

**MPR 8823.1
REVISION E**

**EFFECTIVE DATE: May 23, 2014
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MARSHALL PROCEDURAL REQUIREMENTS

AS01

DESIGN CONTROL OF FACILITIES

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DOCUMENT HISTORY LOG

Status (Baseline/ Revision/ Change/ Revalidation/ Canceled)	Document Revision/ Change	Effective Date	Description
Baseline		12/13/99	
Revision	A	6/14/01	Extensive rewrite to incorporate ISO 9001:2000.
Revision	B	9/27/2004	Changed title to "Marshall Procedural Requirements." Changed "MPG" to "MPR," "will" to "shall," and "must" to "shall" in various paragraphs. Reflects minor editorial changes.
Revision	C	8/22/2005	Revised to reflect organizational changes.
Revision	D	10/20/2008	Revised applicability statement and organizational change in paragraph 2.4. Revised paragraph P.1 to add MAF. Revised paragraphs 1.4 and 1.5. Revised paragraphs 2.1.2, 2.2.3, 2.2.5, 2.4.1, 2.5.1, 3.1, 3.2.2, 3.2.5, 3.6 and 4.0 to separate the "Shall's." Added reference NPR 1441.1 to Paragraph 4.
Revision	E	05/23/2014	Directive reformatted to comply with new required template per MPR 1410.2 and as instructed in MWI 1410.1.
Revalidation	E	8/29/2019	Distributing for five-year review as required by NPR 1400.1. No changes to responsibilities, requirements, or processes.

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PREFACE

P.1 PURPOSE

This Marshall Procedural Requirements (MPR) defines the methods and responsibilities for design control of facility designs at the Marshall Space Flight Center (MSFC) and MSFC's Michoud Assembly Facility (MAF) in accordance with NPD 8820.2,

P.2 APPLICABILITY

- a. This MPR applies to Center personnel, programs, projects, and activities, including contractors and resident agencies to the extent specified in their respective contracts or agreements. ("Contractors," for purposes of this paragraph, include contractors, grantees, Cooperative Agreement recipients, Space Act Agreement partners, or other agreement parties.)
- b. This MPR applies to MAF.
- c. This MPR applies the following: all mandatory actions (i.e., requirements) are denoted by statements containing the term "shall." The terms: "may" or "can" denote discretionary privilege or permission, "should" denotes a good practice and is recommended, but not required, "will" denotes expected outcome, and "are/is" denotes descriptive material.
- d. This MPR applies the following: all document citations are assumed to be the latest version unless otherwise noted.

P.3 AUTHORITY

NPD 8820.2, Design and Construction of Facilities

P.4 APPLICABLE DOCUMENTS AND FORMS

- a. NRRS 1441.1, NASA Records Retention Schedules (NRRS)
- b. MPR 1440.2, MSFC Records Management Program
- c. MPR 5000.1, Purchasing

P.5 MEASUREMENT/VERIFICATION

None.

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P.6 CANCELLATION

MPR 8823.1D, Design Control of Facilities, dated October 20, 2008

Original signed by

Patrick E. Scheuermann
Director

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CHAPTER 1. RESPONSIBILITIES

1.1 Director, Safety and Mission Assurance (S&MA) Directorate, or designee:

1.1.1 Provides institutional safety design input requirements relating to the product, including applicable statutory and regulatory requirements and other institutional safety requirements essential for design and development.

1.1.1.1 Verifies safety design input requirements are complete, unambiguous, not in conflict with each other, and documented.

1.1.2 Participates in design reviews to verify that the design meets institutional safety statutory and regulatory requirements at the various stages of the design process. Design verification, including any necessary actions, is documented.

1.1.3 Reviews and validates the design output prior to release by the design organization when required by the design organization's approved plans and procedures. Design validation, including any necessary actions, is documented.

1.2 Environmental Engineering and Occupational Health Office:

1.2.1 Provides environmental design input requirements relating to the product, including applicable statutory and regulatory requirements and other environmental requirements essential for design and development.

1.2.1.1 Verifies environmental design input requirements are complete, unambiguous, not in conflict with each other, reviewed for adequacy, and documented.

1.2.2 Participates in design reviews to verify that the design meets environmental statutory and regulatory requirements at the various stages of the design process.

1.2.2.1 Performs design verification and documents any necessary actions.

1.2.3 Reviews and validates design output prior to release by the design organization when required by the design organization's approved plans and procedures.

1.2.3.1 Performs design validation and documents any necessary actions.

1.3 Manager, Facilities Management Office (FMO), or designee, reviews and approves the design organization's plans and procedures for control, verification, and validation of facilities designs.

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1.4 Design Organization:

1.4.1 Establishes and maintains plans and procedures to plan and control the design and development of facility designs in order to ensure the product user's requirements are met.

1.4.1.1 Identifies the design and development stages and the review, verification, and validation that are appropriate to each design.

1.4.1.2 Identifies the responsibilities and authorities for design and development.

1.4.1.3 Provides for updating, as appropriate, the planning output as the design and development progresses.

1.4.1.4 Documents the approval of the Manager, FMO.

1.4.2 Assigns qualified personnel, equipped with adequate resources, to each design activity.

1.4.3 Provides facility design input requirements relating to the product, including facility statutory and regulatory requirements and other facility requirements essential for design and development.

1.4.3.1 Includes, where applicable, facility design input requirements derived from previous similar designs.

1.4.3.2 Verifies facility design input requirements are complete, unambiguous, and not in conflict with each other.

1.4.3.3 Reviews facility design input requirements for adequacy and documented.

1.4.4 Reviews design inputs and resolves conflicting requirements with the responsible organizations.

1.4.5 Conducts and participates in systemic design/verification reviews.

1.4.5.1 Verifies that the design meets all input requirements and identifies any problems requiring necessary actions.

1.4.5.2 Performs Design review/verification and documents any necessary actions.

1.4.6 Manages interfaces between different groups involved in design and development to ensure communication and clear assignment of responsibilities.

1.4.7 Ensures the design output/validation documents are reviewed and validated by applicable organizations prior to release to make certain that the input requirements are met and the appropriate information for purchasing, acceptance, and safe and proper use is included.

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1.4.8 Ensures the output documents are capable of fulfilling the requirements for the specified or intended use.

1.4.9 Ensures the design output/validation, including any necessary actions, is documented.

1.4.10 Reviews, verifies, validates, and approves design changes, as appropriate, before implementation. The review of the design changes includes evaluation of the impact of the change to the final product. Records of the results of review of changes and any necessary actions are documented.

1.4.11 Ensures that the responsible organizations are informed of design changes that affect the responsible organization's design input.

1.4.12 Establishes the records retention schedules, disposition, and the records custodian or a link where this information is available. (See Appendix D, Records.)

1.5 Verifies the Construction Organization purchases and accepts facility construction in accordance with MPR 5000.1.

1.6 Product User:

1.6.1 Requests design services from the design organization. Design requests are to be documented.

1.6.2 Provides functional, special, and performance requirements that the product can meet.

1.6.2.1 Product requirements reviewed for adequacy.

1.6.2.2 Verifies requirements are complete, unambiguous, not in conflict with each other, and documented.

1.6.3 Participates in design reviews to verify that the design meets all users' requirements at the various stages of the design process. Design verification, including any necessary actions, is documented.

1.6.4 Validates the design at design completion to ensure the product conforms to the defined user's requirements. Design validation, including any necessary actions, is documented.

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CHAPTER 2. PROCEDURES

2.1 Design and Development Planning

Actionee

Action

Design Organization

- 2.1.1 Shall establish and maintain plans and procedures to plan and control the design and development of facility designs in order to ensure the product user's requirements are met.
- 2.1.2 The plans and procedures shall address the management of interfaces between groups involved in the design and development to ensure communication and clear assignment of responsibilities.
- 2.1.3 Plans and procedures shall determine the design and development stages and the review, verification, and validation that are appropriate to each design.
- 2.1.4 Plans and procedures shall determine the responsibilities and authorities for design and development and be documented by the design organization and approved by the Manager, FMO.
- 2.1.5 Plans and procedures shall identify the records retention schedules, disposition, and records custodian or a link (identification) to where this information exists.

2.2 Design and Development Input

Actionee

Action

Product User

- 2.2.1 Shall request design services from the design organization.
- 2.2.2 Shall provide the design organization with the functional, special, and performance requirements for the product.

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- | | | |
|---------------------|-------|---|
| Environmental | 2.2.3 | Shall provide the design organization with environmental design input requirements relating to the product, including applicable statutory and regulatory requirements and other environmental requirements essential for design and development. |
| Safety | 2.2.4 | Shall provide institutional safety design input requirements relating to the product, including applicable statutory and regulatory requirements and other institutional safety requirements essential for design and development. |
| Design Organization | 2.2.5 | Shall provide design input requirements relating to the product, including applicable facility statutory and regulatory requirements and other facility requirements essential for design and development. |
| | 2.2.6 | Where applicable, facility design input requirements shall include information derived from previous similar designs. |
| | 2.2.7 | Shall review design inputs and resolve conflicting, incomplete, or ambiguous requirements with the responsible organizations. |

2.3 Design Reviews/Verification

Actionee

Action

- | | | |
|---|-------|---|
| Design Organization | 2.3.1 | Shall conduct and document design reviews/verification. |
| Product User/
Environmental/Safety/
Design Organization | 2.3.2 | Shall participate in design reviews to ensure design-stage output meets design input. |

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2.4 Design and Output/Validation

Actionee

Action

Design Organization	2.4.1	Shall ensure that the design output is documented in terms that can be verified against design input requirements and validated prior to release for purchasing of facility construction.
	2.4.2	Shall verify that the design output meets the design and development input requirements.
	2.4.3	Shall verify that the design output contains or makes reference to acceptance criteria.
	2.4.4	Shall ensure that the design output includes the appropriate information for purchasing.
	2.4.5	Shall ensure that the design output documents are reviewed and validated by the applicable organizations prior to release for procurement of facility construction.
	2.4.6	Shall identify those characteristics of the design that are crucial to the safe and proper functioning of the facility.
Product User/ Environmental/Safety	2.4.7	Shall review and validate design output prior to release when required by the design organization's approved plans and procedures.

2.5 Design Changes

Actionee

Action

Design Organization	2.5.1	Shall review, verify, validate, and approve design changes, as appropriate, before implementation. Evaluates impact of the change on the final product.
	2.5.2	Shall ensure that the responsible organizations are informed of design changes that affect the responsible organization's design input.

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2.6 Facility Construction

Actionee

Action

Construction Organization

2.6.1 Shall purchase facility construction in accordance with MPR 5000.1.

2.6.2 The design output shall be used as the description of work for purchasing and accepting facility construction.

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APPENDIX A

Definitions

Design and Development Input. Functional, special, statutory, regulatory, and performance requirements that the product has to meet.

Design and Development Output/Product. Result of the design process such as design drawings, specifications, sketches, instructions, etc. The design output is the product for this MPR.

Design and Development Planning. An organized effort by qualified personnel to create design output that produces a product that meets the design input requirements.

Design and Development Output/Validation. Confirmation by examination and objective evidence that specified requirements for the design output/product are fulfilled.

Design Organization. The MSFC organization responsible for the design. The design organization may use a qualified design firm for the design production.

Facility. Land, buildings, structures, and other real property improvements including utility systems and collateral equipment. The term does not include operating materials, supplies, special tooling, special test equipment, flight hardware, and noncapitalized equipment. The term facility is used in connection with land, buildings (facilities having the basic function to enclose usable space), structures (facilities having the basic function of a research or operational activity), and other real property improvements.

Product User. The MSFC or contractor organization that requests facility design services from the design organization.

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APPENDIX B

Acronyms

FMO	Facilities Management Office
MAF	Michoud Assembly Facility
NRRS	NASA Records Retention Schedules

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APPENDIX C

(Reserved for Verification Matrix)

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APPENDIX D

Records

Records are retained in accordance with MPR 1440.2 and NRRS 1441.1. The records required by other procedures referenced herein are not included in this section. The records retention schedules, disposition, and records custodian or a link (identification) to where this information exists is defined in the design organization's plans and procedures. The records required by this procedure are as follows:

D.1 Design Requests

D.2 Product Requirements

D.3 Design Verification/Reviews

D.4 Design Validation

D.5 Design Changes