

EIA-649-1 Configuration Management Requirements for Defense Contracts

By Larry Gurule and Daniel Christensen



DoD publishes military standards to ensure defense contractors and suppliers employ consistent, efficient, and effective processes and conform to government policy. Section 12(d) of the National Technology Transfer and Advancement Act of 1996, Public Law 104-113, directed the federal government to use technical standards developed or adopted by voluntary consensus standards bodies as a means to carry out policy objectives or activities determined by the agencies and departments.

During acquisition reform in the late 1990s and early 2000s, and in response to Public Law 104-113, DoD canceled many of the military standards and adopted commercial standards in their place as a cost-saving measure. For example, the Department adopted EIA-649, “National Consensus Standard for Configuration Management,” then canceled MIL-STD-973, “Configuration Management (CM),” in 2000.

However, some of the commercial process standards were not developed or structured for use on defense contracts. The foreword of the current version of SAE International’s ANSI/EIA-649-B, “Configuration Management Standard,” states that “because of the broad scope of its applicability, this standard is not written as a requirements document, per se, but as the foundation document upon which requirements may be structured.” The foreword goes on to address the “per se”:

In the acquirer/supplier context there are several methodologies to conformance by a supplier: ...

- Acquirer uses 649 as the basis for developing either, or both, an enterprise CM requirements document or a specific project CM requirements document to impose on suppliers.
- The requirements documents may state 649 principles as requirements and reference 649 paragraphs. Compliance with the contractual requirements constitutes conformance with 649.

Because ANSI/EIA-649-B contains the text “this standard is not written as a requirements document, per se,” it has been applied inconsistently in DoD contracts.

Gap Analyses and Development of EIA-649-1

In 2010, the Air Force briefed the Defense Standardization Council (DSC) regarding the need to reinstate several military standards, including the canceled MIL-STD-973 for CM. The DSC, which champions standardization throughout DoD to reduce costs and improve operational effectiveness, agreed that having some select standards applicable across DoD acquisition programs could improve program execution. The DSC directed DSPO to work with the services to form a CM gap analysis working group to confirm

the need for an enterprise-wide approach to certain process standards, including CM. In 2011, the CM gap analysis working group submitted its findings indicating that suitable standards do not exist to meet DoD's requirements. The DSC agreed with the findings.

In March 2012, the Defense Standardization Executive directed that the first course of action should be to engage organizations that develop non-government standards (NGSs) to determine whether existing NGSs could be modified or whether the organizations may be interested in developing new standards to meet DoD's requirements. This direction complies with Public Law 104-113, which states that

Federal agencies and departments shall consult with voluntary, private sector, consensus standards bodies and shall, when such participation is in the public interest and is compatible with agency and departmental missions, authorities, priorities, and budget resources, participate with such bodies in the development of technical standards.

Understanding the length of time it takes to develop a standard, the Army requested and received DSC approval to release MIL-STD-3046, "Interim Standard Practice for Configuration Management," for use on contracts while the CM NGS was developed. Released on March 6, 2013, MIL-STD-3046 will be canceled when the CM NGS is published, or after 2 years.

The Navy stood up and led the chartered Configuration Management Standards Working Group (CMSWG) to develop the CM NGS. The CMSWG comprises participants from the uniformed services, including the U.S. Coast Guard, and from other DoD agencies, such as the Defense Contract Management Agency, National Security Agency, and Defense Logistics Agency. The CMSWG generated an initial draft standard, which was presented to the SAE G-33 Committee on Configuration Management in October 2013. The SAE G-33 Committee initiated a formal project in November 2013 to develop the EIA-649-B addendum, referred to as EIA-649-1, "Configuration Management Requirements for Defense Contracts."

The CMSWG distributed multiple drafts of the EIA 649-1 for review across DoD and industry. To date, this group has adjudicated more than 3,750 comments to provide a standard compliant with DoD policy and supported by both DoD and industry. In addition to writing the EIA-649-1, the CMSWG modified 19 CM-related data item descriptions (DIDs) to prescribe deliverables compliant with EIA-649-1. In addition, the CMSWG reviewed and updated five CM-related DoD forms—DD Form 1692, Engineering Change Proposal (ECP); DD Form 1694, Request for Variance (RFV); DD Form 1695, Notice of Revision (NOR); DD Form 1696, Specification Change Notice (SCN); and DD Form 2617, Engineering Release Record (ERR)—and added detailed instructions to support consistent implementation and use in support of EIA-649-1.

Configuration Management Requirements for Defense Contracts

ANSI/EIA-649-B and other standards, including MIL-STD-3046 and DoD addenda to ISO/IEC/IEEE 15288, “Systems and Software Engineering—System Life Cycle Processes,” influenced the development of EIA-649-1. Other key sources of information guiding EIA-649-1 development include current DoD policy (in particular, the interim DoD Instruction 5000.02, “Operation of the Defense Acquisition System”) and related DoD guidance, such as the *Defense Acquisition Guidebook*, Chapter 4, “Systems Engineering” (in particular, Section 4.3.7 on configuration management) and the military handbook MIL-HDBK-61A, *Configuration Management Guidance*.

Consistent with ANSI/EIA-649-B, EIA-649-1 makes use of the acquirer and supplier roles to define requirements. The SAE G-33 website contains the following information describing the scope of EIA-649-1:

This document defines configuration management requirements which are to be applied, based on program needs, in contracts with suppliers for products and/or their designs during the contract period of any Configuration Item (CI) which meets the following criteria:

- a. Developed wholly or in part with Acquirer funds, including non-developmental items when the development of technical data is required to support the products or services being acquired or
- b. Designated for configuration management for reason of integration, logistics support or interface controls.

By defining how CM requirements are to be applied in contracts with suppliers, EIA-649-1 drives the program to understand and quantify the requirements as accurately and as early as possible to support effective CM and control of the system baseline.

The foreword to the EIA-649-1 further emphasizes the standard’s purpose and inherent linkage to EIA-649-B:

This document defines requirements for a Defense enterprise implementation of the American National Standards Institute/Electronics Industry Association, ANSI/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 ANSI/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 standard 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 is intended to be used as a stand-alone reference, invoked on a contract where the acquirer intends to be consistent with ANSI/EIA-649 Principles, and may be used for Department of Defense (DoD) programs in all phases of the acquisition life cycle.

Even though EIA-649-1 is intended to satisfy DoD contracting requirements, this CM standard applies to any commercial or government enterprise engaged in acquirer/supplier CM activities.

Appropriate CM, the “Goldilocks Factor”

EIA-649-1 is intended to help the government and industry in the acquirer role place CM requirements on DoD contracts by supplying the “shall” statements for implementing the EIA-649-B CM functions and principles.

The standard is intended to be tailored to fit the unique needs of a defense acquisition or sustainment program. To help facilitate this, EIA-649-1 contains a tailoring worksheet listing all the CM requirements, or “shall” statements, by paragraph number. Figure 1 is an example. CM practitioners may use the worksheet to help tailor the requirements of this standard to fit their program’s phase, acquisition strategy, and system development approach. This worksheet is not intended to be part of the contract but to help determine which requirements, i.e., activities and deliverables, are needed for placement on contract.

Status

EIA-649-1 successfully completed two rounds of formal voting at the SAE G-33 Committee level in September 2014. The SAE Aerospace Council formally approved EIA-649-1 in October, and the DSC CMSWG officially issued the standard in November.

The standard will be synchronized with the cancellation of the interim MIL-STD-3046 and associated DIDs.

Figure 1. EIA-649-1 Tailoring Worksheet

ANNEX B Tailoring Worksheet

B.1 General

This Annex is a tool for practitioners to use to aid them in tailoring requirements of this standard and is not intended to be part of the contract.

B.2 Matrix Description

A check mark in the column entitled "Applies" indicates where the Acquirer has determined the applicability of the SAE Configuration Management Requirements for Defense Contracts, EIA-649-1.

Paragraph	Requirement	Sub requirement	Applies Y/N	Change or Clarification	SOW Paragraph	DID No.	CDRL Number	CDRL Tailoring
3.0 Configuration Management Requirements	(1)							
	(2)							
	(3)							
	(4)							
3.1 Planning and Management	(1)	a.				DI-SESS-80858 Supplier's Configuration Management Plan		
		b.						
		c.						
		d.						
		e.						
		f.						
		g.						
		h.						
		i.						

Complementary Coordinated Family of CM Principles and Processes

The acquirer should use EIA-649-1 in concert with EIA-649-B and leverage the guidance provided in associated handbooks, such as EIA-HB-649 and MIL-HDBK-61A. With this arsenal of collaborative and standardized CM requirements, processes, principles, and guiding information, the CM professional should have a strategic advantage in implementing and executing acquirer/supplier (i.e., government/contractor) CM more efficiently and effectively.

About the Authors

Larry Gurule is president of i-Infusion, Inc., a CMPIC® associate instructor, and an active SAE G-33 Configuration Management committee member. An experienced consultant, he specializes in process- and knowledge-driven environments, including product development, engineering, manufacturing, supply chain, retail, distribution, and service/process industries. Mr. Gurule has also owned and/or held senior-level positions in manufacturing, software, and service-based businesses, and he has lectured to and consulted with hundreds of individuals from Fortune 500 companies and various government agencies on process improvement and enterprise IT implementation initiatives.

Daniel Christensen is the configuration/data manager for the Naval Air Systems Command and chairman of the DSC CMSWG. He holds numerous certifications, including Enterprise CM Professional, CMII Professional from the Institute of Configuration Management, CMPIC Masters Certification of Enterprise Configuration Management and Configuration Management Subject Matter Expert from the University of Houston, and Certified Configuration and Data Manager from National Defense Industrial Association (NDIA). Mr. Christensen is a member of the International Society of Configuration Management and of SAE International. For the latter, he is the government liaison to the G-33 committee and to the NDIA Technical Information Division committee. Mr. Christensen is a 2012 recipient of the TechAmerica Associate Technical Fellowship award.