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Configuration Management Definitions for Digital Computer Programs

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CONFIGURATION MANAGEMENT

BULLETIN No. 4-1A

Configuration Management Definitions for Digital Computer Programs

NOTE: CMB4, published in 1971, which was originally conceived to cover CM for Digital Computer Programs is currently being revised and superseded with a family of CM Bulletins as follows:

CMB4-0	CM for Digital Computer Programs (Will supersede CMB4)	CMB4 to be revised
CMB4-1A	CM Definitions for Digital Computer Programs (Supersedes Bulletin No. 4-1)	Published September, 1984
CMB4-2	Configuration Identification for Digital Computer Programs	Published June, 1981
CMB4-3	Computer Software Libraries	Published February, 1981
CMB4-4	Configuration Change Control For Digital Computer Programs	Published May, 1982

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CONFIGURATION MANAGEMENT DEFINITIONS FOR
DIGITAL COMPUTER PROGRAMS

Prepared by

G-33 DATA AND CONFIGURATION COMMITTEE

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FOREWORD

EIA Bulletin No. 4-1A (formerly Bulletin No. 4-1) is presented by the Electronic Industries Association G-33 Data and Configuration Management Committee to provide common definitions pertaining to Configuration Management of Digital Computer Software. Although not necessarily endorsed by EIA, document content was derived from both Government and industry sources and compiled, coordinated, and edited by the Computer Software Definitions Task Group of the G-33 Committee.

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We extend our thanks and appreciation to the members of the Computer Software Definitions subcommittee and the full G-33 Configuration Management Committee, along with their organizations that have cooperated by providing their time and talent to review the information we have assembled for this Bulletin.

The full G-33 Committee, with the support of its subcommittees, will continue to devote its efforts to the advancement of knowledge and understanding of the subject of Configuration Management. Therefore, we invite your comments on this Bulletin and welcome your suggestions concerning publication of additional information that would aid contractor management in the effective conduct of any activity relative to the broad field of our concern -- Configuration Management.

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1.0 SCOPE

This Bulletin is intended for use as a guide and defines the terms and definitions to be used during the development, documentation, verification, and delivery cycles of new and modified computer software. It lists and defines the most common terms currently used in the world of computer software configuration management. There has been no attempt to compete with some of the more formal documents in use within the software programming community.

2.0 DEFINITIONS

2.1 ACCEPTANCE CRITERIA

The criteria a software product must meet to successfully complete a test phase or meet delivery requirements.

2.2 ACCEPTANCE TESTING

Formal testing, usually conducted by the developer for the customer, to verify that a system satisfies its acceptance criteria and to enable the customer to determine whether to accept the system.

2.3 ACCREDITATION

Accreditation is the process whereby accuracy to a predefined standard is ascertained and demonstrated for a software product. Accreditation as a term in software engineering has come to be used only recently, primarily in the DOD community, to describe an authoritative endorsement of a software product. It has been used synonymously with the term certification. Accreditation requires user experience to evaluate the reliability of the product. Procedures for directly examining the software are also required before the accreditation can be made for the product in question.

2.4 ACQUISITION LIFE CYCLE

Normally consists of five phases (Concept Exploration, Demonstration and Validation, Full-Scale Development, Production and Deployment) with three decision points (Program, Verification, and Production) between the first four phases. The normal acquisition path progresses through these five phases, but it is not a prescribed path which all programs must follow. A program may skip a phase, have program elements in any or all other phases, or have multiple decision points per phase.

a. Conceptual Phase

The Concept Exploration Phase extends from the determination of a needed operational capability to the program decision that authorizes the accomplishment of the Demonstration and Validation Phase. This phase defines and selects the systems concepts which warrant further development.

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b. Validation Phase

The second phase is the Demonstration and Validation Phase. In this phase, the program characteristics (performance, cost and schedule) are validated and refined through extensive study and analysis, hardware development, or prototype testing.

c. Full-Scale Development Phase

Third is the Full-Scale Development phase when the system, including all support items, is designed, fabricated, and tested. The intended output is, as a minimum, a preproduction system that closely approximates the final product, the documentation necessary to enter the Production Phase, and the test results that meet requirements.

d. Production and Deployment Phase

The Production and Deployment Phases are the fourth and fifth of the system life cycle during which the system, as well as the training, equipment, spares, facilities, and so forth, are produced for operational use. The planning and verification reviews for production are accomplished during the Full-Scale Development Phase. The primary objective of this phase is to produce and deliver to the operating unit an effective, efficient, and supportable system at optimum cost.

2.5 ALLOCATED BASE LINE

The initial approved Allocated Configuration Identification (ACI). The establishment of the allocated base line for a system or CI normally signals the end of the Validation Phase or the beginning of the Full-Scale Development Phase.

2.6 ALLOCATED CONFIGURATION IDENTIFICATION (ACI)

Current, approved performance oriented specifications governing the development of configuration items that are part of a system or higher-level CI, in which each specification:

- a. Defines the functional characteristics that are allocated from those of the higher-level system or CI.
- b. Establishes the tests required to demonstrate achievement of its allocated functional characteristics.
- c. Delineates necessary interface requirements with other associated configuration items.
- d. Establishes design constraints, if any, such as component/part standardization, use of inventory items, and integrated logistic support requirements.

2.7 ANALYSIS

When referring to a qualification method, analysis is a method which processes accumulated data to yield results which are used to establish that a requirement has or has not been met.

2.8 ARCHITECTURE, INSTRUCTION SET

The attributes of a digital computer or processor as seen by a machine (assembly) language programmer, i.e., the conceptual structure and functional behavior of a digital computer (at the machine language level) as distinct from the organization of data flows and control, logic design, and physical implementation.

2.9 ASSESSMENT OF CORRECTNESS

The process of judging that a program (or part) is correct, based on a partial demonstration of its actual or envisioned behavior. Demonstration may range from rigorous, formal mathematical proof to informal rationale, or from exhaustive testing to simple program checkout.

2.10 AUDIT, COMPUTER SOFTWARE

An independent review of computer software for the purpose of assessing compliance with established requirements, standards, and base lines. See also: FUNCTIONAL CONFIGURATION AUDIT and PHYSICAL CONFIGURATION AUDIT.

2.11 AUTHENTICATION

To be provided.

2.12 AUTOMATIC DATA PROCESSING

To be provided.

2.13 AUTOMATIC DATA PROCESSING EQUIPMENT

To be provided.

2.14 BASELINE

A configuration identification document or a set of such documents (regardless of media) formally designated and fixed at a specific time during a CI's life cycle. Baselines, plus approved changes from those base lines, constitute the current configuration identification. For configuration management, there are three formal base lines: Functional, Allocated, and Product. See also: FUNCTIONAL BASELINE, ALLOCATED BASELINE, AND PRODUCT BASELINE.

2.15 BASELINE MANAGEMENT

The application of technical and administrative direction to designate the documents and changes thereto which formally identify, designate, and control the configuration of a CI at specific times during its life cycle. See also: FUNCTIONAL BASELINE, ALLOCATED BASELINE, AND PRODUCT BASELINE.

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2.16 BUILT-IN TEST

Test capability which is integral to a unit and which may perform system checks as well as self-test functions.

2.17 CAPABILITY

Capabilities are discretely identified elements of performance which are expected (either formally or informally) of a product or combination of products.

2.18 CERTIFICATION

Certification extends the processes of verification and validation to an operational environment, confirms that the system is operationally effective, is capable of satisfying requirements under specified operating conditions; and finally guarantees its compliance with requirements in writing. Certification usually implies the existence of an independent quality control group for the acceptance testing of the overall system. The acceptance testing may be accomplished by operational testing, laboratory testing, and/or placing the system in simulated operation.

2.19 CHANGE

A modification to design, code, or documentation. A change might be made to correct an error, to improve system performance, to add a capability, to improve appearance, to implement a requirements change, and so on.

2.20 CHANGE CONTROL

The process by which a change is proposed, communicated, evaluated, approved or rejected, scheduled and tracked.

2.21 COMPILER

A computer program that accepts a source program expressed in a higher order language as input, and produces either a machine code, or assembly language, or an intermediate code generatable representation of the source program as output.

2.22 COMPONENT

A component is a basic part of a system or program identified by name or common function (e.g., separately compilable function).

2.23 COMPUTER/COMPUTER EQUIPMENT/COMPUTER HARDWARE

A device (or devices) capable of accepting and storing computer data, executing a systematic sequence of operations on computer data, or producing control output. Such devices can perform substantial interpretation, computation, communication, control, and other logic functions.

2.24 COMPUTER DATA

Basic elements of information operated on, produced by or otherwise used by computer equipment/hardware in responding to a computer program. NOTE: Such data can be external (in computer-readable form) or resident within the computer equipment and can be in the form of analog or digital signals.

2.25 COMPUTER DATA BASE

A collection of data in a form capable of being processed and operated on by a computer.

2.26 COMPUTER DATA DEFINITIONS

The definitions of basic elements of information operated upon by hardware in responding to computer instructions.

2.27 COMPUTER DOCUMENTATION

a. Computer Subsystem/System Segment Documentation

Information that describes the technical details of the computer subsystem/system segment over its life cycle. Documentation includes, but is not limited to, equipment design specification, engineering drawings, operator manuals, technical orders, computer software documentation, systems specifications, run diagrams, and interface specifications.

b. Computer Software Documentation

Technical data, including computer listings and printouts in human-readable form, which documents the requirements, design or details of computer software, explains the capabilities of the software, or provides operating instructions for using or maintaining computer software. See also: TECHNICAL DOCUMENTATION AND INFORMATION.

2.28 COMPUTER PROGRAM

A series of instructions, statements or rules in a form acceptable to computer equipment, designed to cause the computer equipment to execute an operation or series of operations or assert the rules. See also: COMPUTER SOFTWARE.

2.29 COMPUTER RESOURCES

The totality of computer hardware, computer programs, computer data, associated documentation, personnel, contractual services, and supplies.