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A	N/A	Initial Release	B. Klatt		UNK
B	N/A	General Review	B. Klatt		03/09/06
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Massachusetts Institute of Technology

Kavli Institute for Astrophysics and Space Research (MKI)

Nonconforming Material and Nonconforming Material Reports

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Revision F
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Preface

This document was taken from LSE Specification QAP-F-601 dated 09/28/90.

Revision A was the Initial Release written by Brian Klatt.

Revision B issued a General Review on 03/09/06.

Revision C issued a Corrected format and clerical errors on 09/17/13.

Revision D issued an updated format and general editorial update on 07/16/14.

Revision E issued to define major and minor non-conformances on 2/4/16.

Revision F issued a major rewrite update to describe the corrective action and preventative action policy and to revise all forms on 5/5/16.

1.0 Scope

This procedure describes the methods used to control, disposition, and address nonconforming product at MKI for flight projects. *Product* may collectively describe components, parts, materials, assemblies, or equipment. This process may also be applied to non-hardware problem issues. The procedure may be adjusted to accommodate sponsored project requirements.

The reporting of failures, although closely related, is not a subject of this procedure.

2.0 Applicable Documents

99-03001	Fabrication Documentation
99-02004.01	NONCONFORMING MATERIAL REPORT (Form)
99-02004.02	NONCONFORMING MATERIAL REPORT LOG (Form)
99-02004.03	SUPPLIER CORRECTIVE ACTION REQUEST (Form)

3.0 Overview

Product is nonconforming if it does not meet requirements or specifications; is defective or damaged; or is otherwise unsuitable for flight use.

Nonconforming product is identified and controlled to prevent mixing with conforming product. The product is then dispositioned. Cause of the nonconforming product is reviewed and corrections are implemented to prevent further reoccurrence and other related occurrence.

4.0 Responsibility

Incoming inspection or receiving personnel should initiate NMRs for issues related to nonconforming product identified upon receipt.

Operations personnel should initiate NMRs for issues related to nonconforming product identified during assembly or integration operations.

Quality Assurance (QA) or Engineering personnel should initiate NMRs for issues related to nonconforming product identified during inspection or test operations.

All MKI Management and Staff may initiate NMRs for an issue of concern.

5.0 Containment Action

Containment Action is the initial, immediate action initiated to address a nonconformance. This action should provide an accurate, detailed description of the current issue and its effect. This realization is important to prevent immediate reoccurrence impacting similar product and for risk mitigation. The product shall be identified, controlled, and dispositioned.

A Nonconforming Material Report (NMR) shall be completed to document nonconforming flight product and the follow-up actions. The use of the report form is described in Section 9.0.

5.1 Identification

Nonconforming product shall be clearly identified to communicate its current status; this may include a notice of hold or disposition. The product or its storage bin/location shall be physically tagged with a

notice of nonconformance. The NMR Form shall remain with the product traveler and be included in the system end item data package.

5.2 Control

Nonconforming product shall be segregated from conforming product to avoid the use, integration, or shipment of the nonconforming product. Best practice is to place the nonconforming product in a controlled access area or cabinet. If sensitive or large products can't be safely moved, extra identification controls shall be implemented to prevent misidentification; this may include signs, covers, or tags. Personnel whose work may be affiliated with the product should be advised of the product status.

5.3 Disposition

Mission Assurance with concurrence from engineering or management directs the immediate containment of the product or issue. Containment efforts seek to resolve and mitigate risk. Additional analysis or review by the team will direct the disposition of the product per one of the following disposition actions:

Minor Nonconformances

- **Rework to Specification:** Rework is action taken on a nonconforming product so it will fulfill the originally specified requirements without an adverse effect on safety, performance, interchangeability, reliability, or quality. Material that has been satisfactorily reworked is returned to the normal flow of operations after inspection and release by QA.
- **Return to the Vendor (RTV):** Nonconforming product that was sourced from a supplier may be dispositioned for product return. This is done when the discrepancy is evidently the suppliers responsibility and MKI rework, scrap, or Material Review Board (MRB) action are not recommended. A supplier corrective action request is typically submitted along with the return.
- **Scrap:** Nonconforming product is discarded if the product is unusable or not recoverable for flight use. The product shall be directly, permanently marked for identification of scrap status and segregated from other product. If there are extended concerns for mixing or misuse, the product should be destroyed.

Major Nonconformances

Nonconforming product not dispositioned as a minor nonconformance shall be dispositioned per a MRB. If there is a question or disagreement regarding disposition of any material, it is referred to the MRB. The following disposition actions may only be authorized by the MRB:

- **Repair:** Action taken on a nonconforming product so it will fulfill the intended usage requirements, although it may not conform to the originally specified requirements. Material that has been satisfactorily repaired is returned to the normal or a designated special flow of operations after inspection and release by QA.
- **Use-as-is:** The nonconforming product is released for flight use without further action.

MRB Process

- The MKI Material Review Board consists of the Mission Assurance Manager, the appropriate Design or Test Engineer, and the System Engineer, as a minimum. This board may be augmented with knowledgeable individuals who are intimately involved with a specific discrepancy. The Ground Support Equipment Engineer, Government Representative, Project Engineer, Project Manager, and

Manufacturing Manager are examples of such augmentation. Dispositions of Major Nonconformances usually require sponsor participation.

- The decisions of the MRB shall be unanimous or the matter will be referred to the sponsoring project office for adjudication. The MRB may disposition product with any of the five disposition decisions. The decisions of the MRB shall be documented in the nonconforming material report and include supporting data as appropriate.

6.0 Corrective Action

Corrective Action is the process taken to address the root cause of a nonconformance so it does not reoccur.

Typical Corrective Actions:

1. Collect the appropriate team to address the problem
2. Identify and describe the problem
3. Implement additional containment actions as needed
4. Utilize cause analysis tools to identify the root cause
5. Determine corrections and analyze effectiveness
6. Implement and validate the selected corrections
7. Expand the corrective actions to similar product

7.0 Preventative Action

Preventative Action is the process taken to avoid an identified potential risk. Preventative Action is performed and documented on a project basis; it is not documented with the NMR Form.

Typical Preventative Actions:

1. Identification of potential risks with tools such as a Failure Mode and Effect Analysis, Fault Detection and Correction Plans, or Project Risk Lists.
2. Collection of data to determine occurrence probability, opportunity for detection, and severity of risk impact.
3. Mitigation of risks:
    a. Avoidance
    b. Acceptance
    c. Transfer
4. Document the improvement actions and review effectiveness. This may be captured within the related risk analysis/plan/list documents.

8.0 Documentation

Table 8-1 details the requirements for nonconformance report distribution.

The NMR/MRB File is the formal record for the NMR Forms; they are maintained by Mission Assurance.

The NMR for incoming product (other than Scrap and RTV) is kept with the product in bonded stores. When the product is kitted, the NMR is kept with the Assembly Work Order (AWO).

The NMR for product in assembly/integration/test (other than Scrap and RTV) is kept with the AWO.

Table 8-1: Nonconformance Report Distribution Requirements

NMR Disposition	To Supplier	In NMR/MRB File	With AWO	With Bonded Stock
RTV	X	X		
Scrap		X		
Rework		X	X	X
Repair		X	X	X
Use As Is		X	X	

9.0 Nonconforming Material Report Instructions

The following details the entries for blocks 1 through 37 on the Nonconforming Material Report, see Figure 9-1; enter 'N/A' if data is not applicable/available:

Table 9-1: Nonconforming Material Report Instructions

Block#	Data Item	Form Entry Detail	Responsible Function
1, 2	Originator & Date	Name of the NMR initiator; date of report initiation	ORIGINATOR
3	Project	Project name from the AWO or the Purchase Order Number	ORIGINATOR
4	NMR#	Record NMR record number obtained from the NMR Log	ORIGINATOR
5	Description	Product title or name	ORIGINATOR
6, 7	P/N & Rev	Product part number and revision	ORIGINATOR
8, 9	*(Quality Assurance)* Name & Date	QA representative signs/dates to acknowledge initiation of NMR	QA
10-17	*PROCUREMENT DETAIL*	*ENTER DATA IN THIS SECTION IF THE ISSUE IS RELATED TO INCOMING PRODUCT.*	*ORIGINATOR*
10	Supplier	Supplier name, as noted on the PO	ORIGINATOR
11	PO#	Purchase Order number	ORIGINATOR
12	Contact	Name of person who ordered the product	ORIGINATOR
13	L/N	Product source lot/batch number	ORIGINATOR
14	S/N	Product serial number	ORIGINATOR
15	#RECD	Product quantity received from the supplier	ORIGINATOR
16	#ACC	Product quantity accepted at the initial lot inspection	ORIGINATOR
17	#REJ	Product quantity rejected at the initial lot inspection	ORIGINATOR
18	ITEM#	Designate an item number or list S/N for each discrepancy	ORIGINATOR
19	QTY	Product quantity applicable to each discrepancy	ORIGINATOR
20	DESCRIPTION	Short informal note describing the product	ORIGINATOR
21	NONCONFORMANCE	Summarized nonconformance description; quote requirements and specifications	ORIGINATOR
22	DISPOSITION	Disposition action per discrepancy; use the noted titles; REPAIR and USE AS IS are only permitted by MRB approval	ENGINEERING
23	N/A	Check this box if an MRB review was not called	ENGINEERING
24, 25	APPROVAL & DATE	MRB members sign and date to indicate approval of the disposition noted in the previous section; clarify membership titles in the GROUP field	MRB CHAIR
26	ITEM#	The item number as is in the FAILURE/DISPOSITION DETAIL	ENGINEERING
27	ROOT CAUSE	Root Cause identified per procedure Section 6.0	ENGINEERING
28	CORRECTIVE ACTION	Corrections identified per procedure Section 6.0; may also list verification of the corrective action as needed	ENGINEERING
29, 30	Name, Date	Signature/Date of approver of the Operation Instructions	ENGINEERING
31	OP#	Line number for correction actions: 1, 2, 3…	ENGINEERING
32	OPERATION INSTRUCTIONS	Rework/Repair/Inspection instructions per ENG/MRB	ENGINEERING
33, 34	TECH & DATE	Initial/Date of individual performing the operation	OPERATIONS
35	INSP	Initial/Stamp of QA approval of the operation	QA
36, 37	Name, Date	Signature/Stamp & Date of QA approval of actions/documentation completion and NMR closure.	QA

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Kavli Institute for Astrophysics and Space Research
NONCONFORMING MATERIAL REPORT

Originator:	1	Date:	2	Project:	3	NMR#:	4

PRODUCT DETAIL				QUALITY ASSURANCE	
Description:	5	P/N: 6	Rev.: 7	Name: 8	Date: 9

PROCUREMENT DETAIL									
Supplier:	10		PO#:	11		Contact:	12		
L/N:	13	S/N:	14	#RECD:	15	#ACC:	16	#REJ:	17

FAILURE/DISPOSITION DETAIL

ITEM#	QTY	DESCRIPTION	NONCONFORMANCE	DISPOSITION
18	19	20	21	22

*Disposition categories: Rework, RTV, Scrap, *Repair, *Use As Is*

MRB DETAIL		N/A 23
GROUP	APPROVAL	DATE
Quality Assurance	24	25
Engineering:		
Engineering:		
Other:		

CAUSE/CORRECTION DETAIL

ITEM#	ROOT CAUSE	CORRECTIVE ACTION
26	27	28

REWORK/REPAIR DETAIL

Eng. Preapproval	Name: 29	Date: 30

OP#	OPERATION INSTRUCTIONS	TECH	DATE	INSP
31	32	33	34	35

QA APPROVAL/CLOSURE

Name:	36	Date:	37

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FIGURE 9-1: Annotated Nonconforming Material Report

10.0 Acronyms

MKI	Kavli Institute for Astrophysics and Space Research
NMR	Nonconforming Material Report
QA	Quality Assurance
RTV	Return to the Vendor
MRB	Material Review Board
AWO	Assembly Work Order