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MILITARY STANDARD

INTERCONTINENTAL BALLISTIC MISSILE SYSTEMS

TRAINING/TRAINING EQUIPMENT MANAGEMENT



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MIL-STD-1577A(USAF)

DEPARTMENT OF DEFENSE  
Washington D. C. 20331

Intercontinental Ballistic Missile Training/Training Equipment Systems Management

MIL-STD-1577A (USAF)

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## MIL-STD-1577A(USAF)

## CONTENTS

		<u>Page</u>
Paragraph		
1	SCOPE	1
1.1	Purpose	1
1.2	Application	1
2	REFERENCED DOCUMENTS	1
2.1	Issues of Documents	1
2.1.1	Specifications, Standards, and Handbooks	1
2.1.2	Other Government Documents, Drawings, and Publications	2
3	DEFINITIONS	2
3.1	Training Equipment	3
3.2	Class I Training Equipment	3
3.3	Class II Training Equipment	3
3.4	Class III Training Equipment	3
3.5	System Training Equipment Package	3
3.6	Individual Training	3
3.7	Operational Readiness Training Program/ Initial Qualification Training and Recurring Training	3
3.8	System Manager (SM)	3
3.9	Acronyms	3
4	GENERAL REQUIREMENTS	4
4.1	Priorities	4
4.2	Configuration Management	4
4.2.1	Engineering Changes	5
4.2.1.1	Engineering Change Orders	5
4.2.1.2	Engineering Change Proposals (ECPs)	5
4.2.2	Configuration Control	5
4.2.3	Status Accounting	5
4.3	Interim Acceptance Demonstration (IAD)	5
4.4	Facility Preparation	5
4.5	Installation and Checkout (I&CO)	6
4.6	Technical Acceptance Demonstration (TAD)	6
4.7	Marking	6
4.7.1	Training Equipment List (TEL)	6
4.7.2	Packages and Containers	6
4.7.3	Identification Tags	6
4.7.4	Rejects	6
4.8	Use of Weapon System Operational Production Rejections Components/Parts	6
4.9	Safety	7
4.10	Training Concept	7
4.11	Schedule of Major Events	7

## MIL-STD-1577A(USAF)

### FOREWORD

This Military Standard describes the functions, roles and responsibilities for development and management of Intercontinental Ballistic Missile (ICBM) Training and Training Systems. It is applicable to all agencies, offices, commands and contractors involved in the development, production or use of ICBM training equipment.

## MIL-STD-1577A(USAF)

5	DETAILED REQUIREMENTS	7
5.1	Training Equipment Requirements Identification	7
5.1.1	Training Requirements Functional Analysis	7
5.1.2	Training and Training Equipment Plan (TTEP)	7
5.1.3	Training Equipment Requirements Conference (TERC)	7
5.1.4	Training Equipment Specifications	8
5.1.4.1	Prime Item Product Function Specification (PIPFS)	8
5.1.4.2	Software Specification	8
5.1.5	Training Equipment Documentation	8
5.2	Design Reviews	9
5.2.1	Training Equipment Requirements Review (TERR)	9
5.2.2	Training Equipment Guidance Conferences	9
5.3	Government Furnished Property (GFP) Acquisition and Supply	9
5.4	Fabrication and Installation	10
5.5	Logistics Support	10
5.5.1	Spares/Repair Parts Support	10
5.5.2	Management Responsibility	10
5.5.3	Common Spares	10
5.5.4	End Article Item Manager (EAIM)	10
5.6	Trainer Assembly and Checkout (A&CO) Analysis	11

## FIGURES

Figure	1.	Trainer Development Process	12
	2.	Training System Development (1)	13
	2.	Training System Development (2)	14
	2.	Training System Development (3)	15
	3.	Training Equipment/Facilities Development (1)	16
	3.	Training Equipment/Facilities Development (2)	17
	3.	Training Equipment/Facilities Development (3)	18
	4.	ICBM Trainer Updates	19

## APPENDICES

Appendix A.	PRELIMINARY TRAINED PERSONNEL REQUIREMENTS	20
Paragraph 10.	SCOPE	20
10.1	Purpose	20
10.2	Applicability	20
20.	REFERENCED DOCUMENTS (Not Applicable)	20

## MIL-STD-1577A(USAF)

	30.	DEFINITIONS	20
	30.1	Acronyms	20
	40.	GENERAL REQUIREMENTS	20
	50.	DETAILED REQUIREMENTS	20
	50.1	Format and Content	20
	50.2	Preliminary Trained Personnel Requirements (PTPR) Report	20
Appendix	B.	TRAINING/TRAINING EQUIPMENT PLAN (TTEP) INFORMATION	24
Paragraph	10.	SCOPE	24
	10.1	Purpose	24
	10.2	Applicability	24
	20.	REFERENCED DOCUMENTS (Not Applicable)	24
	30.	DEFINITIONS	24
	30.1	Acronyms	24
	40.	GENERAL REQUIREMENTS	24
	40.1	Preparation	24
	40.2	Contents	24
	40.3	Consistency	25
	40.4	Format	25
	40.4.1	Contents Page	25
	40.4.2	Preparation	25
	40.4.2.1	Task Analysis	25
	40.4.2.2	Selection of Tasks for Training	25
	40.4.2.3	Determination of Prerequisites	25
	40.4.2.4	Development of Behavioral Objectives	25
	40.4.2.5	Formulation of Course Groups	26
	40.4.2.6	Development of Course Outlines	26
	40.4.2.7	Media and Equipment Selection	26
	40.4.2.8	Develop Course Data and Particulars	26
	50.	DETAILED REQUIREMENTS	26
Figure	B-1	Training Analysis Process Flow	27
Appendix	C.	TRAINING EQUIPMENT REQUIREMENTS	28
Paragraph	10.	SCOPE	28
	10.1	Purpose	28
	10.2	Applicability	28

## MIL-STD-1577A(USAF)

	50.11	Training Equipment Management Plan	35
	50.11.1	Format	35
	50.11.2	Contents	35
	50.11.3	Management Plan Submittal	36
	50.12	Trainer Assembly and Checkout (A&CO)/ Technical Analysis	36
	50.13	Agenda Design Reviews, Configuration Audits and Demonstrations	36
	50.14	Minutes of Formal Review, Inspections and Audits	36
	50.15	Computer Programming Manual	36
	50.16	User's Manual (Computer Program)	36
	50.17	Long Lead Time Items List	36
	50.18	Project Status Report	36
	50.19	Request for Nomenclature	36
	50.20	Computer Program Identification Numbers	36
	50.21	Technical Operating Report	36
	60.	NOTES	36
	60.1	Management Plan Submittal	37
Figure	D-1	Software Development Cycle	38
Appendix	E.	TRAINING EQUIPMENT SPECIFICATIONS	39
Paragraph	10.	SCOPE	39
	10.1	Purpose	39
	10.2	Applicability	39
	20.	REFERENCED DOCUMENTS	39
	20.1	Issues of Documents	39
	30.	DEFINITIONS	39
	30.1	Acronyms	39
	40.	GENERAL REQUIREMENTS (Not Applicable)	40
	50.	DETAILED REQUIREMENTS	40
	50.1	Hardware Specifications	40
	50.2	Engineering Change Proposals (ECPs)	42
	50.3	Deviations and Waivers	42
	50.3.1	Deviations	42
	50.3.2	Waivers	42
Figure	E-1	Engineering Change Proposal Matrix	43

## MIL-STD-1577A(USAF)

	20.	REFERENCED DOCUMENTS	28
	20.1	Issues of Documents	28
	30.	DEFINITIONS	28
	30.1	Acronyms	28
	40.	GENERAL REQUIREMENTS	29
	40.1	Content	29
	50.	DETAILED REQUIREMENTS	29
	50.1	Content and Format	29
	50.1.1	Cover Sheet	29
	50.1.2	Technical Requirements	29
	50.2	Supporting Documents	31
	50.3	Training Films	31
	60.	NOTES	31
	60.1	Use of Technical Equipment Requirements	31
Appendix	D.	TRAINING EQUIPMENT DOCUMENTATION	32
Paragraph	10.	SCOPE	32
	10.1	Purpose	32
	10.2	Applicability	32
	20.	REFERENCED DOCUMENTS	32
	20.1	Issues of Documents	32
	30.	DEFINITIONS	33
	30.1	Acronyms	33
	40.	GENERAL REQUIREMENTS (Not Applicable)	33
	50.	DETAILED REQUIREMENTS	33
	50.1	Government Furnished Property List	33
	50.2	Training Equipment List	33
	50.3	Acceptance Test Procedures	33
	50.5	Technical Publications	33
	50.5.1	Technical Orders	33
	50.5.1.1	MIL-M-82376	33
	50.5.1.2	MIL-M-38784	34
	50.5.2	Technical Order CFAE/CFE Notices and Related Technical Orders	34
	50.5.3	Technical Order, Time Compliance	34
	50.5.4	Commercial Manuals	34
	50.6	Installation and Checkout (I&CO) Plans	34
	50.7	Computer Program Development Plan	34
	50.8	Engineering Drawings and Associated Lists	34
	50.9	Acceptance Test Report	35
	50.10	Computer Software	35
	50.10.1	Computer/Machine Products (Special)	35

## MIL-STD-1577A(USAF)

Appendix	F.	TRAINING SOFTWARE DOCUMENTATION	44
Paragraph	10.	SCOPE	44
	10.1	Purpose	44
	10.2	Applicability	44
	20.	REFERENCED DOCUMENTS	44
	20.1	Issues of Documents	44
	30.	DEFINITIONS	44
	30.1	Acronyms	44
	40.	GENERAL REQUIREMENTS	45
	40.1	Software Engineering	45
	40.2	Software Development Planning	45
	50.	DETAILED REQUIREMENTS	45
	50.1	Government furnished Property List (GFPL)	45
	50.2	Training Software List (TSL)	45
	50.3	Support Software List (SSL)	45
	50.4	Acceptance Test Procedures	45
	50.5	Acceptance Test Report	45
	50.6	Computer Program Specifications	46
	50.6.1	Computer Program Development Specifications (CPDS)	46
	50.6.2	Computer Program Product Specifications (CPPS)	46
	50.6.3	Vendor Commercial Documentation (VCD)	46
	50.7	Engineering Change Proposals (ECPs)	46
	50.8	Deviations and Waivers	46
	50.8.1	Deviations	46
	50.8.2	Waivers	46
Appendix	G.	DATA ITEM DESCRIPTIONS (DID) REFERENCES	47

## MIL-STD-1577A(USAF)

## 1. SCOPE

1.1 Purpose. This standard defines the functions, roles and responsibilities of the Training and Training Equipment Division of the Human Factors Engineering and Management Team of the Intercontinental Ballistic Missiles Program Office (ICBM PO), Air Training Command (ATC), the Using Commands, Air Force Logistics Command (AFLC), and the contractor(s) to:

- a. Identify all training equipment comprising the system training equipment package.
- b. Design; develop; fabricate; install and check out; and accept required training equipment.
- c. Develop Operations and Maintenance (O&M) manuals required to operate and maintain trainers.
- d. Establish personnel and training requirements; and accomplish training and training equipment planning as defined in Appendices A and B.
- e. Establish training equipment requirements and prepare training equipment specifications as provided in Appendices C and E.
- f. Document training equipment and software per Appendices D and F.

The overall process of trainer development will progress in accordance with the basic flowchart provided in Figure 1. This document provides guidelines and establishes requirements and methodology for the execution of that process.

1.2 Application. This standard applies to all agencies involved in the development, production or use of ICBM training equipment.

## 2. REFERENCED DOCUMENTS

2.1 Government documents.

2.1.1 Specifications, standards, and handbooks. Unless otherwise specified, the following specifications, standards, and handbooks of the issue listed in that issue of the Department of Defense Index of Specifications and Standards (DoDISS) specified in the solicitation form a part of this standard to the extent specified hereing.

DOD-STD-480	Configuration Control - Engineering Changes, Deviations and Waivers
MIL-STD-129	Marking for Shipment and Storage

## MIL-STD-1577A(USAF)

MIL-STD-130	Identification Marking of US Military Property
MIL-STD-483	Configuration Management Practices for Systems, Equipment, Munitions and Computer Programs
MIL-STD-490	Specification Practices
MIL-STD-1521	Technical Review and Audits for Systems, Equipments and Computer Programs
MIL-STD-1644	Trainer System Software Development
MIL-HDBK-220	Military Standardization Handbook, Glossary of Training Device Terms

2.1.2 Other Government documents, drawings, and publications. The following other Government documents form a part of the standard to the extent specified herein.

SAMSO 77-6	System Requirements Analysis
AFR 50-8	Instructional System Development
AFR 50-11	Management and Utilization of Training Devices
AFP 50-58	Handbook for Designers of Instructional Systems
AFM 50-2	Instructional System Development

The following documents and the documents referenced in the cited documents (first tier) form a part of this standard to the extent specified. All others (listed in 2.1.1 and 2.1.2) are for guidance and information only.

DOD-STD-48  
MIL-STD-129  
MIL-STD-130  
MIL-STD-483  
MIL-STD-490  
MIL-STD-1521  
MIL-STD-1644

(Copies of specifications, standards, drawings, and publications required by suppliers in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

3. DEFINITIONS. For purposes of this standard, the definitions of MIL-HDBK-220, except as modified herein, and the following definitions shall apply.

## MIL-STD-1577A(USAF)

3.1 Training equipment. Any item or combination of items used for instructional purposes to support the training of personnel.

3.2 Class I training equipment. Distinctive end items of training equipment specifically designed, developed, fabricated and assembled for training purposes to meet specific training objectives. These items are subject to configuration control and require logistic support. Self-instructional devices are included in this category.

3.3 Class II training equipment. Weapon system parts, components and end items used for training purposes in their original configuration. These items will retain their federal supply classification identity regardless of the fact that they are used for training purposes.

3.4 Class III training equipment. Items designed to demonstrate or illustrate a concept, or to portray the functional characteristics of an end item without use of the actual working medium as a motivating force. The device is usually instructor operated, but may also be used by the student for self-instruction. (Examples are: animated panels, cut-aways, exploded display models.)

3.5 System training equipment package. All items or combinations of items which must be procured to support the training of system operation and maintenance personnel.

3.6 Individual training. Technical training for maintenance and operation personnel in their AF specialty conducted by ATC.

3.7 Operational readiness training program/initial qualification training and recurring training. Technical training for maintenance and operation personnel conducted by the using command to fully qualify, certify and maintain proficiency of personnel to operate or maintain the system. This includes team training and crew proficiency training.

3.8 System Manager (SM). The AFLC focal point for integrating and managing the functional elements of logistics on a timely basis to assure support of the assigned system. During the acquisition phases prior to program transfer, the SM provides a vital link to the Deputy Program Manager for Logistics/ Integrated Logistic Support Manager in support planning concepts. The SM also assures proper phasing of End Article Inventory Manager (EAIM) actions with approved system program target dates.

3.9 Acronyms. The following acronyms are used in this standard.

A&CO	Assembly and Checkout
AFLC	Air Force Logistics Command
AFSC	Air Force Systems Command
ALC/IM	Air Logistics Center/Item Manager
ASCON	Associate Contractor

## MIL-STD-1577A(USAF)

ATC	Air Training Command
BMO	Ballistic Missile Office
EAIM	End Article Item Manager
ECO	Engineering Change Order
ECP	Engineering Change Proposal
FSG	Federal Supply Group
GFE	Government Furnished Equipment
GFP	Government Furnished Property
GFPL	Government Furnished Property List
IAD	Interim Acceptance Demonstration
ICBM	Intercontinental Ballistic Missile
I&CO	Installation & Checkout
LCC	Life Cycle Cost
LSA	Logistics Support Analysis
MSE	Maintenance Support Equipment
O&M	Operations and Maintenance
OO-ALC	Ogden Air Logistics Center
ORA	Operational Requirements Analysis
PIPFS	Prime Item Product Function Specification
PO	Program Office
SA-ALC	San Antonio Air Logistics Center
SM	System Manager
SRA	System Requirements Analysis
SRR	System Requirements Review
TAD	Technical Acceptance Demonstration
TAT	Technical Acceptance Team
TEL	Training Equipment List
TER	Training Equipment Requirements
TERC	Training Equipment Requirements Conference
TERR	Training Equipment Requirements Review
TTEP	Training and Training Equipment Plan

## 4. GENERAL REQUIREMENTS

4.1 Priorities. Weapon system equipment and material needed to build or modify training equipment, individual end items and components required for direct support of training programs, spares and support equipment shall be allocated for delivery in accordance with the following priorities:

- Priority 1: Research and Development Program
- Priority 2: Individual Training Program
- Priority 3: Operational Readiness Training Program/Initial Qualification Training Program
- Priority 4: Operational Program

4.2 Configuration management. The configuration management of Class I and II items of training equipment shall be in accordance with DoD-STD-480, MIL-STD-483 and MIL-STD-490.

## MIL-STD-1577A(USAF)

4.2.1 Engineering changes. Throughout the system acquisition phase, all weapon system engineering change orders (ECOs) and weapon system engineering change proposals (ECPs) shall be evaluated to assure that training equipment is compatible with the configuration of maintenance support equipment (MSE) and weapon system/equipment insofar as is necessary to ensure adequate training and logistic support. All engineering changes not accomplished on the training equipment or maintenance support equipment prior to delivery shall be documented as a part of the acceptance test report. During training equipment development a precise definition of the configuration of the training equipment shall be maintained including any variations from the basic weapon system configuration.

4.2.1.1 Engineering Change Orders (ECOs). After approval, weapon system ECOs which impact the ability of the trainer to support training shall be incorporated into the training equipment, provided such incorporation will not adversely impact schedules or trainer costs. Where such impacts occur, the ECO will be implemented in the next trainer update.

4.2.1.2 Engineering Change Proposals (ECPs). After training equipment configuration definition and design freeze (baselined), an ECP shall be prepared for each training equipment engineering change, including changes to established facility criteria to assure effective use of the equipment in training personnel for the operation and maintenance of the system. Approved ECPs accomplished prior to delivery of the training equipment shall be reflected in the training equipment documentation.

4.2.2 Configuration control. During fabrication and assembly, compliance with approved drawings and specifications shall be assured. To assure this compliance, contractor employees, subcontractor and vendor personnel shall be indoctrinated in configuration control procedures. Engineering and manufacturing documentation and related administrative records shall be controlled in accordance with Appendix X of MIL-STD-483.

4.2.3 Status accounting. At the time of trainer acceptance, the chairman of the Technical Acceptance Team (TAT) shall be provided with data for inclusion in the Weapon System Operational Configuration Identification Index. This data shall be a part of the acceptance test report.

4.3 Interim Acceptance Demonstration (IAD). An IAD shall be conducted in which AF personnel will participate prior to shipment of a trainer to the final destination. This demonstration will assure the trainer is satisfactory for shipment. The IAD shall be accomplished in accordance with the approved acceptance test procedure. Upon successful completion of the IAD, the trainer shall be shipped to the final destination. The IAD may be waived if BMO concurs that an effective test cannot be reasonably accomplished at the contractor's facility.

4.4 Facility preparation. Using contractor-prepared criteria, ATC or the Using Command in conjunction with the ICBM Program Office (PO) will take appropriate action for preparation of space/facilities required for trainer installation.

## MIL-STD-1577A(USAF)

4.5 Installation and Checkout (I&CO). The trainer shall be installed and checked out at the final destination in accordance with the approved I&CO plan. The required I&CO spare/repair parts shall be provided by the contractor for the I&CO effort. Upon completion of the I&CO effort, all excess I&CO spares/ repair parts shall be transferred to the using activity/ATC. The local base supply shall report the transfer to the appropriate AFLC Air Logistic Center.

4.6 Technical Acceptance Demonstration (TAD). A TAD shall be conducted at the final destination. A Technical Acceptance Team (TAT) will be established and chaired by a representative of the ICBM/PO. This team will consist of representatives from ICBM/PO, OO-ALC, the Using Command and/or ATC, and a government quality assurance representative. This TAD will be accomplished in accordance with the approved acceptance test procedures. Upon satisfactory completion of the technical acceptance demonstration, accountability for the training equipment shall be transferred to the government.

4.7 Marking. Items shall be marked in accordance with instructions provided by the program office, and as stated below:

4.7.1 Training Equipment List (TEL) items. Markings for physical items listed in the TEL shall coincide with the identification contained in the TEL.

4.7.2 Packages and containers. Interior packages and exterior shipping containers shall be marked in accordance with MIL-STD-129 and MIL-STD-130, and the words "Training Equipment" shall be stenciled thereon. Interior packages shall also bear the:

- a. TEL Item Number
- b. Stock Number (if available), or TEL Part Number
- c. Condition Status (if reject).

4.7.3 Identification tags. Identification tags, when used, will bear, in addition to the information required above, the words "Training Equipment".

4.7.4 Rejects. Training equipment, including parts of trainers, furnished in reject status, shall be permanently marked by stencil, stamp, engraving or decalomania: "Factory Production Reject".

4.8 Use of weapon system operational production reject components/parts. Rejected components/parts shall be authorized for use as approved by the procuring activity in the fabrication of trainers provided they meet the following criteria:

- a. Satisfy the training requirement.
- b. Meet form, fit and function requirements.

## MIL-STD-1577A(USAF)

- c. Can be configuration controlled (unless it is a Class III item).
- d. Logistically supportable from established assets (unless it is a Class III item).
- e. Approved for use by the procuring activity with concurrence of ATC/using command.

4.9 Safety. Training equipment shall meet the same system and personnel safety constraints used in the design, development and production of the operational system unless specifically exempted by the ICBM/PO

4.10 Training concept. An optimum training concept shall be developed that considers personnel requirements (Appendix A) ISD requirements (AFP 50-58, AFR 50-8, AFM 50-2) weapon system requirements (SAMSO 77-6) and deployment requirements (AFR 50-11). Detailed training and training equipment requirements are generated from the training concept resulting in the development and delivery of training programs and training equipment to the using and training commands.

4.11 Schedule of major events. Figures 2, 3 and 4 of this standard depict an ideal sequential portrayal of significant events and activities which would normally be integrated during definition and acquisition of the system training equipment package. Figures 5, 6 and 7 depict the equipment/facilities development cycle. Significant training equipment milestones, such as design approval, will be carefully phased with the development engineering of the weapon system. Figure 8 of this standard depicts activities required to update training equipment subsequent to delivery of that equipment.

## 5. DETAILED REQUIREMENTS

### 5.1 Training equipment requirements identification

5.1.1 Training requirements functional analysis. A functional analysis of the operations tasks, organizational level maintenance tasks, intermediate level maintenance tasks, and depot level maintenance tasks shall be performed and identified in the Operational Requirements Analysis (ORA)/Logistic Support Analysis (LSA) to determine the training required for that task. Each task will be examined in sequence beginning with the highest numbered ORA/LSA task. The training and training equipment required for a task shall be documented in a Training and Training Equipment Plan (TTEP).

5.1.2 Training and Training Equipment Plan (TTEP). The TTEP, prepared in accordance with Appendix B, shall be based on the results of the analysis required by 5.1.1. Consideration shall be given, at all times, to the most cost effective use of Class I, II and III training equipment and modified existing training equipment.

5.1.3 Training Equipment Requirements Conference (TERC). A training equipment requirements conference will be held to permit interested parties to advocate

## MIL-STD-1577A(USAF)

the requirements they have identified in the TTEP document. This conference will be scheduled and chaired by the ICBM Program Office.

5.1.4 Training equipment specifications. Training equipment specifications shall be prepared in accordance with Appendix E for those items of training equipment selected and approved for procurement for which the contractor is responsible. The specification requirements shall be evolved from the Training Equipment Requirements (TER) using System Requirements Analysis (SRA) techniques including performance of Life Cycle Cost (LCC) studies/analyses, interfacing with weapons system engineering, and working closely with ICBM/PO, ATC and the Using Command in establishing clearly defined requirements. Requirements which are high cost drivers shall be brought to the attention of the procuring activity at each Technical Interchange Meeting (TIM).

5.1.4.1 Prime Item Product Function Specification (PIPFS). A PIPFS shall be prepared as defined in MIL-STD-490 (Type C1a) for each Class I trainer. At the discretion of the program office, B1/B2 specifications may be utilized.

5.1.4.2 Software specifications. Software specifications shall be prepared in accordance with MIL-STD-1644, except as called out in the statement of work. Specifications shall include a MIL-STD-490 Computer Program Development Specification (Type B5), DI-E-3119 and a Computer Program Product Specification (Type C5), DI-E-3120 as defined therein.

5.1.5 Training equipment documentation. The following documentation shall be prepared in accordance with Appendix D:

- a. Government Furnished Property List (GFPL).
- b. Training Equipment List (TEL).
- c. Facility Design Criteria.
- d. Acceptance Test Procedures.
- e. Technical Publications.
- f. Installation and Checkout (I&CO) Plans.
- g. Computer Program Development Plan.
- h. Engineering Drawings and Associated Lists.
- i. Acceptance Test Reports.
- j. Computer/Machine Products.
- k. Training Equipment Management Plan.

## MIL-STD-1577A(USAF)

- l. Assembly, Installation and Checkout Technical Analysis.
- m. Agenda for Design Reviews, Configuration Audits and Demonstrations.
- n. Minutes of Formal Reviews, Inspections and Audits.
- o. Computer Programming Manual.
- p. User's Manual (Computer Program).
- q. High Risk and Long Lead Time Item List.
- r. Project Status Report.
- s. Request for Nomenclature.
- t. Computer Program Identification Number.
- u. Technical Operating Report (TOR).

5.2 Design reviews. Design reviews shall be conducted in accordance with MIL-STD-1521 for each trainer.

5.2.1 Training Equipment Requirements Review (TERR). A TERR shall be conducted no later than 60 days after trainer contract award. During this meeting, training equipment hardware and software specifications are reviewed.

5.2.2 Training equipment guidance conferences. Periodic training equipment guidance conferences may be scheduled to coordinate training equipment requirements. During these conferences, the participants may:

- a. Provide guidance on items of training equipment which have been approved.
- b. Establish a program for acquisition of the equipment with consideration for long lead time, design and development time, use of Government Furnished Equipment (GFE) and incremental procurement based upon scheduled development of the system, and the most cost-effective method of maintaining contractual disciplines and efficient management of the program.
- c. Review previously selected equipment items, including those which have been interim released.
- d. Review and approve or reject items of training equipment not previously acted upon.

5.3 Government Furnished Property (GFP) acquisition and supply. As GFP requirements are identified, assets will be screened to determine availability

## MIL-STD-1577A(USAF)

of the items. If the items are available, they will be earmarked for the training program. The System Manager will assure that requisitioned GFP items are earmarked and are available to meet programmed delivery dates. The System Manager will make arrangements for timely acquisition of those items which are not available as GFP.

5.4. Fabrication and installation. The Air Force may fabricate trainers or install equipment when the capability exists and the ICBM Program Office determines it is in the best interest of the Air Force. When this option is exercised, the agency which designs the trainers, either Air Force or contractor, will deliver to the ICBM Program Office the specifications, drawings, and technical orders required by this standard for operation, configuration/control and logistics support.

## 5.5 Logistics support

5.5.1 Spares/Repair parts support. Upon selection of an item to be procured as training equipment (Class I), provisioning data is required for the item of training equipment. San Antonio Air Logistics Center (SA-ALC) will provision and source code those items associated with nuclear weapons trainers. This action shall be initiated in sufficient time to insure delivery of spare parts concurrently with the delivery of the training equipment which they support. The ATC and the using command will participate and assist AFLC in the determination and selection of spares/repair parts for training equipment.

5.5.2 Management responsibility. AFLC shall have overall management responsibility for spare parts procurement for training equipment. The Systems Manager (SM), appropriate Air Logistics Center/Item Manager (ALC/IM), and the Using Command shall provision spares for trainers and operational hardware used for training. On approval of training equipment items to be procured, AFLC will issue Purchase Requests and Work Statements to be included in the Air Force Systems Command system contracts to establish a line item or task for initial spare parts support for training equipment.

5.5.3 Common spares. Spares which are common to the weapon system and system support training equipment shall be identified in the provisioning document as having dual application. These spares will be procured under a provisioning schedule. They will be released to procurement to effect delivery concurrent with acceptance of the training equipment into the Air Force inventory. Trainer-peculiar spares will be provisioned in accordance with the provisioning schedule established by AFLC.

5.5.4 End Article Item Manager (EAIM). Class I items of training equipment are catalogued in Federal Supply Group (FSG) 69 for which Ogden Air Logistics Center (OO-ALC) is the EAIM. SA-ALC Directorate of Special Weapons is responsible for nuclear weapons trainers associated spare parts and other related FSG 11 items.

MIL-STD-1577A(USAF)

5.6 Trainer Assembly and Checkout (A&CO) analysis. An A&CO analysis of trainers which utilize Class II training equipment to be installed in operationally configured trainer facilities shall be conducted. This analysis shall augment the Trainer I&CO Plans. The operational A&CO technical analysis shall be the baseline for the training equipment A&CO analysis. The trainer A&CO analysis shall include all changes from the operational A&CO analysis which are required to reflect the trainer configuration.

MIL-STD-1577A(USAF)

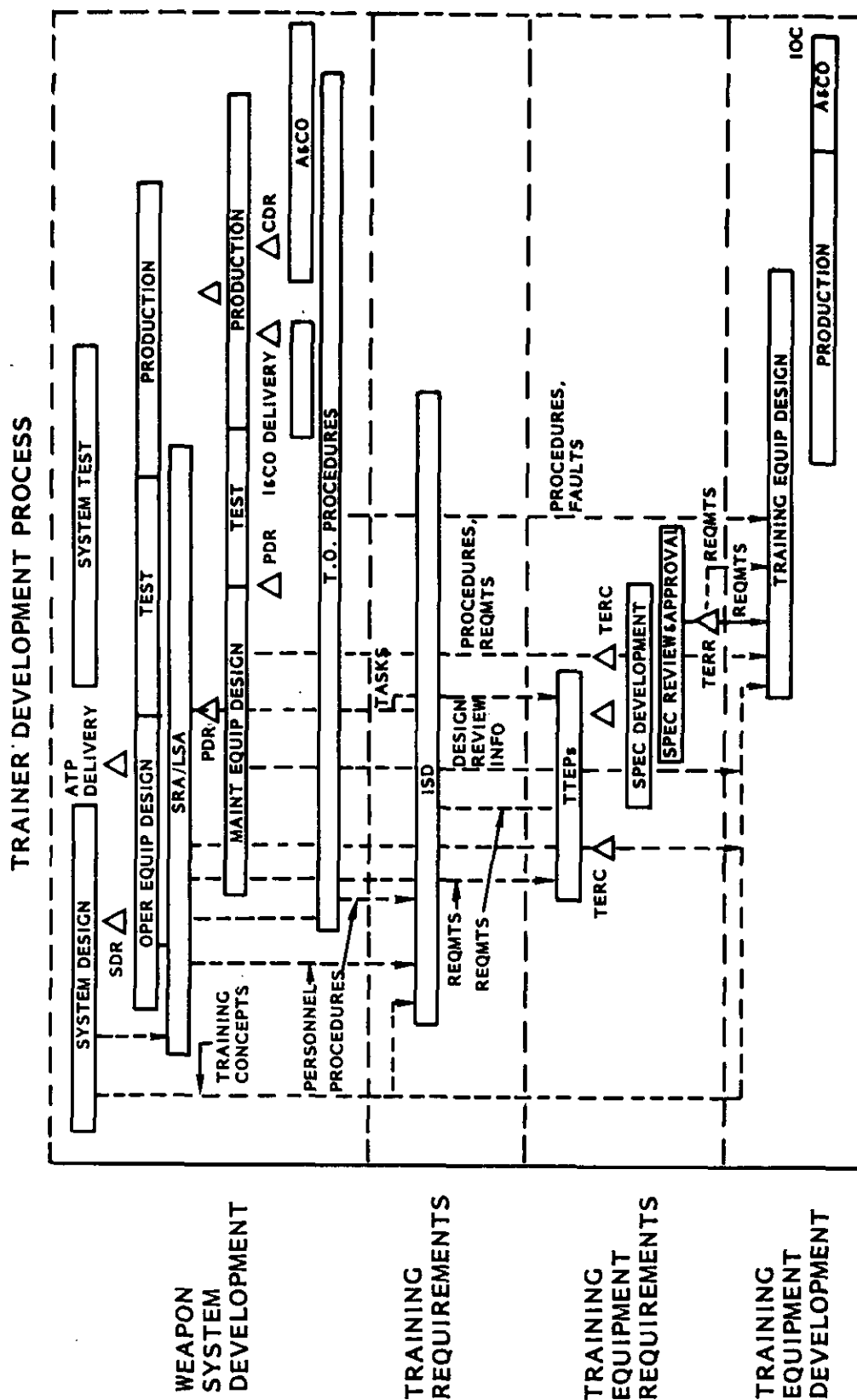


FIGURE 1. TRAINER DEVELOPMENT PROCESS

## MIL-STD-1577A(USAF)

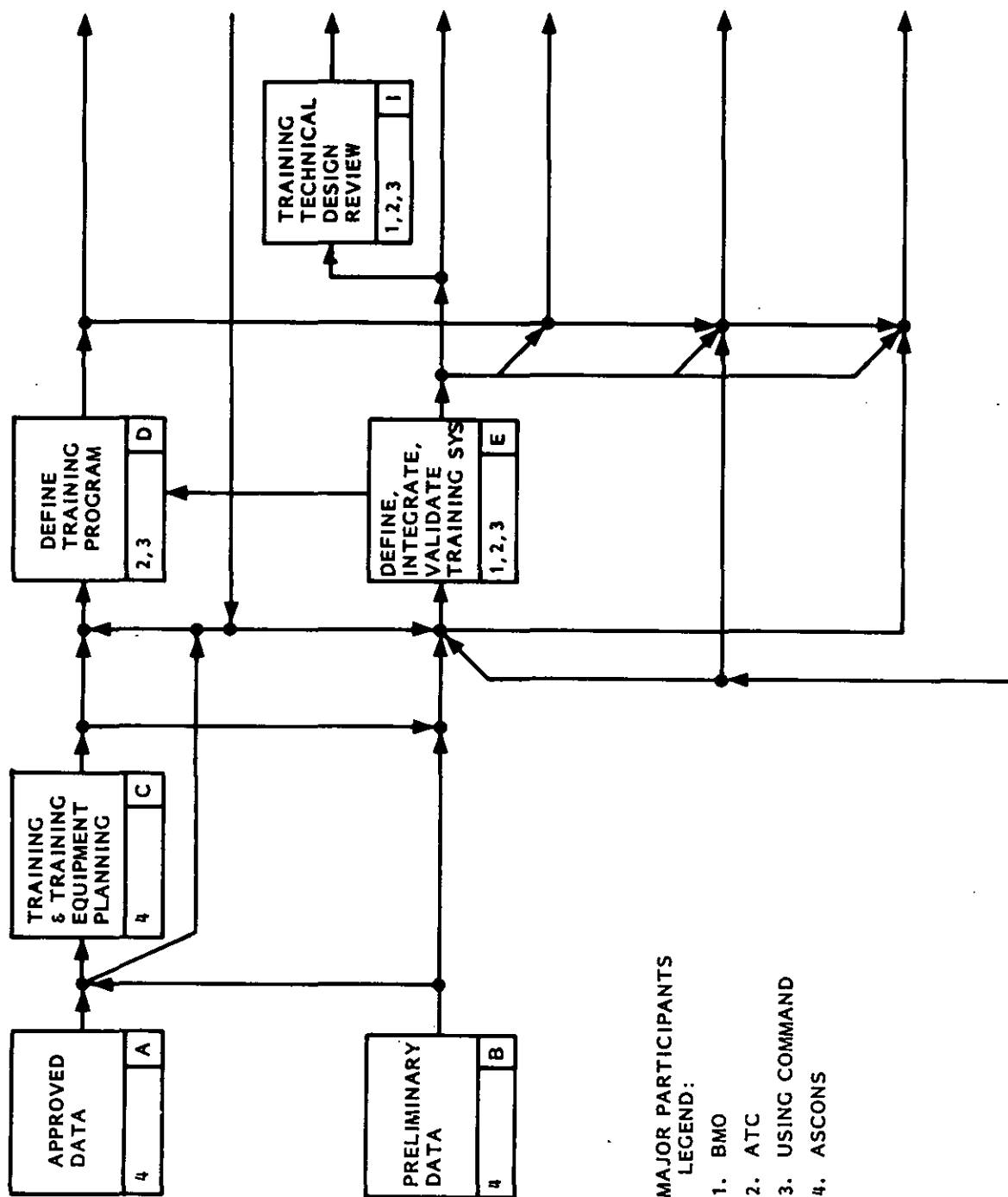


FIGURE 2. TRAINING SYSTEM DEVELOPMENT (1)

## MIL-STD-1577A(USAF)

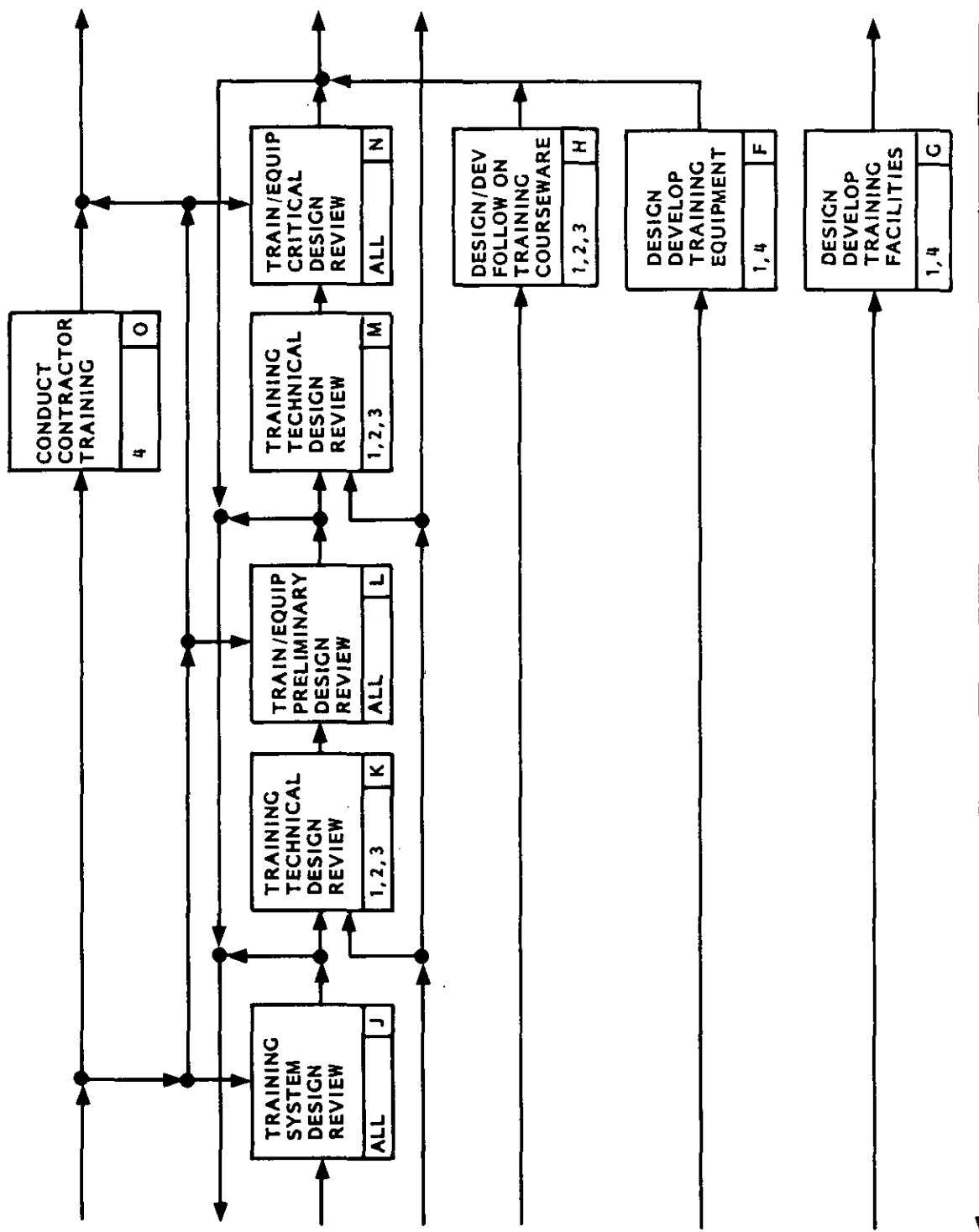


FIGURE 2. TRAINING SYSTEM DEVELOPMENT (2)

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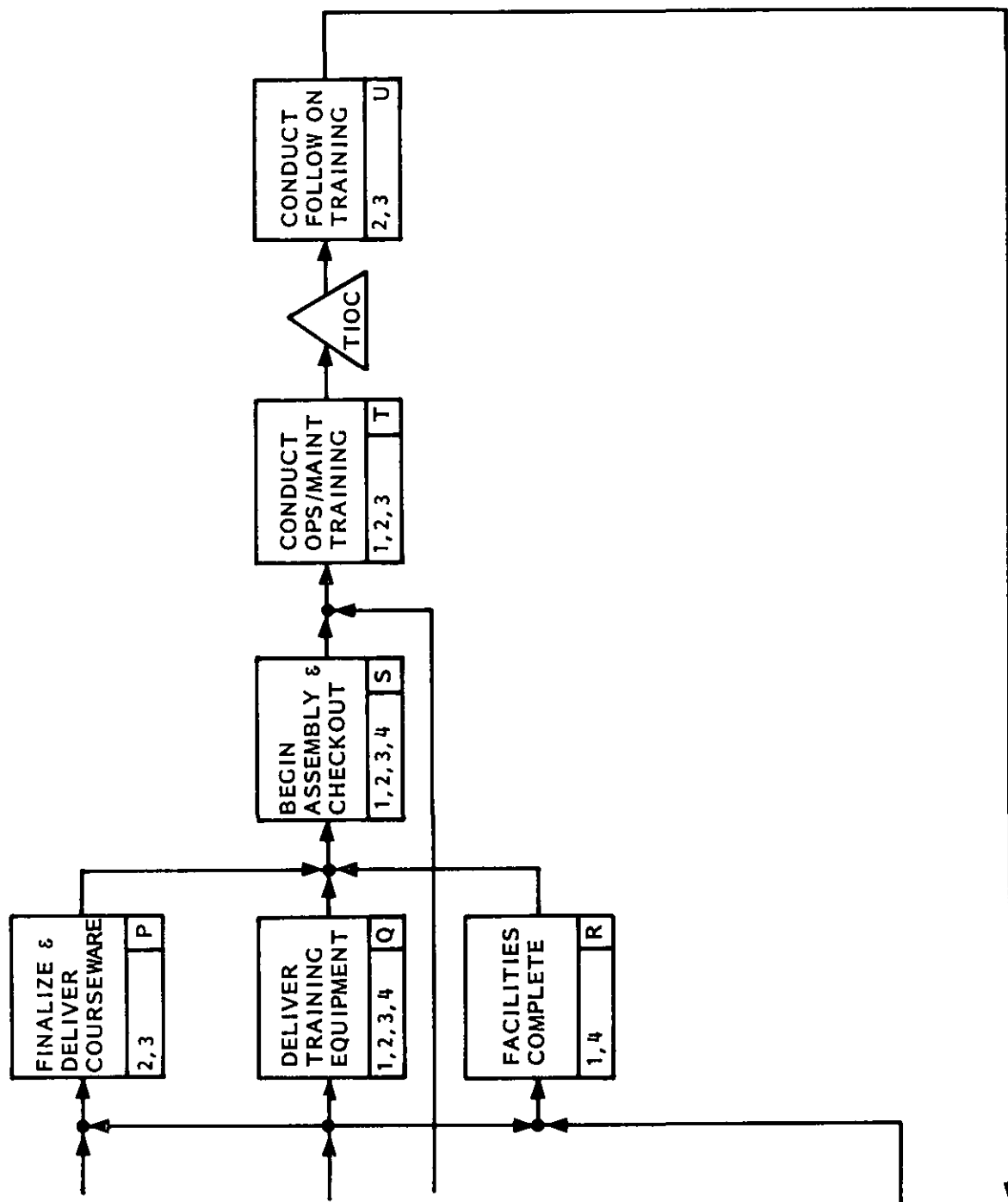


FIGURE 2. TRAINING SYSTEM DEVELOPMENT (3)

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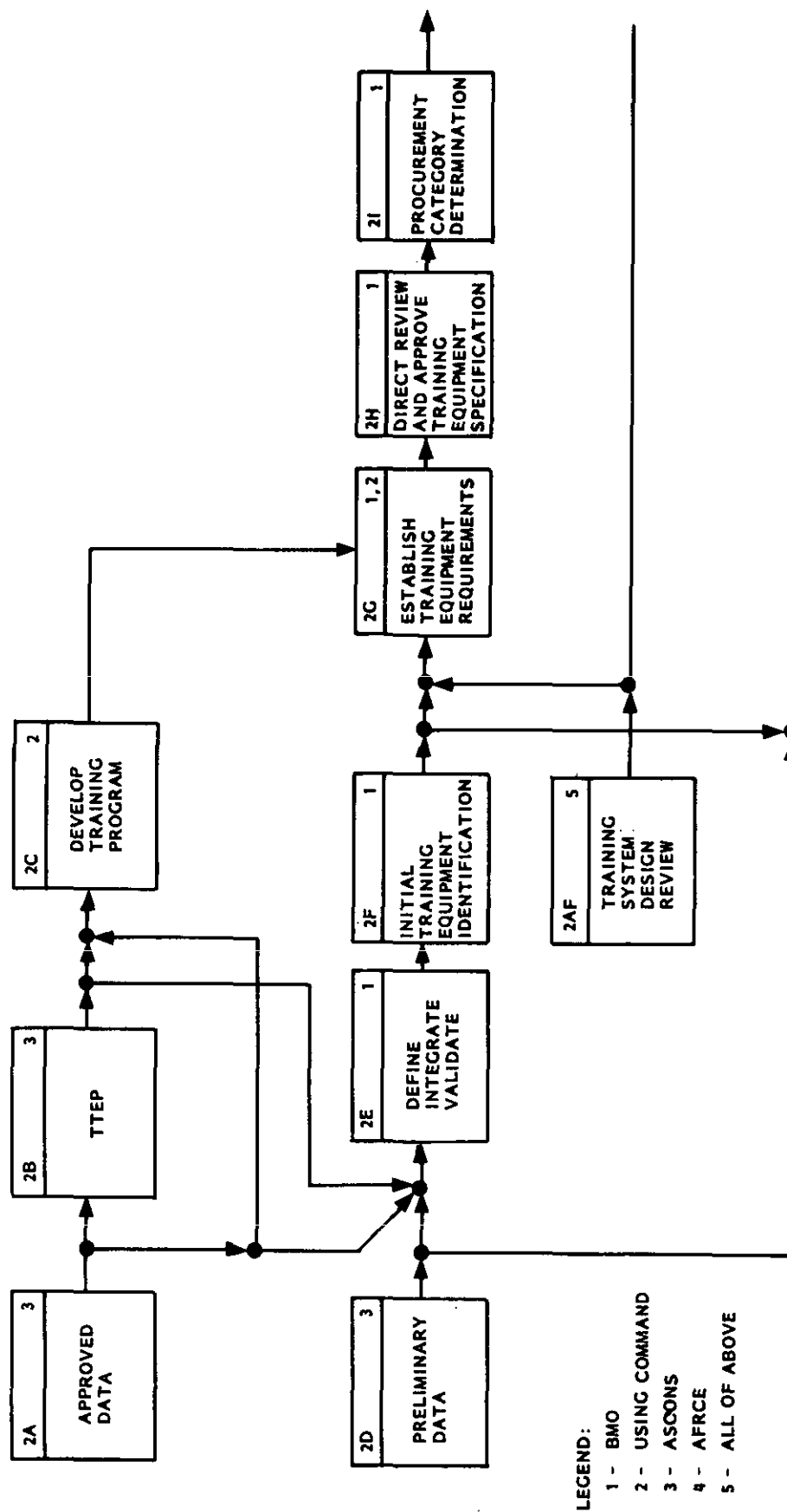
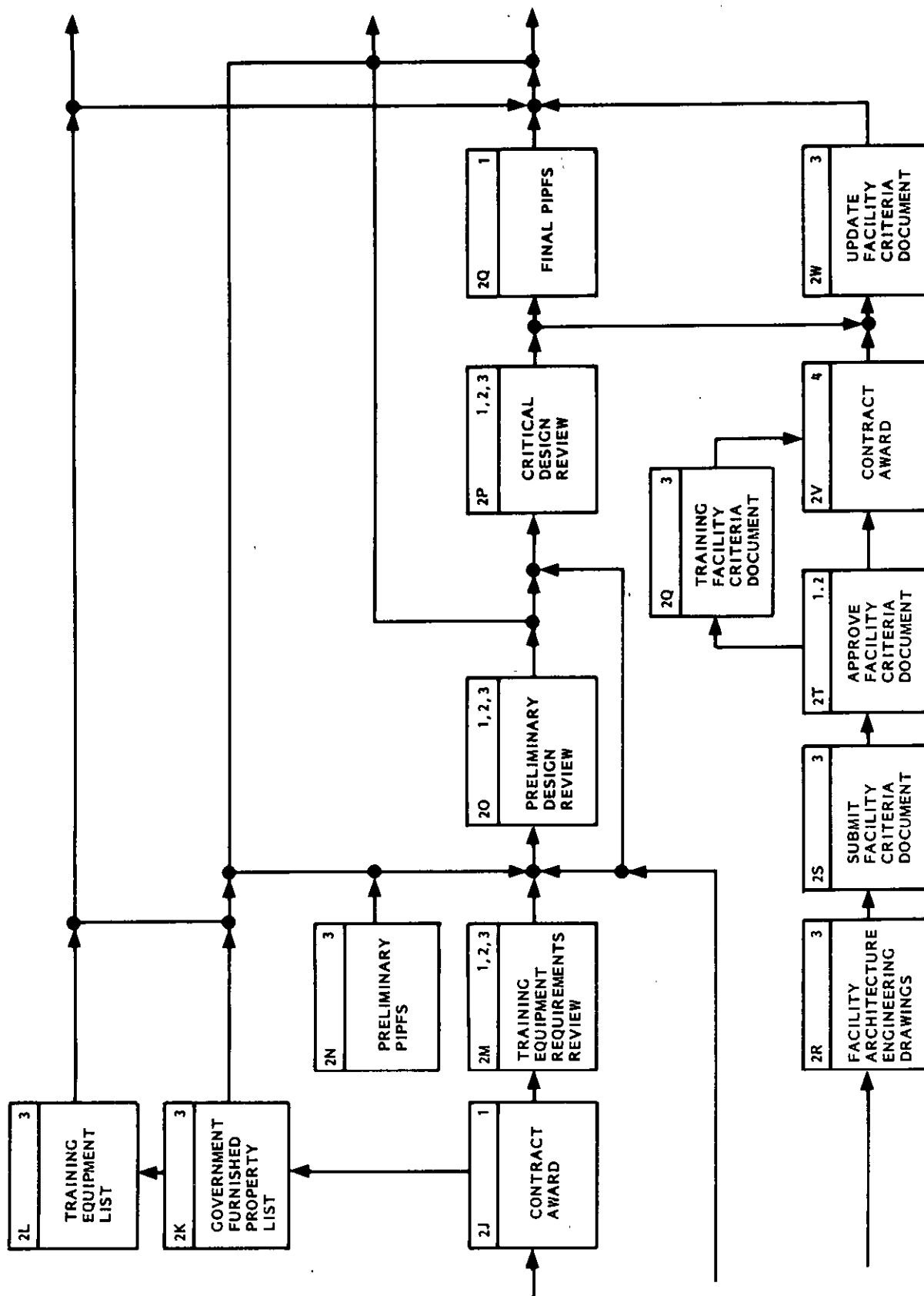


FIGURE 3. TRAINING EQUIPMENT/FACILITIES DEVELOPMENT (1)



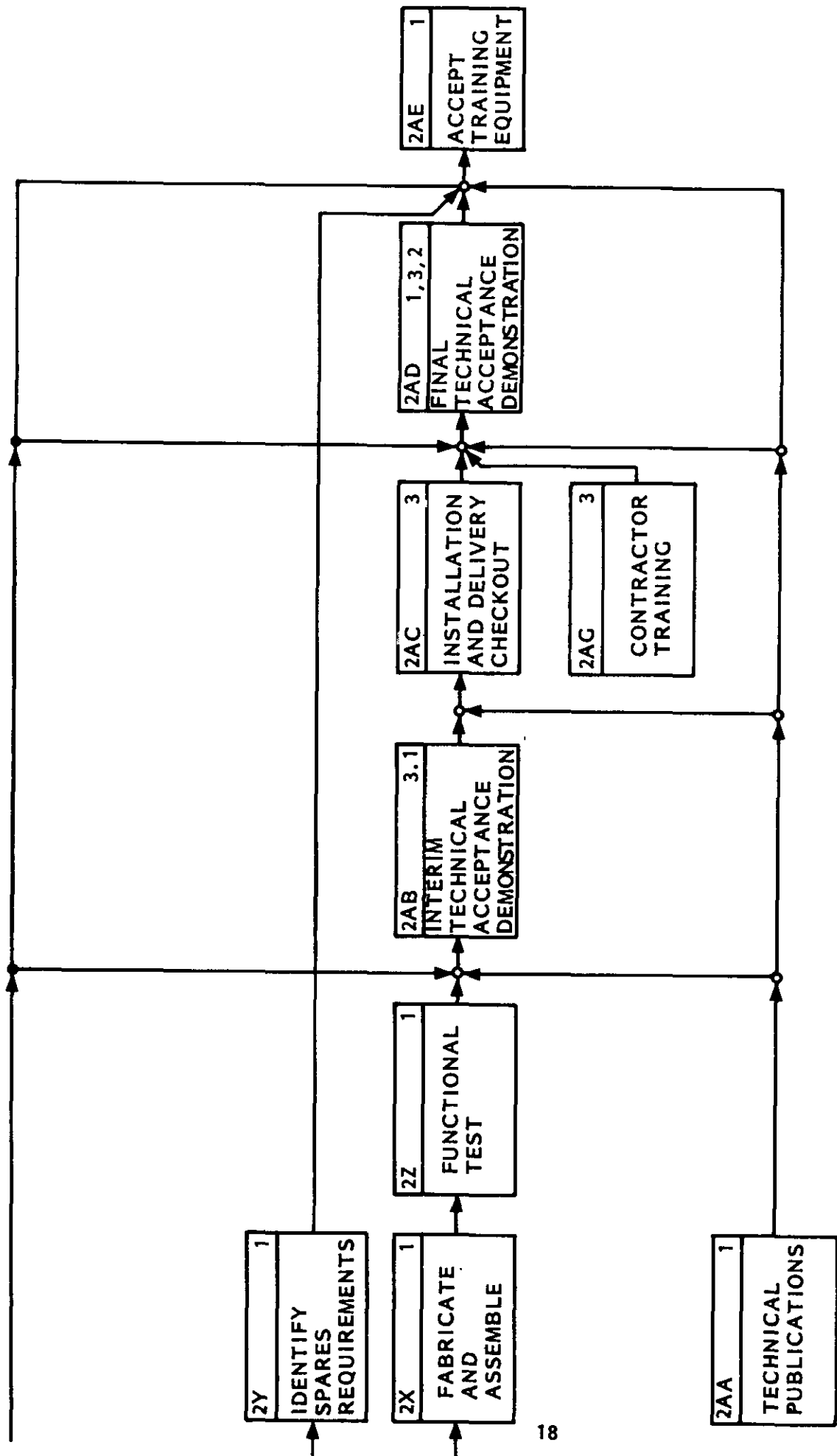


FIGURE 3. TRAINING EQUIPMENT/FACILITIES DEVELOPMENT (3)

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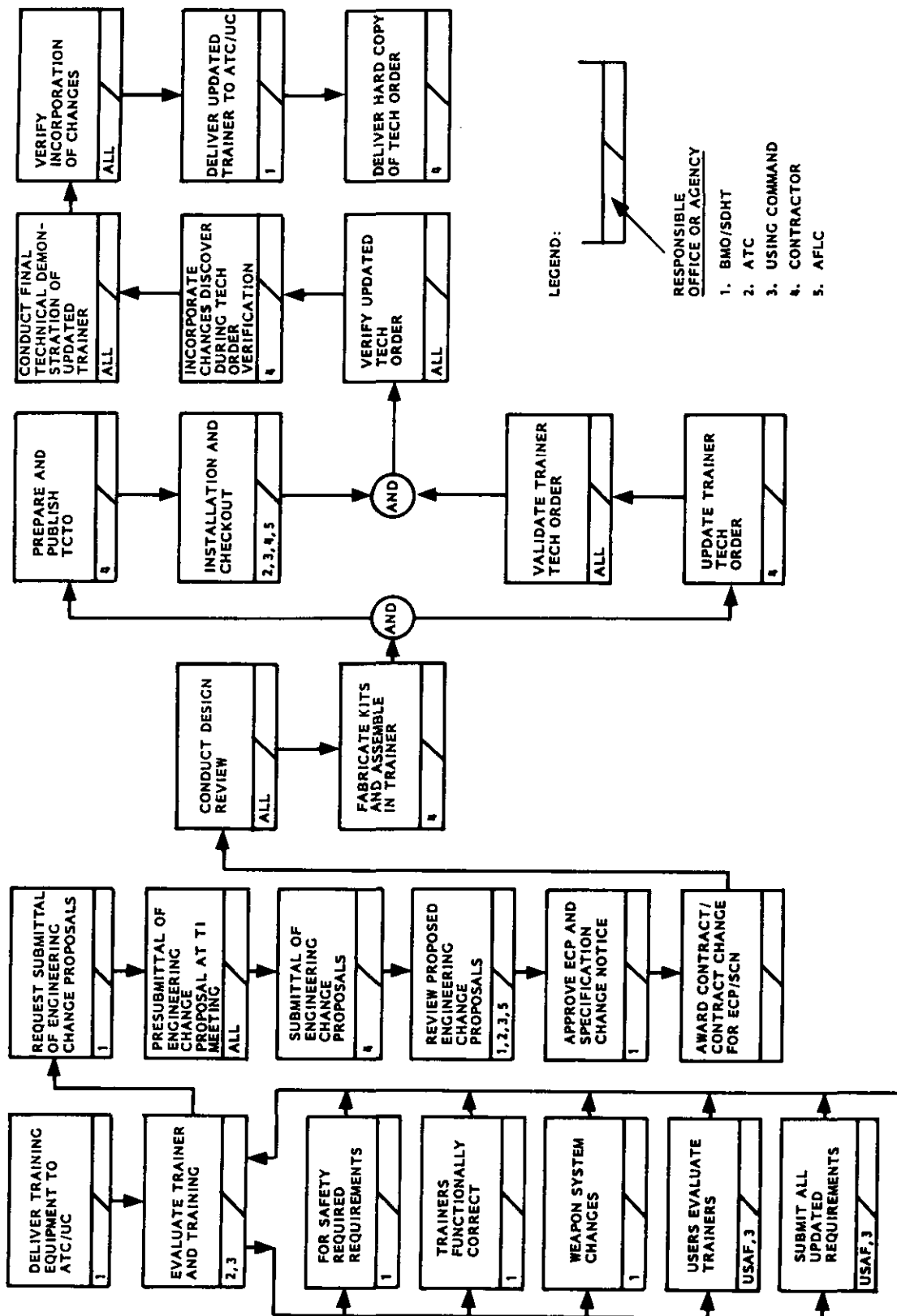


FIGURE 4. ICBM TRAINER UPDATES

## MIL-STD-1577A(USAF)

## APPENDIX A

## PRELIMINARY TRAINED PERSONNEL REQUIREMENTS

## 10. SCOPE

10.1 Purpose. This appendix prescribes instructions for the identification of operations and maintenance personnel requirements by numbers, skills and other qualifications. This identification will support planning for the establishment and conduct of necessary training programs in operation and maintenance.

10.2 Applicability. This appendix is a mandatory part of this standard.

## 20. REFERENCED DOCUMENTS (Not Applicable)

## 30. DEFINITIONS

30.1 Acronyms. The following acronyms are used in this appendix:

AFSC	Air Force Specialty Code
CDRL	Contract Data Requirement List
PTPR	Preliminary Trained Personnel Requirements
TTEP	Training and Training Equipment Plan

## 40. GENERAL REQUIREMENTS

A Preliminary Trained Personnel Requirements (PTPR) Report shall be prepared in accordance with the detailed preparation instructions and format requirements of the procuring activity specified on DD Form 1423, Contractor Data Requirements List (CDRL), for equipment which is to be delivered under contracts to the USAF Ballistic Missile Office in accordance with the guidelines of this standard. Information requirements shall be as defined herein.

## 50. DETAILED REQUIREMENTS

50.1 Format and content. The document defined herein shall be generated as a separately bound deliverable report.

It shall be scheduled and formatted as required by the relevant DD Form 1423 requirements. Content shall satisfy requirements established in the subsequent paragraphs.

50.2 PTPR report. This report shall establish the personnel and training requirements in a timely manner.

Information in this report shall provide preliminary estimates of trained personnel required for build up of the operational force and supporting agencies.

## MIL-STD-1577A(USAF)

The primary purpose of this document is to enable initial planning in the areas of:

- a. Training concepts
- b. Facility requirements
- c. Training support equipment requirements
- d. Courses and course development requirements.

This document will serve as an element of the preliminary data input for the Training and Training Equipment Plan (TTEP).

Definition of requirements for initial cadre and operational support personnel shall be supported. Requirements for Type I and Type III training shall be established.

The information provided in this document shall be derived from preliminary system requirements analysis and from direct contact with designated representatives of each using command. Relevant implementing contractors shall also be contacted as necessary. Procedures shall be established for updating of the personnel and training requirements at specified intervals.

Specifically, the document will encompass:

- a. Trained personnel requirements to include:
  - 1) A list of estimated duty positions to maintain and operate the equipment.
  - 2) General description of these positions and suggested AFSC assignments. Revised or new Air Force Specialty Code (AFSC) codes will be described and justified.
  - 3) Numerical personnel requirements, in both chart and narrative form, showing estimates of manpower required to operate and to perform maintenance at all levels.
  - 4) Special skills, knowledge, abilities or qualifications required to perform operator or maintenance tasks. Primary effort should focus on identification of new and/or unique skills.
- b. Definition of all significant planning factors. This shall include, as a minimum:
  - 1) Baseline concepts and effective date thereof
  - 2) System utilization and deployment factors

MIL-STD-1577A(USAF)

- 3) System configuration
  - 4) Maintenance concept
  - 5) Assumptions and ground rules
- c. A trained personnel build-up schedule for each user command or facility involved. This shall include:
- 1) Estimated AFSCs and number of each, and predicted need dates at all stations.
  - 2) Expected start and end dates for activity at each user/test station and expected total numbers of personnel for each station.
  - 3) Numbers, descriptive titles, estimated durations, basic support requirements and schedules for any training courses required.
  - 4) Total trained personnel required defined by year and by facility or command to which they are assigned.
- d. Operator and maintenance training course requirements shall be reported in narrative format and shall contain details for planning conduct of the following:
- 1) Staff Planner Courses
  - 2) Technical training courses for initial cadre of DoD personnel and instructors.
- e. Details shall include as appropriate:
- 1) Course title
  - 2) Course length
  - 3) Functional area (Maintenance or Operations)
  - 4) AFSC skill level to which course is addressed
  - 5) Course output stated in terms of an existing AFSC or appropriate position definition
  - 6) Class size (number of students per class session and practical exercise session)
  - 7) Equipment required
  - 8) Training devices and aids

MIL-STD-1577A(USAF)

- 9) Training equipment
- 10) Facilities/services.

## MIL-STD-1577A(USAF)

### APPENDIX B

#### TRAINING/TRAINING EQUIPMENT PLAN (TTEP) INFORMATION

##### 10. SCOPE

10.1 Purpose. This appendix provides preparation instructions for the documentation of training and training equipment requirements.

10.2 Applicability. This appendix is a mandatory part of this standard.

##### 20. REFERENCED DOCUMENTS (Not Applicable)

##### 30. DEFINITIONS

30.1 Acronyms. The following acronyms are used in this appendix:

ISD	Instructional System Development
TTEP	Training/Training Equipment Plan

##### 40. GENERAL REQUIREMENTS

40.1 Preparation. DI-H-33054 shall be the pattern for the format and content of the TTEP to be prepared. This appendix shall be used as a guide to the preparation of the TTEP.

40.2 Content. The TTEP shall include recommendations for training, training equipment and materials to support system training, each item of training equipment which will require a specification, and all equipment and technical data required to support recommended Configuration Items (CIs) of trainer equipment. In particular the TTEP shall provide:

- a. A list of recommended training courses
- b. Summaries of course content (including objective and completion criteria), schedules, trainer and support requirement data
- c. Management and administrative data, covering instructors and logistic factors
- d. Recommendations for further training and cost factors.

These training elements are to be identified as part of the analysis and design phases of a curtailed ISD process which has been tailored as defined herein. Recommended equipment should support:

- a. Individual training

## MIL-STD-1577A(USAF)

- b. Initial qualification training
- c. Crew training
- d. Operational unit proficiency training.

All training and training equipment recommendations shall be based on task analysis data.

40.3 Consistency. Information developed will be consistent with the system PTPR and the existing training concepts and plans.

#### 40.4 Format.

40.4.1 Contents page. A contents page, or pages, shall identify the elements of the TTEP in sequential order and shall show the location (page number) of each element within the TTEP.

40.4.2 Preparation. The basic methodology is described in the following paragraphs and the sequence of events in the preparation of the TTEP is indicated in Figure B-1. The description of each step in the process is provided as a brief overview in the following paragraphs.

40.4.2.1 Task analysis. Training analysis guidelines are supplied as part of the TTEP, and summarized herein. The process begins with a Task Analysis (Step 1). The jobs that the various USAF people must perform in support of Initial Operating Capability and over the life cycle of the system are described in the form of task lists. Job breakdowns stop at the task level. Subtask and step/activity data are examined but not listed. Data on special tools, equipment and any special information such as warnings, cautions and notes are included if available.

40.4.2.2 Selection of tasks for training. Completed task lists are examined to determine which tasks will require some form of training and which will not (Step 2). This selection process is aided by a set of criteria which include criticality, newness, skill, knowledge demand, and practice requirements.

40.4.2.3 Determination of prerequisites. Those tasks which are judged to require some form of training are scrutinized for prerequisite skills and knowledge, i.e., capabilities which must be acquired prior to training on a given task (Step 3). The task selected for training together with prerequisite skill and knowledge requirements that the prospective trainee does not meet on training entry, represent the total training requirement.

40.4.2.4 Development of behavioral objectives. The training requirements, which consist of brief action statements, are translated into precise behavioral objectives (Step 4). Objectives include the conditions under which the action is to be learned and the standard of performance which represents satisfactory acquisition of the desired behavior.

## MIL-STD-1577A(USAF)

40.4.2.5 Formulation of course groups. Once the behavioral objectives have been established, they must be grouped into blocks suitable for training the required personnel and for support by available resources (Step 5). All basic training analysis and design work is completed with this step.

40.4.2.6 Development of course outlines. After the Training Course Coordination meeting, the training course design can be completed by developing course outlines (Step 7).

40.4.2.7 Media and equipment selection. The next step involves definition of the media and equipment needed for delivery of the courses (Step 8).

40.4.2.8 Develop course data and particulars. All remaining course design tasks can now be completed (Step 9). This will include such items as estimates of training time and manpower for getting courses on-line. The final step (Step 10) consists of assembling all the data assembled into a TTEP and submitting it.

## 50. DETAILED REQUIREMENTS.

The detailed requirements shall be as specified in DI-H-33054. These requirements, which will be established by the CDRL, will expand upon and clarify the basic requirements which have been enunciated in the General Requirements section. The general requirements and the sequence of events shall not be changed.

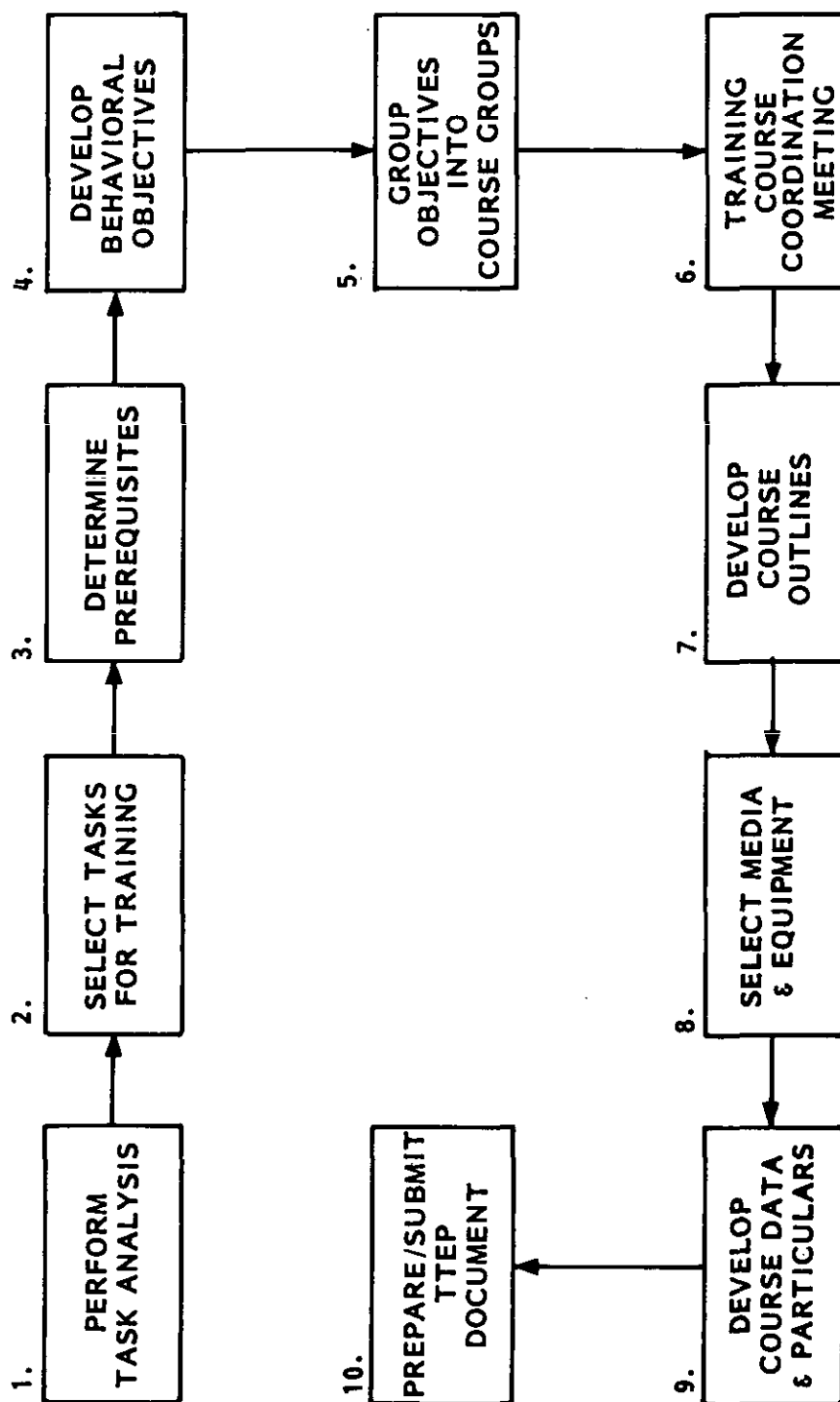


FIGURE B-1. TRAINING ANALYSIS PROCESS FLOW

## MIL-STD-1577A(USAF)

## APPENDIX C

## TRAINING EQUIPMENT REQUIREMENTS

## 10. SCOPE

10.1 Purpose. This appendix prescribes instructions for preparation of training equipment requirements.

10.2 Applicability. This appendix is a mandatory part of this standard. It is applicable as shown in 1.2 of the basic standard. It is prepared by ATC/Using Commands for presentation to the ICBM Program Office and is included in this standard to maintain a continuity of the integrated program.

## 20. REFERENCED DOCUMENTS

20.1 Issues of documents. The following documents of the issue in effect on the date of invitation for bids or request for proposal form a part of this standard to the extent specified herein:

MILITARY STANDARDS

MIL-STD-490      Specification Practices

(Copies of specifications, standards, drawings, and publications required by contractors in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting office.)

## 30. DEFINITIONS

30.1 Acronyms. The following acronyms are used in this appendix:

ATC	Air Training Command
BMO	Ballistic Missile Office
CI	Configuration Item
ICBM	Intercontinental Ballistic Missile
ISD	Instructional System Development
LSA	Logistic Support Analysis
MSE	Maintenance Support Equipment
MTBF	Mean Time Between Failure
MTTR	Mean Time To Repair
ORA	Operational Requirements Analysis
OSE	Operational Support Equipment
QQPRI	Qualitative, Quantitative Personnel Information Requirements

## MIL-STD-1577A(USAF)

RPIE	Real Property Installed Equipment
SIM	Simulated Software Program
TCTO	Time Compliance Technical Order
TTEP	Training and Training Equipment Plan

## 40. GENERAL REQUIREMENTS

40.1 Content. Include training equipment requirements, and Operational Support Equipment (OSE) and Maintenance Support Equipment (MSE) required to support the training equipment and devices. The document should include all training equipment/devices which require development of a trainer specification (normally only Class I and Class III items as defined in Section 3. of the basic standard).

## 50. DETAILED REQUIREMENTS

50.1 Format and content. Prepare in accordance with the following format. Provide required information for each training device identified:

50.1.1 Cover sheet. Each package will include a cover sheet which contains the following:

- a. Title: (Provide a descriptive title of the device being identified.)
- b. Need Date: (Provide the date the training device will be required at the specific location(s) to start training.)
- c. Quantity and location(s) required.

50.1.2 Technical requirements. (Use the paragraph numbers shown below and provide the information described in each paragraph.)

## 1. SCOPE

1.1 Briefly describe the intended use of the trainer, by whom it is intended to be used, and where it is to be located (contractor plant, ATC base, etc.).

## 2. APPLICABLE DOCUMENTS

2.1 Government Documents. Include a list of documents e.g., TCTOs of operational equipment which will be used to define trainer design/layout. This section shall also include a list of source data documents, e.g., ORA/LSA, ISD, QQPRI, TTEP, etc.

2.2 Non-Government documents. Under this section a list of contractor documents may be listed, e.g., Preliminary Operational TOs for which an Air Force TO number has not been assigned.

## 3. REQUIREMENTS

## MIL-STD-1577A(USAF)

3.1 Item definition. Provide a general description of the trainer/training aid and identify operational systems/subsystems it contains or simulates. Subparagraphs and tables may be used to identify major operational and simulated components and trainer/training aid control and monitoring functions.

3.1.1 Item diagrams. Reference specific figures which will be contained in the document that will further identify requirements of the device.

3.1.2 Interface definitions. Include known facility interface requirements.

3.1.3 Major component list. List major components of the trainer/training aid which must be developed, and/or fabricated.

3.1.4 Government furnished property list. List any Government Furnished Property (GFP) incorporated into the design and fabrication of the trainer.

3.1.5 Government loaned property list. List trainer maintenance support equipment (MSE), government loaned equipment, etc., to be provided for use in trainer development.

3.2 Characteristics.

3.2.1 Performance. Provide detailed performance requirements.

3.2.1.1 Operation. Identify and/or describe the trainer operation as it relates to the operational system/subsystem which it depicts.

3.2.1.1.1 Limitations.

3.2.1.1.1.1 Equipment. List trainer equipment limitations.

3.2.1.1.2 Procedures. List trainer procedures which differ from operational procedures.

3.2.1.2 Control and monitor. Describe the trainer control and monitor features.

3.2.1.2.2 Faulting. Describe the faulting capabilities of the trainer.

3.2.1.2.3 Override. Describe initiation of commands used to override trainer operation.

3.2.2 Physical characteristics.

3.2.2.1 Layout. Provide the physical layout of the trainer.

3.2.2.2 Security. Identify security considerations to be incorporated in the development of the trainer.

3.2.3 Reliability. Provide reliability requirements.

## MIL-STD-1577A(USAF)

3.2.4 Maintainability. Provide maintainability requirements.

3.2.5 Environmental conditions. Provide the environmental conditions for the trainer.

3.2.6 Transportability. State if the trainer is to be mobile or permanently installed at a specific location.

3.3 Design and construction. Describe the unique features of the trainer design/construction.

3.4 Major component characteristics. This section shall establish the detailed requirements for simulated operational equipment and trainer peculiar equipment which will be required in the trainer to support the training task.

3.4.1 Simulated operational equipment. This section shall identify any operational equipment or function which is to be simulated.

3.4.2 Trainer peculiar equipment. List trainer peculiar equipment.

3.4.2.1 Trainer computation group. If a computer is required, this section will identify this requirement.

3.4.2.2 Instructor control console. Provide physical and electrical requirements for control and monitoring of the trainer operation.

3.4.2.3 Fault Insertion Set. Provide a description of any trainer peculiar hardware sets required to fault operational hardware.

50.2 Supporting documents. Requirements for charts, transparencies, slides and other audio-visual aids shall be submitted in accordance with the format shown below:

- a. Title:
- b. Purpose of (chart, transparency, etc.)
- c. Description (content of chart or transparency)
- d. Special Features (if any). (Requirements for color, overlays, movement or animation, pointers or labeling.)

50.3 Training films. Requirements for training film(s) shall be in accordance with DI-H-7072.

## 60. NOTES

60.1 Use of technical equipment requirements.

The technical requirements portion of the Training Equipment Requirements format will be used by the procuring activity (ICBM/PO) to direct a contractor to prepare a specification for the particular device.

## MIL-STD-1577A(USAF)

## APPENDIX D

## TRAINING EQUIPMENT DOCUMENTATION

## 10. SCOPE

10.1 Purpose. This appendix provides preparation instructions for training equipment documentation.

10.2 Applicability. This appendix is a mandatory part of this standard and is applicable as shown in 1.2 of the basic standard.

## 20. REFERENCED DOCUMENTS

20.1 Issues of documents. The following documents of the issue in effect on date of invitation for bids or request for proposal, form a part of this standard to the extent specified herein.

MILITARY SPECIFICATIONS

MIL-M-7298	Manuals, Technical: Commercial Equipment
MIL-M-38784	Manuals, Technical: General Style and Format
MIL-M-38807	Manuals, Technical: Illustrated Parts Breakdown
MIL-M-82376	Manuals, Technical: Operation and Maintenance Instruction for Training Devices
MIL-N-7384	Notice: Contractor Furnished Equipment, Preparation of

MILITARY STANDARDS

MIL-STD-499	Engineering Management
MIL-STD-831	Test Reports, Preparation of
MIL-STD-1644	Trainer System Software Development

PUBLICATIONS

DOD-I-7000.10	Contract Cost Performance, Funds Status and Cost/ Schedule Status Reports
AFAD 71-531-(11)	Technical Order Data Requirements for Training Equipment, Mobile Training Sets, and Maintenance Trainers
AFAD 71-531-(18)	Technical Order Data for Time Compliance Technical Orders
AFAD 71-531-(19)	Technical Manual Requirements for Commercial Equipment Technical Orders

## MIL-STD-1577A(USAF)

(Copies of specifications, standards, drawings, and publications required by contractors in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting office.)

## 30. DEFINITIONS

30.1 Acronyms. The following acronyms are used in this appendix:

ATC	Air Training Command
BMO	Ballistic Missile Office
GFPL	Government Furnished Property List
I&CO	Installation and Checkout
IPB	Illustrated Parts Breakdown
TEL	Training Equipment List

40. GENERAL REQUIREMENTS. (Not Applicable)

## 50. DETAILED REQUIREMENTS

50.1 Government Furnished Property List (GFPL). The GFPL shall be in accordance with DI-H-3257 and shall contain separate listings for:

a. Items known or expected to be available from government assets.

b. Items to be procured by the government from associate contractor. (Prepare a separate list for each associate contractor.)

50.2 Training Equipment List (TEL). The TEL shall be in accordance with DI-H-3256.

50.3 Facility design criteria. The Facility Design Criteria document shall be in accordance with DI-E-3102.

50.4 Acceptance test procedures. The Acceptance Test Procedures document shall be in accordance with DI-H-3714. It shall identify all incorporated operation and maintenance procedures which are compatible with those of an operational unit.

50.5 Technical publications.

50.5.1 Technical orders. Technical Orders for trainers shall be in accordance with DI-M-3407 and AFAD 71-531-(11) further explained in MIL-M-82376, MIL-M-38784 and MIL-M-38807, as tailored below.

50.5.1.1 MIL-M-82376. This document is supplemented/tailored as follows:

a. Reference 3.3.9.6.1. Wiring lists may be provided in lieu of wiring diagrams. Wiring lists may be located in Section VI to facilitate use and handling of the manual.

## MIL-STD-1577A(USAF)

b. Add the following to 3.3.8.5.2: "Information concerning removal and replacement of common weapon system components will be provided by reference to the appropriate technical manual for such equipment. Where specific trainer unique information is required for preventing damage to a system or where an unusual technique is necessary, removal and replacement instructions will be provided. Information on system components such as valves, actuators, relays, filters, etc., and minor details of maintenance procedures which experienced maintenance personnel could be expected to know shall be omitted."

c. Add the following to 3.3.8.4: "A step-by-step checkout procedure for determining proper operation of the trainer shall be included. The procedure shall outline the method of checking the equipment after maintenance has been performed."

d. Reference 3.3.10. The IPB required in 3.3.10 of MIL-M-82376 shall include illustrations as specified by the procuring activity. The parts list shall consist only of:

I Introduction

II Group Assembly Parts Breakdown with Reference Designator, less Illustrations.

III Numerical Index

e. The level and quantity of illustrations will be determined by the procuring activity with concurrence of ATC/Using Command.

50.5.1.2 MIL-M-38784. Change the seventh sentence of 3.5.7.2 to read: "Layout shall conform to Figure 17 except that chapter titles, section titles and paragraph titles shall be indented."

50.5.2 Technical order CFAE/CFE notices and related technical orders. Use DI-M-3405 and MIL-N-7384.

50.5.3 Technical order, time compliance. Use DI-M-3407 and AFAD 71-530-(18).

50.5.4 Commercial manuals. Use DI-M-3407. Commercial Manuals shall be in accordance with AFAD 71-531-(19) and MIL-M-7298.

50.6 Installation & Checkout (I&CO) plans. Use DI-H-30253.

50.7 Computer Program Development Plan. The computer program development plan shall be in accordance with DI-S-30567. The overall sequence of events shall be in accordance with MIL-STD-1644. In particular, the sequence of events and interdependencies shall be in accordance with Figure D-1.

50.8 Engineering drawings and associated lists. Engineering drawings and associated lists for training equipment shall be prepared in accordance with DI-E-7031.

## MIL-STD-1577A(USAF)

50.9 Acceptance test report. Use contractor format to document the results of the acceptance tests of each item of training equipment. These reports shall be in accordance with DI-T-3721, using MIL-STD-831 as a guide only. This report shall include:

a. A list of all weapon system engineering changes not accomplished on training equipment or maintenance support equipment prior to delivery of that item of equipment.

b. Copies of required data for incorporation into the Weapons System Operational Configuration Identification Index.

50.10 Computer software. Computer software shall be documented in accordance with MIL-STD-1644 except as modified in the contract document.

50.10.1 Computer machine products (special). Computer/machine products (cards, tapes, printouts, etc.) shall be in accordance with DI-A-30008.

50.11 Training Equipment Management Plan. Use DI-H-30261.

50.11.1 Format. Prepare in contractor format. The format shall include the following:

a. Identification. The plan shall be identified with the preparing office or contractor's title, the identifying numbers or designation of the Contract/Procurement Request, the identity and/or nomenclature of the system/component/program/project, the security classification and the Government activity issuing the controlling contract.

b. Letter of promulgation. The plan shall contain a letter of promulgation or other document signed by the contractor's authorized official that establishes the contractor's official plan for carrying out the described work.

c. Descriptive material. As may be needed to clarify or explain matters in the text, the plan may include descriptive material, sketches, drawings, photographs, tables, forms, graphs, worksheets, charts, etc.

d. Page size. Type or print on standard size paper, (8½ x 11 inches). The pages shall be sequentially numbered and securely bound together. As necessary, graphic material may be one-way foldouts. All attachments shall be identified and referenced in the text. Each section and paragraph shall be numbered.

e. Tables of contents and index. Plans shall contain a table of contents. Plans more than 120 pages in length shall also include an index.

50.11.2 Contents. Include each of the following:

a. Organizational structure. Organizational chart and supporting narrative portraying the contractor's business (corporate) structure. Describe the functional relationships and responsibilities among the organizational elements that will participate in the accomplishment of the contractual commitments.

## MIL-STD-1577A(USAF)

b. Program management. The plan shall define the direct lines of control, responsibilities, functional relationships, and authority between the management office and the contractor's other organizational elements. Describe all interfaces between the contractor and the Government and between the contractor and other contractors which are necessary and pertinent to the accomplishment of contractual tasks, projects, and programs.

c. Methodology. A narrative description of the technical approach or methods the contractor will employ to accomplish contractual tasks, projects, and programs, including, as applicable, development, tests, manufacture, construction, formulation, installation, logistics support, training, maintenance, documentation, and configuration control. State the specific procedures to respond to anticipated situations.

d. Milestone chart. The plan shall include a milestone chart graphically depicting the schedule of major events associated with accomplishing each contractual commitment.

e. Sequence and flow chart. Include a sequence and flow chart for each major trainer being developed.

f. Personnel. List the personnel staffing of the contractor's management office that directs the contract tasks, projects, and programs and assists in completion of the contract.

50.11.3 Management plan submittal. See 60.1 of this appendix.

50.12 Trainer assembly and checkout (A&CO)/technical analysis. Use DI-S-30604.

50.13 Agenda - design reviews, configuration audits and demonstrations. Use DI-A-3029.

50.14 Minutes of formal review, inspections and audits. Use DI-E-3118.

50.15 Computer Programming Manual. Use DI-M-3411.

50.16 User's Manual (Computer Program). Use DI-M-3410.

50.17 Long Lead Time Items list. Use DI-V-7004 and MIL-STD-499 (USAF).

50.18 Project status report. Use DI-A-5004 and DoDI 7000.10.

50.19 Request for nomenclature. Use DI-E-3126.

50.20 Computer program identification numbers. Use DI-E-3162.

50.21 Technical operating report. Use DI-S-30559.

60. NOTES.

MIL-STD-1577A(USAF)

60.1 Management plan submittal. Submittal of the Management Plan shall be in accordance with the CDRL.

## MIL-STD-1577A(USAF)

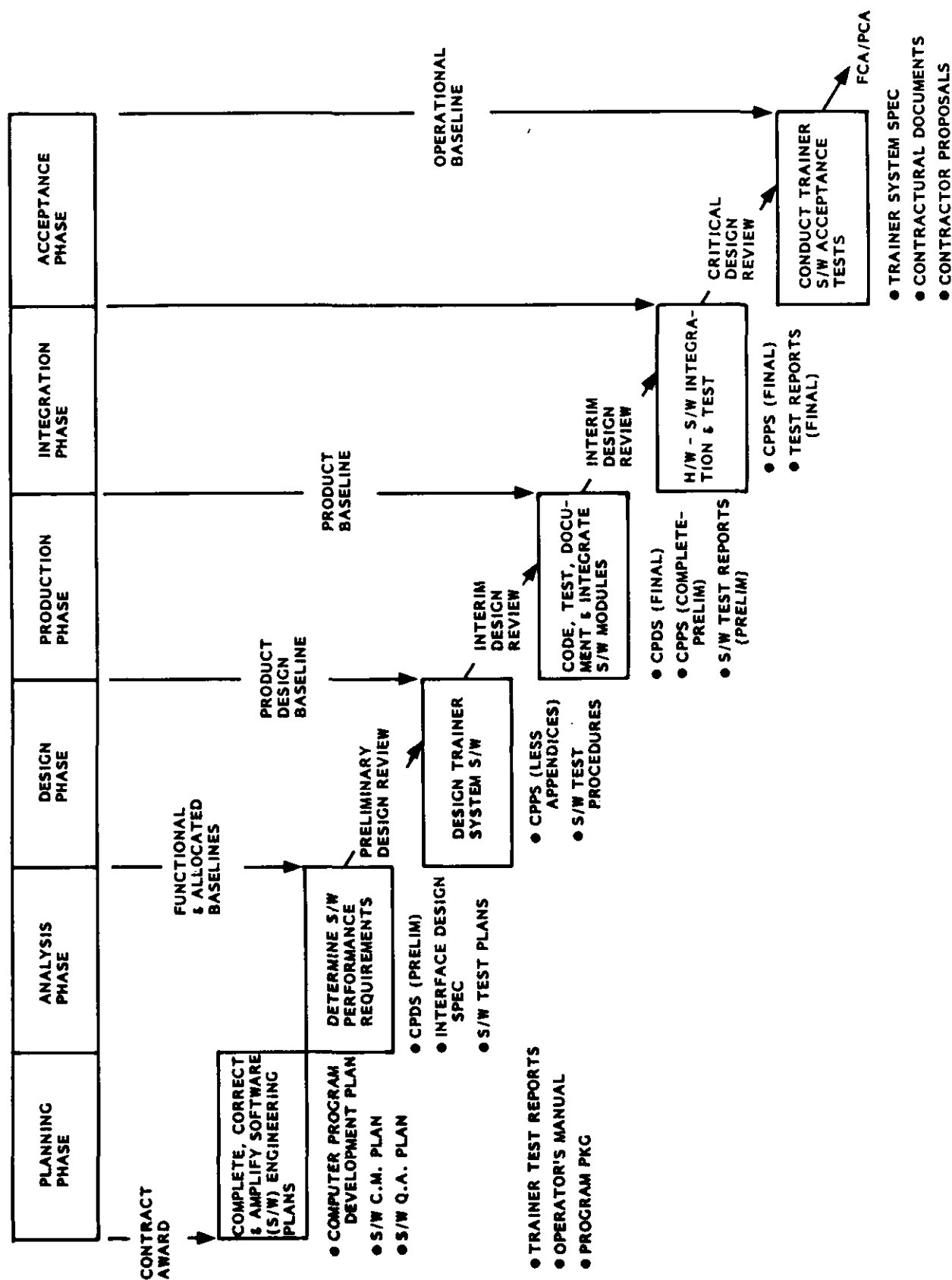


FIGURE D-1. SOFTWARE DEVELOPMENT CYCLE

## MIL-STD-1577A(USAF)

## APPENDIX E

## TRAINING EQUIPMENT SPECIFICATIONS

## 10. SCOPE

10.1 Purpose. This appendix provides preparation instructions for certain training equipment specifications, changes, deviations and waivers thereto, for which the contractor is responsible.

10.2 Applicability. This appendix is a mandatory part of this standard and is applicable as shown in 1.2 of the basic standard.

## 20. REFERENCED DOCUMENTS

20.1 Issues of documents. The following documents of the issue in effect on the date of invitation for bids or request for proposal form a part of this standard to the extent specified herein:

MILITARY SPECIFICATIONS

MIL-M-38795	Manuals, Technical: System Peculiar Corrosion Control
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MILITARY STANDARDS

DOD-STD-480	Configuration Control - Engineering Changes, Deviations and Waivers
MIL-STD-171	Finishing of Metal and Wood Surfaces
MIL-STD-490	Specification Practices
MIL-STD-1568	Materials and Processes for Corrosion Prevention and Control

(Copies of specifications, standards, drawings, and publications required by contractors in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting office.)

## 30. DEFINITIONS

30.1 Acronyms. The following acronyms are used in this appendix:

CDRL	Contractor Data Requirements List
ECP	Engineering Change Proposal

## MIL-STD-1577A(USAF)

LSA  
SRALogistic Support Analysis  
System Requirements Analysis

## 40. GENERAL REQUIREMENTS. (Not Applicable)

## 50. DETAILED REQUIREMENTS

50.1 Hardware specifications. Use DI-E-3132. MIL-STD-490, Appendix VII, is supplemented/tailored as follows:

a. Add to 70.2, Section 2, Applicable documents: "This section shall include a list of documents for operational equipment which will be used to define trainer design/layout.

b. Add to 70.3.1.2, Interface definition: "This paragraph shall describe the trainer-facility interface requirements.

c. Add to 70.3.2.1, Performance; "This paragraph shall include:

1) A summary of the training tasks to completely qualify Air Force personnel to operate and maintain the system equipment represented by the trainer, including identification and location(s) of operational equipment upon which these tasks will be performed in the operational situation. This summary should reflect both organizational and field levels of operation and maintenance.

2) A list of the training tasks identified in the preceding paragraph which the trainer will support, accompanied by a statement of the method by which the trainer will support the tasks listed (i.e., method by which malfunction can be inserted into the trainer system to practice isolation of malfunctions and/or emergency operating procedures).

3) Other trainers - reference to other trainers/training equipment or operational equipment to be used jointly with or to supplement the trainer to cover the training tasks and limitations described in paragraphs 70.3.2.1(1) and (2) above.

4) Simultaneous training - identification of the tasks covered by this trainer requiring simultaneous student participation at different work stations. Training tasks numbers from paragraph 70.3.2.1(2), above, should be used.

5) Class size - The maximum number of students that may be efficiently trained simultaneously with this trainer in (1) demonstration with observers and (2) student participation.

6) Fault insertion - The types of faults to be inserted, method of generating such faults, where they will be inserted in the system, source of information identifying the faults to be inserted, and a description of the provisions in trainer design for including additional faults not identifiable during trainer design.

## MIL-STD-1577A(USAF)

7) Special features - A description of the special features of the trainer which make it more flexible as a training device than the operational hardware which it reflects; i.e., the capability of controlling functions that are automatically sequenced in the operational equipment; simulation of system to provide a capability of continuously operating/recycling in a training situation.

8) Related functional simulation - A description of how simulation of operational equipment or functions not physically represented in the trainer will be accomplished shall be provided. The degree of simulation or visual presentations, control positions, and physical configuration of the operational equipment being reflected in the trainer shall be specified.

e. Replace 70.3.2.3, Reliability, with: "This paragraph shall reflect a requirement which shall be stated as MTBF. This paragraph shall reflect a requirements for Service Life of trainer unique equipment which shall have a minimum service life of ten (10) years, and an aggregate operating MTBF of at least 250 hours."

f. Add to 70.3.2.6, Transportability: "State whether this trainer is to be permanently installed at a specified location, road mobile, railroad mobile, or air mobile."

g. Add to 70.3.3.1, Materials, processes and parts: "This paragraph shall specify an order of preference in the selection of material, processes and parts giving reference to Government specification controlled materials, processes and parts. The requirements of MIL-STD-454 for materials, processes and parts shall apply. Part derating requirements shall be specified. Special attention shall be directed to corrosion prevention and control. Apply MIL-STD-1568, MIL-STD-1250 and MIL-STD-808 to training equipment on a selective basis for corrosion prevention and control."

h. Add 70.3.3.1.2, Modification: Sufficient design flexibility shall be incorporated in the trainer to permit rapid and inexpensive modifications when changes to the target system occur.

i. Add to 70.4.2, Quality conformance inspections: "An acceptance inspection covering the functional characteristics and suitability shall be outlined defining the tests to be used in determining the adequacy of the trainer to accomplish the general and specific objectives of Section 3. This outline shall be stated in 'requirement for test' language and shall describe the criteria methods, materials, and personnel that will be applied or required in the acceptance inspection. Further, procedural checklists developed for use with the trainer shall be compatible with and representatives of the checklist and procedures developed for the system which this trainer represents. The objectives of acceptance inspection are to determine;

1) The functional adequacy and performance capability of the equipment in relation to its planned use in the training mission.

2) Design adequacy in terms of layout, recording devices, tolerances, limits of operation, proficiency measures, and related characteristics.

3) The adequacy of installation, calibration, and maintenance procedures, including training equipment parts consumption.

4) The suitability of the equipment as reflected in the responses of representative students, instructors, and operators."

j. Add to 70.6: "This section shall also briefly describe the intended use of the trainer, and where and by whom it is intended to be used (contractor's plant, ATC base, etc.)."

50.2 Engineering Change Proposals (ECPs). ECPs for each proposed Class I change shall be in accordance with DI-E-3128 and DoD-STD-480, except that 30.6(e) of DoD-STD-480 shall include the following:

a. ECP Matrix - An ECP CDRL matrix on a format the same as or similar to Figure E-2, for each ECP. Preparation instructions are contained in Figure E-2.

b. A recommended DD Form 1423 for each proposed new CDRL shall be attached to the completed ECP CDRL matrix.

c. If an ECP does not affect an approved specification, place the letters NA in block 8 or b of the ECP Form (DD Form 1692) in lieu of submitting an SCN for change traceability.

50.3 Deviations and waivers. Requests for deviations/waivers shall be in accordance with DI-E-3129 and DoD-STD-480.

50.3.1 Deviations. Deviations shall be in accordance with 7. of DoD-STD-480 (long form).

50.3.2 Waivers. Waivers shall be in accordance with 8. of DoD-STD-480 (long form).

MIL-STD-1577A(USAF)

ENGINEERING CHANGE PROPOSAL MATRIX							
FOR ECP NUMBER: (1)							
(2) Title of Data to the Government	(3) Basic CDRL which covers this Data	(4) New CDRL	(5) Data Price Cp	(6) Manhours to Prepare	(7) Pages	(8) Price	
<p><u>PREPARE AS FOLLOWS:</u></p> <p>(1) Enter the ECP number for which this matrix is prepared.</p> <p>(2) Enter the title of each piece of data which is to be delivered to the Government as a result of this ECP.</p> <p>(3) If there is an existing CDRL which covers this data, enter the contract number, attachment number of the CDRL, applicable task number cited on the CDRL, and the CDRL sequence number which requires the data. If this matrix is for a new item, enter the word "NONE" in this space.</p> <p>(4) Enter YES or NO in this column to indicate if this requires a new CDRL.</p> <p>(5) Enter Price Group, I, II or III in this column.</p> <p>(6) This should be the contractor's estimate of the number of manhours required to prepare this data.</p> <p>(7) The contractor would enter his best estimate of the number of pages to be prepared for this data package.</p> <p>(8) Enter the estimated data price for each piece of data to be prepared as a result of this ECP. If there will be no cost, so state and attach appropriate justification for the estimate.</p>							

FIGURE E-1. Engineering Change Proposal Matrix.

## MIL-STD-1577A(USAF)

## APPENDIX F

## TRAINING SOFTWARE DOCUMENTATION

## 10. SCOPE

10.1 Purpose. This appendix provides preparation instructions for the training software specifications and the associated software documentation for which the contractor is responsible.

10.2 Applicability. This appendix is a mandatory part of this standard and is applicable as shown in 1.2 of the basic standard.

## 20. REFERENCED DOCUMENTS

20.1 Issues of documents. The following documents of the issue in effect on the date of invitation for bids or request for proposal form a part of this standard to the extent specified herein:

MILITARY STANDARDS

DOD-STD-480	Configuration Control - Engineering Changes, Deviations and Waivers
MIL-STD-483	Configuration Management Practices
MIL-STD-490	Specification Practices
MIL-STD-1644	Trainer System Software Development

(Copies of specifications, standards, drawings, and publications required by contractors in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting office.)

## 30. DEFINITIONS

30.1 Acronyms. The following acronyms are used in this appendix:

CDRL	Contractor Data Requirements List
CPDS	Computer Program Development Specifications
CPPS	Computer Program Product Specifications
ECP	Engineering Change Proposal
GFPL	Government Furnished Property List

## MIL-STD-1577A(USAF)

PDR	Preliminary Design Review
SSL	Support Software List
TSL	Training Software List
VCD	Vendor Commercial Documentation

## 40. GENERAL REQUIREMENTS

40.1 Software specifications. The overall software engineering process shall be accomplished in accordance with MIL-STD-1644.

40.2 Software development planning. Software development shall be accomplished in accordance with DI-M-3410 and DI-M-3411.

## 50. DETAILED REQUIREMENTS

50.1 Government Furnished Property List (GFPL). The GFPL shall be in accordance with DI-H-3257 and shall contain separate listings for:

- a. Items known or expected to be available from government assets.
- b. Items to be procured by the government from an associate contractor. (Prepare a separate list for each associate contractor.)

50.2 Training Software List (TSL). The TSL shall provide a comprehensive list of all training system software. It shall include at least:

- a. The names of all programs, routines, subprograms, etc., used in the trainer.
- b. A definition of the function and purpose of each software element.
- c. A definition of the interfaces and interrelationships among all software elements.
- d. A description of the relationships of the SEs to the trainer equipment and definition of the interdependencies involved.
- e. A statement of any special support requirements.

50.3 Support Software List (SSL). The SSL will define the same elements for the support software as the TSL does for the training software. In addition, the need for the support software shall be justified.

50.4 Acceptance test procedures. The Acceptance Test Procedures document shall be in accordance with DI-T-3714. It shall identify all incorporated operation and maintenance procedures which are compatible with those of an operational unit.

50.5 Acceptance test report. Free form test reports providing a narrative description of acceptance testing shall be prepared. Copies of all test proce-

## MIL-STD-1577A(USAF)

dures and test data shall be included. Copies of all failure reports shall be attached. Any open failure reports shall be justified prior to acceptance of the test report.

## 50.6 Computer Program Specifications

50.6.1 Computer Program Development Specifications (CPDS). A CPDS shall be prepared for each deliverable program in accordance with MIL-STD-1644.

50.6.2 Computer Program Product Specifications (CPPS). A CPPS shall be prepared for each deliverable program in accordance with Appendix VI of MIL-STD-483 and Appendix XIII of MIL-STD-490 as described by MIL-STD-1644.

50.6.3 Vendor Commercial Documentation (VCD). VCD shall be used "as-is" for standard off-the-shelf software to the maximum extent practical. This use shall be subject to AF review and approval at Preliminary Design Review (PDR).

50.7 Engineering Change Proposals (ECPs). ECPs for each proposed Class I change shall be in accordance with DI-E-3128 and DoD-STD-480, except that 30.6(e) of DoD-STD-480 shall include the following:

a. ECP Matrix - An ECP CDRL matrix on a format the same as or similar to Figure E-2, for each ECP. Preparation instructions are contained in Figure E-2.

b. A recommended DD Form 1423 for each proposed new CDRL shall be attached to the completed ECP CDRL matrix.

c. If an ECP does not affect an approved specification, place the letters NA in block 8 or b of the ECP Form (DD Form 1692) in lieu of submitting an SCN for change traceability.

50.8 Deviations and waivers. Requests for deviations/waivers shall be in accordance with DI-E-3129 and DoD-STD-480.

50.8.1 Deviations. Deviations shall be in accordance with Paragraph 7. of DoD-STD-480 (long form).

50.8.2 Waivers. Waivers shall be in accordance with Paragraph 8. of DoD-STD-480 (long form).

## MIL-STD-1577A(USAF)

## APPENDIX G

## DATA ITEM DESCRIPTIONS (DID) REFERENCES

Data items associated with this standard are not deliverable unless specified in the Contract Data Requirements List (CDRL). The data normally associated with this standard include the following:

<u>Paragraph</u>	<u>Data Requirements</u>	<u>Applicable DID</u>
5.1.5 and Appendix D	Agenda - Design Reviews, Configuration Audits and Demonstrations	DI-A-3029
5.1.5 and Appendix D	Configuration Item Development Specification (Facility Criteria)	DI-E-3102
5.1.5 and Appendix D	Minutes of Formal Reviews, Inspections and Audits	DI-E-3118
5.1.4.2	Computer Program Development Specifications	DI-E-3119
5.1.4.2	Computer Program Product Specification	DI-E-3120
5.1.5 and Appendix D	Request for Nomenclature	DI-E-3126
4.2.1.2 and Appendix E	Engineering Change Proposals	DI-E-3128
5.1.4 and Appendix E	Request for Deviation/Waiver	DI-E-3129
5.1.4 and Appendix E	Configuration Item Product Function Specification	DI-E-3132
5.10 and Appendix D	Computer Program Identification Numbers	DI-E-3162
5.1.5 and Appendix D	Training Equipment List	DI-H-3256
5.1.5 and Appendix D	Training Equipment Government Furnished Property List	DI-H-3257
5.1.5 and Appendix D	Technical Orders, CFAE/CFE Notices and Related Technical Orders	DI-M-3405

## MIL-STD-1577A(USAF)

5.1.5 and Appendix D	Technical Orders	DI-M-3407
Appendix D	Users Manual (Computer Program)	DI-M-3410
5.1.5 and Appendix D	Computer Programming Manual	DI-M-3411
5.1.5 and Appendix D	Long Lead Time Items List	DI-V-7004
5.1.5 and Appendix D	Acceptance Test Procedures	DI-T-3714
5.1.5 and Appendix D	Acceptance Test Reports	DI-T-3721
5.1.5 and Appendix D	Project Status Report	DI-A-5004
Appendix C	Audio Visual Aids, Training Equipment and Training Courses	DI-E-7072
5.1.5 and Appendix D	Drawings, Engineering, and Associated Lists	DI-E-7031
5.1.2 and Appendix D	Training and Training Equipment Plan	DI-H-33054
5.1.5 and Appendix D	Computer/Machine Products (Special)	DI-A-30008
5.1.5 and Appendix D	Installation and Checkout Plan, Training Equipment	DI-H-30253
5.1.5 and Appendix D	Training Equipment Management Plan	DI-H-30261
5.1.5 and Appendix D	Technical Operating Report	DI-S-30559
5.1.5 and Appendix D	Computer Program Development Plan	DI-S-30567
5.1.5 and Appendix C	Assembly, Installation and Checkout Technical Analysis	DI-S-30604

MIL-STD-1577A(USAF)

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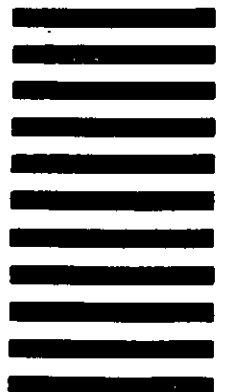
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