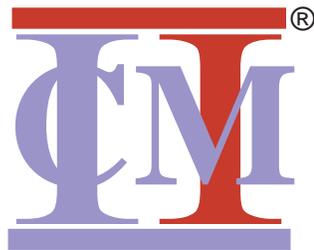# *Configuration Management Plans — From Traditional CM to CMII*
(Rev B)

SUMMARY —Traditional CM plans evolved in the defense environment where customers paid for development and took ownership of the design.

CM, under CMII, is transformed into a business process infrastructure that can accommodate change and keep all design and process information clear, concise and valid. It represents the ultimate CM plan.

Institute of Configuration Management
The Home of CMII

TRADITIONAL CM AND ITS FOUR KEY FUNCTIONS

> Configuration Management: A discipline applying technical and administrative direction and surveillance over the life cycle of configuration items (CIs) to:
>
> (1) Identify and document the functional and physical characteristics of CIs. (Identification)
> (2) Control changes to CIs and related documentation. (Change Control)
> (3) Record and report status of proposed and approved changes. (Status Accounting)
> (4) Audit CI's to verify conformance to documented requirements. (Design Review and Configuration Audit)
>
> *MIL-STD-973, Configuration Management, 17 April, 1992*

Identification:

- *How the product is subdivided into configuration items (CIs);*
- *How CIs are identified and serialized;*
- *How each CI is documented;*
- *How supporting documents for CIs are identified;*
- *Length and format of identification numbers;*
- *How owners of configuration items and documents are identified;*
- *How baselines are used to maintain the above information.*

Change control:

- *How changes are requested and the associated forms;*
- *How requested changes are categorized;*
- *How requested changes in each category are processed;*
- *How costs versus benefits are compiled;*
- *How requested changes are reviewed and dispositioned;*
- *How approved changes are implemented;*
- *How the associated baselines are updated.*

Status accounting:

- *Validation and release status of required documents;*
- *Verification (or audit) status of as-built CIs;*
- *Requested changes currently in the disposition cycle;*
- *Approved changes currently in the implementation cycle;*
- *Implementation status of each approved change.*

Design review and configuration audit:

- *How product baselines are validated and approved;*
- *How as-built CIs are verified to conform to requirements.*

EXAMPLE OF A TRADITIONAL CM PLAN

ISO 10007 exemplifies a traditional CM plan since it uses *identification, change control, status accounting, reviews and audits* as its foundation.

ISO 10007 "Quality Management — Guidance for CM" (1995)

1 Scope

2 Normative Reference

3 Definitions

4 Configuration Management System, Description and Objectives
   — the main objective is to document and provide full visibility of the product's present configuration and the status of achievement of its physical and functional requirements — and that everyone working on the project at any time in its life cycle is using correct and accurate information.

5 Configuration Management Process

   .2   CONFIGURATION IDENTIFICATION

   .1   Product Structure and Selection of Configuration Items

   .2   Documentation of Configuration Items

   .3   Numbering

   .4   Establishment of Configuration Baselines (and REVIEWS)
   — approved baselines, plus approved changes, constitute the current approved configuration.

   .3   CONFIGURATION (or CHANGE) CONTROL
   — document and justify the change, evaluate the consequences of the change, approve or disapprove the change, implement and verify the change, process deviations and waivers.

   .4   CONFIGURATION STATUS ACCOUNTING

   .5   CONFIGURATION AUDIT

   .2 Functional Configuration Audit

   .3 Physical Configuration Audit

6 Organization of Configuration Management

7 Configuration Management Procedures

   .2   Configuration Identification Procedures

   .3   Configuration Board

   .4   Configuration Control Procedure

   .5   Procedures for Configuration Status Accounting

   .6   Configuration Audit Procedures

   .7   Configuration Management Plan

8 Configuration Management System Audit

FIXED VERSUS MOVING BASELINES

All resources work to current information. Overall effectiveness is optimized when such information is clear, concise and valid.

Therein lies the problem with fixed baselines. Individual documents are updated with accumulated changes at the end of each development phase.
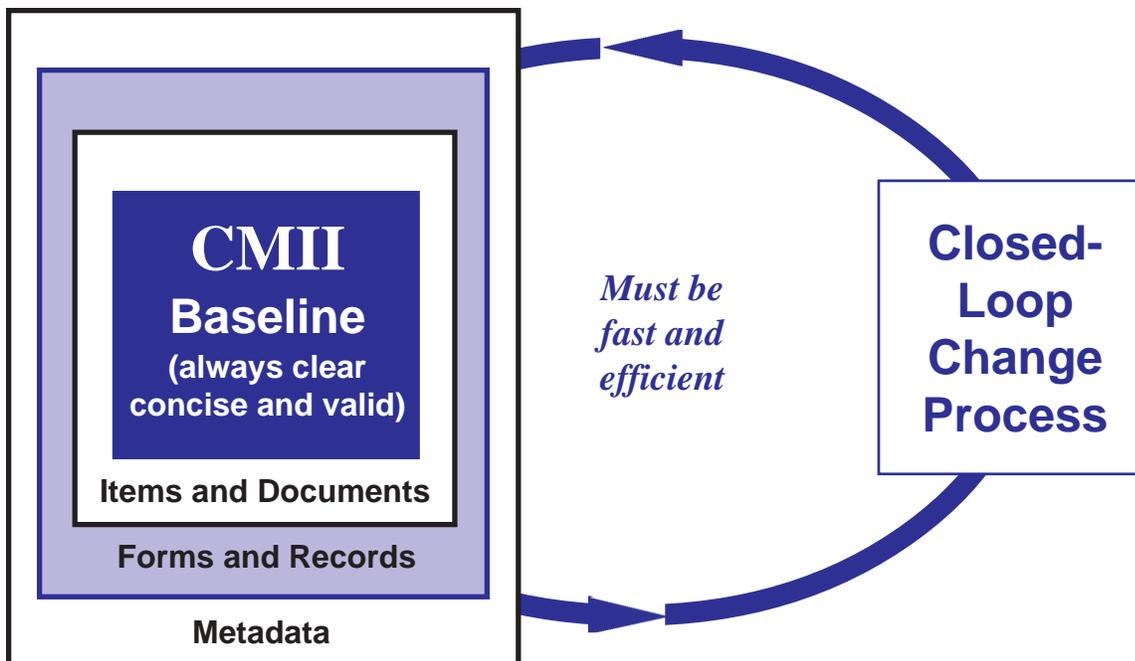
Any document with one or more unincorporated changes cannot stand alone. Each user must interpret the document plus its unincorporated changes.

Baselines and the individual documents that reside therein must be kept current. Changes must be incorporated promptly after they are approved.

This does not mean that the four functions of traditional CM (identification change control, status accounting, reviews and audits) are wrong.

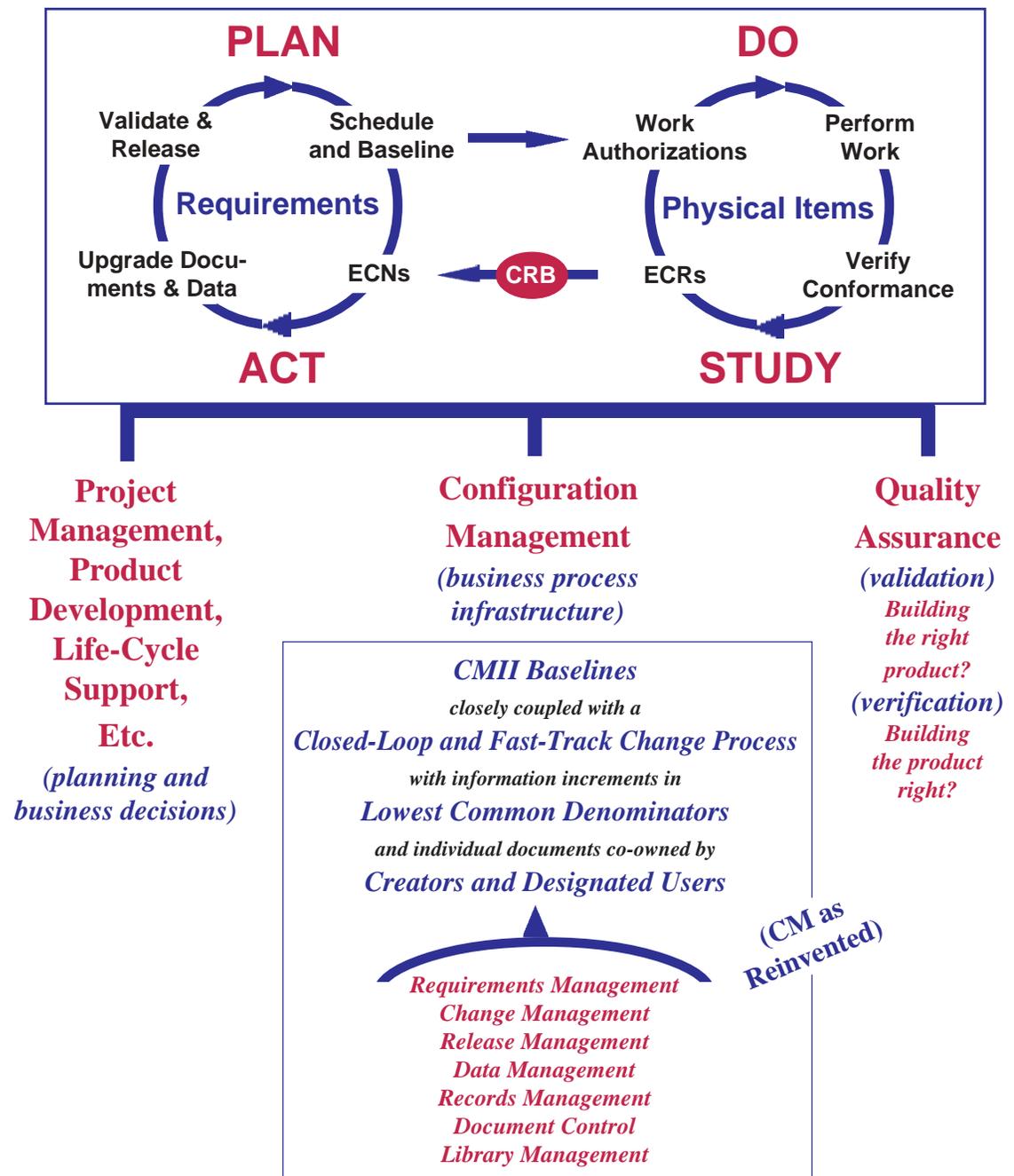It simply means those functions, in themselves, are inadequate. They are components of a larger process. It is the larger process that must be fixed.

To fix the larger process begins with fixing the baselines — to transition from fixed baselines to moving baselines.

CMII
Baseline
(always clear concise and valid)

Items and Documents

Forms and Records

Metadata

Must be fast and efficient

Closed-Loop Change Process

BUSINESS PROCESS INFRASTRUCTURE

The larger process is the *business process infrastructure* which enables all other core business processes to be reliable and efficient.

To fix the infrastructure, it is necessary to reinvent CM. Moving baselines coupled with a closed-loop change process provide the proper cornerstone.

PLAN

Validate & Release — Schedule and Baseline

Requirements

Upgrade Documents & Data — ECNs

CRB

Work Authorizations — Perform Work

Physical Items

ECRs — Verify Conformance

ACT

DO

STUDY

Project Management, Product Development, Life-Cycle Support, Etc.

(planning and business decisions)

Configuration Management

(business process infrastructure)

CMII Baselines
closely coupled with a
Closed-Loop and Fast-Track Change Process
with information increments in
Lowest Common Denominators
and individual documents co-owned by
Creators and Designated Users

Requirements Management
Change Management
Release Management
Data Management
Records Management
Document Control
Library Management

(CM as Reinvented)

Quality Assurance

(validation)
Building the right product?
(verification)
Building the product right?

KEY FUNCTIONS OF CM AS REINVENTED

> CM REDEFINED: CM serves to manage products and processes by managing the information about them. The scope includes all information that could impact safety, quality, schedule, cost, profit or the environment. CM, as reinvented, serves to:
>   (1) accommodate change,
>   (2) optimize the reuse of standards and best practices,
>   (3) ensure that all requirements remain clear, concise and valid,
>   (4) communicate (1), (2) and (3) to each User promptly and precisely, and
>   (5) verify that the results conform in each case.
> CMII is CM plus continuous improvement in (1) through (5).

As-Planned and As-Released Baselines:
- *Baselines for products are identified by a Model Number;*
- *Physical item hierarchies are used as the framework;*
- *End-item application requirements reside at level 0;*
- *The end-item and its design basis documents reside at level 1;*
- *Each item at each level is linked to its supporting documents;*
- *The ECN authority is provided for each revision of each document;*
- *Release and effective dates are provided for each document;*
- *The effectivity for each ECN is provided.*

Closed-Loop and Fast-Track Change Process:
- *Process is managed by three change administration functions;*
- *Technical reviews are coordinated by a creator of impacted documents;*
- *75 to 85% of all changes are processed on a fast-track basis;*
- *High-risk changes are dispositioned by a Change Review Board and low-risk changes by the creator who did the technical review;*
- *Separate forms are used to manage analysis and implementation;*
- *End-item traceability is achieved without breaking the rules of interchangeability.*

Lowest Common Denominators (used as information handles):
- *Physical items, documents, forms and records plus supporting data;*
- *Objects and classes are terms used by IT, not CM.*

Ownership by Creators and Designated Users:
- *Each document is co-owned by its creator and one or more users.*
- *Each data set is also co-owned and the goal for accuracy is 100%.*

CMII INFRASTRUCTURE — THE ULTIMATE CM PLAN

With CMII, the requirements to be achieved by each core business process are consolidated into one set of enterprise operating standards.

There is no stand-alone CM plan or quality plan. Both are an integral part of the enterprise plan which includes the business process (or CMII) infrastructure.

The power of such an infrastructure is derived from the CM components and their enabling tools. CM is the process. Processes must lead. Tools enable.

Core Business Processes and Enterprise Operating Standards	Process Owners
Strategic Business Plan	_____
1.0 As-Planned and As-Released Baselines	
2.0 3-Tier, 8-Step Development Process	
3.0 Naming, Numbering and Reuse	_____
4.0 Validation and Release Records	
5.0 Changes and Revision Records	
6.0 Information Systems	_____
7.0 Facilities	_____
8.0 Business Program Management	_____
9.0 Research and Development Engineering .	_____
10.0 Marketing and Sales	_____
11.0 Supply Chain Management	_____
12.0 Order Fulfillment and As-Built Records .	_____
13.0 Support, Operation and Maintenance . .	_____
14.0 Human Resources and Training	_____
15.0 Financial Accounting and Reporting . . .	_____
16.0 Oversight and Internal Audit	_____

Process Infrastructure (spans items 1.0–5.0)

Core CM Process (spans items 1.0–5.0)

Other Core Business Processes (spans items 7.0–16.0)