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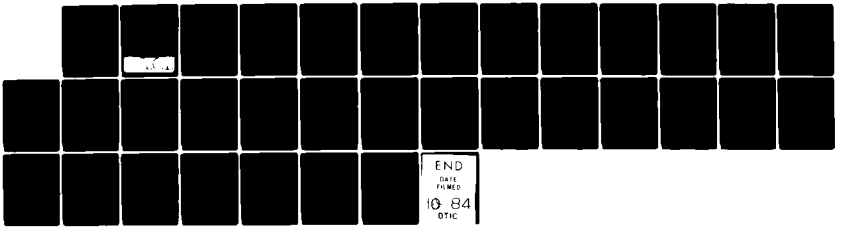

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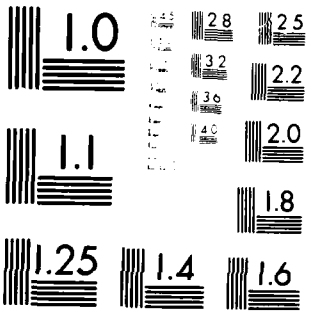

REPORT OF FINDINGS

OF

"Research/Analyses to develop a work plan and proposed plan of action and milestones to extend the scope of detail of the application of PSL/PSA methodology to logistics planning functional configuration management."

January 22, 1982

Submitted to:

Air Force Logistics Command
AFLC/XRB

Submitted by:

CACI, Inc.-Federal
Information Systems Support Department
1815 North Fort Myer Drive
Arlington, Virginia 22209

CONTRACT NO. F33600-82-M-0967

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PSL/PSA is a structured method of breaking down complex activities into a hierarchy of functions along with their inputs, outputs, and interfaces. The purpose of this research effort was: (1) to develop a means to extend the scope of detail of the application of PSL/PSA methodlogy to logistics planning functional configuration management, and (2) to provide an associated work plan and plan of Action and Milestones (POA&M). The results of the research effort is a work plan and POA&M. Based on the research and analysis it is concluded that early demonstration and implementation of the Functional Configuration Management System (FCMS) is critical to the ability of AFLC to control configuration of the overall LMS program.

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C.A.C.I.

WASHINGTON, D.C. OFFICES

January 22, 1982

Air Force Logistics Command
(AFLC/XRB)
Area A
Wright-Patterson AFB, Ohio 45433

Contract Number F33600-82-M-0967

Gentlemen:

CACI, Inc.-Federal is pleased to submit the enclosed final report describing the findings of "Research/Analyses to develop a work plan and proposed plan of action and milestones to extend the scope of detail of the application of PSL/PSA methodology to logistics planning functional configuration management." This report satisfies the requirement of item 0001 of the basic contract.

Lorn J. MacUmber
Vice President and Manager
Information Systems Support Division

cc w/o enclosure:
2750 ABW/ACFSS
Building 1, Area C
Wright-Patterson AFB, Ohio 45433

REPORT OF FINDINGS

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"Research/Analyses to develop a work plan and proposed plan of action and milestones to extend the scope of detail of the application of PSL/PSA methodology to logistics planning functional configuration management."

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EXECUTIVE SUMMARY

The Air Force Logistics Command (AFLC) is taking actions to renew its Logistics Management System through a Logistics Management System (LMS) Modernization Program. The planning approach is based on the philosophy of dividing the AFLC functional structure into manageable pieces and designing management systems based on the decision structure required to support those functional pieces. An initial effort undertaken by AFLC was a basic analysis of its logistics mission so as to describe management systems in logistics terms, determine and isolate areas of relatively intense interactions and develop Logical Application Groups (LAGs).

Functional Configuration Management (FCM) is essential to the LMS Modernization Program. Problem Statement Language/Problem Statement Analyzer (PSL/PSA) has been selected as the primary tool for accomplishing FCM. PSL/PSA is a proven tool having a history of successful use. It represents a structured method of breaking down complex activities into a hierarchy of functions along with their inputs, outputs, and interfaces. PSL provides the language conventions and PSA provides programmed methods of extracting conventionalized data and maintaining it through change.

The purpose of this research effort was: (1) to develop a means to extend the scope of detail of the application of PSL/PSA methodology to logistics planning functional configuration management, and, (2) to provide an associated work plan and Plan of Action and Milestones (POA&M).

The results of the research effort is a work plan and POA&M described in Chapter II which falls into three logical groupings of activities. These groupings are:

a. Group 1. This group includes the development and demonstration of a prototype FCM data base using LAG 50 as the prototype LAG.

b. Group 2. This group consists of the activities required to extend the prototype FCM data base to all other AFLC logistics planning areas.

c. Group 3. This group encompasses those activities required to develop a user-friendly environment for the IBM System 34/4331 and provide menu-driven systems and preformatted aids to simplify usage by analysts, programmers and technicians.

Based on the research and analysis it is concluded that:

a. Early demonstration and implementation of the FCMS is critical to the ability of AFLC to control configuration of the overall LMS program.

b. The work plan and POA&M contained in Chapter II will accomplish the objectives of the Statement of Work.

c. The work can be accomplished either as a single consolidated effort, as individual group activities, or as six separate but related efforts under individual objectives.

CHAPTER I - INTRODUCTION

1.0 BACKGROUND

The Air Force Logistics Command (AFLC) is taking actions to renew its Logistics Management System through a Logistics Management System (LMS) Modernization Program. The planning approach is based on the philosophy of dividing the AFLC functional structure into manageable pieces and designing management systems based on the decision structure required to support those functional pieces.

An initial effort undertaken by AFLC was a basic analysis of its logistics mission so as to describe management systems in logistics terms, determine and isolate areas of relatively intense interactions and develop Logical Application Groups (LAGs). This macro business analysis produced an aggregate description of AFLC logistics business, broken into logistics processes. It further produced modular components (LAGs) of the logistics mission small enough to comprehend and to better define functional requirements in the planning activities to follow.

Functional Configuration Control in the LMS Modernization Program is essential. Configuration of both baseline and planned LMS capabilities will be defined in terms of management functions performed, information flows involved, management characteristics represented and Automated Data Processing/Telecommunications (ADP/T) concepts employed. Elements of guidance which drive plans and intermediate results of planning will also be configured to provide an ability to assess the impacts on LMS of changes in guidance and to provide a Planning Audit Capability. Finally, all facets of requirements validation will be fully integrated with configuration control to incorporate the impact of the day-to-day dynamics of AFLC's system requirements or plans.

The functional configuration control noted above has been termed Functional Configuration Management (FCM). It is separate and distinct from the physical configuration of ADP hardware and operating software. FCM has however been conceived to have the same basic objectives of other types of configuration management. Specifically, FCM objectives are: (1) to identify and document the

functional characteristics of a configured item; (2) to control changes to those characteristics; and (3) to record and report change processing and implementation.

All documentation of configuration data will be maintained mechanically with an IBM System 34 computer employing a system language convention and data base management system, developed by the University of Michigan, and called Problem Statement Language (PSL)/Problem Statement Analyzer (PSA). Therefore, all data involved in Configuration Management must be converted into PSL/PSA language convention and the PSL/PSA model, itself, adapted to the policies and procedures specified by AFLC for Configuration Management.

2.0 PURPOSE

The purpose of this document is to provide: (1) a report of the results of the research/analyses conducted regarding means to extend the scope of detail of the application of PSL/PSA methodology to logistics planning functional configuration management; and, (2) an associated work plan and proposed POA&M.

3.0 METHODOLOGY

The methods used in this research effort were designed specifically to accomplish the following tasks:

1. Collect documentation and conduct study/analysis of current AFLC procedures/methods for applying PSL/PSA to selected logistics processes representative of the AFLC mission.

2. Prepare an approach and work plan to develop/implement methodology for PSL/PSA data base design to accomplish functional configuration management utilizing LAGs.

3. Conduct analysis of LAG 50 (Production Management of Exchangeables) and develop a plan to load the data base, test, evaluate, and demonstrate the methodology developed under Task 2 above.

4. Develop an approach/plan to extend FCM (procedures, development, documentation, evaluation, and training) into all other areas to be planned and all aspects of planning which must be considered.

5. Prepare a list of tasks to create a methodology for creating a user-friendly interactive environment on the IBM system 34 for preparation of PSL input, including documentation and training aids.

6. Prepare a list of tasks to provide technical support for the IBM System 34 processing environment. This includes operation of the communications package to process on-line with the Michigan 4331 computer, ability of Air Logistics Centers (ALCs) to process with Hq AFLC based System 34, use of System 34 utilities, etc., and develop user-friendly documentation for AFLC use of the System 34 for PSL preprocessing.

Initial research efforts began with briefings, discussions and review of documentation concerning the background and development process of AFLC's logistics management systems. This review included LMS planning philosophy, planning approach which included the three levels of planning (corporate, process and LAG levels respectively), and planning methodology within the levels. Further, review was conducted regarding the scope, objectives and concept of AFLC long range FCM and tools selected for FCM (specifically PSL/PSA). CACI personnel obtained both management and technical level reviews on PSL/PSA and standards and conventions methodology regarding PSL/PSA application. Further detailed reviews were made regarding IBM System 34 configuration and capabilities.

The second major effort consisted of review and analysis of all documentation provided to CACI and held by AFLC regarding LMS and the Functional Configuration Management System. This review and associated discussions led to the establishment of initial work plan objectives, methodologies to satisfy these objectives, and products of the tasks involved. Information gaps were identified and questions were developed which were essential to more precise understanding of the problem and development of the work plan.

The third major effort consisted of more detailed research and discussions with AFLC personnel at AFLC Headquarters. Work plan objectives were more precisely defined. Specific tasks were developed to satisfy the objectives and products were identified. An initial Plan of Action and Milestones was developed.

The fourth and final major effort leading to the preparation of this report consisted of a detailed examination of the previous work, a refinement where appropriate of tasks and of milestones and final consolidation of the work plan and POA&M which are included in the following chapters.

4.0 ORGANIZATION

This report is organized into three chapters, preceeded by an Executive Summary. The Executive Summary provides highlights of the findings and recommendations of the research. Chapter I introduces the report and provides background as well as introductory information. Chapter II discusses the work plan and POA&M and provides a recommended approach. Chapter III addresses work plan alternatives, discusses overall aspects of the FCMS and provides recommendations.

CHAPTER II - RECOMMENDED APPROACH

2.0 INTRODUCTION

As a result of CACI's review and analysis of AFLC planning documentation and the discussions held with AFLC personnel, the approach described below and shown in Figure 2-1 is recommended as the program of work AFLC should follow in order to extend the scope of detail of PSL/PSA coverage to logistics planning functional configuration management (FCM). The proposed work plan falls into three logical groupings of activities. Group 1 would include the development and demonstration of the prototype FCM data base using LAG 50 or equivalent as the prototype LAG. Group 1 consists of Objectives 1 and 2 of the plan and the associated tasks. Group 2 would consist of the activities required to extend the prototype FCM data base to all other AFLC logistics planning areas, e.g., all other LAGs and to full logistics planning source documentation. Group 2 consists of Objective 3 and the associated tasks. Group 3 would encompass those activites required to develop a user-friendly environment for System 34 and provide menu-driven systems and preformatted aids to simplify usage by analysts, programmers and technicians. Group 3 consists of Objectives 4 through 6 and the associated tasks. Specifically, the program of work CACI recommends has six objectives, accomplishment of which should satisfy AFLC's desire to develop and use an automated configuration management system in support of AFLC's logistics planning mission. Each objective described below is accompanied by a set of tasks presenting a methodology designed to achieve the objective in the most expeditious and cost effective manner. Products to be obtained from completion of the objectives are shown in Figure 2-2.

2.1 OBJECTIVE 1

To develop a prototype data base that will define retrievable relationships and provide traceability between processes, functions and source documentation within the boundaries of planning Level I to Level III, inclusive.

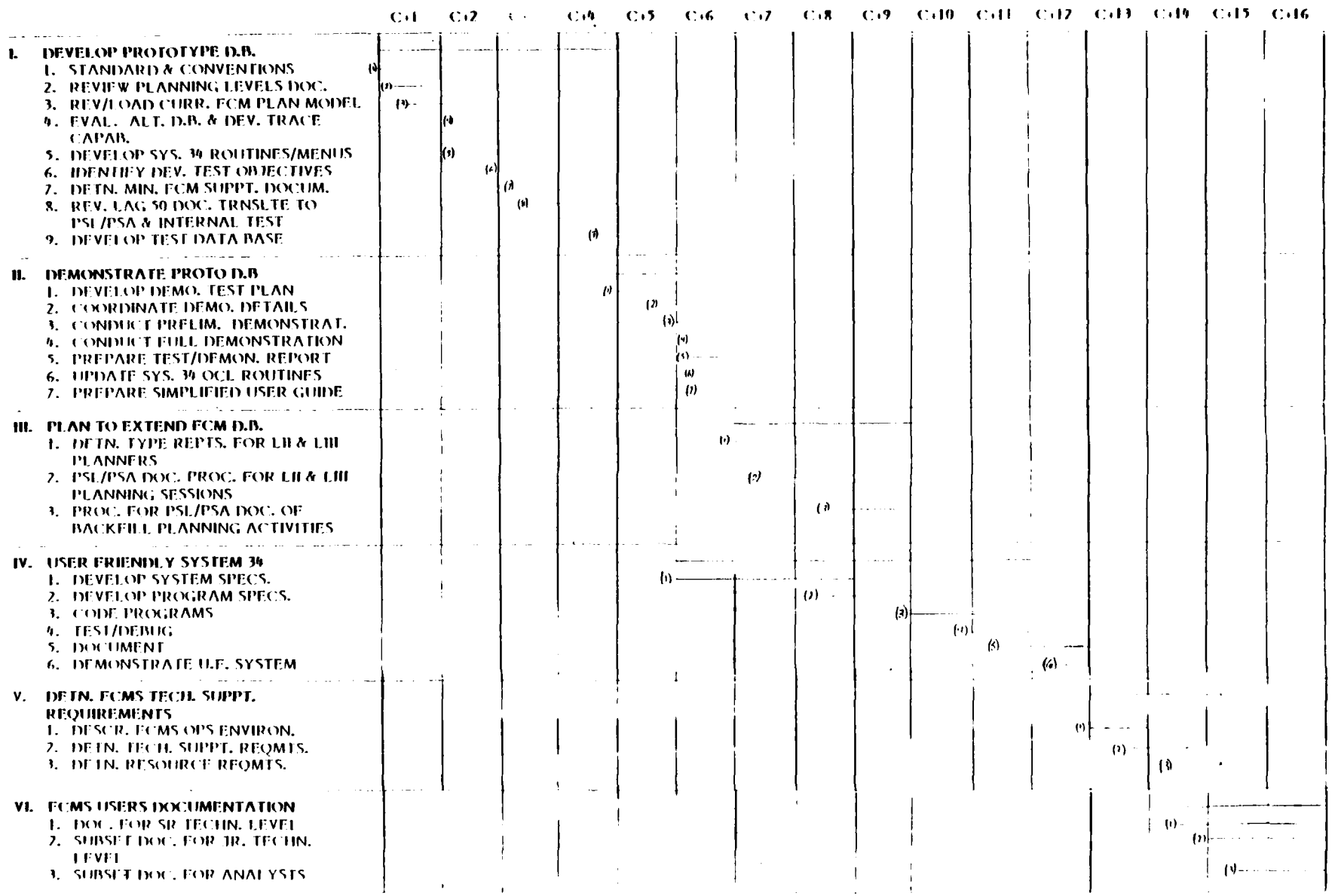

FIGURE 2-1 MILESTONE CHART

DELIVERABLES → / OBJECTIVES ↓	OBJECTIVE 1	OBJECTIVE 2	OBJECTIVE 3	OBJECTIVE 4	OBJECTIVE 5	OBJECTIVE 6
STDS. AND CONVENTIONS MANUAL	X					
FCM DATA BASE FOR LAG 1	X					
REPT. ON ALTERN. FCM DB ARRGMTS.	X					
PREFERRED FCM DB. LOADED	X					
TRACE CAPABILITY LOADED	X					
PROGRAMS FOR MENU-DRIVEN SYSTEM 34	X					
STATEMENT OF TEST OBJECTIVES/CRITERIA	X					
LIST OF DOCUMENTATION REQUIREMENTS	X					
LAG 50 LOADED	X					
CONTR./GOVT. TST DB. LOADED	X					
TEST PLAN FOR DEMONSTRATION		X				
TEST DEMONSTRATION REPORT		X				
OCL/MENU PROCED. & SCREEN DES.		X				
FCM PROTOTYPE SYSTEM DOC.		X				
REPT. ON LEVEL I & II REPTG.			X			
MANUAL ON INTERACT LEVEL I & II REPTG.			X			
PROC. FOR DOC. PRIOR LEV. I & II ACTVTY.			X			
SYSTEM SPECIFICATIONS				X		
USER-FRNDLY SYSTEM 34 PROGR. SPECS.				X		
U.F. SYSTEM PROGRAMS				X		
TEST REPORT				X		
DESCRIPT. FCM OPS ENVIRON.				X		
TECHNICAL REF MAN. FOR SYSTEM 34 FCM					X	
TECHNICAL SUPPORT REQS. REPORT					X	
FCMS RESOURCE/PERSONNEL REQMTS. RPT.					X	
FCM DOCUM. FOR SR. TECHN.						X
FCMS SUBSET DOCUM. FOR JR. TECHN.						X
FCMS SUBSET DOCUM. FOR ANALYSTS						X

FIGURE 2-2 MATRIX OF DELIVERABLES

2.1.1 DISCUSSION

This objective is a mandatory prerequisite for developing automated functional configuration management of the AFLC logistic planning processes. The functional configuration management data base must be designed in PSL/PSA terminology. It must contain source documentation used in Level I, II and III planning, the basic processes which express the mission of AFLC, and the processes, functions and, where necessary, sub-functions of the Logical Application Groups (LAGs). The design of the FCM data base must be structured so as to permit audit or traceability through, within, and between LAGs and their source planning documentation, as well as to enable retrieval of the desired information in real time.

2.1.2 METHODOLOGY

The methodology proposed for achieving Objective 1 is comprised of nine tasks. These are listed below with comments as appropriate and brief description of the deliverable that should result.

2.1.2.1 Task 1 - Develop standards/conventions for using PSL/PSA for FCM.

Comment: This very important step is necessary in order to ensure that the data base contain only unique, unambiguous names and synonyms and that their manner of usage in the data base be clearly defined.

Deliverable: A manual of PSL/PSA standards/conventions using logistics nomenclature and definitions within PSL/PSA structure and capabilities.

2.1.2.2 Task 2 - Review Levels I, II and III planning processes and pertinent documentation.

Comment: A necessary step for acquiring a thorough understanding of the AFLC planning methodology, for identifying gaps or unclear

documentation and for determining the procedures followed in deriving the LAGs.

2.1.2.3 Task 3 - Review/modify the current FCM planning model (LAG 1) for completeness and expand and adapt as necessary. Load into PSA data base.

Comment: The current FCM planning model consists of those parts of the planning process that have been used to develop LAGs. Some of the available source documentation has been translated into PSL and entered into a PSA data base. It is necessary to complete the translation into PSL and finish loading the data base.

Deliverable: A PSA data base updated with existing planning data as necessary for completeness and in conformity with standards and conventions (Task 1 deliverable).

2.1.2.4 Task 4 - Define and evaluate alternative physical data base structures. Develop trace capability.

Comment: It may be necessary to re-arrange the FCM data base into different physical arrangements (not different bases) in order to develop a trace capability with the desired responsiveness and scope. As far as the user is concerned, the physical structure of the single data base will not be apparent.

Deliverable: A recommended FCM data base structured within PSA capabilities and that will facilitate traceability. Also, recommended procedures for obtaining traceability.

2.1.2.5 Task 5 - Develop System 34 routines and menus for data base applications.

Comment: In this task, Operating Control Language (OCL) will be used to make the System 34 ADP hardware easier to use. This would be accomplished by developing a menu-driven system and screen designs through which it would be simple for an inexperienced user to call up the various software routines which run the PSL/PSA on the host IBM 4331 computer at the University of Michigan.

Deliverables: Programs for a menu-driven system and efficient screen formats which will facilitate use of System 34 by non-technical and inexperienced users to call up the software routines which run the PSL/PSA on IBM 4331 at the University of Michigan.

2.1.2.6 Task 6 - Identify test objectives for development testing.

Comment: This task will establish performance and acceptance criteria for use in the testing of the FCM LAG 1 data base with prototype LAG 50.

Deliverables: Statement of objectives and performance and acceptance criteria for the FCM LAG 1 data base testing with LAG 50 prototype.

2.1.2.7 Task 7 - Determine minimum documentation required to support FCM.

Comment: This task will establish the minimum planning documentation necessary to ensure that valid LAGs and traceability are retrievable from the FCM data base.

Deliverable: Recommendations for defining the minimum subject matter from source documentation and the extent of coverage and description required to support FCM from the perspective of retrievability, traceability and data storage requirements.

2.1.2.8 Task 8 - Review LAG 50 documentation for minimum content, augment where possible, translate into PSL/PSA and perform internal testing.

Comment: LAG 50 is the proposed prototype LAG for testing LAG 1, Strategic Planning. This task will ensure that LAG 50 is representative of the desired LAG evolution from the planning process and suitable for demonstrating traceability and retrieval capabilities.

Deliverables: An updated LAG 50 data base in full conformity with standards and conventions.

2.1.2.9 Task 9 - Develop test data base.

Comment: The purpose of this task is to ensure that the test data base used in the demonstration of the FCM data base with LAG 50 has a scope and content that will include multiple LAG processing capability.

Deliverables: An FCM test data base that includes all aspects of FCM that AFLC wants included in the FCM demonstration, e.g., FCM with multiple LAGs; adequate scope and content to develop answers to wide range of questions.

2.2 OBJECTIVE 2

To demonstrate the satisfactory performance of the prototype data base in accordance with the AFLC-approved test plan.

2.2.1 DISCUSSION: The demonstration of the FCM data base using LAG 50 will show the capabilities for retrieval of data and traceability of source documentation, processes and functions within and across all planning levels, and will prove the feasibility of automated functional configuration management.

2.2.2 METHODOLOGY

The methodology proposed for Objective 2 includes the preparation of a test plan, preliminary then final demonstration, and the documentation of the test. The tasks are as follow:

2.2.2.1 Task 1 - Develop a test plan for evaluating the model for FCM application.

Comment: This task is necessary to ensure that the demonstration fairly represents the retrieval and traceability characteristics of the prototype FCM data base.

Deliverables: A test and demonstration plan with system description, environment, system functions, test/function relationship, test methods, test descriptions, test/demonstration setup, initialization, test steps, and test evaluation.

2.2.2.2 Task 2 - Conduct preliminary demonstration. Identify/correct any deficiencies.

2.2.2.3 Task 3 - Conduct full demonstration and document the test.

Deliverables: Test/demonstration report documenting the FCM demonstration and results.

2.2.2.4 Task 4 - Update Operating Control Language (OCL) routines on System 34 to simplify and aid demonstration of the data base by AFLC personnel.

Comment: This task updates the routines developed under Task 5, Objective 1.

Deliverables: Same as Task 5, Objective 1, but updated as necessary.

2.2.2.5 Task 5 - Prepare simplified user's manual and help guides for System 34 application to prototype FCM data base.

Comment: This task will provide System 34 users with easily understandable documentation and training aids to assist their acquiring familiarity with the prototype FCM data base.

Deliverables: Simplified user's manual and help guides for System 34 application to prototype FCM data base.

2.3 OBJECTIVE 3

To provide a plan through which FCM can be extended into all other areas planned by AFLC.

2.3.1 DISCUSSION: The extension of FCM to encompass the complete AFLC logistics planning process will require the enlargement of the data base so that it accepts planning documentation at all three planning levels and includes all current and planned LAGs. The successful use of an automated FCM system will require pre-formatted and menu-driven procedures that are easily understood and used by analysts, programmers, and technicians. Different approaches/procedures will be required for entering already documented planning activities into the data base as opposed to future planning activities which will be developed by analysts through real time computer aided procedures.

2.3.2 METHODOLOGY

2.3.2.1 Task 1 - Conduct a study to determine the type and quantity of reports required by Level II and Level III planners.

Comment: This task will ensure that the automated FCM will produce the reports needed by Level II and Level III planners.

Deliverable: A listing and brief description with formats of the type of reports required by Level II and III planners.

2.3.2.2 Task 2 - Develop procedures to document, interactively in PSL/PSA, results of Level II and Level III planning sessions.

Comment: Much Level II and III planning is done by groups of planners in sessions. This task will delineate what and how the results of these planning sessions shall be entered into the FCM data base as source material.

Deliverable: A procedures manual covering the entering of planning session data into the FCM data base.

2.3.2.3 Task 3 - Develop backfill procedures for documenting results of previous planning activities.

Comment: Different procedures for entering previous planning activities as source material into the data base will be required as compared with on-line, interactive dialogue that will be used with future planning sessions and the FCM data base as developed.

Deliverable: A procedures manual for entering historical planning data into the FCM data base.

2.4 OBJECTIVE 4

To design and develop a IBM System 34 Functional Configuration Management Systems (FCMS).

2.4.1 DISCUSSION: A user-friendly interactive processing system should be developed for the IBM System/34 computer system to provide a user transparent environment for PSL input and PSA inquiry. This system will provide an environment to allow the XRB analysts or technicians to input planning documentation as it is created throughout the Level II and Level III planning stages. This information can then be translated into the correct PSL syntax for input to the PSA data base. This PSL pre-processing system should be developed as a menu driven, screen format system and should be modeled to follow the XRB planning cycles.

Another major function of the IBM System 34 should be to provide a structured environment for the generation of PSA reports. This system would allow the XRB analysts to ask for PSA reports in a user-familiar unstructured environment. The System 34 would translate the inquiry into the correct PSA syntax, transmit the inquiry to the University of Michigan (UM) for PSA processing and direct the response to the originating analyst.

A subfunction of the System 34 should be the generation of standard PSA reports after each data base update. These reports would be used to examine each data base update for corrections and completion.

2.4.2 METHODOLOGY

The methodology proposed for Objective 4 includes the design, development and demonstration of a user-friendly IBM System 34/4331 environment for functional configuration management.

2.4.2.1 Task 1 - Design and develop system specification for a IBM System/34 FCMS.

Comment: The system specifications document will describe in detail all of the external characteristics of the IBM System 34 FCMS environment. It will describe the function of each program module in the system, describe command and message formats, and describe input/output screen formats. These specifications will be used as input for the development of each program module specification.

The methodology for program development will be defined in this document and the implementation strategies developed. For instance, in order to provide functional capabilities at the earliest possible time, the FCMS should be developed in a top-down modular fashion. This process will allow functional capabilities to be implemented as they are developed. Thus, a major category of the system specification document should be the decomposition of the FCMS processes into

distinct functional modules that can be implemented independently of each other.

Deliverable: System specification for IBM System 34 FCMS.

2.4.2.2 Task 2 - Design and develop individual program specifications for a IBM System 34 FCMS.

Comment: This document will describe the internal specifications of each program module that was identified in the system specification document. It will serve as the basic reference document for the coding of each program module in that it will document the programming approach for the development of each individual function.

Deliverable: Program specification for IBM System 34 FCMS.

2.4.2.3 Task 3 - Develop program work and OCL for each specified program module.

Comments: This phase begins the actual coding of each functional module in the system design. Program development of the IBM System 34 will be accomplished by a functional approach where each module can be tested independently, added to a baseline, and implemented in phases. In conjunction with program development, the required IBM Operator Control Language (OCL) statements will be developed and incorporated into program run-time procedures to create a user-friendly operational environment.

Deliverable: Programs for IBM System 34 FCMS.

2.4.2.4 Task 4 - Test and debug the IBM System 34 FCMS.

Comment: This phase encompasses the developed in-house test of FCMS in a IBM System 34 environment. A test baseline will be

developed at the beginning of the test phase. As each individual program module is tested it will be added to the baseline which will represent the input for a system-wide test of FCMS. After a successful system test, the program module can be demonstrated to XRB and turned over for system use. The system test should cover the following categories:

- o Demonstration
- o Completeness
- o Reliability
- o Stability

2.4.2.5 Task 5 - Demonstrate the IBM System 34 FCMS.

Comment: A complete set of program and system documentation of the IBM System 34 environment will be developed in this phase. The documentation will also include a description of all test procedures and unique OCL used during system development. This documentation will serve as a technical reference manual to be used throughout the life cycle of the system. It is specifically oriented to the technical aspects of the IBM System 34 environment.

Deliverable: Technical reference manual for IBM System 34 FCMS.

2.4.2.6 Task 6 - Demonstrate the use of the IBM System 34 FCMS.

Comment: This phase represents a demonstration of functions that are ready for system release. Depending on the requirements of XRB, the system can be released as a whole unit or individual program modules can be released as they are developed. Those modules that have not been developed or that are incomplete will be generated as "stubs" to create a complete system unit if individual program modules are released. This approach represents a living demonstration until all program modules have been developed and released. These alternatives

will be discussed in detail in the test plan for the IBM System 34 environment.

2.5 OBJECTIVE 5

To determine the level and scope of technical support required to manage the IBM System/34 FCMS environment.

2.5.1 DISCUSSION: In order to manage FCMS throughout its life cycle, the technical support requirements must be established and a proper staffing level determined. The following paragraphs will identify a methodology that can be used to determine these requirements.

2.5.2 METHODOLOGY

The methodology proposed for Objective 5 includes the documentation of the IBM System/34/4331 operating environment, the determination of the technical support level required, and the determination of the resource requirements for management of the FCMS.

2.5.2.1 Task 1 - Document the IBM System 34/4331 operating environment.

Comment: A document should be prepared that describes the overall IBM System 34/4331 operating environment. This manual can be used as a reference and/or a training manual and should cover the following categories:

- IBM System 34 Operating System Parameters
- IBM System 34/4331 Communications Environment
- IBM System 34/4331 Hardware Environment

- IBM System 34 Standard and Non-Standard OCL Procedures
- PSL/PSA AFLC Subset
- IBM System 34/4331 Technical Naming Conventions

- o IBM System 34/4331 Utilities
- o IBM System 34/4331 Recovery Procedures

Deliverable: Manual describing the IBM System 34/4331 operating environment under the FCMS.

2.5.2.2 Task 2 - Define and document the technical support requirement for the IBM System 34 FCMS environment.

Comment: The FCMS operating environment document can be used to define many areas of technical support that will be required to maintain the FCMS. The FCMS technical support document will cover all areas of the FCMS environment. Many areas not directly associated with the IBM System 34 PSL pre-processing and query system must be supported. These areas will be investigated also in this document and include such items as:

- o Programming Requirements
- o OCL Generation
- o Special PSA Report Generation
- o Modification of PSA Reports

Once the types of technical support have been investigated and documented, a recommendation will be made as to the technical support level required to maintain FCMS throughout its life cycle.

Deliverable: Report on the technical support level required to maintain FCMS throughout its life cycle.

2.5.2.3 Task 3 - Determine and document the resource requirements for the IBM System 34 FCMS environment.

Comment: Using the technical support document as input, this phase will develop a document that describes the personnel resource requirements needed to support FCMS.

Deliverable: Report on the personnel resource requirements needed to support FCMS.

2.6 OBJECTIVE 6

To document the FCMS for senior and junior technicians, and to provide user documentation for the XRB planning analysts.

2.6.1 DISCUSSION: In order to properly manage and execute the FCMS an appropriate level and type of system documentation must be provided. This documentation must cover the very technical components of FCMS and also provide user-friendly documentation for the casual user of the system. It must document for all levels the usage of the IBM System 34 for functional configuration management.

2.6.2 METHODOLOGY

The methodology proposed for Objective 6 includes three levels of user documentation: (1) senior technical level, (2) junior technical level, and (3) planning analysts level.

2.6.2.1 Task 1 - Develop complete technical documentation of FCMS.

Comment: This document will define in detail how the Level II and Level III planning process is incorporated into the IBM System 34 environment. Its intended use is for the highly skilled technician that must understand the internals of FCMS, the planning process, the System 34, and the IBM 4331 environment.

Deliverable: Technical manual on complete FCMS system.

2.6.2.2 Task 2 - Develop a technical subset of FCMS documentation for junior level technicians.

Comment: This documentation will be designed for day-to-day operation of FCMS. It will provide, in a "cookbook" format, a detailed description of the planning process, what reports must be generated at each block level, how to input and query the system, usage of utilities, system initialization, system shutdown, etc. It is therefore an on-line documentation package of the entire FCMS.

Deliverable: "Cookbook" formatted manual of AFLC planning process and usage of the FCMS suitable for junior level technicians.

2.6.2.3 Task 3 - Develop user-friendly FCMS documentation for XRB planning analysts.

Comment: This documentation will be designed for the end-user of the FCMS. It will be specifically designed to offer as much user transparency of the internal operating environment of FCMS as possible. This documentation will also be structured in a "cookbook" format with appropriate "help" routines. Its major objective will be to provide a user-friendly documentation of the Level II and Level III planning process as they relate to the IBM System 34 FCMS environment.

Deliverable: Simplified "cookbook" formatted non-technical manual with "help" routines for use by planning analysts.

CHAPTER III - DISCUSSION AND CONCLUSION

3.0 DISCUSSION

During this research effort it was apparent that early demonstration and implementation of the FCMS is critical to the ability of AFLC to control configuration of the overall LMS program. Standards and procedures must be established at the front end to ensure FCM throughout the program, avoid a backlog of developed LAGs which have not been included in the program and to provide a means to efficiently integrate all future LAGs into the FCMS as they are developed. Resource requirements now are considered minimal when compared to the resources required to improve and implement the FCM System in the future. The latter must consider work requirements to resolve the backlog while effectively integrating LAGs that are being planned concurrently. The work plan and its POA&M provided in the recommendations chapter is considered optimum both from the productivity and resources aspect. There are alternatives, however, should urgency of completion dictate an earlier completion date or resources dictate a more time expanded effort. Further, there are various options which could be exercised in phasing of the overall program. Alternatives and options are discussed below.

3.1 ALTERNATIVES: As noted in Chapter III, the work plan is divided into three groups of activities. Ideally, accomplishment of prototype development and demonstration, development of plans to extend FCM to all LAG areas, and creation of a user-friendly environment would be sequenced as noted in Figure 2-1. This would allow maximum continuity of effort by development personnel throughout the entire effort. However, there are various alternatives should AFLC desire to deviate from the recommended plan. Essentially these alternatives include:

a. Extending the time to accomplish specific tasks and objectives and reducing the manpower required for the short term.

Comment: This alternative will allow spread in resources over an extended period of time. It will not, however, reduce the total costs and will delay achievement of the objectives.

b. Reduce the time to achieve objectives by increasing the number of personnel working on the individual tasks and objectives.

Comment: This alternative is not applicable to Objectives I and II (Group I activities) since they have been streamlined to the maximum extent desirable. It is applicable to some extent to Group II and III activities. The advantage of this alternative would be total completion of all tasks in minimum time. In this respect CACI estimates the minimum time to accomplish all tasks efficiently is approximately 12 months. A disadvantage to this alternative would be introduction of new personnel into the problem rather late in development with some loss of productivity initially due to required learning curve. Costs could be increased slightly by the learning curve time.

3.2 PHASING OPTIONS: The work plan provides flexibility as to how phasing of the work could be accomplished. Basically the options are to:

a. Conduct the work under a single effort in accordance with the plan described in Chapter II.

b. Conduct the work as three separate efforts by Group Activities as previously described (i.e. (1) Group 1 including Objectives 1 and 2, (2) Group 2 including Objective 3, and (3) Group 3 including Objectives 4, 5, and 6.

c. Conduct the work as six separate but related efforts by individual objectives.

3.3 CONCLUSIONS AND RECOMMENDATIONS

Based on the research and analysis accomplished it is concluded that:

a. The work plan and POA&M contained in Chapter II provides a detailed description of work to be accomplished to achieve the stated objectives of the Statement of Work.

b. The work can be accomplished under a single effort, divided into Group activities, or as six separate but related efforts by individual objectives.

c. It is possible to deviate from the recommended plan by extending the time and reducing the manpower required for the short term, or reducing the time and increasing the manpower required to do the work.

d. Many areas of the FCMS environment not directly associated with the IBM System 34 PSL pre-processing and query system must be supported. These areas should be investigated.


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