SAE INTERNATIONAL

SYSTEMS MANAGEMENT STANDARD

EIA-649-1™ REV. A

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Superseding EIA-649-1

(R) Configuration Management Requirements for Defense Contracts

RATIONALE

This is a defense unique companion to the non-government standard, EIA-649 “Configuration Management Standard," that is generated, managed, and controlled by the non-government standard body with defense membership, to provide requirements specific for defense contracts. Defense programs often include requirements for configuration management beyond those outlined in EIA-649. Additional guidance is needed for configuration management requirements for defense applications and for placing these requirements on contracts. This standard is for placing tailored Configuration Management requirements on defense contracts. Tailoring CM requirements is essential for program success and mitigating impacts to cost, schedule, and resources. Therefore, it is not recommended to put this entire standard on contract.

FOREWORD

This document defines requirements for a Defense enterprise implementation of the EIA-649 in an Acquirer/Supplier contractual relationship. The requirements are intended to be tailored by the Acquirer and cited in contracts or similar agreements with Suppliers to establish requirements for Configuration Management tasks consistent with EIA-649 and each of its functions and principles. Unless otherwise indicated, the requirements described herein apply to both hardware and software systems. It is the responsibility of the Acquirer to determine the specific needs for their respective programs and ensure that their contracts or agreements sufficiently communicate those requirements. This document also applies when other types of agreements exist, such as agreements between government organizations who play the roles of Acquirer and Supplier.

Finally, this document, once tailored, is intended to be used as a stand-alone reference, invoked on a contract where it intends to be consistent with EIA-649 principles, and can be used for Defense programs in all phases of the acquisition life cycle.

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INTRODUCTION

The planning and execution of Configuration Management (CM) is an essential part of the product development and life cycle management. It provides control of all configuration documentation, physical parts and software representing or comprising the product. CM's overarching goal is to establish and maintain consistency of a product's functional and physical attributes with its requirements, design, and operational information throughout its life cycle. To achieve this purpose, CM provides:

a. Management and planning of CM tasks;

b. Identification of the functional requirements, operational requirements, and physical attributes of each product;

c. Documentation of these attributes;

d. Management and control of changes to each product and its documentation; and

e. Verification that the configuration of the product design meets its requirements and matches its documentation.

1. SCOPE

This document applies to hardware and software and provides CM requirements to be placed on contracts after being tailored by the Acquirer. The requirements have been organized by the following five CM functions:

a. Configuration Planning and Management

b. Configuration Identification

c. Configuration Change Management

d. Configuration Status Accounting

e. Configuration Verification and Audit

1.1 Responsibility of Acquiring and Supplying Activities

1.1.1 Responsibility of Acquirer

The Acquirer establishes and controls the product's functional requirements, performance requirements and has oversight and contract compliance responsibility during product development, production, fielding/deployment, operation, upgrade/modification, maintenance, and disposal. The Acquirer defines the contractual CM terms and conditions for the contract(s) it issues through tailoring of this document.

1.1.2 Responsibility of Supplier

The Supplier is responsible for complying with the requirements cited in this document, as tailored by the Acquirer. In addition, the Supplier is responsible for ensuring that their Sub-suppliers also conduct CM in such a manner that these requirements are achieved.

1.1.3 Applicability

This document applies to Acquirers and their Suppliers covered by the contract and/or statement of work can be considered, whether the Supplier is a commercial enterprise or another government entity, tasked with CM responsibilities. CM is implemented on programs throughout the product life cycle or as specified in the contract.

1.2 Tailoring Requirements

This document is applicable only to the extent specified in the tasking directive or contract. The Acquirer tailors the requirements from this CM document to make them applicable to a specific program. Factors that influence the tailoring include; the program's life cycle phase, contract type/structure, acquisition or procurement method, complexity, size, intended use, mission criticality, and logistics support requirements of the affected Configuration Item. The EIA-649 principles listed in this document are copyright-protected by SAE. Except as permitted under the applicable laws of the user's country, neither the EIA-649 principles nor any extract may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, photocopying, recording or otherwise, without prior written permission being secured; they are intended to be for reference only. However, the requirements in this document, which are listed in Annex A, may be used and quoted in contracts. Annex A is provided as a tool to aid the Acquirer in tailoring these requirements for use on specific contracts. For additional guidance, refer to GEIA-HB-649A.

2. REFERENCES

2.1 Normative References

NOTE: Basic document numbers are referenced here. Unless otherwise specified, the issue in effect at the date of request for bids applies.

ASME Y14.35	Revision of Engineering Drawings and Associated Documents
ASME Y14.100	Engineering Drawing Practices
DAG	Defense Acquisition Guidebook
DoDI 5230.24	Distribution Statements on Technical Documents
GEIA-HB-649	Configuration Management Standard Implementation Guide
FAR	Federal Acquistion Regulation
IEEE 15288.2	Technical Reviews and Audits on Defense Programs
IEEE 24765	Systems and software engineering - Vocabulary
ISO/IEC/IEEE 15288	Systems and software engineering — System life cycle processes
ISO 9000	Quality management systems – Fundamentals and vocabulary
MIL-HDBK-505	Definitions of Item Levels, Item Exchangeability, Models, and Related Terms
MIL-DTL-15024	Plates, Tags, and Bands for Identification of Equipment, General Specification for
MIL-STD-130	Identification Marking of U.S. Military Property
MIL-STD-196	Joint Electronics Type Designation System
MIL-STD-961	Defense and Program-Unique Specifications Format and Content
MIL-STD-1285	Department of Defense Standard Practice: Marking of Electrical and Electronic Parts
MIL-STD-13231	Department of Defense Standard Practice: Marking of Electronic Items
MIL-STD-1464	Army Nomenclature System
MIL-STD-1661	Mark and Mod Nomenclature System
MIL-STD-31000	Technical Data Packages

EIA-649	Configuration Management Standard
Title 10 United States Code	Section 2302, Definitions

2.2 Informative References

ACMP 2009 (STANAG 4427)	Guidance on Configuration Management
ANSI/EIA-836	Configuration Management - Data Exchange and Interoperability
ASME Y14.24	Types and Application of Engineering Drawings
ASME Y14.41	Digital Product Definition Data Practices
Defense Standardization	DoD Acquisitions: Buying Commercial Items and Nondevelopmental Program Office SD-2 Items
DoDD 5000.01	The Defense Acquisition System
DoDD 8320.04	Item Unique Identification (IUID) Standards for Tangible Personal Property
DoDI 5000.02	Operation of the Defense Acquisition System
DoDI 5000.75	Business Systems Requirements and Acquisition
IEEE 828	IEEE Standard for Configuration Management in Systems and Software Engineering
ISO 10007	Quality management systems - Guidelines for configuration management
IEEE 12207	Systems and software engineering - Software life cycle processes
IEEE 15288.1	Application of Systems Engineering on Defense Programs
MIL-HDBK-61	Configuration Management Guidance
MIL-HDBK-502	DoD Handbook Product Support Analysis
MIL-STD-881	Work Breakdown Structures for Defense Materiel Items
MIL-STD-882	System Safety
MIL-STD-962	Defense Standards Format and Content
SAE GEIA-STD-0007	Logistics Product Data
SAE TA-STD-0017	Product Support Analysis
SRD-2009-49	NATO-US Configuration Management Contract Scoping Tool

2.3 Definitions

ADMINISTRATIVE CHANGE: An Administrative change which does not meet the definition of a Major (Class I) or Minor (Class II). Administrative change affects the configuration documentation only, not the configuration of the item, and therefore does not affect, or have the potential to affect, end item use, form, fit or function, interface or any other performance characteristics. Administrative changes are generally a correction of typographical errors, addition of information for clarification, changes to title block information or distribution legends, changes to Model Based Definitions (MBD) datasets, which do not affect the design, minor format changes, changes to reference documents, etc.

ACQUIRER: An individual or enterprise that (1) commissions the engineering, design, manufacturing, production, or maintenance of a product; (2) is a prospective purchaser of the end products of a system or a portion thereof; (3) is a procurer of the product; (4) is a user or consumer of the product; or (5) is an obtainer of output service or product.

ALLOCATED BASELINE (ABL): The approved requirements for a product, subsystem, or component, describing the functional, performance, interoperability, and interface requirements, that are allocated from higher-level requirements, and the verifications required to demonstrate achievement of those requirements, as established at a specific point in time and documented in the allocated configuration documentation. The allocated baseline for each lower-level system element (hardware and software) is usually established and put under configuration control at the system element Preliminary Design Review (PDR) (adopted from Defense Acquisition Guidebook (DAG)).

ALLOCATED CONFIGURATION DOCUMENTATION (ACD): The documentation describing a Configuration Item functional, performance, and interoperability requirements that are allocated from those of a system or higher-level configuration items; interface requirements with interfacing configuration items; and the verifications required to confirm the achievement of those specified requirements.

APPROVED CONFIGURATION: The baseline plus any approved changes.

AS-DESIGNED CONFIGURATION: The configuration of an item as documented by the design activity.

AS-BUILT CONFIGURATION: The configuration of an item as actually produced. The as-built configuration consists of the as-designed configuration at the time of production as modified with approved engineering changes and variances. In addition, if the as-designed configuration consists of design alternatives, the as-built configuration reflects the actual produced item.

NOTE: The as-built configuration may be referred to as the as-delivered configuration in some cases. In other cases, the as-delivered and as-maintained configurations may be further modification of the as-built configuration. When this distinction exists, the exact definition of each is described in the Configuration Management Plan (CMP).

AS-MAINTAINED CONFIGURATION: The configuration of an item as currently in-service. The as-maintained configuration consists of the as-built configuration, plus any approved changes, retrofits, or modifications implemented after the item is put into service; also referred to as the as-supported, as-installed, or in-service configuration.

AUDIT: A systematic, independent, and documented process for obtaining evidence and evaluating it objectively to determine the extent to which pre-defined criteria are fulfilled. Conducted by authorized individuals for the purpose of assessing compliance with established design/ performance requirements, commercial and appropriate military standards, and functional, allocated, and product baselines as appropriate (adopted from ISO 9000).

BASELINE: A formally controlled and maintained set of data that serves as the basis for defining change. When used as a verb, baseline is the act of initially establishing and approving a set of data at a given point in time.

CHANGE REQUEST: Information describing the justification to request a change submitted to a Configuration Approval Authority for disposition (i.e., approval/disapproval/deferral). Information, by which a change is proposed, described, justified, and submitted to the approver.

COMMERCIAL AND GOVERNMENT ENTITY (CAGE) CODE: A five position alphanumeric code that provides a unique activity identifier to commercial and government activities that manufacture or develop items or provide services or supplies for the government or the Design Activity Identification (adopted from ASME Y14.100).

COMMERCIAL-OFF-THE-SHELF (COTS): Any item or supply (including construction material) that is (1) a commercial item (as defined in FAR Subpart 2.101 – Definitions); (2) sold in substantial quantities in the commercial marketplace; and (3) offered to the Government, under a contract or subcontract at any tier, without modification, in the same form in which it is sold in the commercial marketplace; and does not include bulk cargo.

COMPONENT: A part, subassembly, or assembly that comprises a composite part of a higher level Configuration Item. Components are identified in the product hierarchy, assigned nomenclature and identifiers, and are defined via drawings, detailed specifications, performance specifications, commercial item definitions, or other means.

COMPUTER SOFTWARE CONFIGURATION ITEM (CSCI): An aggregate of software that satisfies an end use function and is designated by the Acquirer for purposes of specification, interfacing, qualification testing, CM, or other purposes. A Computer Software Configuration Item is composed of one or more software units which may consist of: (1) source code, object code, control code, control data or a collection of these items; (2) an aggregation of software, such as a computer program or database, that satisfies an end use function and is designated for specification, qualification testing, interfacing, CM or other purposes; or (3) an identifiable part of a software product. A Computer Software Configuration Item may also be interchangeably termed as a Software Configuration Item (SWCI) (adopted from ISO/IEC/IEEE 24765).

COMPUTER SOFTWARE UNIT: The lowest separately compilable piece of code element within the software product structure, corresponding to a separately compilable piece of code (adopted from EIA-649).

CONFIGURATION: (1) The product attributes of an existing or planned product, or a combination of products, i.e., product requirements, the product, and associated product configuration information; (2) one of a series of sequentially created variations of a product.

CONFIGURATION APPROVAL AUTHORITY: The organization or person authorized to approve: (1) a baseline, (2) a configuration change to a product, (3) changes to product definition information and other related documents, (4) release or cancellation of documents for use in a specific program, and (5) results of audits.

CONFIGURATION AUDIT: Review of processes, product definition information, documented verification of compliance with requirements and an inspection of products to confirm that products have achieved their required attributes and conform to released product configuration definition information. See also “Functional Configuration Audit” and “Physical Configuration Audit” (adopted from EIA-649).

CONFIGURATION BASELINE: Configuration of a product, at a specific point in time, which serves as a basis for defining change, for conducting verifications and for other management activities. For a software product, the build baseline includes the actual product (adopted from EIA-649).

CONFIGURATION CONTROL: The systematic proposal, justification, evaluation, coordination, disposition of proposed changes or requested variances and the implementation of all approved changes, or variances in the configuration of a configuration item after establishment of the configuration baseline.

CONFIGURATION CONTROL BOARD (CCB): A chartered board composed of technical and administrative representatives who recommend approval, defer with comments to be adjudicated, or disapproval of proposed engineering changes and variances to a configuration item’s current approved and baselined configuration documentation.

CONFIGURATION DOCUMENTATION: The technical documentation that identifies and defines the item’s functional performance and physical characteristics. The configuration documentation is developed, approved, and maintained through three distinct evolutionary, increasing levels of detail. The three levels of configuration documentation are the functional configuration documentation, the allocated configuration documentation, and the product configuration documentation.

CONFIGURATION IDENTIFICATION: The configuration management function that encompasses the selection of configuration items which are to be separately configuration managed, organization of system into a hierarchical structure of all its components, the determination of the types of configuration documentation required for the system and its components; the issuance of identifiers to be affixed to the system and its components; and to the technical documentation that defines their configuration; the release of Configuration Items and their associated configuration documentation; and the establishment of configuration baselines for Configuration Items.

CONFIGURATION ITEM (CI): A product or an aggregation of products (hardware, software, firmware, or documentation) that accomplishes an end-use function, is under separate configuration control and is designated for configuration management control. It is the primary identifier for referencing a product and/or allocated components that satisfies an end-use function. An item is designated as a Configuration Item for purposes of additional configuration management focus due to its complexity, logistic support requirements, acquisition strategy, or because it is intended to undergo configuration status accounting or verification and audit separately from other items. Configuration items are end items or major components of end items, which typically have performance requirements allocated to them and documented in their own specification. The term Configuration Item will be used to mean hardware and software items unless there is a specific need to distinguish between them in which case the term Hardware Configuration Item (HWCI) and Software Configuration Item (SWCI) will be used.