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NAVAL WEAPONS ENGINEERING SUPPORT ACTIVITY WASHINGTON DC F/G 5/1
LIFE CYCLE COST GUIDE FOR MAJOR WEAPON SYSTEMS.(U)
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LEVEL III

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6 LIFE CYCLE COST GUIDE FOR
MAJOR WEAPON SYSTEMS.

PREPARED FOR
NAVAL MATERIAL COMMAND

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THE NAVAL WEAPONS ENGINEERING SUPPORT ACTIVITY
ENGINEERING MANAGEMENT DEPARTMENT
COST MANAGEMENT DIVISION

11 November 1977

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Management Summary

The Life Cycle Cost Guide for Major Weapon Systems is a standardized and automated Life Cycle Cost methodology used in the Life Cycle Cost Analysis of major weapon systems procured for the Navy.

The total Life Cycle Cost is divided into five major cost elements: Research & Development, Investment, Operating & Support, Associated Systems, and Termination Costs. These cost elements are divided into 98 sub cost elements, 77 of which comprise the basic equations. The basic equations are further defined by 109 cost factors.

Each equation is identified as belonging to a cost category i.e., Contracted Research, Management, Testing, Prime Equipment, Training, Supply Support, Technical Data, Support Equipment, Operation, or Maintenance, and a funding type i.e.; Research & Development, Procurement, Construction, Operation & Maintenance, Military Personnel, or Other. The costs can be adjusted to reflect the time value of money.

The program provides 13 reports at different depths of detail and with various types of information. These reports are grouped into two basic categories:

A. Input Data Reports present the input data and the information built in the program in five formats to provide the basic information about the cost model, the cost factor description, values, and general remarks about the project.

These reports are:

1. Equations
2. Remarks
3. Dictionary
4. Variable Values
5. Cost Adjustment Factors

B. Output Reports present the calculated values of the Life Cycle Cost in eight formats. These reports are:

1. Summary
2. Funding by Cost Category
3. Cost Breakdown by Year
4. Cost Breakdown Totals
5. General Funding
6. Annual cost by Funding Type
7. Annual Cost by Cost Category
8. Sensitivity Analysis

Accession For	
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DDC TAB	☐
Unannounced	☐
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<i>FORM 3D</i>	
By _____	
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<i>A</i>	<i>PLW</i>

The computer program developed for the Life Cycle Cost Major Weapon System Model is designed to provide the analyst the flexibility to modify the standard Life Cycle Cost model to his specific project needs. The procedures are user-oriented and do not require any computer program changes. Using this technique, the analyst can redefine the entire cost structure. This special programming technique provides the user a program readily available to be adopted to various types of cost models.

TABLE OF CONTENTS

	<u>PAGE</u>
I. Introduction	1
A. Purpose	1
B. Applicability	1
C. Overview	2
II. Cost Breakdown Structure	3
A. Introduction	3
B. Significant Cost Elements	3
C. Cost Estimate Levels	5
D. Omitted Costs	6
III. Cost Methodology	11
A. Introduction	11
B. Definitions and Formulas	11
C. Time Value of Money	12
IV. Guidelines	123
A. Introduction	123
B. Tailoring The Analysis	123
C. Objectives of The Cost Analysis	123
D. Illustrations For Altering The CBS and Cost Equations	124
V. LCC FLEX Computer Program	127
A. Introduction	127
B. Standard CBS and Equations	127
C. Data Collection	129
D. Automatic Data Processing	130
E. LCC Model Input Formats	132
F. Output Formats	158
G. FLEX Technique in LCC Methodology	164

FIGURES

Figure 1 LCC FLEX Run Deck Sequence	133
-------------------------------------	-----

TABLES

Table 1 Cost Breakdown Structure for Major Weapon Systems	4
Table 2 Hardware Levels vs. Cost Elements	7
Table 3 Level 3 Items vs Generic Subsystems	8
Table 4 Cost Breakdown Structure and Equation Directory	128
Table 5 Life Cycle Cost Factor Directory	149

APPENDICES

A. Learning Curve Concept
B. Sample Computer Run

I. Introduction

A. Purpose

This document provides guidance for preparing life cycle cost estimates of major weapon systems. It provides a framework for objective comparison of research and development, investment, and operating and support costs of program, design or support alternatives, using consistent methodologies and terminology. A suggested cost breakdown structure (CBS) is presented, a general methodology for life cycle cost-estimating is described, and a description of the FLEX computer program used to facilitate the computations is provided.

The guidance presented herein is intended to aid in achieving a consistent framework for estimating life cycle costs of major weapon systems. The material contained in this document should be considered a guide - an update of the Naval Material Command Life Cycle Cost Guide for Major Weapons Systems originally published 1 January 1977 - not a rigid specification for Life Cycle Cost analysis.

B. Applicability

The guidance provided in this report applies to both aircraft and ship systems. The CBS is generally applicable to any cost analysis performed on these weapon systems during the acquisition process, including cost effectiveness and trade-off studies.

The guidance presented herein is directed toward estimating costs that are variable with respect to acquisition program decisions; hence, the estimates are not the same as total program or budget costs, and contain only part of the information necessary for budget impact analysis. An analyst may deem it

necessary to alter the CBS and methodology presented as warranted by the purpose or time frame of the cost analysis.

C. Overview

Section II recommends a CBS to be used in the life cycle cost analysis of major weapon systems. Designed to have multi-system types applicability, the CBS attempts to capture all relevant costs associated with the development, acquisition, ownership, and disposal of the weapon system. Section III presents the general methodology for performing a major weapon system life cycle cost analysis, describing each of the cost elements, and expressing these cost elements with mathematical formulas. Section IV reinforces the fact that the CBS and cost estimating technique should be flexible, adjusting to the purposes and needs for the cost analysis. Illustrated are examples of analyses requiring that the CBS and costing methodology be tailored for specific issues.

Section V discusses the FLEX computer model. Data requirements, model operation, and output results are described.

II. Cost Breakdown Structure

A. Introduction

A cost breakdown structure (CBS) is an ordered listing of the relevant cost elements attributable to a major weapon system during its life cycle. The purpose for the CBS is twofold: 1) promote consistency in the computation and display of costs, and 2) provide a check list to assure that all pertinent costs are included and without duplication in the analysis.

The CBS for major weapon systems is shown in Table 1. Definitions are given in Section III. The total life cycle cost is divided into five major cost elements; Research and Development, Investment, Operating and Support, Associated Systems, and Termination costs. These cost elements are then divided into 99 sub-cost elements, 77 of which comprise the basic equations which quantify the major cost elements

B. Significant Cost Elements

Not all cost elements require or deserve the same attention when developing cost estimates for a new weapon system. The greatest analytic effort should be devoted to those accounting for a substantial part of the total life cycle cost, which can be affected by acquisition program decisions or assist in distinguishing between alternatives. In Research & Development category, the elements normally deserving the greatest attention are:

1.212 (Engineering), 1.214 (Software), 1.216 (Documentation), and 1.223 (System Test and Evaluation). In the Investment category, the significant cost elements are normally : 2.11 (Production Hardware), 2.12 (Peculiar Support Equipment), 2.19 (Initial Spares and Repair Parts), 2.21 (GFE/GFM), 2.271 (Operational Sites), and 2.272 (Maintenance Facilities). In the Operat-

Table I
Cost Breakdown Structure
for
Major Weapon Systems

1.	RESEARCH AND DEVELOPMENT	3.2	ORGANIZATIONAL/INTERMEDIATE MAINTENANCE ACTIVITY
1.1	VALIDATION	3.21	AFLOAT FACILITIES
1.11	CONTRACTOR	3.211	LABOR
1.12	GOVERNMENT	3.2111	WEAPON SYSTEM MAINTENANCE
1.2	FULL SCALE DEVELOPMENT	3.2112	ORDNANCE MAINTENANCE
1.21	CONTRACTOR	3.212	MATERIAL
1.211	PROGRAM MANAGEMENT	3.213	PERSONNEL SUPPORT
1.212	ENGINEERING	3.214	SITE MAINTENANCE
1.213	PROTOTYPE HARDWARE	3.22	ASHORE FACILITIES
1.214	SOFTWARE	3.221	LABOR
1.215	INTEGRATION AND TEST	3.2211	WEAPON SYSTEM MAINTENANCE
1.216	DOCUMENTATION	3.2212	ORDNANCE MAINTENANCE
1.22	GOVERNMENT	3.222	MATERIAL
1.221	PROJECT MANAGEMENT	3.223	PERSONNEL SUPPORT
1.222	SYSTEMS ENGINEERING	3.224	SITE MAINTENANCE
1.223	SYSTEM TEST AND EVALUATION	3.3	INSTALLATION SUPPORT
1.2231	TEST PERSONNEL AND TRAINING	3.31	BASE OPERATING SUPPORT
1.2232	TEST SPARES	3.32	REAL PROPERTY MAINTENANCE
1.2233	TEST AGE/USE/TE	3.33	PERSONNEL SUPPORT
1.2234	TEST FACILITIES	3.4	DEPOT MAINTENANCE
1.224	FOREIGN MILITARY SALES	3.41	SCHEDULED MAINTENANCE
2.	INVESTMENT	3.42	UNSCHEDULED MAINTENANCE
2.1	ACQUISITION (CONTRACTOR)	3.43	MODERNIZATION
2.11	PRODUCTION HARDWARE	3.44	COMPONENT REPAIR
2.12	PECULIAR SUPPORT EQUIPMENT	3.5	DEPOT SUPPLY
2.13	TRAINING	3.51	MATERIAL MANAGEMENT
2.14	INTEGRATION AND TEST	3.52	TECHNICAL SUPPORT
2.15	PROGRAM MANAGEMENT	3.6	SECOND DESTINATION TRANSPORTATION
2.16	DOCUMENTATION	3.61	SCHEDULED
2.17	TECHNICAL SUPPORT	3.62	UNSCHEDULED
2.18	INDUSTRIAL FACILITIES	3.7	PERSONNEL SUPPORT AND TRAINING
2.19	INITIAL SPARES AND REPAIR PARTS	3.71	INDIVIDUAL TRAINING
2.2	GOVERNMENT	3.72	HEALTH CARE
2.21	GFE/GFM	3.73	PERSONNEL ACTIVITIES
2.22	CUSTOMER SUPPORT EQUIPMENT	3.74	PERSONNEL SUPPORT
2.23	TRAINING	3.8	SUSTAINING INVESTMENTS
2.24	SYSTEM TEST AND EVALUATION	3.81	REPLENISHMENT SPARES
2.25	PROJECT MANAGEMENT	3.82	MODIFICATIONS
2.26	DOCUMENTATION	3.83	REPLENISHMENT SUPPORT EQUIPMENT
2.27	SITE ACTIVATION	3.84	EXPENDABLE STORES
2.271	OPERATIONAL SITES	4.	ASSOCIATED SYSTEMS
2.272	MAINTENANCE FACILITIES	4.1	INVESTMENT
2.28	SUPPLY INTRODUCTION	4.11	MOBILE LOGISTICS SUPPORT FORCE
2.29	TRANSPORTATION	4.12	TENDERS AND REPAIR SHIPS
3.	OPERATING AND SUPPORT	4.13	ASHORE IMA
3.1	OPERATING	4.2	OPERATING AND SUPPORT
3.11	CREW	4.21	MOBILE LOGISTICS SUPPORT FORCE
3.12	STAFF	4.22	TENDERS AND REPAIR SHIPS
3.13	MATERIAL	4.23	ASHORE IMA
3.14	SECURITY	4.24	EMBARKED SYSTEMS
3.15	OTHER DEPLOYED MANPOWER	5.	TERMINATION
3.16	PERSONNEL SUPPORT		

ing & Support category, the predominate cost elements are normally: 3.11 (Crew), 3.13 (Material), 3.2 (IMA), 3.4 (Depot Maintenance), and 3.8 (Sustaining Investments). In the Associated Systems category, the significant cost element is 4.1 (Investment).

Other cost elements not pertinent to distinguishing between alternatives can usually be addressed in a straight forward manner with planning factors. For example, cost element 2.25 (Project Management) is included in the structure to provide an appreciation of the full variable investment costs of acquiring the major weapon system. However, the magnitude of this cost element is usually more a function of the Navy Department's organizational structure than a function of the major weapon system characteristics. For the non-significant cost elements, planning factors should be used, unless alternatives need to be compared in greater detail.

C. Cost Estimate Levels

The cost elements delineated in the CBS introduce a choice whether the cost estimate should be for a single weapon system, a deployable unit, or the total fleet. In most cases, the choice will be the total fleet. Decisions on affordability or budget impact require visibility of total fleet costs, time-phased over the expected life of the weapon system. The cost methodology presented in Section III reflects estimates made at the total fleet level.

Another choice introduced by the CBS is at what hardware indenture level cost estimates should be made. The costs attributable to a weapon system may be incurred by the total weapon system, subsystems, or components. To provide guidance in this area, the weapon system is divided into five generic subsystems: Structure, Electronics, Propulsion, Armament, and Other.

Table 2 provides guidance for selecting the appropriate hardware indenture level costs are normally incurred at. The subsystem level represents cost estimates made at the subsystem level or cost estimates made at the component level and aggregated into the subsystem level. The actual selection of the appropriate levels should be based on the status of system design and purposes for the cost analysis.

Table 3 is an aid for correlating the Level 3 items for both the air vehicle and ship delineated in Military Standard Work Breakdown Structures for Defense Material Items 881A dated 25 April 1975 to the five generic subsystems suggested in this report.

D. Omitted Costs

The CBS identifies all variable costs associated with the proposed weapon system relevant to the decision process. Consequently, some costs are excluded.

1. Base-Fixed Costs

This category includes costs of personnel and material primarily dependent on the existence of the base. These costs typically include:

- Maintenance and protection of base facilities, such as buildings, road construction and repair, police and fire protection, trash and sewage disposal and utility services
- Maintenance of base living conditions (commissaries, exchanges, religious activities, and sports and entertainment facilities)
- Supervision of the above activities

2. Central Support Overhead

The cost of headquarters organizations that provide administrative guidance and oversee the operation of maintenance depots, supply depots, and

TABLE 2

HARDWARE LEVELS
VS
COST ELEMENTS

ELEMENT NO.	TOTAL SYSTEM	STRUCTURE	ELECTRONICS	PROPULSION	ARMAMENT	OTHER
1.11	*					
1.12	*					
1.211		*	*	*	*	*
1.212		*	*	*	*	*
1.213		*	*	*	*	*
1.214		*	*	*	*	*
1.215		*	*	*	*	*
1.216		*	*	*	*	*
1.221		*	*	*	*	*
1.222		*	*	*	*	*
1.2231		*	*	*	*	*
1.2232		*	*	*	*	*
1.2233		*	*	*	*	*
1.2234		*	*	*	*	*
1.224	*					
2.11	*					
2.12		*	*	*	*	*
2.13		*	*	*	*	*
2.14		*	*	*	*	*
2.15		*	*	*	*	*
2.16		*	*	*	*	*
2.17		*	*	*	*	*
2.18		*	*	*	*	*
2.19		*	*	*	*	*
2.21		*	*	*	*	*
2.22		*	*	*	*	*
2.23		*	*	*	*	*
2.24		*	*	*	*	*
2.25		*	*	*	*	*
2.26		*	*	*	*	*
2.271	*					
2.272		*	*	*	*	*
2.28		*	*	*	*	*
2.29		*	*	*	*	*
3.11	*					
3.12	*					
3.13		*	*	*	*	*
3.14	*					
3.15	*					
3.16	*					
3.2111		*	*	*	*	*
3.2112					*	*
3.212		*	*	*	*	*
3.213	*					
3.214		*	*	*	*	*
3.2211		*	*	*	*	*
3.2212					*	*
3.222		*	*	*	*	*
3.223	*					*
3.224		*	*	*	*	*
3.31	*					*
3.32		*	*	*	*	*
3.33	*					*
3.41		*	*	*	*	*
3.42		*	*	*	*	*
3.43		*	*	*	*	*
3.44		*	*	*	*	*
3.51		*	*	*	*	*
3.52		*	*	*	*	*
3.61		*	*	*	*	*
3.62		*	*	*	*	*
3.71		*	*	*	*	*
3.72	*					
3.73	*					
3.74	*					
3.81		*	*	*	*	*
3.82		*	*	*	*	*
3.83		*	*	*	*	*
3.84					*	*
4.11	*					
4.12	*					
4.13	*					
4.21	*					
4.22	*					
4.23	*					
4.24	*					
5.	*					

TABLE 3

LEVEL 3 ITEMS VS GENERIC SUBSYSTEMS

		Structure	Electronics	Propulsion	Armament	Other
Aircraft System	Airframe	*				
	Propulsion unit			*		
	Other propulsion			*		
	Communications		*			
	Navigation/guidance		*			
	Fire control		*			
	Penetration aids		*			
	Reconnaissance equipment		*			
	Automatic flight control		*			
	Central integrated checkout		*			
	Antisubmarine warfare		*			
	Auxiliary electronics equipment		*			
	Armament				*	
	Weapons delivery equipment				*	
	Auxiliary armament/weapons delivery equipment				*	
Ship System	Hull structure	*				
	Propulsion plant			*		
	Electric plant		*			
	Communications and control		*			
	Auxiliary systems					*
	Outfit and furnishings					*
	Armament				*	
	Integration/engineering					
	Ship assembly					

training activities. These headquarters include, for example the Naval Material Command and subordinate Systems Commands.

3. Command Structure Overhead

The costs of operational headquarters/commands and staffs above the Air Wing or ship level. Collectively, headquarters directly supervise the operation of the Air Wings or ships and provide overall policy formulation and administration.

4. Selected Non-Service Appropriated Funds

The cost of programs, such as family housing, not directly identifiable with a specific Navy appropriation.

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III. Cost Methodology

A. Introduction

Section III presents a general methodology for estimating the life cycle cost of a major weapon system. The costing methodology presented predominately uses deterministic cost estimating techniques. The purpose for using this technique is to provide visibility to the reader as to what costs are considered relevant to each cost element. In general, the context of the problem and cost analysis considerations determine the estimating technique. Context includes the phase of the acquisition program, the decisions to be made, and the accuracy and resolution required in the estimate. The cost analysis considerations are the resources available for the task: time, data, methodology and manpower.

B. Definitions And Formulas

Definitions and mathematical expressions for the cost elements contained in the CBS are provided on the following pages. Descriptions of the cost factors which comprise the equations are also provided.

Although not absolutely necessary, cost equations are shown for the cost elements having lower indentured cost elements below them; a cost element with cost elements below it is equal to the sum of the costs of the cost elements below it. For example, cost element 1.223 (System Test and Evaluation) is the sum of the following cost elements:

1.2231 (Test Personnel and Training), 1.2232 (Test Spares), 1.2233 (Test AGE/GSE/TE), and 1.2234 (Test Facilities). Another example is cost element 1.22 (Government) equal to the sum of 1.221 (Project Management), 1.222 (Systems Engineering), 1.223 (System Test and Evaluation), and 1.224 (Foreign Military Sales Benefit).

C. Time Value of Money

Each of the cost elements that do not have lower indentured cost elements are estimated by year in constant budget-year dollars of the fiscal year following the calendar year of the cost estimate. These costs are then adjusted by the time value of money theory.

To adjust for the time value of money, two basic categories of adjustment factors are used. The first category of adjustment factors converts a future expenditure, from the base year (reference year from which costs occurring in other years are adjusted) dollar value, to the dollar value at the future year. The expression used to derive this factor is given by

$$(1+IR)^n$$

where,

IR is the average inflation rate

n is the number of years after the base year

The second category of adjustment factors converts the dollar value at the future year into the present value of the base year. The present value dollars represent the amount of money the Government must put into a profit or interest generating account at the time of the base year in order to have the future dollars available for expenditure occurring at the end of "n" years. The expression used to derive this factor is given by

$$\left[\frac{1}{1 + DR} \right]^n$$

where

DR is the average discount rate.

The two categories of adjustment factors, as presented above, assume that the future expenditure occurs at the end of "n" years. In reality, however,

the cost is usually incurred throughout the year. Therefore, in accordance with SECNAVINST 7000.14B, an arithmetic mean (average) adjustment factor equation is developed. The annual adjustment factor is equal to

$$\frac{\left[\frac{1 + IR}{1 + DR} \right]^{n-1} + \left[\frac{1 + IR}{1 + DR} \right]^n}{2}$$

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1. Research and Development Costs

Definition:

Research and development costs refer to all costs associated with the research, development, test and evaluation of the system/equipment. Specifically, this covers all costs during the validation and full scale development phase of the program. This category includes costs for engineering design, development, fabrication, assembly and test of engineering prototype models; initial system evaluation; and associated documentation. The costs incurred in this category terminate with the satisfactory completion of the Initial Operational Test and Evaluation and Government's approval for Service use.

Cost Formula:

$$RD = VC + FSD$$

where:

RD = Research and development costs. (\$)

VC = Validation costs. (\$)

FSD = Full scale development costs. (\$)

1.1 Validation Costs

Definition

This subcategory refers to all costs associated with the efforts categorized as "Validation." These efforts include validation of the selected technical approach and costs, performance predictions, schedules and military requirements being made.

Cost Formula:

$$VC = CV + GV$$

where:

VC = Validation costs. (\$)

CV = Contractor validation cost. (\$)

GV = Government validation cost. (\$)

1.11 Contractor Validation Cost

Definition:

This element includes that portion of the validation cost incurred by private business while under contract with the Government.

Cost Formula:

$$CV = \sum_{I=1}^Y ADC(I)$$

where:

CV = Contractor validation cost. (\$)

ADC(I) = Contractor payments paid by the Government to contractors for the major weapon system validation effort during year I. (\$/yr)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

1.12 Government Validation Cost

Definition:

This element includes that portion of the validation cost incurred by the Government.

Cost Formula:

$$GV = \sum_{I=1}^Y ADG(I)$$

where:

GV = Government validation cost. (\$)

ADG(I) = Government expenditures during year I for the major weapon system validation effort. (\$/yr)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

1.2 Full Scale Development Costs

Definition:

This subcategory refers to all costs associated with the efforts categorized as "Engineering Development" within the Department of the Navy. Engineering developments are those development programs being engineered for Service use, but which have not yet been approved for procurement or operation.

Cost Formula:

$$FSD = CFS + GFS$$

where:

FSD = Full scale development costs. (\$)

CFS = Contractor full scale development costs. (\$)

GFS = Government full scale development costs. (\$)

1.21 Contractor Full Scale Development Costs

Definition:

The costs included in this subcategory shall be limited to the contractual full scale development costs. These include:

- 1.2101 Program Management
- 1.2102 Engineering
- 1.2103 Prototype Hardware
- 1.2104 Software
- 1.2105 Integration and Test
- 1.2106 Documentation

In addition, the overhead cost of general and administrative expenses and contract fee shall be included.

Cost Formula:

$$CFS = CM + CE + PH + CS + CI + CD$$

where:

CFS = Contractor full scale development costs. (\$)

CM = Contractor full scale development program management cost. (\$)

CE = Contractor engineering cost. (\$)

PH = Contractor prototype hardware cost. (\$)

CS = Contractor software development cost. (\$)

CI = Contractor integration and test cost. (\$)

CD = Contractor full scale development documentation cost. (\$)

1.211 Program Management Cost

Definition:

This element refers to the technical and administrative planning, organizing, directing, coordinating, controlling and approval actions designed to accomplish overall program objectives during the full scale development phase of the equipment life cycle. Examples of these activities are configuration management, cost/schedule management, data assurance and integrated logistics support management.

Cost Formula:

$$CM = \sum_{I=1}^Y DCPM(I)$$

where:

CM = Contractor full scale development program management cost. (\$)

DCPM(I) = Contractor payments paid by the Government to contractors for program management during year I for the full scale development effort. (\$/yr)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

1.212 Engineering Cost

Definition:

This element refers to all engineering efforts associated with the system/equipment design and development. Specifically, this includes the cost of systems engineering and integration, design engineering (electrical, mechanical, drafting, etc.), design support (reliability, maintainability, human factors engineering and safety, value engineering, microelectronics), and the redesign or formulation of engineering charges. It includes the cost of direct labor, materials, overhead and other direct costs which must be incurred during the engineering process.

Cost Formula:

$$CE = \sum_{I=1}^Y DCE(I)$$

where:

CE = Contractor engineering cost (\$)

DCE(I) = Contractor payments paid by the Government to contractors for engineering during year I for the full scale development effort. (\$/yr)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

1.213 Prototype Hardware Cost

Definition:

This element refers to the fabrication and assembly of full scale development prototype models in support of the engineering design activity. Specifically, this includes the cost of direct labor, materials and overhead associated with material procurement and handling in support of manufacturing, fabrication, assembly, system integration, and checkout.

Cost Formula:

$$PH = \sum_{I=1}^Y DCH(I)$$

where:

PH = Contractor prototype hardware cost. (\$)

DCH(I) = Contractor payments paid by the Government to contractors for prototype hardware during year I for the full scale development effort. (\$/yr)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

1.214 Software Cost

Definition:

This element refers to the effort associated with the development of computer software. Cost of computer time is also contained herein.

Cost Formula:

$$CS = \sum_{I=1}^Y DCS(I)$$

where:

CS = Contractor software development cost. (\$)

DCS(I) = Contractor payments paid by the Government to contractors for development of software during year I for the full scale development effort. (\$/yr)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

1.215 Integration and Test Cost

Definition:

This element includes the cost of integrating the subsystems into a complete weapon system. It also includes that portion of the test cost incurred by private business while under contract with the Government. Test cost refers to those costs which are incurred in support of the Government testing (TECH/OPEVAL), during the full scale development phase of the equipment life cycle.

Cost Formula:

$$CI = \sum_{I=1}^Y DCTE(I)$$

where:

CI = Contractor integration and test cost. (\$)

DCTE(I) = Contractor payments paid by the Government to contractors for integrating and testing the weapon system during year I for the full scale development effort. (\$/yr)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

1.216 Documentation Cost

Definition:

The documentation element refers to all deliverable data acquired during Full Scale Development. The cost includes the effort for acquiring, writing, assembling, reformatting, production, packaging and shipping the following:

a. Engineering Data - Engineering drawings, associated lists, specifications, and other documentation required by the Government. Additionally, all plans, procedures, reports and documentation pertaining to systems, subsystems, component engineering, and testing.

b. Support Data - Data items required by the Government to develop and acquire the Support System. This includes maintenance data, provisioning data and lists, support and test equipment data and lists, logistics support plans and progress reports, technical publications requirements data, training plan data and transportation and handling data, etc..

c. Management Data - Data items necessary for configuration management, cost, schedule, contractual data management, programs management, etc., required by Government.

Cost Formula

$$CD = \sum_{I=1}^Y DCD(I)$$

where:

CD = Contractor full scale development documentation cost. (\$)

DCD(I) = Contractor payments paid by the Government to contractors for documentation during year I for the full scale development effort. (\$/yr)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

1.22 Government Full Scale Development Costs

Definition:

The costs included in this subcategory include:

- 1.2201 Project Management
- 1.2202 Systems Engineering
- 1.2203 System Test and Evaluation
- 1.2204 Foreign Military Sales Benefit

Cost Formula:

$$GFS = PM + SE + STE + FMS$$

where:

GFS = Government full scale development costs. (\$)

PM = Government full scale development project management cost. (\$)

SE = Government systems engineering cost. (\$)

STE = Government full scale development system test and evaluation costs. (\$)

FMS = Foreign military sales benefit. (\$)

1.221 Project Management Cost

Definition:

This element refers to the technical and administrative planning, organizing, directing, coordinating, controlling, and approval actions designed to accomplish overall program objectives during the full scale development phase of the equipment life cycle. Examples of these activities are configuration management, cost/schedule management, data assurance and integrated logistics support management.

Cost Formula:

$$PM = \sum_{I=1}^Y DGPM(I)$$

where:

PM = Government full scale development project management cost. (\$)

DGPM(I) = Government expenditures during year I for project management for the full scale development effort. (\$/yr)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

1.222 Systems Engineering Cost

Definition:

The systems engineering element refers to the technical and management efforts of directing and controlling a totally integrated engineering effort of a system program. This element encompasses the system engineering effort to define the system and the integrated planning and control of the technical program efforts of design engineering, logistics engineering, specialty engineering, production engineering, and integrated test planning. This element includes but is not limited to: the system engineering effort to transform an operational need or statement of deficiency into a description of system requirements and a preferred system configuration; the logistics engineering effort to define, optimize and integrate the logistics support considerations into the mainstream engineering effort to insure the development and production of a supportable and cost effective weapon system; and the technical planning and control effort for planning, monitoring, measuring, evaluating, directing and replanning the management of the technical program. It excludes the actual design engineering, and production engineering directly related to the products or services of a deliverable end item. Examples of system engineering efforts include:

a. System definition, overall system design, design integrity analysis, system optimization, system/cost effectiveness analysis, and intrasystem and intersystem compatibility assurance, etc., the integration and balancing of reliability, maintainability, producibility, safety, and survivability; human factors, personnel and training program requirements, security requirements, configuration identification and control, quality assurance program, value engineering, preparation of equipment and component performance specifications, design of test and demonstration plans;

b. Support synthesis, design impact projections, life cycle cost factors, time factors, tradeoff analysis, logistics design appraisal, use studies, support function requirements identification, repair level determination, task analysis, standardization review, logistics requirements identification, logistics support verification, and the preparation and updating of the logistics support plan, the maintenance plan, facilities planning (operational and maintenance), the transportation and handling plan, etc., and:

c. Preparation of the Systems Engineering Management Plan (SEMP), specification tree, program risk analysis, system test planning, decision control process, technical performance measurement, technical reviews, subcontractor/vendor reviews, work authorization, technical documentation control, etc.

Cost Formula:

$$SE = \sum_{I=1}^Y DCSE(I)$$

where:

SE = Government systems engineering cost. (\$)

DCSE(I) = Government expenditures during year I for systems engineering for the full scale development effort. (\$/yr)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

1.223 System Test and Evaluation Costs

Definition:

System test and evaluation costs refer to those costs which are incurred with the Navy for testing and evaluation (TECH/OPEVAL) of the prototype system during the full scale development phase. The costs included in this subcategory include:

1.22031 Test Personnel and Training

1.22032 Test Spares

1.22033 Test AGE/GSE/TE

1.22034 Test Facilities

Cost Formula:

$$STE = TP + TS + TE + TF$$

where:

STE = Government full scale development system test and evaluation costs. (\$)

TP = Government test personnel and training cost. (\$)

TS = Government test spares cost. (\$)

TE = Government test equipment costs. (\$)

TF = Government test facilities cost. (\$)

1.2231 Test Personnel and Training Cost

Definition:

This element refers to Government expenditures necessary to insure that trained personnel are available to conduct tests and evaluate the prototype during full scale development. It includes the pay & allowance and travel expenses, the course fees and training facilities provided by the Government.

Cost Formula:

$$TP = \sum_{I=1}^Y DGT(I)$$

where:

TP = Government test personnel and training cost. (\$)

DGT(I) = Government expenditures during year I for test personnel and training cost for the full scale development effort. (\$/yr)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

1.2232 Test Spares Cost

Definition:

This element refers to the spare equipments, modules, sub-assemblies and components used for maintenance replacement purposes in end items of the prototype equipment. Its purpose is to provide the necessary items to insure operation of the prototype system during the test and evaluation period.

Cost Formula:

$$TS = \sum_{I=1}^Y DCTS(I)$$

where:

TS = Government test spares cost. (\$)

DCTS(I) = Government expenditures during year I for test spares for the full scale development effort. (\$/yr)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

1.2233 Test AGE/GSE/TE Cost

Definition:

This element is for the costs of Aerospace Ground Equipment (AGE), Ground Support Equipment (GSE), and Test Equipment (TE) used for testing and evaluation of the prototype system during the full scale development phase.

Cost Formula:

$$TE = \sum_{I=1}^Y DCT(I)$$

where:

TE = Government test equipment costs. (\$)

DCT(I) = Government expenditures during year I for AGE/GSE/TE used in support of the Test & Evaluation program during the full scale development phase. (\$/yr)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

1.2234 Test Facilities Cost

Definition:

This element refers to Government costs for test site activation/deactivation during full scale development Test & Evaluation program in year I. This refers to the costs for test site modification, transportation and installation of the prototype models at the test site, test site operation, restoration and facilities leased or government facilities used during Test & Evaluation program.

Cost Formula:

$$TF = \sum_{I=1}^Y DGTA(I)$$

where:

TF = Government test facilities cost. (\$)

DGTA(I) = Government costs for test site activation/deactivation during full scale development Test & Evaluation program in year I. (\$/yr)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

1.244 Foreign Military Sales Benefit

Definition:

This element refers to the cost benefits realized by the Government due to the sale of previously developed weapon systems to foreign countries. Moneys received from these sales may be used by the Government to help defray the R&D cost of the major weapon system under analysis.

Cost benefits may be realized by the foreign military sales of the weapon system under analysis during the production phase. This is caused by the lower unit production costs achieved by the manufacturing of larger quantities.

Cost Formula:

$$FMS = \sum_{I=1}^Y FM(I)$$

where:

FMS = Foreign military sales benefit. (\$)

FM(I) = Moneys received by the Government from the foreign military sales of previously developed weapon systems, to defray the R&D cost of the major weapon system.

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

2. Investment Costs

Definition:

Investment costs refer to all costs associated with the production of system/equipments. This category includes costs for management; materials, fabrication, assembly, and test of the production units; initial logistics support requirements (e.g., spare provisioning, support equipment and tools, technical publications, initial training, facility construction, etc.) and installation and checkout of the system/equipment for operational use. The costs incurred in this category terminate with the satisfactory turnover of an operationally usable system to the using command or organization.

Cost Formula:

$$IN = AQ + GO$$

where:

IN = Investment costs. (\$)

AQ = Acquisition costs. (\$)

GO = Government investment costs. (\$)

2.1 Acquisition Costs

Definition:

The costs included in this subcategory include:

- 2.11 Production Hardware
- 2.12 Peculiar Support Equipment
- 2.13 Training
- 2.14 Integration and Test
- 2.15 Program Management
- 2.16 Documentation
- 2.17 Technical Support
- 2.18 Industrial Facilities
- 2.19 Initial Spares and Repair Parts

In addition, the overhead cost of general and administrative expenses and contract fee shall be included.

Cost Formula:

$$AQ = APH + PSE + AT + AI + APM + ADO + ATS + AIF + ASRP$$

where:

AQ = Acquisition costs. (\$)

APH = Acquisition production hardware cost. (\$)

PSE = Acquisition peculiar support equipment cost. (\$)

AT = Acquisition training cost. (\$)

AI = Acquisition integration and test cost. (\$)

APM = Acquisition program management cost. (\$)

ADO = Acquisition documentation cost. (\$)

ATS = Acquisition technical support cost. (\$)

AIF = Acquisition industrial facilities cost. (\$)

ASRP = Acquisition initial spares and repair parts cost. (\$)

2.11 Production Hardware Cost

Definition:

This cost element includes those production costs incurred by a private business while under contract with the Federal Government, that occur with each unit produced. These costs tend to be subject to a learning curve concept in which the cost per unit decreases as quantity increases. Appendix 1 presents theory of the learning curve concept.

Costs included in this element are:

Manufacturing - Direct labor, overhead and other direct charges incurred during the fabrication, processing, subassembly, final assembly, reworking, modification and installation of parts and equipment to an end item of equipment.

Production Material - All the purchased equipment and parts, subcontracted items and other material that is used in the production of the prime mission equipment. It includes, but is not limited to, raw and processed material, parts, components, assemblies, and small tools and supplies which may be consumed in normal use during the manufacturing process.

Purchased Equipment and Parts - The cost of manufactured and assembled items, usually procured from outside sources by the contractor. Purchased equipment usually costs in excess of \$100 per unit and exhibits a wide range of complexity. It is usually termed off-the-shelf equipment and consists of, for example, batteries, motors, generators, air conditioning equipment, hydraulic pumps and instruments. Purchased parts are distinguished from purchased equipment by cost and complexity. Usually, purchased parts cost under \$100 per unit and are essentially standard, off-the-shelf hardware items.

Subcontracted Items - The cost of parts, components, and assemblies produced by manufacturers other than the prime contractor in accordance with the prime contractor's design, specifications or directions. It does not include equipment bought off-the-shelf. It does include the cost of transportation or shipment if itemized by the subcontractor.

Other Material - All the raw and semifabricated material, intercompany transfers and other material used in the production of the equipment.

Sustaining Engineering - All engineering performed after quantity production starts is included in this element. This will include such items as maintainability-reliability engineering, maintenance engineering, value engineering, and production engineering. It also includes redesign, evaluation, and other sustaining efforts of the engineering function.

Quality Control and Inspection - This includes such tasks as receiving inspection, in-process and final inspection of tools, parts, subassemblies and complete assemblies. Quality Control is that function of management relative to all procedures, inspections, examinations, and tests required during procurement, production, receipt, storage, and issue that are necessary to provide the user with an item of the required quality.

Cost Formula:

$$APH = \sum_{I=1}^Y NN(I) * CQR$$

where:

$$CQR = \frac{AA \sum_{I=1}^{NNN} J^{BB}}{NNN}$$

for which:

$$NNN = \sum_{I=1}^Y NN(I)$$

$$BB = \frac{\log SSS}{\log 2}$$

and for which:

APH = Acquisition production hardware cost. (\$)

NN(I) = Number of weapon systems introduced into inventory during year I. (systems/yr)

CQR = Average cost of weapon system. (\$)

AA = First piece cost of weapon system. (\$)

NNN = Total number of weapon systems procured. (systems)

BB = Coefficient factor. (ratio)

SSS = Slope of learning curve, (ratio)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

2.12 Peculiar Support Equipment Cost

Definition:

This element refers to the costs for Organizational level, Intermediate level, Prime Intermediate Maintenance Activity level, and depot level support and test equipments, including costs for design, material, fabrication, tooling, and unit test for all the items. Also included are the materials and services involved with the installation of the support and test equipments.

The support and test equipment refers to the equipment, including tools, required to maintain and care for the system or portions of the system while not directly engaged in the performance of its mission, and which have application peculiar to a given defense material item. This includes, vehicles, equipment, and tools used to service, transport and hoist, repair, overhaul, assemble, disassemble, test, inspect, or otherwise maintain the mission equipment.

Cost Formula:

$$PSE = \sum_{I=1}^Y \sum_{C=1}^D NSE(I,C) * CSE(C)$$

where:

PSE = Acquisition peculiar support equipment cost. (\$)

NSE (I,C) = Total population of support equipments of type C during year I. (equipments/yr)

CSE (C) = Acquisition cost of support equipment type C. (\$/equipment)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

2.13 Training Cost

Definition:

This element refers to factory training provided by contractors at their facilities to qualify an initial cadre of skilled personnel to: (1) operate and maintain the weapon system when operationally deployed or (2) initially man the Navy Department's weapon system related courses. This includes all efforts associated with the design, development, and production of training equipment as well as the execution of training services.

Equipment - refers to those distinctive end items of training equipment required to meet specific training objectives. This element includes: for example, operational trainers (i.e., simulators), maintenance trainers, and other items such as cutaways, mockups, and models.

Services - refers to services, devices, accessories, and aids necessary to accomplish the objectives of training. This includes; for example, training plans, training aids, training course materials, new equipment training, etc.

Cost Formula:

$$AT = \sum_{I=1}^Y CTE(I) + CTS(I)$$

where:

AT = Acquisition training cost. (\$)

CTE(I) = Cost of contractor training equipment in year I. (\$/yr)

CTS(I) = Cost of contractor training services in year I. (\$/yr)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

2.14 Integration and Test Cost

Definition:

This element refers to the effort of technical and functional activities associated with the design, development, and production of mating surfaces, structures, equipments, parts, and materials required to assemble the major subsystems into a major weapon system as a whole. Integration and test includes all effort associated with:

- a. The development of engineering layouts, determination of overall design characteristics, and determination of requirements of design review.
- b. The set up, conduct and review of testing assembled components or subsystems prior to installation.
- c. The detailed production design.
- d. Inspection activities related to receiving, factory and vendor liaison.
- e. Design maintenance effort.
- f. Quality planning and control.
- g. Tooling (planning, design and fabrication)
- h. Administrative engineering.
- i. The joining or mating and final assembly of level 3 equipment elements to form a complete prime mission equipment when the effort is performed at the manufacturing facility.
- j. The conduct of production acceptance testing.

Cost Formula:

$$AI = \sum_{I=1}^Y CIT(I)$$

where:

AI = Acquisition integration and test cost. (\$)

CIT(I) = Contractor payments paid by the Government during year I for integration and test of the complete weapon system. (\$/yr)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

2.15 Program Management Cost

Definition:

This element refers to the technical and administrative planning, organizing, directing, coordinating, controlling, and approval actions designed to accomplish overall program objectives during the investment phase of the equipment life cycle. Examples of these activities are configuration management, cost/schedule management, data management, contract management, liaison, value engineering, quality assurance and integrated logistics support management.

Cost Formula:

$$APM = \sum_{I=1}^Y CPM(I)$$

where:

APM = Acquisition program management cost. (\$/yr)

CPM(I) = Contractor payments paid by the Government during year I for program management of the production units. (\$/yr)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

2.16 Documentation Cost

Definition:

The data element refers to all deliverable data acquired during the investment phase which is required to be listed on a DD Form 1423. The data requirements will normally be selected from the departmental or agency Authorized Data List. It includes the effort for acquiring, writing, assembling, reformatting, reproduction, packaging and shipping.

It includes the following items:

- a. Technical Publications
- b. Engineering Data
- c. Management Data
- d. Support Data

Technical Publications - This element refers to those handbooks, technical manuals, technical orders, technical data sheets, etc., required by the Government.

Engineering Data - The engineering data element refers to those engineering drawings, associated lists, specifications, and other documentation required by the Government. This element includes all plans, procedures, reports and documentation pertaining to systems, subsystems, and components engineering and testing.

Management Data - The management data element refers to those data items necessary for configuration management, cost, schedule, contractual data management, programs management, etc., required by the Government.

Support Data - The support data element refers to those data items required by the Government to develop and acquire the Support System. This includes maintenance data, provisioning data and lists, support and test equipment data and lists, logistics support plans and progress reports, technical publications requirements data, training planning data and transportation and handling data, etc.

Cost Formula:

$$ADO = \sum_{I=1}^Y AD(I)$$

where:

ADO = Acquisition documentation cost. (\$)

AD(I) = Documentation acquisition cost during year I. (\$/yr)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

2.17 Technical Support Cost

Definition:

This element refers to those costs which are incurred in support of Government testing (PATE and OTE) during the investment phase of the equipment life cycle.

Production Acceptance Test and Evaluation (PATE) Support - The production acceptance tests are conducted on production items produced early in the production run (generally identified as the "initial production run"). They are designed to assure that production systems and equipment conform to design specifications and performance requirements when manufactured in accordance with production specifications and quantity production processes.

Operational Test and Evaluation (OTE) Support - User Operational Tests and Evaluation (OTE) are tests generally conducted by user personnel (military unit(s)) under conditions of operational tactical environments. They are designed to determine the system/equipment operational effectiveness and validate organization doctrine, tactics, basis of issue, training requirements and logistics support.

Cost Formula:

$$ATS = \sum_{I=1}^Y CSU(I)$$

where:

ATS = Acquisition technical support cost. (\$)

CSU(I) = Government payments to contractors for technical support during year I of the investment phase. (\$/yr)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

2.18 Industrial Facilities Cost

Definition:

The industrial facilities element refers to the construction, conversion, or expansion of facilities for production, inventory, and contractor depot maintenance required by one or more suppliers for the specific system. This element includes; for example, equipment acquisition, or modernization, where applicable, and maintenance of the above facilities or equipment.

Construction/conversion/expansion - refers to the real estate and preparation of system peculiar facilities for production, inventory, depot maintenance, and other related activities.

Equipment acquisition or modernization - refers to production equipment acquisition, modernization, or transferal of equipment for the particular system. (Pertains primarily to government owned and leased equipment under facilities contract.)

Maintenance (industrial facilities) - refers to the maintenance, preservation, and repair of industrial facilities and equipment.

Cost Formula:

$$AIF = \sum_{I=1}^Y CIF(I)$$

where:

AIF = Acquisition industrial facilities cost. (\$)

CIF(I) = Government payments to contractors for industrial facilities during year I. (\$/yr)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

2.19 Initial Spares and Repair Parts Cost

Definition:

The initial spares and repair parts element refers to the initial provisioning of modules, assemblies, and spare components to be used for maintenance replacement purposes in end items of equipment and for repair of end items. Its purpose is to provide the necessary items to operate and maintain the equipment until the supply system comes into routine operation. Quantitative requirements for initial spare and repair parts are determined through logistics support analysis, and are based on the System Stock Requirement and the Total Allowance Quantity.

Cost Formula:

$$ASRP_s = \sum_{I=1}^Y NN(I) * CSPS + SS(I) \quad \text{for ship systems}$$

$$ASRP_a = \sum_{I=1}^Y NB(I) * CSPB + SS(I) \quad \text{for aircraft systems}$$

where:

$ASRP_s$ = Acquisition initial spare and repair parts cost for ship systems.

$ASRP_a$ = Acquisition initial spare and repair parts cost for aircraft systems.

$NN(I)$ = Number of weapon systems introduced into inventory during year I. (systems/yr)

$CSPS$ = Cost of initial spares and repair parts per ship system. (\$/system)

$SS(I)$ = Cost of system stock for year I. (\$)

$NB(I)$ = Number of newly introduced bases supporting aircraft during year I. (bases)

$CSPB$ = Cost of initial spares and repair parts per aircraft supporting base. (\$/base)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

2.2 Government Costs

Definition:

The costs included in this subcategory include:

- 2.21 GFE/GFM
- 2.22 Common Support Equipment
- 2.23 Training
- 2.24 System Test and Evaluation
- 2.25 Project Management
- 2.26 Documentation
- 2.27 Site Activation
- 2.28 Supply Introduction
- 2.29 Transportation

Cost Formula:

$$GO = GFE + GSE + GT + GTE + GPM + GD + GOSA + GSI + GTR$$

where:

GO = Government investment costs. (\$)

GFE = GFE/GFM cost. (\$)

GSE = Government common support equipment cost. (\$)

GT = Government training cost. (\$)

GTE = Government system test and evaluation cost. (\$)

GPM = Government project management cost. (\$)

GD = Government documentation cost. (\$)

GOSA = Government site activation costs. (\$)

GSI = Government supply introduction cost. (\$)

GTR = Government transportation cost. (\$)

2.21 GFE/GFM Cost

Definition:

This element refers to the cost of material and equipment supplied by the Government or the contractor(s) in the production of an end item of equipment.

Cost Formula:

$$GFE = \sum_{I=1}^Y NN(I) * GF$$

where:

GFE = GFE/GFM cost. (\$)

NN(I) = Number of weapon systems introduced into inventory during year I. (systems/yr)

GF = Cost of GFE/GFM per weapon system. (\$/weapon system)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

2.22 Common Support Equipment Cost

Definition:

This element refers to the cost of those items required to support and maintain the weapon system or portions of the system while not directly engaged in the performance of its mission, and which are presently in the DOD inventory for support of other systems. This element includes all effort required to assure availability of this equipment for support of the particular weapon system. It also includes the acquisition of additional quantities of these equipments if caused by the introduction of the weapon system into operational service.

This element should include all requirements at organizational/intermediate and depot levels of maintenance.

Cost Formula:

$$GSE = \sum_{I=1}^Y ASE(I) + AQSE(I)$$

where:

GSE = Government common support equipment cost. (\$)

ASE(I) = Government expenditures in year I to make common support equipment available for support of the weapon system. (\$/yr)

AQSE(I) = Government expenditures in year I for the acquisition of common support equipment. (\$/yr)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

2.23 Training Cost

Definition:

This element refers to training services, devices, accessories, aids, equipment, and parts used to facilitate instruction through which personnel will acquire sufficient concepts, skills, and aptitudes to operate and maintain the system with maximum efficiency. This element includes all effort associated with the design, development, and production of training equipment as well as the execution of training services.

The cost included in this element are:

Equipment
Services
Facilities

Equipment - refers to those distinctive end items of training equipment required to meet specific training objectives. This element includes: operational trainers, maintenance trainers and other items such as cutaways, mockups, and models.

Services - refers to services, devices, accessories, and aids necessary to accomplish the objectives of training. This element includes: training plans, training aids, training course materials, new equipment training, etc.

Facilities - refers to that special construction necessary to accomplish the objectives of training. (Primarily, the brick-and-mortar-type facility constructed solely for the training mission.)

Cost Formula:

$$GT = \sum_{I=1}^Y TRE(I) + TRS(I) + TRF(I)$$

where:

GT = Government training cost. (\$)

TRE(I) = Government expenditures in year I for training equipment.
(\$/yr)

TRS(I) = Government expenditures in year I for training services.
(\$/yr)

TRF(I) = Government expenditures in year I for training facilities.
(\$/yr)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

2.24 System Test and Evaluation Cost

Definition

This element refers to costs which are incurred for Production Acceptance Test and Evaluation (PATE) and Operational Test and Evaluation (OTE). PATE are conducted on production items produced early in the production run. They are designed to assure that production equipments conform to design specifications and performance requirements when manufactured in accordance with production specifications. Operational tests are conducted by user personnel under the conditions of the tactical environment. They are designed to determine the equipment operational effectiveness and validate organization doctrine, tactics, training requirements and logistics support.

Cost Formula:

$$GTE = \sum_{I=1}^Y PTE(I)$$

where:

GTE = Government system test and evaluation cost. (\$)

PTE(I) = Test and evaluation costs incurred in year I. (\$/yr)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

2.25 Project Management Cost

Definition:

This element refers to the technical and administrative planning, organizing, directing, coordinating, controlling and approval actions designed to accomplish overall program objectives. Examples of these activities are configuration management, cost/schedule management, data management, contract management, value engineering, quality assurance, and integrated logistics management.

Cost Formula:

$$GPM = \sum_{I=1}^Y PMG(I)$$

where:

GPM = Government project management cost. (\$)

PMG(I) = Government project management cost incurred during year I. (\$/yr)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

2.26 Documentation Cost

Definition:

This element refers to the costs to the Government for storing, reproducing, packaging and shipping technical and managerial data.

Cost Formula:

$$GD = \sum_{I=1}^Y DC(I)$$

where:

GD = Government documentation cost. (\$)

DC(I) = Government expenditures in year I for storing, reproducing, packaging and shipping technical and managerial data. (\$/yr)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

2.27 Site Activation Costs

Definition:

This element refers to the real estate, construction, conversion utilities, and equipment to provide all facilities required to house, service, and launch prime mission equipment. It also includes contractor support.

Cost Formula:

$$\text{GOSA} = \text{OSA} + \text{MFA}$$

where:

GOSA = Government site activation costs. (\$)

OSA = Operational site activation cost. (\$)

MFA = Maintenance facility activation cost. (\$)

2.271 Operational Site Activation Cost

Definition:

This element refers to that portion of site activation costs for facilities required to launch prime mission equipment. It includes conversion of site, ship; system assembly, checkout, and installation into site facility or ship to achieve operational status.

Cost Formula:

$$OSA = \sum_{I=1}^Y SA(I)$$

where:

OSA = Operational site activation cost. (\$)

SA(I) = Government expenditures in year I for operational site activation. (\$/yr)

I = Designator for a specific project year.

Y = Number of years in life cycle (yrs)

2.272 Maintenance Facility Activation Cost

Definition:

This element refers to that portion of site activation cost for facilities required to service or maintain the prime mission equipment. It includes intermediate and depot facilities.

Cost Formula:

$$MFA = \sum_{I=1}^Y FA(I)$$

where:

MFA = Maintenance facility activation cost. (\$)

FA(I) = Government expenditures in year I for maintenance facility activation. (\$/yr)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

2.28 Supply Introduction Cost

Definition:

This element refers to the management costs for entering an item introduced into the supply system by the prime equipment and support systems, in inventory. The costs include identification, description, submission to and screening and editing by Data Documents Center, and inclusion in maintenance supply catalogs.

Cost Formula:

$$GSI = \frac{\sum_{I=IYI} IYI}{I=IYI} (NSNP + NSNS) * RIE$$

where:

GSI = Government supply introduction cost. (\$)

NSNP = Number of new National Stock Numbers (NSN)
introduced into supply system by the major weapon system. (NSN's)

NSNS = Number of new NSN's introduced into supply system by
support systems of the major weapon system. (NSN's)

RIE = Average NSN entry into the supply system cost. (\$/NSN)

I = Designator for a specific project year.

IYI = Year I during which initial costs occur.

2.29 Transportation Cost

Definition

This refers to the cost associated with transporting the weapon system from the point of procurement, production, or testing to the first destination point.

Cost Formula:

$$GTR = \sum_{I=1}^Y NN(I) * CTPE$$

where:

GTR = Government transportation cost. (\$)

NN(I) = Number of weapon systems introduced into inventory during year I. (systems/yr)

CTPE = First destination transportation cost for the weapon system. (\$/system)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

3. Operating and Support Costs

Definition:

Operating and support costs refer to all costs associated with the operation and logistics support of the system subsequent to equipment turnover to the using command or organization. Specifically, this covers all Government ownership costs including operation costs, maintenance costs, and logistics support costs.

Operation costs refer to all costs associated with the direct operation of the system. This includes all costs of electrical power, consumable materials and operational personnel. Maintenance and support costs refer to all costs associated with the maintenance and supply support of the system during the system's operational life.

Cost Formula:

$$OS = OP + IMA + IS + DM + DS + SDT + PST + SI$$

where:

OS = Operating and support costs. (\$)

OP = Operating costs. (\$)

IMA = Organizational/Intermediate maintenance activity costs. (\$)

IS = Installation support costs. (\$)

DM = Depot maintenance costs. (\$)

DS = Depot supply costs. (\$)

SDT = Second destination transportation costs. (\$)

PST = Personnel support and training costs. (\$)

SI = Sustaining investments costs. (\$)

3.1 Operating Costs

Definition:

The cost of manpower, fuel, material, and other operating expenses chargeable to the non-maintenance activities of the weapon system including contractual support.

Cost Formula:

$$OP = CR + STA + MAT + SEC + OTH + PER$$

where:

OP = Operating costs. (\$)

CR = Crew cost. (\$)

STA = Staff cost. (\$)

MAT = Material cost. (\$)

SEC = Security cost. (\$)

OTH = Other deployed manpower cost. (\$)

PER = Personnel support cost. (\$)

3.11 Crew Cost

Definition:

The cost of pay and allowances of personnel required to man the weapon system; and the cost associated with the temporary assignment of personnel away from the deployed system for training, administrative or other purposes. These costs include transportation, lodging, mileage and per diem allowances and incidental travel expenses.

Cost Formula:

$$CR = \sum_{I=1}^Y \sum_{A=1}^B NCR(I,A) * [PA(A) + TAD]$$

where:

CR = Crew cost. (\$)

NCR(I,A) = Total number of crew personnel of grade A in year I. (men)

PA(A) = Annual pay and allowances per man of grade A. (\$/man)

TAD = Annual temporary assignment of duties cost per member of crew. (\$/man)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

A = Designator for a specific grade of crew personnel.

B = Number of different grades of crew personnel. (grades)

3.12 Staff Cost

Definition:

Aircraft only: The cost of paying the personnel required for unit flying supervision. These personnel perform such jobs as command, operations control, planning and scheduling, flying safety, quality control on aircrew training and flying proficiency and include the combat commander, the squadron commanders and their respective staffs.

Cost Formula:

$$STA = \sum_{I=1}^Y \sum_{E=1}^F NSTA(I,E) * PAS(E)$$

where:

STA = Staff Cost. (\$)

NSTA(I,E) = Total number of command staff personnel of grade E in year I. (men)

PAS(E) = Annual pay and allowances per man of grade E. (\$/man)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

E = Designator for a specific grade of command staff personnel.

F = Number of different grades of command staff personnel. (grades)

3.13 Material Cost

Definition:

This element refers to the costs incurred for items actually consumed in the operation of the equipment. It includes: petroleum, oil and lubricants; repair parts used for equipment repair, but not considered reparable themselves; and consumable supplies and equipage items not directly related to the support of specific equipment or systems.

Cost Formula:

$$MAT = \sum_{I=1}^Y NNN(I) * MATS$$

where:

$$NNN(I) = \sum_{G=1}^I NN(G)$$

for which:

MAT = Material cost. (\$)

NNN(I) = Total number of weapon systems procured through year I. (systems)

MATS = Material cost per system per year. (\$/system)

NN(G) = Number of weapon systems introduced into inventory during year G. (systems/yr)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

G = Designator for a specific project year.

3.14 Security Cost

Definition:

The element refers to the cost of paying personnel needed for equipment security. For example, entry control, close and distant boundary support, and security alert teams.

Cost Formula:

$$SEC = \sum_{I=1}^Y ASEC(I)$$

where:

SEC = Security cost. (\$)

ASEC(I) = Security cost incurred during year I. (\$/yr)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

3.15 Other Deployed Manpower Cost

Definition:

The cost of paying all other personnel (for example, public information and social action people) assigned to a typical deployed unit, except those personnel included in cost elements 3.11 (Crew), 3.12 (Staff), and 3.2 (Organizational/Intermediate Maintenance Activity).

Cost Formula:

$$OTH = \sum_{I=1}^Y ODM(I)$$

where:

OTH = Other deployed manpower cost. (\$)

ODM(I) = Government expenditures in year I for other deployed manpower. (\$/yr)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

3.16 Personnel Support Cost

Definition:

The cost of supplies, services and equipment needed to support deployed unit personnel. Examples of included costs are administrative supply items; travel expenses; expendable office machines and equipment; custodial services; and other variables personnel-oriented support costs incurred at the deployed unit.

Cost Formula:

$$PER = \sum_{I=1}^Y PSC(I)$$

where:

PER = Personnel support cost. (\$)

PSC(I) = Government expenditures in year I for personnel support. (\$/yr)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

3.2 Organizational/Intermediate Maintenance Activity Costs

Definition:

This element refers to the cost of manpower and material needed for maintenance of deployed unit weapon systems, support equipment and ordnance including contractual support.

Cost Formula:

$$\text{IMA} = \text{AFL} + \text{ASH}$$

where:

IMA = Organizational/Intermediate maintenance activity costs. (\$)

AFL = Afloat facilities costs. (\$)

ASH = Ashore facilities costs. (\$)

3.21 Afloat Facilities Costs

Definition:

The cost of manpower, material, services and repair parts needed for afloat maintenance activity availabilities. For aircraft systems, afloat facilities refer to aircraft carriers; for ship systems, afloat facilities refer to tenders and repair ships.

Cost Formula:

$$AFL = AFLL + AFLM + AFLP + AFLS$$

where:

AFL = Afloat facilities cost. (\$)

AFLS = Afloat facilities labor costs. (\$)

AFLM = Afloat facilities material cost. (\$)

AFLP = Afloat facilities personnel support cost. (\$)

AFLS = Afloat facilities site maintenance cost. (\$)

3.211 Afloat Facilities Labor Costs

Definition:

This element refers to the cost of paying the personnel excluding crew needed to meet below depot maintenance requirements (including contractor support) of the deployed unit and its ordnance. For the case of aircraft systems, it includes organizational and intermediate level maintenance personnel on the aircraft carrier; for ship systems, it includes the intermediate level personnel on tenders and repair ships.

Cost Formula:

$$\text{AFL} = \text{AFLW} + \text{AFLO}$$

where:

AFL = Afloat facilities labor costs. (\$)

AFLW = Afloat facilities weapon system maintenance labor cost. (\$)

AFLO = Afloat facilities ordnance maintenance labor cost. (\$)

3.2111 Afloat Facilities Weapon System Maintenance Labor Cost

Definition:

This element refers to the cost of paying personnel needed to meet below depot maintenance requirements. For aircraft systems: included are personnel needed to meet maintenance of the assigned aircraft and aircraft support equipment; precision measurement laboratory equipment; training simulators; and support equipment: to provide for maintenance supervision and control: and to cover administrative requirements such as leave. For ship systems: the cost of direct labor expended by tender and repair ship personnel.

Cost Formula:

$$AFLW = \sum_{I=1}^Y \sum_{T=1}^U NMP(I,T) * MS(T) * POT(T)$$

where:

AFLW = Afloat facilities weapon system maintenance labor cost. (\$)

NMP(I,T) = Number of personnel of grade T maintaining the weapon system during year I. (men/grade/yr)

MS(T) = Unit pay and allowance of grade T personnel. (\$/man)

POT(T) = Proportion of time personnel of grade T are dedicated to weapon system. (ratio)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

T = Designator for a specific pay grade.

U = Number of different pay grades of personnel maintaining the weapon system. (grades)

3.2112 Afloat Facilities Ordnance Maintenance Labor Cost

Definition:

Aircraft only: The cost of paying the personnel needed for: loading, unloading, arming and dearming of munitions and missiles; inspection, testing and maintenance of all aircraft weapons release systems; maintenance ammunition loading, activation and deactivation of aircraft gun systems; and maintenance and handling of the munitions and missile stockpile authorized by the War Reserve Material plan.

Cost Formula:

$$AFLO = \sum_{I=1}^Y \sum_{V=1}^W NOP(I,V) * MSO(V)$$

where:

AFLO = Afloat facilities ordnance maintenance labor cost. (\$)

NOP(I,V) = Number of personnel of grade V maintaining ordnance systems during year I. (men/grade/yr)

MSO(V) = Unit pay and allowance of grade V personnel. (\$/man)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

V = Designator for a specific pay grade.

W = Number of different pay grades of personnel maintaining the ordnance systems. (grades)

3.212 Afloat Facilities Material Cost

Definition:

The cost of material and repair parts consumed by the afloat facilities in support of the weapon system. This includes only non-repairable expense items; repairable items are included in cost element 3.81 (Replenishment Spares).

Cost Formula:

$$AFLM = \sum_{I=1}^Y NNN(I) * RMF$$

where:

$$NNN(I) = \sum_{G=1}^I NN(G)$$

for which:

AFLM = Afloat facilities material cost. (\$)

NNN(I) = Total number of weapon systems procured through year I.
(systems)

RMF = Repair material cost per system per year. (\$/system)

NN(G) = Number of weapon systems introduced into inventory
during year G. (systems/yr.)

I = Designator for a specific project year

Y = Number of years in life cycle. (yrs)

G = Designator for a specific project year.

3.213 Afloat Facilities Personnel Support Cost

Definition:

The cost of supplies, services and equipment needed to support aircraft organizational and intermediate level personnel or tender and repair ship intermediate level personnel. Examples of included costs are administrative supply items; travel expenses; expendable office machines and equipment; custodial services; and other variable personnel-oriented support costs incurred at the maintenance activities.

Cost Formula:

$$AFLP = \sum_{I=1}^Y APS(I)$$

where:

AFLP = Afloat facilities personnel support cost. (\$)

APS(I) = Government expenditures in year I for personnel support at afloat facilities. (\$/yr)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

3.214 Afloat Facilities Site Maintenance Cost

Definition:

This element refers to the cost of maintaining the afloat facilities used to service the major weapon system. This element includes the material and labor costs used to renovate the facilities.

Cost Formula:

$$AFLS = \sum_{I=1}^Y MFC(I)$$

where:

AFLS = Afloat facilities site maintenance cost. (\$)

MFC(I) = Government expenditures during year I for maintenance of the afloat facilities. (\$/yr)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

3.22 Ashore Facilities Costs

Definition:

The cost of manpower, material, services and repair parts needed for ashore maintenance activity availabilities. For aircraft systems, ashore facilities refer to Naval Air Stations (NASs).

Cost Formula:

$$ASH = ASLL + ASLM + ASLP + ASLS$$

where:

ASH = Ashore facilities costs. (\$)

ASLL = Ashore facilities labor costs. (\$)

ASLM = Ashore facilities material cost. (\$)

ASLP = Ashore facilities personnel support cost. (\$)

ASLS = Ashore facilities site maintenance cost. (\$)

3.221 Ashore Facilities Labor Costs

Definition:

This element refers to the cost of paying the personnel excluding crew needed to meet below depot maintenance requirements (including contractor support) of the deployed unit and its ordnance. For the case of aircraft systems, it includes organizational and intermediate level maintenance personnel at the NAS; for ship systems, it includes intermediate level personnel at ashore Intermediate Maintenance Activities (IMA's).

Cost Formula:

$$ASLL = ASLW + ASLO$$

where:

ASLL = Ashore facilities labor costs. (\$)

ASLW = Ashore facilities weapon system maintenance labor cost. (\$)

ALSO = Ashore facilities ordnance maintenance labor cost. (\$)

3.2211 Ashore Facilities Weapon System Maintenance Labor Cost

Definition:

This element refers to the cost of paying personnel needed to meet below depot maintenance requirements. For aircraft systems: included are personnel needed to meet maintenance of the assigned aircraft and aircraft support equipment; precision measurement laboratory equipment; training simulators; and support equipment: to provide for maintenance supervision and control: and to cover administrative requirements such as leave. For ship systems: the cost of direct labor expended by ashore IMA personnel.

Cost Formula:

$$ASLW = \sum_{I=1}^Y \sum_{T=1}^U NMPA(I,T) * MS(T) * POT(T)$$

where:

ASLW = Ashore facilities weapon system maintenance labor cost. (\$)

NMPA(I,T) = Number of personnel of grade T maintaining the weapon system during year I. (men/grade/yr)

MS(T) = Unit pay and allowance of grade T personnel. (\$/man)

POT(T) = Proportion of time personnel of grade T are dedicated to weapon system. (ratio)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

T = Designator for a specific pay grade.

U = Number of different pay grades of personnel maintaining the weapon system. (grades)

3.2212 Ashore Facilities Ordnance Maintenance Labor Cost

Definition:

Aircraft only: The cost of paying the personnel needed for: loading, unloading, arming and dearming of munitions and missiles; inspection, testing and maintenance of all aircraft weapons release systems; maintenance, ammunition loading, activation and deactivation of aircraft gun systems; and maintenance and handling of the munitions and missile stockpile authorized by the War Reserve Material Plan.

Cost Formula:

$$ASLO = \sum_{I=1}^Y \sum_{V=1}^W NOPA(I,V) * MSO(V)$$

where:

ASLO = Ashore facilities ordnance maintenance labor cost. (\$)

NOPA(I,V) = Number of personnel of grade V maintaining ordnance systems during year I. (men/grade/yr)

MSO(V) = Unit pay and allowance of grade V personnel. (\$/man)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

V = Designator for a specific pay grade.

W = Number of different pay grades of personnel maintaining the ordnance systems. (grades)

3.222 Ashore Facilities Material Cost

Definition:

The cost of material and repair parts consumed by the ashore facilities in support of the weapon system. This includes only non-repairable expense items; repairable items are included in cost element 3.81 (Replenishment Spares)

Cost Formula:

$$ASLM = \sum_{I=1}^Y NNN(I) * RMFA$$

where:

$$NNN(I) = \sum_{G=1}^I NN(G)$$

for which:

ASLM = Afloat facilities material cost. (\$)

NNN(I) = Total number of weapon systems procured through year I.
(systems)

RMFA = Repair material cost per system per year. (\$/system)

NN(G) = Number of weapon systems introduced into inventory during
year G. (systems/yr)

I = Designator for a specific project year

Y = Number of years in life cycle. (yrs)

G = Designator for a specific project year.

3.223 Ashore Facilities Personnel Support Cost

Definition:

The cost of supplies, services and equipment needed to support NAS organizational and intermediate level personnel or ashore intermediate level personnel. Examples of included costs are administrative supply items; travel expenses; expendable office machines and equipment; custodial services; and other variable personnel-oriented support costs incurred at the maintenance activities.

Cost Formula:

$$ASLP = \sum_{I=1}^Y APSA(I)$$

where:

ASLP = Ashore facilities personnel support cost. (\$)

APSA(I) = Government expenditures in year I for personnel support at ashore facilities. (\$/yr)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

3.224 Ashore Facilities Site Maintenance Cost

Definition:

This element refers to the cost of maintaining the ashore facilities used to service the major weapon system. This element includes the material and labor costs used to renovate the facilities.

Cost Formula:

$$ASLS = \sum_{I=1}^Y MFCA(I)$$

where:

ASLS = Ashore facilities site maintenance cost. (\$)

MFCA(I) = Government expenditures during year I for maintenance of the ashore facilities. (\$/yr)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

3.3 Installation Support Costs

Definition:

This element refers to the variable cost of providing support for deployed unit personnel at the unit's support installation(s). It includes contractual support.

Cost Formula:

$$IS = BOS + RPM + PS$$

where:

IS = Installation support costs. (\$)

BOS = Base operating support cost. (\$)

RPM = Real property maintenance cost. (\$)

PS = Installation personnel support cost. (\$)

3.31 Base Operating Support Cost

Definition:

The cost of installation personnel and material necessary to directly support the deployed unit. Examples of installation functions which directly support the unit include food service, supply and motor pool operations. These personnel and material costs would no longer be incurred by the installation if the deployed unit were moved elsewhere.

Cost Formula:

$$BOS = \sum_{I=1}^Y BOSC(I)$$

where:

BOS = Base operating support cost. (\$)

BOSC = Government expenditures during year I for base operating support. (\$/yr)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

3.32 Real Property Maintenance Cost

Definition:

This element refers to the variable costs of construction, maintenance and operation of real property facilities, and related management and engineering support work and services.

Cost Formula:

$$RPM = \sum_{I=1}^Y RPMC(I)$$

where:

RPM = Real property maintenance cost. (\$)

PPMC(I) = Government expenditures during year I for real property maintenance. (\$/yr)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

3.33 Installation Personnel Support Cost

Definition:

This element refers to the cost of supplies, services and equipment needed to support installation support personnel. Examples of included costs are administrative supply items; travel expenses; expendable office machines and equipment; custodial services; and other variable personnel-oriented support costs incurred at the installation(s).

Cost Formula:

$$PS = \sum_{I=1}^Y IPS(I)$$

where:

PS = Installation personnel support cost. (\$)

IPS(I) = Government expenditures during year I for installation personnel support. (\$/yr).

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

3.4 Depot Maintenance Costs

Definition:

The cost of manpower and material needed to perform overhaul, progressive maintenance, analytical rework, modification, repair, inspection and test, manufacture and reclamation of the weapon system and subsystems, components, parts and support equipment at centralized and contractor repair facilities.

Cost Formula:

$$DM = SM + UM + MOD + DCR$$

where:

DM = Depot maintenance costs. (\$)

SM = Depot scheduled maintenance cost. (\$)

UM = Depot unscheduled maintenance cost. (\$)

MOD = Depot modernization cost. (\$)

DCR = Depot component repair cost. (\$)

3.41 Depot Scheduled Maintenance Cost

Definition:

This element refers to the depot rework/overhaul labor and material costs for equipments in the weapon system.

Cost Formula:

$$DM = \sum_{I=1}^Y \sum_{X=1}^Z NNN(I) * OT * GOH(X) / MTGO(X)$$

where:

$$NNN(I) = \sum_{G=1}^I NN(G)$$

for which:

DM = Depot scheduled maintenance cost. (\$)

NNN(I) = Total number of weapon systems procured through year I.
(systems)

OT = Annual operating time of the weapon system. (hrs/system/yr)

GOH(X) = Depot rework/overhaul cost for equipment X.
(\$/(rework/overhaul))

MTGO(X) = Mean time between depot rework/overhaul of the Xth
equipment (hrs/(rework/overhaul))

NN(G) = Number of weapon systems introduced into inventory during
year G. (systems/yr)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

X = Designator for a specific equipment

Z = Number of equipments in the weapon system subjected to depot
rework/overhaul. (equipments)

G = Designator for a specific project year.

3.42 Depot Unscheduled Maintenance Cost

Definition:

This element refers to the depot labor and material costs for unscheduled maintenance for equipments in the weapon system.

Cost Formula:

$$UM = \sum_{I=1}^Y \sum_{CC=1}^{DD} NNN(I) * OT * BCM(CC) * GMC(CC) / MTBF(CC)$$

where:

$$NNN(I) = \sum_{G=1}^I NN(G)$$

for which:

UM = Depot unscheduled maintenance cost. (\$)

NNN(I) = Total number of weapon systems procured through year I. (systems)

OT = Annual operating time of the weapon system. (hrs/system/yr)

BCM(CC) = Beyond capability rate of equipment CC. (ratio)

GMC(CC) = Depot repair material and labor cost for equipment CC. (\$/failure)

MTBF(CC) = Mean time between failures of the CCth equipment. (hrs/failure)

NN(G) = Number of weapon systems introduced into inventory during year G. (systems/yr)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

CC = Designator for a specific equipment

DD = Number of equipments in the weapon system subjected to depot maintenance. (equipments)

G = Designator for a specific project year.

3.43 Depot Modernization Cost

Definition:

The cost of the installation of alterations and improvements (for example, SHIPALTS and ORDALTS) to effect changes in a system's configuration or equipment to improve its safety, habitability, maintainability, or technical characteristics. This cost is primarily a labor cost, although the cost of common, miscellaneous industrial material locally procured or fabricated by the installation activity is also included. The labor cost will include a pro rata share of variable installation overhead costs. Special material required for these alterations or modifications is covered in element 3.82.

Cost Formula:

$$MOD = \sum_{I=1}^Y NNN(I) * MODC(I)$$

where:

$$NNN(I) = \sum_{G=1}^I NN(G)$$

for which:

MOD = Depot modernization cost. (\$)

NNN(I) = Total number of weapon systems procured through year I. (systems)

MODC(I) = Modernization cost per weapon system during year I. (\$/system)

NN(G) = Number of weapon systems introduced into inventory during year G. (systems/yr)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

G = Designator for a specific project year.

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3.44 Depot Component Repair Cost

Definition:

Ship systems only: The labor and material cost of the repair, calibration, and testing of the ship's equipment and components at industrial facilities. Missiles and other ordnance, ordnance equipment and components, and electronic, hull, mechanical, and electrical equipment and components designated for repair at industrial facilities are included.

Cost Formula:

$$CDR = \sum_{I=1}^Y NNN(I) * DCRS$$

where:

$$NNN(I) = \sum_{G=1}^I NN(G)$$

for which:

DCRS = Depot component repair cost. (\$)

NNN(I) = Total number of weapon systems procured through year I. (systems)

DCRS = Depot labor and material cost per ship per year for component repair. (\$/ship/yr)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

G = Designator for a specific project year.

3.5 Depot Supply Costs

Definition:

The cost of manpower and material needed to buy, store, package, manage and control the supplies, spares and repair parts used in operating and maintaining the weapon and components and support equipment; and to provide system sustaining (service) engineering and technical data support for the systems. Includes contractual support.

Cost Formula:

$$DS = MM + TES$$

where:

DS = Depot supply costs. (\$)

MM = Material management cost. (\$)

TES = Technical support cost. (\$)

3.51 Material Management Cost

Definition:

The cost of manpower and material needed to fill requisitions for supplies, spares and repair parts. Included are receiving, unpacking, storage, inspection and packing and crating costs; the cost of manpower and material needed to manage the procurement of supplies, spares and repair parts and maintain control and accountability of these assets.

Cost Formula:

$$MM = \sum_{I=1}^Y NSNP + NSNS * RIM + FSA * NMFP(I) * NSNP + NMFS(I) * NSNS$$

where:

MM = Government material management cost. (\$)

NSNP = Number of new National Stock Numbers (NSNs) introduced into supply system by the major weapon system. (NSNs)

NSNS = Number of new NSNs introduced into supply system by support systems of the major weapon system. (NSNs)

RIM = Average NSN retention cost in the supply system. (\$/NSN/yr)

FSA = Field supply administration cost of the NSN. (\$/NSN/site/yr)

NMFP(I) = Number of maintenance facilities servicing the major weapon system in year I. (sites)

NMFS(I) = Number of maintenance facilities servicing support systems of the major weapon system in year I. (sites)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

3.52 Technical Support Cost

Definition:

The cost of sustaining (service) engineering and technical data and documents needed to perform sustaining engineering and maintenance of weapon system components and support equipment.

Cost Formula:

$$TES = \sum_{I=1}^Y TESC(I)$$

where:

TES = Technical support cost. (\$)

TESC(I) = Government expenditures for technical support during year I. (\$/yr)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

3.6 Second Destination Transportation Costs

Definition:

This cost element includes packaging, handling and transportation of spares, repair parts and other material between organizational, intermediate, depot and supply points (overseas and CONUS) in support of maintenance operations. Also included is the transportation of the end item to the depot and return for the purpose of depot rework/overhaul.

Cost Formula:

$$SDT = SSDT + USDT$$

where:

SDT = Second destination transportation costs. (\$)

SSDT = Scheduled maintenance transportation cost. (\$)

USDT = Unscheduled maintenance transportation cost. (\$)

3.61 Schedule Maintenance Transportation Cost

Definition:

This element refers to that portion of second destination transportation cost incurred by scheduled maintenance of items in the weapon system.

Cost Formula:

$$SSDT = \sum_{I=1}^Y \sum_{X=1}^Z NNN(I) * OT * [ATNS(X) + ALR(X) + AMTR(X)] / MTGO(X)$$

where:

$$NNN(I) = \sum_{G=1}^I NN(G)$$

for which

SSDT = Scheduled maintenance transportation cost. (\$)

NNN(I) = Total number of weapon systems procured through year I. (systems)

OT = Annual operating time of the weapon system. (hrs/system/yr)

ATNS(X) = Average two way shipping cost incurred in the process of shipping rework/overhaul items in equipment X from intermediate to depot level maintenance facility and return. (\$/(rework/overhaul))

ALR(X) = Average two way packaging labor cost incurred during the process of shipping rework/overhaul items in equipment X between the intermediate and depot level maintenance facilities. (\$/(rework/overhaul))

AMTR(X) = Average packaging material cost incurred during the process of shipping rework/overhaul items in equipment X between the intermediate and depot level maintenance facilities. (\$/(rework/overhaul))

MTGO(X) = Mean time between depot rework/overhaul of the Xth equipment (hrs/(rework/overhaul)).

NN(G) = Number of weapon systems introduced into inventory during year G. (systems/yr)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

X = Designator for a specific equipment

Z = Number of equipments in the weapon system subjected to depot rework/overhaul. (equipments)

G = Designator for a specific project year.

3.62 Unscheduled Maintenance Transportation Cost

Definition:

This element refers to that portion of second destination transportation cost incurred by unscheduled maintenance of items in the weapon system.

Cost Formula:

$$USDT = \sum_{I=1}^Y \sum_{CC=1}^{DD} NNN(I) * OT * BCM(CC) * [ATR(CC) + ALBR(CC) + AMAT(CC)] / MTBF(CC)$$

where:

$$NNN(I) = \sum_{G=1}^I NN(G)$$

for which:

USDT = Unscheduled maintenance transportation cost. (\$)

NNN(I) = Total number of weapon systems procured through year I.
(systems)

OT = Annual operating time of the weapon system. (hrs/system/yr)

BCM(CC) = Average beyond capability of maintenance rate of item in equipment CC. (BCM's/failure)

ATR(CC) = Average two way shipping cost incurred in the process of shipping failed items in equipment CC from intermediate to depot level maintenance facility and return. (\$/BCM)

ALBR(CC) = Average two way packaging labor cost incurred during the process of shipping failed items in equipment CC between the intermediate and depot level maintenance facilities. (\$/BCM)

AMAT(CC) = Average packaging material cost incurred during the process of shipping failed items in equipment CC between the intermediate and depot level maintenance facilities. (\$/BCM)

MTBF(CC) = Mean time between failures of the CCth equipment.
(hrs/failure)

NN(G) = Number of weapon systems introduced into inventory during year G. (systems/yr)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

CC = Designator for a specific equipment.

DD = Number of equipments in the weapons system subjected to depot maintenance. (equipments)

G = Designator for a specific project year.

3.7 Personnel Support and Training Costs

Definition:

This element accounts for the variable cost of replacement training; moving; health care and support of personnel.

Cost Formula:

$$PST = TRA + HC + PAC + PES$$

where:

PST = Personnel support and training costs. (\$)

TRA = Individual training cost. (\$)

HC = Health care cost. (\$)

POAC = Personnel activities cost. (\$)

PES = Personnel support cost. (\$)

3.71 Individual Training Cost

Definition:

This element accounts for the replacement costs associated with training personnel to operate and maintain the weapon system. This element includes the replacement cost of training equipment as well as the services cost associated with training personnel to replace those lost through attrition.

Cost Formula:

$$TRA = \sum_{I=1}^Y RTRE(I) + RTRS(I)$$

where:

TRA = Government attrition training cost. (\$)

RTRE(I) = Government expenditures in year I for replacement training equipment. (\$/yr)

RTRS(I) = Government expenditures in year I for training services for personnel replacing those lost through attrition. (\$/yr)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

3.72 Health Care Cost

Definition:

The variable cost of providing medical support to deployed unit, below-depot maintenance, installation support and training pipeline personnel including:

- the pay of medical personnel who provide this support
- the cost of medical material

Cost Formula:

$$HC = \sum_{I=1}^Y HCC(I)$$

where:

HC = Health care cost. (\$)

HCC(I) = Government expenditures in year I for health care. (\$/yr)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

3.73 Personnel Activities Cost

Definition:

The permanent change of station costs of: deployed unit, below-depot maintenance, installation support, training pipeline and medical personnel.

Cost Formula:

$$PAC = \sum_{I=1}^Y PACC(I)$$

where:

PAC = Personnel activities cost. (\$)

PACC(I) = Government expenditures during year I for personnel activities. (\$/yr)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

3.74 Personnel Support Cost

Definition:

The cost of supplies, services and equipment needed to support training pipeline and medical personnel. Examples of included costs are administrative supply items; travel expenses; expendable office equipment and machines; custodial services; and other variable personnel-oriented support costs incurred at training centers and medical facilities.

Cost Formula:

$$PES = \sum_{I=1}^Y PESC(I)$$

where:

PES = Personnel support cost. (\$)

PESC(I) = Government expenditures during year I for personnel support. (\$/yr)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

3.8 Sustaining Investments Costs

Definition:

This element refers to the cost of procuring spares, modification kits and material, support equipment and training ordnance needed to sustain deployed unit peacetime operations.

Cost Formula:

$$SI = RS + MDF + RSE + EXS$$

where:

SI = Sustaining investments costs. (\$)

RS = Replenishment spares cost. (\$)

MDF = Modifications cost. (\$)

RSE = Replenishment support equipment cost. (\$)

EXS = Expendable stores cost. (\$)

3.81 Replenishment Spares Cost

Definition:

Replenishment spares cost accounts for the recurring cost of inventory (parts, subassemblies, assemblies, units, etc.) purchased to resupply the system stock requirement due to items being discarded or scrapped during the maintenance process. Inventory already purchased as initial spares and repair parts is not included.

Cost Formula:

$$RS = \sum_{I=1}^Y \sum_{EE=1}^{FF} NNN(I) * OT * ACST(EE) * ADSC(EE) / MTBF(EE)$$

where:

$$NNN(I) = \sum_{G=1}^I NN(G)$$

for which:

RS = Replenishment spares cost. (\$)

NNN(I) = Total number of weapon systems procured through year I.
(systems)

OT = Annual operating time of the weapon system. (hrs/system/yr)

ACST(EE) = Average cost of item per discard or scrap maintenance action to the EEth equipment. (\$/scrap action)

ADSC(EE) = Average scrap rate of items in the EEth equipment.
(scrap actions/failures)

MTBF(EE) = Mean Time Between Failure of the EEth equipment. (hrs/failure)

NN(G) = Number of weapon systems introduced into inventory during year G.
(systems/yr)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

EE = Designator for a specific equipment.

FF = Number of equipments in the weapon system. (equipments)

G = Designator for a specific project year.

3.82 Modifications Cost

Definition:

The cost of the acquisition of special material for alterations or modifications needed for effecting improvements in the weapon system's safety, habitability, maintainability, or technical characteristics. Included are spares for modified equipment.

Cost Formula:

$$MDF = \sum_{I=1}^Y NNN(I) * MODK(I)$$

where:

$$NNN(I) = \sum_{G=1}^I NN(G)$$

for which:

MDF = Modifications cost. (\$)

NNN(I) = Total number of weapon systems procured through year I.
(systems)

MODK(I) = Modification kit cost per weapon system during year I.
(\$/system)

NN(G) = Number of weapon systems introduced into inventory during year G. (systems/yr)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

G = Designator for a specific project year.

3.83 Replenishment Support Equipment Cost

Definition:

The cost of replenishing common servicing equipment, maintenance and repair shop equipment, instruments and laboratory test equipment, and other equipment including spares for these equipments. Covers such items as generators; jet engine stands; test sets for radios, radars and fire control systems; hand tools; compressors; gauges and other minor items. These equipment demands are generated by a need to: (1) replace peculiar support equipment bought using procurement funds; (2) obtain common off-the-shelf equipment that is needed to support operations; and (3) replenish support equipment that is no longer useable.

Cost Formula:

$$RSE = \sum_{I=1}^Y RSEC(I)$$

where:

RSE = Replenishment support equipment cost. (\$)

RSEC(I) = Government expenditures during year I for replenishment support equipment. (\$/yr)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

3.84 Expendable Stores Cost

Definition:

The cost of the expendable ordnance, ammunition, pyrotechnics, missiles, ballistic weapons, guided weapons, torpedoes, mines, depth charges and sonobuoys used in training exercises.

Cost Formula:

$$EXS = \sum_{I=1}^Y NNN(I) * EXSC(I)$$

where:

$$NNN(I) = \sum_{G=1}^I NN(G)$$

for which:

EXS = Expendable stores cost. (\$)

NNN(I) = Total number of weapon systems procured through year I.
(systems)

EXSC(I) = Stores cost per weapon system during year I. (\$/system)

NN(G) = Number of weapon systems introduced into inventory during year G. (systems/yr)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

G = Designator for a specific project year.

4. Associated Systems Costs

Definition:

Ship systems only: The procurement and operating and support costs of additional hardware needed to insure effective operational use of the new ship. These additional hardware needs can range from new logistics support force ships to helicopters which will be deployed on the new ship.

Cost Formula:

$$ASC = ASCI + ASCO$$

where:

ASC = Associated systems costs. (\$)

ASCI = Associated systems investment costs. (\$)

ASCO = Associated systems operating and support costs. (\$)

4.1 Associated Systems Investment Costs

Definition:

This cost refers to all costs associated with the procurement of additional hardware needed to insure effective operational use of the new ship.

Cost Formula:

$$ASCI = MLI + TRI + AII$$

where:

ASCI = Associated systems investment costs. (\$)

MLI = Mobile Logistics Support Force investment cost. (\$)

TRI = Tenders and repair ships investment cost. (\$)

AII = Ashore Intermediate Maintenance Activity (IMA) investment cost. (\$)

4.11 Mobile Logistics Support Force Investment Cost

Definition:

The cost of constructing, converting, altering, or modifying oilers, ammunition ships, supply ships, etc., to support the operation of these particular ships.

Cost Formula:

$$MLI = \sum_{I=1}^Y MLIC(I)$$

where:

MLI = Mobile Logistics Support Force (MLSF) investment cost. (\$)

MLIC(I) = Government expenditures during year I for constructing, converting, altering, or modifying the MLSF. (\$/yr)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

4.12 Tenders and Repair Ships Investment Cost

Definition:

The cost of constructing, converting, altering, or modifying tenders and repair ships for the intermediate maintenance of these particular ships.

Cost Formula:

$$TRI = \sum_{I=1}^Y TRIC(I)$$

where:

TRI = Tenders and repair ships investment cost. (\$)

TRIC(I) = Government expenditures during year I for constructing, converting, altering, or modifying tenders and repair ships. (\$/yr)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

4.13 Ashore Intermediate Maintenance Activity Investment Cost

Definition:

The cost of constructing, converting, altering, or modifying of shore facilities to provide intermediate maintenance for these particular ships. Investments made solely for repairable component repair facilities, which should be reflected in 2.27 are excluded.

Cost Formula:

$$AII = \sum_{I=1}^Y AIIC(I)$$

where:

AII = Ashore Intermediate Maintenance Activity investment cost. (\$)

AIIC(I) = Government expenditures during year I for constructing, converting, altering, or modifying shore facilities. (\$/yr)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

4.2 Associated Systems Operating and Support Costs

Definition:

This cost refers to all costs associated with the operating and support of additional hardware needed to insure effective operational use of the new ship.

Cost Formula:

$$\text{ASCO} = \text{MLO} + \text{TRO} + \text{AIO} + \text{ES}$$

where:

ASCO = Associated systems operating and support costs. (\$)

MLO = MLSF operating and support cost. (\$)

TRO = Tenders and repair ships operating and support costs. (\$)

AIO = Ashore IMA operating and support cost. (\$)

ES = Embarked systems operating and support cost. (\$)

4.21 Mobile Logistics Support Force Operating and Support Cost

Definition:

The significant incremental costs of operating and supporting the MLSF (except tenders and repair ships) that result from the introduction and operation of these particular ships. The operating and support cost of the MLSF ship is to include the cost categories in the 300 series defined by this report.

Cost Formula:

$$MLO = \sum_{I=1}^Y MLOC(I)$$

where:

MLO = MLSF operating and support cost. (\$)

MLOC(I) = Incremental costs during year I for operating and support of the MLSF. (\$/yr)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

4.22 Tenders and Repair Ships Operating and Support Cost

Definition:

The significant incremental costs of operating and supporting the tenders and repair ships that result from the introduction and operation of these particular ships. The O&S cost of the tenders and repair ships is to include the cost categories, (except for direct labor, covered in 3.211) in the 300 series defined by this report. If these particular ships require particular tenders or repair ships, the costs associated with them must be shown separately.

Cost Formula:

$$TRO = \sum_{I=1}^Y TROC(I)$$

where:

TRO = Tenders and repair ships operating and support cost. (\$)

TROC(I) = Incremental costs during year I for operating and support of the tenders and repair ships. (\$/yr)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

4.23 Ashore IMA Operating and Support Cost

Definition:

The significant incremental costs of operating and supporting the ashore IMAs that result from the introduction and operation of these particular ships. The O&S cost of the ashore IMAs includes manpower, (except for direct labor, covered in 3.221), training, personnel support, and other support as defined by the 300 series of this report. These costs also include support services received from host facilities. If these particular ships require particular IMAs, the costs associated with them must be shown separately.

Cost Formula:

$$AIO = \sum_{I=1}^Y AIOC(I)$$

where:

AIO = Ashore IMA operating and support cost. (\$)

AIOC(I) = Incremental costs during year I for operating and support of ashore IMAs. (\$/yr)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

4.24 Embarked Systems Cost

Definition:

Pro rata share of the operation and support costs of embarked systems, such as helicopters, etc., not intended to be permanently affixed to the ship. The pro rata allocation of aviation systems is to be based on a proportionate share of the total squadron operating and support costs as defined by the cost categories in this report. Costs will be shown separately for each kind of "embarked system." The "embarked systems" will be specifically identified.

Cost Formula:

$$ES = \sum_{I=1}^Y ESC(I)$$

where:

ES = Embarked systems cost. (\$)

ESC(I) = Pro rata share of operating and support costs of embarked systems during year I. (\$/yr)

I = Designator for a specific project year.

Y = Number of years in life cycle. (yrs)

5. Termination Cost

Defintion:

This element refers to the salvage value and/or disposal cost incurred when the weapon system is removed at the end of its economic life.

Cost Formula:

$$TERV = \sum_{I=1}^Y NPO(I) * TERM$$

where:

TERV = Termination cost. (\$)

NPO(I) = Number of major weapon systems phased out during year I. (systems/yr)

TERM = Major system terminal cost/value. (+/-\$/system)

122-blank

IV. Guidelines

A. Introduction

This section presents situations for tailoring the CBS and cost methodology. The material presented is for guidance - it should in no way limit the use of imagination and good judgement in performing cost analyses relevant to acquisition program decisions.

B. Tailoring The Analysis

The conducting of a life cycle cost analysis must be tailored to the phase of the acquisition program and the cost issues involved. As a program progresses, the issues change, and both the uncertainties in the cost estimation and the opportunities to affect those costs diminish. Consequently, the nature of decisions and the related cost analyses will change as the design progresses.

Depending on the phase of the program and the specific issues involved, the cost analysis might address alternative weapon systems, subsystems, or support plans. Additionally interest will frequently focus on the sensitivity of certain costs to the goals established for mission performance and support of the weapon system.

C. Objectives Of The Cost Analysis

Although each cost analysis and its format must be tailored to the decisions at hand, it should always:

- Define each alternative
- Identify differences between alternatives
- Show cost impact of the differences, taking uncertainty into account

- Explain the rationale of the cost analysis (assumptions, limitation, methods, data) and note any deviations from the guidelines set forth by the requesting activity for the cost analysis
- Relate the results to the decisions being considered

D. Illustrations For Altering The CBS And Cost Equations

This sub-section presents examples where the CBS and cost equations presented earlier are altered to address the issues under consideration during the cost analysis. The illustrations are hypothetical, though based on real world issues. They are descriptive rather than prescriptive.

Example 1. Assume that it is desired to compare the life cycle cost of two proposed weapon systems in similar stages of development.

In this example, it is important that the cost-estimating model, where feasible, be the same for the two systems. This is to ensure that differences between cost estimates of the systems result from differences inherent in the systems, and not from differences in the cost-estimating approaches.

The depth of detail of the CBS used in the cost-estimating model is dependent on the stage of development of the weapon systems. Comparing two systems in the conceptual stage, may require the cost coverage of Research and Development costs suggested in this report; whereas, the Operating and Support costs may be estimated on a more aggregate level than that presented.

Cost-estimating techniques also vary as the stage of development progresses. During the early stages of development, it may be desirable to estimate costs based on historical cost trends of similar or analogous systems. These estimates may be made at the system-level. As the system design matures, the estimating techniques become more related to the weapon systems characteristics and operating scenario. Cost estimates may be made at the subsystem or component level.

Example 2. Purpose of analysis: Compare the cost of modifying an existing weapon system to that of developing and acquiring a proposed new weapon system.

This example would require two different cost-estimating models. The cost-estimating model for the modified weapon system would focus on research and development, and investment costs for the proposed modifications. Operating and support costs would be considered for the entire system with the proposed modifications. Previous expenditures for developing, acquiring, and supporting the weapon system would not be considered.

Historical data would be the predominate basis for cost estimates of the operating and support costs for the portion of the weapon system not undergoing modification.

The proposed new weapon system would require a cost-estimating model that considers the costs of developing, acquiring, and supporting the entire weapon system. As in the previous example, the CBS and cost-estimating technique used would depend on the systems stage of development.

Example 3. Purpose of analysis: Trade-off two different component designs.

Here again, it is desirable that the cost-estimating model be the same for the two alternative components. The model should involve only a small portion of the total weapon system's cost, focussing on the selected components trade-offs. Detailed analysis considering acquisition cost versus maintenance cost as a function of reliability should be a characteristic of the model used.

Example 4. Purpose of analyses: Trade-off two different support concepts.

Again, it would be desirable to use one cost-estimating model for the two different support policies. The model would focus on the cost differences of the support concepts concentrating on the cost of maintaining the system, subsystem(s), or component(s) being considered for alternative support concepts.

V. LCC FLEX Computer Program

A. Introduction

This section discusses the LCC FLEX computer model. The model is an updated version of the models previously developed for major weapon system and equipment level life cycle cost analysis. This updated version allows the user to store on a computer file, rather than program into the model, the standard CBS and associated equations. This feature allows the user to permanently change the CBS or equations without changing the computer program.

B. Standard CBS and Equations

The Life Cycle Cost Breakdown Structure and Equation Directory which identifies the CBS number assigned to each element; and the cost category, funding type, and inflation factor type assigned to each basic equation is provided in Table 4 .

Every cost element in the CBS is assigned a CBS number. The numbering scheme determines the hierarchy from which lower cost elements are aggregated into higher cost elements. The FLEX model is constructed to accept six digit CBS numbers, with the hierarchy determined from left to right. Thus cost elements 110000 and 120000 are aggregated into cost element 100000.

Every cost element without lower cost elements below it, must be defined by a cost equation. Every cost equation is assigned to one of ten major cost categories. For reference purposes, each is assigned a numerical code. These Cost Categories and their assigned code numbers in the Equation Directory are:

Contracted Research	1
Management	2
Testing	3
Prime Equipment	4
Training	5
Supply Support	6
Technical Data	7
Support Equipment	8
Operation	9
Maintenance	10

TABLE 4
COST BREAKDOWN STRUCTURE
AND
EQUATION DIRECTORY

CBS NO	COST CAT.	FUND TYPE	INFL. TYPE	CBS NO	COST CAT.	FUND TYPE	INFL. TYPE
100000	1	1	1	320000			
110000	2	1	1	321000			
120000				321100			
130000				321110			
140000				321120			
150000				321200			
160000				321300			
170000				321400			
180000				322000			
190000				322100			
200000				322110			
210000				322120			
220000				322200			
230000				322300			
240000				322400			
250000				330000			
260000				331000			
270000				332000			
280000				333000			
290000				340000			
300000				341000			
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490000				384000			
500000				400000			
510000				410000			
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580000				423000			
590000				424000			
600000				500000			
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970000							
980000							
990000							

Every cost equation is assigned to one of six funding types. These funding types and their code numbers in the Equation Directory are:

Research & Development	1
Procurement	2
Construction	3
Operation & Maintenance	4
Military Personnel	5
Others	6

Each cost equation in the Equipment Life Cycle Cost model can be adjusted for the time value of money by one of four types of inflation factors and one discount factor. These inflation factors and their code numbers in the Equation Directory are:

R&D	1
Procurement	2
Construction	3
O&M	4

Operation and Maintenance and Military Personnel are assumed to use the same O&M type of inflation factor. Funding type "Others" could use any one of the inflation factors.

C. Data Collection

Life Cycle Cost analysis requires the collection and processing of 109 cost factors. The principal data sources are the System Project Office, the Contractor, and the Logistic Support organization. The Project Management Office will provide data concerning the system operations, acquisition costs, project schedules and various contractual related information. Information pertaining to the inherent design characteristics of the system will be available from the contractor. The ILS Manager and his Logistic Element Managers will have access to data on maintenance, personnel and training, technical data, transportation, etc., during the ownership period. The analyst will be required to provide all other cost factors by converting

some of the raw data collected during the interviews into applicable information. It is recommended that the cost equations' description presented in section III be used as a guide during the interviews.

The basic steps in the data collection and processing are the same whether life cycle costs are calculated manually or by using the Automatic Data Processing (ADP) program. The ADP method simplifies the calculation requirements, but it also requires an analyst to become familiar with translating LCC factors into a format acceptable to a computer.

Sections D and E will provide information on how to use the ADP techniques for the LCC model. Section G will present the FLEX technique on how to modify the FLEX LCC Model.

D. Automatic Data Processing

Although an analyst can use the model without knowing all the details of the calculations, a general knowledge of the logical content contained in the model is useful in properly developing input data, in properly interpreting results and in appreciating the capabilities and limitations of the model.

The LCC model consists of three functional processes:

1. ADP Model Input Logic

Like any computer model, a problem to be analyzed by the LCC model must be presented in the form of input data of particular types. Once the analyst has prepared data on the input forms, the data is converted to punched cards. Each type of data card is read in and the data is converted to a form needed for subsequent operations. The model routines that process input data also apply various logical tests to verify that the data is correct and complete within certain limits. If these tests or edit checks uncover discrepancies in the data, error messages are produced. For some errors operation of the model will stop, while for others processing will continue.

The input routings also provide reports of the input data which are returned to the analyst along with results of the output reports. These input reports can be used to check that the data has been properly entered. They also serve as ready reference for interpreting the results of the model. Once all input data is read in and established in arrays, the logical process of the model automatically begins. All of the processing is done internally and does not require the attention or intervention of the analyst.

2. Cost Calculations

In calculating Life Cycle Cost, the model considers the hierarchal structure of the cost elements that have been defined in section II. The cost of a cost element is the sum of the indented cost elements below it. For example: total life cycle cost is calculated as the sum of the Research and Development, Investment, Operating and Support, Associated Systems, and Termination costs. This feature requires that only those cost elements that do not have lower indented cost elements need be described by equations. The model calculates the cost of each equation by year. These costs are then adjusted as required by the time value of money theory.

Every cost element described by an equation also has identified with it a life cycle phase, cost category, funding type, and adjustment factor.

3. Reports

The purpose of a life cycle methodology is to take the diverse bits of information describing a specific bid or set of circumstances and produce a unique value called the total life cycle cost. The comparison of the LCC values provides the System Project Manager with an important decision-making factor. The ADP program provides various reports at different depth of detail and types of information that are grouped into two basic categories.

(3) The COST BREAKDOWN BY YEAR report presents the yearly breakdown of the basic cost elements.

(4) The COST BREAKDOWN TOTALS report presents the total life cycle cost of each basic cost element. The cost of each basic cost element is also expressed as a percentage of total LCC.

(5) The GENERAL FUNDING report presents the total life cycle cost cross-referenced by funding types.

(6) The ANNUAL COST BY FUNDING TYPE report presents the total life cycle cost by year by funding type.

(7) The ANNUAL COST BY COST CATEGORY report presents the total life cycle cost by year by cost category.

(8) The SENSITIVITY ANALYSIS report summarizes the effect of varying a single cost factor's value on the total life cycle cost.

E. LCC Model Input Formats

The operation of the Equipment Life Cycle Cost model requires that a variety of input data be prepared by the analyst to describe the equipment being analyzed. A Run Deck sequence of the computer cards is shown in figure 1. A Major Weapon System LCC model sample computer run is provided in Appendix B. There are five types of input formats required from the analyst. These are:

1. Analysis Identification

This form identifies the analysis and prints the title on the cover page and on the succeeding report pages. The maximum number of characters for the analysis identification is 100. The identification is to be contained in columns 1 through 80 of the first card and columns 1 through 20 of the second card (if required). All characters will appear as the analysis identification on each report page; if no information is given then "No analysis identification was provided" will be printed.

LCCFLEX RUN DECK SEQUENCE

```
//NWQPxxxx JOB (13440dii,C,U,N),'LCC-Analyst's name)
// EXEC LCCFLEX,RUN=1,LINES=5000
//IDENT DD *
```

```
.....
: Identification cards go in here
: .....
```

```
//CS DD *
```

```
.....
: CS and EQ cards go in here
: Referred to as CS FILE and used only for FLEX option
: .....
```

```
//NV DD *
```

```
.....
: NV and DS cards go in here
: Referred to as NV FILE and used only for FLEX option
: .....
```

```
//DATA DD *
```

```
.....
: CN card
:
: RM cards
:
: &INPUT
:
: NAMELIST input data cards go in here
:
: &END
:
: SA Sensitivity analysis cards go in here
: .....
```

```
//
//
```

```
xxxx Project identification
d      department code
ii     Analyst's initials
```

FIGURE 1

2. Control Options Card (CN card)

The control options card (CN card) has several switches to suppress printing of reports.

Input Data Reports are selectively printed or not printed in accordance with the following code:

0 or blank = No report printed
1 = Report printed

Output Reports are selectively printed or not printed in accordance with the following code:

0 or blank = No report printed
1 = Report printed in constant dollars
2 = Report printed in inflated dollars
4 = Report printed in inflated and discounted dollars

If more than one type of printout is desired, simply add the integer of the individual reports and enter the resultant number. For example, the number 3 (1+2) will produce two reports, one in constant dollars and the other in inflated dollars. An entry of 7 (1+2+4) will produce three reports, one in constant dollars, one in inflated dollars, and one in inflated and discounted dollars.

The last switch on the form provides the user with an option of entering the adjustment factor for the inflation in the form of either the inflation rate or the inflation factor. The switch is controlled as follows:

0 or blank = Inflation rates
1 = Inflation factors

If there is no CN card all of the reports will be printed.

The format of the CN card is as follows:

<u>Column(s)</u>	<u>Description</u>
1-2	Card type "CN"
3	Equation
4	Remarks
5	Dictionary
6	Built-in variable values
7	User input variable values (Used only for LCCFLEX)
8	Cost adjustment factors
9	Summary
10	Funding by cost category
11	Cost breakdown by year
12	Cost breakdown totals
13	General funding
14	Annual cost by funding
15	Annual cost by cost categories
16	Sensitivity analysis
17-19	Not used
20	Inflation rate/factor input option
21-80	Not used

LCC MODEL ☐ CN OUTPUT REPORT SELECTOR

PAGE
OF

REPORTS		INFLAT RATES OR FACT		SENSITIVITY ANALYSIS		ANNUAL COST BY CAT		ANNUAL COST BY FUND		GENERAL FUNDING		COST BREAK TOTALS		COST BREAK BY YR		FUND VS COST CAT		SUMMARY		INFLATION FACTORS		REMARKS		EQUATIONS	
1																									
2																									
3																									
4																									
5																									
6																									
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3. Remark Cards (RM Cards)

The remark cards allow the user to describe or provide additional information for explanatory purposes. The remarks entered in this format are printed on a separate output page. If no remark card is used, "No remarks" is printed. Each remark card should be coded with the characters RM on the first and the second column of the card. The user can include as many RM cards as needed.

4. Input Card (for NAMELIST input)

The basic input data is entered on NAMELIST input cards. NAMELIST is a special input processing technique that allows a great deal of freedom and brevity in providing input data to a program.

Certain rules govern the use of the NAMELIST technique; these rules are described here. The first card for NAMELIST input must have "&" in column 2 followed by a NAMELIST name (for this program that name is input) and the name followed by a blank. Subsequent cards do not use this identification but column 1 must be blank. The end of NAMELIST data is signified by entering "&END" after the final model input data. Data is entered in the format "Variable name = Variable value." If the variable is defined as an integer (in this program only dimensioned scalars are integers), the value must be an integer (not contain a decimal point). Embedded blanks in the name or value are illegal, but blanks may appear before or after each (CAUTION: Blanks after a value with no decimal point will be interpreted as zeros). A comma must be used to delimit and separate data entries. Input to arrays (matrices) may be done in one of several ways. Some of these ways are illustrated in the following example.

REMARKS REPORT

PAGE

30

REMARKS

[illegible]

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LCC MODEL **8** & INPUT

VARIABLE NAME = VARIABLE VALUE

8 INPUT

8 END

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Assume an array "A" dimensioned as two by three, into which it is desired to enter the values

```
2 2 8
8 8 8
```

This can be done, under NAMELIST input by:

```
A(1,1)=2.,A(1,2)=2.,A(1,3)=8.,
A(2,1)=8.,A(2,2)=8.,A(2,3)=8.,
```

or

```
A=2.,2.,8.,8.,8.,8.,
```

or

```
A=2*2.,4*7.,
```

or

```
A(1,1)=2.,A(1,3)=8.,
```

In the last form each of the missing elements will take the immediately preceeding value given, as their default value.

The Major Weapon System Life Cycle Cost model contains 77 cost factors which are written in the NAMELIST format. There are three types of cost factors:

a. Scalars

These are the single value cost factors. There are 19 scalars in the LCC model. All scalars have a range varying from 0 to 10^9 except scalars "BY" and "IFY" which are restricted to vary from 1 to 30, and scalar 'TERM' which varies from -10^9 to 10^9 . Scalar names are listed in alphabetical order as follows:

AA	CSPB	CSPS	CTPE	DCRS	FSA
GF	IFI	MATS	NSNP	NSNS	OT
RIE	RIM	RMF	RMFA	SSS	TAD
TERM					

b. Dimensioning Scalars

These are the single value cost factors governing the dimensions of the arrays. There are 9 dimensioning scalars in the LCC Model. Dimensioning scalars and their respective minimum and maximum range values are listed as follows:

<u>Name</u>	<u>Min. range</u>	<u>Max. Range</u>
B	1	5
D	1	30
DD	1	50
F	1	5
FF	1	50
U	1	5
W	1	5
Y	1	30
Z	1	50

c. Arrays

These are the subscripted multiple entry cost factors. Dimensions of these arrays are controlled by dimensioning scalars. All arrays have a range varying from 0 to 10^5 except arrays "MTBF" and "MTGO" are restricted to a minimum of 0.01 to avoid division by zero during calculations. There are 84 arrays in the Major Weapon System LCC model. The listing of the arrays by dimension types are as follows:

(1) The 65 arrays subscripted by "I" and dimensioned by "Y"

(which has a range from 1 to 30) are as follows:

AD	ADC	ADG	AIIC	AIOC	APS	APSA
AQSE	ASE	ASEC	BOSC	CIF	CIFF	CPM
CSU	UTE	CTS	DC	DCD	DCE	DCH
DCPM	DCS	DCSE	DCT	DCTE	DCTS	DGPM
DGTA	DCTT	ESC	EXSC	FA	FM	HCC
IPS	MFC	MFCA	MLIC	MLOC	MODC	MDDK
NB	NFMP	NMFS	NNN	NPO	ODM	PACC
PESC	PMG	PSC	PTE	RPMC	RSEC	RTRE
RTRS	SA	SS	TESC	TRE	TRF	TRIC
TROC	TRS					

(2) The 6 arrays subscripted by "CC" and dimensioned by "DD"
(which has a range from 1 to 50) are as follows:

ALBR AMAT ATRN BCM GMC MTBS

(3) The 5 arrays subscripted by "X" and dimensioned by "Z"
(which has a range from 1 to 50 are as follows:

ALR AMTR ATNS GOH MTGO

(4) The 2 arrays subscripted by "EE" and dimensioned by "FF"
(which has a range from 1 to 50) are as follows:

ACST ADSC

(5) The 2 arrays subscripted by "T" and dimensioned by "U"
(which has a range from 1 to 5) are as follows:

MS POT

(6) The 1 array subscripted by "A" and dimensioned by "B"
(which has a range from 1 to 5) is:

PA

(7) The 1 array subscripted by "E" and dimensioned by "F"
(which has a range from 1 to 5) is:

PAS

(8) The 1 array subscripted by "V" and dimensioned by "Z"
(which has a range from 1 to 50) is:

MSO

(9) The 1 array subscripted by "C" and dimensioned by "D"
(which has a range from 1 to 30) is:

CSE

d. Matricies

These are the double subscripted multiple entry cost factors
controlled by 2 dimensioning scalars simultaneously. There are 7 matricies
in the model. They are as follows:

(1) The 2 matrices subscripted by "I" and "T" and dimensioned by "Y" and "U" are as follows:

NMP NMPA

(2) The 2 matrices subscripted by "I" and "V" and dimensioned by "Y" and "B" are as follows:

NOP NOPA

(3) The matrix subscripted by "I" and "A" and dimensioned by "Y" and "B" is:

NCR

(4) The matrix subscripted by "I" and "C" and dimensioned by "Y" and "D" is:

NSE

(5) The matrix subscripted by "I" and "E" and dimensioned by "Y" and "F" is:

NSTA

Table 5 presents an alphabetically sequenced Life Cycle Cost Directory with names and descriptions of the Cost Factors and a cross reference of the Equations in which they are used.

5. Sensitivity Analysis Card

Variables to be sensitized are noted on the sensitivity analysis card. These cards are identified by punching SA in columns 1 and 2.

The mnemonic of the variable to be sensitized is entered in columns 10 through 17. The lower and upper values of the range over which the variable is to be sensitized are entered in columns 20 through 29 and 30 through 39 respectively.

Up to ten scalar variables and up to ten array variables may be sensitized in a given program execution.

TABLE 5
LIFE CYCLE COST FACTOR DIRECTORY

<u>NAME</u>	<u>DESCRIPTION</u>	<u>CBS NO</u>
AA	First piece cost of weapon system. (\$)	211000
ACST(E)	Average cost of item per discard or scrap maintenance action to the EEth equipment. (\$/scrap action)	381000
AD(I)	Documentation acquisition cost during year I. (\$/yr)	216000
ADC(I)	Contractor payments paid by the Government to contractors for the major weapon system validation effort during year I. (\$/yr)	111000
ADG(I)	Government expenditures during year I for the major weapon system validation effort. (\$/yr)	112000
ADSC(E)	Average scrap rate of items in the EEth equipment. (scrap actions/failure)	381000
AIIC(I)	Government expenditures during year I for constructing, converting, altering, or modifying shore facilities. (\$/yr)	413000
AIOC(I)	Incremental costs during year I for operating and support of ashore IMAs. (\$/yr)	423000
ALBR(CC)	Average two way packaging labor cost incurred during the process of shipping failed items in equipment CC between the intermediate and depot level facilities. (\$/BCM)	362000
ALR(X)	Average two way packaging labor cost incurred during the process of shipping rework/overhaul items in equipment X between the intermediate and depot level maintenance facilities. (\$/(rework/overhaul))	361000
AMAT(CC)	Average packaging material cost incurred during the process of shipping failed items in equipment CC between the intermediate and depot level facilities. (\$/BCM)	362000
AMTR(X)	Average packaging material cost incurred during the process of shipping rework/overhaul items in equipment X between the intermediate and depot level maintenance facilities. (\$/rework/overhaul))	361000

TABLE 5 (CONT'D)
LIFE CYCLE COST FACTOR DIRECTORY

<u>NAME</u>	<u>DESCRIPTION</u>	<u>CBS NO</u>
APS(I)	Government expenditures in year I for personnel support at afloat facilities. (\$/yr)	321300
APSA(I)	Government expenditures in year I for personnel support at ashore facilities. (\$/yr)	322300
AQSE(I)	Government expenditures in year I for the acquisition of common support equipment. (\$/yr)	222000
ASE(I)	Government expenditures in year I to make common support equipment available for support of the weapon system. (\$/yr)	222000
ASEC(I)	Security cost incurred during year I. (\$/yr)	314000
ATNS(X)	Average two way shipping cost incurred during the process of shipping rework/overhaul items in equipment X between the intermediate and depot level maintenance facilities. (\$/(rework/overhaul))	361000
ATRN(CC)	Average two way shipping cost incurred during the process of shipping failed items in equipment CC between the intermediate and depot level maintenance facilities. (\$/BCM)	362000
BCM(CC)	Beyond capability of maintenance rate of equipment CC. (ratio)	342000 362000
BOSC(I)	Government expenditures during year I for base operating support. (\$/yr)	331000
CIF(I)	Government payments to contractors for industrial facilities during year I. (\$/yr)	218000
CIT(I)	Contractor payments paid by the Government during year I for integration and test of the complete weapon system. (\$/yr)	214000
CPM(I)	Contractor payments paid by the Government during year I for program management of the production units. (\$/yr)	215000
CSE(C,	Acquisition cost of support equipment type C. (\$/equipment)	212000

TABLE 5 (CONT'D)

LIFE CYCLE COST FACTOR DIRECTORY

<u>NAME</u>	<u>DESCRIPTION</u>	<u>CBS NO</u>
CSPB	Cost of initial spares and repair parts per aircraft supporting base. (\$/base)	219000
CSPS	Cost of initial spares and repair parts per ship system. (\$/system)	219000
CSU(I)	Government payments to contractors for technical support during year I of the investment phase. (\$/yr)	217000
CTE(I)	Cost of contractor training equipment in year I. (\$/yr)	213000
CTPE	First destination transportation cost for the weapon system. (\$/system)	229000
CTS(I)	Cost of contractor services in year I. (\$/yr)	213000
DC(I)	Government expenditures in year I for storing, reproducing, packaging, and shipping technical and managerial data. (\$/yr)	226000
DCD(I)	Contractor payments paid by the Government to contractors for documentation during year I for the full scale development effort. (\$/yr)	121600
DCE(I)	Contractor payments paid by the Government to contractors for engineering during year I for the full scale development effort. (\$/yr)	121200
DCH(I)	Contractor payments paid by the Government to contractors for prototype hardware during year I for the full scale development effort. (\$/yr)	121300
DCPM(I)	Contractor payments paid by the Government to contractors for program management during year I for the full scale development effort. (\$/yr)	121100
DCRS	Depot labor and material cost per ship per year for component repair. (\$/ship/yr)	344000
DCS(I)	Contractor payments paid by the Government to contractors for development of software during year I for the full scale development effort. (\$/yr)	121400

TABLE 5 (CONT'D)
LIFE CYCLE COST FACTOR DIRECTORY

<u>NAME</u>	<u>DESCRIPTION</u>	<u>CBS NO</u>
DCSE(I)	Government expenditures during year I for systems engineering for the full scale development effort. (\$/yr)	122200
DCT(I)	Government expenditures during year I for AGE/GSE/TE used in support of the Test and Evaluation program during the full scale development phase. (\$/yr)	122330
DCTE(I)	Contractor payments paid by the Government to contractors for integrating and testing the weapon system during year I for the full scale development effort. (\$/yr)	121500
DCTS(I)	Government expenditures during year I for test spares for the full scale development effort. (\$/yr)	122320
DGPM(I)	Government expenditures during year I for project management for the full scale development effort. (\$/yr)	122100
DGTA(I)	Government costs for test site activation/deactivation during full scale development Test and Evaluation program in year I. (\$/yr)	122340
DGTT(I)	Government expenditures during year I for test personnel and training cost for the full scale development effort. (\$/yr)	122310
ESC(I)	Pro rata share of operating and support costs of embarked systems during year I. (\$/yr)	424000
EXSC(I)	Stores cost per weapon system during year I. (\$/system)	384000
FA(I)	Government expenditures in year I for maintenance facility activation. (\$/yr)	227200
FM(I)	Moneys received by the Government from the foreign military sales of previously developed weapon systems, to defray the R & D cost of the major weapon system. (\$/yr)	122400
FSA	Field supply administration cost of the NSN. (\$/NSN/site/yr)	351000

TABLE 5 (CONT'D)
LIFE CYCLE COST FACTOR DIRECTORY

<u>NAME</u>	<u>DESCRIPTION</u>	<u>CBS NO</u>
GF	Cost of GFE/GFM per weapon system. (\$/system)	221000
GOH(X)	Depot rework/overhaul cost for equipment X. (\$/ (rework/overhaul))	341000
GMC(CC)	Depot repair material and labor cost for equipment CC. (\$/failure)	342000
HCC(I)	Government expenditures in year I for health care. (\$/yr)	372000
IPS(I)	Government expenditures during year I for installa- tion personnel support. (\$/yr)	333000
MATS	Material cost per system per year. (\$/system)	313000
MFC(I)	Government expenditures during year I for mainten- ance of the afloat facilities. (\$/yr)	321400
MFCA(I)	Government expenditures during year I for mainten- ance of the afloat facilities. (\$/yr)	322400
MLIC(I)	Government expenditures during year I for construct- ing, converting, altering, or modifying the MLSF. (\$/yr)	411000
MLOC(I)	Incremental costs during year I for operating and support of the MLSF. (\$/yr)	421000
MODC(I)	Moderization cost per weapon system during year I. (\$/system)	343000
MODK(I)	Modification cost per weapon system during year I. (\$/system)	382000
MS(T)	Unit pay and allowances of grade T personnel. (\$/ man)	321110 322110
MSO(V)	Unit pay and allowances of grade V personnel. (\$/ man)	321120 322120
MTBF(CC)	Mean time between failures of the CCth equipment. (hrs/failures)	342000 362000

TABLE 5 (CONT'D)
LIFE CYCLE COST FACTOR DIRECTORY

<u>NAME</u>	<u>DESCRIPTION</u>	<u>CBS NO</u>
MTGO(X)	Mean time between depot rework/overhaul of the Xth equipment. (hrs/(rework/overhaul))	341000 361000 381000
NB(I)	Number of newly introduced bases supporting aircraft during year I. (bases)	219000
NCR(I,A)	Total number of crew personnel of grade A in year I. (men)	311000
NFMP(I)	Number of maintenance facilities servicing the major weapon system in year I. (sites)	351000
NMFS(I)	Number of maintenance facilities servicing support systems of the major weapons system in year I. (sites)	351000
NMP(I,T)	Number of personnel of grade T at afloat facilities maintaining the weapon system during year I. (men/grade/yr)	321110
NMPA(I,T)	Number of personnel of grade T at ashore facilities maintaining the weapon system during year I. (men/grade/yr)	322110
NN(I)	Number of weapon systems introduced into inventory during year I. (system/yr)	221000
NNN(I)	Number of weapon systems in inventory during year I. (systems)	211000 219000 221000 229000 313000 321200 322200 341000 342000 343000 344000 361000 362000 381000 382000 384000
NOP(I,V)	Number of personnel of grade V at afloat facilities maintaining ordnance systems during year I. (men/grade/yr)	321120

TABLE 5 (CONT'D)

LIFE CYCLE COST FACTOR DIRECTORY

<u>NAME</u>	<u>DESCRIPTION</u>	<u>CBS NO</u>
NOPA(I,V)	Number of personnel of grade V at ashore facilities maintaining ordnance systems during year I. (men/grade/yr)	322120
NPO(I)	Number of weapon systems phased out during year I. (systems/yr)	500000
NSE(I,C)	Total population of support equipments of type C during year I. (equipments/yr)	212000
NSNP	Number of new NSNs introduced into supply system by the major weapon system. (NSNs)	228000 351000
NSNS	Number of new NSNs introduced into supply system by support systems of the major weapon system. (NSNs)	228000 351000
NSTA(I,E)	Total number of command staff personnel of grade E in year I. (men)	312000
ODM(I)	Government expenditures in year I for other deployed manpower. (\$/yr)	315000
OT	Annual operating time of the weapon system. (hrs/system/yr)	341000 342000 361000 362000 381000
PA(A)	Annual pay and allowances per man of grade A. (\$/man)	311000
PACC(I)	Government expenditures during year I for personnel activities. (\$/yr)	373000
PAS(E)	Annual pay and allowances per man of grade E. (\$/man)	312000
PESC(I)	Government expenditures during year I for personnel support. (\$/yr)	374000
PMG(I)	Government project management cost incurred during year I. (\$/yr)	225000
POT(T)	Proportion of time personnel of grade T are dedicated to weapon system. (ratio)	321110 322110

TABLE 5 (CONT'D)
LIFE CYCLE COST FACTOR DIRECTORY

<u>NAME</u>	<u>DESCRIPTION</u>	<u>CBS NO</u>
PSC(I)	Government expenditures during year I for personnel support. (\$/yr)	316000
PTE(I)	Test and Evaluation costs incurred during year I. (\$/ year)	224000
RIE	Average NSN entry cost into the supply system. (\$/ NSN)	228000
RIM	Average NSN retention cost in the supply system. (\$/ NSN/yr)	351000
RMF	Repair material cost at afloat facility per system per year. (\$/system)	321200
RMFA	Repair material cost at ashore facility per system per year. (\$/system)	322200
RPMC(I)	Government expenditures during year I for real property maintenance. (\$/yr)	332000
RSEC(I)	Government expenditures during year I for replenishment support equipment. (\$/yr)	383000
RTRE(I)	Government expenditures in year I for replacement training equipment. (\$/yr)	371000
RTRS(I)	Government expenditures in year I for training services for personnel replacing those lost through attrition. (\$/yr)	371000
SA(I)	Government expenditures in year I for operational site activation. (\$/yr)	227100
SS(I)	Cost of system stock for year I. (\$)	219000
SSS	Slope of learning curve. (ratio)	211000
TAD	Annual temporary assignment of duty cost per member of crew. (\$/man)	311000
TERM	Major weapon system terminal cost/value. (+/-\$/system)	500000

TABLE 5 (CONT'D)

LIFE CYCLE COST FACTOR DIRECTORY

<u>NAME</u>	<u>DESCRIPTION</u>	<u>CBS NO</u>
TESC(I)	Government expenditures for technical support during year I. (\$/yr)	3252000
TRE(I)	Government expenditures in year I for training equipment. (\$/yr)	223000
TRF(I)	Government expenditures in year I for training facilities. (\$/yr)	223000
TRIC(I)	Government expenditures during year I for constructing, converting, altering, or modifying tenders and repair ships. (\$/yr)	412000
TROC(I)	Incremental costs during year I for operating and support of the tender and repair ships. (\$/yr)	422000
TRS(I)	Government expenditures in year I for training services. (\$/yr)	223000

The sensitivity analysis for a scalar begins by setting the variable to the lower range value, performing the model calculations, and printing a line of output. The process is repeated ten times successively adding 1/10 of the range to the variable's value.

The sensitivity analysis for an array variable begins by multiplying all original elements of the array by a multiplier initially set equal to the lower range value, performing the model calculations, and printing a line of output. The process is repeated ten times successively adding 1/10 of the range to the multiplier. Array elements are subsequently printed giving the original and eleven modified values of each element.

If more than ten scalars or ten arrays are used for sensitivity analysis, the excess will be ignored and a warning message issued for each.

F. Output Formats

In this section each of the eight output reports will be described followed by an example output report.

1. Summary Report

In this report, the total life cycle cost is broken down into the ten cost categories and three life cycle phases. Within each cost category as identified by life cycle phase is given: cost-percent of total category cost, and percent of total life cycle cost.

On the left side of the report, the ten cost categories are listed by name; and within each category are given the headings: % of Cost Category Total, and % of Cost Element Total. The ten cost categories are followed by a total line of the cost of the life cycle phase and its contribution of total life cycle cost. Across the top of the report, the cycle phases (labeled as Cost Elements) are identified ending with a Cost Category Total heading. The entire report is contained on one page.

SA SENSITIVITY ANALYSIS DATA

SA

LCC MODEL

		RANGE		UPPER	
		LOWER	VALUE	VALUE	
		VALUE			
NAME					
1	SA				79
2	SA				78
3	SA				77
4	SA				76
5	SA				75
6	SA				74
7	SA				73
8	SA				72
9	SA				71
10	SA				70
11	SA				69
12	SA				68
13	SA				67
14	SA				66
15	SA				65
16	SA				64
17	SA				63
18	SA				62
19	SA				61
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66	SA				14
67	SA				13
68	SA				12
69	SA				11
70	SA				10
71	SA				9
72	SA				8
73	SA				7
74	SA				6
75	SA				5
76	SA				4
77	SA				3
78	SA				2
79	SA				1

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2. Funding vs Cost Category Report

This report breaks out the total life cycle cost into the ten cost categories and six funding types. The format of the report is similar to the Summary Report. Within each cost category, costs for each funding type are given. In addition to the cost for the funding type, its contribution to total cost of the cost category is given as a percent. Additionally, within each funding type, the contribution of the cost to the total cost of the funding type is given as a percent. On the left side of the report, the ten cost categories are listed by name; and within each category are given the headings: % of Cost Category Total, and % of Funding Type Total. The ten cost categories are followed by a total line of the cost of the funding type and its contributions to the total life cycle cost. Across the top of the report, the funding types are identified, ending with a Cost Category Total heading. This report is contained on one page.

3. Cost Breakdown by Year Report

In this report, annual costs are given for each element contained in the cost breakdown structure. The report is organized with the cost breakdown structure numbers and elements listed down the left-hand side by order of their hierarchical structure. Up to forty-six lines may be identified on one page. This format is repeated with forty-six line items per page until the cost breakdown structure is completed. The years of the life cycle are identified by column headings across the top of the report, organized into groups of five. This format is successively repeated for as many years as are given. The number of pages for this report will depend upon the number of years in the life cycle (three times the number of five year groups).

4. Cost Breakdown Totals Report

In this report, life cycle costs and percent contributions to their next higher indentured cost element are identified for each element in the cost breakdown structure.

On the left side of the report, the cost breakdown structure numbers and elements are listed in order of their hierarchial structure. Up to forty-six lines may be listed on one page. This format is successively repeated until the entire cost breakdown structure is listed. Across the top of the report, column headings are identified for total cost and percent contributions. The percent contribution heading is divided into six columns corresponding to the six indenture levels established by the cost breakdown structure hierarchy. The right-most column represents the highest indentured cost element (total life cycle cost). Under the appropriate column, the percent contribution of the cost element to its next higher indentured level cost element is identified. This report consists of three pages.

5. General Funding Report

In this report, life cycle costs are given by cost breakdown structure element and by funding type. The cost breakdown structure numbers and elements are listed by hierarchical structure down the left-hand side of the page. This format is successively repeated per page until the structure is completed. Across the top of each page, headings identify the six funding types. The funding types are followed by a total column. The entire report is contained on three pages.

6. Annual Cost by Funding Type Report

This report breaks out the annual costs into the six funding types. On the left side of the report, each year of the life cycle is listed. The last year is followed by a total line of the cost within the funding type. Across the top of the report, the funding types are identified, ending with a total heading. The entire report is contained on one page.

7. Annual Cost by Cost Category Report

Annual costs are identified in this report according to the ten cost categories.

The format of this report is similar to the previous report. Each year of the life cycle is listed down the left side of the report followed by a total line. Across the top of the report, the cost categories are identified followed by a total heading. The entire report is contained on one page.

8. Sensitivity Analysis Report

The results of sensitivity analysis are presented in this report. For each value of the sensitized variable, the life cycle cost is broken out into the five life cycle phases. In addition to the cost, the percentage change from the cost derived for the base value is given. If the sensitized variable is an array, a supplemental report displaying the values of the elements is presented.

On the left side of the report, the number of different values an element assumes is numbered starting with zero to denote the base value. Across the top of the page, the sensitized variable is identified. Beneath the identification of the sensitized variable, column headings are identified for the value of the sensitized variable, the life cycle phases, and total life cycle. For each life cycle phase and total life cycle, there are two sub-headings, one for the life cycle cost and the other for the percent change in the cost from the base analysis.

For the case where a scalar is sensitized, the value column displays the different values of the variable. If an array is sensitized, the value column displays the value of the multiplicative factor.

The supplemental report provided for sensitized arrays lists the number of elements in the array down the left-hand side of the report. Across the top of the report, the values of the elements are identified by sensitivity number and multiplicative factor corresponding to the values in the form mentioned report. The number of pages for this report depends upon the number of elements in the array.

G. FLEX Technique in LCC Methodology

FLEX option of the LCC Model provides the analyst the flexibility to modify the standard LCC model to his specific project needs. It is realized that within the limits of the standard LCC model it is not feasible to cover a wide range of possible unique situations of every project. With this in mind, the FLEX technique is introduced. Using this technique, the analyst can modify the standard LCC model to the extent of even redefining the entire cost structure. However, this is neither intended nor recommended. The user should stay within the same framework of the standard cost model and add or delete cost elements, define and use new variables, or make use of other miscellaneous options provided by the FLEX technique to emphasize certain cost areas or make some changes in the cost calculation methodology that is more fitting to his specific project. Run Deck sequence of the computer program is shown in Figure 1. The basic optional changes of the FLEX technique are as follows:

1. Revision, Addition, or Deletion of Cost Elements

Revision, addition, or deletion of a cost element is done by providing A "CS" card in the "CS" file (refer to figure 1). The format of a "CS" card is as follows:

<u>Column(s)</u>	<u>Description</u>
1-2	Card type "CS"
3-8	Cost Breakdown Structure number
9-10	Not used
11-50	Cost element description
51-54	Not used
55-56	Cost category
57-59	Not used
60	Funding type
61-64	Not used
65	Inflation factor type
66-69	Not used
70	Equation code
71-79	Not used
80	Deletion code

Code numbers of cost categories, funding types, and inflation factor types are provided in section II.

a. Revision

If the analyst wants to maintain the cost element but make changes in the description, cost category, funding type, or inflation factor type, he must prepare a "CS" card and identify the cost breakdown structure number and modify only the changes to be implemented.

b. Addition

If the user is introducing a new cost element, he should prepare a "CS" card, and by using the standard LCC model as a reference, define a cost breakdown structure number. If the cost element is not the lowest indenture level, a cost breakdown structure number and description of the cost element is all that is needed. However, if the cost element is at the lowest indenture level, then the analyst must provide the information associated with the cost category, funding type, inflation factor type and also indicate that an equation card will follow the "CS" card (Lowest indenture level cost elements must have equations). The computer program is dimensioned to accept 100 new cost elements.

c. Deletion

If the analyst wants to delete a cost element, he prepares a "CS" card, defines the cost breakdown structure number and punches 1 in the 80th column. Caution: This will delete the cost element specified and also all the lower indenture level cost elements below it. The analyst may use the deleted cost structure numbers for new cost element definitions. Note: If a standard LCC model cost factor is deleted thru deletion of cost elements not being used again, it may be excluded from the NAMELIST data.

2. Equations for Cost Elements

Equations are identified with an "EQ" card provided in the same field with "CS" cards. Equations may be provided to modify the existing equations or for new cost elements. In either case, an "EQ" card must follow a "CS" card with the same cost breakdown structure number. Equation card format is as follows:

<u>Column(s)</u>	<u>Description</u>
1-2	Card type "EQ"
3-8	Cost breakdown structure number
9-10	Not used
11-80	Cost equation

Equations may be continued to another card by breaking off at a comma or semicolon and resuming in the next card. A continuation card must be an "EQ" card and must be identified by the same cost breakdown structure number.

Equations are written in Reversed Polish notation in which each operation (+ , - , * , / , **) acts on the two quantities immediately preceding it, working from left to right (many electronic calculators use this technique). Thus A,B,C,+,* represents $(B+C)*A$. Equation elements are

separated by commas. Summation is indicated by the semicolon. The sequence is "subscript, minimum value, maximum value". The subscript "I" always denotes the year and is treated differently. Those years outside the range of "I" are assigned a cost of zero while those within the range are assigned the cost obtained by fixing the value of "I" appropriately and summing over the other subscripts. Samples of equations written in Reversed Polish Notation are:

a. $A(I); I, 1, Y$

Same as,

$$\sum_{I=1}^Y A(I)$$

b. $A(I,J)(,B,+,C(J),*D,E,**,-,F,/; I, 1, Y, J, 1, N$

Same as,

$$\sum_{I=1}^Y \sum_{J=1}^N [[[A(I,J) + B] * C(J)] - D] / F$$

3. New Variables

In new equations, the analyst has the option to use the built-in cost factors defined for the standard cost model or define, describe, and use values for new variables thru the "NV" file (refer to Figure V.1). The computer program is dimensioned to accept 50 new scalars and 50 new arrays. The analyst must use internally defined dimensioning scalars for the new arrays, they must be read in before any of the arrays dimensioned by it.

a. Variable Description Card

This card is optionally used to describe the user input variables. If one card is not enough, the description of the variable is continued on the next card. A maximum of two cards can be used for each variable. The format of both cards are identical. If two cards are used, they must be consecutive in the "NV" file. "DS" cards may appear anywhere in the file as long as they do not separate an "NV" card from its continuation. The format of a "DS" card is as follows:

<u>Column(s)</u>	<u>Description</u>
1-2	Card type "DS"
3-4	Not used
5-15	Variable name
16-72	Variable description
73-80	Not used

b. Variable name and value input card ("NV" Card)

Whenever a new variable is used, it must be defined and its value must be used by an "NV" card. An "NV" card may appear anywhere in the "NV" file as long as it does not separate another "NV" card from its continuation. An "NV" card may be continued to another "NV" card by breaking off at a comma (comma signifies the continuation of the card) and resuming on the next "NV" card identified by the same variable name. Variable values are used the same way as in the NAMELIST data input procedures as described in Section V. The format of the "NV" file is as follow:

<u>Column(s)</u>	<u>Description</u>
1-2	Card type "NV"
3-4	Not used
5-15	Variable name
16-80	Variable value

4. Other FLEX Options

a. Cost Categories

The standard LCC cost model provides 10 defaulted cost categories. However the analyst may vary the number of cost categories from one to twenty, and define the cost category names at his option. These variables must be used through the NAMELIST data as follows:

NOCAT- The number of cost categories (Integer) e.g.,

NOCAT=11,

CAT1,CAT2.....CAT20- The variables that define the cost category names.

The first ten default to the names in the standard LCC cost categories. These variables must be entered in quotes in blocks of maximum 8 characters:

CAT8='FACILITL','ES',

CAT11='MANAGEME','NT',

b. Cost Elements (Cost elements defined in the summary report)

The standard LCC model defaults to five cost elements in the summary report. However, the analyst may vary this by changing the LCC model cost breakdown structure definition. The first number of the cost breakdown structure number determines the number of cost elements in the summary report. Using the FLEX technique the analyst may vary this number from one to six. The reporting format of the computer program automatically adjusts to the changes. The analyst may also change the title of the cost elements in the summary report by using the following variables which must be input thru NAMELIST data:

ELT1,ELT2,.....ELT6- Cost element titles. The first five default to DEVELOPMENT, INVESTMENT, O&S, ASSOC SYSTEMS and TERMINATION. These variables must be entered in quotes with a maximum of 8 characters:

ELT4='OPERATIO','NS',

c. Funding type (Titles for the Funding reports)

The number of funding types are fixed to six. However, the analyst may change the title of the funding type by providing the following variables thru NAMELIST data:

FUND1,FUND2,.....FUND6- Funding titles default to R&D, PROCUREMENT, CONSTRUCTION, O&M, MILITARY, OTHERS. They must be entered in quotas with a maximum of eight characters (e.g. FUND6='SUNK COS','T',).

d. Years

Life cycle cost years are automatically generated in the program from 1 to total number of years 'Y'. However, the analyst may provide alpha-numeric presentation of the years by providing values for the variable 'YEARS' thru NAMELIST data:

Years are read in quotes in block of four characters (e.g. YEARS='BY94','FY95','1996',).

LCC MODEL

NV

DATA ELEMENT VALUES

PAGE
OF

NAME		VALUE	
1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16
17	18	19	20
21	22	23	24
25	26	27	28
29	30	31	32
33	34	35	36
37	38	39	40
41	42	43	44
45	46	47	48
49	50	51	52
53	54	55	56
57	58	59	60
61	62	63	64
65	66	67	68
69	70	71	72
73	74	75	76
77	78	79	80

APPENDIX A

Learning Curve Concept

A. Learning Curves

One of the assumptions needed to perform life cycle costing is production quantity. Sometimes the cost data collected on unit production cost does not correspond exactly to the production quantity to be used for the life cycle costing analysis. This appendix presents the theory regarding learning curves. It will allow the cost analyst to convert the collected data to the production cost needed for the analysis.

The learning curve is based on historical evidence that as the total quantity of units produced increases, the man hours or cost to produce that quantity will be reduced by some percentages.

Some of the factors contributing to this decline are:

1. Repetition causes workers to become more familiar with job
2. Development of more efficient tools and machines
3. Improvement in organization and management
4. Solution of engineering production problems.

Figure A-1 is an example of a learning curve plotted on rectilinear graph paper. However, when this same example is plotted on log-log graph paper, the curve becomes a straight line (Figure A-2). Thus, the learning curve is known as "log-linear."

The general form of the equation for Figure A-1 and A-2 is:

$$Y = AX^B$$

where,

- Y = cost for unit
- A = the cost to produce the first unit
- X = the cumulative output
- B = the slope of the learning curve

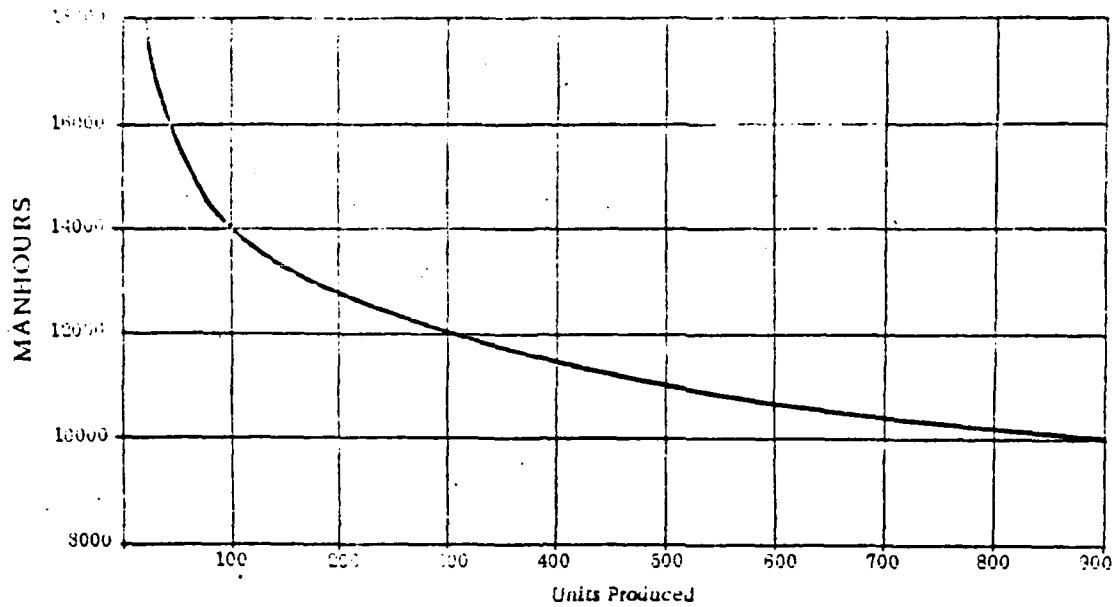


FIGURE A-1
Learning Curve Example Plotted on Rectilinear Graph Paper

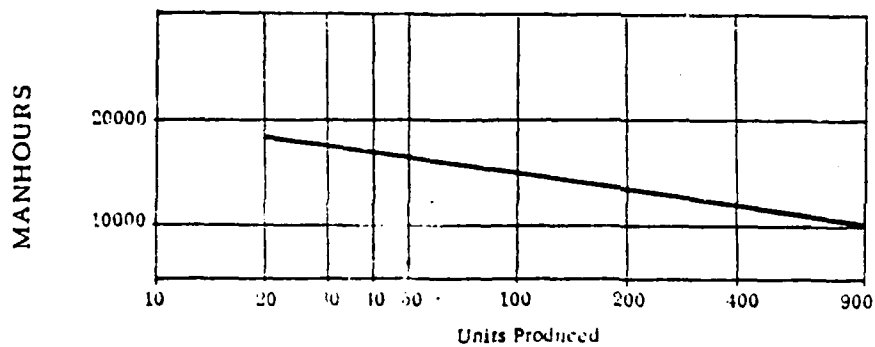


FIGURE A-2
Learning Curve Example (From Figure A-1) Plotted on Log-Log Paper

The type of learning curve applicable to major weapon system programs is the unit cost curve. For this learning curve, a fixed and declining relationship exists between the unit costs and successively increased production quantities.

It should be noted that the slope of the learning curve varies among different products, contractors and even multiple production lines. Therefore, it is necessary that the analyst exercise due care in estimating these slopes and in application of the theory.

B. Unit Cost Learning Curve

When an increased production quantity results in a constant percentage decline in the unit cost, the unit cost learning curve is described by the function:

$$y_i = Ax_i^B \quad (1)$$

where,

y_i = cost of the i th unit

x_i = cumulative output

A = cost of the first unit

B = slope of the learning curve.

When the unit cost learning curve is log-linear, the cumulative average cost can be found by the relationship:

$$Y = \frac{A \sum_{i=1}^n x_i^B}{n} \quad (2)$$

where,

Y = cumulative average cost for n items

A = cost of first unit

x = cumulative output

B = slope of the learning curve.

Figure A-3 presents values of Equations (1) and (2) for selected production quantities and slopes when A is equal to one.

C. Learning Curve Slope

The value of the learning curve slope, S, is defined as the ratio of y values as two x values which differ by a factor of two. The slope may be expressed as:

$$S = \frac{\bar{Y}_{2x}}{\bar{Y}_x} = \frac{A(2x)^B}{A(x)^B} = 2^B$$

Figure A-4 presents values of B for slopes running from 75 to 90 percent. When the slope S is known, B can be found in the tables and substituted in one of the Equations (1) or (2).

FIGURE 3 SLOPE - QUANTITY FACTORS FOR THE UNIT COST LEARNING CURVE

SLOPE	QUANTITY										
	2	5	10	25	50	100	250	500	1000	2000	5000
(Y_1)											
90%	0.900	0.783	0.705	0.613	0.552	0.497	0.432	0.389	0.350	0.315	0.274
85%	0.850	0.740	0.663	0.570	0.500	0.440	0.374	0.333	0.298	0.268	0.235
80%	0.800	0.696	0.617	0.525	0.454	0.392	0.326	0.285	0.250	0.220	0.186
$(\bar{Y}_n)$											
90%	0.950	0.866	0.799	0.708	0.643	0.581	0.508	0.457	0.412	0.371	0.323
85%	0.925	0.806	0.712	0.592	0.510	0.438	0.355	0.303	0.258	0.219	0.178
80%	0.900	0.747	0.632	0.492	0.402	0.327	0.246	0.198	0.159	0.127	0.0947
$(\bar{Y}_n)$											
90%	1.05	1.11	1.13	1.15	1.16	1.17	1.18	1.18	1.18	1.18	1.18
85%	1.09	1.17	1.22	1.26	1.28	1.29	1.30	1.30	1.30	1.30	1.31
80%	1.13	1.25	1.32	1.39	1.42	1.44	1.44	1.44	1.44	1.44	1.44

Y_1 = COST PER UNIT FOR THE 1TH UNIT
 Y_n = CUMULATIVE AVERAGE COST OF "N" ITEMS.
 $y_i = x$

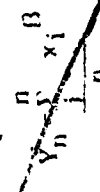


FIGURE A-4

VALUES OF B FOR SLOPES BETWEEN 75 AND 90 PERCENT

<u>SLOPE S</u>	<u>B</u>
90	-0.152
89	-0.168
88	-0.184
87	-0.201
86	-0.218
85	-0.234
84	-0.252
83	-0.269
82	-0.286
81	-0.304
80	-0.322
79	-0.340
78	-0.358
77	-0.377
76	-0.396
75	-0.415

APPENDIX B

Sample Computer Run

A. Introduction

This Appendix presents a sample computer run of the FLEX LCC Model. The values used in this sample should not be considered as reference for actual calculations.

B. Sample Input Data

The following pages provide a listing of the input data used for the sample run. Recent modifications to the computer program have caused a change to the input processing of data as described in the main part of this document. These changes are described below and are obvious by examining the listing of input data.

1. NAMelist Inputs

Table B-1 identifies only those cost factors that may be entered via the NAMelist input technique. Prior to the recent modifications, all variables contained in the defaulted equations were entered by this technique.

2. New Variable Inputs

All the cost factors listed in Table 5 of the main report are now entered via NV cards. It should be noted that factor "NNN(I)" is no longer calculated but entered directly.

Table B-1

NAMelist INPUT COST FACTOR DIRECTORY

<u>NAME</u>	<u>DESCRIPTION</u>
BY	Base year during/from which all cost adjustments are made.
IRCON(I)	Annual inflation rate for future costs for construction type of funding during year I. (ratio)
IROM(I)	Annual inflation rate for future costs of O&M type of funding during year I. (ratio)
IRPROC(I)	Annual inflation rate for future costs of procurement type of funding during year I. (ratio)
IRRD(I)	Annual inflation rate for future costs of R&D type of funding during year I. (ratio)
IYI	Year I during which initial costs occur.
Y	Total number of years covered by the life cycle cost analysis.

DS	CIT	GOVT. PAYMENTS TO CONTRACTORS FOR INFORMATION AND TEST OF THE COMPLETE WEAPON SYSTEM. (18/YR)
DS	CIT	
DS	PCN	GOVT. PAYMENTS TO CONTRACTORS FOR PROGRAM MANAGEMENT OF TM
DS	PCN	F PRODUCTION UNITS. (18/YR)
DS	CE	ACQUISITION COST OF SUPPORT EQUIPMENT TYPE C. (18/EQUIPMENT)
DS	CE	
DS	PCN	COST OF INITIAL SPARES AND REPAIR PARTS PER AIRCRAFT SUPP
DS	PCN	ORTING BASE. (18/BASE)
DS	PCN	COST OF INITIAL SPARES AND REPAIR PARTS PER SHIP SYSTEM.
DS	PCN	(18/SYSTEM)
DS	PCN	GOVT. PAYMENTS TO CONTRACTORS FOR TECHNICAL SUPPORT OF TM
DS	PCN	F INVESTMENT PHASE. (18/YR)
DS	PCN	COST OF CONTRACTOR TRAINING EQUIPMENT IN YEAR 1. (18/YR)
DS	PCN	FIRST DESTINATION TRANSPORTATION COST FOR THE WEAPON SYST
DS	PCN	EM. (18/SYSTEM)
DS	PCN	COST OF CONTRACTOR SERVICES. (18/YR)
DS	PCN	GOVT. EXPENDITURES FOR STORING, REPRODUCING, PACKAGING, AND
DS	PCN	SHIPPING TECHNICAL AND MANAGERIAL DATA. (18/YR)
DS	PCN	GOVT. PAYMENTS TO CONTRACTORS FOR DOCUMENTATION FOR THE F
DS	PCN	ULL SCALE DEVELOPMENT EFFORT. (18/YR)
DS	PCN	GOVT. PAYMENTS TO CONTRACTORS FOR ENGINEERING FOR THE FUL
DS	PCN	L SCALE DEVELOPMENT EFFORT. (18/YR)
DS	PCN	GOVT. PAYMENTS TO CONTRACTORS FOR PROTOTYPE HARDWARE FOR
DS	PCN	THE FULL SCALE DEVELOPMENT EFFORT. (18/YR)
DS	PCN	GOVT. PAYMENTS TO CONTRACTORS FOR PROGRAM MANAGEMENT FOR
DS	PCN	THE FULL SCALE DEVELOPMENT EFFORT. (18/YR)
DS	PCN	DEPT LABOR AND MATERIAL COST PER SHIP FOR COMPO
DS	PCN	MENT WEAPON. (18/SHIP/YR)
DS	PCN	GOVT. PAYMENTS TO CONTRACTORS FOR DEVELOPMENT OF SOFTWARE
DS	PCN	FOR THE FULL SCALE DEVELOPMENT EFFORT. (18/YR)
DS	PCN	GOVT. EXPENDITURES FOR SYSTEMS ENGINEERING FOR FULL SCALE
DS	PCN	DEVELOPMENT EFFORT. (18/YR)
DS	PCN	GOVT. EXPENDITURES FOR AGE/GSE/IE IN SUPPORT OF THE ICE PR
DS	PCN	OGRAM DURING FULL SCALE DEVELOPMENT PHASE. (18/YR)
DS	PCN	GOVT. PAYMENTS TO CONTRACTORS FOR INTEGRATING AND TESTING
DS	PCN	WEAPON SYSTEM FOR FULL SCALE DEVELOPMENT EFFORT. (18/YR)
DS	PCN	GOVT. EXPENDITURES FOR TEST SPARES FOR THE FULL SCALE DEVE
DS	PCN	LOPMENT EFFORT. (18/YR)
DS	PCN	GOVT. EXPENDITURES FOR PROJECT MANAGEMENT FOR THE FULL SCA
DS	PCN	LE DEVELOPMENT EFFORT. (18/YR)
DS	PCN	GOVT. COSTS FOR TEST SITE ACTIVATION/DEACTIVATION DURING
DS	PCN	FULL SCALE DEVELOPMENT THE PROGRAM. (18/YR)
DS	PCN	GOVT. EXPENDITURES FOR TEST PERSONNEL AND TRAINING COST F
DS	PCN	OF THE FULL SCALE DEVELOPMENT EFFORT. (18/YR)
DS	PCN	DDO DATA SHARE OF OPERATING AND SUPPORT COSTS OF FURNISHED
DS	PCN	SYSTEMS. (18/YR)
DS	PCN	STORES COST PER WEAPON SYSTEM DURING YEAR 1. (18/SYSTEM)
DS	PCN	GOVT. EXPENDITURES FOR MAINTENANCE FACILITY ACTIVATION (18
DS	PCN	YR)
DS	PCN	GOVT. DEFICITS FROM LOSS OF MILITARY SALES OF PREVIOUSLY D
DS	PCN	EVELOPED WEAPON SYSTEMS TO DEFEND AND COST OF MWS. (18/YR)
DS	PCN	STEEL SUPPLY ADMINISTRATION COST OF THE PSN. (18/NSN/SITE/Y
DS	PCN	R)
DS	PCN	COST OF GEF/GRM PER WEAPON SYSTEM. (18/SYSTEM)
DS	PCN	REPORT WEAPON/VEHICLE COST FOR EQUIPMENT A. (18/INFORM/NOV
DS	PCN	W/PUL)
DS	PCN	REPORT REPAIR MATERIAL AND LABOR COST FOR EQUIPMENT CC. (18/
DS	PCN	FAILURE)
DS	PCN	GOVT. EXPENDITURES FOR HEALTH CARE. (18/YR)
DS	PCN	GOVT. EXPENDITURES FOR INSTALLATION PERSONNEL SUPPORT. (18/
DS	PCN	YR)
DS	PCN	MATERIAL COST PER SYSTEM PER YEAR. (18/SYSTEM)
DS	PCN	GOVT. EXPENDITURES FOR MAINTENANCE OF THE AFLOAT FACILITY
DS	PCN	ES. (18/YR)
DS	PCN	GOVT. EXPENDITURES FOR MAINTENANCE OF THE ASHORE FACILITY

[illegible]

B-9

C. Sample Output Report

The following pages contain an example of the types of Reports available from the computer program.

WEAPON SYSTEM LCC TEST RUN
INPUT DATA LISTING AND ERROR DIAGNOSTICS
VV MODIFICATIONS

DATE 11/25/77

VV	F	1.	12000000.	1
VV	R	2.	20500000.	2
VV	W	1.	50..20424200..728000..134000..968500..170.	3
VV	U	2.	2064000..5875000..240.	4
VV	0	1.	0..502000..240.	5
VV	Z	1.	20..804	6
VV	00	10.	260.	7
VV	FF	20.	260.	8
VV	TVI	5.	11025.	9
VV	AA	12000000.	0..42200..0..42200.	10
VV	ACST(20)	20500000.	11025.	11
VV	AD(1)	50..20424200..728000..134000..968500..170.	0..42200..0..42200.	12
VV	ADC(1)	2064000..5875000..240.	11025.	13
VV	AD3(1)	0..502000..240.	0..42200..0..42200.	14
VV	ABSC(20)	20..804	11025.	15
VV	ATC(1)	260.	0..42200..0..42200.	16
VV	ALC(1)	260.	11025.	17
VV	AL3(1)	0..42200..0..42200.	0..42200..0..42200.	18
VV	AM(1)	11025.	0..42200..0..42200.	19
VV	AMT(1)	0..42200..0..42200.	11025.	20
VV	AMT(1)	11025.	0..42200..0..42200.	21
VV	APSA(1)	60..33100000..53600000..125400000.	0..42200..0..42200.	22
VV	ADSE(1)	50..10260000..1540000..10080000..35040000..2520000..140.	0..42200..0..42200.	23
VV	ASE(1)	50..10260000..1540000..10080000..35040000..2520000..140.	0..42200..0..42200.	24
VV	ASEC(1)	60..150000..31000..45000..75000..250000..105000..120000.	0..42200..0..42200.	25
VV	ASEC(1)	135000..135000..2120000..40105000..409000.	0..42200..0..42200.	26
VV	ATVS(1)	11025.	0..42200..0..42200.	27
VV	ATVS(1)	0..42200..0..42200.	0..42200..0..42200.	28
VV	BC(1)	0..42200..0..42200.	0..42200..0..42200.	29
VV	BOC(1)	60..200000..603000..40000..140000..2160000..220000..220000.	0..42200..0..42200.	30
VV	BOC(1)	22200000..22200000..4200000..4100000.	0..42200..0..42200.	31
VV	CT(1)	260.	0..42200..0..42200.	32
VV	CP(1)	60..21400000..190.	0..42200..0..42200.	33
VV	CSE(1)	60..26400000..190.	0..42200..0..42200.	34
VV	CS2	30000000.	0..42200..0..42200.	35
VV	CS2	3333333.	0..42200..0..42200.	36
VV	CSJ(1)	50..58800000..7040000..5440000..5640000..9010000..4340000..150.	0..42200..0..42200.	37
VV	CTE(1)	50..12660000..12660000..190.	0..42200..0..42200.	38
VV	CTE	7000.	0..42200..0..42200.	39
VV	CTSV(1)	60..14940000..190.	0..42200..0..42200.	40
VV	DC(1)	50..3080200..102400.	0..42200..0..42200.	41
VV	DC3(1)	0..14100000..3465000..10070000..14800000..2000.	0..42200..0..42200.	42
VV	DC4(1)	20..466000000..81635000..78335100..26810000..32040.	0..42200..0..42200.	43
VV	DC4(1)	20..163200000..288510000..26282500..9257000..200.	0..42200..0..42200.	44
VV	DC2(1)	20..68800000..120400000..10246000..4128000..200.	0..42200..0..42200.	45
VV	DCRS	0.	0..42200..0..42200.	46
VV	DCSV(1)	260.	0..42200..0..42200.	47
VV	DCSE(1)	20..1032000..1812600..1709400..632630..200.	0..42200..0..42200.	48
VV	DC1(1)	20..540000..2360000..2244000..3200000..200.	0..42200..0..42200.	49
VV	DCFE(1)	20..204034000..143500000..428400000..166800000..200.	0..42200..0..42200.	50

DATE 11/25/77

WEAPON SYSTEM LCC TEST RUN

PAGE 1.002

INPUT DATA LISTING AND ERROR DIAGNOSTICS

NV MODIFICATIONS

51	0CTS(Y)	2*0..100000..412000..476800..194000..20*0.
52	0G2N(Y)	2*0..1032000..1812600..1709400..626300..20*0.
53	0GTA(Y)	2*0..540000..2060000..2284000..3200000..20*0.
54	0GTF(Y)	2*0..4240000..7040000..6650000..1800000..20*0.
55	0GTC(Y)	2*0..0.
56	0GSC(Y)	2*0..100000.
57	0GTA(Y)	5*0..1242600..1862600..1260000..3730000..315000..14*0.
58	0GTA(Y)	2*0..0.
59	0GTA(Y)	36.75
60	0GTA(Y)	0.
61	0GTA(Y)	11*00000.
62	0GTA(Y)	0..230070..0..4435000.
63	0GTA(Y)	6*0..45000..90000..135000..225000..270000..270000..315000..
64	0GTA(Y)	2*0..600000..2*315000..4*270000..5*225000.
65	0GTA(Y)	6*0..90000..130000..270000..450000..2*540000..630000..
66	0GTA(Y)	720000..2*810000..2*720000..4*630000..5*540000.
67	0GTA(Y)	160000.
68	0GTA(Y)	2*0..0.
69	0GTA(Y)	2*0..0.
70	0GTA(Y)	2*0..0.
71	0GTA(Y)	2*0..0.
72	0GTA(Y)	2*0..120000.
73	0GTA(Y)	2*0..240000.
74	0GTA(Y)	20000..24900.
75	0GTA(Y)	34000.
76	0GTA(Y)	5000..4*20000..5000..1*20000.
77	0GTA(Y)	11*35000.
78	0GTA(Y)	6*0..1..2..1..3..1..0..2..1..1..1..1..0.
79	0GTA(Y)	12*0..2*36..2*54..2*90..2*106..2*126..2*144..4*162..4*144..
80	0GTA(Y)	10*126..10*106.
81	0GTA(Y)	6*0..1..3..4..7..8..8..10..11..2*12..2*11..4*10..4*9.
82	0GTA(Y)	6*0..3*1..5*2..12*3.
83	0GTA(Y)	1*0..2*60..2*90..2*150..4*180..2*210..2*240..4*270..4*240..
84	0GTA(Y)	8*210..8*180.
85	0GTA(Y)	12*0..2*120..2*180..2*300..4*360..2*420..2*480..4*540..
86	0GTA(Y)	4*480..8*420..10*360.
87	0GTA(Y)	6*0..1..15..23..25..4*36..30..24..10*0.
88	0GTA(Y)	6*0..1..16..35..60..94..126..157..186..206..223..213..204..
89	0GTA(Y)	195..187..179..171..164..157..150..144.
90	0GTA(Y)	6*0..5..10..15..25..2*30..35..49..2*45..2*40..4*35..4*30.
91	0GTA(Y)	6*0..10..20..30..50..2*50..70..90..2*90..2*80..4*70..4*60.
92	0GTA(Y)	9*0..1..2..4..5..7..8..9..10..2*9..3*9..3*7..6.
93	0GTA(Y)	6*0..1..3..4..7..8..9..10..11..2*12..2*11..4*10..4*9.
94	0GTA(Y)	9000.
95	0GTA(Y)	3600.
96	0GTA(Y)	6*0..1..3..4..7..8..10..11..2*12..2*11..4*10..4*9.
97	0GTA(Y)	2*0..0.
98	0GTA(Y)	350.
99	0GTA(Y)	22000..26000.
100	0GTA(Y)	6*0..10000..33000..40000..70000..2*88000..100000..

DATE 11/25/77

WEAPON SYSTEM LCC TEST RUN

PAGE 1.003

INPUT DATA LISTING AND ERROR DIAGNOSTICS

WV MODIFICATIONS

WV PAC(IV)	110000..2*120000..2*110000..4*100000..4*90000.	101
WV PAS(IV)	36000.	102
WV PESC(IV)	6*0..20000..60000..90000..140000..2*160000..200000..220000..	103
WV PESC(IV)	2*240000..2*220000..4*200000..4*180000.	104
WV PSC(IV)	6*0..2600000..19*0.	105
WV PSC(IV)	1..1.	106
WV PSC(IV)	6*0..20000..63000..90000..140000..2*160000..200000..220000..	107
WV PSC(IV)	2*240000..2*220000..4*200000..4*180000.	108
WV PSC(IV)	6*0..2100000..19*0.	109
WV PSC(IV)	47.	110
WV R14	104.	111
WV R14	50000.	112
WV R14	50000.	113
WV R14	26*0.	114
WV R14	6*0..641300..1402500..2232500..2547500..2862500..3177500..	115
WV R14	4*33150..3177500..3020000..2705000..2235000..6*2000000.	116
WV R14	26*0.	117
WV R14	6*0..19*50000..0.	118
WV R14	26*0.	119
WV R14	5*0..20000000..20*0.	120
WV R14	95.	121
WV R14	2000.	122
WV R14	0.	123
WV R14	6*0..1655600..3447200..1553600..1546900..1239000..15*7862.	124
WV R14	5*0..1386000..1386000..19*0.	125
WV R14	25*0.	126
WV R14	26*0.	127
WV R14	26*0.	128
WV R14	26*0.	129
WV R14	7*0..600000..300000..1500000..2*1800000..2100000..2400000..	130
WV R14	2*2700000..2*200000..4*2100000..4*1800000.	131

DATE 11/25/77

WEAPON SYSTEM LCC TEST, RUN

PAGE 1.004

INPUT DATA LISTING AND ERROR DIAGNOSTICS

NAMELIST DATA

CN11111 11111110 0	1
LIINPUT	2
V=26.9Y=1.	3
IR30=26*.04, IRPROC=26*.05, IRCON=26*.06, IRDM=26*.07, DR=26*.10,	4
LEND	5

AD-A082 273

NAVAL WEAPONS ENGINEERING SUPPORT ACTIVITY WASHINGTON DC
LIFE CYCLE COST GUIDE FOR MAJOR WEAPON SYSTEMS.(U)
NOV 77

F/6 5/1

UNCLASSIFIED

NL

3 of 3
NOV 77



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DATE 11/23/77

WEAPON SYSTEM LCC TEST RUN

PAGE 1.005

INPUT DATA LISTING AND ERROR DIAGNOSTICS

*** INPUT STATISTICS ***
***** CARDS READ

0 ERRORS

STATISTICS 29 SCALARS 92 ARRAYS 2150 ARRAY ELEMENTS

WEAPON SYSTEM LCC TEST RUN
INPUT DATA LISTING AND ERROR DIAGNOSTICS

CURRENT CS FILE

[illegible]

DATE: 11/25/77

WEAPON SYSTEM LCC TEST RUN

PAGE 1.007

INPUT DATA LISTING AND ERROR DIAGNOSTICS

CURRENT CS FILE

ES216000	ADIIII.I.Y				51
ES217000	TECHNICAL SUPPORT	4	2	2	52
ES218000	CSJIIII.I.Y	4	2	2	53
ES219000	INDUSTRIAL FACILITIES	4	2	2	54
ES220000	CIPIIII.I.Y	4	2	2	55
ES221000	INITIAL SPARES AND REPAIR PARTS	4	2	2	56
ES222000	VRIII.CSPH.CSII.II.I.Y				57
ES223000	GOVERNMENT	4	2	2	58
ES224000	3FE/6F4	4	2	2	59
ES225000	VRIII.CF.CII.I.Y	4	2	2	60
ES226000	COMMON SUPPORT EQUIPMENT	4	4	4	61
ES227000	ASCI.I.ASCII.II.I.Y	5	3	3	62
ES228000	TRAINING	5	3	3	63
ES229000	TRACII.TSIIII.TSMII.CII.I.Y	3	2	2	64
ES230000	SYSTEM TEST AND EVALUATION	3	2	2	65
ES231000	2IEII.II.I.Y	2	2	2	66
ES232000	PROJECT MANAGEMENT	2	2	2	67
ES233000	2N3IIII.I.Y	7	2	2	68
ES234000	DOCUMENTATION	7	2	2	69
ES235000	JCIIII.I.Y	4	3	3	70
ES236000	SITE ACTIVATION	4	3	3	71
ES237000	OPERATIONAL SITES	4	3	3	72
ES238000	MAINTENANCE FACILITIES	4	3	3	73
ES239000	FAIIII.I.Y	4	4	4	74
ES240000	SUPPLY INTRODUCTION	4	4	4	75
ES241000	NSVNSNS.CIE.CII.IYIYI	4	4	4	76
ES242000	TRANSPORTATION	4	2	2	77
ES243000	VRIII.CTPE.CII.I.Y	4	2	2	78
ES244000	OPERATING AND SUPPORT				79
ES245000	OPERATING				80
ES246000	CREW	9	5	4	81
ES247000	NCRII.AI.PAII.IAD.CII.IY.AAII.O	9	5	4	82
ES248000	STAFF	9	5	4	83
ES249000	NSFAI.IE.PAS.IE.CIEI.CII.I.Y	9	5	4	84
ES250000	MATERIAL	9	4	4	85
ES251000	NRV.II.MATS.CII.I.Y	9	4	4	86
ES252000	SECURITY	9	5	4	87
ES253000	ASCI.III.I.Y	9	5	4	88
ES254000	3T-ER DEPLOYED MANPOWER	9	5	4	89
ES255000	3D4I.II.I.Y	9	5	4	90
ES256000	PERSONNEL SUPPORT	9	4	4	91
ES257000	2SCIIII.I.Y	9	4	4	92
ES258000	2CIIII.I.Y				93
ES259000	3/I MAINTENANCE ACTIVITY				94
ES260000	AFLOAT FACILITIES				95
ES261000	LA233	10	4	4	96
ES262000	WEAPON SYSTEM MAINTENANCE	10	4	4	97
ES263000	NS2.II.II.NSII.CC2C7I.CII.IY	10	4	4	98
ES264000	ADVANCE MAINTENANCE				99
ES265000	NS2.II.II.NSII.CC2C7I.CII.IY				100

DATE 11/25/77

WEAPON SYSTEM LCC TEST RUN

PAGE 1.000

INPUT DATA LISTING AND ERROR DIAGNOSTICS

CURRENT CS FILE

CS373000	PERSONNEL ACTIVITIES	9	5	4	1	151
CS373000	PERSONNEL SUPPORT	9	4	4	1	152
CS374000	PERSONNEL SUPPORT	9	4	4	1	153
CS374000	PERSONNEL SUPPORT	9	4	4	1	154
CS380000	SUSTAINING INVESTMENTS	6	2	2	1	155
CS381000	REPLENISHMENT SPARES	6	2	2	1	156
CS381000	REPLENISHMENT SPARES	6	2	2	1	157
CS382000	REPLENISHMENT SPARES	6	2	2	1	158
CS382000	REPLENISHMENT SPARES	6	2	2	1	159
CS382000	REPLENISHMENT SPARES	6	2	2	1	160
CS382000	REPLENISHMENT SPARES	6	2	2	1	161
CS382000	REPLENISHMENT SPARES	6	2	2	1	162
CS382000	REPLENISHMENT SPARES	6	2	2	1	163
CS382000	REPLENISHMENT SPARES	6	2	2	1	164
CS382000	REPLENISHMENT SPARES	6	2	2	1	165
CS382000	REPLENISHMENT SPARES	6	2	2	1	166
CS382000	REPLENISHMENT SPARES	6	2	2	1	167
CS382000	REPLENISHMENT SPARES	6	2	2	1	168
CS382000	REPLENISHMENT SPARES	6	2	2	1	169
CS382000	REPLENISHMENT SPARES	6	2	2	1	170
CS382000	REPLENISHMENT SPARES	6	2	2	1	171
CS382000	REPLENISHMENT SPARES	6	2	2	1	172
CS382000	REPLENISHMENT SPARES	6	2	2	1	173
CS382000	REPLENISHMENT SPARES	6	2	2	1	174
CS382000	REPLENISHMENT SPARES	6	2	2	1	175
CS382000	REPLENISHMENT SPARES	6	2	2	1	176
CS382000	REPLENISHMENT SPARES	6	2	2	1	177
CS382000	REPLENISHMENT SPARES	6	2	2	1	178
CS382000	REPLENISHMENT SPARES	6	2	2	1	179
CS382000	REPLENISHMENT SPARES	6	2	2	1	180
CS382000	REPLENISHMENT SPARES	6	2	2	1	181
CS382000	REPLENISHMENT SPARES	6	2	2	1	182
CS382000	REPLENISHMENT SPARES	6	2	2	1	183

STATISTICS 650 EQUATION ELEMENTS READ

DATE 11/25/77

WEAPON SYSTEM LCC TEST RUN

PAGE 2,002

NAMES, DESCRIPTIONS, AND DIMENSIONS OF VARIABLES

M224 GOVT. PAYMENTS TO CONTRACTORS FOR PROGRAM MANAGEMENT FOR THE FULL SCALE DEVELOPMENT EFFORT. (15/YR)
 M225 DEPT LAROR AND MATERIAL COST PER SHIP PER YEAR FOR COMPONENT REPAIR. (15/SHIP/YR)
 M226 GOVT. PAYMENTS TO CONTRACTORS FOR DEVELOPMENT OF SOFTWARE FOR THE FULL SCALE DEVELOPMENT EFFORT. (15/YR)
 M227 GOVT. EXPENDITURES FOR SYSTEMS ENGINEERING FOR FULL SCALE DEVELOPMENT EFFORT. (15/YR)
 M228 GOVT. EXPENDITURES FOR ASSESS/TEST IN SUPPORT OF THE TEST PROGRAM DURING FULL SCALE DEVELOPMENT PHASE. (15/YR)
 M229 GOVT. PAYMENTS TO CONTRACTORS FOR INTEGRATING AND TESTING WEAPON SYSTEM FOR FULL SCALE DEVELOPMENT EFFORT. (15/YR)
 M230 GOVT. EXPENDITURES FOR TEST SPARES FOR THE FULL SCALE DEVELOPMENT EFFORT. (15/YR)
 M231 GOVT. EXPENDITURES FOR PROJECT MANAGEMENT FOR THE FULL SCALE DEVELOPMENT EFFORT. (15/YR)
 M232 GOVT. COSTS FOR TEST SITE ACTIVATION/DEACTIVATION DURING FULL SCALE DEVELOPMENT THE PROGRAM. (15/YR)
 M233 GOVT. EXPENDITURES FOR TEST PERSONNEL AND TRAINING COST FOR THE FULL SCALE DEVELOPMENT EFFORT. (15/YR)
 M234 PRO DATA SHARE OF OPERATING AND SUPPORT COSTS OF EMERGENCY SYSTEMS. (15/YR)
 M235 STRIKE COST PER WEAPON SYSTEM DURING YEAR 1. (15/SYSTEM)
 M236 GOVT. EXPENDITURES FOR MAINTENANCE FACILITY ACTIVATION. (15/YR)
 M237 GOVT. RECEIPTS FROM FOREIGN MILITARY SALES OF PREVIOUSLY DEVELOPED WEAPON SYSTEMS TO DEFRAY R&D COST OF MDS. (15/YR)
 M238 FIELD SUPPLY ADMINISTRATION COST OF THE MDS. (15/MNS/SITE/YR)
 M239 COST OF REPAIR/REPAIR COST FOR WEAPON SYSTEM. (15/SYSTEM)
 M240 DEPT REPAIR MATERIAL AND LABOR COST FOR EQUIPMENT X. (15/(REWORK/OVERHAUL))
 M241 GOVT. EXPENDITURES FOR HEALTH CARE. (15/YR)
 M242 GOVT. EXPENDITURES FOR INSTALLATION PERSONNEL SUPPORT. (15/YR)
 M243 MATERIAL COST PER SYSTEM PER YEAR. (15/SYSTEM)
 M244 GOVT. EXPENDITURES FOR MAINTENANCE OF THE AFLOAT FACILITIES. (15/YR)
 M245 GOVT. EXPENDITURES FOR MAINTENANCE OF THE ASHORE FACILITIES. (15/YR)
 M246 GOVT. EXPENDITURES FOR CONSTRUCTING, CONVERTING, ALTERING, OR MODIFYING THE MDS. (15/YR)
 M247 INCREMENTAL COSTS FOR OPERATING AND SUPPORT OF THE MDS. (15/YR)
 M248 MODERNIZATION COST PER WEAPON SYSTEM DURING YEAR 1. (15/SYSTEM)
 M249 MODIFICATION COST PER WEAPON SYSTEM DURING YEAR 1. (15/SYSTEM)
 M250 UNIT PAY AND ALLOWANCES OF GRADE V PERSONNEL. (15/MAN)
 M251 MEAN TIME BETWEEN FAILURES OF THE GCM EQUIPMENT. (MHS/FAILURE)
 M252 MEAN TIME BETWEEN DEPT REPAIR/OVERHAUL OF THE MDS EQUIPMENT. (MHS/REWORK/OVERHAUL)
 M253 NUMBER OF NEWLY INTRODUCED BASES SUPPORTING AIRCRAFT DURING YEAR 1. (BASES)
 M254 TOTAL NUMBER OF CREW PERSONNEL OF GRADE A IN YEAR 1. (MEN)
 M255 NUMBER OF MAINTENANCE FACILITIES SERVICING THE MAJOR WEAPON SYSTEM IN YEAR 1. (SITES)
 M256 NUMBER OF MAINTENANCE FACILITIES SERVICING SUPPORT SYSTEMS OF THE MAJOR WEAPON SYSTEM IN YEAR 1. (SITES)
 M257 NUMBER OF PERSONNEL OF GRADE I AT AFLOAT FACILITIES MAINTAINING THE WEAPON SYSTEM. (MEN/GRADE/YR)
 M258 NUMBER OF PERSONNEL OF GRADE I AT ASHORE FACILITIES MAINTAINING THE WEAPON SYSTEM. (MEN/GRADE/YR)
 M259 NUMBER OF WEAPON SYSTEMS INTRODUCED INTO INVENTORY DURING YEAR 1. (SYSTEMS)
 M260 NUMBER OF WEAPON SYSTEMS IN INVENTORY DURING YEAR 1. (SYSTEMS)
 M261 NUMBER OF PERSONNEL OF GRADE V AT AFLOAT FACILITIES MAINTAINING ADVANCE SYSTEMS. (MEN/GRADE/YR)
 M262 NUMBER OF PERSONNEL OF GRADE V AT ASHORE FACILITIES MAINTAINING ADVANCE SYSTEMS. (MEN/GRADE/YR)
 M263 NUMBER OF WEAPON SYSTEMS PHASED OUT DURING YEAR 1. (SYSTEMS/YR)
 M264 TOTAL CIRCULATION OF SUPPORT EQUIPMENTS OF TYPE C. (EQUIPMENTS/YR)
 M265 NUMBER OF NEW MNS INTRODUCED INTO SUPPLY SYSTEM BY THE MAJOR WEAPON SYSTEM. (MNS)
 M266 NUMBER OF NEW MNS INTRODUCED INTO SUPPLY SYSTEM BY SUPPORT SYSTEMS OF THE MAJOR WEAPON SYSTEM. (MNS)
 M267 TOTAL NUMBER OF COMMAND STAFF PERSONNEL OF GRADE E IN YEAR 1. (MEN)
 M268 GOVT. EXPENDITURES IN YEAR 1 FOR OTHER EMPLOYED MANPOWER. (15/YR)
 M269 ANNUAL OPERATING TIME OF THE WEAPON SYSTEM. (HRS/SYSTEM/YR)
 M270 ANNUAL PAY AND ALLOWANCES PER MAN OF GRADE A. (15/MAN)
 M271 GOVT. EXPENDITURES FOR PERSONNEL ACTIVITIES. (15/YR)
 M272 ANNUAL PAY AND ALLOWANCES PER MAN OF GRADE E. (15/MAN)
 M273 GOVT. EXPENDITURES FOR PERSONNEL SUPPORT. (15/YR)

WEAPON SYSTEM LCC TEST RUN

VARIABLES, DESCRIPTIONS, AND DIMENSIONS OF VARIABLES

DATE 11/25/77

P40	GOVT. PROJECT MANAGEMENT COST. (S/YR)
P41	PROPORTION OF TIME PERSONNEL OF GRADE 7 ARE DEDICATED TO WEAPON SYSTEM. (RATIO)
P42	GOVT. EXPENDITURES FOR PERSONNEL SUPPORT. (S/YR)
P43	TEST AND EVALUATION COSTS INCURRED DURING YEAR 1. (S/YR)
P44	AVERAGE NSN ENTRY COST INTO THE SUPPLY SYSTEM. (S/NSN)
P45	AVERAGE NSN RETENTION COST IN THE SUPPLY SYSTEM. (S/NSN)
P46	REPAIR MATERIAL COST AT AFLOAT FACILITY PER SYSTEM PER YEAR. (S/SYSTEM)
P47	REPAIR MATERIAL COST AT ASHORE FACILITY PER SYSTEM PER YEAR. (S/SYSTEM)
P48	GOVT. EXPENDITURES FOR REAL PROPERTY MAINTENANCE. (S/YR)
P49	GOVT. EXPENDITURES FOR REPLACEMENT SUPPORT EQUIPMENT. (S/YR)
P50	GOVT. EXPENDITURES FOR REPLACEMENT TRAINING EQUIPMENT. (S/YR)
P51	GOVT. EXPENDITURES FOR TRAINING SERVICES FOR PERSONNEL REPLACING THOSE LOST THROUGH ATTRITION. (S/YR)
P52	GOVT. EXPENDITURES FOR OPERATIONAL SITE ACTIVATION. (S/YR)
P53	COST OF SYSTEM STOCK FOR YEAR 1. (S)
P54	SLOPE OF LEARNING CURVE. (RATIO)
P55	ANNUAL TEMPORARY ASSIGNMENT OF DUTY COST PER MEMBER OF CREW. (S/MAN)
P56	MAJOR WEAPON SYSTEM TERMINAL COST/VALUE. (S/SYSTEM)
P57	GOVT. EXPENDITURES FOR TECHNICAL SUPPORT. (S/YR)
P58	GOVT. EXPENDITURES FOR TRAINING EQUIPMENT. (S/YR)
P59	GOVT. EXPENDITURES FOR TRAINING FACILITIES. (S/YR)
P60	GOVT. EXPENDITURES FOR CONSTRUCTING/CONVERTING, ALTERING, OR MODIFYING TENDERS AND REPAIR SHIPS. (S/YR)
P61	INCREMENTAL COSTS FOR OPERATING AND SUPPORT OF THE TENDER AND REPAIR SHIPS. (S/YR)
P62	GOVT. EXPENDITURES FOR TRAINING SERVICES. (S/YR)

PAGE 3,001

WEAPON SYSTEM LCC TEST RUN

DATE 11/25/77

NO REMARKS

DESCRIPTION

BASE YEAR

RV 1.00

WOCAT 10.00 NUMBER OF COST CATEGORIES

V 20.00 NUMBER OF YEARS IN LIFE CYCLE

F 1.00 NUMBER OF DIFFERENT GRADES OF COMMAND STAFF PERSONNEL

A 2.00 NUMBER OF DIFFERENT GRADES OF CREW PERSONNEL

W 1.00 NUMBER OF DIFFERENT GRADES OF PERSONNEL MAINTAINING THE ORDNANCE SYSTEMS

U 2.00 NUMBER OF DIFFERENT GRADES OF PERSONNEL MAINTAINING THE WEAPON SYSTEM

N 1.00 NUMBER OF DIFFERENT TYPES OF SUPPORT EQUIPMENT

Z 11.00 NUMBER OF EQUIPMENTS IN THE WEAPON SYSTEM SUBJECTED TO DEPOT REWORK / OVERHAUL

NO 10.00 NUMBER OF EQUIPMENTS IN THE WEAPON SYSTEM SUBJECTED TO DEPOT MAINTENANCE

PF 20.00 NUMBER OF EQUIPMENTS IN THE WEAPON SYSTEM

TVI 5.00 YEAR 1 DURING WHICH INITIAL COSTS OCCUR

AA 12.000.000.00 FIRST PIECE COST OF WEAPON SYSTEM. (1)

PS93 33.333.333.00 COST OF INITIAL SPARES AND REPAIR PARTS PER AIRCRAFT SUPPORTING BASE. (15/93SE)

CPE 7.000.00 FIRST DESTINATION TRANSPORTATION COST FOR THE WEAPON SYSTEM. (18/SYSTEM)

NC95 0.00 DEPOT LABOR AND MATERIAL COST PER SHIP PER YEAR FOR COMPONENT REPAIR. (15/SHIP/YR)

1144- AAO 688L E-0110 A10 BOLL BISMOLL 01 AS8004PROSEM

WEAPON SYSTEM LCC TEST RUN

*** INPUT DATA - SCALARS ***

DESCRIPTION

FIELD SUPPLY ADMINISTRATION COST OF THE NSN. (\$/NSN/SITE/YR)

PSA 36.75

CF 0.00

WATS 160,000.00

NSNS 9,000.00

NSNS 3,600.00

NT 360.00

NT 67.00

NT 104.00

NT 50,000.00

NT 50,000.00

SSS 0.05

TAD 2,000.00

TE24 0.00

COST OF 3ME/SP4 PER WEAPON SYSTEM. (S/SYSTEM)

MATERIAL COST PER SYSTEM PER YEAR. (S/SYSTEM)

NUMBER OF NEW NSNS INTRODUCED INTO SUPPLY SYSTEM BY THE MAJOR WEAPON SYSTEM. (NSNS)

NUMBER OF NEW NSNS INTRODUCED INTO SUPPLY SYSTEM BY SUPPORT SYSTEMS OF THE MAJOR WEAPON SYSTEM. (NSNS)

ANNUAL OPERATING TIME OF THE WEAPON SYSTEM. (HRS/SYSTEM/YR)

AVERAGE NSN ENTRY COST INTO THE SUPPLY SYSTEM. (S/NSN)

AVERAGE NSN RETENTION COST IN THE SUPPLY SYSTEM. (S/NSN)

REPAIR MATERIAL COST AT AFLOAT FACILITY PER SYSTEM PER YEAR. (S/SYSTEM)

REPAIR MATERIAL COST AT ASHORE FACILITY PER SYSTEM PER YEAR. (S/SYSTEM)

SLOPE OF LEARNING CURVE. (RATIO)

ANNUAL TEMPORARY ASSIGNMENT OF DUTY COST PER MEMBER OF CREW. (S/MAN)

MAJOR WEAPON SYSTEM TERMINAL COST/VALUE. (S/SYSTEM)

WEAPON SYSTEM LCC TEST RUN

*** INPUT DATA - ARRAYS ***

DESCRIPTION

NAME	DATE 11/25/77	DESCRIPTION	VALUE
ATTC (26)	0.00	GOVT. EXPENDITURES FOR CONSTRUCTING, CONVERTING, ALTERING, OR MODIFYING SHORE FACILITIES. (S/YR)	0.00
0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00
ATDC (26)	0.00	INCREMENTAL COSTS FOR OPERATING AND SUPPORT OF ASHORE IMAS. (S/YR)	0.00
0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00
ALR2 (10)	0.00	AVG. 2 DAY PACKING LABOR COST FOR SHIPPING EQUIP. CC FAILED ITEMS BETWEEN INT. & DEPOT LEVEL FACILITIES. (S/BCM)	0.00
0.00	200.00	200.00	200.00
0.00	200.00	200.00	200.00
ALR (11)	25.00	AVG. 2 DAY PACKING LABOR COST FOR SHIPPING EQUIP. X REMORK/OVERHAUL ITEMS BETWEEN INT. & DEPOT LEVEL FACILITIES. (S/BCM/OVNAL)	25.00
25.00	25.00	25.00	25.00
25.00	25.00	25.00	25.00
ANAT (10)	0.00	AVG. 2K3. NAT. COST FOR SHIPPING EQUIP. CC FAILED ITEMS BETWEEN INT. & DEPOT LEVEL FACILITIES. (S/BCM)	0.00
0.00	60.00	60.00	60.00
0.00	60.00	60.00	60.00
ANAT (11)	60.00	AVG. 2K3. NAT. COST FOR SHIPPING EQUIP. X REMORK/OVERHAUL ITEMS BETWEEN INT. & DEPOT LEVEL FACILITIES. (S/BCM/OVNAL)	60.00
60.00	60.00	60.00	60.00
60.00	60.00	60.00	60.00
ANSA (26)	0.00	GOVT. EXPENDITURES FOR PERSONNEL SUPPORT AT ASHORE FACILITIES. (S/YR)	0.00
0.00	0.00	0.00	0.00
3.600.000.00	3.600.000.00	3.600.000.00	3.600.000.00
5.400.000.00	5.400.000.00	5.400.000.00	5.400.000.00
ANSE (26)	0.00	GOVT. EXPENDITURES FOR ACQUISITION OF COMMON SUPPORT EQUIPMENT. (S/YR)	0.00
0.00	0.00	0.00	0.00
5.840.000.00	5.840.000.00	5.840.000.00	5.840.000.00
0.00	0.00	0.00	0.00
ASE (26)	0.00	GOVT. EXPENDITURES TO MAKE COMMON SUPPORT EQUIP. AVAILABLE FOR SUPPORT OF THE WEAPON SYSTEM. (S/YR)	0.00
0.00	0.00	0.00	0.00
504.000.00	504.000.00	504.000.00	504.000.00
0.00	0.00	0.00	0.00
ASEC (26)	0.00	SECURITY COST INCURRED DURING YEAR 1. (S/YR)	0.00
0.00	0.00	0.00	0.00
90.000.00	90.000.00	90.000.00	90.000.00
105.000.00	105.000.00	105.000.00	105.000.00
ATNS (11)	400.00	AVG. 2 DAY SHIPPING COST FOR SHIPPING EQUIP. X REMORK/OVERHAUL ITEMS BETWEEN INT. & DEPOT LEVEL FACILITIES. (S/BCM/OVNAL)	400.00
400.00	400.00	400.00	400.00

***** READ ARRAY VALUES FROM LEFT TO RIGHT *****

0.0% INPUT DATA - ARRAYS 0.00

DESCRIPTION

(26. 2) TOTAL NUMBER OF CREW PERSONNEL 0-1 GRADE A IN YEAR 1. (MEN)

0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
36.00	36.00
54.00	54.00
90.00	90.00
109.00	109.00
126.00	126.00
144.00	144.00
162.00	162.00
180.00	180.00
198.00	198.00
216.00	216.00
234.00	234.00
252.00	252.00
270.00	270.00
288.00	288.00
306.00	306.00
324.00	324.00
342.00	342.00
360.00	360.00
378.00	378.00
396.00	396.00
414.00	414.00
432.00	432.00
450.00	450.00
468.00	468.00
486.00	486.00
504.00	504.00
522.00	522.00
540.00	540.00
558.00	558.00
576.00	576.00
594.00	594.00
612.00	612.00
630.00	630.00
648.00	648.00
666.00	666.00
684.00	684.00
702.00	702.00
720.00	720.00
738.00	738.00
756.00	756.00
774.00	774.00
792.00	792.00
810.00	810.00
828.00	828.00
846.00	846.00
864.00	864.00
882.00	882.00
900.00	900.00
918.00	918.00
936.00	936.00
954.00	954.00
972.00	972.00
990.00	990.00
1008.00	1008.00
1026.00	1026.00
1044.00	1044.00
1062.00	1062.00
1080.00	1080.00
1098.00	1098.00
1116.00	1116.00
1134.00	1134.00
1152.00	1152.00
1170.00	1170.00
1188.00	1188.00
1206.00	1206.00
1224.00	1224.00
1242.00	1242.00
1260.00	1260.00
1278.00	1278.00
1296.00	1296.00
1314.00	1314.00
1332.00	1332.00
1350.00	1350.00
1368.00	1368.00
1386.00	1386.00
1404.00	1404.00
1422.00	1422.00
1440.00	1440.00
1458.00	1458.00
1476.00	1476.00
1494.00	1494.00
1512.00	1512.00
1530.00	1530.00
1548.00	1548.00
1566.00	1566.00
1584.00	1584.00
1602.00	1602.00
1620.00	1620.00
1638.00	1638.00
1656.00	1656.00
1674.00	1674.00
1692.00	1692.00
1710.00	1710.00
1728.00	1728.00
1746.00	1746.00
1764.00	1764.00
1782.00	1782.00
1800.00	1800.00
1818.00	1818.00
1836.00	1836.00
1854.00	1854.00
1872.00	1872.00
1890.00	1890.00
1908.00	1908.00
1926.00	1926.00
1944.00	1944.00
1962.00	1962.00
1980.00	1980.00
1998.00	1998.00
2016.00	2016.00
2034.00	2034.00
2052.00	2052.00
2070.00	2070.00
2088.00	2088.00
2106.00	2106.00
2124.00	2124.00
2142.00	2142.00
2160.00	2160.00
2178.00	2178.00
2196.00	2196.00
2214.00	2214.00
2232.00	2232.00
2250.00	2250.00
2268.00	2268.00
2286.00	2286.00
2304.00	2304.00
2322.00	2322.00
2340.00	2340.00
2358.00	2358.00
2376.00	2376.00
2394.00	2394.00
2412.00	2412.00
2430.00	2430.00
2448.00	2448.00
2466.00	2466.00
2484.00	2484.00
2502.00	2502.00
2520.00	2520.00
2538.00	2538.00
2556.00	2556.00
2574.00	2574.00
2592.00	2592.00
2610.00	2610.00
2628.00	2628.00
2646.00	2646.00
2664.00	2664.00
2682.00	2682.00
2700.00	2700.00
2718.00	2718.00
2736.00	2736.00
2754.00	2754.00
2772.00	2772.00
2790.00	2790.00
2808.00	2808.00
2826.00	2826.00
2844.00	2844.00
2862.00	2862.00
2880.00	2880.00
2898.00	2898.00
2916.00	2916.00
2934.00	2934.00
2952.00	2952.00
2970.00	2970.00
2988.00	2988.00
3006.00	3006.00
3024.00	3024.00
3042.00	3042.00
3060.00	3060.00
3078.00	3078.00
3096.00	3096.00
3114.00	3114.00
3132.00	3132.00
3150.00	3150.00
3168.00	3168.00
3186.00	3186.00
3204.00	3204.00
3222.00	3222.00
3240.00	3240.00
3258.00	3258.00
3276.00	3276.00
3294.00	3294.00
3312.00	3312.00
3330.00	3330.00
3348.00	3348.00
3366.00	3366.00
3384.00	3384.00
3402.00	3402.00
3420.00	3420.00
3438.00	3438.00
3456.00	3456.00
3474.00	3474.00
3492.00	3492.00
3510.00	3510.00
3528.00	3528.00
3546.00	3546.00
3564.00	3564.00
3582.00	3582.00
3600.00	3600.00
3618.00	3618.00
3636.00	3636.00
3654.00	3654.00
3672.00	3672.00
3690.00	3690.00
3708.00	3708.00
3726.00	3726.00
3744.00	3744.00
3762.00	3762.00
3780.00	3780.00
3798.00	3798.00
3816.00	3816.00
3834.00	3834.00
3852.00	3852.00
3870.00	3870.00
3888.00	3888.00
3906.00	3906.00
3924.00	3924.00
3942.00	3942.00
3960.00	3960.00
3978.00	3978.00
3996.00	3996.00
4014.00	4014.00
4032.00	4032.00
4050.00	4050.00
4068.00	4068.00
4086.00	4086.00
4104.00	4104.00
4122.00	4122.00
4140.00	4140.00
4158.00	4158.00
4176.00	4176.00
4194.00	4194.00
4212.00	4212.00
4230.00	4230.00
4248.00	4248.00
4266.00	4266.00
4284.00	4284.00
4302.00	4302.00
4320.00	4320.00
4338.00	4338.00
4356.00	4356.00
4374.00	4374.00
4392.00	4392.00
4410.00	4410.00
4428.00	4428.00
4446.00	4446.00
4464.00	4464.00
4482.00	4482.00
4500.00	4500.00
4518.00	4518.00
4536.00	4536.00
4554.00	4554.00
4572.00	4572.00
4590.00	4590.00
4608.00	4608.00
4626.00	4626.00
4644.00	4644.00
4662.00	4662.00
4680.00	4680.00
4698.00	4698.00
4716.00	4716.00
4734.00	4734.00
4752.00	4752.00
4770.00	4770.00
4788.00	4788.00
4806.00	4806.00
4824.00	4824.00
4842.00	4842.00
4860.00	4860.00
4878.00	4878.00
4896.00	4896.00
4914.00	4914.00
4932.00	4932.00
4950.00	4950.00
4968.00	4968.00
4986.00	4986.00
5004.00	5004.00
5022.00	5022.00
5040.00	5040.00
5058.00	5058.00
5076.00	5076.00
5094.00	5094.00
5112.00	5112.00
5130.00	5130.00
5148.00	5148.00
5166.00	5166.00
5184.00	5184.00
5202.00	5202.00
5220.00	5220.00
5238.00	5238.00
5256.00	5256.00
5274.00	5274.00
5292.00	5292.00
5310.00	5310.00
5328.00	5328.00
5346.00	5346.00
5364.00	5364.00
5382.00	5382.00
5400.00	5400.00
5418.00	5418.00
5436.00	5436.00
5454.00	5454.00
5472.00	5472.00
5490.00	5490.00
5508.00	5508.00
5526.00	5526.00
5544.00	5544.00
5562.00	5562.00
5580.00	5580.00
5598.00	5598.00
5616.00	5616.00
5634.00	5634.00
5652.00	5652.00
5670.00	5670.00
5688.00	5688.00
5706.00	5706.00
5724.00	5724.00
5742.00	5742.00
5760.00	5760.00
5778.00	5778.00
5796.00	5796.00
5814.00	5814.00
5832.00	5832.00
5850.00	5850.00
5868.00	5868.00
5886.00	5886.00
5904.00	5904.00
5922.00	5922.00
5940.00	5940.00
5958.00	5958.00
5976.00	5976.00
5994.00	5994.00
6012.00	6012.00
6030.00	6030.00
6048.00	6048.00
6066.00	6066.00
6084.00	6084.00
6102.00	6102.00
6120.00	6120.00
6138.00	6138.00
6156.00	6156.00
6174.00	6174.00
6192.00	6192.00
6210.00	6210.00
6228.00	6228.00
6246.00	6246.00
6264.00	6264.00
6282.00	6282.00
6300.00	6300.00
6318.00	6318.00
6336.00	6336.00
6354.00	6354.00
6372.00	6372.00
6390.00	6390.00
6408.00	6408.00
6426.00	6426.00
6444.00	6444.00
6462.00	6462.00
6480.00	6480.00
6498.00	6498.00
6516.00	6516.00
6534.00	6534.00
6552.00	6552.00
6570.00	6570.00
6588.00	6588.00
6606.00	6606.00
6624.00	6624.00
6642.00	6642.00
6660.00	6660.00
6678.00	6678.00
6696.00	6696.00
6714.00	6714.00
6732.00	6732.00
6750.00	6750.00
6768.00	6768.00
6786.00	6786.00
6804.00	6804.00
6822.00	6822.00
6840.00	6840.00
6858.00	6858.00
6876.00	6876.00
6894.00	6894.00
6912.00	6912.00
6930.00	6930.00
6948.00	6948.00
6966.00	6966.00
6984.00	6984.00
7002.00	7002.00
7020.00	7020.00
7038.00	7038.00
7056.00	7056.00
7074.00	7074.00
7092.00	7092.00
7110.00	7110.00
7128.00	7128.00
7146.00	7146.00
7164.00	7164.00
7182.00	7182.00
7200.00	7200.00
7218.00	7218.00
7236.00	7236.00
7254.00	7254.00
7272.00	7272.00
7290.00	7290.00
7308.00	7308.00
7326.00	7326.00
7344.00	7344.00
7362.00	7362.00
7380.00	7380.00
7398.00	7398.00
7416.00	7416.00
7434.00	7434.00
7452.00	7452.00
7470.00	7470.00
7488.00	7488.00
7506.00	7506.00

READ ARRAY VALUES FROM LEFT TO RIGHT

PAGE 4,010

WEAPON SYSTEM LCC TEST RUN

*** INPUT DATA - ARRAYS ***

DESCRIPTION

DATE 11/25/77

NAME

M40 (CONTINUED)

180.00
180.00
180.00
210.00
240.00
240.00
270.00
270.00
240.00
240.00
210.00
210.00
210.00
210.00
180.00
180.00
180.00
180.00

M404 (20, 2) NUMBER OF PERSONNEL OF GRADE Y AT ASHORE FACILITIES MAINTAINING THE WEAPON SYSTEM.(MEN/GRADE/YR)

0.00
0.00
0.00
0.00
0.00
0.00
0.00
0.00
120.00
150.00
300.00
360.00
360.00
420.00
490.00
560.00
560.00
490.00
490.00
420.00
420.00
420.00
420.00
350.00
350.00
350.00
350.00
360.00

READ ARRAY VALUES FROM LEFT TO RIGHT

WEAPON SYSTEM LCC TEST RUN

0.00 INPUT DATA - ARRAYS 0.00

DESCRIPTION

DATE 11/25/77

NAME

WSE (CONTINUED)

9.00
9.00
9.00

WSTA (20. 1) TOTAL NUMBER OF COMMAND STAFF PERSONNEL OF GRADE E IN YEAR 1. (MEN)

0.00
0.00
0.00
0.00
0.00
0.00
1.00
1.00
3.00
4.00
7.00
9.00
9.00
10.00
11.00
12.00
12.00
11.00
11.00
10.00
10.00
10.00
10.00
9.00
9.00
9.00
9.00

024 (20) GOVT. EXPENDITURES IN YEAR 1 FOR OTHER DEPLOYED MANPOWER. (S/YR)

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

04 (21) ANNUAL PAY AND ALLOWANCES PER MAN OF GRADE A. (S/MAN)

22,000.00 26,000.00

044 (24) GOVT. EXPENDITURES FOR PERSONNEL ACTIVITIES. (S/YR)

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

044 (24) GOVT. EXPENDITURES FOR PERSONNEL ACTIVITIES. (S/YR)

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

044 (24) GOVT. EXPENDITURES FOR PERSONNEL ACTIVITIES. (S/YR)

0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

WEAPON SYSTEM LCC TEST RUN

*** INPUT DATA - ARRAYS ***

DATE 11/25/77

NAME	DESCRIPTION	ANNUAL PAY AND ALLOWANCES PER MAN 30 GRADE E. (S/MAN)	GOVT. EXPENDITURES FOR PERSONNEL SUPPORT. (S/YR)	GOVT. EXPENDITURES FOR PERSONNEL REPLACING THOSE LOST THROUGH ATTRITION. (S/YR)	GOVT. EXPENDITURES FOR PERSONNEL SITE ACTIVATION. (S/YR)
PAS (1)	ANNUAL PAY AND ALLOWANCES PER MAN 30 GRADE E. (S/MAN)	36,000.00	0.00	0.00	0.00
PESC (26)	GOVT. EXPENDITURES FOR PERSONNEL SUPPORT. (S/YR)	0.00	0.00	0.00	0.00
160,000.00	0.00	200,000.00	220,000.00	240,000.00	240,000.00
200,000.00	0.00	180,000.00	180,000.00	180,000.00	180,000.00
P43 (26)	GOVT. EXPENDITURES FOR PERSONNEL SUPPORT. (S/YR)	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00
PJT (2)	PROPORTION OF TIME PERSONNEL OF GRADE T ARE DEDICATED TO WEAPON SYSTEM. (RATIO)	1.00	0.00	0.00	0.00
PSC (26)	GOVT. EXPENDITURES FOR PERSONNEL SUPPORT. (S/YR)	0.00	0.00	0.00	0.00
160,000.00	0.00	200,000.00	220,000.00	240,000.00	240,000.00
200,000.00	0.00	180,000.00	180,000.00	180,000.00	180,000.00
PTE (26)	TEST AND EVALUATION COSTS INCURRED DURING YEAR T. (S/YR)	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00
PM4C (26)	GOVT. EXPENDITURES FOR REAL PROPERTY MAINTENANCE. (S/YR)	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00
PSEC (26)	GOVT. EXPENDITURES FOR REPLACEMENT SUPPORT EQUIPMENT. (S/YR)	0.00	0.00	0.00	0.00
2,962,500.00	0.00	33,350.00	33,350.00	33,350.00	33,350.00
2,000,000.00	0.00	2,000,000.00	2,000,000.00	2,000,000.00	2,000,000.00
PTRZ (26)	GOVT. EXPENDITURES FOR REPLACEMENT TRAINING EQUIPMENT. (S/YR)	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00
PTRS (26)	GOVT. EXPENDITURES FOR TRAINING SERVICES FOR PERSONNEL REPLACING THOSE LOST THROUGH ATTRITION. (S/YR)	0.00	0.00	0.00	0.00
50,000.00	0.00	50,000.00	50,000.00	50,000.00	50,000.00
50,000.00	0.00	50,000.00	50,000.00	50,000.00	50,000.00
SA (26)	GOVT. EXPENDITURES FOR OPERATIONAL SITE ACTIVATION. (S/YR)	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00

*** HEAD: ARRAY VALUES FROM LEFT TO RIGHT ***

WEAPON SYSTEM LCC TEST RUN

DATE 11/25/77

YEAR	COST ADJUSTMENT FACTORS				INFLATION AND DISCOUNT FACTORS				DISCOUNT FACTORS	
	R & D	PROCUREMENT	CONSTRUCTION	O & M	R & D	PROCUREMENT	CONSTRUCTION	O & M		
1	1.026	1.025	1.030	1.035	0.973	0.977	0.962	0.966	0.955	
2	1.061	1.075	1.092	1.107	0.920	0.933	0.946	0.959	0.868	
3	1.103	1.130	1.157	1.185	0.870	0.890	0.912	0.933	0.789	
4	1.147	1.187	1.227	1.268	0.822	0.850	0.879	0.908	0.717	
5	1.193	1.245	1.300	1.357	0.777	0.811	0.847	0.883	0.652	
6	1.241	1.305	1.378	1.452	0.735	0.774	0.816	0.859	0.593	
7	1.291	1.374	1.461	1.553	0.695	0.739	0.786	0.836	0.539	
8	1.342	1.442	1.549	1.662	0.657	0.706	0.758	0.813	0.490	
9	1.396	1.514	1.642	1.778	0.621	0.674	0.730	0.791	0.445	
10	1.452	1.590	1.740	1.903	0.587	0.643	0.703	0.769	0.405	
11	1.510	1.670	1.845	2.036	0.555	0.614	0.678	0.748	0.368	
12	1.570	1.733	1.955	2.179	0.525	0.586	0.651	0.724	0.335	
13	1.633	1.801	2.073	2.331	0.496	0.559	0.629	0.704	0.304	
14	1.699	1.873	2.197	2.494	0.469	0.534	0.607	0.689	0.276	
15	1.766	2.029	2.329	2.669	0.444	0.510	0.585	0.670	0.251	
16	1.837	2.131	2.468	2.856	0.419	0.486	0.563	0.651	0.229	
17	1.910	2.237	2.617	3.053	0.396	0.464	0.543	0.634	0.208	
18	1.987	2.343	2.774	3.263	0.375	0.443	0.523	0.616	0.189	
19	2.065	2.457	2.940	3.498	0.354	0.423	0.504	0.600	0.172	
20	2.149	2.570	3.116	3.743	0.335	0.404	0.485	0.593	0.156	
21	2.235	2.720	3.303	4.005	0.317	0.385	0.468	0.567	0.142	
22	2.324	2.855	3.502	4.285	0.300	0.368	0.451	0.552	0.129	
23	2.417	2.994	3.712	4.585	0.283	0.351	0.435	0.537	0.117	
24	2.514	3.144	3.934	4.906	0.268	0.335	0.419	0.522	0.107	
25	2.615	3.305	4.170	5.250	0.253	0.320	0.404	0.509	0.097	
26	2.719	3.471	4.421	5.617	0.239	0.305	0.389	0.494	0.088	

***** MILITARY PERSONNEL FINDING USES THE SAME COST ADJUSTMENT FACTORS AS O&M *****

DATE 11/25/77

WEAPON SYSTEM LCC TEST RUN

PAGE 6.001

\$\$\$ COSTS IN THOUSAND DOLLARS \$\$\$

SUMMARY

*****BASE YEAR= 1 *****CONSTANT DOLLARS*****

COST CATEGORY	DEVELOPMENT	INVESTMENT	OLS	COST ELEMENT	COST CATEGORY TOTAL
CONTRACTOR	562,582	0	0	0	562,582
% OF COST CATEGORY TOTAL	100.0	0.0	0.0	0.0	100.0
% OF COST ELEMENT TOTAL	95.7	0.0	0.0	0.0	4.4
PROGRAM MANAGEMENT	10,869	53,600	0	0	64,469
% OF COST CATEGORY TOTAL	18.9	83.1	0.0	0.0	100.0
% OF COST ELEMENT TOTAL	1.8	0.6	0.0	0.0	0.5
TESTING	16,479	21,800	0	0	38,279
% OF COST CATEGORY TOTAL	39.9	60.1	0.0	0.0	100.0
% OF COST ELEMENT TOTAL	2.5	0.2	0.0	0.0	0.3
ONLINE EQUIPMENT	0	3,177,033	0	0	3,177,033
% OF COST CATEGORY TOTAL	0.0	100.0	0.0	0.0	100.0
% OF COST ELEMENT TOTAL	0.0	34.0	0.0	0.0	24.9
TRAINING	0	177,544	950	0	178,494
% OF COST CATEGORY TOTAL	0.0	99.5	0.5	0.0	100.0
% OF COST ELEMENT TOTAL	0.0	1.9	0.0	0.0	1.4
SUPPLY SUPPORT	0	420,532	591,727	0	1,012,319
% OF COST CATEGORY TOTAL	0.0	37.8	62.2	0.0	100.0
% OF COST ELEMENT TOTAL	0.0	4.5	24.4	0.0	8.7
TECHNICAL DATA	0	209,593	98,104	0	307,697
% OF COST CATEGORY TOTAL	0.0	64.1	31.9	0.0	100.0
% OF COST ELEMENT TOTAL	0.0	2.2	3.5	0.0	2.4
SUPPORT EQUIPMENT	0	5,278,805	36,332	0	5,315,137
% OF COST CATEGORY TOTAL	0.0	99.3	0.7	0.0	100.0
% OF COST ELEMENT TOTAL	0.0	56.5	1.3	0.0	41.7
OPERATION	0	531,479	0	0	531,479
% OF COST CATEGORY TOTAL	0.0	0.0	100.0	0.0	100.0
% OF COST ELEMENT TOTAL	0.0	0.0	22.3	0.0	5.0
MAINTENANCE	0	0	1,371,206	0	1,371,206
% OF COST CATEGORY TOTAL	0.0	0.0	100.0	0.0	100.0
% OF COST ELEMENT TOTAL	0.0	0.0	48.5	0.0	10.7
COST ELEMENT TOTAL	587,930	9,338,968	2,329,794	0	12,756,695
% OF LIFE CYCLE COST	4.6	73.2	22.2	0.0	100.0

FUNDING VS. COST CATEGORY

SSS COSTS IN THOUSAND DOLLARS \$\$\$

*****PHASE YEAR= 1 *****CONSTANT DOLLARS*****

COST CATEGORY	R & D	PROCUREMENT	CONSTRUCTION	D & M	MILITARY PERSONNEL	OTHERS	COST CATEGORY TOTAL
CONTRACTOR	552,582	0	0	0	0	0	552,582
% OF COST CATEGORY TOTAL	100.0	0.0	0.0	0.0	0.0	0.0	100.0
% OF FUNDING TYPE TOTAL	45.7	0.0	0.0	0.0	0.0	0.0	4.4
PROGRAM MANAGEMENT	10,969	53,500	0	0	0	0	64,469
% OF COST CATEGORY TOTAL	16.9	93.1	0.0	0.0	0.0	0.0	100.0
% OF FUNDING TYPE TOTAL	1.8	0.5	0.0	0.0	0.0	0.0	0.5
TESTING	14,679	21,300	0	0	0	0	36,279
% OF COST CATEGORY TOTAL	39.9	50.1	0.0	0.0	0.0	0.0	100.0
% OF FUNDING TYPE TOTAL	2.5	0.2	0.0	0.0	0.0	0.0	0.3
EQUIPMENT	0	3,170,153	6,870	0	0	0	3,177,023
% OF COST CATEGORY TOTAL	0.0	99.8	0.2	0.0	0.0	0.0	100.0
% OF FUNDING TYPE TOTAL	0.0	31.6	29.3	0.0	0.0	0.0	24.9
TRAINING	0	175,722	2,772	0	0	0	178,494
% OF COST CATEGORY TOTAL	0.0	98.4	1.6	0.0	0.0	0.0	100.0
% OF FUNDING TYPE TOTAL	0.0	1.8	11.4	0.0	0.0	0.0	1.4
SUPPLY SUPPORT	0	1,111,727	0	592	0	0	1,112,319
% OF COST CATEGORY TOTAL	0.0	99.9	0.0	0.1	0.0	0.0	100.0
% OF FUNDING TYPE TOTAL	0.0	11.1	0.0	0.0	0.0	0.0	0.7
TECHNICAL DATA	0	209,593	0	98,104	0	0	307,697
% OF COST CATEGORY TOTAL	0.0	58.1	0.0	31.9	0.0	0.0	100.0
% OF FUNDING TYPE TOTAL	0.0	2.1	0.0	4.9	0.0	0.0	2.4
SUPPORT EQUIPMENT	0	5,256,331	0	58,806	0	0	5,315,137
% OF COST CATEGORY TOTAL	0.0	99.9	0.0	1.1	0.0	0.0	100.0
% OF FUNDING TYPE TOTAL	0.0	52.4	0.0	3.0	0.0	0.0	41.7
OPERATION	0	28,710	0	671,225	131,544	0	631,479
% OF COST CATEGORY TOTAL	0.0	4.5	0.0	74.6	20.8	0.0	100.0
% OF FUNDING TYPE TOTAL	0.0	0.3	0.0	23.7	100.0	0.0	5.0
MAINTENANCE	0	0	14,640	1,356,566	0	0	1,371,206
% OF COST CATEGORY TOTAL	0.0	0.0	1.1	98.9	0.0	0.0	100.0
% OF FUNDING TYPE TOTAL	0.0	0.0	60.3	68.3	0.0	0.0	10.7
FUNDING TYPE TOTAL	597,930	10,027,547	24,282	1,985,292	131,544	0	12,756,695
% OF LIFE CYCLE COST	4.6	78.6	0.2	15.6	1.0	0.0	100.0

DATE 11/25/77

WEAPON SYSTEM LCC TEST RUN

PAGE 0.001

*****BASE YEAR= J *****CONSTANT DOLLARS*****

*****COST BREAKDOWN BY YEAR*****

SS COSTS IN THOUSAND DOLLARS \$\$\$

STRUCTURE NUMBER	COST BREAKDOWN STRUCTURE ELEMENT	1	2	3	4	5
00000	LIFE CYCLE COST	27.374	50.537	96.676	174.703	174.806
10000	RESEARCH AND DEVELOPMENT	26.064	59.227	95.365	173.392	172.903
11000	VALIDATION	26.064	59.227	0	0	0
11100	CONTRACTOR	26.064	59.227	0	0	0
11200	GOVERNMENT	0	502	0	0	0
12000	FULL SCALE DEVELOPMENT	0	0	95.365	173.392	172.903
12100	CONTRACTOR	0	0	91.873	164.531	153.774
12110	PROGRAM MANAGEMENT	0	0	6.980	12.040	10.246
12120	ENGINEERING	0	0	46.400	91.635	74.335
12130	PROTOTYPE HARDWARE	0	0	16.320	28.031	25.282
12140	SOFTWARE	0	0	0	0	0
12150	INTERACTION AND TEST	0	0	20.403	38.540	42.840
12160	DOCUMENTATION	0	0	1.870	3.455	10.070
12200	GOVERNMENT	0	0	3.492	6.831	9.130
12210	PROJECT MANAGEMENT	0	0	1.032	1.813	1.709
12220	SYSTEMS ENGINEERING	0	0	1.032	1.813	1.709
12230	SYSTEM TEST AND EVALUATION	0	0	1.428	5.236	5.711
12240	TEST PERSONNEL AND TRAINING	0	0	240	704	666
12250	TEST SPARES	0	0	108	412	477
12260	TEST ARE/SE/TE	0	0	540	2,056	2,284
12270	TEST FACILITIES	0	0	540	2,056	2,284
12280	FOREIGN MILITARY SALES	0	0	0	0	0
20000	INVESTMENT	0	0	0	0	592
21000	ACQUISITION (CONTRACTOR)	0	0	0	0	0
21100	PRODUCTION HARDWARE	0	0	0	0	0
21200	PRODUCTION SUPPORT EQUIPMENT	0	0	0	0	0
21300	TRAINING	0	0	0	0	0
21400	INTERACTION AND TEST	0	0	0	0	0
21500	PROGRAM MANAGEMENT	0	0	0	0	0
21600	DOCUMENTATION	0	0	0	0	0
21700	TECHNICAL SUPPORT	0	0	0	0	0
21800	INDUSTRIAL FACILITIES	0	0	0	0	0
21900	INITIAL SPARES AND REPAIR PARTS	0	0	0	0	0
22000	GOVERNMENT	0	0	0	0	592
22100	GFE/SPM	0	0	0	0	0
22200	COMMUN SUPPORT EQUIPMENT	0	0	0	0	0
22300	TRAINING	0	0	0	0	0
22400	SYSTEM TEST AND EVALUATION	0	0	0	0	0
22500	PROJECT MANAGEMENT	0	0	0	0	0
22600	DOCUMENTATION	0	0	0	0	0
22700	SITE ACTIVATION	0	0	0	0	0
22710	OPERATIONAL STIFFS	0	0	0	0	0
22720	MAINTENANCE FACILITIES	0	0	0	0	0
22800	SUPPLY INTRODUCTION	0	0	0	0	592

DATE 11/25/77

WEAPON SYSTEM LCC TEST RUN

PAGE 0.002

COSTS IN THOUSAND DOLLARS \$\$\$

COST BREAKDOWN BY YEAR

*****BASE YEAR 1 CONSTANT DOLLARS*****

COST BREAKDOWN STRUCTURE NUMBER	COST BREAKDOWN BY YEAR				
	1	2	3	4	5
223000	0	0	0	0	0
TRANSPORTATION					
300000	1,310	1,310	1,310	1,310	1,310
OPERATING AND SUPPORT					
310000	0	0	0	0	0
OPERATIONS					
311000	0	0	0	0	0
CREW					
312000	0	0	0	0	0
STAFF					
313000	0	0	0	0	0
MATERIAL					
314000	0	0	0	0	0
SECURITY					
315000	0	0	0	0	0
OTHER DEPLOYED MANPOWER					
316000	0	0	0	0	0
PERSONNEL SUPPORT					
317000	0	0	0	0	0
Q/1 MAINTENANCE ACTIVITY					
320000	0	0	0	0	0
AFLC/AT FACILITIES					
321000	0	0	0	0	0
LAROR					
321100	0	0	0	0	0
WEAPON SYSTEM MAINTENANCE					
321120	0	0	0	0	0
ADVANCE MAINTENANCE					
321200	0	0	0	0	0
MATERIAL					
321300	0	0	0	0	0
PERSONNEL SUPPORT					
321400	0	0	0	0	0
SITE MAINTENANCE					
322000	0	0	0	0	0
ASWORE FACILITIES					
322100	0	0	0	0	0
LAROR					
322110	0	0	0	0	0
WEAPON SYSTEM MAINTENANCE					
322120	0	0	0	0	0
ADVANCE MAINTENANCE					
322200	0	0	0	0	0
MATERIAL					
322300	0	0	0	0	0
PERSONNEL SUPPORT					
322400	0	0	0	0	0
SITE MAINTENANCE					
330000	0	0	0	0	0
INSTALLATION SUPPORT					
331000	0	0	0	0	0
BASE OPERATING SUPPORT					
332000	0	0	0	0	0
REAL PROPERTY MAINTENANCE					
333000	0	0	0	0	0
PERSONNEL SUPPORT					
340000	0	0	0	0	0
DEPT MAINTENANCE					
341000	0	0	0	0	0
SCHEDULED MAINTENANCE					
342000	0	0	0	0	0
UNSCHEDULED MAINTENANCE					
343000	0	0	0	0	0
MODERNIZATION					
344000	0	0	0	0	0
COMPONENT REPAIR					
350000	0	0	0	0	0
DEPT SUPPLY					
351000	1,310	1,310	1,310	1,310	1,310
MATERIAL MANAGEMENT					
352000	1,310	1,310	1,310	1,310	1,310
TECHNICAL SUPPORT					
353000	0	0	0	0	0
SECOND DESTINATION TRANSPORTATION					
354000	0	0	0	0	0
SCHEDULED					
355000	0	0	0	0	0
UNSCHEDULED					
356000	0	0	0	0	0
PERSONNEL SUPPORT AND TRAINING					
357000	0	0	0	0	0
INDIVIDUAL TRAINING					
358000	0	0	0	0	0
HEALTH CARE					
359000	0	0	0	0	0
PERSONNEL ACTIVITIES					
360000	0	0	0	0	0
PERSONNEL SUPPORT					
361000	0	0	0	0	0
SUSTAINING INVESTMENTS					
362000	0	0	0	0	0
363000	0	0	0	0	0

WEAPON SYSTEM LCC TEST RUN

DATE 11/25/77

*****BASE YEAR 1 CONSTANT DOLLARS*****

COST BREAKDOWN BY YEAR

\$\$\$ COSTS IN THOUSAND DOLLARS \$\$\$

COST BREAKDOWN STRUCTURE NUMBER	COST FOR YEAR				
	1	2	3	4	5
COST BREAKDOWN STRUCTURE ELEMENT					
351000	0	0	0	0	0
352000	0	0	0	0	0
353000	0	0	0	0	0
354000	0	0	0	0	0
REPLACEMENT SPARES					
400000	0	0	0	0	0
401000	0	0	0	0	0
402000	0	0	0	0	0
403000	0	0	0	0	0
404000	0	0	0	0	0
405000	0	0	0	0	0
406000	0	0	0	0	0
407000	0	0	0	0	0
408000	0	0	0	0	0
409000	0	0	0	0	0
410000	0	0	0	0	0
411000	0	0	0	0	0
412000	0	0	0	0	0
413000	0	0	0	0	0
414000	0	0	0	0	0
415000	0	0	0	0	0
416000	0	0	0	0	0
417000	0	0	0	0	0
418000	0	0	0	0	0
419000	0	0	0	0	0
420000	0	0	0	0	0
421000	0	0	0	0	0
422000	0	0	0	0	0
423000	0	0	0	0	0
424000	0	0	0	0	0
425000	0	0	0	0	0
426000	0	0	0	0	0
427000	0	0	0	0	0
428000	0	0	0	0	0
429000	0	0	0	0	0
430000	0	0	0	0	0
431000	0	0	0	0	0
432000	0	0	0	0	0
433000	0	0	0	0	0
434000	0	0	0	0	0
435000	0	0	0	0	0
436000	0	0	0	0	0
437000	0	0	0	0	0
438000	0	0	0	0	0
439000	0	0	0	0	0
440000	0	0	0	0	0
441000	0	0	0	0	0
442000	0	0	0	0	0
443000	0	0	0	0	0
444000	0	0	0	0	0
445000	0	0	0	0	0
446000	0	0	0	0	0
447000	0	0	0	0	0
448000	0	0	0	0	0
449000	0	0	0	0	0
450000	0	0	0	0	0
451000	0	0	0	0	0
452000	0	0	0	0	0
453000	0	0	0	0	0
454000	0	0	0	0	0
455000	0	0	0	0	0
456000	0	0	0	0	0
457000	0	0	0	0	0
458000	0	0	0	0	0
459000	0	0	0	0	0
460000	0	0	0	0	0
461000	0	0	0	0	0
462000	0	0	0	0	0
463000	0	0	0	0	0
464000	0	0	0	0	0
465000	0	0	0	0	0
466000	0	0	0	0	0
467000	0	0	0	0	0
468000	0	0	0	0	0
469000	0	0	0	0	0
470000	0	0	0	0	0
471000	0	0	0	0	0
472000	0	0	0	0	0
473000	0	0	0	0	0
474000	0	0	0	0	0
475000	0	0	0	0	0
476000	0	0	0	0	0
477000	0	0	0	0	0
478000	0	0	0	0	0
479000	0	0	0	0	0
480000	0	0	0	0	0
481000	0	0	0	0	0
482000	0	0	0	0	0
483000	0	0	0	0	0
484000	0	0	0	0	0
485000	0	0	0	0	0
486000	0	0	0	0	0
487000	0	0	0	0	0
488000	0	0	0	0	0
489000	0	0	0	0	0
490000	0	0	0	0	0
491000	0	0	0	0	0
492000	0	0	0	0	0
493000	0	0	0	0	0
494000	0	0	0	0	0
495000	0	0	0	0	0
496000	0	0	0	0	0
497000	0	0	0	0	0
498000	0	0	0	0	0
499000	0	0	0	0	0
500000	0	0	0	0	0
TERMINATION					

*****BASE YEAR= 1 *****CONSTANT DOLLARS*****

COST BREAKDOWN BY YEAR

\$\$\$ COSTS IN THOUSAND DOLLARS \$\$\$

COST STRUCTURE NUMBER	LIFE CYCLE COST	COST FOR YEAR									
		6	7	8	9	10					
000000	RESEARCH AND DEVELOPMENT	322,001	377,356	301,213	403,407	709,296					
100000	VALIDATION	60,978	0	0	0	0					
110000	CONTRACTOR	0	0	0	0	0					
111000	GOVERNMENT	0	0	0	0	0					
120000	FULL SCALE DEVELOPMENT	60,978	0	0	0	0					
121000	CONTRACTOR	57,615	0	0	0	0					
121100	PROGRAM MANAGEMENT	4,128	0	0	0	0					
121200	ENGINEERING	26,078	0	0	0	0					
121300	PROTOTYPE HARDWARE	9,257	0	0	0	0					
121400	SOFTWARE	0	0	0	0	0					
121500	INTEGRATION AND TEST	16,680	0	0	0	0					
121600	DOCUMENTATION	1,400	0	0	0	0					
121700	GOVERNMENT	3,363	0	0	0	0					
122000	PROJECT MANAGEMENT	626	0	0	0	0					
122100	SYSTEMS ENGINEERING	631	0	0	0	0					
122200	SYSTEM TEST AND EVALUATION	2,104	0	0	0	0					
122300	TEST PERSONNEL AND TRAINING	100	0	0	0	0					
122310	TEST SPARES	104	0	0	0	0					
122320	TEST ARE/SE/TE	820	0	0	0	0					
122330	TEST FACILITIES	920	0	0	0	0					
122400	FOREIGN MILITARY SALES	0	0	0	0	0					
200000	INVESTMENT	259,003	362,774	355,004	406,703	625,459					
210000	ACQUISITION (CONTRACTOR)	242,000	293,700	343,241	400,142	619,010					
211000	PRODUCTION HARDWARE	0	12,000	100,000	250,000	300,000					
212000	PRODUCTION SUPPORT EQUIPMENT	0	30,000	90,000	120,000	210,000					
213000	TRAINING	12,686	162,086	0	0	0					
214000	INTEGRATION AND TEST	0	21,800	0	0	0					
215000	PROGRAM MANAGEMENT	0	26,800	0	0	0					
216000	DOCUMENTATION	0	720	135	960	9,010					
217000	TECHNICAL SUPPORT	204,242	7,000	6,440	5,860	0					
218000	INDUSTRIAL FACILITIES	5,800	0	0	0	0					
219000	INITIAL SPARES AND REPAIR PARTS	0	0	0	0	0					
220000	GOVERNMENT	20,000	33,333	66,667	33,333	100,000					
221000	GPE/TFM	16,995	68,996	12,643	6,551	6,449					
222000	COMMON SUPPORT EQUIPMENT	0	0	0	0	0					
223000	TRAINING	11,206	17,028	11,000	5,544	5,544					
224000	SYSTEM TEST AND EVALUATION	1,386	21,800	0	0	0					
225000	PROJECT MANAGEMENT	0	26,800	0	0	0					
226000	DOCUMENTATION	3,000	102	190	147	0					
227000	SITE ACTIVATION	1,243	1,053	1,260	730	730					
227100	OPERATIONAL STIES	0	0	0	0	0					
227200	MAINTENANCE FACILITIES	1,243	1,053	1,260	730	730					
229000	SUPPLY INTRODUCTION	0	0	0	0	0					

WEAPON SYSTEM LCC TEST RUN

DATE 11/25/77

*****BASE YEAR= 1 *****CONSTANT DOLLARS*****

/COST BREAKDOWN BY YEAR

\$\$\$ COSTS IN THOUSAND DOLLARS \$\$\$

COST BREAKDOWN STRUCTURE NUMBER	COST BREAKDOWN STRUCTURE ELEMENT	COST FOR YEAR						
		6	7	8	9	10		
220000	TRANSPORTATION	0	0	105	140	175		
300000	OPERATING AND SUPPORT	1,310	14,582	35,329	56,794	93,837		
310000	OPERATING	0	2,103	5,566	10,709	15,683		
311000	CREW	0	1,872	2,809	4,690	5,616		
312000	STAFF	0	36	109	144	252		
313000	MATERIAL	0	160	2,560	5,760	9,600		
314000	SECURITY	0	15	30	45	75		
315000	OTHER DEPLOYED MANPOWER	0	0	0	0	0		
316000	PERSONNEL SUPPORT	0	20	60	80	140		
320000	O/I MAINTENANCE ACTIVITY	0	7,799	15,796	25,341	35,549		
321000	AFLDPT FACILITIES	0	220	4,414	7,251	12,085		
321100	LABOR	0	170	3,014	4,531	7,585		
321110	WEAPON SYSTEM MAINTENANCE	0	0	2,594	4,041	6,735		
321120	ORDNANCE MAINTENANCE	0	170	340	510	850		
321200	MATERIAL	0	50	800	1,800	3,000		
321300	PERSONNEL SUPPORT	0	0	600	900	1,500		
321400	SITE MAINTENANCE	0	0	0	0	0		
322000	ASHORE FACILITIES	0	0	0	0	0		
322100	LABOR	0	0	0	0	0		
322110	WEAPON SYSTEM MAINTENANCE	0	7,578	11,362	18,090	24,464		
322120	ORDNANCE MAINTENANCE	0	5,729	8,762	14,490	17,864		
322200	MATERIAL	0	5,389	8,082	13,470	16,164		
322300	PERSONNEL SUPPORT	0	340	880	1,020	1,700		
330000	INSTALLATION SUPPORT	0	1,800	1,800	1,800	3,600		
331000	SITE MAINTENANCE	0	0	0	0	0		
332000	BASE OPERATING SUPPORT	0	110	240	350	590		
333000	REAL PROPERTY MAINTENANCE	0	20	60	80	140		
334000	PERSONNEL SUPPORT	0	0	0	0	0		
335000	DEPT MAINTENANCE	0	90	180	270	450		
340000	SCHEDULED MAINTENANCE	0	125	1,996	4,491	7,486		
341000	UNCHEDULED MAINTENANCE	0	5	72	163	272		
342000	MODERNIZATION	0	0	4	4	14		
343000	CONVENT REPAIR	0	120	1,920	4,320	7,200		
344000	DEPT SUPPLY	0	0	0	0	0		
350000	TECHNICAL SUPPORT	1,310	3,429	5,882	4,319	5,437		
351000	TECHNICAL SUPPORT	1,310	1,773	2,435	2,756	3,890		
352000	SECOND DESTINATION TRANSPORTATION	0	1,654	3,447	1,554	1,547		
353000	SCHEDULED	0	0	1	2	4		
354000	UNCHEDULED	0	0	0	0	0		
355000	PERSONNEL SUPPORT AND TRAINING	0	0	0	0	0		
356000	INDIVIDUAL TRAINING	0	125	230	305	495		
357000	HEALTH CARE	0	50	50	50	50		
358000	PERSONNEL ACTIVITIES	0	45	90	135	225		
359000	PERSONNEL SUPPORT	0	10	30	40	70		
360000	SUSTAINING INVESTMENTS	0	20	60	80	140		
361000		0	892	5,617	11,755	17,604		

DATE 11/25/77

WEAPON SYSTEM LCC TEST RUN

PAGE 8.006

COST BREAKDOWN BY YEAR

COST BREAKDOWN BY YEAR

*****BASE YEAR= 1 *****CONSTANT DOLLARS*****

COST WEAPON SYSTEM STRUCTURE NUMBER	COST BREAKDOWN STRUCTURE ELEMENT	COST FOR YEAR									
		6	7	8	9	10	11	12	13	14	15
31000	REPLENISHMENT SPARES	0	1	15	36	56					
32000	IDENTIFICATIONS	0	260	3,840	8,640	14,400					
33000	REPLENISHMENT SUPPORT EQUIPMENT	0	641	1,603	2,233	2,548					
34000	EXPENDABLE STORES	0	10	160	360	600					
40000	ASSOCIATED SYSTEMS	0	0	0	0	0					
41000	INVESTMENT	0	0	0	0	0					
42000	MOBILE LOGISTICS SUPPORT FORCE	0	0	0	0	0					
43000	TENDERS AND REPAIR SHIPS	0	0	0	0	0					
44000	ASPHALT TMA	0	0	0	0	0					
45000	OPERATING AND SUPPORT	0	0	0	0	0					
46000	MOBILE LOGISTICS SUPPORT FORCE	0	0	0	0	0					
47000	TENDERS AND REPAIR SHIPS	0	0	0	0	0					
48000	ASPHALT TMA	0	0	0	0	0					
49000	ARMED SYSTEMS	0	0	0	0	0					
50000	TERMINATION	0	0	0	0	0					

WEAPON SYSTEM LCC TEST RUN

DATE 11/25/77

*****BASE YEAR= 1 *****CONSTANT DOLLARS*****

*****COST BREAKDOWN BY YEAR*****

\$\$\$ COSTS IN THOUSAND DOLLARS \$\$\$

COST BREAKDOWN STRUCTURE NUMBER	LIFE CYCLE COST	C O S T F O R Y E A R				
		11	12	13	14	15
000000	RESEARCH AND DEVELOPMENT	825,339	807,537	954,091	975,032	950,672
100000	VALUATION	0	0	0	0	0
110000	CONTRACTOR	0	0	0	0	0
111000	GOVERNMENT	0	0	0	0	0
120000	FULL SCALE DEVELOPMENT	0	0	0	0	0
121000	CONTRACTOR	0	0	0	0	0
121100	PROGRAM MANAGEMENT	0	0	0	0	0
121200	ENGINEERING	0	0	0	0	0
121300	PROTOTYPE HARDWARE	0	0	0	0	0
121400	SOFTWARE	0	0	0	0	0
121500	INTEGRATION AND TEST	0	0	0	0	0
121600	DOCUMENTATION	0	0	0	0	0
122000	GOVERNMENT	0	0	0	0	0
122100	PROJECT MANAGEMENT	0	0	0	0	0
122200	SYSTEMS ENGINEERING	0	0	0	0	0
122300	SYSTEM TEST AND EVALUATION	0	0	0	0	0
122310	TEST PERSONNEL AND TRAINING	0	0	0	0	0
122320	TEST SPARES	0	0	0	0	0
122330	TEST AREAS/TESTS	0	0	0	0	0
122340	TEST FACILITIES	0	0	0	0	0
122400	FOREIGN MILITARY SALES	0	0	0	0	0
200000	INVESTMENT	714,199	675,339	790,919	795,585	753,543
210000	ACQUISITION (CONTRACTOR)	709,873	672,000	798,667	795,333	753,333
211000	PRODUCTION HARDWARE	632,000	432,000	432,000	432,000	360,000
212000	PRODUCTION SUPPORT EQUIPMENT	240,000	240,000	300,000	330,000	360,000
213000	TRAINING	0	0	0	0	0
214000	INTEGRATION AND TEST	0	0	0	0	0
215000	PROGRAM MANAGEMENT	0	0	0	0	0
216000	DOCUMENTATION	0	0	0	0	0
217000	TECHNICAL SUPPORT	4,340	0	0	0	0
218000	INDUSTRIAL FACILITIES	0	0	0	0	0
219000	INITIAL SPARES AND REPAIR PARTS	33,333	0	66,667	33,333	33,333
220000	GOVERNMENT	6,526	3,339	252	252	210
221000	GENERAL	5,544	2,772	0	0	0
222000	COMBAT SUPPORT EQUIPMENT	0	0	0	0	0
223000	TRAINING	0	0	0	0	0
224000	SYSTEM TEST AND EVALUATION	0	0	0	0	0
225000	PROJECT MANAGEMENT	0	0	0	0	0
226000	DOCUMENTATION	0	0	0	0	0
227000	SITE ACTIVATION	730	315	0	0	0
227100	OPERATIONAL SITES	0	0	0	0	0
227200	MAINTENANCE FACILITIES	730	315	0	0	0
228000	SUPPLY INTRODUCTION	0	0	0	0	0

DATE 11/25/77		WEAPON SYSTEM LCC TEST RUN		PAGE 0,000		
SSB COSTS IN THOUSAND DOLLARS \$\$\$		COST BREAKDOWN BY YEAR		*****BASE YEAR= 1 *****CONSTANT DOLLARS*****		
COST BREAKDOWN STRUCTURE ELEMENT		C O S T F O R Y E A R				
COST BREAKDOWN STRUCTURE ELEMENT		11	12	13	14	15
COST BREAKDOWN STRUCTURE ELEMENT		252	232	252	252	210
223000	TRANSPORTATION					
309000	OPERATING AND SUPPORT					
313000	OPERATING	189,140	132,190	155,572	179,447	197,129
311000	CREW	22,130	20,180	34,209	38,920	41,575
312000	STAFF	6,552	7,450	9,424	8,424	7,406
313000	MATERIAL	288	280	360	336	432
314000	SECURITY	15,040	20,160	25,120	29,760	33,280
315000	OTHER DEPLOYED MANPOWER	90	90	105	120	135
316000	PERSONNEL SUPPORT	0	0	0	0	0
317000	D/I MAINTENANCE ACTIVITY	160	160	200	220	240
318000	AIRCRAFT FACILITIES	42,106	40,000	55,951	63,702	69,859
321000	LAND	15,602	17,202	20,569	23,435	26,753
321100	WEAPON SYSTEM MAINTENANCE	9,102	9,102	10,619	12,136	13,653
321120	MAINTENANCE	8,082	8,092	9,429	10,775	12,123
321200	MATERIAL	1,020	1,020	1,140	1,360	1,530
321300	PERSONNEL SUPPORT	4,700	6,300	7,850	9,300	10,400
321400	SITE MAINTENANCE	1,800	1,800	2,100	2,400	2,700
322000	ASHORE FACILITIES	0	0	0	0	0
322100	LAND	26,504	30,790	35,302	39,854	43,106
322110	WEAPON SYSTEM MAINTENANCE	18,204	20,890	23,932	26,956	29,306
322120	MAINTENANCE	16,164	18,630	21,552	24,246	26,246
322200	MATERIAL	2,040	2,040	2,340	2,720	3,060
322300	PERSONNEL SUPPORT	4,700	6,300	7,850	9,300	10,400
322400	SITE MAINTENANCE	3,600	3,600	3,600	3,600	3,600
330000	INSTALLATION SUPPORT	0	0	0	0	0
331000	BASE OPERATING SUPPORT	700	700	830	940	1,050
332000	REAL PROPERTY MAINTENANCE	140	160	200	220	240
333000	PERSONNEL SUPPORT	0	0	0	0	0
334000	DEPT MAINTENANCE	540	540	610	720	810
335000	SCHEDULED MAINTENANCE	11,727	15,720	19,507	23,205	25,950
336000	UNSCHEDULED MAINTENANCE	425	570	711	842	941
337000	MODERNIZATION	22	29	37	44	49
338000	CONVENT REPAIR	11,200	15,120	18,840	22,320	24,960
339000	DEPT SUPPORT	0	0	0	0	0
340000	MATERIAL MANAGEMENT	5,440	4,220	4,800	5,221	5,604
341000	TECHNICAL SUPPORT	4,221	4,221	4,803	5,213	5,674
342000	SECOND DESTINATION TRANSPORTATION	1,239	0	0	0	0
343000	SCHEDULED	6	6	9	11	13
344000	UNSCHEDULED	5	7	9	10	11
345000	PERSONNEL SUPPORT AND TRAINING	1	1	1	1	1
346000	INDIVIDUAL TRAINING	560	560	665	740	770
347000	HEALTH CARE	50	50	50	50	50
348000	PERSONNEL ACTIVITIES	270	270	315	350	360
349000	PERSONNEL SUPPORT	80	80	100	110	120
350000	SUSTAINING INVESTMENTS	160	150	200	220	240
		26,450	34,795	39,430	44,707	52,229

DATE 11/25/77		WEAPON SYSTEM LCC TEST SUM		PAGE 0.000		
SSS COSTS IN THOUSAND DOLLARS 191		COST F DOWN BY YEAR		PERCENTAGE YEARS 1 CONSTANT DOLLARS*****		
COST STRUCTURE NUMBER	COST BREAKDOWN STRUCTURE ELEMENT	11	12	13	14	15
301000	REPLENISHMENT STAGES	48	118	147	174	195
302000	MODIFICATIONS	22,560	30,240	37,000	44,450	49,920
303000	REPLENISHMENT SUPPORT EQUIPMENT	2,863	3,174	33	33	33
304000	ENGINEERING STAGES	940	1,260	1,570	1,800	2,000
400000	ASSOCIATED SYSTEMS	0	0	0	0	0
410000	INVESTMENT	0	0	0	0	0
411000	MOBILE LOGISTICS SUPPORT FORCE	0	0	0	0	0
412000	TENDERS AND REPAIR SHIPS	0	0	0	0	0
413000	ASWAVE IFA	0	0	0	0	0
414000	OPERATING AND SUPPORT	0	0	0	0	0
421000	MOBILE LOGISTICS SUPPORT FORCE	0	0	0	0	0
422000	TENDERS AND REPAIR SHIPS	0	0	0	0	0
423000	ASWAVE IFA	0	0	0	0	0
424000	ENHANCED SYSTEMS	0	0	0	0	0
500000	TERMINATION	0	0	0	0	0

*****PHASE YEAR 1 - CONSTANT DOLLARS*****

COST BREAKDOWN BY YEAR

\$\$\$ COSTS IN THOUSAND DOLLARS \$\$\$

COST BREAKDOWN NUMBER	COST BREAKDOWN STRUCTURE ELEMENT	COST FOR YEAR				
		16	17	18	19	20
000000	LAKE CYCLE COST	952,094	527,078	518,460	479,724	474,166
100000	RESEARCH AND DEVELOPMENT	0	0	0	0	0
110000	VALIDATION	0	0	0	0	0
111000	CONTRACTOR	0	0	0	0	0
112000	GOVERNMENT	0	0	0	0	0
120000	FULL SCALE DEVELOPMENT	0	0	0	0	0
121000	CONTRACTOR	0	0	0	0	0
121100	PROGRAM MANAGEMENT	0	0	0	0	0
121200	ENGINEERING	0	0	0	0	0
121300	PROTOTYPE HARDWARE	0	0	0	0	0
121400	SOFTWARE	0	0	0	0	0
121500	INTEGRATION AND TEST	0	0	0	0	0
121600	DOCUMENTATION	0	0	0	0	0
122000	GOVERNMENT	0	0	0	0	0
122100	SUBJECT MANAGEMENT	0	0	0	0	0
122200	SYSTEMS ENGINEERING	0	0	0	0	0
122300	SYSTEM TEST AND EVALUATION	0	0	0	0	0
122310	TEST PERSONNEL AND TRAINING	0	0	0	0	0
122320	TEST SPARES	0	0	0	0	0
122330	TEST AGE/SEATE	0	0	0	0	0
122340	TEST FACILITIES	0	0	0	0	0
122400	EXPORT MILITARY SALES	0	0	0	0	0
200000	INVESTMENT	548,168	330,000	330,000	300,000	300,000
210000	ACQUISITION (CONTRACTOR)	548,000	330,000	330,000	300,000	300,000
211000	PRODUCTION HARDWARE	288,000	0	0	0	0
212000	PRODUCTION SUPPORT EQUIPMENT	360,000	330,000	330,000	300,000	300,000
213000	TRAINING	0	0	0	0	0
214000	INTEGRATION AND TEST	0	0	0	0	0
215000	PROGRAM MANAGEMENT	0	0	0	0	0
216000	DOCUMENTATION	0	0	0	0	0
217000	TECHNICAL SUPPORT	0	0	0	0	0
218000	INDUSTRIAL FACILITIES	0	0	0	0	0
219000	INITIAL SPARES AND REPAIR PARTS	0	0	0	0	0
220000	GOVERNMENT	168	0	0	0	0
221000	GENERAL	0	0	0	0	0
222000	COMMON SUPPORT EQUIPMENT	0	0	0	0	0
223000	TRAINING	0	0	0	0	0
224000	SYSTEM TEST AND EVALUATION	0	0	0	0	0
225000	PROJECT MANAGEMENT	0	0	0	0	0
226000	DOCUMENTATION	0	0	0	0	0
227000	SITE ACTIVATION	0	0	0	0	0
228000	INTERNATIONAL SITES	0	0	0	0	0
229000	MAINTENANCE FACILITIES	0	0	0	0	0
230000	SUPPLY INTRODUCTION	0	0	0	0	0

SSS COSTS IN THOUSAND DOLLARS \$\$\$ COST BREAKDOWN BY YEAR *****BASE YEAR= 1 *****CONSTANT DOLLARS*****

COST BREAKDOWN STRUCTURE ELEMENT		COST FOR YEAR				
		16	17	18	19	20
COST BREAKDOWN STRUCTURE ELEMENT	TRANSPORTATION	168	0	0	0	0
300000	OPERATIVE AND SUPPORT	203,926	197,078	188,460	179,724	174,166
310000	OPERATING	43,975	41,368	39,929	38,417	37,137
311000	CREW	7,444	6,552	6,552	6,552	5,552
312000	STAFF	432	394	394	350	360
313000	MATERIAL	35,480	34,080	32,640	31,200	29,920
314000	SECURITY	135	120	120	105	105
315000	OTHER DEPLOYED MANPOWER	0	0	0	0	0
316000	PERSONNEL SUPPORT	240	220	220	200	200
320000	Q71 MAINTENANCE ACTIVITY	68,665	65,504	61,914	59,857	58,057
321000	AFLCOT FACILITIES	27,503	25,184	24,736	22,459	22,069
321100	LABOR	13,653	12,134	12,134	10,619	10,619
321110	WEAPON SYSTEM4 MAINTENANCE	12,123	10,774	10,774	9,429	9,429
321120	ADVANCE MAINTENANCE	1,530	1,430	1,368	1,310	1,190
321200	MATERIAL	11,150	10,630	10,200	9,750	9,350
321300	PERSONNEL SUPPORT	2,700	2,400	2,400	2,100	2,100
321400	SITE MAINTENANCE	0	0	0	0	0
322000	ASPHR FACILITIES	41,162	40,322	37,174	36,334	35,949
322100	LABOR	24,612	24,272	21,574	21,234	21,234
322110	WEAPON SYSTEM4 MAINTENANCE	21,552	21,552	18,856	18,858	18,858
322120	ADVANCE MAINTENANCE	3,060	2,720	2,720	2,340	2,380
322300	MATERIAL	11,150	10,630	10,200	9,750	9,350
322400	PERSONNEL SUPPORT	5,400	5,400	5,400	5,400	5,400
330000	INSTALLATION SUPPORT	1,050	940	940	830	830
310000	BASE OPERATING SUPPORT	240	220	220	200	200
330000	REAL PROPERTY MAINTENANCE	0	0	0	0	0
330000	PERSONNEL SUPPORT	810	720	720	630	630
340000	DEPT MAINTENANCE	27,821	26,574	25,451	24,328	23,330
341000	SCHEDULED MAINTENANCE	1,009	964	923	843	846
342000	UNSCCHEDULED MAINTENANCE	52	30	48	46	44
343000	MODERNIZATION	26,760	25,580	24,480	23,400	22,440
344000	COMPONENT REPAIR	0	0	0	0	0
350000	DEPT SUPPLY	5,684	5,353	5,353	5,023	5,023
310000	MATERIAL MANAGEMENT	5,676	5,346	5,346	5,015	5,015
350000	TECHNICAL SUPPORT	8	8	8	8	8
350000	SECOND DESTINATION TRANSPORTATION	13	13	12	12	11
351000	SCHEDULED	12	12	11	11	10
352000	UNSCCHEDULED	1	1	1	1	1
370000	PERSONNEL SUPPORT AND TRAINING	725	695	650	620	620
371000	INDIVIDUAL TRAINING	50	50	50	50	50
372000	HEALTH CARE	315	315	270	270	270
373000	PERSONNEL ACTIVITIES	110	110	110	100	100
374000	PERSONNEL SUPPORT	240	220	220	200	200
380000	SUSTAINING INVESTMENTS	55,992	56,627	54,211	51,434	49,154

DATE 11/25/77

WEAPON SYSTEM LCC TEST RUN

PAGE 6.012

\$\$\$ COSTS IN THOUSAND DOLLARS \$\$\$

COST BREAKDOWN BY YEAR

*****BASE YEAR= 1 *****CONSTANT DOLLARS*****

COST BREAKDOWN STRUCTURE NUMBER	C O S T F O R Y E A R				
	16	17	18	19	20
COST BREAKDOWN STRUCTURE ELEMENT					
391000 REPLETISHMENT SPARES	209	199	191	193	175
392000 MODIFICATIONS	53,520	51,120	48,960	46,800	44,580
393000 REPLETISHMENT SUPPORT EQUIPMENT	33	3,178	3,020	2,705	2,233
394000 EXPENDABLE STORES	2,230	2,130	2,040	1,950	1,870
ASSOCIATED SYSTEMS					
403000 INVESTMENT	0	0	0	0	0
410000 MOBILE LOGISTICS SUPPORT FORCE	0	0	0	0	0
412000 TENDERS AND REPAIR SHIPS	0	0	0	0	0
413000 ASHORE IFA	0	0	0	0	0
OPERATING AND SUPPORT					
420000 MOBILE LOGISTICS SUPPORT FORCE	0	0	0	0	0
421000 TENDERS AND REPAIR SHIPS	0	0	0	0	0
422000 ASHORE IFA	0	0	0	0	0
423000 EMARKED SYSTEMS	0	0	0	0	0
500000 TERMINATION	0	0	0	0	0

WEAPON SYSTEM LCC TEST RUN

DATE 11/25/77

*****BASE YEAR= 1 *****CONSTANT DOLLARS*****

COST BREAKDOWN BY YEAR

COSTS IN THOUSAND DOLLARS \$\$\$

COST STRUCTURE NUMBER	COST BREAKDOWN STRUCTURE ELEMENT	C O S T F O R Y E A R				
		21	22	23	24	25
000000	LIFE CYCLE COST	468,847	460,086	422,937	418,485	414,036
100000	RESEARCH AND DEVELOPMENT	0	0	0	0	0
110000	VALIDATION	0	0	0	0	0
111000	CONTRACTOR	0	0	0	0	0
112000	GOVERNMENT	0	0	0	0	0
120000	FULL SCALE DEVELOPMENT	0	0	0	0	0
121000	CONTRACTOR	0	0	0	0	0
121100	PROGRAM MANAGEMENT	0	0	0	0	0
121200	ENGINEERING	0	0	0	0	0
121300	PROTOTYPE HARDWARE	0	0	0	0	0
121400	SOFTWARE	0	0	0	0	0
121500	INTEGRATION AND TEST	0	0	0	0	0
121600	DOCUMENTATION	0	0	0	0	0
122000	GOVERNMENT	0	0	0	0	0
122100	PROJECT MANAGEMENT	0	0	0	0	0
122200	SYSTEMS ENGINEERING	0	0	0	0	0
122300	SYSTEM TEST AND EVALUATION	0	0	0	0	0
122310	TEST PERSONNEL AND TRAINING	0	0	0	0	0
122320	TEST SPACES	0	0	0	0	0
122330	TEST AGE/GSE/TE	0	0	0	0	0
122340	TEST FACILITIES	0	0	0	0	0
122400	FOREIGN MILITARY SALES	0	0	0	0	0
200000	INVESTMENT	300,000	300,000	270,000	270,000	270,000
210000	ACQUISITION (CONTRACTOR)	300,000	300,000	270,000	270,000	270,000
211000	PRODUCTION HARDWARE	0	0	0	0	0
212000	PRODUCTION SUPPORT EQUIPMENT	300,000	300,000	270,000	270,000	270,000
213000	TRAINING	0	0	0	0	0
214000	INTEGRATION AND TEST	0	0	0	0	0
215000	PROGRAM MANAGEMENT	0	0	0	0	0
216000	DOCUMENTATION	0	0	0	0	0
217000	TECHNICAL SUPPORT	0	0	0	0	0
218000	INDUSTRIAL FACILITIES	0	0	0	0	0
219000	INITIAL SPARES AND REPAIR PARTS	0	0	0	0	0
220000	GOVERNMENT	0	0	0	0	0
221000	GFE/GFA	0	0	0	0	0
222000	COMMON SUPPORT EQUIPMENT	0	0	0	0	0
223000	TRAINING	0	0	0	0	0
224000	SYSTEM TEST AND EVALUATION	0	0	0	0	0
225000	PROJECT MANAGEMENT	0	0	0	0	0
226000	DOCUMENTATION	0	0	0	0	0
227000	SITE ACTIVATION	0	0	0	0	0
227100	OPERATIONAL SITES	0	0	0	0	0
227200	MAINTENANCE FACILITIES	0	0	0	0	0
228000	SUPPLY INTRODUCTION	0	0	0	0	0

DATE 11/23/77

WEAPON SYSTEM LCC TEST RUN

PAGE 8.010

\$\$\$ COSTS IN THOUSAND DOLLARS \$\$\$

COST BREAKDOWN BY YEAR

*****BASE YEAR= 1 *****CONSTANT DOLLARS*****

COST BREAKDOWN STRUCTURE NUMBER	C O S T F O R Y E A R				
	21	22	23	24	25
COST BREAKDOWN STRUCTURE ELEMENT					
223000 TRANSPORTATION	0	0	0	0	0
300000 OPERATING AND SUPPORT	168,847	160,086	152,937	148,487	144,036
310000 OPERATING	35,857	33,641	32,450	31,330	30,210
311000 CREW	6,552	5,616	5,616	5,615	5,616
312000 STAFF	360	350	324	324	324
313000 MATERIAL	28,640	27,350	26,240	25,120	24,000
314000 SECURITY	105	105	90	90	90
315000 OTHER DEPLOYED MANPOWER	0	0	0	0	0
316000 PERSONNEL SUPPORT	200	200	180	190	180
320000 O/T MAINTENANCE ACTIVITY	57,257	53,763	50,906	50,206	49,506
321000 APLD/AT FACILITIES	21,669	21,259	19,102	18,732	18,402
321100 LABOR	10,619	10,619	9,102	9,102	9,102
321110 WEAPON SYSTEM MAINTENANCE	9,429	9,429	8,092	8,092	8,092
321120 ADVANCE MAINTENANCE	1,190	1,190	1,020	1,020	1,020
321200 MATERIAL	8,950	8,550	8,200	7,850	7,500
321300 PERSONNEL SUPPORT	2,100	2,100	1,800	1,800	1,800
321400 SITE MAINTENANCE	0	0	0	0	0
322000 AS-HORE FACILITIES	35,588	32,434	31,404	31,434	31,104
322100 LABOR	21,238	18,544	18,204	18,204	18,204
322110 WEAPON SYSTEM MAINTENANCE	18,858	16,164	16,164	16,154	16,164
322120 ADVANCE MAINTENANCE	2,380	2,380	2,040	2,040	2,040
322200 MATERIAL	8,950	8,550	8,200	7,850	7,500
322300 PERSONNEL SUPPORT	5,400	5,400	5,400	5,400	5,400
322400 SITE MAINTENANCE	0	0	0	0	0
330000 INSTALLATION SUPPORT	830	830	720	720	720
331000 BASE OPERATING SUPPORT	200	200	180	190	180
332000 REAL PROPERTY MAINTENANCE	0	0	0	0	0
333000 PERSONNEL SUPPORT	630	630	540	540	540
340000 DEPT MAINTENANCE	22,332	21,334	20,461	19,587	18,714
341000 SCHEDULED MAINTENANCE	810	774	742	711	679
342000 UNSCHEDULED MAINTENANCE	42	40	38	37	35
343000 MODERNIZATION	21,480	20,520	19,680	18,840	18,000
344000 COMPONENT REPAIR	0	0	0	0	0
350000 DEPT SUPPORT	5,023	5,023	4,692	4,692	4,692
351000 MATERIAL MANAGEMENT	5,015	5,015	4,684	4,684	4,684
352000 TECHNICAL SUPPORT	0	0	0	0	0
353000 SECOND DESTINATION TRANSPORTATION	11	10	10	9	9
354000 SCHEDULED	11	10	10	9	8
355000 UNSCHEDULED	1	1	1	1	1
370000 PERSONNEL SUPPORT AND TRAINING	620	575	545	545	545
371000 INITIAL TRAINING	50	50	50	50	50
372000 HEALTH CARE	270	225	225	225	225
373000 PERSONNEL ACTIVITIES	100	100	90	90	90
374000 PERSONNEL SUPPORT	200	200	180	190	180
380000 SUSTAINING INVESTMENTS	46,918	44,910	43,154	41,397	39,640

DATE 11/25/77

WEAPON SYSTEM LCC TEST RUN

PAGE 8.015

999 COSTS IN THOUSAND DOLLARS \$\$\$

COST BREAKDOWN BY YEAR

*****BASE YEAR= 1 *****CONSTANT DOLLARS*****

COST BREAKDOWN STRUCTURE NUMBER	COST BREAKDOWN STRUCTURE ELEMENT	C O S T F O R Y E A R				
		21	22	23	24	25
391000	REPLACEMENT SPARES	168	168	154	147	140
392000	MODIFICATIONS	42,900	41,000	39,260	37,680	36,000
393000	REPLACEMENT SUPPORT EQUIPMENT	2,000	2,000	2,000	2,000	2,000
394000	REPAIRABLE SPARES	1,190	1,770	1,860	1,870	1,500
400000	ASSOCIATED SYSTEMS	0	0	0	0	0
410000	INVESTMENT	0	0	0	0	0
411000	WHALE LOGISTICS SUPPORT FORCE	0	0	0	0	0
412000	TENSING AND REPAIR SPARES	0	0	0	0	0
413000	ASMORE 1VA	0	0	0	0	0
420000	OPERATIVES AND SUPPORT	0	0	0	0	0
421000	WHALE LOGISTICS SUPPORT FORCE	0	0	0	0	0
422000	TENSING AND REPAIR SPARES	0	0	0	0	0
423000	ASMORE 1VA	0	0	0	0	0
424000	EMERGED SYSTEMS	0	0	0	0	0
500000	TERMINATION	0	0	0	0	0

DATE 11/25/77

HEADON SYSTEM LCC TEST RUN

PAGE 0.010

\$\$\$ COSTS IN THOUSAND DOLLARS \$\$\$

COST BREAKDOWN BY YEAR

*****BASE YEAR= 1 *****CONSTANT DOLLARS*****

----- COST FOR YEAR ----->

COST BREAKDOWN STRUCTURE ELEMENT

26

410.172

LIFE CYCLE COST

100000	RESEARCH AND DEVELOPMENT	0
110000	VALIDATION	0
111000	CONTRACTOR	0
112000	GOVERNMENT	0
120000	FULL SCALE DEVELOPMENT	0
121000	CONTRACTOR	0
121100	PROGRAM MANAGEMENT	0
121200	ENGINEERING	0
121300	PROTOTYPE HARDWARE	0
121400	SOFTWARE	0
121500	INTEGRATION AND TEST	0
121600	DOCUMENTATION	0
122000	GOVERNMENT	0
122100	PROJECT MANAGEMENT	0
122200	SYSTEMS ENGINEERING	0
122300	SYSTEM TEST AND EVALUATION	0
122310	TEST PERSONNEL AND TRAINING	0
122320	TEST SPARES	0
122330	TEST AGE/SEITE	0
122340	TEST FACILITIES	0
122400	FOREIGN MILITARY SALES	0
200000	INVESTMENT	270.000
210000	ACQUISITION (CONTRACTOR)	270.000
211000	PRODUCTION HARDWARE	0
212000	PRODUCTION SUPPORT EQUIPMENT	270.000
213000	TRAINING	0
214000	INTEGRATION AND TEST	0
215000	PROGRAM MANAGEMENT	0
216000	DOCUMENTATION	0
217000	TECHNICAL SUPPORT	0
218000	INDUSTRIAL FACILITIES	0
219000	INITIAL SPARES AND REPAIR PARTS	0
220000	GOVERNMENT	0
221000	GFE/3FA	0
222000	COMBAT SUPPORT EQUIPMENT	0
223000	TRAINING	0
224000	SYSTEM TEST AND EVALUATION	0
225000	PROJECT MANAGEMENT	0
226000	DOCUMENTATION	0
227000	SITE ACTIVATION	0
227100	OPERATIONAL SITES	0
227200	MAINTENANCE FACILITIES	0
228000	SUPPLY INTRODUCTION	0

DATE 11/25/77

WEAPON SYSTEM LCC TEST RUN

PAGE 8.017

\$\$\$ COSTS IN THOUSAND DOLLARS \$\$\$

COST BREAKDOWN BY YEAR

*****BASE YEARS 1 CONSTANT DOLLARS*****

COST
BREAKDOWN
STRUCTURE
NUMBER

COST BREAKDOWN STRUCTURE ELEMENT

COST FOR YEAR

26

0

TRANSPORTATION

160.172

OPERATING AND SUPPORT

294250

CREW

5.616

STAFF

324

MATERIAL

23.040

SECURITY

90

OTHER DEPLOYED MANPOWER

0

PERSONNEL SUPPORT

180

O&I MAINTENANCE ACTIVITY

48.906

AFLOAT FACILITIES

18.102

LABOR

9.102

READY SYSTEM MAINTENANCE

8.082

ORDNANCE MAINTENANCE

1.020

MATERIAL

7.200

PERSONNEL SUPPORT

1.800

SITE MAINTENANCE

0

ASPHRE FACILITIES

30.804

LABOR

18.204

READY SYSTEM MAINTENANCE

16.164

ORDNANCE MAINTENANCE

2.040

MATERIAL

7.200

PERSONNEL SUPPORT

5.400

SITE MAINTENANCE

0

INSTALLATION SUPPORT

720

BASE OPERATING SUPPORT

180

REAL PROPERTY MAINTENANCE

0

PERSONNEL SUPPORT

540

DEPT MAINTENANCE

17.985

SCHEDULED MAINTENANCE

652

UNSCCHEDULED MAINTENANCE

34

MODERNIZATION

17.280

CONSUMABLES

0

DEPT SUPPLY

4.692

MATERIAL MANAGEMENT

4.684

TECHNICAL SUPPORT

9

SECOND DESTINATION TRANSPORTATION

9

SCHEDULED

1

UNSCCHEDULED

1

PERSONNEL SUPPORT AND TRAINING

495

INDIVIDUAL TRAINING

0

HEALTH CARE

225

PERSONNEL ACTIVITIES

90

PERSONNEL SUPPORT

180

SUSTAINING INVESTMENTS

36.135

DATE 11/25/77

WEAPON SYSTEM LCC TEST RUN

PAGE 0.018

YSS COSTS IN THOUSAND DOLLARS \$\$\$

COST BREAKDOWN BY YEAR

*****BASE YEAR= 1 *****CONSTANT DOLLARS*****

COST BREAKDOWN STRUCTURE ELEMENT		COST FOR YEAR	
COST	STRUCTURE	26	
361400	REPLENISHMENT SPARES	135	
382000	MODIFICATIONS	34,340	
393000	REPLENISHMENT SUPPORT EQUIPMENT	2,800	
384000	EXPENDABLE SPARES	1,440	
400000	ASSOCIATED SYSTEMS		
410000	INVESTMENT		
411000	WHALE LOGISTICS SUPPORT FORCE		
412000	TENDERS AND REPAIR SHIPS		
413000	AS-33E 1A		
420000	OPERATING AND SUPPORT		
421000	WHALE LOGISTICS SUPPORT FORCE		
422000	TENDERS AND REPAIR SHIPS		
423000	AS-33E 1A		
424000	ENGAGED SYSTEMS		
500000	TERMINATION		

*****BASE YEAR= 1 *****CONSTANT DOLLARS*****

COST BREAKDOWN TOTALS

\$\$\$ COSTS IN THOUSAND DOLLARS \$\$\$

COST BREAKDOWN NUMBER	COST BREAKDOWN STRUCTURE ELEMENT	TOTAL ADJUSTED COST	PERCENTS OF TOTAL ADJUSTED COST FOR TOTAL LIFE CYCLE
000000	LIFE CYCLE COST	12,756,695	100.0
100000	RESEARCH AND DEVELOPMENT	5,874,930	46.5
110000	VALIDATION	85,291	0.7
111000	CONTRACTOR	84,789	0.7
112000	GOVERNMENT	502	0.0
120000	FULL SCALE DEVELOPMENT	502,639	3.9
121000	CONTRACTOR	477,793	3.7
121100	SYSTEMS MANAGEMENT	33,294	0.3
121200	ENGINEERING	228,440	1.8
121300	PROTOTYPE HARDWARE	80,710	0.6
121400	SOFTWARE	0	0.0
121500	INTEGRATION AND TEST	118,463	0.9
121600	DOCUMENTATION	16,885	0.1
122000	GOVERNMENT	24,846	0.2
122100	PROJECT MANAGEMENT	5,180	0.0
122200	SYSTEMS ENGINEERING	5,187	0.0
122300	SYSTEM TEST AND EVALUATION	14,479	0.1
122310	TEST PERSONNEL AND TRAINING	1,790	0.0
122320	TEST SPARES	1,181	0.0
122330	TEST AGE/SEATE	5,704	0.0
122340	TEST FACILITIES	5,804	0.0
122400	FOREIGN MILITARY SALES	0	0.0
200000	INVESTMENT	9,338,968	73.2
210000	ACQUISITION (CONTRACTOR)	9,215,995	72.2
211000	PRODUCTION HARDWARE	3,108,000	24.4
212000	PRODUCTION SUPPORT EQUIPMENT	5,219,999	40.9
213000	TRAINING	174,772	1.4
214000	INFORMATION AND TEST	21,800	0.2
215000	PROGRAM MANAGEMENT	26,800	0.2
216000	DOCUMENTATION	206,074	1.6
217000	TECHNICAL SUPPORT	38,550	0.3
218000	INDUSTRIAL FACILITIES	0	0.0
219000	INITIAL SPARES AND REPAIR PARTS	420,000	3.3
220000	GOVERNMENT	122,973	1.0
221000	OFF/TECH	0	0.0
222000	COMMON SUPPORT EQUIPMENT	58,806	0.5
223000	TRAINING	2,772	0.0
224000	SYSTEM TEST AND EVALUATION	21,400	0.2
225000	PROJECT MANAGEMENT	26,800	0.2
226000	DOCUMENTATION	3,519	0.0
227000	SITE ACTIVATION	6,870	0.1
227100	OPERATIONAL SITES	0	0.0
227200	MAINTENANCE FACILITIES	6,870	0.1
228000	SUPPLY PRODUCTION	592	0.0

NOTES ON THE SYSTEMS

DATE 11/29/77

*****BASE YEAR= 1 CONSTANT COLLEGE*****

COST BREAKDOWN TOTALS

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223000	TRANSPORTATION	1.813	0.0	22.2
30000	OPERATING AND SUPPORT	2,829,799		
31000	OPERATIONS	592,644		
31100	CRA	121,690		4.6
31200	STAFF	6,264		
31300	MATERIAL	459,360		
31400	SECURITY	1,850		
31500	OTHER DEPLOYED MANPOWER	3,490		
31600	PERSONNEL SUPPORT	988,647		
32000	DEPT MAINTENANCE ACTIVITY	367,211		
32100	ACTUAL FACILITIES	186,761		
32110	LARZ	165,681		
32111	ARMY SYSTEM MAINTENANCE	21,080	1.3	
32112	NAVY MAINTENANCE	147,550	0.2	
32120	MATERIAL	21,080	1.1	
32130	PERSONNEL SUPPORT	147,550	0.3	
32140	SITE MAINTENANCE	36,900	0.0	
32160	ASPHRE FACILITIES	0		
32200	LARZ	621,436		4.9
32210	ARMY SYSTEM MAINTENANCE	389,686	3.1	
32211	NAVY MAINTENANCE	347,326	2.7	
32212	MATERIAL	42,160	0.3	
32220	PERSONNEL SUPPORT	147,550	1.1	
32230	SITE MAINTENANCE	88,200	0.7	
32240	INSTALLATION SUPPORT	0	0.0	
33000	BASE OPERATING SUPPORT	14,640		0.1
33100	REAL PROPERTY MAINTENANCE	3,480		
33200	PERSONNEL SUPPORT	0		
33300	DEPT MAINTENANCE	11,160		
34000	SCHEDULED MAINTENANCE	358,185		2.9
34100	UNSCHEJLED MAINTENANCE	12,993		
34200	CONVERSION	872		
34300	COMPONENT REPAIR	344,520		
34400	DEPT SUPPLY	0		
35000	MATERIAL MANAGEMENT	107,664		0.8
35100	TECHNICAL SUPPORT	94,104		
35200	SECOND DESTINATION TRANSPORTATION	9,560		
35300	SCHEDULED	173		0.0
35400	UNSCHEJLED	158		
36000	PERSONNEL SUPPORT AND TRAINING	16		
37000	INDIVIDUAL TRAINING	11,075		0.1
37100	HEALTH CARE	950		
37200	PERSONNEL ACTIVITIES	4,905		
37300	PERSONNEL SUPPORT	1,740		
37400	SUSTAINING INVESTMENTS	3,490		
40000		756,769		5.9

*****BASE YEAR= 1 *****CONSTANT DOLLARS*****

COST BREAKDOWN TOTALS

SSS COSTS IN THOUSAND DOLLARS \$\$\$

COST BREAKDOWN STRUCTURE NUMBER	COST BREAKDOWN STRUCTURE ELEMENT	TOTAL ADJUSTED COST	PERCENTS OF TOTAL ADJUSTED COST FOR TOTAL LIFE CYCLE
381000	REPLETISHMENT SPARES	2.687	0.0
382000	MODIFICATIONS	689.060	5.4
383000	REPLETISHMENT SUPPORT EQUIPMENT	36.332	0.3
384000	EXPENDABLE STORES	28.710	0.2
401000	ASSOCIATED SYSTEMS	0	0.0
410000	INVESTMENT	0	0.0
411000	MOBILE LOGISTICS SUPPORT FORCE	0	0.0
412000	TENDERS AND REPAIR SHIPS	0	0.0
413000	ASWAGE TMA	0	0.0
420000	OPERATING AND SUPPORT	0	0.0
421000	MOBILE LOGISTICS SUPPORT FORCE	0	0.0
422000	TENDERS AND REPAIR SHIPS	0	0.0
423000	ASWAGE TMA	0	0.0
424000	EMBARKEE SYSTEMS	0	0.0
500000	TERMINATION	0	0.0

*****BASE YEAR= 1 *****CONSTANT DOLLARS*****

GENERAL FUNDING REPORT

955 COSTS IN THOUSAND DOLLARS \$\$\$

COST STRUCTURE NUMBER	COST BREAKDOWN STRUCTURE ELEMENT	GENERAL TYPE OF FUNDING					CONSTANT DOLLARS				
		R & D	PROCURE- MENT	CONSTRUC- TION	O & M	4IL. PER- SONNEL	OTHERS	TOTAL			
000000	LIFE CYCLE COST	507,330	10,027,647	24,292	1,085,292	131,544		012,756,695			
100000	RESEARCH AND DEVELOPMENT	507,330	0	0	0	0	0	507,330			
110000	VALIDATION	85,291	0	0	0	0	0	85,291			
111000	CONTRACTOR	85,291	0	0	0	0	0	85,291			
112000	GOVERNMENT	302	0	0	0	0	0	302			
120000	FULL SCALE DEVELOPMENT	502,539	0	0	0	0	0	502,539			
121000	CONTRACTOR	477,793	0	0	0	0	0	477,793			
121100	PROGRAM MANAGEMENT	33,294	0	0	0	0	0	33,294			
121200	ENGINEERING	225,440	0	0	0	0	0	225,440			
121300	ACQUISITION HARDWARE	80,710	0	0	0	0	0	80,710			
121400	SOFTWARE	0	0	0	0	0	0	0			
121500	INTEGRATION AND TEST	118,463	0	0	0	0	0	118,463			
121600	DOCUMENTATION	16,995	0	0	0	0	0	16,995			
122000	GOVERNMENT	24,346	0	0	0	0	0	24,346			
122100	PROJECT MANAGEMENT	5,150	0	0	0	0	0	5,150			
122200	SYSTEMS ENGINEERING	5,107	0	0	0	0	0	5,107			
122300	SYSTEM TEST AND EVALUATION	15,479	0	0	0	0	0	15,479			
122310	TEST PERSONNEL AND TRAINING	1,730	0	0	0	0	0	1,730			
122320	TEST SPARES	1,191	0	0	0	0	0	1,191			
122330	TEST AFFECTIVE	5,704	0	0	0	0	0	5,704			
122340	TEST FACILITIES	5,304	0	0	0	0	0	5,304			
122400	FOREIGN MILITARY SALES	0	0	0	0	0	0	0			
200000	INVESTMENT	0	9,269,927	9,642	59,398	0	0	9,338,965			
210000	ACQUISITION (CONTRACTOR)	0	9,215,995	0	0	0	0	9,215,995			
211000	PRODUCTION HARDWARE	0	3,108,000	0	0	0	0	3,108,000			
212000	DOCLUTAR SUPPLY EQUIPMENT	0	5,219,999	0	0	0	0	5,219,999			
213000	TRAINING	0	174,772	0	0	0	0	174,772			
214000	INTEGRATION AND TEST	0	21,800	0	0	0	0	21,800			
215000	PROGRAM MANAGEMENT	0	25,800	0	0	0	0	25,800			
216000	DOCUMENTATION	0	205,074	0	0	0	0	205,074			
217000	TECHNICAL SUPPORT	0	39,550	0	0	0	0	39,550			
218000	INDUSTRIAL FACILITIES	0	0	0	0	0	0	0			
219000	INITIAL SPARES AND REPAIR PARTS	0	420,000	0	0	0	0	420,000			
220000	GOVERNMENT	0	53,932	9,642	59,398	0	0	122,972			
221000	OPERATION	0	0	0	0	0	0	0			
222000	COMMON SUPPORT EQUIPMENT	0	0	0	58,806	0	0	58,806			
223000	TRAINING	0	0	2,772	0	0	0	2,772			
224000	SYSTEM TEST AND EVALUATION	0	21,800	0	0	0	0	21,800			
225000	PROJECT MANAGEMENT	0	25,800	0	0	0	0	25,800			
226000	DOCUMENTATION	0	3,519	0	0	0	0	3,519			
227000	SITE ACTIVATION	0	0	6,070	0	0	0	6,070			
228000	OPERATIONAL SITES	0	0	0	0	0	0	0			
229000	MAINTENANCE FACILITIES	0	0	0	0	0	0	0			
230000	SUPPLY INTRODUCTION	0	0	5,670	0	0	0	5,670			
231000		0	0	0	592	0	0	592			

WEAPON SYSTEM LCC TEST RUN

DATE 11/23/77

GENERAL FUNDING REPORT *****BASE YEAR= 1 *****CONSTANT DOLLARS*****

\$\$\$ COSTS IN THOUSAND DOLLARS \$\$\$

COST AREA STRUCTURE VJ-450	COST BREAKDOWN STRUCTURE ELEMENT	GENERAL TYPE OF FUNDING					TOTAL
		R & D	PROCURE- MENT	CONSTRUC- TION	MIL. PER- SONNEL	OTHERS	
381000	REPLETISHMENT SPARES	0	2,697	0	0	0	2,697
392000	MODIFICATIONS	0	689,040	0	0	0	689,040
393000	REPLETISHMENT SUPPORT EQUIPMENT	0	35,332	0	0	0	35,332
394000	EXPENDABLE STORES	0	29,710	0	0	0	29,710
400000	ASSOCIATED SYSTEMS	0	0	0	0	0	0
410000	INVESTMENT	0	0	0	0	0	0
411000	MOBILE LOGISTICS SUPPORT FORCE	0	0	0	0	0	0
412000	TENDERS AND REPAIR SHIPS	0	0	0	0	0	0
413000	AS-ARE IMA	0	0	0	0	0	0
420000	OPERATING AND SUPPORT	0	0	0	0	0	0
421000	MOBILE LOGISTICS SUPPORT FORCE	0	0	0	0	0	0
422000	TENDERS AND REPAIR SHIPS	0	0	0	0	0	0
423000	AS-ARE IMA	0	0	0	0	0	0
424000	ENTRAPPED SYSTEMS	0	0	0	0	0	0
500000	TERMINATION	0	0	0	0	0	0

DATE 11/25/77

WEAPON SYSTEM LCC TEST RUN

PAGE 11.001

\$\$\$ COSTS IN THOUSAND DOLLARS \$\$\$

ANNUAL COST BY FUNDING TYPE

*****BASE YEAR= 1 *****CONSTANT DOLLARS*****

YEAR	R & D	ACQUISITION	CONSTRUCTION	O & M	MIL. PERSONNEL	OTHERS	TOTAL
1	26,064	0	0	1,310	0	0	27,374
2	50,227	0	0	1,310	0	0	51,537
3	95,155	0	0	1,310	0	0	96,465
4	173,132	0	0	1,310	0	0	174,442
5	172,403	0	0	1,003	0	0	173,406
6	60,078	245,085	2,629	12,596	0	0	322,091
7	0	343,640	3,359	28,625	1,973	0	377,556
8	0	349,204	1,500	37,533	2,976	0	391,213
9	0	611,745	1,080	45,753	4,909	0	663,487
10	0	535,839	1,320	65,124	6,013	0	709,296
11	0	735,424	1,430	80,473	7,010	0	825,339
12	0	707,097	1,015	91,478	7,945	0	807,537
13	0	374,599	830	106,273	9,949	0	591,651
14	0	442,163	940	122,700	9,050	0	675,853
15	0	403,821	1,050	135,626	8,175	0	650,672
16	0	704,210	1,050	138,659	8,175	0	952,094
17	0	345,677	940	132,243	7,178	0	527,078
18	0	381,261	940	126,081	7,178	0	518,660
19	0	351,548	830	120,090	7,117	0	479,724
20	0	343,208	830	117,011	7,117	0	474,166
21	0	345,969	830	113,932	7,117	0	468,947
22	0	344,960	830	108,115	6,141	0	460,046
23	0	313,203	720	102,693	6,120	0	422,937
24	0	311,447	720	100,200	5,120	0	415,486
25	0	304,600	720	97,506	5,120	0	414,036
26	0	304,135	720	95,197	5,120	0	410,172
TOTAL	547,938	10,027,647	24,242	1,285,292	131,544	0	12,756,695

ANNUAL COST BY COST CATEGORY

*****PHASE YEAR= 1 *****CONSTANT DOLLARS*****

YEAR	CONTRACTOR MANAGEMENT	TESTING	PRIME EQUIPMENT	TRAINING	SUP-PLY	TECHNICAL DATA	SUPPORT EQUIPMENT	OPERATION	MAINTEN-ANCE	TOTAL
1	26,064	0	0	0	0	1,310	0	0	0	27,374
2	58,725	502	0	0	0	1,310	0	0	0	60,537
3	91,473	2,064	0	0	0	1,310	0	0	0	95,675
4	164,531	3,625	0	0	0	1,310	0	0	0	174,703
5	163,774	3,413	0	0	592	1,310	0	0	0	174,806
6	57,615	1,253	2,104	14,072	20,000	208,633	11,236	0	0	322,041
7	0	53,600	21,400	163,522	33,574	2,605	47,669	2,194	9,694	377,355
8	0	0	0	0	70,522	2,760	102,531	5,905	21,490	391,213
9	0	0	0	0	42,007	3,681	127,777	11,724	31,734	463,487
10	0	0	0	0	114,456	3,890	214,032	14,714	45,175	709,295
11	0	0	0	0	55,981	4,221	244,407	23,440	53,174	625,333
12	0	0	0	0	10,358	4,221	245,350	29,454	64,435	807,537
13	0	0	0	0	104,494	4,893	300,033	35,134	75,346	954,491
14	0	0	0	0	73,147	5,213	330,033	41,470	87,455	975,032
15	0	0	0	0	43,448	5,676	350,033	44,375	95,479	950,672
16	0	0	0	0	53,729	5,676	350,033	46,440	97,558	852,094
17	0	0	0	0	51,319	5,346	331,177	44,143	93,043	527,074
18	0	0	0	0	47,151	5,346	333,020	42,569	84,325	514,460
19	0	0	0	0	45,943	5,015	302,705	40,437	84,035	479,724
20	0	0	0	0	43,055	5,015	302,233	39,577	82,236	474,166
21	0	0	0	0	43,128	5,015	302,000	38,217	80,434	469,947
22	0	0	0	0	41,200	5,015	302,000	35,476	75,445	460,045
23	0	0	0	0	39,514	4,684	272,000	34,545	72,104	422,937
24	0	0	0	0	37,827	4,684	272,000	33,395	70,531	418,485
25	0	0	0	0	35,140	4,684	272,000	32,205	68,457	414,035
26	0	0	0	0	34,695	4,684	272,000	31,195	67,608	410,172
TOTAL	562,582	64,469	36,279	3,177,033	179,494	307,697	5,315,137	631,479	1,371,206	12,756,695