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REVISION HISTORY			
REV	Description of Change	Author	Effective Date
0	Initial Release	L. Williams	5/27/98
1	Clarifications based on 7/98 DNV Audit and 6/98 Internal Audit (see DCR 98-022). Major rewrite.	M. Hines	9/18/98
2	Clarifications based on 11/98 DNV Audit (DCR 98-065)	R. Serrano	12/18/98
3	Add reference to 53.ARC.0005 in paragraph 6.1.1 (DCR 99-004)	R. Serrano	02/26/99

REFERENCE DOCUMENTS	
Document Number	Document Title
53.ARC.0000	Ames Research Center Quality Manual, Section 4.11
53.ARC.0005	Document and Data Control
53.ARC.0016	Quality Records

Documents referenced in this procedure are applicable to the extent specified herein.

## 1. Purpose

This procedure establishes the process to control, calibrate, and maintain Inspection, Measuring, and Test Equipment (IM&TE) and associated software in accordance with the Ames Research Center (ARC) Quality Manual.

## 2. Scope

This procedure applies to organizations using IM&TE. Only IM&TE used to directly evaluate and assure the quality of ARC products and services is covered by these procedures. This procedure shall apply to ARC organizations calibrating IM&TE in accordance with the above criteria.

## 3. Definitions and Acronyms

- |     |             |   |
|-----|-------------|---|
| 3.1 | Calibration | Set of operations which establishes, under specified conditions, the relationship between values indicated by a measuring instrument or measuring system and the corresponding standard or known values derived from the standard |
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3.2	Calibration Interval	Designated period of time between calibration; IM&TE can be calibrated before each use if specified in lower-level procedures
3.3	Calibration Lab	Organization that performs the calibration of IM&TE. This organization can be an ARC functional area, or an on-site or off-site contractor.
3.4	Calibration Procedures	Detailed processes used in the calibration of IM&TE against certified calibration standards which include the check method, acceptance criteria, equipment identification and type, and actions required when results are unsatisfactory
3.5	Calibration Records	Records of IM&TE calibration status as-found, date calibrated or date due for calibration, and other pertinent information
3.6	IM&TE User	On-site personnel or organizations using IM&TE
3.7	Inspection, Measuring, and Test Equipment (IM&TE)	Measuring instruments, measurement standards, test software, comparative references, and auxiliary apparatus necessary to verify that a product or process conforms to requirements
3.8	Responsible Manager	Person having the responsibility and authority to accomplish/implement a specific activity or process (includes organizational line managers, project managers, etc.)

#### 4. Flowchart

There is no flowchart required for this document.

#### 5. Responsibilities

- 5.1 **Responsible Manager** shall:
- ensure compliance with the requirements in this procedure.
- 5.2 **Performing Calibration Labs** shall:
- be compliant with the requirements in this procedure unless specifically exempted by contract.
- 5.3 **IM&TE User's** responsibilities are defined in the Procedure section of this document.



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## 6. Procedure

6.1 The Responsible Manager shall:

6.1.1 Ensure that documented procedures are established and maintained in accordance with the requirements in this procedure **and controlled per 53.ARC.0005**,

6.1.2 Ensure that IM&TE is calibrated in accordance with this procedure if the equipment is used to generate a measurement necessary to demonstrate product conformance to requirements,

6.1.3 Determine the frequency and extent of testing required to ensure that software or hardware used to inspect or test product is capable of verifying the acceptability of the product; keep Quality Records of the testing of such software or hardware; and,

6.1.4 Ensure that categories of IM&TE that need to be calibrated in accordance with this procedure are identified in lower-level procedures, work instructions, etc. IM&TE used for indication only that does not require calibration may be identified with a "Calibration not Required" or "For Indication Only" sticker.

6.2 The IM&TE User shall:

6.2.1 Determine the necessary accuracy or allowable uncertainty for measurements critical to verification of product or process conformance to requirements whenever products or processes change,

6.2.2 Use only IM&TE that is capable of meeting the accuracy and uncertainty requirements determined above,

6.2.3 Determine the calibration interval and the acceptable tolerances for the IM&TE and give this information to the calibration lab,

6.2.4 Submit IM&TE for calibration prior to initial use after acquisition and at the required calibration intervals,

6.2.5 Use only IM&TE calibrated in accordance with this procedure when required by lower-level procedures to verify conformance to specified requirements,

6.2.6 Reassess calibration and measurement needs when processes or product requirements change, and

6.2.7 Handle and store IM&TE in such a way that accuracy and fitness for use is maintained,

6.2.8 Ensure environmental conditions are suitable for the use of IM&TE, and

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6.2.9 Safeguard IM&TE against adjustments that would invalidate calibration.

6.3 Equipment Found Out-of-Tolerance

6.3.1 The calibration lab shall provide the IM&TE User with notification of equipment found out-of-tolerance during calibration.

6.3.2 The IM&TE User shall:

6.3.2.1 Analyze and document the impact on product quality of the IM&TE being out of tolerance,

6.3.2.2 If the out-of-tolerance condition could have impacted product quality, take appropriate action based on the significance of the error and the instrument's application, and

6.3.2.3 Adjust the calibration interval if necessary and request the change from the calibration lab.

6.4 The calibration lab (whether internal, external, or the IM&TE User) shall:

6.4.1 Define and document the calibration procedures employed in calibration and ensure traceability to an international or national standard,

6.4.2 Ensure environmental conditions are suitable for the calibrations, inspections, measurements, and tests carried out,

6.4.3 Safeguard calibration inspection, measuring, and test facilities, including hardware and software, against adjustments that would invalidate the calibration,

6.4.4 Provide the IM&TE User with documentation of the calibration status, including information on equipment that could not be calibrated or was out-of-tolerance as found, and the date calibrated (for IM&TE calibrated before each use) or date due for calibration and calibration interval (this information is a Quality Record),

6.4.5 Place a calibration sticker on the IM&TE which shows either the date calibrated or the date due for next calibration if appropriate,

6.4.6 Keep records of the calibrations performed, and

6.4.7 Determine and document IM&TE recall procedures to notify the IM&TE User when calibrations are due.

6.5 Calibration Data for Customers



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Where specified by, and to the extent specified in, the customer agreement, technical data pertaining to the calibration of IM&TE shall be made available to the customer.

## 7. Metrics

There are no metrics required for this document.

## 8. Quality Records

The following Quality Records shall be generated and managed in accordance with 53.ARC.0016.

Required Record	Custodian
Record of calibration	Calibration lab, or the IM&TE User if the calibration lab is off-site
Record of testing of software or hardware used to inspect product	User of software or hardware

## 9. Forms

There are no forms required for this document.