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United States Coast Guard

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COMDTINST 4130.6
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COMMANDANT INSTRUCTION 4130.6

Subj: COAST GUARD CONFIGURATION MANAGEMENT

Ref:
(a) COMDTINST 4100.7, Coast Guard Engineering Logistics Concept of Operations (ECONOP), 31 May 1994
(b) COMDTINST 4105.2, Acquisition and Management of Integrated Logistics Support (ILS) For Coast Guard Systems and Equipment
(c) COMDTINST M4150.2 (series), Systems Acquisition Manual
(d) MIL-STD-973, Configuration Management

1. PURPOSE. This instruction is the basis for all Coast Guard Configuration Management (CM) policy and procedures. It establishes the foundation that will allow the Coast Guard to implement CM as an effective engineering management discipline. It further defines key CM concepts, elements and assigns responsibilities. As an effective management tool, CM must be tailored to the specific life cycle phase requirements of a platform or asset. The life cycle phases of an asset are acquisition (acquiring the asset), sustainment (operating and maintaining the asset) and disposal (disposition of the asset). Because the Coast Guard has assets in various life cycle phases, implementation of Coast Guard CM policy must address the specific life cycle phase of the asset. Specific policies relating to CM in the acquisition and sustainment phases will be promulgated separately.

2. ACTION. Area and district commanders, commanders maintenance and logistics commands, commanding officers of

headquarters units, commanding officers of Coast Guard units and officers in charge shall recognize, acknowledge and implement Coast Guard CM policy and procedures as set forth in this instruction.

3. DIRECTIVES AFFECTED. This instruction does not cancel or change any other Coast Guard directives.

4. BACKGROUND. The Coast Guard has long recognized an increasing need for CM as a necessary engineering management tool. In October 1988, the Systems Coordinating Council designated Commandant (G-ELM) as the focal point for developing Coast Guard CM policy. As a result, several Coast Guard instructions were promulgated to address particular aspects or applications of CM. These are:

   a The ECONOP, Reference (a), is an important logistics document which establishes principles for the future CG logistics system. It presents a conceptual view of the optimum state of engineering logistics, and provides a framework for the development of future business practices and information systems. The logistics system will be configuration based, and address both the ILS Management and CM disciplines as necessary improvements in asset management and visibility.

   b Reference (b) defines the ILS elements and key logistics management concepts.

   c Reference (c) addresses CM procedures and requirements for major systems acquisition projects.

   d Related Military Standards, such as reference (d), provides guidance and information on CM.

   e In addition, Commandant (G-ELM) will monitor Department of Defense (DOD), Other Government Agency (OGA) and industry CM developments in order to keep Coast Guard CM policy consistent with current best practices.

5. SCOPE.

   a CM policy and procedures, as established by this instruction, are applicable to:

      (1) All Coast Guard platforms, i.e., aircraft, vessels, small boats, shore facilities and equipment, including computers and IRM systems designated for CM. Also included are all subsystems, components, support and test equipment, and training equipment or devices designated for CM.

      (2) All Level I, IIIA and IV major acquisition projects subject to the requirements of reference (a).

(3) All non-major acquisition projects for which CM has been determined as a project requirement.

(4) All major and non-major modification projects for operational assets, including Engineering Change Proposals (ECPs), ShipAlts, BoatAlts and Ordalts.

b Enclosure (1) defines specific responsibilities for Coast Guard CM.

c This information does not address policies and procedures unique to any specific platform. Policy and procedural statements are written as a framework on which specific projects or operationally unique CM requirements shall be developed and implemented.

6. DEFINITION OF CONFIGURATION MANAGEMENT.

a The essence of CM is knowing what you have, what it does, and where it is. It includes controlling the form, fit, and function of an item designated for CM. CM is simply a management discipline that allows for visibility and control of an asset throughout its life cycle.

b CM is an important tool which ensures that changes to equipment arrangements, replacements or additions are justifiable and supportable. Controlling the configuration of machinery, systems or equipments improves their life cycle supportability by providing commonality of support requirements...specifically required repair parts and other logistics elements. Configuration management processes also ensure adequate technical documentation exists to support future operations and engineering requirements.

c CM is achieved by the following key processes:

(1) Configuration Identification. Identifying, selecting, and documenting requirements which describe and establish Configuration Items (CIs).

(2) Configuration Control. Controlling changes to items designated for CM;

(3) Configuration Status Accounting. Recording and reporting information needed to manage and support CIs effectively; and,

(4) Configuration Audits, Technical Reviews and Configuration Reviews. Continuously verifying the current configuration of CIs throughout their life cycle.

d CM provides the capability to know the definitive baseline or "benchmark" knowledge of the current configuration of CIs. CM may be implemented at any point in time during the acquisition, sustainment or disposal phase of an asset/platform. However, the earlier this occurs in the acquisition phase the better.

e CM uses three configuration baselines to identify and document design information for the platform and lower level components/items designated for CM. The three configuration baselines are the Functional Baseline (FBL), Allocated Baseline (ABL) and Product Baseline (PBL).

(1) Functional Baseline. The FBL describes the performance requirements of the platform and major subsystems. This is done in the acquisition phase of the life cycle and is the "design to" requirement. CM is normally implemented when the FBL is established.

(2) Allocated Baseline. The ABL describes the design requirements of the platform and major subsystems. This is done in the acquisition phase of the life cycle and is the "develop to" baseline.

(3) Product Baseline. The PBL is the "build to" (during acquisition) and "maintain to" (during sustainment) description of the platform.

7. DEFINITION OF A CONFIGURATION ITEM (CI).

a The focus of CM is to provide appropriate identification and control of CIs during the life cycle phases of a platform, equipment, or system.

b A CI is an aggregation of hardware, software, or both; or any of its discrete portions, which satisfies an end-use function, and is either maintenance worthy, or engineering/logistics critical, and is designated for CM. Enclosure (2) provides an expanded and more detailed definition of a CI.

c CIs vary widely in complexity, size and type, i.e., a facility, Hardware Configuration Item (HWCI) or Computer Software Configuration Item (CSCI). A HWCI may be an aircraft, minicomputers, microcomputers and peripherals, vehicles and their components (mechanical, electrical, electronic, hydraulic, pneumatic). A CSCI may be an operating system, office automation, application software or Information Resource Management (IRM) system. Unless it is necessary to specify HWCI or CSCI, the acronym "CI" is used generically to include hardware and software components of a platform, equipment, air station, shore facility, system, etc. when designated for CM.

8. POLICY AND PROCEDURES.

a CM is applied only to designated CIs. Subdividing a platform/equipment or system into CIs is a technical management decision. It is important to carefully select the number of designated CIs in order to control the management effort in an affordable manner that reduces government cost.

b When designated as a CI, a Non-Developmental Item (NDI) or an Off-the-Shelf (OTS) item from an OGA or commercial sources require special CM consideration and treatment. Generally, these items should not be modified. Use caution when modifying these items to avoid creating unique Coast Guard items, support requirements and costs.

c When more than one service/agency is involved in the acquisition, modification or support of a CI, the lead service/agency will develop and document mutual agreements and procedures for CM. The Coast Guard will strive at all times to ensure CM compliance, commonality and consistency with DOD or OGA CM authority for common CIs to the maximum extent possible.

d All Coast Guard personnel involved or associated with new acquisition projects, and the management and support of operational systems shall refer to enclosure (1) for specific responsibilities on implementing CM, and shall familiarize themselves with the definitions of terms used in this instruction provided in enclosure (2).

E. J. Barrett
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Encl: (1) Responsibilities for Coast Guard Configuration Management
(2) Definitions Relating to Configuration Management

RESPONSIBILITIES FOR COAST GUARD CONFIGURATION MANAGEMENT

1. Commandant (G-ELM) is responsible for developing and promulgating CM policy, which will allow the implementation of CM as an effective engineering management discipline throughout the Coast Guard. Commandant (G-ELM) will coordinate with major acquisition Project Managers (PMs), non-major acquisition Project Sponsors, Operational Managers and Facility Managers to determine the need for CM designation, and the development of CI selection criteria. Additionally, G-ELM will approve any software CM application used to perform CM functions.

2. Commandant (G-A) is responsible for ensuring that CM requirements, as specified in reference (c), are applied to major acquisition projects, and are appropriately tailored to the complexity, size, quantity, intended use, and the mission criticality and requirements of the project.

3. Commandant (G-AT) will ensure that major acquisition projects have appropriately chartered CCBs.

4. Commandant (G-O) and (G-N), Operational Managers and Facility Managers, shall participate in project CM efforts, early in the acquisition phase, to ensure smooth transition from an acquisition project to operational status. This includes assisting the PM in the development of the project Configuration Management Plan (CMP). They are responsible for ensuring that appropriate CM procedures are continued for readiness support during the sustainment or operational phase.

5. Commandant (G-E) is responsible for ensuring that the degree of CM, used during identification of CIs, is appropriately tailored to the complexity, size, quantity, intended use and mission criticality of the system or equipment. Commandant (G-E) shall participate in project CM efforts when CM efforts are initiated to facilitate the transition from acquisition project to operational status.

6. Commandant (G-T) is responsible for ensuring that the degree of CM applied to electronics equipment, computers and peripherals, as well as operating system, office automation and application software is appropriately tailored to the complexity, size, quantity, intended use and mission criticality of the equipment. G-T shall insure that all information for these systems to support accountable property requirements shall be maintained in the approved Coast Guard property system. G-T shall participate in project CM efforts when CM efforts are initiated to facilitate the transition from acquisition project to operational status.

7. Configuration Control Boards (CCBs) are responsible for - thoroughly evaluating and determining appropriate disposition of proposed configuration changes. Configuration changes to CIs affecting the form, fit or function, or logistics support structure shall be approved by a designated CCB that reviews proposed changes, votes on, advises or recommends disposition to applicable PMs, Operating Managers or Facility Managers.

8. Project Managers and Project Sponsors for major acquisitions are responsible for management of configuration and technical data for assigned acquisition projects. The major acquisition PM is responsible for developing a CMP in accordance with reference (c).

9. Project Officers/Project Sponsors for non-major acquisition projects are responsible for configuration and technical data management for assigned acquisition projects. The Project Officer/Project Sponsor, in conjunction with Commandant (G-ELM) and (G-AT) as appropriate, shall make the final determination on whether a CMP shall be prepared for the non- major acquisition project. The non-major acquisition PM is responsible for developing a CMP and may use reference (c) for guidance to do so.

10. The Supply Centers/future Engineering Logistics Center are responsible for maintaining accurate configuration information on assigned platforms and designated systems or equipment, as well as supply support and technical data to ensure readiness during the sustainment phase.

11. Commanding Officers and Officers-In-Charge are responsible for maintaining accurate configuration documentation on all CIs under their cognizance. This consists of maintaining and updating unit level configuration data bases to reflect current configuration identification and any configuration changes thereto. It also includes assisting with and providing information for use during CRs and audits of operational assets.

12. Area Commanders are responsible for ensuring that units under their direction comply with CM practices.

13. District Commanders are responsible for ensuring that units under their direction comply with CM practices.

14. Commanders, Maintenance and Logistics Commands (MLCs), shall provide technical and administrative support on CM policy and procedures to Area, District and unit level Commanders. MLCs shall provide appropriate documentation in proposed configuration changes.

DEFINITIONS RELATING TO CONFIGURATION MANAGEMENT

1. Configuration. Configuration is the required technical, functional and physical characteristics relating to form, fit and function of a CI.

2. Configuration Item (CI). A CI is an aggregation of hardware, software or both; or any of its discrete portions, which satisfies an end-use function, and is either maintenance worthy, engineering/logistics critical, and is designated for CM.

   a End-Use Function. An item has an end-use function if, at a minimum, the item has one functional use which is essential to accomplishment of the mission.

   b Maintenance Worthy. A system, item or structural component is maintenance worthy when the need exists to preserve a condition of good repair or efficiency.

   c. Engineering Critical Item. An item is functionally significant or engineering critical when:

      (1) The technical complexity of the item requires an individual specification:

      (2) Reliability of the item is critical to the overall function of the platform or system.

      (3) Safety, health or security are of concern with respect to the design, manufacturing, fielding and/or disposal of the item;

      (4) Separate testing and evaluation of the item for functional and physical suitability in its required application is necessary to adequately evaluate a system or higher level item.

   d. Logistics Critical Item. An item is logistics critical when:

      (1) A unique maintenance plan, including Preventive Maintenance System (PMS), is required to preserve the item in a condition of good repair or efficiency;

      (2) Repair parts will be provisioned for the item;

      (3) The item will be reproduced by or reprocured from multiple sources. If there are numerous suppliers, tighter control of the interfaces between various CIs is required;

(4) Less than a minimum support level for any of the ten Coast Guard recognized ILS elements identified in enclosure (2) of reference (c) would adversely affect the project schedule, or the operational capability of the system or component:

(5) Different activities have been identified to maintain various parts/components of a system. Both the system and the parts/components should be designated as separate CIs.

e A Hardware Configuration Item. A HWCI is a CI that is comprised of material, such as aircraft, minicomputers, microcomputers and peripherals, vehicles and their components (mechanical, electrical, electronic, hydraulic, pneumatic). Unless specifically designated in future instructions, minicomputers, microcomputers and peripherals are exempt from the maintenance profile reporting and tracking requirements of CMplus.

f Computer Software Configuration Item. A CSCI is a CI comprised of one software component, or a CI comprised of an aggregation of software, such as an operating system, office automation and application software. Unless specifically designated in future instructions, operating systems, office automation and application software are exempt from the maintenance profile reporting and tracking requirements of CMplus.

g Non-Developmental Item (NDI) or Off-the-Shelf (OTS). NDI and OTS is a broad generic term that covers material available from a wide variety of sources with little or no development effort required by the government.

3. Configuration Identification. Configuration identification is a process of CI selection, determination, verification, and documentation of CIs. It also includes the labeling, numbering and marking of CIs and related support documentation. Configuration identification is used to incrementally establish a series of three definitive baselines, the FBL, ABL and PBL. This ensures that all technical documentation describing the functional and physical characteristics of CIs is complete, and that the verified technical documents defining the applicable configuration baseline are current, approved and available for use when needed.

a CIs are developed, identified and described by their configuration baselines.

b Configuration baselines are composed of approved configuration documentation including all approved changes to that documentation.

c Configuration documentation is technical in nature. The documentation includes specifications, drawings, identification numbers, parts listings, operational and maintenance manuals, and training material. This documentation becomes more precise as the design progresses toward production and use. The documentation provides the basis for development, testing, production, delivery, operation and support throughout the life cycle of the CI.

4. Configuration Control. Configuration control entails the approval or disapproval of proposed changes to a CI and its associated baselines. "Configuration change" is a general term which signifies that the configuration of an item has been or will be changed through the configuration control process. Configuration changes should not be made unless specifically authorized by the appropriate CCB. Configuration change control should include careful review of all potential impacts of proposed configuration changes to a CI and its logistics support structures. Configuration changes will identify the impact of proposed changes to the functional and physical characteristics of a CI, and the current approved configuration baselines/configuration documentation of the CI.

   a Configuration changes to CIs affecting the form, fit or function, or logistics support structure shall only be made by the chartered CCB.

   b Prior to implementation of a configuration change, all configuration documentation and impacted logistics support structures shall be updated to reflect and support design changes.

   c Related configuration changes should be grouped for implementation to reduce the number of configurations supported in the field.

5. Configuration Status Accounting (CSA). CSA includes the collecting, documenting, recording, processing, maintaining and reporting historical and current information necessary to effectively manage CIs and related configuration documentation throughout the life cycle of a system. Information in the CSA database should be available and useful to all organizations involved with the development, support and operation of a platform/system, or CI.

   a CSA provides traceability of previous and current configuration of CIs and the supporting configuration documentation.

b For an acquisition project, the CSA system should be established concurrent with Coast Guard approval of the initial configuration baseline (normally the FBL), and initiation of configuration control.

6. Configuration Audits, Technical Reviews and Configuration Reviews (CRs). Configuration audits and technical reviews may be described as "investigations" which are conducted to verify the technical performance of a CI(s). This ensures that the approved configuration, as implemented by the product, is completely and adequately described by its configuration documentation. Conducting configuration audits, formal and informal technical reviews, and operational configuration reviews verify the CI design and help establish appropriate configuration baselines.

   a Configuration audits are conducted by the project configuration manager during the acquisition phase for the primary purpose of establishing a configuration baseline to which future CIs will be built, and operational CIs maintained. Configuration audits verify and document that the CI and its configuration identification (baseline/documentation) agree, are complete and accurate, and satisfy program/project requirements.

   b Technical reviews are conducted by technical support managers and the PM to ensure that all requirements pertaining to form, fit and function, performance and reliability requirements are or will be met. Also, to ensure that no design weaknesses exist which may compromise the performance, reliability or quality of the system and for the CI.

   c CRs are conducted during the operational phase to validate, reconfirm the accuracy of, and identify inconsistencies between the configuration of an operational system and the CSA data file. CRs consist of visual verification and analysis of on-site inventory. Various entities within the organization are responsible for conducting CRs depending on the validation requirement.

7. Configuration Control Boards (CCBs). A CCB is composed of technical and administrative representatives who review, approve or disapprove proposed configuration changes to a CI. CCB approval is required for all proposed configuration changes affecting the form, fit and function or logistics support structure of every CI. CCB membership is normally composed of a chairman, configuration manager, voting board members and ad hoc nonvoting members. CCB members should represent the project, operational, safety and ILS elements.

8. Configuration Management Plan (CMP). The document defining how CM will be implemented for a particular project or operational program. A CMP should include standard CM policies, appropriately tailored procedures and the applicable CCB charter for the project.

9. Fit. Fit is the ability of an item to physically interface or interconnect with or become an integral part of another item. Basically a change which would affect interface connectivity or electromagnetic characteristics affects fit.

10. Form. Form is defined by the quantitative and qualitative descriptions of material features, such as composition, dimensions, size, weight, finishes and the respective tolerances. Any change affecting the weight, balance or inertia; shape, size, dimensions, mass and/or other visual parameters which uniquely characterize an item affects the form. For software, form denotes the language and media.

11. Function. Function is the operations or action(s) that an item is designed and required to perform. Performance parameters include operational requirements such as range, speed, lethality, reliability, maintainability, survivability or safety, including operational and logistics parameters and their respective tolerances. Any change affecting intended performance affects function.

12. Interoperability. The ability of systems or units to provide services to or accept services from other systems or units and to use the services exchanged to operate effectively together.

13. Standardization. Use of the same or common item, i.e., system, equipment, part or component, across multiple functions or applications and where economically feasible. Economy of scale and increased supportability over the service life is promoted by increased populations of standardized or common items.

14. Tailoring. The decision process by which policies, requirements, desired attributes, procedures or management considerations are applied to a project. Evaluation criteria are developed to determine and document the extent to which the requirements or desired attributes are most suitable for specific acquisition projects, modification projects or operational programs. Tailoring also includes modifying or deleting operational requirements to ensure an optimal balance between operational needs and cost.

15. Unit Level Configuration Management. CM at the unit level consists of maintaining and updating unit level configuration data bases to reflect current configuration identification and any configuration changes thereto. This includes assisting with and providing information for use during CRs and audits of operational assets.