

Issuance Transmittal Sheet

George C. Marshall Space Flight Center
Marshall Space Flight Center, Alabama 35812

Issuance Number: MMI 8040.15C, Change 1	Date: April 7, 1997
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Material Transmitted:

1. Marshall Management Instruction MMI 8040.15C, Change 1, subject:
"Configuration Management"
2. This Instruction is being revised to:
 - a. Add the requirement that MSFC projects must have a Configuration Management Plan prior to the initiation of the design phase.
 - b. Add the requirement for a matrix of required signatures to define the documentation approval and release process.
 - c. Allow the use of unreleased drawings for fabrication of hardware.
3. Remove page 2 of MMI 8040.15C and insert the attached page 2 which includes new subparagraph 3.e.

Original signed by

J. Wayne Littles
Director

Distribution:
SDL 2

Filing Instructions:

Remove page 2 from MMI 8040.15C, dated November 24, 1993, and replace with the attached page 2.

George C. Marshall Space Flight Center
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Issuance Number: MMI 8040.15C	Date: November 24, 1993
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Material Transmitted:

1. Marshall Management Instruction: MMI 8040.15C, "Configuration Management"
2. This instruction has been revised to:
 - a. Update responsibilities for Configuration Management to agree with current MSFC organizational structure;
 - b. Update and clarify policy concerning the implementation of Configuration Management for MSFC programs, projects, and end items; and
 - c. Update the Center Configuration Management Documentation Tree to agree with current and proposed Configuration Management documentation.

Filing Instructions:

Remove MMI 8040.15B and replace it with the attached MMI 8040.15C.

George C. Marshall Space Flight Center
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Originating Organization: EA01	Effective Date: November 24, 1993	MMI: 8040.15C
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Subject: CONFIGURATION MANAGEMENT

* 1. PURPOSE

To establish Marshall Space Flight Center (MSFC) policies and assign responsibilities for the most cost effective, efficient, and uniform implementation of Configuration Management (CM) which is essential for baseline management and to properly identify, control, account for, and verify the configuration of MSFC programs/projects/end items (EI's).

* 2. APPLICABILITY

This instruction applies to all MSFC organizations and shall be applied to all interfaces between MSFC and other NASA Centers/ Government Agencies, and between MSFC and its contractors. Changes made by Revision C of this document are not intended for retroactive application, but shall be imposed on all new effort and voluntarily on ongoing tasks.

3. POLICY

- * a. Configuration Management shall be applied to all MSFC programs, projects (including program/project/EI unique facility projects), and EI's procured through contracts or acquired through in-house activities. This includes all design and development projects involving flight, qualification protoflight, designated development hardware/software, and associated support equipment.
- b. The identification, control, accounting, and verification disciplines of Configuration Management (see Attachment A) shall be utilized to assure that the program/project/EI technical requirements will be attained in the end products in the most cost effective manner.
- c. The optimum degree of uniformity in CM procedures, forms, and reports shall be sought at all interfaces within MSFC and between MSFC and other NASA Centers/Government agencies/ contractors.

* Changed/added by this revision.

- d. Unless otherwise approved by Center Management, the Change Processing, Tracking, and Accounting System (CPTAS) computer system as described in MSFC-MNL-1951 shall be utilized for the integration and tracking of change processing activities.
- e. MSFC projects are required to prepare a baseline Configuration Management Plan prior to initiation of the design phase of a project. The CM Plan will be ISO 9000 compatible and will detail the project approach to CM. The project manager is responsible for the preparation of this plan which will contain a matrix of required signatures to define the documentation approval and release process. This matrix will designate which organizational elements will be required to approve each document type. The CM plan will also address whether or not the use of unreleased drawings for fabrication of hardware will be allowed, and whether or not the project will allow the "non-release" of any drawings, engineering parts list (EPL's), etc., until the project completion, at which time, **all** documentation will be entered into the DRS data base. The project CM Plan shall also address whether or not the use of noncertified parts may be used in ground support equipment (GSE) where their failure could not damage flight hardware.

4. DEFINITIONS (See Attachment B.)

5. GENERAL PROVISIONS

- a. Application - Configuration Management, in accordance with this Instruction, specifically applies to those programs/projects/EI's where MSFC has the lead center responsibility. Where MSFC is not the lead center, this Instruction shall be implemented to the extent possible on a non-interference basis with instructions issued by another lead center or parent NASA Headquarters Program Office. For change processing and accounting activities, facilities other than those associated with a specific project are exempt from the required use of CPTAS (reference Paragraph 3.d) and may use a manual or alternate computer system that will accomplish the same purpose.
- b. Initiation and Duration - Configuration Management shall be initiated on a project upon its selection by NASA Headquarters, or as directed by MSFC Management, and shall continue until its completion or as long as it is an active project.
- c. Planning and Procurement Aspects - Appropriate provisions for CM shall be included in project plans, procurement plans, requests for proposals, inter-center agreements, contracts and in-house agreements involved in program/project/EI definition, design, development, operation, modification, and maintenance.
- d. Joint Configuration Management - Mutual agreement on CM consistent with this Instruction shall be developed and documented in instances where two or more MSFC programs/projects are contracted, in the same time period, to the same contractor.
- e. Baseline Management - The baseline management concept, as defined in Attachment B, shall be utilized to formally establish, identify, control, account for, and verify the evolution of the requirements for all MSFC programs/projects/EI's.

- * f. Design Reviews and Configuration Inspections - Design reviews and configuration inspections shall be utilized to establish the necessary baselines as described in MMI 8010.5. These reviews and inspections shall also be performed to establish a mutual MSFC and contractor understanding of the approved technical requirements and to assure MSFC that the contractor-selected design approach and resulting detailed design documentation are progressing in a manner which will provide the required configuration. The appropriate Preliminary Design Review (PDR) and Critical Design Review (CDR) configuration and performance definition documentation shall be placed under change control by prime contractors (for out-of-house developments) and by the Science and Engineering (S&E) Directorate (for in-house developments). Notification of departure from these commitments shall be provided to the appropriate program/project office for review. The mechanism to be used for providing these notifications shall be established by the program/project office.
- * g. Configuration Management Documentation - Attachment C shows the CM Documentation Tree.

6. RESPONSIBILITIES (See Attachment D.)

7. CANCELLATION

* MMI 8040.15B dated May 12, 1976

(Orig s/by)

T. J. Lee
Director

- 4 Attachments:
- A. Configuration Management Disciplines
 - B. Definitions
 - C. Configuration Management Documentation
 - D. Responsibilities

Distribution:
SDL 2

* Changed/added by this revision.

CONFIGURATION MANAGEMENT DISCIPLINES1. Configuration Identification

- a. Identification shall define and establish the total technical requirements for each MSFC program/project/EI in the form of technical documentation. This identification becomes more detailed as the program/project/EI progresses through the definition, design, development, and operation phases.
- * b. Identification shall provide the baseline for status accounting throughout the program/project/EI life cycle and shall be changed only through a formalized change control process. Design reviews and configuration inspections shall be utilized to establish and record the specific documentation constituting necessary baselines. The baseline, plus approved changes thereto, will constitute the approved configuration of an EI at a later date.
- * c. Identification numbers shall be applied to all specifications, drawings, documents, EI's, assemblies, components, parts, and change packages to assure traceability of requirements and control of the program/project/EI configuration.

2. Configuration Control

- * a. General
 - (1) Configuration control shall be exercised on all baselines established throughout the program/project/EI life cycle. All aspects of formal configuration control, as set forth in the following paragraphs, may not be required during definition effort. It is necessary, however, that configuration control be implemented to properly control all basic technical requirements to ensure that only essential changes are made. A duly established Configuration Control Board (CCB) shall document, review, evaluate, and disposition all changes; and upon CCB approval, these changes shall be implemented, verified, and incorporated into affected documentation.
 - (2) A CCB shall be established at each level of management which has been assigned responsibility for identifying and maintaining a baseline. The CCB shall be the single authority for establishing baselines and authorizing changes, deviations, or waivers to established baselines.

* Changed/added by this revision.

(3) All affected activities, such as the various engineering disciplines, materials, processes, safety, reliability, quality assurance, logistics, facilities, and operations shall participate in evaluating proposed baselines and changes to previously established baselines.

* b. Change Criteria

Engineering changes, waivers, or deviations (hereinafter called changes) affecting the configuration of items shall be limited to those which are deemed necessary. Necessary changes are required to correct deficiencies, satisfy changes in operational requirements, effect cost savings, or prevent or allow desired slippage in an approved schedule.

* c. Change Evaluation

(1) Every proposed change affecting MSFC established baselines shall be critically evaluated on the basis of the above criteria, including, as an alternative, not making the proposed change.

(2) The evaluation of each proposed change shall take into consideration the possible impact of the change on all aspects of the baseline. Such aspects include design, performance, interface, cost, schedule, operational effectiveness, facilities, test, safety, reliability, maintainability, quality assurance, logistics, and training.

* d. Change Approval

MSFC CCB chairpersons are authorized to give final approval of changes unless the effect of these changes requires joint approval of other CCB chairpersons or higher level chairpersons. The CCB chairperson shall have sole authority for approving changes, deviations, or waivers to established baselines. Concurrences and nonconcurrences with the action of the CCB chairperson shall be documented.

* e. Change Implementation

Upon formal CCB approval of a change, implementation instructions (including funding authorization and required contract changes) shall be issued which will assure timely and economical implementation of all aspects of the change. Contract modifications to implement approved changes shall be issued in strict accordance with the contract terms and conditions. Contractual changes to the configuration baseline shall only be made in accordance with the direction issued by the CCB.

f. Change Processing

- (1) Activities involved in the processing of proposed changes from initiation through CCB decision and contract action shall be integrated and tracked for continuing visibility and control.
- (2) Time spans and effective controls to enforce these spans shall be established to assure that decisions on proposed changes are made in a timely manner.

3. Accounting and Verification

- a. Accounting information necessary to manage configurations effectively and economically shall be recorded and reported. This information shall include a listing of the approved configuration identification, all approved changes, and the implementation status of approved changes.
- b. Appropriate data verifying the incorporation of changes into the program/project/EI shall be recorded and maintained. This data shall be capable of providing a clear audit trail (top-down and bottom-up) from the change authorization to the actual incorporation of the change into the affected documentation and hardware/software.

DEFINITIONS

- * 1. Baseline - The technical requirements of a program/project/EI as approved by the respective CCB at a specific time during its life cycle and recorded in a configuration identification document or set of documents. For MSFC configuration management, there are three basic baselines as indicated below. Other baselines may be established as deemed appropriate by program/project/EI managers.
 - a. Mission Baseline - The technical requirements as recorded in the initial approved program/project (system) specification or other requirements documents. This baseline is established as a product of the Program/Project Requirements Review (PRR) and is similar to the DOD Functional Baseline as defined in MIL-STD-973.
 - b. Design Requirements Baseline - The technical requirements as recorded in the initial approved Part I End Item Detail Specification. This baseline is established as a product of the Preliminary Design Review (PDR) and is similar to the DOD Allocated Baseline as defined in MIL-STD-973.
 - c. Product Baseline - The technical requirements as recorded in the initial approved Part II End Item Detail Specification and subordinate approved detail specifications and drawings. This baseline is finalized as a product of the Configuration Inspection (CI) and is similar to the DOD Product Baseline as defined in MIL-STD-973.
- 2. Configuration - The technical requirements of hardware/software as set forth in technical documentation and achieved in the product.
- 3. Configuration Accounting - The recording, maintaining, correlating, reporting, and storing of information necessary to effectively manage the approved configuration.
- 4. Configuration Control - The systematic definition, evaluation, coordination, and disposition of each proposed change, deviation, or waiver, and the implementation of each approved change in the configuration of a program/project/EI after formal establishment of the configuration identification.
- * 5. Configuration Control Board (CCB) - The functional body responsible for establishing baselines, reviewing, and dispositioning all changes, deviations, or waivers to these baselines.

* Changed/added by this revision.

- * 6. Configuration Identification - The establishment of approved technical documentation defining the approved configuration of a program/project/EI throughout its life cycle and its maintenance on a current basis. This documentation consists of specifications, drawings and associated lists, and documents referenced therein.
- 7. Configuration Management (CM) - A discipline applying technical and administrative direction and surveillance to accomplish the following tasks:
 - a. Identify and baseline the technical requirements of programs/projects/EI's.
 - b. Control changes, deviations, and waivers to these technical requirements.
 - c. Record and report change processing and implementation status.
 - * d. Account for approved changes and their incorporation into programs/projects/EI's.
- * 8. End Item (EI) - An aggregation of hardware/software defined by a specification and designated by MSFC as requiring the CM discipline. End items procured from a contractor are commonly referred to as Contract End Items (CEI's).

* Changed/added by this revision.

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CONFIGURATION MANAGEMENT DOCUMENTATION

This attachment presents the Documentation Tree for MSFC CM and a brief description of the documents identified by the tree.

1. MM 8040.12, "Standard Contractor Configuration Management Requirements, MSFC Programs."

This document provides the requirements that are contractually imposed on MSFC prime contractors for the performance of CM.

2. MMI 8040.15, "Configuration Management."

This document establishes the policies and assigns the responsibilities for CM at MSFC.

3. MM 8040.20, "Configuration Management Manual, MSFC Programs."

This document will define the CM implementing instructions for MSFC and provide a more complete description of CM and the role CM plays in the development of a product than that provided by MMI 8040.15.

4. S&E 8040.1, "Science and Engineering Configuration Management Plan."

This document establishes policies and defines and assigns responsibilities for implementation of a uniform CM system within S&E.

5. MSFC Configuration Management Standards.

These documents provide standardized detail instructions or procedures and will be referenced in higher level procedural documents.

6. Contractor Configuration Management Plans.

Depending on the terms and conditions of the request for proposal or the contract, contractor CM plans define the requirements that prescribe what is to be done by the contractor to implement CM in order to be in compliance with this Instruction.

* Changed/added by this revision.

November 24, 1993

The Document Tree is not electronically available at this time. A copy is available from the Central Repository.

Center Configuration Management Document Tree

RESPONSIBILITIES1. The Science and Engineering Directorate shall:

- a. Ensure compliance of all levels of management within their organization with the policies conveyed in this Instruction.
- * b. Ensure that adequate requirements and associated planning for CM are included in program/project plans (internal and contractor), procurement plans, requests for proposals, requirements documents, contracts, and in-house agreements for those program/project phases under the management jurisdiction of S&E.
- c. Support MSFC program/project and task team managers by providing the primary systems engineering analyses to identify technical requirements for all MSFC programs/projects/EI's and performing the necessary change integration support activities to ensure complete technical impact assessment of all changes proposed to the approved technical requirements of MSFC programs/projects/EI's.
- d. Serve as the MSFC focal point for developing the format, content, and maintenance requirements for interface documentation for all MSFC programs/projects/EI's.
- e. Support Program Development and program/project offices in ensuring that MSFC contractors comply with CM provisions of contracts.
- * f. Provide change package engineers to make presentations to CCB's for all changes involving technical considerations as designated by the S&E chief engineer.
- * g. Administer Center institutional CM including the following responsibilities:
 - (1) Plan and direct all functions related to implementation and administration of the MSFC CM system.
 - (2) Provide CM requirements and procedures to implement policies set forth herein and perform functions associated with baseline identification, change processing, tracking, accounting, reviews, audits, and compliance verification.
 - (3) Direct development of automated systems used in the accomplishment of CM activities.

* Changed/added by this revision.

(4) Provide CCB secretariats and change integration for in-house projects.

(5) Provide co-located personnel with CM responsibility to projects.

2. Program/Project Offices shall:

a. Ensure compliance of all levels of management within their organizations with the policies conveyed in this Instruction.

* b. Ensure that adequate requirements and associated planning for CM are included in program/project plans (internal and contractor), procurement plans, requests for proposals, requirements documents, contracts, and in-house agreements for those program/project phases under the management jurisdiction of the program/project office.

* c. Ensure that MSFC contractors comply with the CM provisions of contracts. Program/Project Offices will request a waiver from Center Management to deviate from policies of this instruction.

* d. In conjunction with other Center elements (Headquarters, other centers, foreign counterparts, etc.), where applicable, establish program/project CCB membership including as a minimum the following members:

(1) Secretary

(2) Safety and Mission Assurance (S&MA) Representative

(3) Chief Engineer

* e. Provide change package engineers to make presentations to program/project CCB's for all changes.

3. Program Development shall:

a. Ensure compliance of all levels of management within their organization with the policies conveyed in this Instruction.

* b. Ensure that adequate requirements and associated planning for CM are included in program/project plans (internal and contractor), procurement plans, requests for proposals, requirements documents, contracts, and in-house agreements for those program/project phases under the management jurisdiction of Program Development.

* Changed/added by this revision.

- * c. Ensure that the CM end products of the definition study effort, i.e., specifications, CM plans, etc., are completed in accordance with standard requirements to the level of definition required for effective transition of the program/project from the management jurisdiction of Program Development to a separate program/project office.
 - d. Ensure that MSFC contractors comply with the CM provisions of contracts.
4. Institutional and Program Support shall:
- a. Ensure compliance of all levels of management within their organization with the policies conveyed in this Instruction.
 - b. Support MSFC program/project and task team managers as appropriate in developing technical requirements and assessing proposed changes to approved technical requirements of MSFC programs/projects/EI's.
 - c. Ensure that procurement plans for MSFC programs/ projects/EI's, under cognizance of Institutional and Program Support, contain adequate provisions for CM and that these provisions are in compliance with MSFC CM policies and instructions, and, as applicable, NASA or other lead center CM policies and instructions.
5. Safety and Mission Assurance shall:
- * a. Ensure compliance of all levels of management within their organization with the policies conveyed in this Instruction.
 - b. Ensure that adequate requirements and associated planning for S&MA aspects of CM are included in program/project plans (internal and contractor), procurement plans, requirements documents, request for proposals, contracts, and in-house agreements.
 - c. Support MSFC program/project and task team managers by providing analyses to identify S&MA technical requirements for all MSFC programs/projects/EI's and performing the necessary change evaluation support to ensure complete technical impact assessment of all changes proposed to the approved technical requirements of MSFC programs/projects/EI's.
 - d. Serve as the MSFC focal point for developing the content of S&MA requirements for inclusion in engineering documentation for all MSFC programs/projects/EI's.

* Changed/added by this revision

e. Support Program Development and program/project offices by ensuring that MSFC contractors comply with S&MA CM provisions of contracts.

6. Human Resources and Administrative Support Office shall:

- * a. Ensure compliance of all levels of management within their organization with the policies conveyed in this Instruction.
- b. Provide repository operation for maintaining effective data management control of applicable documentation as required by MSFC programs/projects/EI's.

* Changed/added by this revision.