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MARSHALL PROCEDURAL REQUIREMENTS

ED01

INSPECTION OF HAZARDOUS TEST FACILITY CONFIGURATION CHANGES

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DOCUMENT HISTORY LOG

Status (Baseline/ Revision/ Change/ Revalidation/ Canceled)	Document Revision/ Change	Effective Date	Description
Baseline		2/2/02	
Revision	A	4/28/2004	Updated header information. Updated the URL link in page footer for new location of MIDL documents. Added NPR 1441.1 to Applicable Documents section. Updated the Records section.
Revision	B	10/22/2004	Updated document throughout, as per the instruction set for the HQ Rules Review action. Clarified definitions in sections 1.1, 1.6, 1.7 & 1.16.
Revision	C	3/16/2006	Updated document to reflect organizational name and code changes due to MSFC transformational realignment. Clarified explanation of purpose in section P.1, including reference to MPD 1280.1 as authority document. Updated definitions in Section 1. Added text to section 2.2.8, 3.9, and 4.2 to require inspection results records to be retained for life of test facility system utilization. Added text to various sections to emphasize the risk assessment aspects of hazard analysis process.
Revision	D	4/15/2008	Revised 2. Applicability statement to address the applicability of this directive to the Michoud Assembly Facility. [On 2/5/09, at the request of the OPRD, an administrative correction was made to the title of MWI 8715.15.]
Revision	E	7/21/2011	Updated to the current applicability statement. Updated definitions to be compatible with MWI 8715.15 and MWI 8715.17. Updated the responsibilities and procedure sections to clarify the verification of the performing organization's inspection process. Updated to include references to the applicable requirements in MWI 8710.1 for pressure systems. Updated records section to include specific retention requirements in accordance with MPR 1410.1. Minor editorial corrections and formatting changes were made throughout the document.
Revision	F	8/10/2012	Updated authority document. Updated responsibilities to reflect the current business model. Added reference to Test Organization inspection responsibilities per MPR 8730.1. Re-formatted to comply with new required template per MPR 1410.2J & as instructed in MWI 1410.1F.
Change	1	12/30/2014	On 12/30/14, at the request of the OPRD, an administrative change was made changing references from MWI 8710.1, Inspection and Certification Process For Pressure Vessels and Systems (PVS), to MPR 8710.1, MSFC Requirements for Ground-Based Pressure Vessels and Pressurized Systems (PVS) throughout the directive.
Change	2	4/15/2016	On 4/15/2016, at the request of the OPRD, administrative changes were made changing NPR 1441.1 to NRRS 1441.1 and S&MA to SMA throughout the document.
Revision	G	7/21/2017	Update to comply with new formatting requirements. Clarified responsibilities and actions. Miscellaneous editorial changes..

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PREFACE

P.1 PURPOSE

To provide requirements for planning and performing in-process inspections for configuration changes to MSFC and MAF test facility systems utilized to perform hazardous test activities, as required by NPD 8700.1.

NOTE: This MPR does not address routine facility safety inspections, which are intended to ensure a safe and healthy workplace and are addressed in MPR 8715.1.

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 the 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 8700.1, NASA Policy for Safety and Mission Success

P.4 APPLICABLE DOCUMENTS AND FORMS

- a. NRRS 1441.1, NASA Records Retention Schedules
- b. MPR 1280.2, Process Control
- c. MPR 1280.10, Marshall Quality Management System
- d. MPR 1440.2, MSFC Records Management Program
- e. MPR 8710.1, MSFC Requirements for Ground-Based Pressure Vessels and Pressurized Systems (PVS)

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- f. MPR 8715.1, Marshall Safety, Health, and Environmental (SHE) Program
- g. MPR 8730.1, Inspection and Testing
- h. MPR 8730.2, Inspection and Test Status
- i. MPR 8730.3, Control of Nonconforming Product
- j. MWI 3410.1, Personnel Certification Program
- k. MWI 3410.5 Personnel Certification Program for Skills
- l. MWI 8715.15, Ground Operations Safety Assessment Program
- m. MWI 8715.17, Hazardous Operations Readiness Review Program
- n. MSFC Form 248, Test Preparation Sheet
- o. MSFC Form 460, Discrepancy Record

P.5 MEASUREMENT/VERIFICATION

None.

P.6 CANCELLATION

MPR 8730.6F, Inspection of Hazardous Test Facility Configuration Changes, dated August 10, 2012.

Original signed by

Todd A. May
Director

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CHAPTER 1. RESPONSIBILITIES

1.1 Safety and Mission Assurance (SMA):

1.1.1 Ensure that the hazard analysis/safety assessment performed for the particular test facility/operation identifies applicable hazards, and that the testing organization (TO) provides the appropriate hazard mitigation techniques, such as required inspections of test facility modifications/configuration changes, operator qualification and/or continuous monitoring requirements per MWI 8715.15. Assist the TO as required.

1.1.2 Perform audits, inspections or surveillance as required by the Center, project, test customer, or as requested by the TO.

1.1.3 Participate in Readiness Reviews as required by MWI 8715.17.

1.2 TO Managers:

1.2.1 Ensure that the TO has a process to generate appropriate inspection planning documentation that specifies, for example, facility inspection requirements, operator qualification, or continuous monitoring requirements, based on the program/project plans, hazard analysis, drawings, applicable safety codes and standards, quality management system requirements and typical test requirements for in-house testing per MPR 1280.10.

1.2.2 Ensure that the TO has established procedures to ensure that all required inspections are performed properly (per applicable NASA or industry standard practices and techniques) and by appropriately certified personnel in accordance with MWI 3410.1 and MWI 3410.5. For example, non-destructive examination procedures and weld inspection procedures would be established to ensure that those type inspections are performed properly.

1.2.3 Ensure that the TO has a system for reviewing and approving work authorization documentation for required inspections, in order to ensure that all appropriate inspections are planned and performed per MPR 8730.1.

1.2.4 Ensure that the TO (or their contractor) performs inspections of facility modifications for hazardous testing, as required by applicable organizational issuances (OIs), project plans, test requirements, hazard analysis, drawings, and all applicable codes and standards per MPR 1280.10. The TO may request assistance from SMA when necessary.

1.2.5 Ensure that the TO and their contractor have a system for documenting inspection status as required by MPR 8730.2.

1.2.6 Ensure that the TO has a system for reviewing, and approving nonconformance documentation generated during facility inspection activities, to include the determining, documenting, and implementing the nonconformance dispositions, per MPR 8730.3 and applicable OIs.

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1.3 TO:

1.3.1 Identify and implement appropriate inspections of test facility modifications/configuration changes, operator qualification and/or continuous monitoring requirements, to mitigate hazards identified in hazard analysis for the test facility/operation requirements per Chapter 2. (See MWI 8715.15 for hazard analysis process requirements and the requirement to maintain configuration control for hazardous operations. See MPR 8710.1 for applicable inspection, configuration control, and deficiency correction requirements for pressure systems.)

1.3.2 Specify facility inspection and/or certification requirements, operator qualification, and/or continuous monitoring requirements unique to the nature of test operations performed within each TO as per test requirements and hazard analysis, as well as all applicable Organizational Instructions, drawings, safety codes, NASA and industry standards, and the MSFC Quality Management System.

1.3.3 Establish procedures and work authorization documentation to ensure that all appropriate inspections are planned and performed in order to provide objective evidence that test requirements are met, hazards are properly mitigated, and all applicable drawings, safety codes, standards and Quality Management System requirements are met.

1.3.4 Perform inspections of facility modifications (by qualified/certified personnel) or coordinate with the organization’s contractor quality assurance for hazardous testing, as required by applicable OIs, project plans, and all applicable drawings, codes and standards. Additional assistance may be required from SMA when requested by the project, test customer, review board, or other special circumstances.

1.3.5 Document the inspection status, as required by local OIs and MPR 8730.2.

1.3.6 Document and resolve all nonconformances detected during facility inspections, per MPR 8730.3, MPR 8710.1, and applicable OIs.

1.3.7 Perform a Test Readiness Review (TRR) (and Operational Readiness Inspection (ORI) / Operational Readiness Review (ORR), as required), per MWI 8715.17 and applicable OIs to ensure all required inspections have been performed, nonconformances resolved, and results documented to verify that facility modifications and interfaces to the test article meet test requirements and to ensure safety of test operations and activities.

1.3.8 Perform or ensure the performance of required inspections during test operations, per documented and approved procedures, to ensure that all test requirements are met, test operations are conducted safely, “as run” test results are recorded properly, and nonconformances are documented.

1.3.9 Maintain records of test facility inspection procedures and the results obtained in accordance with Appendix D “Records.”

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CHAPTER 2 PROCEDURES

The TO shall plan and develop the inspection requirements and the process controls to assure their proper implementation, based on the particular hazards, processes and test requirements applicable to the specific types of testing performed by each test organization, and in accordance with project or test customer requirements.

<u>Actionee</u>	<u>Step</u>	<u>Action (Shall)</u>
TO, SMA	2.1	<p>Ensure hazard analysis/safety assessment identifies applicable hazards and includes appropriate hazard mitigation techniques, such as required inspections of test facility modifications/configuration changes, operator qualification and/or continuous monitoring requirements.</p> <p style="text-align: center;"><i>NOTE: See MPR 8710.1 for pressure system requirements and MPR 8715.1 and MWI 8715.15 for SHE Program and hazard analysis process requirements.</i></p> <p>Contact the SMA Engineering Team Lead for assistance.</p>
TO	2.2	Determine and document the facility system modification processes where the resulting output cannot be verified by subsequent inspection, and thus, require qualified operators and/or continuous monitoring of process parameters to ensure specified requirements are met in accordance with MPR 1280.2.
TO	2.3	Determine and document the inspection requirements for facility system modifications as per hazard analysis, quality assurance requirements, drawings, customer requirements, and applicable safety codes and standards.
TO	2.4	Perform or ensure the performance of required inspections and record results of facility system modifications and continuous monitoring of special processes as specified in all approved documentation per MPR 8730.1.
TO	2.5	Document or ensure the documentation of inspection status as required by MPR 8730.2.

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TO	2.6	<p>Document as a nonconformance (utilizing squawk tag, Quality Test Preparation Sheet (QTPS), Test Discrepancy Record (TDR), or withhold tag, as appropriate) or ensure the documentation of, facility systems or components which fail to meet the acceptance criteria per MPR 8730.3.</p> <p style="text-align: center;"><i>NOTE: Routine maintenance generally does not require nonconformance documentation. Consult local OIs.</i></p>
TO	2.7	Implement appropriate actions to resolve all identified nonconformances and document the actions taken. Contact SMA if the test article is affected per MWI 8730.3.
TO	2.8	Prior to beginning specified test operations, verify that all facility system modification inspections have been successfully completed, that all facility systems have been verified to comply with requirements (i.e., “baselined”) and validated for proper functional operation (i.e., “activated”), and that all resulting documentation is completed per MPR 1280.10.
TO	2.9	Perform or ensure the performance of required inspections during test operations. Record (in documented procedures) all inspections performed, and “as run” results obtained, in order to validate that operations performed and test conditions applied meet specified test requirements per MPR 8730.2.
TO	2.10	Transfer all facility inspection records to the appropriate location and maintain records in accordance with Appendix D “Records.”

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APPENDIX A. DEFINITIONS

“As Run” Test Procedure. A test procedure record that has been annotated to indicate detailed sequence of steps actually performed, including annotation of all critical test parameters and/or test conditions actually applied and results obtained during actual conduct of test operations.

Continuous Monitoring. The execution of continuous monitoring of a particular test facility modification process from beginning to end.

Hazard Analysis. A term used to describe a method or technique used to identify hazards, the hazard cause, the hazard effect (undesired event), and their associated risks for a given facility or operation and for providing the corrective actions to mitigate these hazards and their risks. This level safety assessment is normally conducted for facilities/operations identified to have an overall level of risk of high or moderate.

Hazardous Test Activities. All activities performed in providing test services that involve hazardous operations or hazardous facilities with an overall level of risk of high or moderate, as defined in MWI 8715.15.

Inspection. The processes performed to verify conformance of test facility systems, components and facility modifications (by examination and/or testing) to meet specified test requirements, applicable safety codes, standards, and quality system requirements. These inspections are performed within the test facility buildup phase of test project execution, which includes fabrication, installation, and checkout/activation of special test equipment and test facility systems.

Quality Test Preparation Sheet (QTPS). A nonconformance reporting or troubleshooting document in the Engineering Directorate, Test Laboratory.

Safety Assessment. A disciplined, systematic approach to analyze and evaluate a facility/operation to determine its potential to effect the safety and health of personnel or its potential to cause damage to the environment, equipment or adjacent facilities/operations. A safety assessment is a general term that covers the total spectrum of methods used to identify hazards and the actions necessary to eliminate, reduce and control them. Safety assessments include all types of hazard analyses, job hazard analyses, operating procedures, and readiness reviews.

Special Test Equipment. Structural elements and equipment that adapt the test article to the test stand.

Test Article. The component or system which will be tested.

Test Discrepancy Record (TDR). An MSFC Form 460 initiated any time a significant problem/anomaly is encountered during testing involving flight hardware/software or when damage to Customer Supplied Product (CSP) is found.

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Test Facility. The test stand and the special test equipment plus other facilities and equipment in the immediate area that provide direct support for testing such as buildings, propellant storage tanks, electrical wiring, control and instrumentation systems, data recording systems, uninterruptible electrical power systems, test software, fire extinguishing systems, and other associated systems.

Test Preparation Sheet (TPS). A document used to specify, authorize, control, and document test preparation work activities, including test facility buildup and test system configuration changes. The TPS may be documented on MSFC Form 248 or electronic equivalent.

Test Readiness Review (TRR). A pre-test review (including review of all risks associated with a specific hazardous test) to determine whether the test facilities, support systems, test procedures, operational personnel, and the test article itself demonstrate an adequate degree of readiness to provide a reasonable expectation that the test objectives can be met (without unacceptable risk of property damage or personnel injury). (See MWI 8715.17)

Test Stand. The permanent structure, in which the test article is mounted for testing.

Verify. To review recorded data (inspection, test, etc.) for conformance to specifications, drawing requirements, etc.

Work Authorization Document. A document used to specify, authorize and document detailed work instruction steps, such as a TPS, work order, traveler, test procedure, etc.

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APPENDIX B. ACRONYMS

CSP	Customer Supplied Product
NRRS	NASA Records Retention Schedules
OI	Organizational Issuance
ORI	Operational Readiness Inspection
ORR	Operational Readiness Review
QTPS	Quality Test Preparation Sheet
SMA	Safety and Mission Assurance
SHE	Safety, Health, and Environmental
TDR	Test Discrepancy Record
TPS	Test Preparation Sheet
TRR	Test Readiness Review
TO	Testing Organization

APPENDIX C. VERIFICATION MATRIX (Reserved)

None.

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APPENDIX D. RECORDS

The following types of records are maintained in accordance with NRRS 1441.1 and MPR 1440.2.

D.1 Organization Issuance - specific inspection requirements and process controls are documented through the Marshall Quality Management System as OIs of the applicable test organizations.

D.2 Inspection results and acceptance evidence (i.e., inspection status stamps or password controlled electronic signatures) are documented in test specific work instructions (such as “as run” test procedures and work authorization documents) as actually performed, for each specific inspection.

D.3 TO records are maintained per NRRS 8/103 or 8/107; destroy/delete when the test facility has been destroyed and/or disposed of by NASA.