

**MPR 8730.3
REVISION L**

**EFFECTIVE DATE: September 22, 2020
EXPIRATION DATE: September 22, 2025**

MARSHALL PROCEDURAL REQUIREMENTS

QD01

CONTROL OF NONCONFORMING PRODUCT

COMPLIANCE IS MANDATORY
DIRECTIVE IS UNCONTROLLED WHEN PRINTED
Verify current version before use at <https://dml.msfc.nasa.gov/directives>

Marshall Procedural Requirements		
QD01		
Control of Nonconforming Product	MPR 8730.3	Revision: L
	Date: September 22, 2020	Page 2 of 41

DOCUMENT HISTORY LOG

Status (Baseline/ Revision/ Change/ Revalidation/ Canceled)	Document Change/ Revision	Effective Date	Description
Baseline		5/14/99	Document converted from MSFC-P13.1 to a Directive. Previous history retained in system as part of canceled or superseded ISO Document files.
Revision	A	8/20/99	Made changes due to reorganization and updates to applicable document references. Clarified purpose to include installation and assure safe products. Deleted Class I change criteria and added definitions for critical, major, and minor characteristics. Replaced Chief Engineer with Systems Engineer as required. Paragraphs 1.2.1, 1.2.2, and 1.2.3: replaced "MRB/Project" with "analysis" as previously stated in baseline version.
Revision	B	4/24/00	<p>Page 6, paragraph P.4 j: The reference to MWI 5300.1 was changed to MWI 5100.1.</p> <p>Page 6, paragraph P.4 f: Added MPG 8730.1, "Inspection and Testing."</p> <p>Page 6, paragraph P.4: Made changes to reflect cancellation of MPG 1441.1, "Control of Quality Records", and replacement with MPG 1440.2H, "MSFC Records Management Program". Also, added reference to MSFC-Tag 10 and included Figure 6.</p> <p>On page 8, paragraph 1.1ee; added, "QA" to the Acronyms and abbreviations.</p> <p>On page 8, paragraph 1.1a; page 18, paragraph 3.2(n); and page 27, Figure 2: Deleted references to ABCSS.</p> <p>Page 8, paragraph 1.1k: Deleted DRS from the acronym list and added ICMS.</p> <p>Page 11, paragraph 1.5: Changed "propulsion test area" to "Space Transportation Directorate, Technology Evaluation Department."</p> <p>Page 12, paragraph 2.1.2: Added the following sentence to the end of the paragraph, "For the Space Transportation Directorate, Technology Evaluation Department activities (East and West Test Areas) Withhold Tags may also be applied to ground support equipment, test facility components, and propellant and pressurant system components."</p> <p>Page 14, paragraph 3.1(a): Added the following to the end of the paragraph, "Initiate a Squawk Tag to document release of product prior to completion of required inspections or tests per MPG 8730.1."</p> <p>Page 14, paragraph 3.1(c): Added to the end of this paragraph, "...or to recall product released prior completion of all required inspections or tests once it has been determined that requirements cannot be met per MPG 8730.1."</p> <p>Page 18, paragraph 3.2(m): At the end of the first paragraph added, "For the Space Transportation Directorate, Technology Evaluation Department activities (East and West Test Areas) a Withhold Tag will be applied to test facility components, ground support equipment, and propellant and pressurant system components that cannot be readily removed and dispositioned."</p> <p>Deleted references to QS10-QA-012, which has been deleted as an Organizational Issuance and incorporated paragraphs into this section describing use of Withhold Tags.</p> <p>Page 19, paragraph 3.3(a): Changed "propulsion east and west test areas" to "Space Transportation Directorate."</p> <p>Page 25, paragraph 4: Made changes to this paragraph by adding the words, ".and TDR Logs", wherever "TDR" was mentioned.</p> <p>Page 33, step 26: Changed entry to read, "Enter QC acceptance stamp on the record copy and also stamp each subsequent copy individually."</p>
Revision	C	6/4/01	<p>Page 4: Added "Appendix F" (previously overlooked) and "Appendix G." Page 5, Paragraph P.1: Changed "P.2.1" to "P.2." Page 6, Paragraph P.2.d. and</p>

Marshall Procedural Requirements		
QD01		
Control of Nonconforming Product	MPR 8730.3	Revision: L
	Date: September 22, 2020	Page 3 of 41

			<p>Paragraph P.4.e: changed “MPG 1700.1” to “MWI 8621.1.” Page 6, Paragraph P.4.I: Deleted applicable document and replaced with Appendix G. Page 6, Former paragraph c. and Page 13, Paragraph 2.1.9: Removed reference to recently canceled document, MPG 1280.5.</p> <p>Page 6, Paragraph I. and Page 19, Paragraph 3.2.14: Changed S&MA OI reference to “Applicable S&MA organizational issuances.”</p> <p>Page 7, Paragraph P.6: Updated to cancel “MPG 8730.B” (canceled by Rev. B) and to cancel “MWI 8730.4B” (replaced by Appendix G). Page 10, Paragraph 1.1.53 and Page 30, Block 8: Added “WAD” to acronym list. Page 10, Paragraph 1.3: Changed “Reference section 6, Responsibilities” to “Reference section 2, Responsibilities.”</p> <p>Page 13, Paragraph 2.2.1.5: Replaced “cognizant systems engineer” with “MRB Chairperson.”</p> <p>Page 14-29: Corrected numbering to comply with MPG 1410.2. Page 17, Paragraph 3.2.j.1: Replaced “MWI 8730.4B” with “Appendix G.”</p> <p>Page 17, Paragraph 3.2.j.3: Added Level II verbiage for clarification. Page 17, Paragraph 3.2.1: Corrected previous mistake by replacing “MWI 8730.4” with “MWI 8730.3.” Page 20, Paragraph 3.3.1: Changed “section 3-2” to “section 3.2.” Page 25, Paragraph 4: Added “Scrap Custody Records.” Page 38, Block 33, 1: Changed “Rpr” to “RP R.” Page 40, Appendix C: Changed “10-12” to “10&12.” Page 45, Appendix E and Page 53, Appendix G: Corrected numbering to comply with MPG 1410.2.</p> <p>Page 53 and 54, Added “Appendix G: Scrap Instructions.” Page 53, 1st sentence: Deleted extra “be.”</p>
Revision	D	03/28/03	<p>Changed document footer to address the new link to the Master List Page 6, Paragraph P.1, and Changed “recording” to “documenting.” Added the sentence “This process also applies to items delivered to the customer that are determined to be nonconforming after delivery or delivered items returned by the customer due to a failure.”</p> <p>Replaced references to “Systems Engineer” to “Lead Systems Engineer” throughout the document. Paragraph P.2, changed “recording” to “documenting” Page 8, Paragraph P.4, Changed, “S&MA Applicable Organizational Issuances” to “QS-QA-001, Acceptance Reporting Instruction and QS-QA-003, Quality Assurance Guidelines for Test Activities Paragraph P.6, Replaced “MPG 8730.3B” with “MPG 8730.3C.” Removed reference to recently canceled document, MWI 8730.4B. Deleted “Original Signed by Sidney P. Saucier for” Page 12, Paragraph 1.5, Replaced all references ” throughout the document from “Space Transportation Directorate, Technology Evaluation Department” to “Space Transportation Directorate, Test and Evaluation Department.” Paragraph 1.7, Replaced “specs” with “specifications” throughout the document. Changed “Non-standard” to “Nonstandard.” Deleted “SRP.” Paragraph 2.1.2, made changes in last sentence “... support equipment or test facility components.” Page 13, Paragraph 2.1, Deleted “:” Paragraph 2.1.3, Changed “DRs/TDRs” to “DRs/TDRs” throughout the document. Page 14, Paragraph 2.1.8, deleted “copies of”, “TDRs”, and “quality records” and added to the end “the QRC.” Paragraphs 2.2.1, 2.2.2 and 2.3, Deleted “:” Paragraph 2.2.1.3, Changed “ECRs” to “ECRs” throughout the document. Paragraph 2.3.3, Moved “Paragraph 2.2.1.5” to “2.3.3.” Page 15, Paragraph 2.3.2, Clarified, “Approve or disapprove all MRB dispositions.” Paragraph 2.4, Changed “ECRs and DARs” to “ECRs and DARs.” Page 16, Paragraph 3.2.1, Deleted “/Test Discrepancy Record” and “/TDR” to clarify. Paragraph 3.2.3, deleted references to the discrepancy record being a four-part form. Clarified sentence. Page 17, Paragraph 3.2.7, replaced first sentence with “Forward a legible DR copy to the QRC upon generation.” Changed second sentence to read “QRC enter DR ...” In second paragraph, replaced “...a multipurpose DR form...” with “inputs.”, deleted the second sentence, and replaced “attached to” in the third sentence with “place with non-conforming part.” Paragraph 3.2.9, Changed “their” to “new” and changed second “their” to “the.” Page 18, Paragraph 3.2.10.2 deleted “... that are in accordance with 3.2(1).” and added “in accordance with MWI 8730.3.” Paragraph 3.2.12, Changed “S&MA</p>

Marshall Procedural Requirements		
QD01		
Control of Nonconforming Product	MPR 8730.3	Revision: L
	Date: September 22, 2020	Page 4 of 41

			Records Center” to “QRC.” Page 19, Paragraph 3.2.13, replaced the last sentence with “All copies may then be discarded.” Page 20, Paragraph 3.2.14, Changed “S&MA organizational issuance” to “QS-QA-001.” Paragraph 3.2.16, Clarified sentence. Page 22, Paragraph 3.3.1, Changed “the applicable OI “to “QS-QA-003.” Page 24, Paragraph 3.3.7.3, deleted “... before giving approval to proceed.” Paragraph 3.3.7.5, added “... based on review of recorded results or witness of completed activities for mandatory monitoring.” To the end of the paragraph. Paragraph 3.3.7.6, Changed “TDRs” to “TDRs” throughout the document. Paragraph 3.3.7.7, Changed “TCPs, SOPs, TPSs” to “TCP’s, SOP’s, TPS’s” throughout the document. Deleted “under a diagonal slashed line.” Page 26, Paragraph 3.3.12, deleted “... in the S&MA QRC” in the first sentence and added “... in the project designated record center.” To the end. Deleted the second sentence. Page 27, Paragraph 4, Specified records plan for “project designated record centers.” Page 28, Paragraph 5, Changed “1-4” to “1 through 4.” Appendix A, Block 1, Changed “Pre-printed” to “Preprinted.” Block 13, deleted “... and routes ... to the QRC.” Added this sentence to the end, “The completed white copy may be retained by the closeout inspector as a historical record.” Appendix B, Block 7, Changed “pre-stamped” to “prestamped.” Block 29.c, deleted reference to MWI 8730.4 and changed “... disposition engineer’s division chief...” to “... Lead System Engineer’s signature...” Page 39, Deleted “(see CM-INST-002).” Appendix C, Added “(Form 460-1)” to title. Appendix E, Block 1.1.1, replaced “WAI” with “change”.
Revision	E	10/15/2004	Revised to bring document in compliance with the HQ Rules Review Action (CAITS: 04-DA01-0387). Replaced MWI 8040.3 with MPR 8040.1. Page 6, added paragraph P.2.5 to address CSP. Page 7, Paragraph P.4, added “MPR 4000.1.” Page 9, Paragraph 1, added “CSP.” Page 15, Paragraph 3.2.1, added “of MSFC owned products.” Page 18, Paragraph 3.2.13 last sentence, changed “record” to “withhold tag.” Page 19, Paragraph 3.2.14, added “traceability, identification, configuration and inspection status of.” Page 22, Paragraph 3.3.6.2, added “or transfer to the customer on rejected CSP unless MSFC performs some limited T/S that is coordinated with the MLP for the CSP.” Page 40, Paragraph 25, add “Record MLR name for CSP.”
Revision	F	8/4/2005	Revised to clarify instructions for completing Forms 460 and 492. Pages changed are: 7, 19, 21, 37, 38, 39, 45, 46 and new page 48. Renumbered paragraphs in Appendix E and G. Added detail to records retention on paragraph 4. Reordered list of applicable documents. Clarified paragraphs 3.3.6.2.b and E.9.
Revision	G	3/6/2007	Revised P.2 a. (2) to exclude software V&V from applicability. Editorial changes made throughout for clarity and correct office nomenclature. Paragraph 4 rewritten in its entirety to comply with current policy. [On 9-17-2010, an administrative change made to replace MSFC –STD-555 with ED-OWI-005.] [On 9/23/10, an administrative change made restoring MSFC-STD-555. At P.2 a. (1) & (2), added DDMS as ED-OWI-005 reference. At 1.1.10, added DDMS acronym. At 3.2.11, added ED-OWI-005 reference.]
Revision	H	6/30/2011	Added P.2 (5) and 2.1.10 to include applicability and responsibility statements addressing timely reporting of delivered nonconforming product in accordance with AS9100C. The standard Applicability Statement has been added at P.2. All “shall” statements have received individual paragraph numbers. Numerous formatting changes were made to comply with current document standards.
Change	1	5/23/13	On 5/23/13, at the request of the OPRD, an administrative change was made at Appendix B for minor word change to address NCR 1527.
Change	2	6/16/2014	On 6/16/14, at the request of the OPRD, an administrative change was made replacing references to MPR 8040.1, “Configuration Management, MSFC Programs/Projects,” which has been Cancelled, to MPR 7123.1, “MSFC Systems Engineering Processes and Requirements.”
Change	3	8/18/2015	On 8/18/15, at the request of the OPRD, administrative changes were made to update document titles listed at P.3 and P.4.
Revision	I	5/20/2016	Major template update per current directives requirements. Updated applicable documents. Changed CCB to Approval Authority and ECR to CR throughout.

Marshall Procedural Requirements		
QD01		
Control of Nonconforming Product	MPR 8730.3	Revision: L
	Date: September 22, 2020	Page 5 of 41

			Added new paragraph 2.2.11.a. Minor editorial updates, including form citations, throughout. Updated Mission Types in P.2.e.(1) Note, deleted P.2.e.(7), P.2.g, 2.3.6.4, J.5.2.2 and J.5.2.3. Added ET01-PRO-OWI-003 in P.4 and 2.3.1.1. Revised 1.1.2 to add OIs. Specified QE to chair MRB in 1.1.4. Revised 2.2.10 to include UAI and Repair. Revised 2.2.10.4 to clarify initiation of DARs. Revised 2.3.1.5 to close TDR with generation of a DR. Replaced 2.3.6.4 with new 2.3.6.3.b to allow test engineering to delete test steps. Revised 2.3.7.1.c and J.5.1.1 to clarify requirement to generate a DR when configuration is broken. Deleted DR from 2.3.9.1. Updated the definition for Change Request. Added definitions for Nonconformance and T/S. Updated the acronym list. Appendix G, Block 11, added an option to enter “NA” when there is no part effectivity; Block 12 corrected form number. Updated flowchart in E.2.
Revision	J	1/27/2017	Revised 1.1.4 to allow SMA Mission Services Contractor personnel to serve as MRB chair with SMA Director approval. Removed MWI 8621.1 from P.4. Added MWI 5100.1 to P.2. App. G, Blk 33 changed WAI to WAD. Formatted “Notes” and “Table of Contents.”
Revision	K	9/29/2017	P.2.e (1) and P.3 added “and MSFC-STD-3528 (for mechanical CAD).” Added P.2.g. and removed other software references. Revised 2.1.5 & 2.2.6 “black ink” wording in response to NCR 1830. Added “(if required)” to 2.2.10.5 and E.2. Form 460 changed to two forms with instructions 2.2 and 2.3 revised accordingly. App. G, I and J deleted.
Revision	L	9/22/2020	Clarified the role of “Cognizant MSA” to be “Quality Assurance Specialist (QAS)” in multiple places throughout the document. Multiple editorial and clarification changes throughout. Added requirements for newly-defined NDIR process (1.4) and throughout the document. Changed P.1 to use MPR 1280.10, rather than NPR 1400.1 and NPD 8730.5. Clarified the applicability in section P.2. Clarified requirements for DR notification by SMA (1.1.10.) Deleted requirements of Systems Engineering Office (formerly section 1.2.1). Added responsibilities for Engineering Directorate (1.6) including the Project Chief Engineer (1.6.3). Identified new form MSFC Form 460-3 for use as the Squawk Report and eliminated mention of MSFC Tag 6. Authorized MSFC Form 460-1 as a continuation sheet for a Squawk. Clarified the criteria for MRB review v/s required use of a DAR (2.2.11.3) and eliminated the terminology of “minor characteristics”. Removed specific language regarding the Withhold Tag and MRC with respect to ED Test Laboratory Activities. Simplified discussion of standard repair and Withhold Tags, requirements for which have been transferred to MWI 8730.3. Added requirements 2.2.14.2 a & b) for handling of parts downgraded from flight status. Added the Quality Engineering or Chief SMA Officer, and project management, to the required signatures (2.2.15.2) to proceed with processing of an open nonconforming item. Noted that the use of TDRs without SMA involvement are to be defined in organizational instructions (2.3.1 & 2.3.4.2). Updated format and content of records section (Appendix D). Changed Appendix E from “Form Examples and Flow Diagrams” as follows: moved the DR flow diagram (formerly E.4) to Appendix G; moved the example of the Tag-10 (formerly E.7) to Appendix F. Changed Appendix F from the example of a Squawk Tag (MSFC Tag-6) to the Withhold Tag (MSFC Tag-10) (Formerly E.7) Changed Appendix G from illustration of the 460-0 (Discrepancy Records Continuation Sheet) to a simplified DR flowchart (formerly E.4) Changed Appendix H from Test Discrepancy Log instructions to DR Best Practices. Edited Appendix I to remove the prohibition on ink stamping (deleted former I.3.1.3, and edited I.3.1.4 to replace the requirement for red pain with the use of the word ‘scrap.’ Added Appendix J to document and enhance nonconformance closure rationale formerly captured in the MSFC Form 460 and 460-2 form instruction.

Marshall Procedural Requirements		
QD01		
Control of Nonconforming Product	MPR 8730.3	Revision: L
	Date: September 22, 2020	Page 6 of 41

TABLE OF CONTENTS

PREFACE

- P.1 Purpose
- P.2 Applicability
- P.3 Authority
- P.4 Applicable Documents and Forms
- P.5 Measurement/Verification
- P.6 Cancellation

CHAPTER 1. Responsibilities

- 1.1 Safety and Mission Assurance (SMA) Directorate
- 1.2 Cognizant Performing Personnel
- 1.3 MRB
- 1.4 MRB Chair
- 1.5 CCB
- 1.6 Engineering Directorate

CHAPTER 2. Procedures

- 2.1 Squawk Report (MSFC Form 460-3)
- 2.2 DR (MSFC Form 460)
- 2.3 TDR (MSFC Form 460-2)
- 2.4 NDIR (MSFC Form 460-4)

- Appendix A. Definitions
- Appendix B. Acronyms
- Appendix C. (Reserved for Verification Matrix)
- Appendix D. Records
- Appendix E. Nonconforming Product Overview
- Appendix F. Example MSFC Tag-10
- Appendix G. Simplified DR Flowchart
- Appendix H. DR Best Practices (Guidance)
- Appendix I. Recommendations for Disposition of Scrap
- Appendix J. Disposition and Closure Rationale

Marshall Procedural Requirements		
QD01		
Control of Nonconforming Product	MPR 8730.3	Revision: L
	Date: September 22, 2020	Page 7 of 41

PREFACE

P.1 PURPOSE

This MPR provides a system for documenting and dispositioning nonconforming products and preventing unintended use or installation at MSFC, to ensure safe products required by MPR 1280.10.

An overview of the nonconforming product process and forms is provided in Appendix E, for reference.

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 does not apply to the Michoud Assembly Facility.
- 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.
- e. This MPR applies to nonconformances (documenting and resolving) for the following:
 - (1) Any items designated by the program/project as “flight hardware,” “ground support equipment,” or designated as “quality sensitive” (see MPR 1280.10 and MPR 8730.1),
 - (2) Items that are released by the MSFC Release Desk,
 - (3) Other hardware that has not been released by the MSFC Release Desk (e.g., Organizational Release items), but designated by the program/project/activity as subject to this MPR,
 - (4) Quality sensitive purchased items found to be nonconforming at MSFC receiving inspection and that are accepted by the Contracting Officer as a contractual nonconformance (Reference 8730.1 and MWI 5100.1),
 - (5) Test facility hardware failures when their failure adversely affects testing of and/or there is a potential damage to flight or quality sensitive hardware or Customer Supplied Product (CSP) resulting from test facility failure (reference paragraph 2.3.2.1),

Marshall Procedural Requirements		
QD01		
Control of Nonconforming Product	MPR 8730.3	Revision: L
	Date: September 22, 2020	Page 8 of 41

(6) CSP at MSFC, or

(7) Nonconformances in hardware outsourced by the ES20 Mechanical Fabrication Contractor, utilizing specific processes defined in organizational instructions.

f. This MPR applies to items identified in item P.2 e. delivered to the customer that are determined to be nonconforming after delivery or delivered items returned by the customer due to a failure.

g. Software nonconformances will be transferred to the cognizant software development organization and will be dispositioned by the Software Review Board and tracked to closure within the organization's closed loop system.

P.3 AUTHORITY

a. MPR 1280.10, Marshall Quality Management System

P.4 APPLICABLE DOCUMENTS AND FORMS

a. NRRS 1441.1, NASA Records Retention Schedules

b. MPR 1280.4, MSFC Corrective Action System

c. MPR 1440.2, MSFC Records Management Program

d. MPR 4000.2, Property Management

e. MPR 7123.1, MSFC Systems Engineering Processes and Requirements

f. MPR 8730.1, Inspection and Testing

g. MWI 5100.1, Initiating Procurement Requisitions

h. MWI 8730.3, MSFC Material Review System

i. MSFC-STD-555, MSFC Engineering Documentation Standard

j. MSFC-STD-3528, Computer-Aided Design (CAD) Standard

k. ET01-PRO-OWI-003, Test Preparation Sheet Instructions

l. QD-QA-001, Acceptance Reporting Instruction

Marshall Procedural Requirements		
QD01		
Control of Nonconforming Product	MPR 8730.3	Revision: L
	Date: September 22, 2020	Page 9 of 41

- m. QD-QA-003, Quality Assurance Requirements for Test Activities
- n. MSFC Form 248, Test Preparation Sheet
- o. MSFC Form 312, Parts Tag
- p. MSFC Form 460, Discrepancy Record
- q. MSFC Form 460-1, Multi-Use 460 Continuation Sheet
- r. MSFC Form 460-2, Test Discrepancy Record
- s. MSFC Form 460-3, Squawk Record
- t. MSFC Form 460-4, Non-Discrepant Investigation Report
- u. MSFC Form 492, Test Discrepancy Record Log
- v. MSFC Form 847, Deviation/Waiver Approval Request (DAR)
- w. MSFC Form 2327, Engineering Change Request
- x. MSFC Form 3959, Test Procedure Deviation
- y. MSFC-Tag 10, Withhold Tag (See Appendix F for an example of this tag)

P.5 MEASUREMENT/VERIFICATION

None.

P.6 CANCELLATION

MPR 8730.3K, Control of Nonconforming Product, dated September 29, 2017.

Electronically approved by

Jody Singer
Director

Marshall Procedural Requirements		
QD01		
Control of Nonconforming Product	MPR 8730.3	Revision: L
	Date: September 22, 2020	Page 10 of 41

CHAPTER 1. RESPONSIBILITIES

1.1 Safety and Mission Assurance (SMA) Directorate shall:

1.1.1 Ensure overall implementation of this system.

1.1.2 Initiate MSFC-Tag 10 [Withhold Tag], MSFC Form 460 [Discrepancy Record (DR)], MSFC Form 460-3 [Squawk Report] and support MSFC Form 460-2 [Test Discrepancy Record (TDR)] or MSFC Form 460-4 [Non-Discrepant Investigation Report (NDIR)] for quality-sensitive flight and flight-associated hardware and other items when required by the quality plan, project plan, or task agreement.

Note: In the case of non-quality sensitive items, the responsibility for initiation of applicable forms will be called out in the Organizational Issuances (OIs), project plans or agreements. For ED, Test Laboratory activities (East and West Test Areas), MSFC-Tag 10 may also be applied by SMA to Ground Support Equipment (GSE) or test facility components.

1.1.3 Evaluate Squawks, DRs and quality sensitive TDRs.

1.1.4 Provide a Quality Engineer to be the Material Review Board (MRB) chair. SMA Services Contractor personnel may serve as MRB chair with SMA Director approval.

1.1.5 Provide real-time tracking and status for DRs.

1.1.6 Provide reports as necessary to appropriate Lead Engineers/responsible design organizations/ SMA Director or Chief Engineer's office for each project denoting the status of unresolved nonconformances.

1.1.7 Provide flight readiness status and recommendations on open nonconformances.

1.1.8 Ensure that all DRs are forwarded to the Quality Record Center (QRC).

1.1.9 Ensure that trending and corrective action related information are provided in accordance with MPR 1280.4.

1.1.10 Ensure, that all appropriate personnel and organizations (which can include suppliers, internal organizations, customers, distributors, and regulatory authorities) are notified, and a DR initiated, in the event nonconformity is discovered after delivery or use has started, or when the product is returned to MSFC due to a failure.

1.1.10.1 Ensure that DRs are dispositioned in accordance with this document.

Marshall Procedural Requirements		
QD01		
Control of Nonconforming Product	MPR 8730.3	Revision: L
	Date: September 22, 2020	Page 11 of 41

1.2 Cognizant Performing Personnel.

1.2.1 Act as an MRB member.

1.2.2 Initiate TDRs or NDIRs.

1.2.3 Initiate Change Requests (CRs), deviations, and waivers.

1.2.4 Evaluate/disposition DRs/TDRs/NDIRs.

1.3 MRB shall:

1.3.1 Evaluate/disposition DRs submitted for material review in accordance with MWI 8730.3.

1.4 Configuration Control Board (CCB) shall:

1.4.1 Process CRs and Deviation/Waiver Approval Requests (DARs) (MSFC Form 847 or equivalent) in accordance with the program/project Configuration Management Plan (CMP).

1.4.2 Provide copies through distribution to SMA to enable closure of the applicable DRs.

1.5 The Engineering Directorate shall:

1.5.1 Define and maintain Standard Repair Procedures (SRPs) applicable to all projects when authorized by the MRB.

1.5.2 Define and utilize a process to ensure SRPs are approved by the Engineering Director or delegee.

1.6 Project Chief Engineer, or designee shall, as needed:

1.6.1 Determine and document accordingly via disposition in accordance with 2.2.15 when it is necessary/appropriate to continue processing a nonconforming item while awaiting MRB review or waiver/deviation approval by the applicable Approval Authority.

1.6.2 Provide flight readiness assessment dispositions on open DRs.

1.6.3 Ensure initiation of CRs as required.

1.6.4 Evaluate/disposition DRs/TDRs as required.

1.6.5 Act as an MRB member or delegate authority.

Marshall Procedural Requirements		
QD01		
Control of Nonconforming Product	MPR 8730.3	Revision: L
	Date: September 22, 2020	Page 12 of 41

CHAPTER 2. PROCEDURES

2.1 Squawk Report (MSFC Form 460-3)

2.1.1 Cognizant SMA Personnel shall use the Squawk report to document obvious/simple rework that can be corrected without engineering disposition or detailed methodization.

Note: The terminology ‘squawk’ is not an acronym but is commonly used terminology for this type of minor nonconformance, which can be corrected with simple rework, especially during the initial manufacturing phase.

2.1.1.1 MSFC Form 460-1 shall be used as a continuation sheet, if needed.

2.1.2 Cognizant Performing Personnel shall disposition the Squawk.

2.1.2.1 No work shall be accomplished until the disposition has been entered.

2.1.2.2 The work performed on a Squawk shall be traceable to the individual performing the task.

2.1.3 Quality Assurance Specialist (QAS) personnel shall upgrade Squawk to a DR if more than obvious/simple rework is involved and requires detailed methodization, or to recall product released prior to completion of all required inspections or tests once it has been determined that requirements cannot be met per MPR 8730.1.

2.1.4 QAS personnel may void a Squawk prior to disposition by writing “VOID” across the MSFC Form 460-3 and stamping with the inspector’s stamp, if it is determined that the condition documented is no longer applicable.

2.1.5 QAS personnel shall file the Squawk with the work order, or other open paperwork associated with the nonconforming item until closure.

2.1.6 QAS personnel shall initiate and close the Squawk in accordance with the instructions on the MSFC 4603-3 form.

2.1.7 Cognizant SMA and Cognizant Performing Personnel shall make all entries on the Squawk with dark, permanent ink, in a manner that preserves the legibility of the record for the full required retention period specified in Appendix D.

Note: Black or dark blue inks are preferred since some colored inks fade over time. However, other dark colored inks may be used on records with a NARA-approved retention of less than a year.

Marshall Procedural Requirements		
QD01		
Control of Nonconforming Product	MPR 8730.3	Revision: L
	Date: September 22, 2020	Page 13 of 41

2.2 DR (MSFC Form 460)

2.2.1 QAS personnel and Cognizant Performing Personnel shall use MSFC Form 460, and MSFC 460-1 to define all nonconformance (other than those documented on a Squawk per section 2.1 of this MPR) to applicable drawings, specifications, tests, or other requirements. See Appendix G for a simplified flowchart of the DR process, and Appendix H for guidance on DR best practices.

2.2.2 Cognizant Performing Personnel shall present the deviation, when an item is known “before-the-fact” to have an approved deviation, to SMA along with the item and its associated documentation to preclude initiation of a DR for a nonconformance that has been previously dispositioned.

2.2.3 QAS personnel shall initiate and close DRs per MSFC Form 460 instructions and this MPR.

2.2.3.1 QAS personnel shall initiate a separate DR for each nonconformance, except that multiple nonconformances involving a single item of hardware at a single inspection point may be listed on one DR. The number of instances documented in this manner should be limited to those that can be reasonably expected to follow a similar troubleshooting and disposition methodology.

2.2.4 QAS personnel shall issue and record a number for all DRs and stamp or sign each DR ensuring that the DR is written correctly and is valid.

2.2.5 A DR may be voided in accordance with the following:

2.2.5.1 The SMA quality assurance supervisor or team lead may void the DR if a DR has been dispositioned but the work has not been performed, by entering “VOID” and recording the reason in the disposition section above the Final Acceptance block 29 of the DR.

2.2.5.2 SMA quality assurance supervisor or team lead shall sign the statement and obtain the engineering signature from the same or higher supervision level than original disposition approval.

2.2.5.3 DRs that have not been dispositioned may be voided with this same process but do not require engineering signatures.

2.2.5.4 When a disposition voids, deletes, or changes any unworked portion of a DR, QAS personnel shall make a notation next to the voided, deleted, or changed paragraphs, and stamp adjacent to the notation.

2.2.5.5 A DR shall not be voided if completed or portions thereof have been worked.

2.2.6 Cognizant Performing Personnel and QAS personnel shall either electronically print or

Marshall Procedural Requirements		
QD01		
Control of Nonconforming Product	MPR 8730.3	Revision: L
	Date: September 22, 2020	Page 14 of 41

mark with dark, permanent ink, in a manner that preserves the legibility of the record for the full required retention period specified in Appendix D on all entries made on DRs.

Note: Black or dark blue inks are preferred since some colored inks fade over time. However, other dark colored inks may be used on records with a NARA-approved retention of less than a year.

2.2.7 QAS personnel shall forward a legible DR copy to the QRC upon generation.

2.2.8 QRC personnel shall enter the DR into the Corrective Action System (CAS) database within one working day of initiation to facilitate screening for corrective action (CA) per MPR 1280.4.

Note: Cognizant SMA Personnel use the DR inputs to define issues requiring recurrence control and dispositions in accordance with MPR 1280.4.

2.2.9 The DR shall be kept with the nonconforming hardware.

2.2.9.1 QAS personnel shall, for Electrostatic Discharge (ESD) sensitive hardware, place the DR in Electrostatic Discharge (ESD) protective holder and place with nonconforming part.

2.2.9.2 In rare situations such as work in class 100 clean rooms, Cognizant Performing Personnel and QAS personnel shall develop methods to maintain the DR in proximity to the nonconforming part.

2.2.10 Cognizant Performing Personnel shall review and disposition the DR.

2.2.10.1 Cognizant Performing Personnel shall enter the following on the DR disposition if remedial action cannot be completed:

“Transfer this DR to (organization) per notification by (organization and person’s name) on (date).”

2.2.10.2 Cognizant Performing Personnel shall forward the hardware and the DR to the new organization to which the responsibility has been transferred.

2.2.10.3 Cognizant Performing Personnel shall provide remedial action for new area of responsibility for hardware transferred to the laboratory.

2.2.11 Cognizant Performing Personnel may make, propose, or request via an initial review (by the performing and design organizations), the following DR dispositions: Scrap, Return to Vendor (RTV), rework (Rwk), Use-As-Is (UAI) or Repair.

2.2.11.1 Cognizant Performing Personnel should consult with the project authority for any RTV or scrap disposition.

Marshall Procedural Requirements		
QD01		
Control of Nonconforming Product	MPR 8730.3	Revision: L
	Date: September 22, 2020	Page 15 of 41

Note: Each project will determine cost thresholds between minor items (e.g. fasteners, heli-coils, etc.) and major items that require programmatic coordination by Cognizant Performing Personnel.

2.2.11.2 Hardware dispositioned as scrap shall be controlled and disposed of in accordance with Appendix I.

2.2.11.3 Hardware dispositions of UAI or repair shall require either MRB review and approval in accordance with MWI 8730.3, or an approved DAR prior to closure.

Note: A DAR is typically required for a nonconformance that – following all remedial steps – affects one or more of the following:

- a. Approved Program/Project Specification or software requirements*
- b. Interface characteristics, documents, or responsibilities with other system hardware*
- c. Affects configuration-controlled support equipment, flight system operational trainers, or training devices/equipment/documentation*
- d. Qualification or Acceptance Requirements*
- e. Safety or reliability*
- f. Interchangeability, substitutability, or replaceability at any planned level of use*
- g. Requires retrofit of other units*
- h. Other criteria defined by the Program/Project*

2.2.11.4 For proposed dispositions that require an approved DAR,

(a) Cognizant Performing Personnel shall prepare a DAR in accordance with the program/project CMP and submit to the applicable Approval Authority for disposition.

(b) QAS personnel shall not close the DR until SMA receives an approved DAR.

2.2.12 Prior to closure, the DR shall be updated with final disposition and rework/repair procedure (if required).

2.2.13 For configuration-controlled items, Cognizant Performing Personnel shall prepare a CR if an engineering problem is indicated, and submit to the applicable Approval Authority for disposition.

2.2.13.1 For MSFC Released configuration-controlled items, advance implementation of work proposed via a CR may be implemented prior to the Approval Authority disposition by utilizing a Floor Engineering Order in accordance with MSFC-STD-555,

2.2.13.2 Changes for items not released by the MSFC Release Desk shall be prepared and processed in accordance with the program/project CMP and/or the applicable design organization's change processes.

Marshall Procedural Requirements QD01		
Control of Nonconforming Product	MPR 8730.3	Revision: L
	Date: September 22, 2020	Page 16 of 41

2.2.14 Material Review Board will disposition UAI and repair nonconformance in accordance with MWI 8730.3.

2.2.14.1 For all nonconforming items referred to MRB, QAS personnel shall either move the nonconforming hardware to a Material Review Crib (MRC) or attach a Withhold Tag, unless approval for continued processing is granted in accordance with 2.2.17. When an item is placed in an MRC with the DR, a Withhold Tag is not required.

- a. The red or hard copy shall be attached to the nonconforming item, and a paper copy attached to the DR, Quality Test Preparation Sheet (QTPS), or other nonconformance documentation.
- b. Hardware with a Withhold Tag attached shall not be opened, moved, modified, or otherwise disturbed until the nonconformance has been dispositioned and either the work authorizing documentation is released to implement the disposition, or work authorizing documentation is released to troubleshoot or investigate prior to final disposition.
- c. QAS personnel shall remove the Withhold Tag upon implementation of the disposition. All copies of the withhold tag may then be discarded.

2.2.14.2 The DR shall serve as the record of the MRB disposition.

2.2.14.3 All repair procedures shall be approved by the MRB.

2.2.14.4 The MRB may define project-unique SRPs applicable to that project.

2.2.14.5 All SRPs shall contain specific definitive application criteria.

2.2.15 Upon closure, the DR shall be forwarded to the QRC by the QAS personnel making final acceptance of the DR.

2.2.16 QAS personnel shall identify dispositions of UAI, repair, or acceptance per previously approved DAR: in the manufacturing build paper, in the as-built listings, and on MSFC Form 312.

2.2.16.1 All information concerning traceability, identification, configuration and inspection status of an item of hardware shall be entered on MSFC Form 312 per QD-QA-001.

2.2.16.2 For parts downgraded from flight status, the MSFC Form 312 shall be annotated and forwarded to the QRC.

- a. Parts downgraded from flight status shall be marked by appropriate means or otherwise altered to indicate the change in status. Marking with indelible ink, paint, or etching are recommended methods for consideration.
- b. The MSFC Form 312 may be retained with the downgraded hardware as a record of history

Marshall Procedural Requirements		
QD01		
Control of Nonconforming Product	MPR 8730.3	Revision: L
	Date: September 22, 2020	Page 17 of 41

but may not be used to justify use or installation in flight hardware higher assemblies or deliveries.

2.2.17 Cognizant Engineer may continue a nonconforming item (on which a DR is awaiting MRB review or DAR disposition by the applicable Approval Authority) through hardware processing operations pending formal disposition under the following conditions:

2.2.17.1 A written order to proceed is provided by the project Chief Engineer, Chief SMA Officer or Quality Engineer, and project management, or by their respective designees.

2.2.17.2 There is no safety risk resulting from continued processing of the nonconforming part (as assessed by cognizant personnel and agreed by the signatures in 2.2.17.1).

2.2.18 Cognizant Performing Personnel shall enter dispositions for DR Block 24 in accordance with form instructions.

2.2.18.1 All dispositions shall be identified to the person(s) making the dispositions by name or initials and date.

2.2.19 When the problem has been resolved, Cognizant Engineering shall document a DR closure statement/summary of the resolution of the issue, consistent with the closure rationales shown in Appendix J, and include the signature of both Cognizant Engineering and any additional approvals required. The summary does not require SMA approval.

2.2.20 QAS personnel shall complete DR Block 29, Final Disposition, in accordance with form instructions.

2.2.21 QAS personnel shall disposition and close within 1 year of initiation all DRs unless the responsible project approves extension in writing.

2.2.21.1 The closed record copy of each DR shall be forwarded to the QRC for filing and retention.

2.3 TDR (MSFC Form 460-2)

2.3.1 Cognizant Performing Personnel and QAS personnel shall utilize TDR (MSFC Form 460-2) for recording and dispositioning test anomalies involving hardware within the applicable scope of Section P.2 of this Directive.

Note: For hardware that is not within the scope of Section P.2 of this Directive and that does not include SMA personnel, the MSFC Form 460-2 form may be used by cognizant performing personnel in accordance with organization instructions or program/project documents.

Marshall Procedural Requirements		
QD01		
Control of Nonconforming Product	MPR 8730.3	Revision: L
	Date: September 22, 2020	Page 18 of 41

2.3.1.1 Within the ED, Test Laboratory, the QTPS may be utilized for recording and dispositioning facility nonconformances and the initial documentation of test anomalies. If the test anomalies are related to a NASA test article, then the TDR and DR system shall be utilized. Use of QTPSs is governed by ET01-PRO-OWI-003 and QD-QA-003 rather than this MPR.

2.3.1.2 When a nonconformance is determined to be contained in software, subsequent actions shall be documented and dispositioned in accordance with the OIs of the developer's Software Review Board.

2.3.1.3 When troubleshooting (T/S) activities on a TDR determine that a test failure is a flight hardware nonconformance, the TDR shall be upgraded to a DR.

2.3.1.4 The TDR shall be completed per section 2.3 of this MPR and MSFC Form 460-2 instructions.

2.3.1.5 MSFC Form 460-1 shall be used for any needed continuation sheets.

2.3.1.6 The TDR shall be closed if the anomaly is transferred to a DR. All dispositions including testing will then be documented on the DR.

2.3.2 Cognizant Performing and/or QAS personnel shall initiate TDRs (normally by the person responsible for the hardware), as the condition warrants.

2.3.2.1 When an MSFC test facility is being utilized to perform development, acceptance, or qualification testing on MSFC in-house or CSP without mandatory test coverage by QAS personnel and the hardware is damaged or potentially damaged as a result of a test facility malfunction or MSFC test personnel error, QAS personnel shall be contacted to initiate a TDR (or review the generated TDR) to ensure the facility problem or MSFC operator error is corrected prior to additional testing at the facility.

2.3.3 Cognizant Performing Personnel shall disposition an initial TDR in the testing organization where the TDR was originated, or it may be dispositioned by the systems engineer/test conductor.

2.3.4 Cognizant Performing Personnel shall enter TDRs onto the TDR Log, MSFC Form 492 to provide traceability. (See also section 2.3.9.)

2.3.4.1 TDR log entries shall be closed when each TDR is closed.

2.3.4.2 Completed logs and TDRs shall be placed in SMA QRC as part of the record copy of the test procedure or Test Preparation Sheet (TPS).

Note: For projects or activities outside the scope of the MPR, organizational or project procedures will define the location for storage of these records.

Marshall Procedural Requirements		
QD01		
Control of Nonconforming Product	MPR 8730.3	Revision: L
	Date: September 22, 2020	Page 19 of 41

2.3.5 Cognizant Personnel process TDRs per MSFC Form 460-2 instructions and as follows:

2.3.5.1 Initiation—The initiator shall complete an unnumbered MSFC Form 460-2 through the preprinted check off section in block 12 and enter the TDR number on the TDR log.

2.3.5.2 Initial Disposition—Cognizant performing personnel shall make one of the following initial dispositions:

- a. Troubleshoot per continuation sheet.
- b. Transfer to (organization) for T/S or transfer to customer on rejected CSP unless MSFC engineers perform limited T/S that is coordinated with the Marshall Lead Representative (MLR) on CSP.
- c. Close by transferring the hardware with the defined problems back to the customer in accordance with MPR 4000.2.
- d. No T/S is required with engineering rationale, description of remedial action taken, statement of retest, and TDR closure and categorization statement.
- e. After notifying the responsible engineer, a CR shall be generated and submitted to the applicable Approval Authority to correct erroneous approved test requirements.

2.3.6 Cognizant Performing Personnel perform TDR T/S operations as follows:

2.3.6.1 Verify nonconformance description. When Test Article (T/A) and/or GSE T/S are required, the T/S steps shall be entered on Form 460-1) and T/S may then be initiated.

2.3.6.2 For all tests with mandatory monitoring by QAS personnel, no T/S shall be conducted without QAS coverage or QE concurrence.

2.3.6.3 Cognizant Performing Personnel shall document each step or group of steps before they can be run.

- a. When monitoring this type of T/S operation, QAS personnel shall ensure that the cognizant performing personnel have adequately documented each step, or series of steps. T/S may be performed and documented concurrently when QAS personnel are in agreement.
- b. Cognizant Performing personnel may delete certain steps. The Cognizant Performing personnel shall write “DNP” (Do Not Perform), “NP” (Not Performed), or “NA” (Not Applicable) on each step or group of steps not performed and initial the annotation.

2.3.6.4 As each T/S page of the TDR is completed and the steps initialed by the performing individual(s), QAS personnel shall accept the work steps and the page based on review of recorded results or witness of completed activities for mandatory monitoring.

Marshall Procedural Requirements		
QD01		
Control of Nonconforming Product	MPR 8730.3	Revision: L
	Date: September 22, 2020	Page 20 of 41

2.3.6.5 If, during TDR T/S operations, other anomalies are discovered not attributable to the same cause as the initial TDR anomaly, new TDRs shall be initiated against the same test documentation that the initial TDR was written against, ensuring that no more than one anomaly is documented per TDR.

2.3.6.6 If excerpts from other documents [e.g., test procedures, Standard Operating Procedures (SOPs), or TPSs)] are to be used as a part of the T/S operations, and will result in the recording of data:

- a. A T/S step shall authorize and define the excerpt. Example, “Perform Attachment A, six pages.”
- b. If the attachment contains portions that have been changed in any way from the original copy (e.g. approved procedure deviation per MSFC Form 3959), then a reproduction of the changed copy shall be used for record purposes.
- c. All attachment pages containing methodization shall be acceptance-stamped by SMA in the lower right-hand corner.

2.3.6.7 A utility sequence (e.g. an existing, approved set of steps that does not result in the manual recording of any data) may be authorized by a T/S step without requiring an attachment. Example, “Perform Sequence 3 of KT-1109.”

2.3.6.8 When the problem has been isolated, the engineer shall summarize the conclusion in a T/S summary, consistent with the closure rationales shown in Appendix J, defining the problem and sign and date the summary. The T/S summary does not require SMA approval.

2.3.6.9 If the anomaly is caused by test article hardware configuration nonconformance, a DR shall be prepared per this procedure.

2.3.6.10 If the anomaly is caused by a facility nonconformance which adversely affects the test article, a DR shall be prepared.

2.3.6.11 If troubleshooting requires disassembly of the test article, or other configuration controlled hardware used in the system, the disassembly and further troubleshooting shall be transferred to a Non-Discrepant Investigation Report (NDIR) (see section 2.4) unless and until it is determined that a nonconformance has been identified that warrants a DR (see section 2.2).

2.3.6.12 The test conductor, with the concurrence of quality assurance, may either close the TDR, or choose to leave the TDR open pending closure of the NDIR, provided no discrepancy is found that requires the use of a DR.

Note: The option to leave the TDR open allows for subsequent investigation if the NDIR is closed without determining a cause that explains the discrepancy noted in the TDR.

Marshall Procedural Requirements		
QD01		
Control of Nonconforming Product	MPR 8730.3	Revision: L
	Date: September 22, 2020	Page 21 of 41

2.3.7 TDR Retest Requirements are conducted by the Cognizant Performing Personnel as follows:

2.3.7.1 When all T/S and/or disposition operations are complete, the test engineer shall address retest requirements including repetition of any invalidated environmental testing.

a. If a breakout box was installed, flight cables disconnected, or fluid connections broken, then the affected systems shall be retested.

b. In the case of an electrical connector disconnected, each copper path in the “broken” circuit shall be re-verified.

c. If retest is to be accomplished at a later stage (e.g. later in the same procedure), a disposition statement specifying the retest shall be included, such as, “Retest shall be accomplished by KT-7002, Sequences 2, 3, and 4.”

2.3.7.2 If no problem is found during T/S, the retest disposition statement shall so state (i.e., “Retest satisfactorily accomplished in steps X through XX”).

2.3.7.3 No TDR shall be closed until the retest has been satisfactorily completed and a disposition added to the TDR stating that the retest was satisfactory, except in those cases where the TDR is transferred to a DR or NDIR and retest requirements are performed as part of the DR.

2.3.7.5 If no retest is required, then a disposition shall be included in the TDR giving the rationale for “no retest.”

2.3.8 TDR Filing

2.3.8.1 The closed TDR (record copy) and continuation sheets shall be filed with their logs and the record copy of the TCP or TPS, in either the QRC or the project designated record center.

2.3.9 TDR Log Form Instructions

2.3.9.1 MSFC Form 492 shall be used to log all TDRs initiated against each separate test document being conducted (i.e., TCP’s, TPSs, or Retest DRs).

2.3.9.2 Each TDR shall be assigned a sequential number for each TDR starting with number 1. The full TDR number is the document number followed by a dash and the TDR number. Run numbers may be included, if applicable.

2.4 NDIR (MSFC Form 460-4)

Under certain circumstances, disassembly and investigation of non-discrepant hardware may be performed. There may be other methods (e.g. TPS, procedure, etc.) approved for documenting the activity. However, in those cases where the configuration of the article will be changed or

Marshall Procedural Requirements		
QD01		
Control of Nonconforming Product	MPR 8730.3	Revision: L
	Date: September 22, 2020	Page 22 of 41

temporarily disturbed (for example, covers removed, internal assemblies removed for inspection, conformal coating disturbed in order to probe electrical signals, etc.) the NDIR form (MSFC 460-4) and processes should be used. Non-discrepant investigations may be initiated either during troubleshooting as part of a TDR, or as a stand-alone determination by the relevant project and engineering personnel.

Note: A possible example of this would be the return of a hardware item from space, having completed its mission and met requirements, but that will undergo investigation of unresolved operational anomalies, or in order to determine possible design upgrades, or other enhancements for future use.

2.4.1 NDIRs shall use, MSFC Form 460-4.

2.4.2 NDIRs do not require trending and corrective action (section 1.1.9) in accordance with MPR 1280.4 and should normally be reported separately from nonconformance DRs.

2.4.3 If an actual nonconformance, or other finding that requires remedial action is discovered, a DR (MSFC Form 460) shall be opened for the issue in accordance with section 2.2.

2.4.4 However, any minor rework required as a result of the disassembly/reassembly process used to conduct the investigation (e.g. touchup to conformal coating following probing of signals) may be performed as part of the NDIR, without opening a DR.

2.4.5 To close an NDIR Cognizant Engineering shall document a closure statement/summary of the conclusion of the investigation and the end-state configuration of the hardware, consistent with the closure rationales shown in Appendix J. The summary does not require SMA approval.

2.4.6 Cognizant SMA shall complete Block 29, Final Disposition, in accordance with MSFC Form 460-4 instructions.

2.4.7 The closed record copy of the NDIR shall be forwarded to the QRC for filing and retention.

2.4.8 An NDIR may be used to document refurbishment of orbital replacement units in order to extend their operational life, or incorporate approved design changes.

Marshall Procedural Requirements		
QD01		
Control of Nonconforming Product	MPR 8730.3	Revision: L
	Date: September 22, 2020	Page 23 of 41

Appendix A. Definitions

Approval Authority. The organization or person, such as CCB Chairperson, authorized to approve: (1) a baseline; (2) a configuration change to a product; (3) changes to product definition information, and other related documents; (4) release or cancellation of documents for use in a specific program; and (5) results of audits.

Change Request (CR). Information, by which a change is proposed, described, justified, and submitted to the configuration approval authority. MSFC Form 2327, Engineering Change Request, is an example of a CR.

Critical Characteristic. Analysis indicates is likely, if defective, to create or increase a hazard to human safety or to result in failure of a system or major product to perform a required mission.

Cognizant Performing Personnel. ED or project personnel responsible for operations (e.g., manufacturing or test) that have designated authority and control over the hardware, and do not necessarily apply to all personnel who are involved with testing.

Nonconformance. The failure of a unit or product to conform to specified requirements.

Quality Test Preparation Sheet (QTPS). A nonconformance reporting/T/S document used in ED Test Laboratory.

Remedial Action. An action that corrects a nonconforming article or material.

Repair. A procedure applied to a nonconforming item that leaves it in an acceptable condition, or restores after decay or damage, but does not completely conform to the applicable drawings, specifications, or contract requirements.

Rework (Rwk). A procedure applied to a nonconforming item that completely eliminates the nonconformance and results in a characteristic that conforms completely to the drawings, specifications, or contract requirements. It includes both “incomplete operations” and “return to print” dispositions.

Standard Operating Procedure (SOP). The more routine or basic operations and guidelines that do not require the execution of a detailed sequence of events at a specific test site.

Test and Checkout Procedure (TCP). The detailed sequence of events to perform a specific test or operation on the T/A.

Test Article (T/A). Flight end items (e.g., stages, spacecraft, modules, or experiments) or test end items/systems undergoing certification/qualification/acceptance/designated development testing at the subsystems/systems level.

Test Conductor. Designated test individual who defines, implements, and controls the test

Marshall Procedural Requirements QD01		
Control of Nonconforming Product	MPR 8730.3	Revision: L
	Date: September 22, 2020	Page 24 of 41

program including activation and operation of the test article system or test facility supporting systems (i.e., instrumentation, controls, or fluid/mechanical systems).

Test Engineer. Designated test individual who ensures that the test program is accomplished safely and conforms to test requirements.

Test Facility. Ground elements which directly provide all the necessary accommodations for supporting a test and which are dedicated to the particular test during test execution. These elements consist of the brick and mortar and the test system and special test equipment portions. These elements include enclosure for the test article, the pneumatic, hydraulic, cryogenic, and electrical distribution systems, the stimuli and control networks, and the instrumentation and data monitoring and recording systems.

Test Preparation Sheet (TPS). A work authorizing document (MSFC Form 248) that may define test facility buildup, test activation/operations, or hardware modification, movement, assembly, or test not previously authorized by other work authorizing documents.

Troubleshooting (T/S). A logical, systematic search for the cause of a nonconformance in order to fix the problem and make a product operational. T/S is documented on a QTPS, a TDR, or a DR.

Marshall Procedural Requirements		
QD01		
Control of Nonconforming Product	MPR 8730.3	Revision: L
	Date: September 22, 2020	Page 25 of 41

Appendix B. Acronyms

CAD	Computer Aided Design
CAS	Corrective Action System
CCB	Configuration Control Board
CMP	Configuration Management Plan
CR	Change Request
CSP	Customer Supplied Product
DAR	Deviation/Waiver Approval Request (MSFC Form 847)
DNP	Do Not Perform
DR	Discrepancy Record (MSFC Form 460)
ED	Engineering Directorate
FRC	Federal Records Center
GSE	Ground Support Equipment
MRB	Material Review Board
MRC	Material Review Crib
NA	Not Applicable
NARA	National Archives and Records Administration
NDIR	Non-Discrepant Investigation Report
NP	Not Performed
NRRS	NASA Records Retention Schedules
OI	Organizational Issuance
P/N	Part Number

Marshall Procedural Requirements		
QD01		
Control of Nonconforming Product	MPR 8730.3	Revision: L
	Date: September 22, 2020	Page 26 of 41

QA Quality Assurance

QAS Quality Assurance Specialist

QRC Quality Record Center

QTPS Quality Test Preparation Sheet

RTV Return to Vendor

Rwk Rework

S/N Serial Number

SOP Standard Operating Procedure

SMA Safety and Mission Assurance

SRP Standard Repair Procedure

STD Standard

T/A Test Article

TCP Test and Checkout Procedure

TDR Test Discrepancy Record (MSFC Form 460-2)

TPS Test Preparation Sheet (MSFC Form 248)

T/S Troubleshooting

UAI Use-As-Is

WAD Work Authorizing Document

Marshall Procedural Requirements QD01		
Control of Nonconforming Product	MPR 8730.3	Revision: L
	Date: September 22, 2020	Page 27 of 41

Appendix C. Verification Matrix

None

Marshall Procedural Requirements QD01		
Control of Nonconforming Product	MPR 8730.3	Revision: L
	Date: September 22, 2020	Page 28 of 41

Appendix D. Records

D.1 The following records will be maintained per NRRS 1441.1 and MPR 1440.2.

D.1.1 Completed DRs and NDIRs will be retained for the life of the project by the QRC, then retired to a FRC 1 year after end of project and destroyed 10 years after the end of the project in accordance with 8/103.

Note: Following the approval of Revision L of this document, for all newly generated DRs or NDIRs, the record copy will be the electronic copy loaded in the CAS database. Prior DRs may consist of either electronic or paper records, with an ongoing transition from paper to electronic.

D.1.2 Such records in the QRC may be transferred to the custody of the Project for retention.

D.2 The following items become part of the records defined by MPR 8730.1.

D.2.1 Completed Squawk Reports will be filed with the inspection report or work order for the hardware.

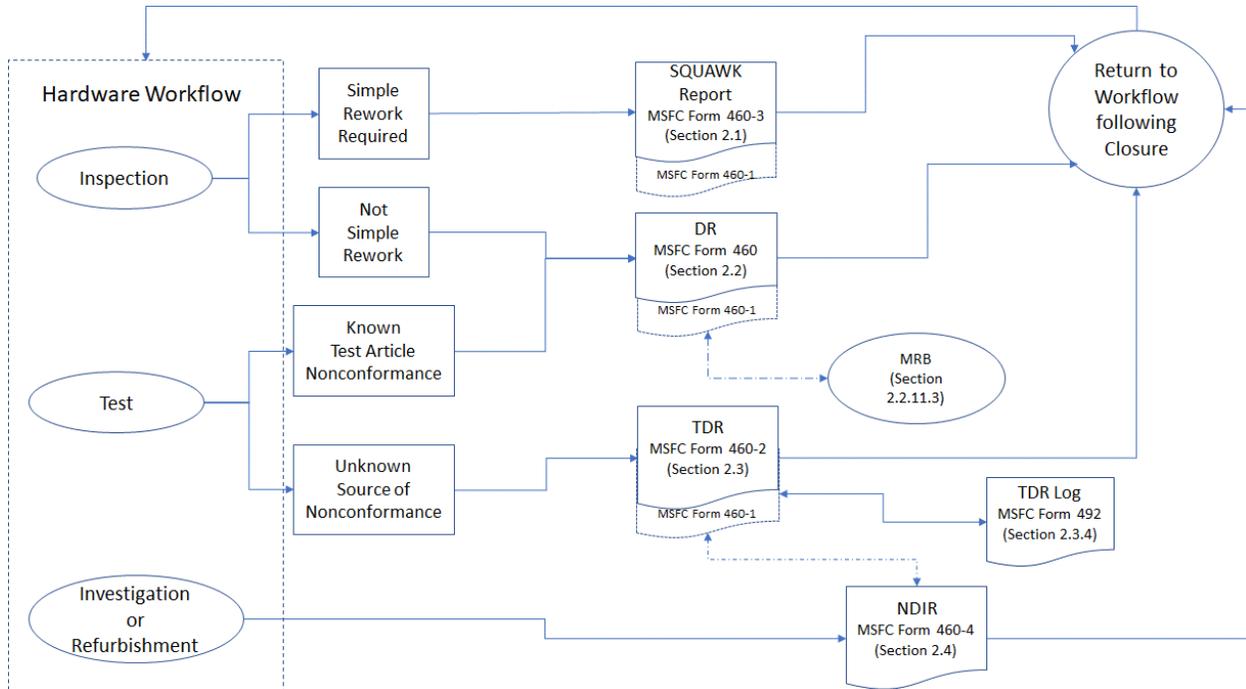
D.2.2 Completed TDRs closed by QAS will be filed with the as-run procedure or TPS in operation at the time the potential nonconformance was noted.

D.3 Completed TDRs closed without QAS will be filed in accordance with applicable organizational or project instruction. The QRC may keep these records as part of higher-level acceptance packages, subject to project planning/agreements.

D.4 Withhold Tags may be destroyed or discarded when no longer needed.

Marshall Procedural Requirements		
QD01		
Control of Nonconforming Product	MPR 8730.3	Revision: L
	Date: September 22, 2020	Page 29 of 41

Appendix E. Nonconforming Product Overview



Marshall Procedural Requirements		
QD01		
Control of Nonconforming Product	MPR 8730.3	Revision: L
	Date: September 22, 2020	Page 30 of 41

Appendix F. Example MSFC Tag-10

National Aeronautics and
Space Administration





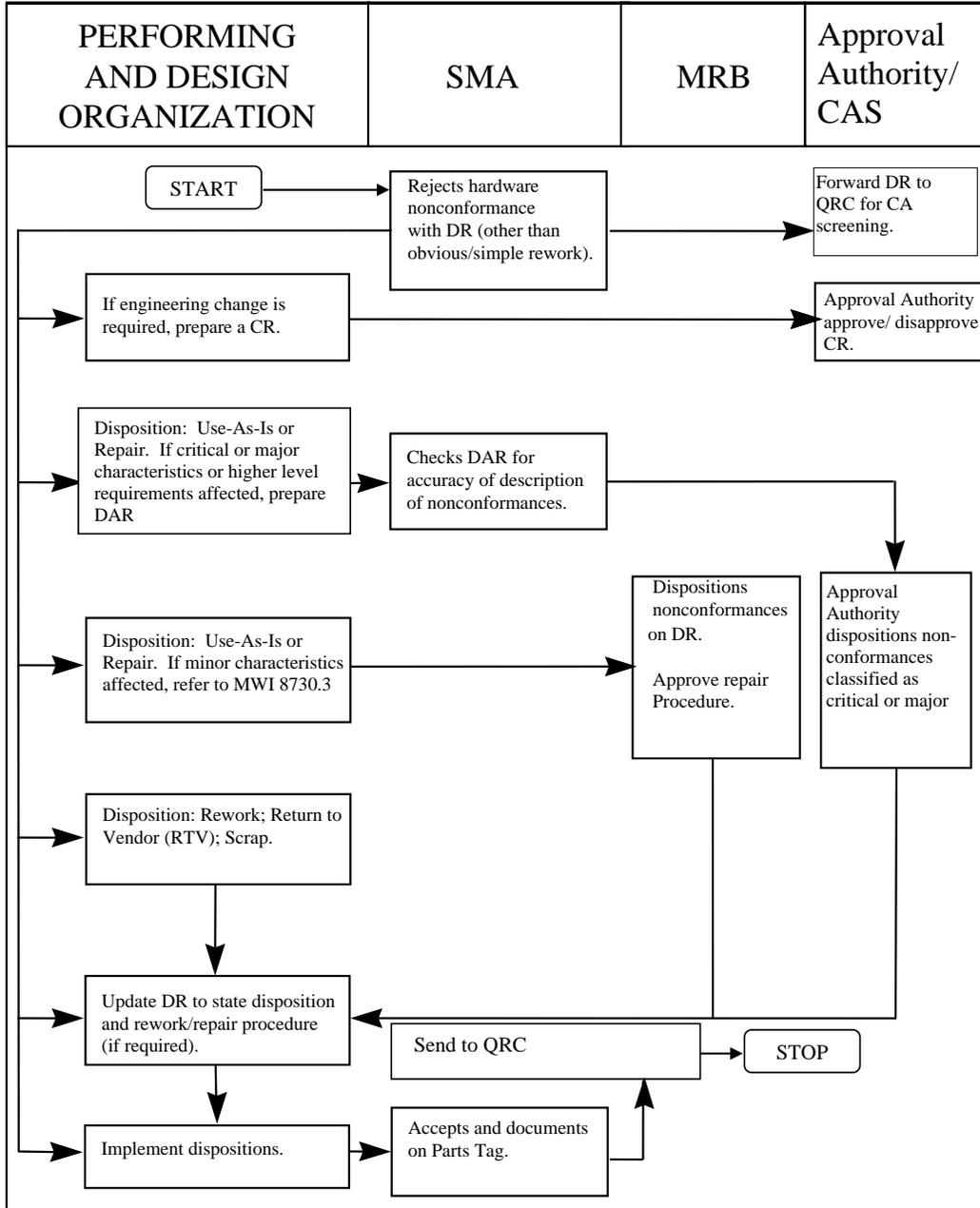
UNAUTHORIZED REMOVAL OF THIS TAG IS PROHIBITED.

WITHHOLD

PART NAME:	CONTRACTOR'S PART NUMBER:	TAG NUMBER:
SUPPLIER'S PART NO.:	PART SERIAL NO.:	PROJECT:
REASON FOR WITHHOLDING		
<p>MRB REQUIRED</p> <p>DO NOT OPEN, MODIFY, DISTURB, OR MISHANDLE THIS ITEM IN ANY MANNER THAT COULD DISTURB ITS NONCONFORMING STATE.</p>		
LOCATION		
DISPOSITIONING FORM (Title and Serial No.):		
PART SERIAL NO.:	DATE:	STAMP:

MSFC Tag 10 (March 2011)
Previous Versions Obsolete

Appendix G. Simplified DR Flowchart Appendix



Marshall Procedural Requirements		
QD01		
Control of Nonconforming Product	MPR 8730.3	Revision: L
	Date: September 22, 2020	Page 32 of 41

Appendix H. DR Best Practices (Guidance)

1. All recorded data should be entered accurately and legibly.
2. Designer signatures on applicable DR pages should include organization code and date with a signature. All signatures should be legible or should have the name printed adjacent to the signature.
3. The Item number for each step consists of two numbers separated by a dash. The first number corresponds to the DR item number (recorded on the first sheet of the DR in the Discrepancy block) and the second number corresponds to the DR step for the item. For example, the steps that correspond to Item 1 on the DR are numbered 1-1, 1-2, 1-3, etc.
4. It is good practice to leave blank lines between steps.
5. DR steps that have been completed cannot be changed or deleted. However, supporting data can be added after the fact (i.e. cal tool usage).
6. Prior to obtaining disposition concurrence, unlimited changes may be made. Pen and ink changes on hand-written pages require the initials, organization and date of the initiator or stamp and date.
7. Pen and ink changes that do not affect technical content can be made after disposition concurrence are obtained, without requiring new concurrences. Pen and ink changes should be accompanied by the initials and organization (or stamp) and date of the individual making the pen and ink changes.
8. Designers should identify which steps they methodized. This can be done by signing the bottom of each page or making a statement before steps are written stating which designer by name is writing the following steps.
9. Coordinate all dispositions and obtaining approval signatures prior to implementing dispositions.
10. Verifying that nonconformance is not pending further engineering assessment such as Nondestructive Testing (NDE). Ensure that results are received and approved and added to interim and final summaries prior to closure.
11. Only allow steps to be performed on flight hardware that are either approved or reversible (i.e. steps can be undone such that hardware can return to its original state). If steps are such that hardware cannot “return to print,” then they should not be performed until the engineering documentation change has been approved (FEO, EO, Drawing Revision, or Waiver) or an MRB approval has been obtained.
12. Only activities that are required to be completed should be performed. Make sure there is a reason to perform each procedure/step. Observations and results should be recorded.
13. DR steps should be written prior to performing work to assure process is well thought out.
14. When comments about a work step or hardware status or observations would be beneficial, informational notes should be added and should include the name of the author and the date.

Marshall Procedural Requirements QD01		
Control of Nonconforming Product	MPR 8730.3	Revision: L
	Date: September 22, 2020	Page 33 of 41

15. Each DR work step should be complete and clearly written such that it can stand alone. Each step should be written such that its completion is verifiable.
16. The applicable drawing should be referenced, including the revision. References to drawing views, sections, details, zones, etc. should be included if find numbers are in more than one location on the drawing or if the location is not apparent.
17. Work steps should be of sufficient detail to identify all parts installed/removed by find number or part number, serial number (if applicable), part name, and quantity
18. Specify what to do with items being removed, i.e. bag and tag, discard, inspect, temporarily set aside, etc.
19. Torque steps should include a space to record running torque, actual applied torque, calibration tag number and calibration due date of the wrench if applicable. This is not required if torque sheets with specific data entry are implemented.
20. Mandatory inspection points should be specifically identified in DR steps where required.
21. When new/replacement hardware is laid out on the DR, space should be reserved for QA to record the IR Tag number for the hardware.
22. Drawing notes should be referenced by note number with enough detail so that the step is understood. For example, Clean 2 each F/N 31, M83248/1-013 o-ring, of 97M12345 Rev. B to VC-Sensitive per note 3 of 97M12345 Rev. B.
23. When any nonconformance requires an attachment, the following rules are observed:
 - Attachments are referenced on a DR continuation sheet.
 - Attachments are labeled with the DR number.
 - Attachments are indexed (e.g., A, B, C) and page numbered, including total number of pages (e.g., Page 4 of 5).
 - Work steps can be performed and bought off on an attachment the same as on a DR continuation sheet

Marshall Procedural Requirements		
QD01		
Control of Nonconforming Product	MPR 8730.3	Revision: L
	Date: September 22, 2020	Page 34 of 41

Appendix I. Recommendations for Disposition of Scrap

I.1 These instructions do not apply to obvious scrap articles or materials such as cutting and boring chips, tag ends, cured adhesive materials or samples, etc., that could not be, under any circumstances, used in manufacturing operations.

I.2 Use of scrap items for nonproduction purposes (e.g., shop aids or engineering evaluation) is allowable, provided that adequate controls are established to prevent scrap usage in manufacturing operations. When these scrap items are not used on a continuing basis, the storage control requirements of section I.3.2 herein apply.

I.3 Permanently identify scrap items used for display as specified in section I.3.1.1 herein.

Cognizant
Performing
Personnel and/or
SMA

I.3.1 Permanently identify all scrap hardware and raw material in such a manner as to prevent confusion with acceptable hardware and materials. The following methods are acceptable for identification of scrap hardware and raw materials.

I.3.1.1 Identify immediately after the hardware or material is determined to be scrap, unless immediate, complete destruction of the scrap hardware or material is planned.

I.3.1.2 Impression Stamping. A unique stamp signifying scrap hardware or raw material may be used for identification purposes when such stamp produces a highly visible, distinct impression in the material. Place stamped identification in conspicuous locations as large as practical.

I.3.1.3 Etching. Scrap hardware and raw materials may also be identified by etching the word “SCRAP” on the hardware or material. Any permanent method of etching may be used. Place “SCRAP” markings in conspicuous locations and as large as practical.

I.3.1.4 Painting or ink stamping. Impression stamping and etching are the preferred methods of identifying metallic scrap hardware and raw materials as scrap; painting the item in a conspicuous and permanent manner, and using the word “SCRAP” where feasible is acceptable. This method is particularly suited for use on large items, nonmetallic materials, and materials that are identified on the exterior packaging (e.g., liquids, powders, or hazardous materials).

Cognizant
Performing
Personnel and

I.3.2 Physically segregate all scrap hardware and raw material from acceptable material, as well as from other nonconforming material awaiting disposition.

Marshall Procedural Requirements		
QD01		
Control of Nonconforming Product	MPR 8730.3	Revision: L
	Date: September 22, 2020	Page 35 of 41

SMA

- I.3.2.1 Store scrap items that are not immediately disposed in an enclosed, locked area.
- I.3.2.2 Log all transfers into and out of the storage area.
- I.3.2.3 Barricade scrap items that are too large to be placed in a storage area.
- I.3.2.4 Permanently display signs identifying the area as “restricted access scrap area.”
- I.3.2.5 Limit access to all areas used as scrap storage to personnel authorized by the responsible QA Lead and/or Management.

Cognizant
Performing
Personnel and/or
SMA

- I.3.3 Dispose of scrap hardware and raw material as soon as possible after the decision to scrap the item has been made.
 - I.3.3.1 Disposal will ensure installation of scrap items into the next higher assembly and the use of scrap raw material for manufacturing is made impossible.
 - I.3.3.2 Any method of disposal (e.g., cutting, hammering, drilling, or burning) that ensures that scrap hardware cannot be installed in the next higher assembly and that scrap raw material cannot be used for manufacturing operations is acceptable.

Marshall Procedural Requirements		
QD01		
Control of Nonconforming Product	MPR 8730.3	Revision: L
	Date: September 22, 2020	Page 36 of 41

Appendix J. Disposition and Closure Rationale

Closure Rationale	Description/Use	Required Actions/Approvals
<p>Facility or Test Equipment</p> <p>TDR Only</p>	<p>If the T/S indicates the problem is “nonsupport” from a facility or test equipment, the test engineer reports the trouble to the appropriate facility support organization and obtains remedial action. Once remedial action has been accomplished and a satisfactory retest accomplished, the TDR can be closed.</p> <p>The appropriate closure disposition is “Close this TDR as a facility problem.” Or “Close this TDR as a test equipment problem.”</p>	<p>Closure rationale is signed by the responsible engineer.</p>
<p>Human Factor</p> <p>TDR Only</p>	<p>If a human factor is determined to be the cause of the anomaly, then state that no T/A or GSE damage occurred as a result of the anomaly in the closure disposition. (If an anomaly caused by human factor requires rework, modification, or repair, then initiate a DR against the hardware affected.)</p> <p>Example “Close this TDR as Human Factor.”</p>	<p>(1) Closure rationale is signed by the responsible engineer (2) Additional required signatures include the project Chief Engineer, or designee.</p>

Marshall Procedural Requirements		
QD01		
Control of Nonconforming Product	MPR 8730.3	Revision: L
	Date: September 22, 2020	Page 37 of 41

Closure Rationale	Description/Use	Required Actions/Approvals
<p>Procedure Error</p> <p>TDR Only</p>	<p>If troubleshooting indicates the problem to be caused by procedure error, reference the permanent deviation/mod sheet, MSFC Form 3959, Test Procedure Deviation (TPD), or requirements change which corrects the procedure error in the closure disposition of the TDR.</p> <p>Example, “TPD 23 written to correct procedure. Close this TDR as a Procedure Error.”</p>	<p>(1) Closure rationale is signed by the responsible engineer.</p> <p>(2) When closing a TDR in this way, the test engineer is responsible for ensuring that the deviation correcting the procedure was run, either in the procedure or as portions of the T/S activities.</p> <p>(3) This retest is required to prove that there was in fact a procedure error. Unless this is done, the deviation will not be accepted by SMA for incorporation into the procedure.</p>

Marshall Procedural Requirements		
QD01		
Control of Nonconforming Product	MPR 8730.3	Revision: L
	Date: September 22, 2020	Page 38 of 41

Closure Rationale	Description/Use	Required Actions/Approvals
<p>T/A or GSE</p> <p>TDR Only</p>	<p>If T/S determines the cause of an anomaly to be in a T/A or GSE (assembly, subassembly, component, cable, etc., or test requirement), notify SMA to initiate a DR against the nonconforming item. All removal, replacement, reinstallation, and system retest instructions are a part of the DR disposition. Any breaking of configuration to replace parts will be recorded on the DR.</p> <p>Example “Transfer this TDR to DR #XYZ”</p>	<p>(1) Closure rationale is signed by the responsible engineer.</p> <p>(2) Close the TDR after it is transferred to a DR.</p> <p>(3) Other work operations are permitted to provide remedial actions on TDRs limited to the following cases:</p> <ol style="list-style-type: none"> a. Modification of test equipment. b. Incorporate adjustments/work order, TPS, or other test. c. Adjustments/calibrations on test equipment. d. Leave the TDR open in these cases until the work operations have been completed, a satisfactory retest has been accomplished, and the closure disposition references all associated documentation (such as a work order, TPS, or engineering order), which was implemented to correct the condition.

Marshall Procedural Requirements		
QD01		
Control of Nonconforming Product	MPR 8730.3	Revision: L
	Date: September 22, 2020	Page 39 of 41

Closure Rationale	Description/Use	Required Actions/Approvals
<p>DR Closure</p> <p>DR only</p>	<p>If the nonconformance is in T/A or GSE is either removed (thru such techniques as <i>Repair</i> or <i>Rework</i>) or made consistent with the approved configuration baseline (i.e. <i>Use-as-is</i>, <i>Waiver</i>, or a requirement configuration/specification change). Rework returns the item to conformance with existing approved drawings/specifications.</p> <p>Examples:</p> <p>“Based upon the rework/repair actions completed and successful test, this DR can be closed.”</p> <p>“Close this DR on the basis of conformance to revised drawing 96MXXXXX, Rev X.”</p> <p>“The MRB has approved a disposition of use-as-is, so this DR can now be closed.”</p>	<p>(1) Closure rational is signed by the responsible engineer.</p> <p>(2) Use-as-is and Repair dispositions require MRB approval prior to closure.</p> <p>(3) Waivers or requirement changes approved prior to closure.</p>
<p>Scrap or Ground Test Only</p> <p>DR only</p>	<p>When the all methods of returning the product to conformance are impossible or impractical within programmatic constraints, a disposition of Scrap or – if the product has use for ground testing - Ground Test Only is used.</p> <p>Example: “Downgrade this hardware to Ground Test Only, and close this DR.”</p>	<p>(1) The responsible engineer notifies the project for any scrap above the project’s defined cost thresholds.</p> <p>(2) Closure rational is signed by the responsible engineer.</p>
<p>Return to Vendor</p> <p>DR only</p>	<p>Items are returned to the vendor thru the Contracting Officer in accordance with the contract.</p> <p>Example: “The hardware is being returned to the vendor, and this DR can be closed.”</p>	<p>(1) The responsible engineer initiates communication to the CO.</p> <p>(2) Closure rational is signed by the responsible engineer.</p>

Marshall Procedural Requirements		
QD01		
Control of Nonconforming Product	MPR 8730.3	Revision: L
	Date: September 22, 2020	Page 40 of 41

Closure Rationale	Description/Use	Required Actions/Approvals
<p>Other - Explainable Condition</p> <p>DR, TDR, or SQUAWK</p>	<p>If the nonconformance documented, after investigation or T/S proves to be a normal condition not requiring remedial action, then the nonconformance is closed as an explainable condition.</p> <p>(1) Provide a clear, concise explanation of why there is no nonconformance and state that there is no effect on system performance as a part of the T/S summary or engineering conclusion.</p> <p>(2) The correct final disposition is “Close this DR/TDR/SQUAWK as an Explainable Condition.”</p>	<p>(1) Closure rationale is signed by the responsible engineer.</p> <p>(2) Obtain additional signatures of the department manager, supervisor, or test conductor. Project Chief Engineer, or designee.</p>
<p>Other - Unexplained Condition</p> <p>DR or TDR</p>	<p>When all T/S possibilities have been exhausted with no definite conclusion as to the cause of the anomaly, the DR/TDR can be closed as an “Unexplainable Condition” as follows:</p> <p>(1) Provide a statement by the test engineer that cause cannot be established and a statement describing the most likely cause.</p> <p>(2) Include the design organization’s risk assessment with DR/TDR closure, and the potential failure modes and any possible effect on missions.</p> <p>(3) A closure disposition of “Close this DR/TDR as an Unexplainable Condition” approved by the appropriate Engineer.</p>	<p>(1) Closure rationale is signed by the responsible engineer.</p> <p>(2) Refer the risk statement to the project for consideration of inclusion in project risk management.</p> <p>(3) Obtain the approval of the project Chief Engineer.</p>

Marshall Procedural Requirements		
QD01		
Control of Nonconforming Product	MPR 8730.3	Revision: L
	Date: September 22, 2020	Page 41 of 41

Closure Rationale	Description/Use	Required Actions/Approvals
<p>Other – Investigation Complete</p> <p>NDIR only</p>	<p>When the investigation is complete, and the part identified in Block 11 has been returned to configuration, the NDIR can be closed as “Investigation Complete” with a simple summary statement.</p> <p>Example: “Thru the investigatory steps above, no discrepancy has been found. The hardware has been returned to the approved configuration, and retest requirements have been completed. Close this NDIR”</p>	<p>Closure rational is signed by the responsible engineer.</p>
<p>Other – Transfer to DR</p> <p>NDIR or TDR</p>	<p>When a nonconformance is determined, the TDR/NDIR can be closed as “Transfer to DR”. The responsible engineer:</p> <ol style="list-style-type: none"> (1) Provides a summary of the steps performed that demonstrated a specific nonconformance; and (2) Enters a statement to transfer to close the TDR and transfer subsequent actions to a specific DR number. 	<p>Closure rational is signed by the responsible engineer.</p>