

BOEING MILITARY AIRPLANE COMPANY

BMAC

CONFIGURATION MANAGEMENT

WHAT IS CONFIGURATION MANAGEMENT

**A MANAGEMENT APPROACH TO GIVE ORDER,
VISIBILITY, AND CONTROL TO LIFE CYCLE
MANAGEMENT OF HARDWARE AND SOFTWARE**

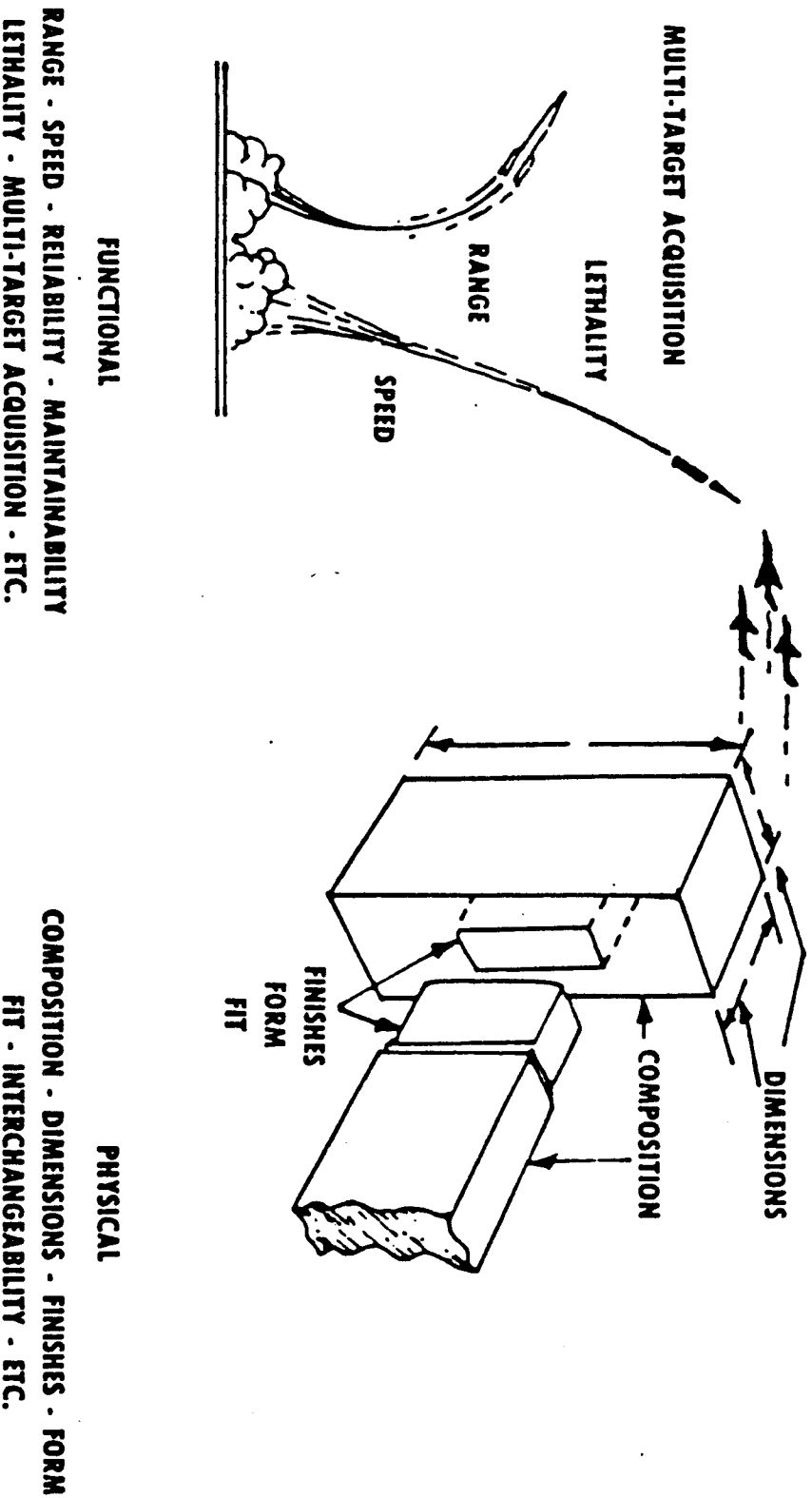
**“KNOWING WHAT YOU HAVE
AND KEEPING TRACK OF IT”**

**IT IS A DISCIPLINE THAT MUST BE LEARNED,
APPLIED, AND SUPPORTED TO BE SUCCESSFUL**

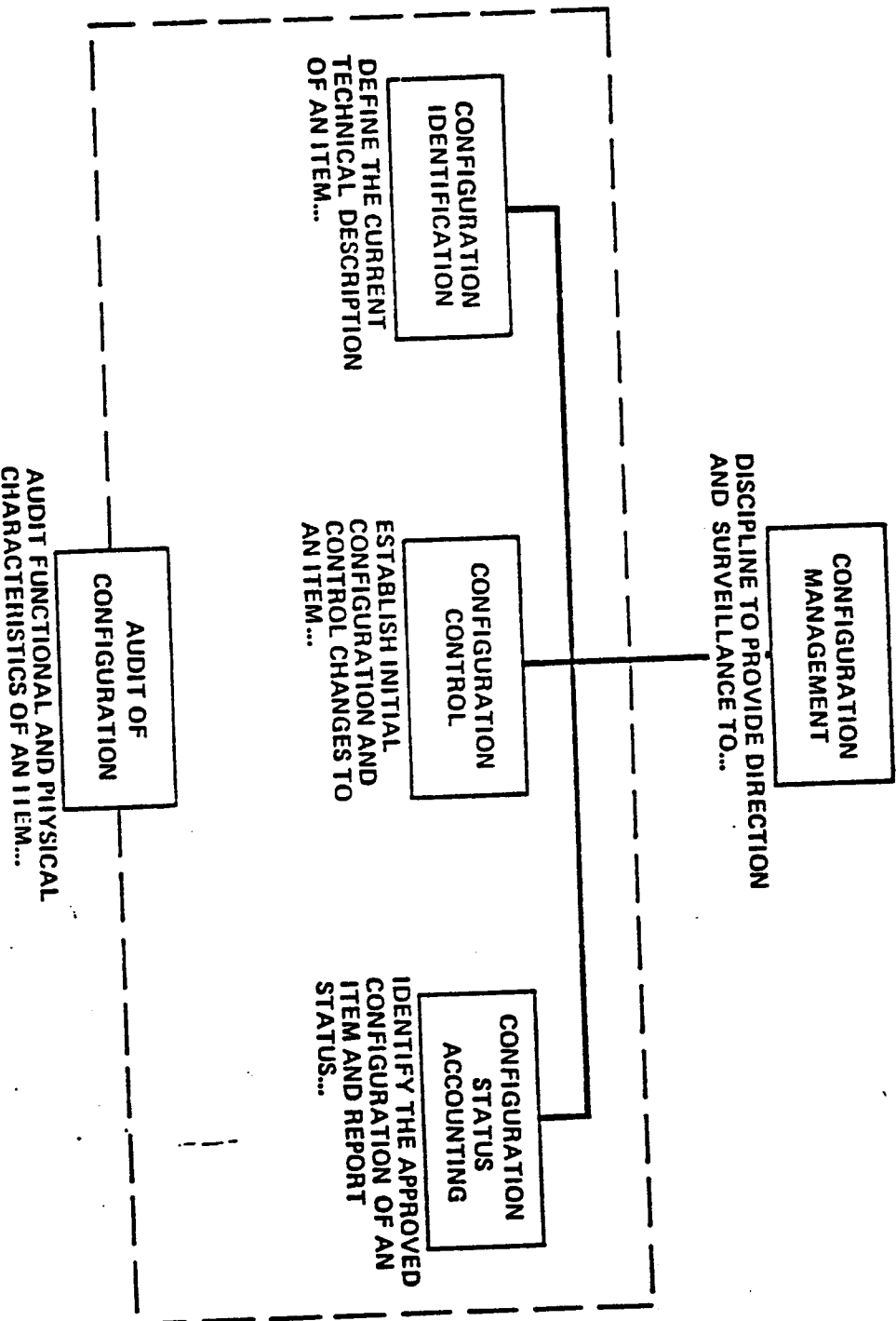
CONFIGURATION MANAGEMENT

WHAT IS CONFIGURATION ?

THE FUNCTIONAL AND/OR PHYSICAL CHARACTERISTICS OF HARDWARE/SOFTWARE AS SET FORTH IN TECHNICAL DOCUMENTATION AND ACHIEVED IN A PRODUCT



CONFIGURATION MANAGEMENT



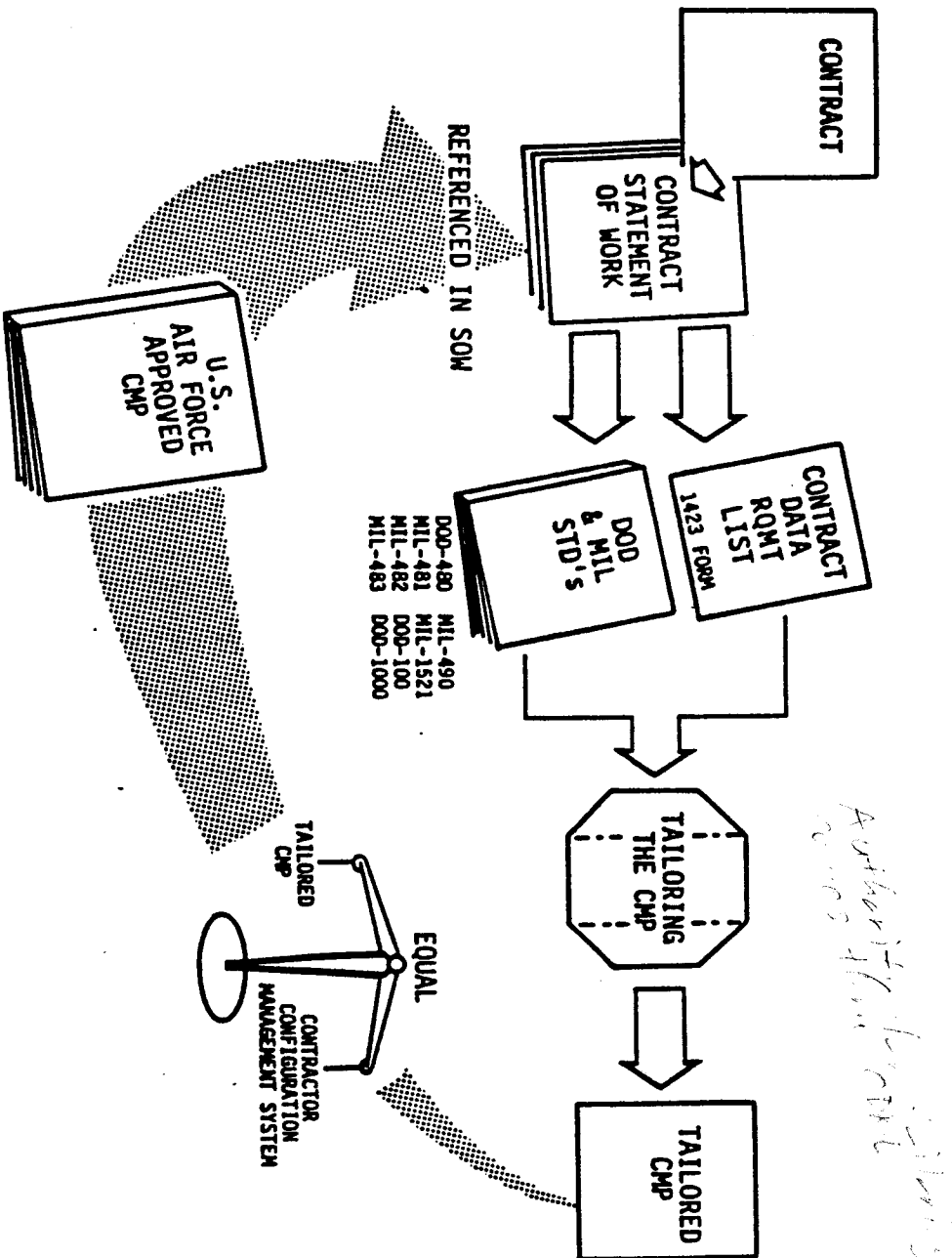
CONFIGURATION MANAGEMENT
REQUIREMENTS

- MIL-STD-483, CONFIGURATION MANAGEMENT PRACTICES FOR SYSTEMS, EQUIPMENT,
MUNITIONS, AND COMPUTER PROGRAMS
 - CONFIGURATION MANAGEMENT PLAN (CMP)
 - CONFIGURATION IDENTIFICATION (MIL-STD-490, DOD-D-100, DOD-STD-100)
 - CONFIGURATION CONTROL (DOD-STD-480, MIL-STD-481)
 - CONFIGURATION AUDITS (MIL-STD-1521)
 - ENGINEERING RELEASE CONTROL
 - CONFIGURATION MANAGEMENT REPORTS/RECORDS (MIL-STD-482)
- "ESTABLISH UNIFORM CONFIGURATION MANAGEMENT PRACTICES THAT CAN BE
ADAPTED TO ALL USAF SYSTEMS AND CONFIGURATION ITEMS"

CONFIGURATION MANAGEMENT
CONFIGURATION MANAGEMENT PLAN

- GENERALLY REQUIRED AS CONTRACT DATA REQUIREMENTS LIST (CDRL) ITEM
- DOCUMENTS THE RESPONSIBILITIES AND PROCEDURES TO BE IMPLEMENTED BY THE CONTRACTOR TO FULFILL CONTRACTED REQUIREMENTS
- PREPARED AND CONTROLLED BY PROGRAM ENGINEERING OPERATIONS ORGANIZATION
- PROVIDES VEHICLE TO TAILOR RELATED MILITARY SPECIFICATION REQUIREMENTS TO SUIT PARTICULAR PROGRAM NEEDS

CONFIGURATION MANAGEMENT PLAN (CMP) TAILORING

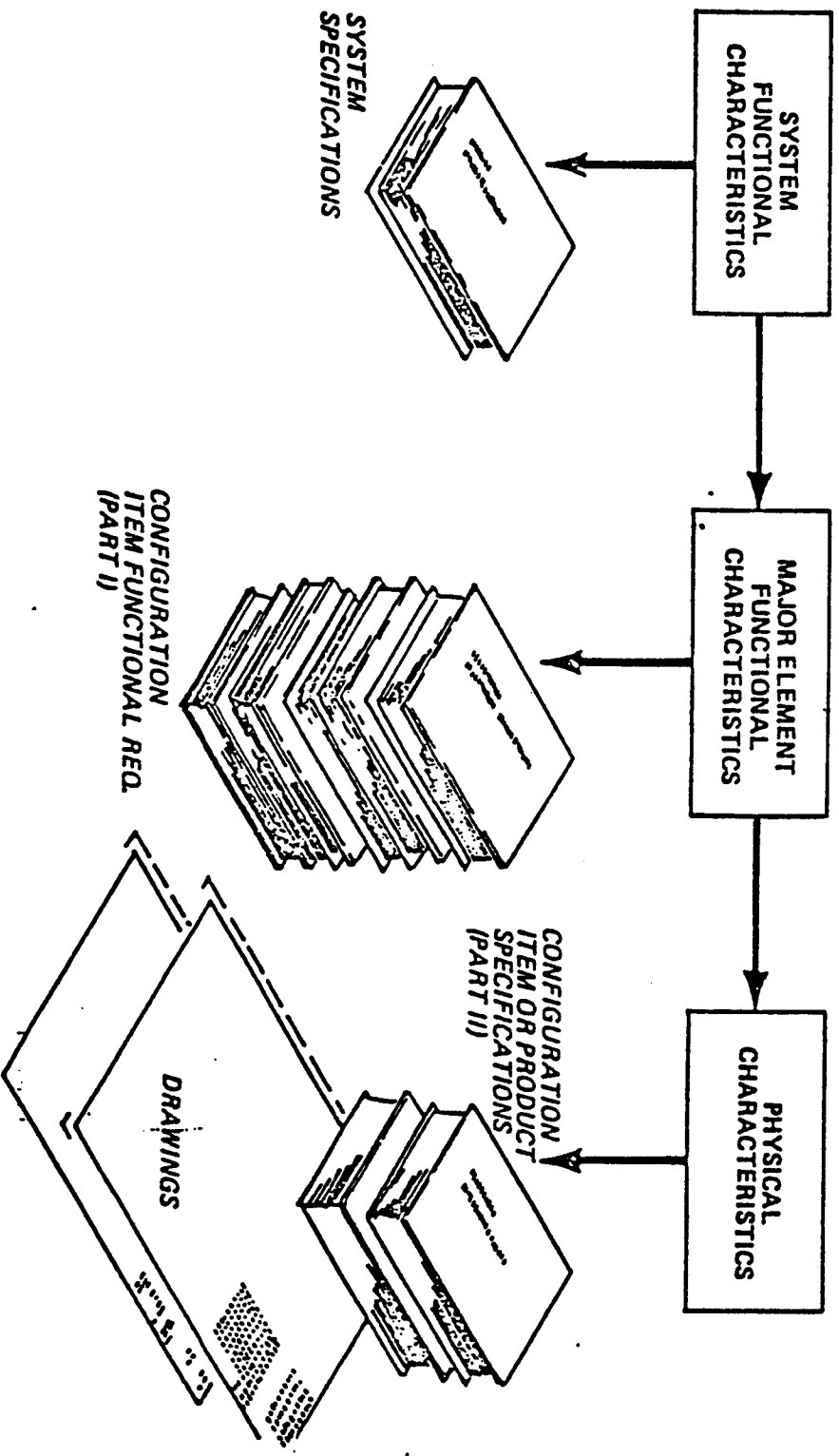


CONFIGURATION IDENTIFICATION

*reference to
the Air Force
reference number*

**THE DOCUMENTED CONFIGURATION OF ITEMS--THE CURRENT
TECHNICAL DESCRIPTION (e.g. SPECIFICATION, ENGINEERING
DRAWINGS, TECHNICAL MANUALS AND OTHER RELATED
TECHNICAL DATA AND INFORMATION) REQUIRED FOR
ENGINEERING OR OPERATIONAL SYSTEMS DEVELOPMENT,
FABRICATION, TEST, ACCEPTANCE, OPERATION, MAINTENANCE
AND LOGISTICS SUPPORT OF SYSTEMS, END ITEMS, EQUIPMENT
OR ANY PORTIONS THEREOF**

CONFIGURATION IDENTIFICATION



TYPES OF SPECIFICATIONS

(MIL-STD-490)

TYPE A — SYSTEM SPEC

TYPE B — DEVELOPMENT SPEC

TYPE C — PRODUCT SPEC

B1 - PRIME ITEM

C1a - PRIME ITEM FUNCTION

C1b - PRIME ITEM FABRICATION

B2 - CRITICAL ITEM

C2 - CRITICAL ITEM FUNCTION

B3 - NON COMPLEX ITEM

C3 - NON-COMPLEX ITEM
FABRICATION

B4 - FACILITY

C4 - INVENTORY ITEM

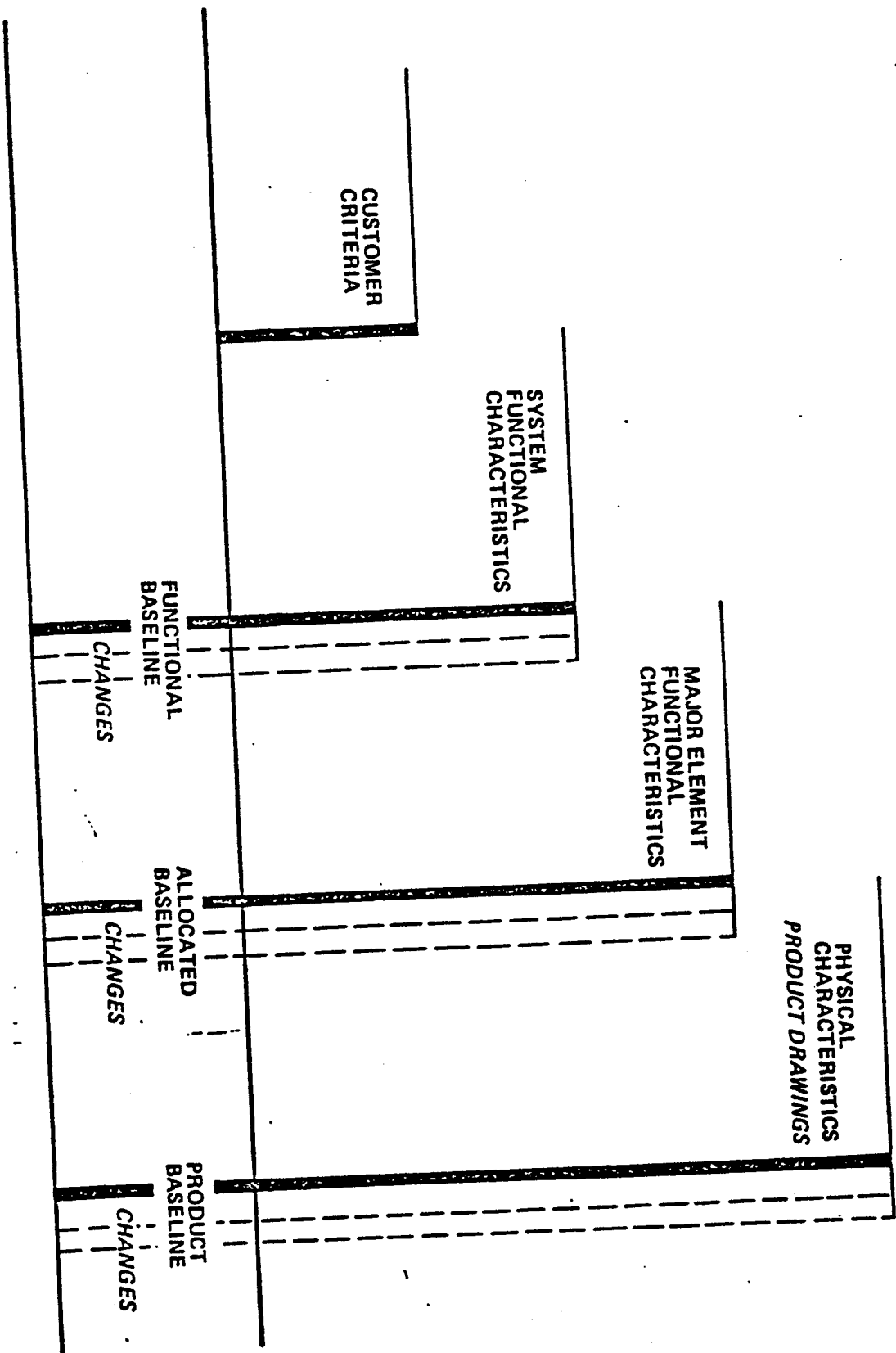
B5 - COMPUTER PROGRAM

C5 - COMPUTER PROGRAM

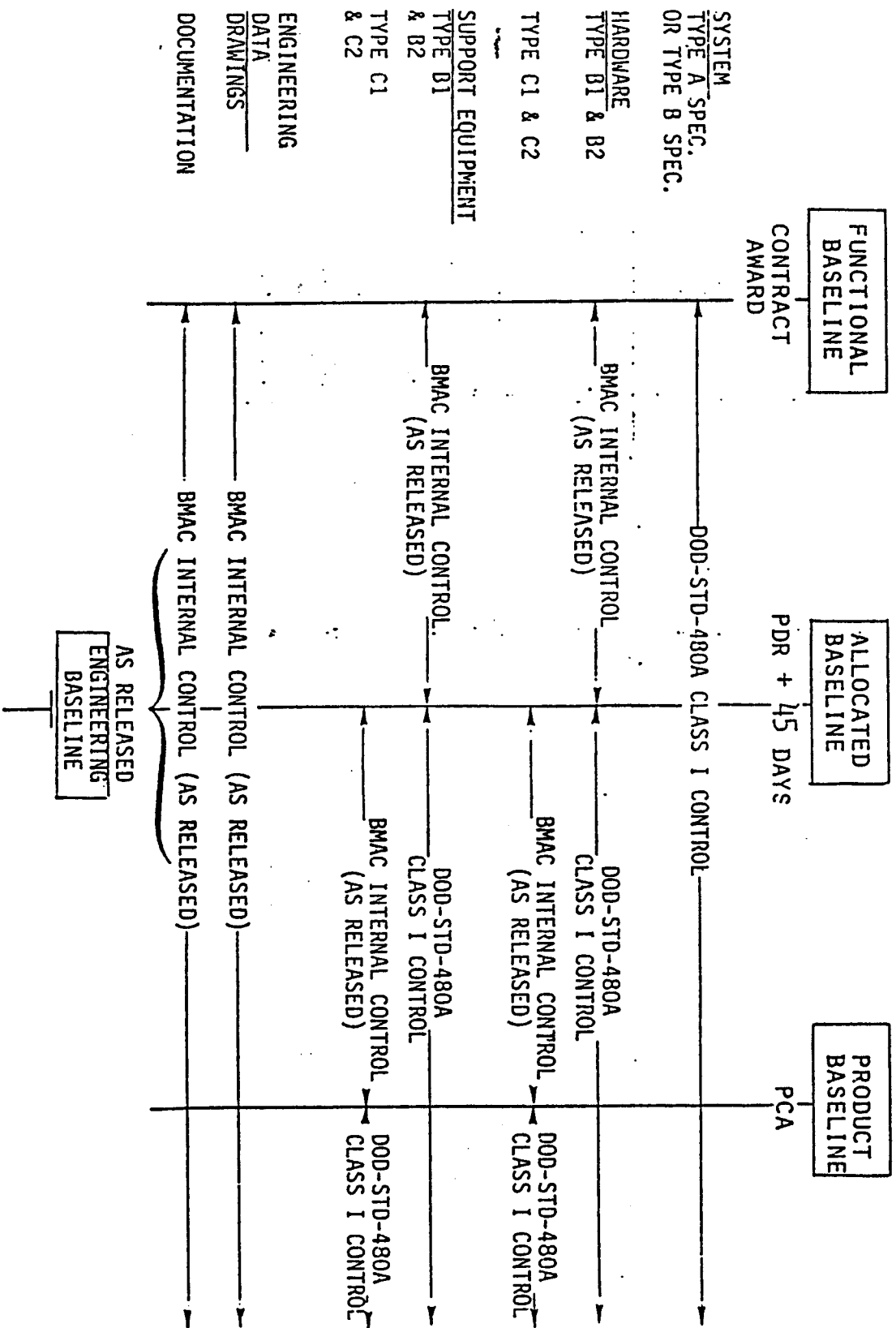
TYPE D — PROCESS SPEC

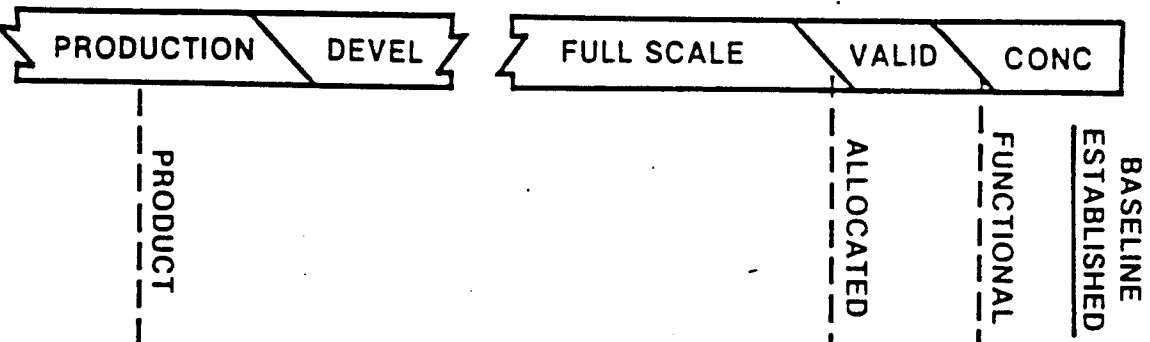
TYPE E — MATERIAL SPEC

BASELINE CONTROL



TYPICAL BASELINE SCENARIO





	BASELINE DOCUMENTATION	TYPE OF MEETING
FUNCTIONAL	SYSTEM SPECIFICATION	SRR
ALLOCATED	CONFIGURATION ITEM DEVELOPMENT SPECS	SDR
	COMPONENT DESIGN CONCEPTS FUNCTIONAL FLOWS/MODULES	PDR
	DETAIL DRAWINGS PARTS LISTS PROGRAMMABLE FLOW CHARTS	CDR

QUALIFICATION TESTING PROGRAM

(CONTRACTOR DETAIL CONTROL)

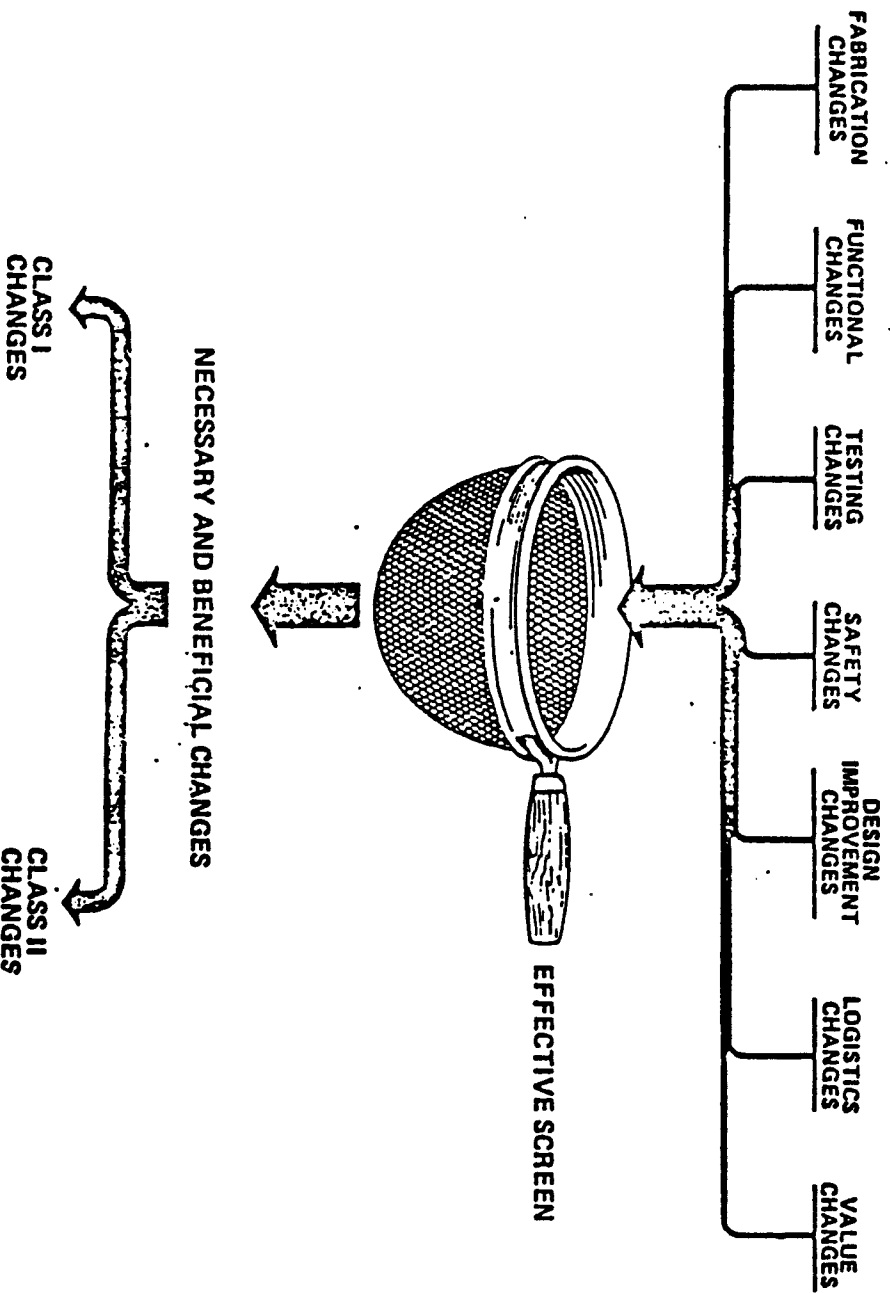
PRODUCT SPECIFICATION FINAL DETAIL DRAWINGS MANUFACTURING INSTRUCTIONS COMPUTER PROGRAM LISTINGS COMPUTER MANUALS/HANDBOOKS ACCEPTANCE TEST PROCEDURES ACTUAL HARDWARE/SOFTWARE	FCA
	PCA

PRODUCT

CONFIGURATION CONTROL

THE SYSTEMATIC EVALUATION, COORDINATION, APPROVAL OR DISAPPROVAL AND IMPLEMENTATION OF (1) INITIAL CONFIGURATION, (2) ALL CHANGES TO THAT CONFIGURATION AFTER THE FORMAL ESTABLISHMENT OF BASELINES AND (3) ALL CHANGES TO THAT CONFIGURATION DURING THE OPERATIONAL PERIOD, PARTICULARLY, MODIFICATION OR MAINTENANCE CHANGES

CHANGE INITIATION

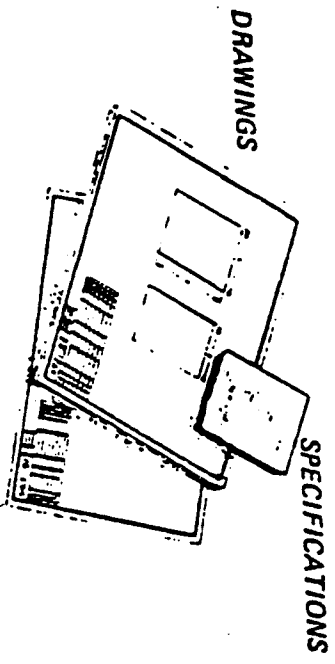


CONFIGURATION MANAGEMENT
CONFIGURATION CONTROL
(DOD-STD-480)

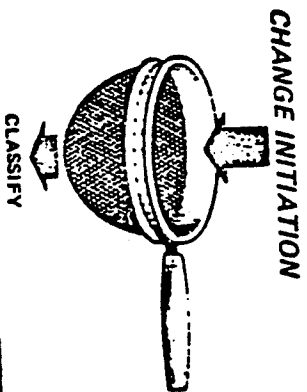
- CONFIGURATION CHANGE SYSTEMS BOTH WITHIN AND BEYOND ESTABLISHED CONFIGURATION BASELINE
- TWO CLASSES OF CHANGES, I.E. ENGINEERING CHANGE PROPOSALS (ECPs)
 - CLASS I CRITERIA
 - FUNCTIONAL OR ALLOCATED CONFIGURATION IDENTIFICATION (FCI, ACI)
 - PRODUCT CONFIGURATION IDENTIFICATION (PCI) AS CONTRACTUALLY SPECIFIED EXCLUDING REFERENCED DRAWINGS, SPECS AND LISTS
 - TECHNICAL REQUIREMENTS CONTAINED IN THE PCI AS CONTRACTUALLY SPECIFIED INCLUDING REFERENCED DRAWINGS AND SPECIFICATIONS SUCH AS PERFORMANCE, RMS, WEIGHT AND BALANCE AND INTERFACE CHARACTERISTICS
 - NON-TECHNICAL CONTRACTUAL PROVISIONS SUCH AS FEE, INCENTIVES, COST, SCHEDULES, GUARANTEES OR DELIVERIES
 - OTHER SUCH AS GFE, SAFETY, EMI, COMPUTER PROGRAMS, COMPATIBILITY WITH SE, TRAINERS OR TRAINING EQUIPMENT, RETROFIT, T.O.s, ETC.
 - CLASS II (BOEING PRODUCTION REVISION RECORD - PRR)
- CONTRACT CHANGE PROPOSAL (CCP)
- NON-TECHNICAL CONTRACT CHANGE

CONFIGURATION CONTROL

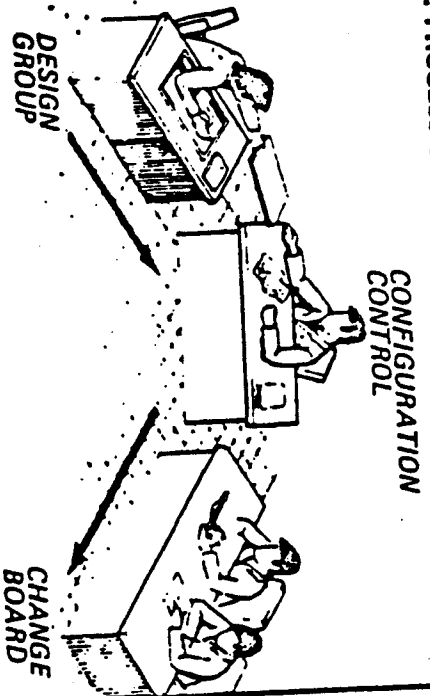
1. ESTABLISH THE APPLICABLE BASELINE -



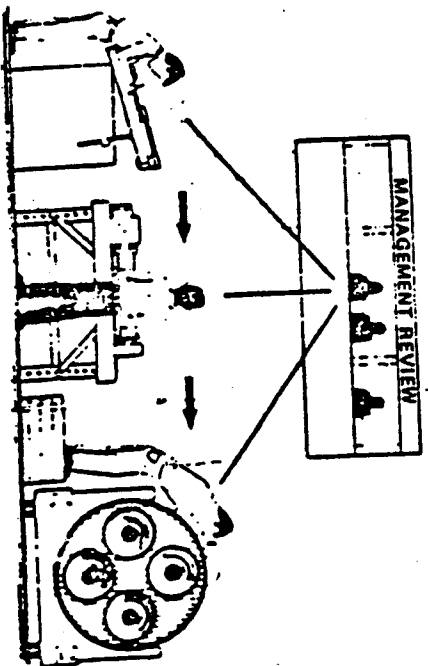
2. SCREEN CHANGE INITIATION AND CLASSIFY -



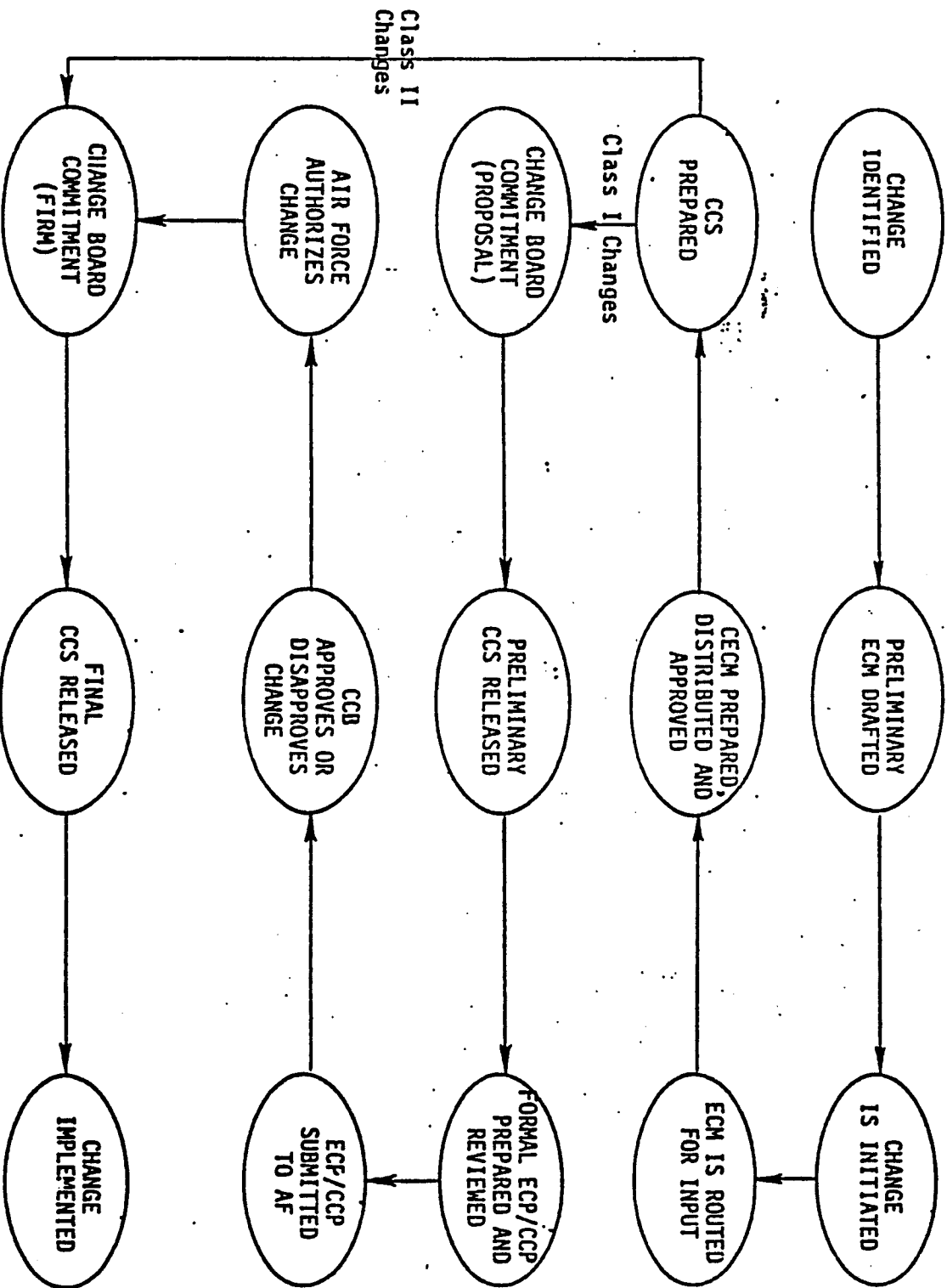
3. PROCESS CHANGES -



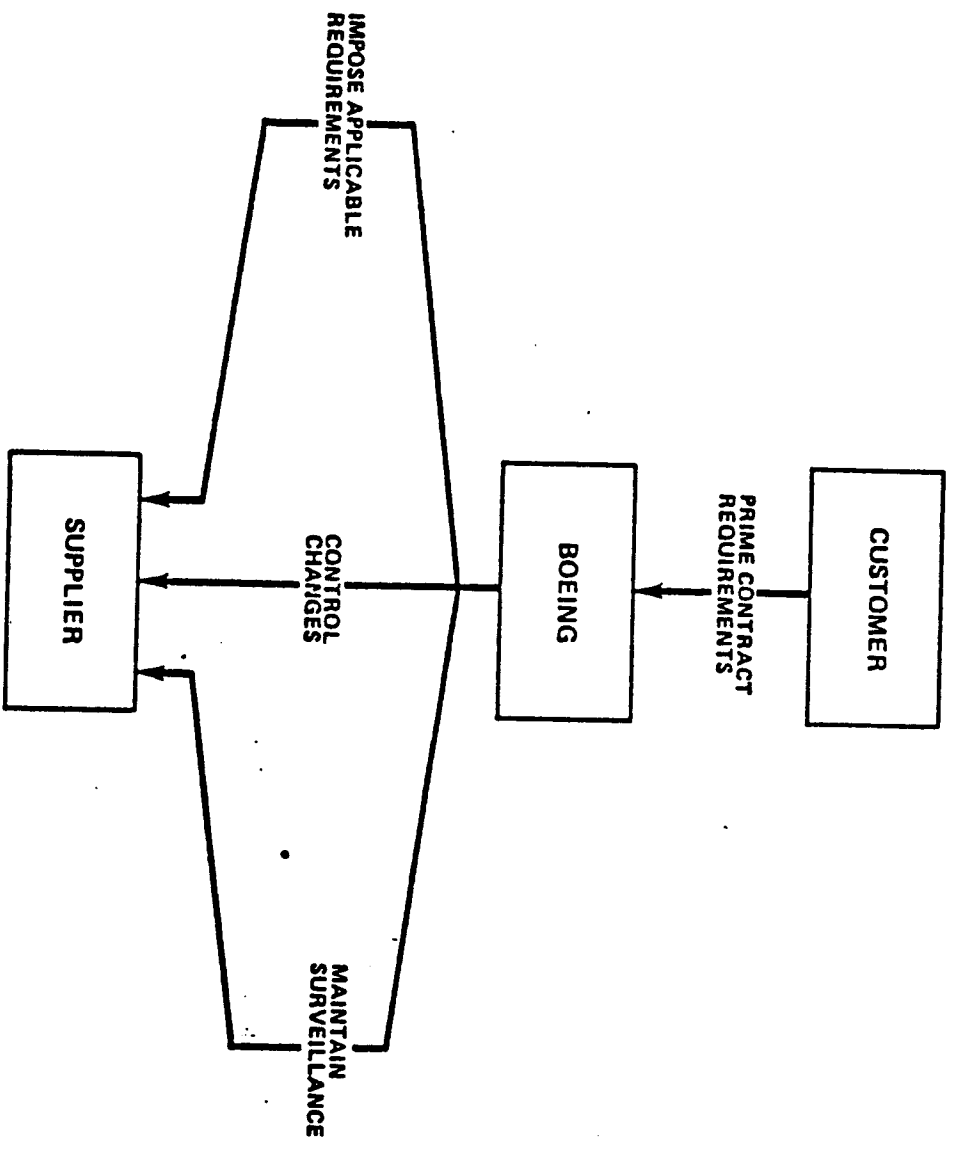
4. IMPLEMENT AND FOLLOWUP CHANGES -



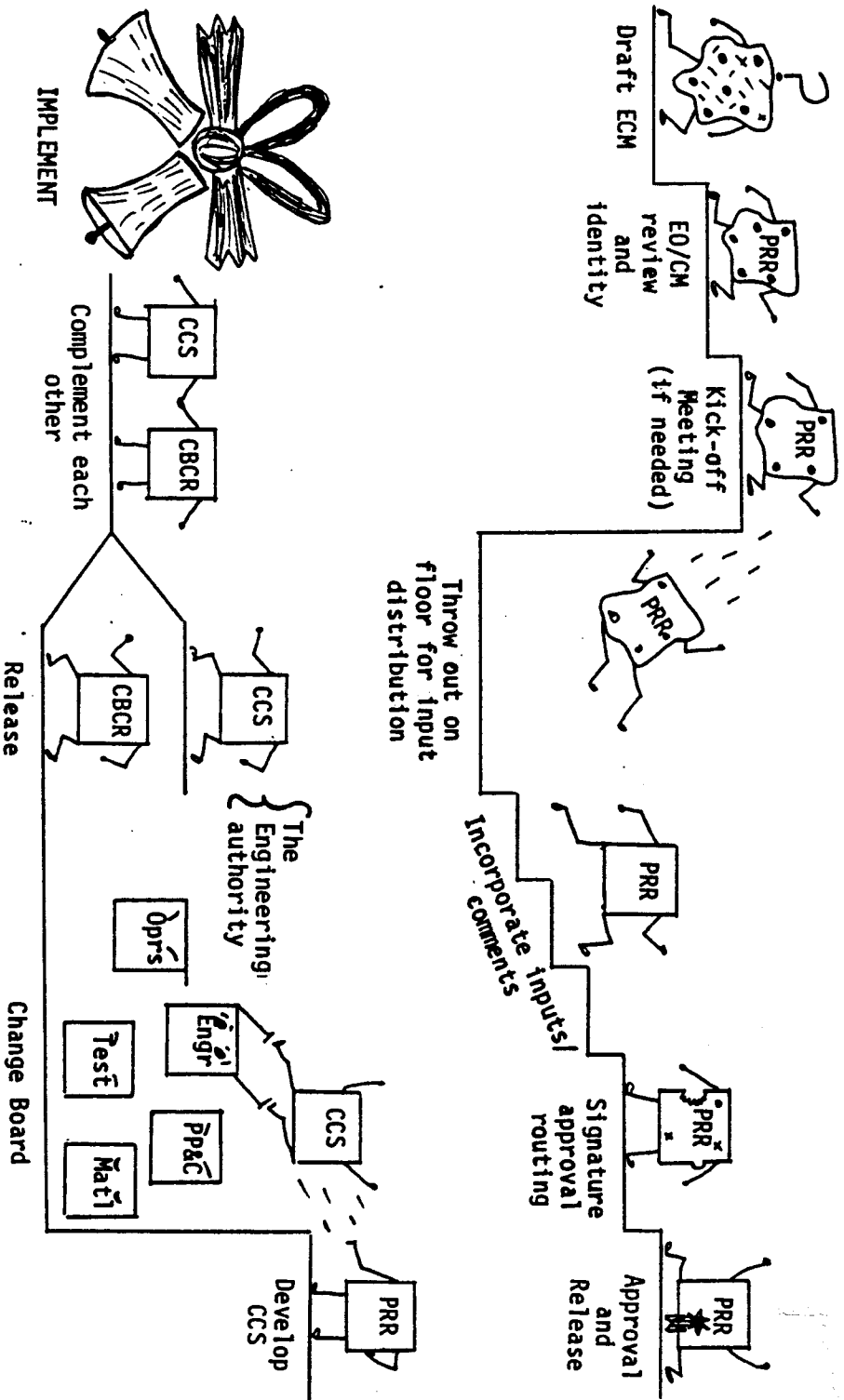
TYPICAL CHANGE/PROPOSAL PROCESSING SCHEME



SUPPLIER CONFIGURATION MANAGEMENT



CLASS II CHANGE PROCESS

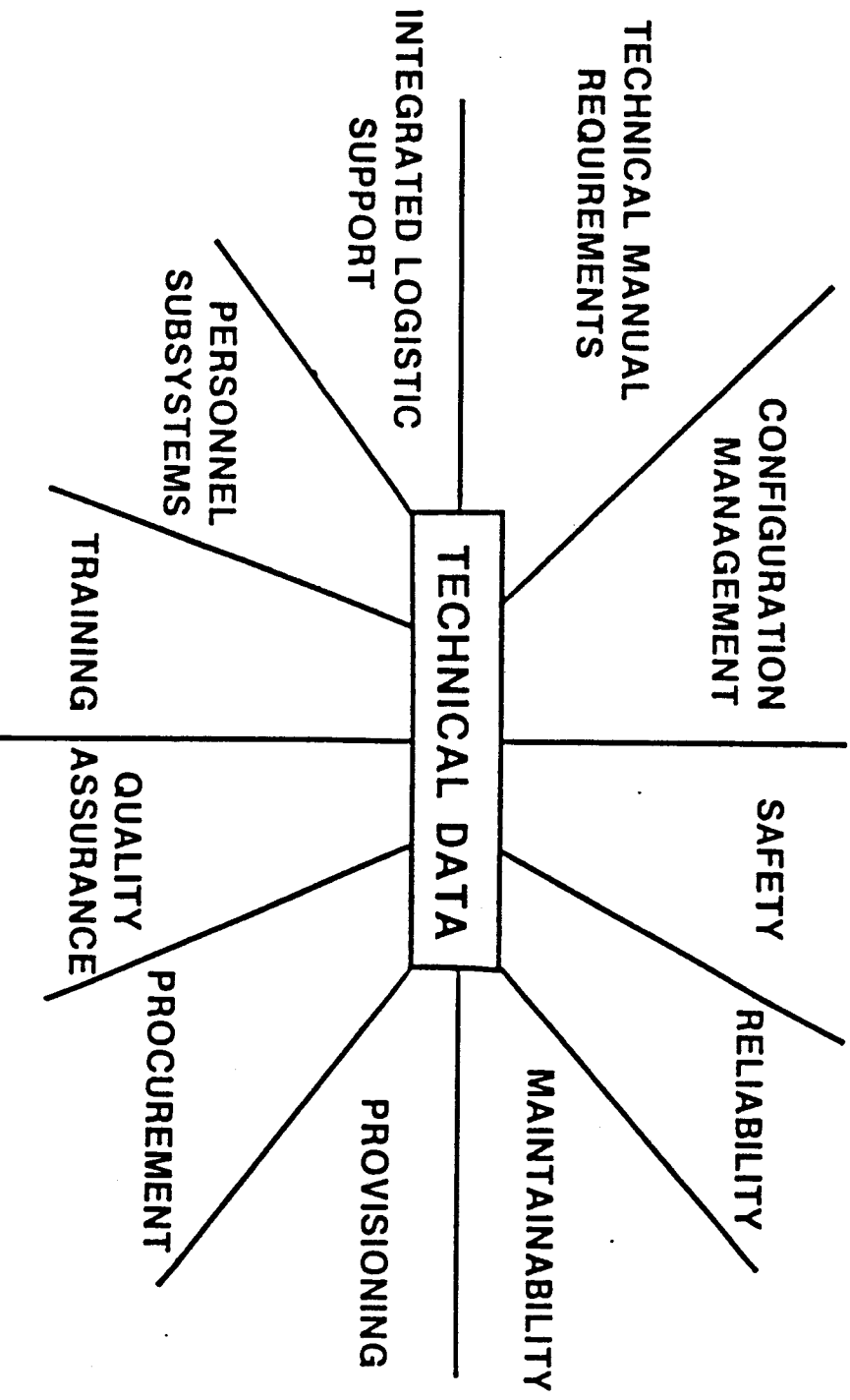


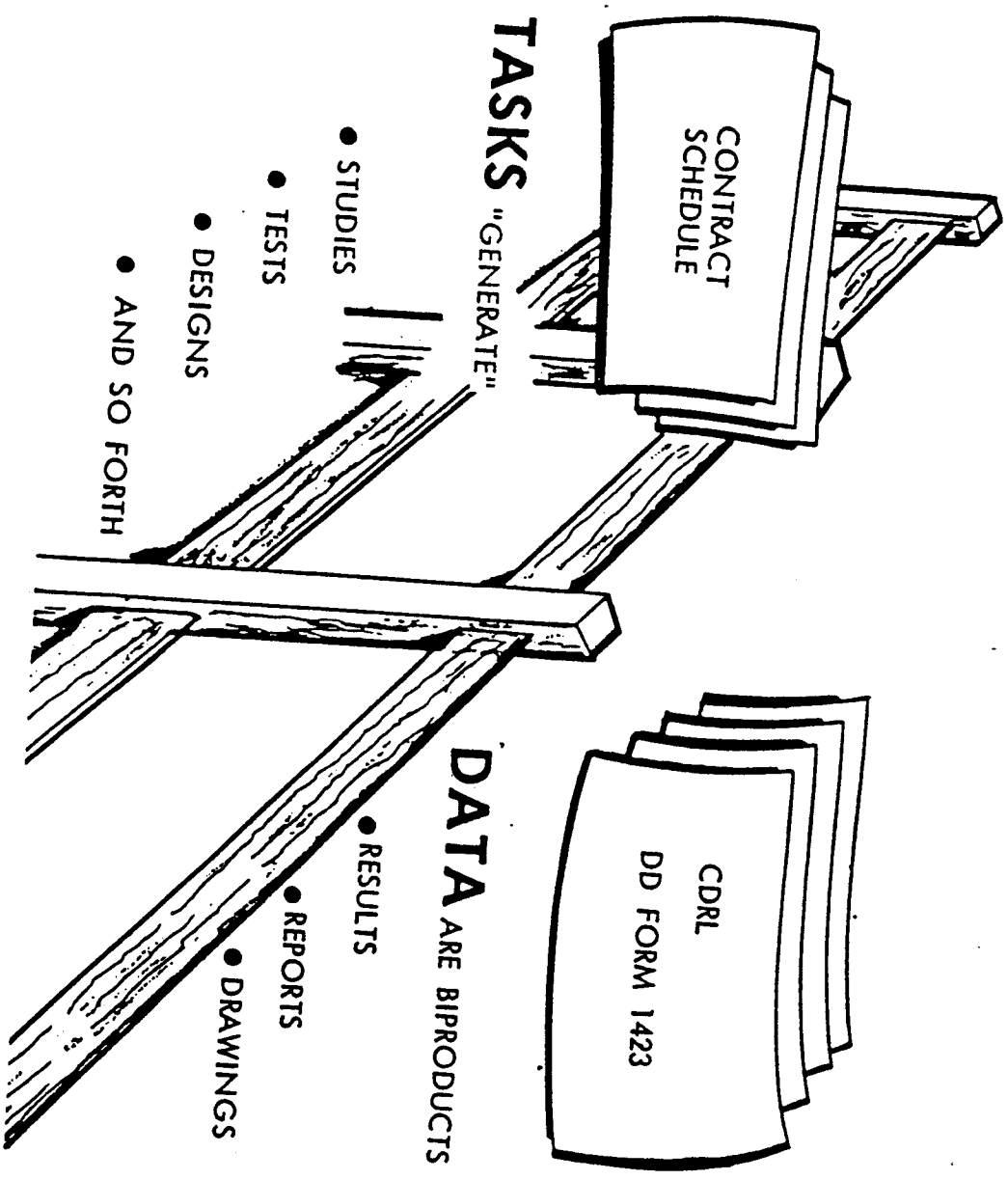
Handwritten notes:
 from process
 CCM

CONFIGURATION MANAGEMENT
CONFIGURATION CONTROL
BMAC IMPLEMENTATION

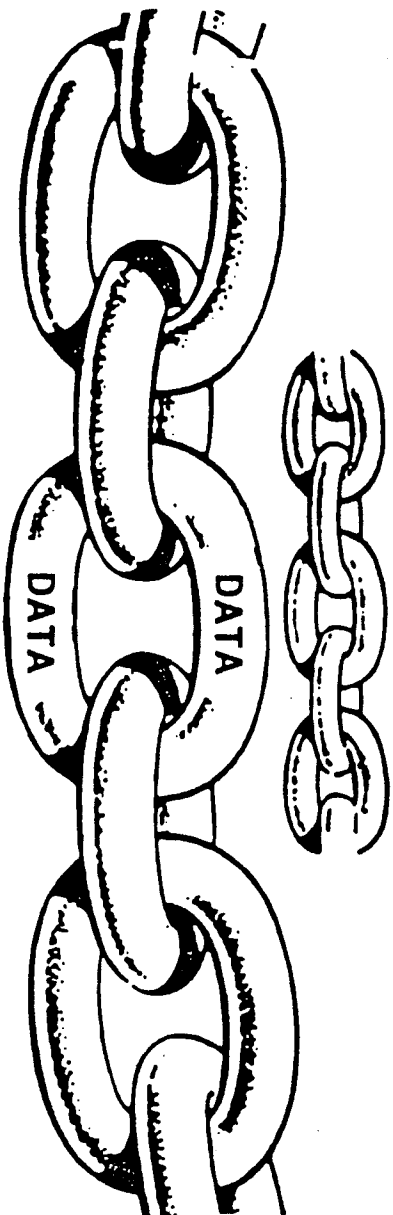
- 0 BMAC OPERATING PROCEDURES
 - #7 - APPROVALS AND CLEARANCES FOR SUPPLIER ITEMS
 - #22 - CHANGE MANAGEMENT AND CONTROL - COMMERCIAL
 - 0 MINOR ENGINEERING CHANGES FOR PROGRAMS USING THE APL SYSTEM
 - #25 - CHANGE MANAGEMENT - PROGRAM CHANGE BOARD
 - 0 CHANGE COMMITMENT SUMMARY
 - 0 CHANGE BOARD COMMITMENT RECORD
 - #27 - COMMUNICATIONS
 - 0 PROCESSING OF ENGINEERING OPERATIONS COORDINATION SHEET
 - #30 - CONFIGURATION MANAGEMENT
 - 0 CONTROL OF FORMALLY COMMITTED CLASS II ENGINEERING CHANGES
 - 0 FUNCTIONAL CONFIGURATION AUDIT
 - 0 CONFIGURATION STATUS ACCOUNTING - FULL SCALE DEVELOPMENT PROGRAM
 - 0 CONFIGURATION MANAGEMENT OF TEMPORARY CONFIGURATION/DESIGN DEPARTURES TO TEST ARTICLES
 - 0 PREPARATION AND PROCESSING OF REQUESTS FOR DEVIATION OR WAIVER
 - 0 CONFIGURATION STATUS ACCOUNTING SYSTEM REQUIREMENTS FOR PRODUCTIVITY MILITARY PROGRAMS
 - 0 SUPPLEMENTAL RELEASE OF ENGINEERING CHANGES - MILITARY
 - 0 ENGINEERING CHANGE MEMORANDUM - MILITARY PROGRAMS
 - 0 MINOR ENGINEERING CHANGES
 - 0 ENGINEERING CHANGE MEMO (ECM)/COMPOSITE ENGINEERING CHANGE MEMO (CECM)

- #54 - ENGINEERING DATA MANAGEMENT
 - 0 ENGINEERING RELEASE
- #56 - ENGINEERING QUALITY
 - 0 KIT PROOFING AND VERIFICATION OF TCTO'S
- #57 - ENGINEERING REVIEWS
 - 0 ENGINEERING TECHNICAL REVIEWS
 - 0 TECHNICAL COORDINATION MEETINGS
 - 0 TECHNICAL INTERCHANGE MEETINGS
- #61 - ESTIMATING
 - 0 ENGINEERING PROPOSAL ESTIMATE
- #127 - PROPOSAL MANAGEMENT
 - 0 BMAC PROPOSAL IDENTIFICATION SYSTEM
- 0 PROGRAM MANAGEMENT DIRECTIVES (PMDs)
- 0 ENGINEERING PROGRAM DIRECTIVES (EPDs)





THE VITAL LINK



WEAPON SYSTEM
ACQUISITIONS

FOLLOW-ON
LOGISTICS SUPPORT

DOD-STD-480A

12 APRIL 1978

4.5 CLASS I ENGINEERING CHANGE PRIORITIES. A PRIORITY SHALL BE ASSIGNED TO EACH CLASS I ECP BASED UPON A SELECTION FROM THE FOLLOWING DEFINITIONS. THE PRIORITY WILL DETERMINE THE RELATIVE SPEED AT WHICH THE ECP IS REVIEWED AND EVALUATED, AND AT WHICH THE ENGINEERING CHANGE IS ORDERED AND IMPLEMENTED. THE PROPOSED PRIORITY IS ASSIGNED BY THE ORIGINATOR AND WILL STAND UNLESS THE PROCURING ACTIVITY HAS A VALID REASON FOR CHANGING THE PROCESSING RATE.

**POOR PLANNING
ON YOUR PART
DOES NOT CONSTITUTE
AN EMERGENCY
ON MINE !!!**

DOD-STD-480A

12 APRIL 1978

4.5.1 EMERGENCY: AN EMERGENCY PRIORITY SHALL BE ASSIGNED TO AN ENGINEERING CHANGE PROPOSED FOR EITHER OF THE FOLLOWING REASONS:

- A. TO EFFECT A CHANGE IN OPERATIONAL CHARACTERISTICS WHICH, IF NOT ACCOMPLISHED WITHOUT DELAY, MAY SERIOUSLY COMPROMISE THE NATIONAL SECURITY.
- B. TO CORRECT A HAZARDOUS CONDITION WHICH MAY RESULT IN FATAL OR SERIOUS INJURY TO PERSONNEL OR IN EXTENSIVE DAMAGE OR DESTRUCTION OF EQUIPMENT. A HAZARDOUS CONDITION USUALLY WILL REQUIRE WITHDRAWING THE ITEM FROM SERVICE TEMPORARILY, OR SUSPENSION OF THE ITEM OPERATION, OR DISCONTINUANCE OF FURTHER TESTING OR DEVELOPMENT PENDING RESOLUTION OF THE CONDITION.

DOD-STD-480A

12 APRIL 1978

4.5.2 URGENT. AN URGENT PRIORITY SHALL BE ASSIGNED TO AN ENGINEERING CHANGE PROPOSED FOR ANY OF THE FOLLOWING REASONS:

- A. TO EFFECT A CHANGE IN OPERATIONAL CHARACTERISTICS WHICH, IF NOT ACCOMPLISHED EXPEDITIOUSLY, MAY SERIOUSLY COMPROMISE THE MISSION EFFECTIVENESS OF DEPLOYED EQUIPMENT.
- B. TO CORRECT A POTENTIALLY HAZARDOUS CONDITION, THE UNCORRECTED EXISTENCE OF WHICH COULD RESULT IN INJURY TO PERSONNEL OR DAMAGE TO EQUIPMENT. A POTENTIALLY HAZARDOUS CONDITION COMPROMISES SAFETY AND EMBODIES RISK, BUT WITHIN REASONABLE LIMITS, PERMITTING CONTINUED USE OF THE AFFECTED EQUIPMENT PROVIDED THE OPERATOR HAS BEEN INFORMED OF THE HAZARD AND APPROPRIATE PRECAUTIONS HAVE BEEN DEFINED AND DISTRIBUTED TO THE USER.

DOD-STD-480A
12 APRIL 1978

4.5.2 URGENT. (CONTINUED)

- C. TO MEET SIGNIFICANT CONTRACTUAL REQUIREMENTS (E.G., WHEN LEAD TIME WILL NECESSITATE SLIPPING APPROVED PRODUCTION, ACTIVATION OR CONSTRUCTION SCHEDULES IF THE CHANGE WERE NOT INCORPORATED).
- D. TO EFFECT AN INTERFACE CHANGE WHICH, IF DELAYED, WOULD CAUSE A SCHEDULE SLIPPAGE OR INCREASE COST.
- E. TO EFFECT, THROUGH VALUE ENGINEERING OR OTHER COST REDUCTION EFFORTS, NET LIFE CYCLE SAVINGS.

DOD-STD-480A

12 APRIL 1978

4.5.3 ROUTINE. A ROUTINE PRIORITY SHALL BE ASSIGNED TO A PROPOSED
ENGINEERING CHANGE WHEN EMERGENCY OR URGENT IS NOT APPLICABLE.

4.4 PART NUMBER CHANGES

DEFINITION OF FORM FIT AND FUNCTION AS DEFINED BY AIR FORCE REGULATION (AFR) 81-11 DATED 2 JUNE 1975.

NEW NUMBERS ARE ASSIGNED WHENEVER DELIVERED ITEMS ARE CHANGED TO THE EXTENT THAT THEY ARE NO LONGER INTERCHANGEABLE FROM A STANDPOINT OF FORM, FIT AND FUNCTION, EXPLAINED AS FOLLOWS:

- A. FORM. ITEMS WITH THE SAME PART NUMBER FIT WITHIN THE SAME DESIGN ENVELOPE. THE DESIGN ENVELOPE INCLUDES ALL MOVEMENT IN ANY AIR-CRAFT DUE TO VIBRATION OR SHOCK, IN ADDITION TO ANY NORMAL OPERATING MOVEMENT THROUGHOUT THE DESIGNED TEMPERATURE RANGE.
- B. FIT. ITEMS WITH THE SAME PART NUMBER WILL FIT THE SAME ATTACHMENT OR MOUNTING AND MATING SURFACE. ATTACHMENTS, CONNECTORS, WIRING, TUBING, AND SO FORTH, WILL BE THE SAME TO THE EXTENT NO REMORK IS REQUIRED ON INSTALLATION. FINAL FIT, THAT IS, ADJUSTMENT OR THE USE OF SHIMS, IS ALLOWED ONLY IF SHOWN ON THE INSTALLATION DRAWING.
- C. FUNCTION. ITEMS WITH THE SAME PART NUMBER MEET (OR EXCEED) THE SAME DESIGN REQUIREMENTS FOR PERFORMANCE. THIS INCLUDES SAFETY, STRENGTH, RELIABILITY, COMPATIBILITY, MAINTAINABILITY, MECHANICAL, ELECTRICAL, LIFE EXPECTANCY, AND SO FORTH. ADJUSTMENT, TESTING, OPERATING AND MAINTENANCE MUST BE CAPABLE OF BEING PERFORMED WITHOUT CHANGE TO THE ORIGINAL TEST EQUIPMENT AND TEST PROCEDURES OR SPECIFICATIONS OR TECHNICAL MANUALS (EXCLUDING THE ILLUSTRATED PARTS BREAKDOWN (IPB) TECHNICAL MANUAL).

CONFIGURATION MANAGEMENT
ENGINEERING RELEASE CONTROL

- BMAC ENGINEERING RELEASE IS PRIMARY RESPONSIBILITY OF RESEARCH AND ENGINEERING
 - A&WSI PROGRAM ENGINEERING OPERATIONS PERFORMS SECONDARY ROLE BY ACTING FOR THE PROGRAM
 - VERIFY CHANGE AUTHORITY FOR RELEASE
 - VERIFY AND STATUS COMMITTED RELEASE DATE
 - MAINTAIN OFFICIAL PROGRAM RELEASE RECORD

CONFIGURATION MANAGEMENT
REPORTS AND RECORDS
(MIL-STD-482)

- CONFIGURATION RECORD DOCUMENTING ALL APPROVED CHANGES TO ALL CONFIGURATION ITEMS
- CONFIGURATION STATUS ACCOUNTING REPORT (CSAR) IS IMPLEMENTED VIA CDRL ITEM AT THE TIME THE PCI IS APPROVED
 - PRODUCT IDENTIFICATION
 - CONTRACTOR CODE
 - RECORD OF APPROVED CLASS I CHANGES AND EFFECTIVETY

USE OF THE CONFIGURATION STATUS ACCOUNTING REPORT

ENGINEERING
CONTRACTS
CHANGE BOARD
LOGISTICS ENGINEERING
CUSTOMER AGENCIES
PROGRAM MANAGEMENT
FIELD ORGANIZATIONS
QUALITY CONTROL

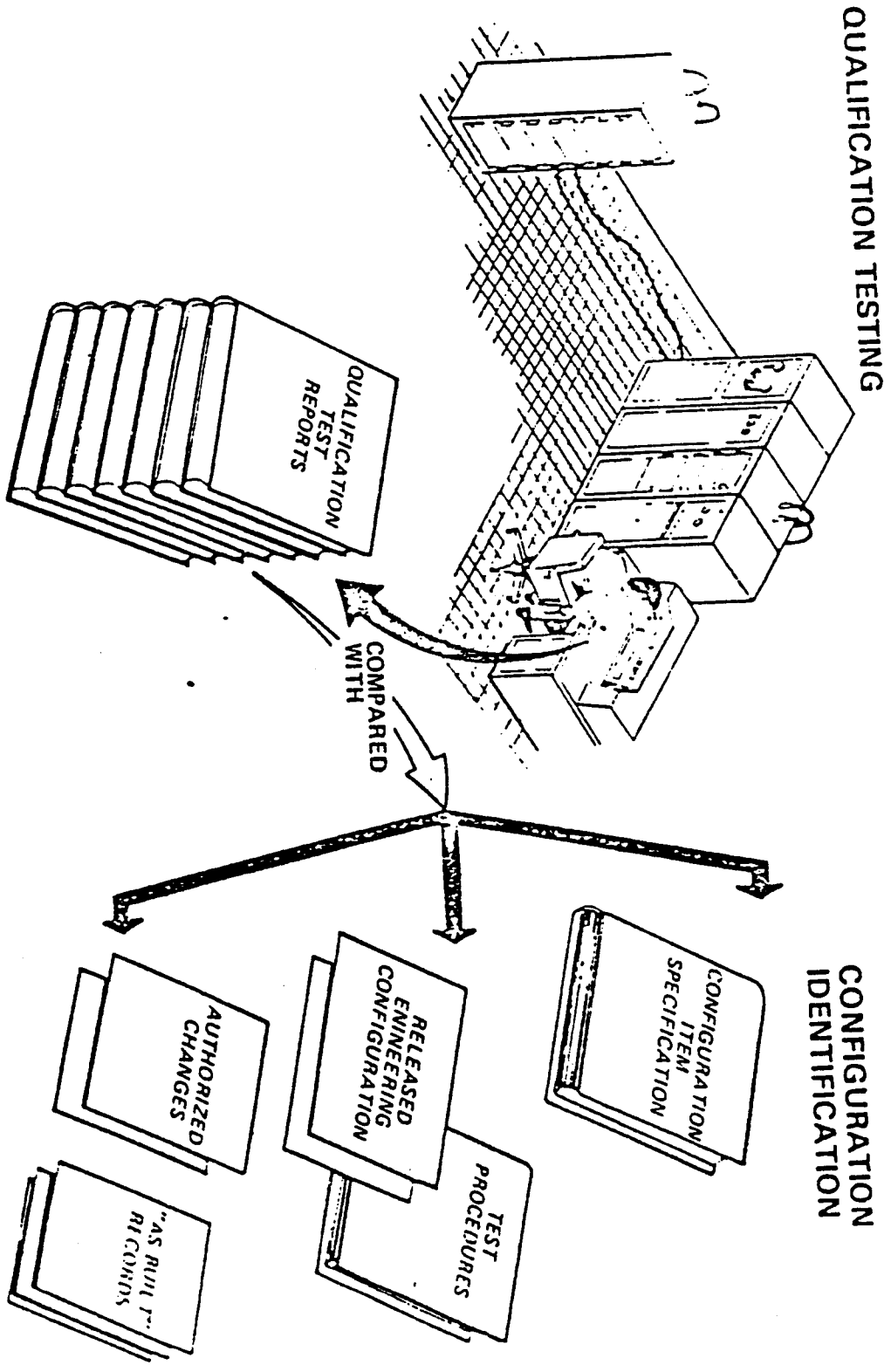
WHAT CLASS I CHANGES ARE INCORPORATED?
WHAT CLASS I CHANGES ARE REMAINING TO BE INCORPORATED?
WHAT IS THE LOCATION OF THE END ITEM?
WHAT IS THE ACTUAL CONFIGURATION OF THE END ITEM?
WHAT TECHNICAL DATA IS AFFECTED BY A CLASS I CHANGE?
WHAT SPARES ARE AFFECTED BY A CLASS I CHANGE?
WHEN ARE KIT DRAWINGS SCHEDULED FOR RELEASE?
WHEN ARE TCITO'S SCHEDULED FOR RELEASE?
WHEN ARE SPARES KITS SCHEDULED FOR DELIVERY?
WHEN ARE END ITEM KITS SCHEDULED FOR DELIVERY?

CONFIGURATION
STATUS
ACCOUNTING
REPORT

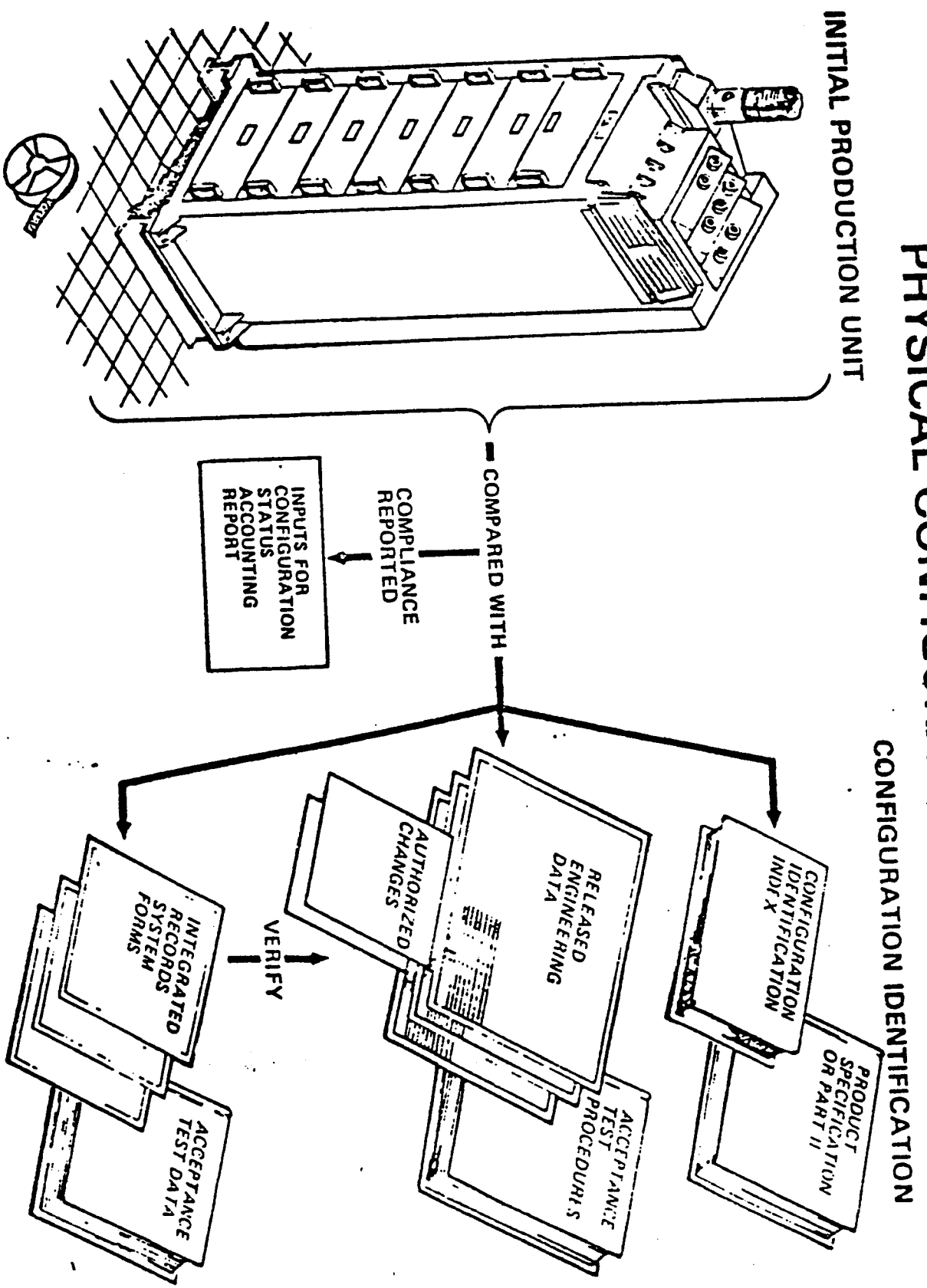
CONFIGURATION MANAGEMENT
CONFIGURATION AUDITS
(MIL-STD-1521)

- REQUIREMENTS TAILORED IN CMP
- FUNCTIONAL CONFIGURATION AUDIT (FCA)
 - FORMAL CUSTOMER AUDIT TO CERTIFY SATISFACTORY COMPLIANCE WITH PART I ACI SPECIFICATION DETAIL PERFORMANCE REQUIREMENTS AS DEMONSTRATED BY QUALIFICATION TESTS, INSPECTIONS, DEMONSTRATIONS AND ANALYSIS
 - USUALLY CONDUCTED ON DEVELOPMENTAL CONTRACT
 - PREREQUISITE TO PCA
- PRODUCT CONFIGURATION AUDIT (PCA)
 - FORMAL CUSTOMER AUDIT TO CERTIFY SATISFACTORY COMPLIANCE WITH PART II PCI SPECIFICATION PRODUCT FABRICATION AND ACCEPTANCE TEST REQUIREMENTS AS VERIFIED BY QUALITY ASSURANCE AND ACCEPTANCE TEST RESULTS
 - ESTABLISHES PRODUCT CONFIGURATION BASELINE FOR PRODUCTION
 - NORMALLY CONDUCTED ON EARLY PRODUCTION UNIT

FUNCTIONAL CONFIGURATION AUDIT



PHYSICAL CONFIGURATION AUDIT



ACTION ITEM

1. PANEL: _____
2. REFERENCED DOCUMENT: _____
3. SUBJECT/TITLE: _____
4. PROBLEM: _____
ACTION ITEM NO.: _____
DATE: _____
PAGE _____ OF _____

5. PROPOSED SOLUTION:

6. AI INTERFACE: _____
INTERFACE PANEL: _____
INITIATOR: _____
(NAME/OFFICE SYMBOL EXTENSION)
TECHNICAL OPRS: _____
ALC _____
CONTR.: _____
8. COORDINATION: _____
AF PANEL LEADER: _____
AF COORDINATOR: _____
CONTRACTOR _____
CO-COORDINATOR: _____

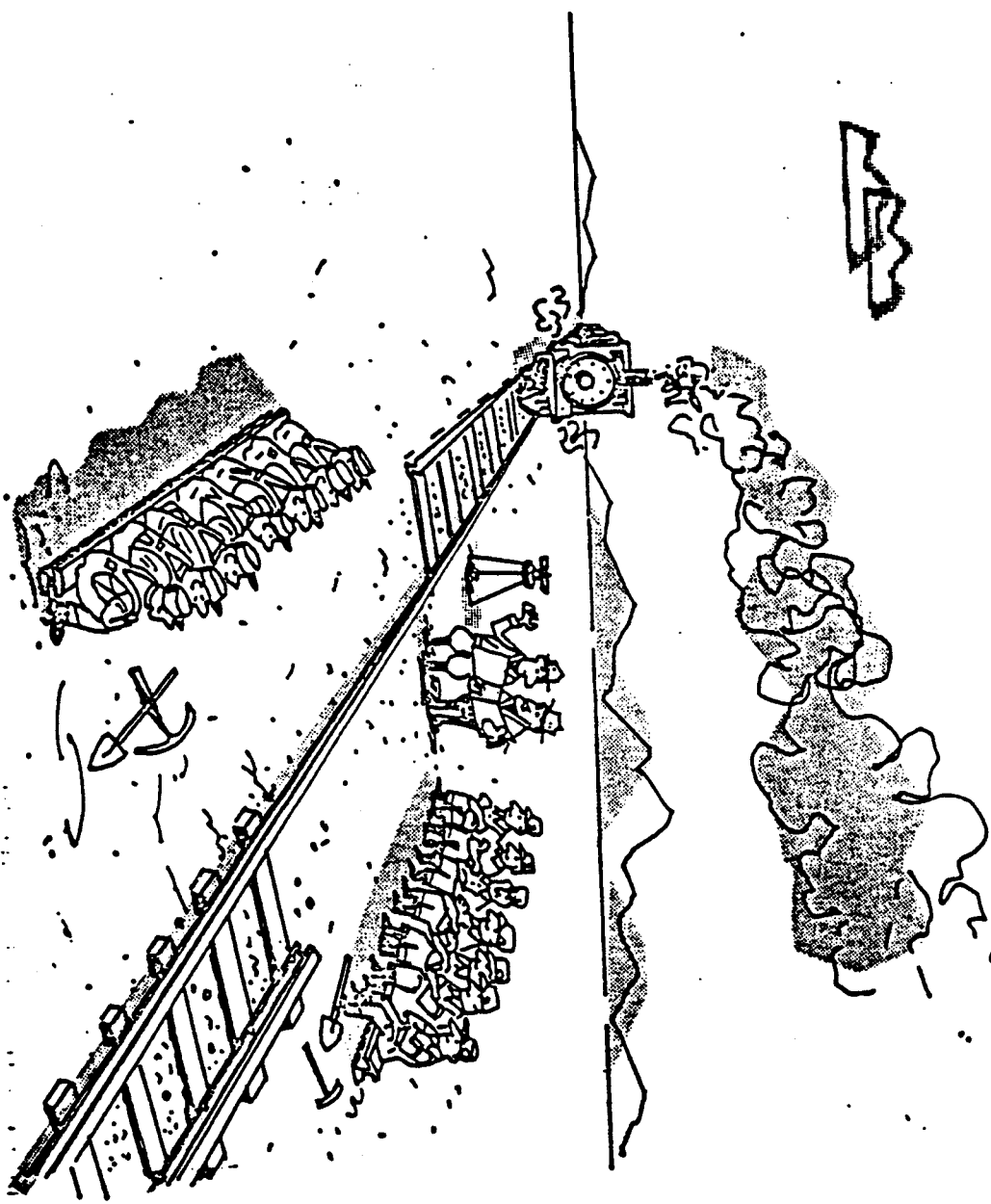
YES NO

9. CATEGORY:

CATEGORY 1 - NO FURTHER ACTION AUTHORIZED
CATEGORY 2 - PROPOSED SOLUTION APPROVED; WITHIN SCOPE
OF PRESENT CONTRACT. SUSPENSE DATE: _____
CATEGORY 3 - PROPOSED SOLUTION WILL REQUIRE ECP/CCP
ACTION. SUBMITTAL UPON AUTHORIZATION BY PCO.
CATEGORY 4 - PROBLEM REQUIRES ADDITIONAL IN-SCOPE EFFORT;
SUBMITTED TO ALC BY: _____

ACROSS PROGRAM CHANGE REVIEW

THE PURPOSE OF THE WEEKLY CHANGE REVIEW IS TO PROVIDE A BRIEF DESCRIPTION OF EACH NEW CHANGE AND TO IDENTIFY POTENTIAL INTERPROGRAM IMPACT. THE MEETING REVIEWS EACH CLASS I AND CLASS II CHANGES WHICH MAY AFFECT OR INTERFACE WITH OTHER MILITARY PROGRAMS.

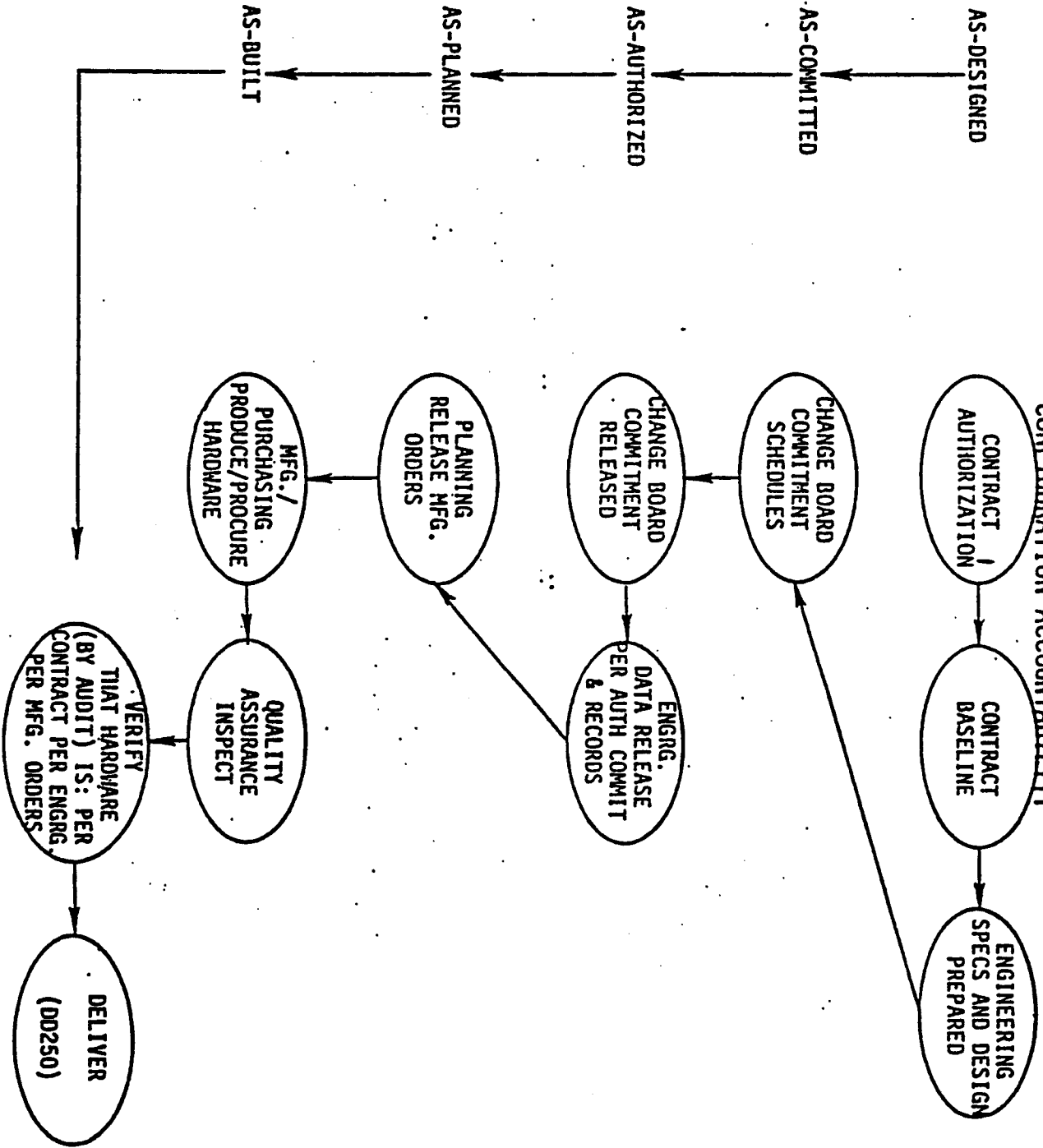


INTERFACE CONTROL



CONCLUSION

CONFIGURATION ACCOUNTABILITY



CONFIGURATION MANAGEMENT GOAL

