Templates For Software Configuration Management Documents
Version 6.0

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For

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Abstract

This document contains a set of templates that enable engineers and managers to implement effective, standards-compliant software configuration management (CM). The templates found in this document conform to the software CM requirements specified in standards ISO/IEC 12207:2008, *Software life cycle processes*, ISO/IEC 15288:2008, *System life cycle processes*, and IEC 62304, *Medical Device Software – Software Life Cycle Processes*. They also provide a process framework consistent with ANSI/EIA-649-B, *Configuration Management Standard*. These templates provide generic descriptions and instructions that are compliant with the above standards and provide a structure within which you can include additional CM standard requirements as well as project-specific information. Once tailored, the templates become a complete set of documents that allow implementation of software configuration management compliant with both widely used standards and project-specific requirements.

Thirteen templates are provided. They are:

Template #	Template Name
1	Software Configuration Management Policy
2	Software Configuration Management Strategy
3	Software Configuration Management Organization Charts
4	Software Configuration Management Plan
5	Software Configuration Management Process
6	Software Configuration Identification Procedure
7	Software Configuration Change Control Procedure
8	Software Configuration Status Accounting Procedure
9	Software Configuration Item Check-in and Check-out Procedure
10	Software Configuration Audits and Reviews Procedure
11A	Subcontractor Software Configuration Control Procedure
11B	External Interface Configuration Control Procedure
12	Software Product Release and Delivery Procedure

In addition to the templates shown above, this document provides five different aids to help tailor the templates.

What's New in Version 6.0

Version 6.0 CM templates have been reviewed and updated to ensure consistency with the Software CM requirements of ANSI/EIA-649-B, *Configuration Managements Standard*. An appendix was added to describe the 649B standard and minor modifications were made to several of the templates to ensure they are compatible with the 649B standard while still remaining compliant with ISO/IEC 12207:2008, ISO/IEC 15288:2008, and IEC 62304.

Version 6.0 still contains the many illustrative diagrams introduced in Version 3.0. These diagrams will continue to provide added value in the implementation and communication of CM processes.

Version 6.0 Enhancement	Description
Reviewed and updated CM templates to ensure compatibility with the ANSI/EIA-649-B standard, *Configuration Management Standard*.	- Added a matrix in the introduction that maps the ANSI/EIA-649-B standard to our CM templates - Added a background and context section to the CM strategy template - Added a project overview section and a training section to the CM plan template - Added text in the status accounting template to ensure that process metrics are gathered and utilized to measure, monitor, and improve CM processes - Added activities in the audits and reviews template to ensure that: - Specification documents are complete and consistent - Test results and/or test reports confirm that the software meets all requirements
Added a review of ANSI/EIA-649-B standard	Added Appendix A, which provides an overview of the ANSI/EIA-649-B standard and discusses how it relates to the ISO/IEC 12207:2008 standard and our CM templates
Added a list of tables	Following the table of contents, a list of tables was added to facilitate rapid access to key data

Table of Contents

List of Figures

List of Tables

1. Introduction

In the past decade, the need for establishing effective software configuration management policies and procedures has grown in conjunction with the need for systems that are complex, fast, accurate, secure, and safety-critical. From simple everyday systems that track bank accounts to the complex systems in airplanes, cars, medical devices, and industrial, or military products, there is a demand for highly reliable, error-free software that either supports the development and maintenance of these systems or is an integral part of them.

This document provides a set of templates for implementing software configuration management processes. These templates are easy to use, self-explanatory, and do not require expensive training or extensive experience. They meet the requirements of ISO/IEC standards 12207:2008, *Software life cycle processes*, 15288:2008, *System life cycle processes*, IEC 62304, *Medical Device Software – Software Life Cycle Processes*, and ANSI/EIA-649-B, *Configuration Management Standard.*

Section 1.4 of this document provides a brief discussion of the ISO/IEC 12207:2008, ISO/IEC 15288:2008, IEC 62304, and ANSI/EIA-649-B standards. It also provides mappings between the various standards' requirements and the templates that address them. Note that in many cases, the name of a standard document is shortened to enhance readability. Unless otherwise noted, any reference containing "649B," "12207," "15288," or "62304" refers to ANSI/EIA-649-B, the 2008 version of ISO/IEC 12207, the 2008 version of ISO/IEC 15288, or the 2006 release of IEC 62304 respectively.

1.1   About Software Configuration Management

The inclusion of software configuration management as a top-level process in the software life cycle has proven to be a necessary and cost effective step in producing and delivering quality products on time and within specified time and dollar limitations. Effective configuration management of a system's software elements is accomplished by:

- Establishing a policy that requires the implementation of software configuration management.

- Defining a software configuration management strategy that drives subsequent plans and procedures.

- Building a comprehensive configuration management plan.

- Establishing a scheme for software item identification.

- Identifying the controlled items and item types that are designed, developed, and delivered.

- Agreeing to a baseline configuration.

- Enabling the development of and changes to that agreed upon baseline.

- Recording the events of an item's evolution via status accounting records.

- Verifying via audits and reviews that:

    - Configuration management processes are measured, monitored and improved

    - The configuration of the product meets the appropriate specification documents

It is imperative for companies that build software to have a clear and concise policy on software configuration management as well as the procedures to implement it. A CM policy should be established by executive level management to provide top-level guidance and constraints to lower level plans and procedures. This guidance and constraint helps ensure consistency across lower level procedures including compliance with key corporate objectives.

Because software CM procedures may affect the utilization of resources across company organizations, these procedures should be reviewed and approved by an appropriate level of management in those organizations. These organizations can include Quality Management, Engineering, Testing, Project Management, and the customer (when applicable). The responsibility for defining and executing CM procedures must be clearly assigned down an organization as well as across it.

In large companies or organizations, different groups or projects may have their own unique CM requirements and resultant policies and procedures. In such cases, each organization must ensure that their unique software CM plan, strategy, and procedures are aligned with higher-level CM documents.

1.2   How to Use This Document

This document is designed to aid a person, with some knowledge of software configuration management, implement a sound software CM system. Expertise in software configuration management is not required. This document provides templates and aids for software CM that can be applied to manual or automated methods and can be implemented by one or more persons depending on the scope and complexity of the project or organization. These materials are applicable to projects of all sizes, and are applicable for all types of products during their life span.

Figure 1 shows the thirteen software CM templates and five CM aids contained in this document and how they relate to one another. Note, for example, how higher level documents (organization, strategy, policy, plan) provide the overall guidance and direction for the establishment of lower level procedures.

References to Standards

In many cases, the name of a standard document is shortened to enhance readability. Unless otherwise noted, any reference containing "649B," "12207," "15288," or "62304" refers to ANSI/EIA-649-B, the 2008 version of ISO/IEC 12207, the 2008 version of ISO/IEC 15288, or the 2006 release of IEC 62304 respectively.

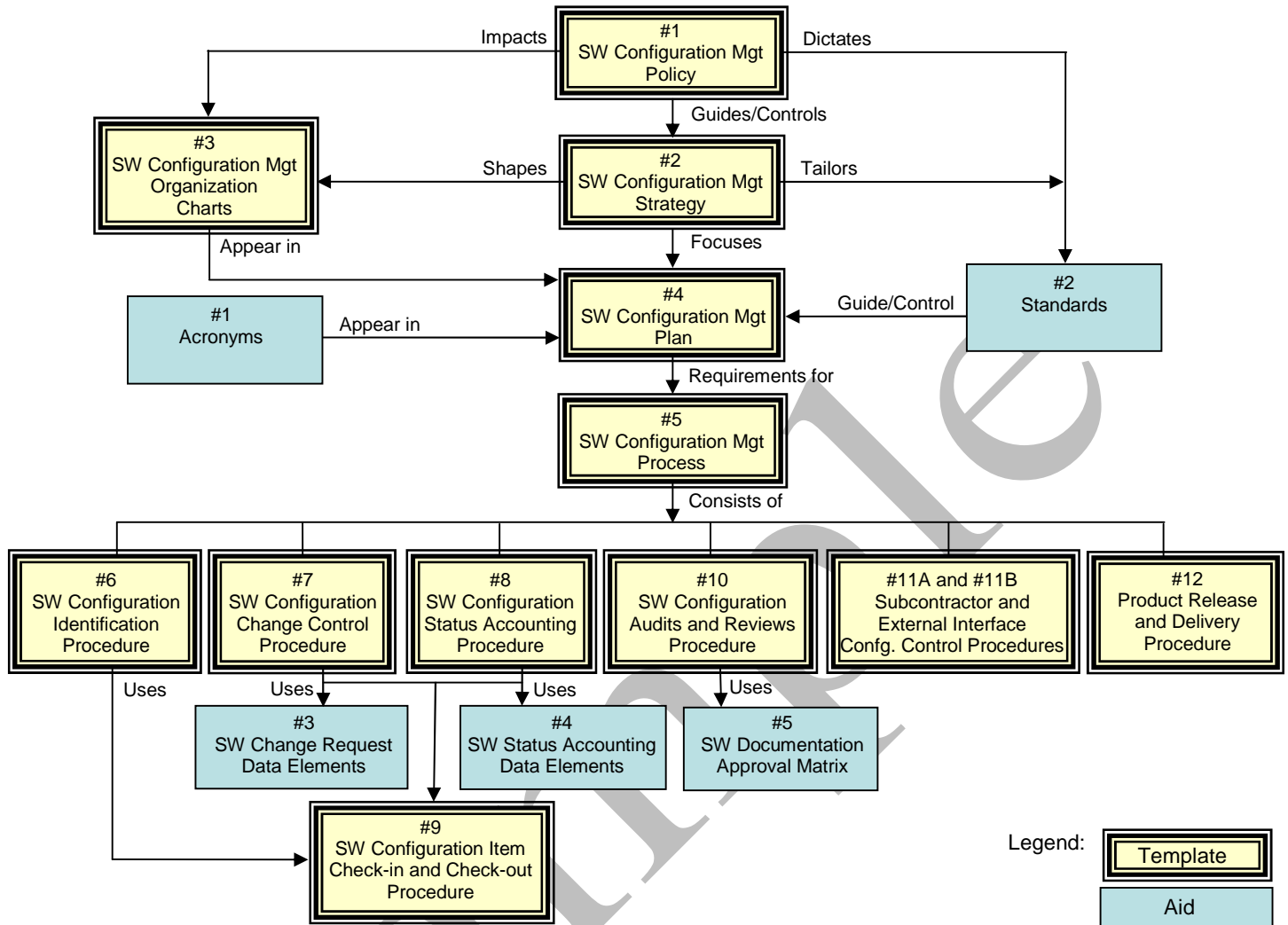# Software Configuration Management Templates - Introduction

Figure 1: *Software CM templates, and aids, and how they relate.*

Software CM Templates

Each subsection of Section 2 (2.1, 2.3, etc) is devoted to one of the thirteen templates shown in Figure 1. Preceding each template, which begins with a title page, is a brief overview of the area being addressed by that template. Guidance notations in the templates are underlined and should be stripped from the implemented template. Template pages can be distinguished from other types of pages in this document by the occurrence of the word "Template" in their page header. Pages that are not part of a template do not have that word in their header.

The template serves as a framework for meeting the unique CM requirements of your organization. Thus, you will have to add text that provides the necessary detail to carry out the activities described in each template. Specific tools, data, and geographic distribution of work products and people will all affect the definition of an activity and will necessitate the tailoring of each template. The size and experience of your software staff will also affect the level of detail required. You may also have to modify text for specific domains and end-item types (embedded software, government software, classified software, etc).