Rev.	ECO	Description	Author	Approved	Date
A		Initial Release	B. Klatt	W. Mayer	03/02/92
B		General Editorial Update	B. Klatt	M. Bautz	07/16/14
C		Technical update to include audit areas	B. Klatt	M. Bautz	12/16/14
D	37-358	New audit items added	M. Gabutti	R. Goeke	02/18/16
E	37-379	Technical updates	M. Gabutti	R. Goeke	04/14/16

Massachusetts Institute of Technology

Kavli Institute for Astrophysics and Space Research (MKI)

Audit System

Dwg. No. 99-02005
Revision E
April 1, 2016

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Preface

Revision A was the Initial Release of 99-02005 (ECO #64-189) written by Brian Klatt 01/09/92 and checked by W. Mayer on 03/02/92.

Revision B issued a new format and general editorial update on 07/16/14.

Revision C issued a technical update to include audit areas on 12/16/14. Changes include added Flowdown to the Procurement System 4.2, added Connector Mate – Demate Log to 4.4 Fabrication Documentation, added 4.7 Nonconformances and 4.8 Government Industry Data Exchange Program (GIDEP)

Revision D issued changes and updates to the Procurement System 4.2, Software 4.6 and GIDEP 4.8 also added new audit items Clean Rooms 4.9, ESD protected areas 4.10 and Suppliers of Qualified Items, 5.1

Revision E issued changes to 3.2 Schedule Criteria to reflect the addition of an audit schedule. Also technical updates were made to MKI internal audit items 4.1, 4.2, 4.3 ,4.4, 4.5, 4.6, 4.7, 4.8, 4.9, 4.10, 5.1

1.0 Scope

This procedure establishes the frequency, documentation, and items subject to audit on MKI Flight Programs.

2.0 Applicable Documents

None

3.0 General

3.1 Responsibility

All audits will be performed under the auspices of the Mission Assurance Manager. Normally an Inspector, Quality Engineer, or the Mission Manager will perform audits. This does not limit audits from being performed by persons outside of Mission Assurance. Suppliers of standard and qualified parts and materials under the surveillance of the Department of Defense will not be audited by MKI.

3.2 Schedule Criteria

Audit frequency is dependent upon the criticality of the activity. An internal audit schedule is maintained by Mission Assurance and internal audits are performed according to the audit schedule. Due to the nature of experimental research projects, i.e. usually one of a kind, volume production surveillance at suppliers is not warranted. Therefore, audits at suppliers will generally be limited to visits when pre-seal or source inspection is otherwise scheduled.

An unscheduled audit may be performed if:

a. The quality or reliability of the product changes
b. Any organization fails to take corrective action
c. The product is the subject of an alert or problem advisory
d. The sponsor requests an audit
e. Fabrication facilities are moved
f. Substantial Quality Assurance changes are implemented

3.3 Procedure

3.3.1 Random Audits

The auditor randomly performs a detailed, step-by-step evaluation of the area, or product that has been selected for audit. In addition, he/she may audit compliance with specifications, processes, and/or procedures.

3.3.2 Conformity

During an audit, the auditor evaluates conformity with, and effectiveness of, organizational procedures.

3.3.3 Audit Report

An audit report is generated for each audit performed, documenting the requirements and results of the audit.

3.3.4 Nonconformity

Nonconformity found by the auditor is reported in writing to the responsible area supervisor on a corrective action report.

3.3.5 Audit Report Log

The audit report is entered in the audit report log and filed in the audit files. A complete history of all audits is maintained in the audit files.

3.3.6 Audit Summaries

Audit summaries are reported in the Performance Assurance section of the project monthly status report.

4.0 MKI Internal Audits

4.1 Configuration Management System

Items for audit may include, among others, the following:

a. Required signature of the chairman of the CCB on Engineering Change Orders (ECO's)
b. Drawings and Specifications versus ECO
c. Frequency: Annually

4.2 Procurement System

Items for audit may include, among others, the following:

a. Parts and materials list versus purchase requisition
b. Email trace of the purchase requisition requestor
c. Statement of standard procurement clauses on each purchase order plus applicable procurement clauses which should be considered for inclusion on specific purchase requests for space-flight items
d. Frequency: Annually

4.3 Fabrication Area

Items for audit may include, among others, the following:

a. Cleanliness (food, drinks, traffic, etc.)
b. Calibration of tools and test equipment
c. Certification of technicians and inspectors
    1. Soldering
    2. Wiring and harnessing
    3. Crimping and wirewrap
    4. Conformal coating and staking
d. Check that materials with a limited shelf life have not exceeded expiration date
e. Check grade and type on chemicals, solvents and gases
f. Frequency: Annually

4.4 Fabrication Documentation

Items for audit may include, among others, the following:

a. Assembly Work Order (AWO)
    1. Completeness
    2. Correct revision on drawings, specifications, and procedures used for fabrication
b. Assembly Fault Log
c. Kit Tag
d. Potting Log
e. Configuration Traceability List
f. Technician signatures and dates
g. Inspectors signatures or stamps and dates
h. Connector Mate – Demate Log
i. Frequency: Annually

4.5 Inspection Documentation

Items for audit may include, among others, the following:

a. Incoming Inspection
    1. Inspection report
    2. Status tag
    3. Shelf life tag
    4. Reject tag
b. In-process Inspection
    1. AWO inspection points
    2. Government Source Inspector inspections
c. Frequency: Annually

4.6 Software

Items for audit may include, among others, compliance with:

a. Project defined coding style such as Linux kernel coding style.
b. Project defined software version control such as “Git” and “Gerrit”
c. Project defined nonconformance reporting such as “Trac”
d. Project defined corrective action reporting such as “Trac”
e. Test Plan for MKI Software or NASA NPR-7150
f. Frequency: Annually

4.7 Nonconformances

Items for audit may include, among others, the following:

a. Nonconforming Material Reports (NMR) and log records
b. NMR forms with signature and date
c. Root cause analysis
d. Corrective action and verification
e. Frequency: Annually

4.8 Government Industry Data Exchange Program (GIDEP)

Items for audit may include, among others, the following:

a. NASA notification of GIDEP alert
b. Record of alert response in timely manner
c. Record of parts batch-list submission before flight use
d. Frequency: Annually

4.9 Clean Rooms

Items for audit may include, among others, the following:

a. Cleanroom certification
b. Cleaning schedule
c. Cleanroom particle monitoring logs
d. Training records for all personnel using the clean rooms
e. Non-Volatile Residue testing report
f. Frequency: Annually

4.10 ESD protected areas

Items for audit may include, among others, the following:

a. Records of compliance verification monitoring
b. Training records for all personnel performing work in the ESD protected area.
c. Frequency: Annually

5.0 Suppliers and Subcontractors

5.1 Suppliers of Qualified Items

MKI will not perform audits of suppliers listed on the US Department of Defense Product Qualification Program, or for products listed on the NASA Parts Selection List or the GSFC Qualified Parts List Directory.

5.2 Suppliers of Nonqualified Off-the-Shelf Items

Items for audit may include, among others, the following:

a. Test equipment calibration
b. Configuration control
c. Inspection documentation
d. Fabrication documentation
e. Purchase order compliance
f. Fabrication area (see 4.3 above)
g. Frequency: MKI will audit this category of supplier during regularly scheduled visits for pre-seal or source inspection

5.3 Subcontractors

Items for audit may include, among others, the following:

a. Test equipment calibration
b. Configuration control
c. Inspection documentation
d. Fabrication documentation
e. Purchase order compliance
f. Fabrication area (see 4.3 above)
g. Frequency: As needed

6.0 Audit Records

All audit records are maintained by Mission Assurance. The audit log is a notebook listing audits performed. Audit reports are filed chronologically.

7.0 Forms

1. Internal Audit Report
2. Audit Log
3. Internal Corrective Action Request
4. Supplier Corrective Action Request
5. Corrective Action Request Log

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INTERNAL AUDIT REPORT

Audit Area/ Supplier:

Audit Area Supervisor/Contact:

Audit Type

Process ___ Test ___ Procedure ___.

Product ___ Area ___ Other _____.

AUDIT ITEM	REQUIREMENT	RESULTS	Conformance	Non-conformance

Audit Performed by: **Date**

SUMMARY

Acceptable ____ Not Acceptable ____ Corrective Action Required? Yes ____ No ____.

AUDIT LOG

Audit Area	**Auditor**	**Date Performed**	**C/A Req'd** (yes or no)	**C/A Due Date**	**Completion Date**

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INTERNAL
CORRECTIVE ACTION REQUEST

TO:	Request Date_____. Audit dated_____.
Area, Process, Drawing, Operation, or Part Affected: Name Number Serial Number	
DESCRIPTION OF CONDITION:	
ORIGINATOR DATE	PERFORMANCE ASSURANCE MANAGER DATE
RECIPIENT COMPLETE THIS SECTION Explanation of cause of discrepancy and corrective action taken to prevent recurrence Implementation date:	
SIGNATURE DATE	

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SUPPLIER
CORRECTIVE ACTION REQUEST

SUPPLIER:	Purchase Order Number_____. Part Number_____. Nomenclature_____. Audit dated_____.

THE MATERIAL RECEIVED OR AUDIT REFERENCED ON THIS REPORT WAS FOUND TO CONTAIN THE DISCREPANCY LISTED BELOW. IT IS REQUESTED THAT POSITIVE CORRECTIVE ACTION BE TAKEN AND A REPORT OF YOUR FINDINGS AND INTENTIONS BE MADE TO THE MANAGER OF PERFORMANCE ASSURANCE WITHIN TWO WEEKS AFTER RECEIPT OF THIS REQUEST.

DISCREPANCY:

ORIGINATOR	DATE

SUPPLIER COMPLETE THIS SECTION

Explanation of cause of discrepancy and corrective action taken to prevent recurrence

Implementation date:

AUTHORIZED SIGNATURE TITLE
DATE

CORRECTIVE ACTION REQUEST LOG

DATE OF REQUEST	SUPPLIER OR ACTION ASSIGNED TO:	SUBJECT	DATE OF CLOSURE