generated in a commonly used word processing format. Ancillary graphics, spreadsheets, and associated data files should be developed in common business software and combined as required by the contract.

3.5.4 -- Publications

Publications data include technical publications, operator's manuals, maintenance manuals, parts manuals, battle damage assessment and repair manuals, training guides and other support manuals.

Publications that will be updated and maintained over the program life-cycle, should be developed using Standard Graphics Markup Language (SGML, MIL-PRF-28001, ISO 8879) and CGM graphics (MIL-PRF-28003, ANSI/ISO 8632, FIPS Pub 128), and delivered in a processable electronic format. Preliminary review versions of publications (text and graphics) can be delivered in MACS formats.

The contractor shall develop Electronic Technical Manuals (ETMs) and Interactive Electronic Technical Manuals (IETMs) for each system for which they would be beneficial and cost effective. Contractors will adhere to MIL-M-87268 for style and format, MIL-D-87269 for data bases and MIL-M-87270 for Quality Assurance to the maximum extent practical for IETM development. These standards typically apply only to Class 3 and higher IETMs.

3.5.5 -- Legacy Data

The decision to convert any existing hard copy technical data item (manual, drawing, etc.) will be based on factors such as current life-cycle stage, volume of data, economic feasibility of conversion, data usage, and frequency of change. In general, if the data item is frequently viewed then it should be converted to at least raster or neutral format (e.g., PDF). If the item will be further processed (commented on, extracted), it should be converted to a neutral format as a minimum. Updates will probably require conversion to a processable format compatible with the formats used for the current program, although this decision will depend on the extent of updates required (e.g., if more than 25% of the document will be updated, it should be converted to processable format). Data already existing in digital format that will be updated should simply be converted into compatible formats, while digital data that will only be viewed may be best converted to neutral format.

3.6 -- Contractor Format and Media Recommendations

The contractor should identify and describe alternative formats and delivery media options offering

increased utility and cost effectiveness. These formats must be compatible with the Sample infrastructure and user capabilities (see Table 5-1). When determining the suitability of a particular format or media option, the contractor will consider the life expectancy and purpose of each deliverable.

Electronic access/delivery of deliverables is required except for data items that could overburden the network. These very large data items should be delivered via magnetic tape or other physical means until such time as network capabilities and performance will permit reasonable on-line access/delivery.

Relatively short-lived data such as agenda, minutes, planning schedules, spreadsheets, plans, and progress reports will be developed in MACS products common to all users of the Sample data. The program's contractors will review the tools used by the Government to ensure data are created in compatible formats that can be accessed using existing application software when required. The information that contractors include in their CAC and/or implementation plan will help determine the method utilized to exchange these data between the Government and the contractor.

Specific MACS products have not been finalized, but will include popular word processing, spreadsheet, database, project management, and graphics programs. The information provided in Table 5-1 identifies the hardware, software, and networks used by Sample program's supporting Activities.

The infrastructure elements most commonly used by this program's Activities are shown below. The numbers in parentheses () indicate the percent of Activities using that item.

Hardware:

- Mainframe/Mini: VAX (24%)
- Other Hardware: CD-ROM Drive (5%)
- Personal Computer: IBM Compatible PCs (90%)

Software:

- CAD: AutoCAD (14%)
- Database: dBase (24%)
- Illustrations/Graphics: Harvard Graphics (33%)
- Operating System: Windows (24%)
- Proj. Mgmt./Workflow: Microsoft Project (24%)
- Spreadsheet: Excel (76%)
- Word Processing: Microsoft Word (71%)

Networks:

- External Communications: Modem (38%)
- Operating System: Apple Talk (33%)
- Protocols: Ethernet (52%)
- Servers: Quick Mail (38%)

4.0 -- IDE Requirements

Sample will establish an IDE functionality that supports the interchange of management and product data between Sample and its prime contractors and between Sample and other Government organizations.

4.1 -- CITIS Functionality

The Sample program is not implementing a CITIS as defined in MIL-STD-974, Contractor Integrated Technical Information Service (CITIS). However, Sample is requiring that the CITIS meet some of the core functional requirements articulated in this military standard and defined below.

4.1.1 -- CITIS Capabilities

Contractually required CITIS/IDE capabilities will be stated in the contract Statement(s) of Work. The CITIS services shall include data management, security, and telecommunications. Additionally, CITIS shall be capable of storing Government Furnished Information (GFI) provided to the contractor. Some capabilities that must be implemented are described below.

On-Line Access:

The Government will be provided with on-line access to contractor-maintained databases containing management, financial, engineering, and logistics program data. On-line access to databases should allow users to perform searches on data, make comments on data, produce and run pre-formatted (standardized) reports with output at their location, produce ad-hoc reports with output at their location, and download selected data to their location for use in further processing.

File Transfer Ability:

This capability should allow users to download contractor data files (CDRL data and non-CDRL data specified in the SOW). This capability should also allow users to upload data files to the contractor (for GFI and information requests).

Electronic Mail:

Electronic mail capability compatible with the existing e-mail system. The e-mail system will be employed as the primary means of communications between activities and individuals. E-mail will not be the mechanism for transfer/access to very large CDRL data deliveries.

Electronic Notification:

Electronic notification will be used to identify the availability of delivery in-place data products. Electronic notification may be via electronic mail or other methods such as workflow as approved by the Government. Electronic notification will be made to all individuals or organizations requiring on-line access for a given information deliverable.

Indexing:

The CITIS will include an index of completed program information held by both the contractor and the Government to enable the location, access, and retrieval of information products from various program data participants.

4.2 -- IDE Functionality

The IDE will support the following functions in addition to the capabilities provided by the CITIS.

Automated Workflow:

Automated workflow techniques will enable electronic 'folders' of multi-media information to be passed among government and contractor organizations to efficiently perform business processes such as submitting or evaluating change requests and reviewing and approving deliverables. The Sample program will identify business processes and define them sufficiently to allow electronic workflow modeling. The workflow system will allow complete interoperability between on-site team members and those at remote locations with the intercommunications and workflow processing transparent to the participants.

Configuration Management:

The IDE will support the integration of a full range of Configuration Management (CM) functions. This includes the system capability to support configuration identification, configuration status accounting, and configuration control. Configuration identification functionality includes the ability to identify configuration items, capture the data elements necessary to establish configuration baseline and the capability to define system interfaces both functional and physical. The IDE will support the configuration status accounting process including change status reporting, audit status reporting, request for waiver/request for deviation status, and provide for traceability of changes to the original baseline. The IDE will also enable the accomplishment of appropriate configuration control procedures including those required to support the Engineering Change Proposals (ECP's) and Notices of Revision as well as preparation of specification change notices.

Video Teleconferencing:

The IDE will include the capability to allow for multi-site personal computer video and document teleconferencing between the contractor sites and the Sample program office and other program participants. This capability will incorporate remotely displayed data and data products from the IDE to support video teleconference interactions.

4.3 -- Delivery Criteria

Data provided by contractors via the technical interface will be considered delivered upon requiring office receiving notification that the data are available for Government access. MIL-STD-974 provides additional guidance: "Data items are deemed to be delivered either when they are electronically transmitted to the government or when they are made available for government access, and the contractor has given notice of delivery to the government (delivery in-place)." Physical media (e.g., magnetic tape) will be used only for large volumes of data that would otherwise degrade internal network performance or in the case of network and/or communications failure.

4.3.1 -- Change History

The concept of baseline management must be adapted for use in the IDE. Baseline documents will have to evolve to a concept of baseline files. Audit trails shall be possible such that the traceability history is retained, from initial availability throughout the remainder of the contract life. Audit trails shall allow traceability from the current file baseline back to the original released version. At each stage of an audit, the applicable version and the change authority which created that version shall be identified.

4.4 -- Government Access

On-line access to contract data will be available to the government from existing personal computers via typical methods such as modems and network connections using Windows user interfaces. The Sample IDE project will build on the existing communications with its contractors and other government organizations to integrate access to data through one common entry point and a common user interface for handling all data.

4.5 -- Data Classification

The Sample program IDE will be required to handle data up to and including confidential.

4.6 -- Data Protection and Security

Sample program IDE capabilities will include a means to ensure that only authorized government users are allowed access to data and that only one proponent for the data can permanently change its content for the record. Data associated with each Sample program will be subject to authentication and regular backup. Backups of both software and data will be made periodically in a manner that assures redundant storage and disaster protection. Viral and intrusion protection shall also be provided.

4.7 -- Data Rights

Rights in technical and/or business data proposed for, or available via the IDE, will be in accordance with Defense Federal Acquisition Regulation Statement (DFARS) 252.227-7013.

5.0 -- IDE Infrastructure

The Sample program is committed to using GOTS and COTS tools and products already owned by the Government for the purpose of performing digital project management operations. This section describes the Sample program infrastructure that participating activities and contractors should consider in determining format and communication capabilities. This data is provided to allow program participants to understand the capabilities of other users and to make informed decisions regarding options and capabilities that will be or could be established to support the program.

5.1 -- User Capabilities

Table 5-1 describes a sample of the hardware, software, and communication network capabilities that each user activity would typically have currently. This information is not intended to be all inclusive; rather it gives prospective offerors a general insight into the infrastructure in place to support the program including hardware, software, and networking capabilities of Sample program activities. This information will be updated as user automated data processing equipment changes.

User	Function	Hardware	Software	Networks
PMA-999	PM	- Vendor B, Type 1	- Vendor A AP s/w 1, 2, & 3	- Vendor A Type 1

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		- Vendor A, Type 1	- Vendor B AP s/w 1, 2, 3, & 4 - Vendor C AP s/w 1	- Vendor B Type 1
	CM	- Vendor A, Type 1	- Vendor A AP s/w 1 - Vendor B AP s/w 1 & 4 - Vendor D AP s/w 1	- Vendor A Type 1 - Vendor B Type 1 - Vendor C Type 1
NAVAIR	Training	- Vendor B, Type 1	- Vendor A AP s/w 2 & 5 - Vendor B AP s/w 2 - Vendor E AP s/w 1, 2 & 3	- Vendor B Type 1 - Vendor D Type 1
	Engineering	- Vendor B, Type 1	- Vendor A AP s/w 2, 5, & 6 - Vendor B AP s/w 2 - Vendor C AP s/w 1 - Vendor E AP s/w 1, 2 & 3	- Vendor B Type 1 - Vendor C Type 1 - Vendor E Type 1
	Cost Anal.	- Vendor B, Type 1	- Vendor A AP s/w 6 - Vendor C AP s/w 1 - Vendor E AP s/w 1 & 2 - Vendor G AP s/w 1	- Vendor C Type 1
NAWC Pt. Mugu	ILS Support	- Vendor B, Type 1 - Vendor A, Type 1 - Vendor C Type 1 Type 2	- Vendor A AP s/w 1, 2, & 5 - Vendor E AP s/w 1 & 2 - Vendor G AP s/w 2 - Vendor H	- Vendor B Type 1 - Vendor E Type 1

Type 3
 AP s/w 1
 - Vendor I
 AP s/w 1
 - Vendor J
 AP s/w 2
 - Vendor K
 AP s/w 1

Table 5-1. -- XXX Program User Capabilities (con't).

User	Function	Hardware	Software	Networks
AF Materiel Command	Design Agent	- Vendor A, Type 2	- Vendor A AP s/w 1, 2, & 4 - Vendor B AP s/w 1, 4 & 5 - Vendor D AP s/w 1 - Vendor L AP s/w 1 - Vendor M AP s/w 1 & 2	- Vendor A Type 1 - Vendor F Type 1
	ILS	- Vendor B, Type 1 - Vendor D, Type 1	- Vendor A AP s/w 2 - Vendor C AP s/w 1 - Vendor E AP s/w 1 - Vendor G AP s/w 1 & 2 - Vendor N AP s/w 1 - Vendor O AP s/w 1	- Vendor A Type 1 - Vendor B Type 1 - Vendor D Type 1
NAWC-AD Lakehurst	Engineering Support	- Vendor B, Type 1 - Vendor A, Type 1 - Vendor E, Type 1 - Vendor F, Type 2	- Vendor F AP s/w 2 - Vendor T AP s/w 1 - Vendor U AP s/w 1 - Vendor V AP s/w 1 & 2	- Vendor G Type 1 & 2 - Vendor H Type 1

Type 1 - Vendor W
 AP s/w 1
 - Vendor X
 AP s/w 1

Table 5-1. -- XXX Program User Capabilities (con't).

User	Function	Hardware	Software	Networks
Army Materiel Command	Component Depot Analysis	- Vendor A, Type 1 - Vendor B, Type 1	- Vendor A AP s/w 1, 3, & 6 - Vendor B AP s/w 1 & 4 - Vendor C AP s/w 1 - Vendor E AP s/w 1 - Vendor G AP s/w 1 - Vendor N AP s/w 1 - Vendor P AP s/w 1	- Vendor A, Type 1 - Vendor B, Type 1 - Vendor C, Type 1 - Vendor E, Type 1 - Vendor H, Type 1 - Vendor I, Type 1 - Vendor J, Type 1
Aviation Army Syscom	Hazard Analysis	- Vendor B, Type 1 - Vendor E, Type 1	- Vendor C AP s/w 1 & 7 - Vendor E AP s/w 1 & 2 - Vendor F AP s/w 2 - Vendor G AP s/w 1 - Vendor W AP s/w 1 - Vendor Y AP s/w 1	- Vendor C Type 1
	ILS Support	- Vendor A, Type 1 - Vendor B, Type 1 - Vendor C, Type 1 - Vendor E	- Vendor F AP s/w 2 - Vendor A AP s/w 1 - Vendor E AP s/w 1 - Vendor G	- Vendor B Type 1 - Vendor I Type 1 - Vendor J Type 1

Type 1	AP s/w 1
- Vendor G	- Vendor J
Type 1	AP s/w 1

Table 5-1. -- XXX Program User Capabilities.

5.2 -- Data Interchange Capabilities

The Sample program currently uses a Local Area Network to exchange data between some of the Sample supporting activities. Other government organizations and the prime contractors currently exchange data with Sample programs via modem and some network connections. All Sample program activities and prime contractors have electronic mail capability, which is used to transfer small data files and administrative information.

5.3 -- Automated Information Systems (AISs)

The DoD and the Services have deployed various CALS-supporting programs for generation, receipt, storage, distribution, and processing of digital data. These initiatives, briefly described below, will be used to various extents in Sample programs depending on the programs' data requirements, existing capability, and AIS availability. Additional detail regarding exact programs to be used and their capabilities will be provided as they become available.

CBT: Computer-Based Training is interactive automated training that is intended to enhance a student's knowledge base. CBT consists of three modules: (1) Computer-Aided Instruction which uses multimedia presentations (e.g., graphics, animation, sound, video, and cutaways) to enhance instruction; (2) Interactive Courseware which is individual self-paced remedial instruction; and (3) Computer-Managed Instruction which provides for a data base management system for performance tracking.

CMIS: Configuration Management Information System is a software tool designed for users to do configuration identification, configuration change control, configuration reporting, configuration audits, and configuration status accounting. CMIS subsumed the Configuration and Logistics Information Program (CLIP), which supported life cycle baseline management for both engineering documentation and hardware.

RAMP/FCIM: Rapid Acquisition of Manufactured Parts and Flexible Computer Integrated Manufacturing are programs designed to result in the reduction of total cycle time of the parts production process. FCIM is the integration of equipment, software, communication, human resources, and business practices within an enterprise to rapidly manufacture, repair, and deliver items on demand with continuous improvements in the processes.

IADS: Interactive Authoring and Display System contains several software modules designed to support the development, sustainment, and navigation of CALS compatible hypertext documents. Originally designed for ETMs and IETMs, IADS allows users to build or edit documents using SGML tags.

JCALs: The Joint Computer-aided Acquisition and Logistic Support (JCALs) System was developed to

provide the tools for DoD to acquire, manage, access, and update the engineering drawings, technical manuals, and logistics data that support DoD weapons systems. The primary goal of the current JCALS design is the integration of databases into a shared structure while creating an environment where technical information could be processed efficiently. JCALS typically includes a Global Data Management System, a Workflow Manager, a Reference Library, and access to other automated information systems. If desired, JCALS can also provide extensive Technical Manual processing capabilities.

JEDMICS: Joint Engineering Data Management Information and Control System provides a standard digital system for storage, retrieval, reproduction, and distribution of engineering drawings and related technical data to support weapon system maintenance, reprocurement of spares, engineering, training, manufacturing, and logistics support.

MEARS: Multi-user Engineering Change Proposal Automated Review System provides an automated ECP review process. MEARS provides for electronic creation of ECPs, Requests for Waivers/Requests for Deviations (RFWs/RFDs), and Problem Change Reports (PCRs), as well as, on-line review, comment, and disposition (electronic Configuration Control Board [CCB]).

Table 5-2 provides a summary of Government users' experience with some of the key DoD standard AISs.

Activity	Function	Systems Used
PMA-999	Program Mgmt, Configuration Mgmt.	CMIS JCALS
NAVAIR	Training, Engineering, Cost Analysis	CBT CMIS JCALS JEDMICS
NAWC Pt. Mugu	Logistics Support	MEARS
AF Materiel Command	Design Agent, Logistics	ATOS EDCARS JCALS
NAWC Lakehurst	Engineering Support	ATIS JEDMICS
Army Materiel Command	Component Depot Analysis	IADS JCALS JEDMICS MEARS
Aviation Army	Logistics Support,	DSREDS

Systems Command

Hazard Analysis

MEARS

Table 5-2. -- Sample Program Experience with Automated Information Systems.

Appendix

Specifications:

MIL-PRF-28000 -- Digital Representation for Communication of Product Data: Initial Graphics Exchange Specification (IGES) Applications Subsets and Applications Protocols

MIL-PRF-28001 -- Markup Requirements and Generic Style Specification for Electronic Printed Output and Exchange of Text SGML

MIL-PRF-28002 -- Requirements for Raster Graphics Representation in Binary Format

MIL-PRF-28003 -- Digital Representation for Communication of Illustration Data: CGM Application Profile

MIL-M-38784 -- Manuals, Technical: General Style and Format Requirements

MIL-M-87268 -- Manuals, Interactive Electronic Technical: General Content, Style, Format, and User-Interaction Requirements

MIL-D-87269 -- Database Revisable: Interactive Electronic Technical Manuals, for the support of

Standards:

MIL-STD-974 -- Contractor Integrated Technical Information Service (CITIS)

MIL-STD-1777 -- Internet Protocol

MIL-STD-1778 -- Transmission Control Protocol

MIL-STD-1840 -- Automated Information for Technical Exchange

Federal Information Processing Standards (FIPS):

FIPS PUB 127-1 -- Database Language -- Standard Query Language (SQL)

FIPS PUB 146-1 -- Government Open Systems Interconnection Profile (GOSIP)

FIPS PUB 146-2 -- Profile for Open Systems Internetworking Technologies (POSIT)

FIPS PUB 151-2 -- Portable Operating System (POSIX)

FIPS PUB 161 -- Electronic Data Interchange (EDI)

Handbooks and Manuals:

DoD 5520.22-M -- Industrial Security Manual for Safeguarding Classified Information

MIL-HDBK-59B -- DoD CALS Implementation Guide

Other Publications:

DoD 5000.1 -- Defense Acquisition

DoD 5000.2-R -- Mandatory Procedures for Major Defense Acquisition Programs (MDAPs) and Major Automated Information System (MAIS) Acquisition Programs

ISO 10303 -- Industrial Automation Systems -- Product Data Representation and Exchange (PDES/STEP)

Section 6
Contractor Integrated Technical Information Service (CITIS)

[Next Section](#)