

SELECTION, CALIBRATION, USE, CONTROL, RECALL, PROCUREMENT, AND STORAGE OF MEASURING AND TEST EQUIPMENT (M&TE)

LMS-CP-0506
Revision J: COD
Expires: 3/21/2014

Objective:

- to provide the LaRC research community with high quality, reliable calibration services that meet the performance requirements of the measurement application and requirements of NPD 8730.1
- to ensure all M&TE (including safety related instruments) that requires calibration has a valid "Designated User" and "Branch Metrology Representative" assigned, is classified correctly for Calibration requirements, is calibrated with acceptable records, is labeled properly, and is entered into the Langley Metrology Information System (MIS) database prior to use

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Approval Original signed on file July 12, 2012
Associate Director Date

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Table 1: M&TE Category, Label, Record, and Storage Requirements

General Information

The following records are generated by this procedure and should be maintained in accordance with LPR 1440.7:

- Calibration Records
 - LF 52, "Shipping/Transfer Document"
 - LF 145, "Maintenance Shipping Form"
 - LF 165, "Work Order and Shipping Memorandum"
- Calibration Task Descriptions
 - Task Description training and competence
 - LF 286, "Calibration Task Description Requirements Checklist"
 - LF 231, "LaRC Calibration T.D. Record Form for Unit Under Test (stand alone device)"
 - LF456, "LaRC Calibration T.D. Record Form for System Calibrations"
 - Task Description Limited Calibration Approval
- Expired Calibration Justification
- M&TE used in test list
- Out of Tolerance Evaluation

General Notes

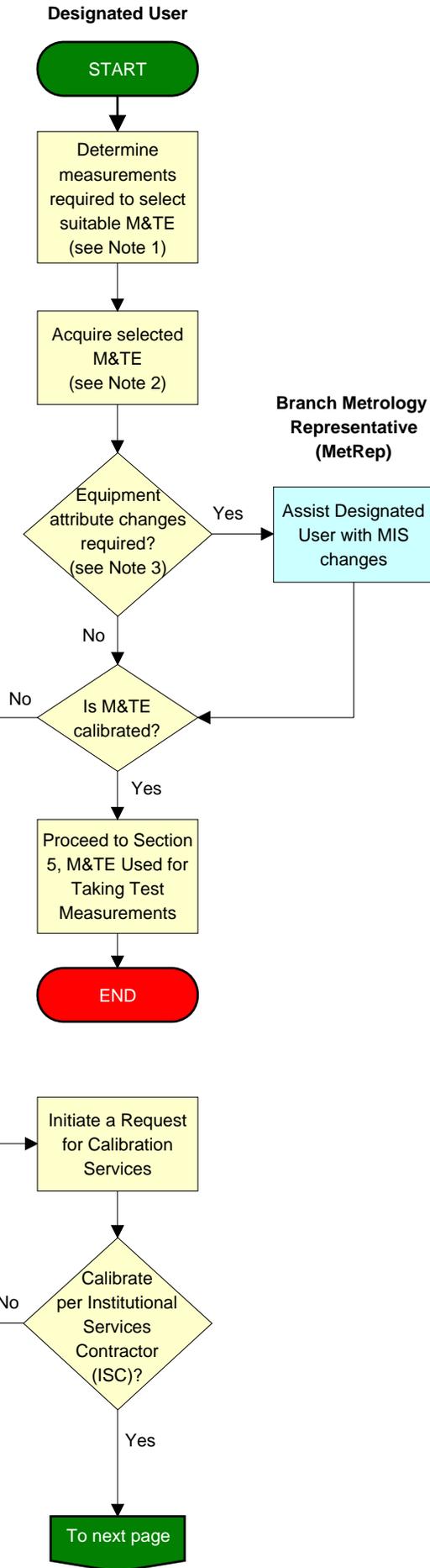
- The current MIS is Equipment Measurement Information Technology (EMIT) and can be accessed at <https://emit.ndc.nasa.gov>.
- Designated Users of M&TE shall be familiar with where and when M&TE assigned to them is being used.
- Personal Tools are not to be used as M&TE.
- Calibration intervals are established by the Metrology Services Contractor per Statement of Work (SOW).
- Metrology Quality Assurance office supplied labels may be obtained from Branch Metrology Representatives (MetReps)
- Calibration Procedures are available through links on the EMIT website.
- Certified Data Acquisition (CERDAAC) Electronic Shipper is available at www.cerdaac.simco.com for pickup and delivery of M&TE.
- Records generated by Functional Checks, Check Standard Calibrations, frequent on-site system calibrations or verifications; will be maintained by the organizational unit. These records shall be identified, stored, and maintained in such a way that they are readily retrievable. Facilities also shall provide a suitable environment to minimize damage and prevent loss.
- Wind Tunnel Balances are used by following LMS-OP-0513, "Strain Gage Balance Inventory Management."

Governing Documents

- NPD 8730.1, "Metrology and Calibration"
- LAPD 8730.1, Metrology and the Control of M&TE

Applicable Standards

- ANSI/NCSL Z540.1-1994 (R2002), "General Requirements for Calibration Laboratories and Measuring and Test Equipment"
- ANSI/NCSL Z540.3-2006, "Requirements for the Calibration of Measuring and Test Equipment"
- ANS/ISO/IEC 17025:2005, "General Requirements for the Competence of Testing and Calibration Laboratories"
- AS9100C SAE Aerospace, "Quality Management Systems - Requirements for Aviation, Space and Defense Organizations"



Note 1

Equipment selected to perform measurements associated with the following functions shall be capable of satisfying measurement application performance requirements (e.g. environmental conditions, accuracy, range, resolution, response time) and be classified by the Designated User as Category 1 or 2 in the MIS; the equipment also shall have ANSI/NCSL Z540.1-1994 compliant calibration records and LMS compliant labels affixed prior to use. ANSI/Z540.1-1994 is available through the NASA Standards and Technical Assistance Research Tool on the LMS web site (<http://standards.nasa.gov/authentication/login>). See Table 1 for M&TE Category definitions including label, record, and storage requirements.

Functional areas requiring calibrated (Category 1 or 2) M&TE: (reference NPJ 8730.1)

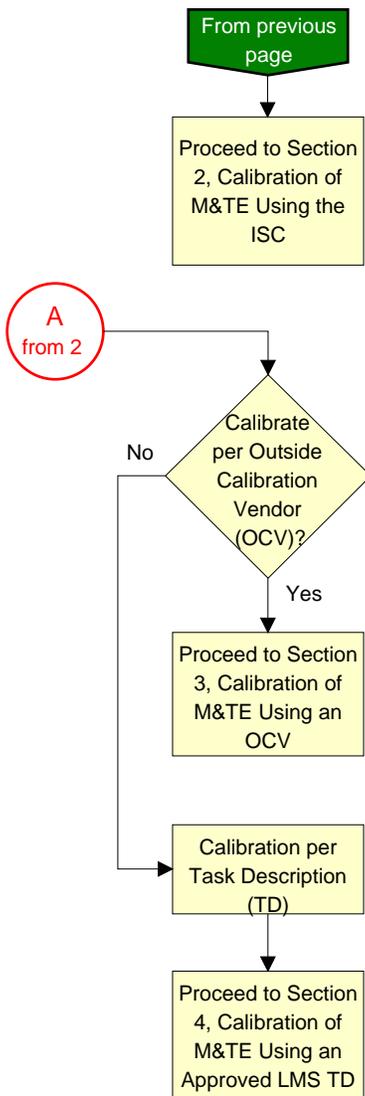
- Testing, qualification, certification, and/or acceptance measurements of flight hardware, ground support equipment, test systems, or other flight-related products
- Measurements essential to the safety of personnel and the public or for the protection of Government or private property, including hazardous and/or critical applications.
- Operation of telecommunications and transmission systems where exact signal interfaces and circuit confirmations are essential to mission success.
- Research and technology development (see NPR 7120.8), manufacturing, inspection, testing, operations, maintenance, support, or other applications where the accuracy of measurements is essential to achieve mission success.
- NASA publications or other documents released for external review whose conclusions/recommendations depend upon the accuracy of measurement results and that impact the safety or success of NASA missions. Excluded are preliminary research papers and research instruments under development that have not had traceable units of measurement established.
- Physical measurements used to apportion, levy, or otherwise assign cost(s), or ensure local, State, or Federal regulatory compliance.

Equipment that is used in applications where substantial accuracy is not required (used for "indication only" purposes in non-hazardous, non-critical applications) does not require compliant calibration records but shall be labeled with a Designated User authorized "Calibration Not Required" label. See Table 1 for M&TE Category N requirements.

NOTE: Industrial controls are not part of the calibration system and are not categorized in the MIS unless specifically requested by a Designated User. Industrial controls are maintained in the MAXIMO database and are normally used to establish approximate conditions that are then accurately monitored, as needed by Category 1 or 2 M&TE.

See LAPD 8730.1, "Metrology and the Control of Measuring, and Test Equipment" for responsibilities of the Designated User.

Designated User



Note 2

When acquiring existing LaRC owned M&TE not already assigned to you, contact your Branch MetRep to arrange transfer from current Designated User and also request MIS updates. For short term temporary M&TE loan arrangements, tracking and accountability is the responsibility of the loaning organization and does not require MIS updates; MIS note field may be used to document short-term loans. Note: the MIS has a "virtual loan pool" search feature to facilitate inter organizational M&TE loans.

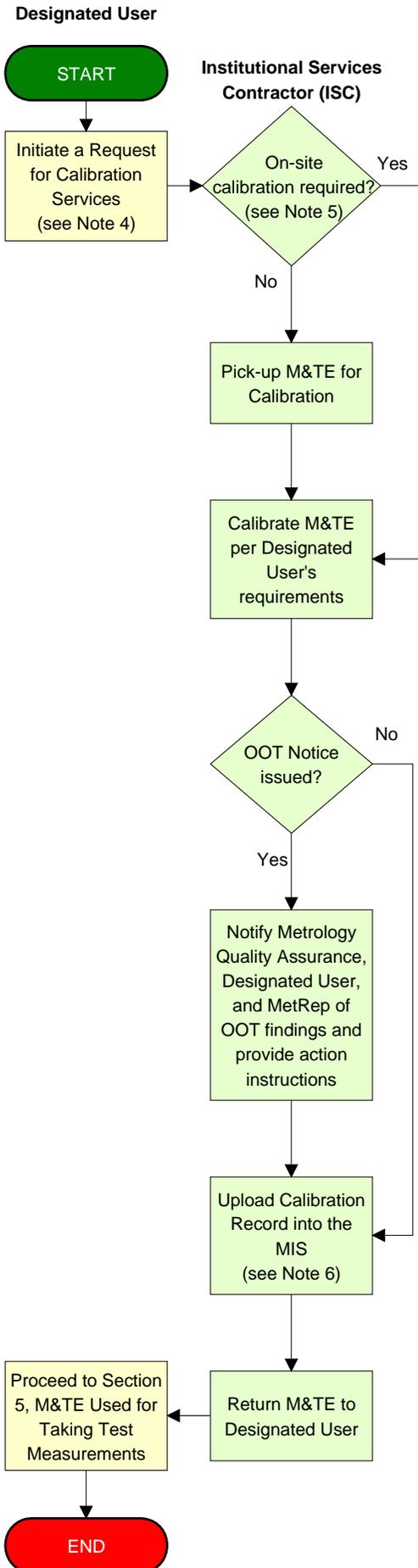
When new measurement equipment is acquired by credit card or purchase order, proceed to Section 8, Procurement of M&TE.

When M&TE selected was "found on Center" (not in the MIS) or when industrial controls (Programmable Logic Controllers and associated input cards or other items currently tracked in MAXIMO) are selected for applications identified in Note 1, the Designated User shall contact the MetRep to have a Metrology Control Number (MCN) assigned and have the item added to the MIS. Proceed to Section 8 (Note 29) for information about how to add M&TE to the MIS.

When Customer supplied M&TE is acquired for a test, refer to LMS-CP-2737; the using Organization is responsible for ensuring that valid calibration labels are affixed and that compliant calibration records for Designated User supplied equipment are maintained and reference the test in which the item was used.

Note 3

MetReps have the ability to add new equipment or make changes to existing equipment category, label, location, and users when requested by the Designated User (see LAPD 8730.1 for responsibilities of Designated Users and MetReps and how they are appointed). See Table 1 for M&TE Category, Label, Record, and Storage Requirements. **Note: N-PROP is not affected by changes made in the MIS.**



Note 4

Calibration may be performed by one of the two LaRC ISCs:

1. Research Operations, Maintenance, and Engineering (ROME) contract for routine and special calibrations for the majority of LaRC equipment.
2. Force Measurement Support Services (FMSS) contract for the calibration or service of: aircraft scales, analytical balances, cable tensiometers, crane scales, dynamometers, force gauges, hydraulic presses, load cells and digital indicators, platform scales, swage terminal testers, tensile testers, torque wrenches, torque testers, torque multiplier, weights and wind tunnel balances.

To have instruments calibrated by ROME:

SIMCO, ROME's metrology services sub-contractor, will provide instructions on how to use a CERDAAC Electronic Shipper. Contact SIMCO Electronics at 757-873-1978 to obtain a user account and password (new users), which is required to initiate a calibration request at www.cerdaac.simco.com. You also may call ROME customer service at 757-864-7663 and a CERDAAC Electronic Shipper will be created for you or access the ROME web site at <https://rome.ndc.nasa.gov>. A funded ROME Tracking Number (RTN) shall be provided when submitting a request; contact a MetRep to obtain organization RTN. If performance requirements other than manufacturers' specification are required, Designated User supplied requirements shall be provided to the calibration laboratory.

- Category 1 equipment receives "as found" and "as left" data along with a statement of traceability.
- Category 2 equipment receives a statement of traceability only; data is provided only when requested or necessary for M&TE operation. Note: OOT notices are issued as necessary for Category 1 or 2 M&TE.
- Category N equipment shall be changed to Category 1 or 2 prior to submission for calibration by contacting a MetRep or requesting the change in the General Comments section of the CERDAAC Electronic Shipper.

To have force related instruments calibrated by FMSS:

SIMCO, ROME's metrology services sub-contractor, will provide instructions on how to use a CERDAAC Electronic Shipper. Contact SIMCO Electronics at 757-873-1978 to obtain a user account and password (new users), which is required to initiate a calibration request at www.cerdaac.simco.com. You also may call ROME customer service at 757-864-7663 and a CERDAAC Electronic Shipper will be created for you or access the ROME web site at <https://rome.ndc.nasa.gov>; an organizational code shall be provided when submitting request (RTNs are not required for FMSS calibrations). For urgent or quick turnaround of force related calibrations, call Modern Machine and Tool at 757-873-8235 or 757-873-1212 and attach LF 145. If performance requirements other than manufacturer's specification are required, Designated User supplied requirements shall be provided to the calibration laboratory.

- Category 1 & 2 equipment receives "as found" and "as left" data along with a statement of traceability.
- Category N equipment shall be changed to Category 1 or 2 prior to submission for calibration by contacting a MetRep or requesting the change in the General Comments section of the CERDAAC Electronic Shipper..

Note 5

To have instruments calibrated by ROME:

For on-site calibration of instruments, enter the words "FIELD SERVICE" in the General Comments section of the CERDAAC Electronic Shipper for each item to which it applies.

The ISC will work with facility points-of-contact (POCs) to identify and schedule on-site opportunities to maximize equipment uptime; call SIMCO Electronics customer service at 757-873-1978 to make arrangements for unscheduled on-site service.

To have force related instruments calibrated by FMSS:

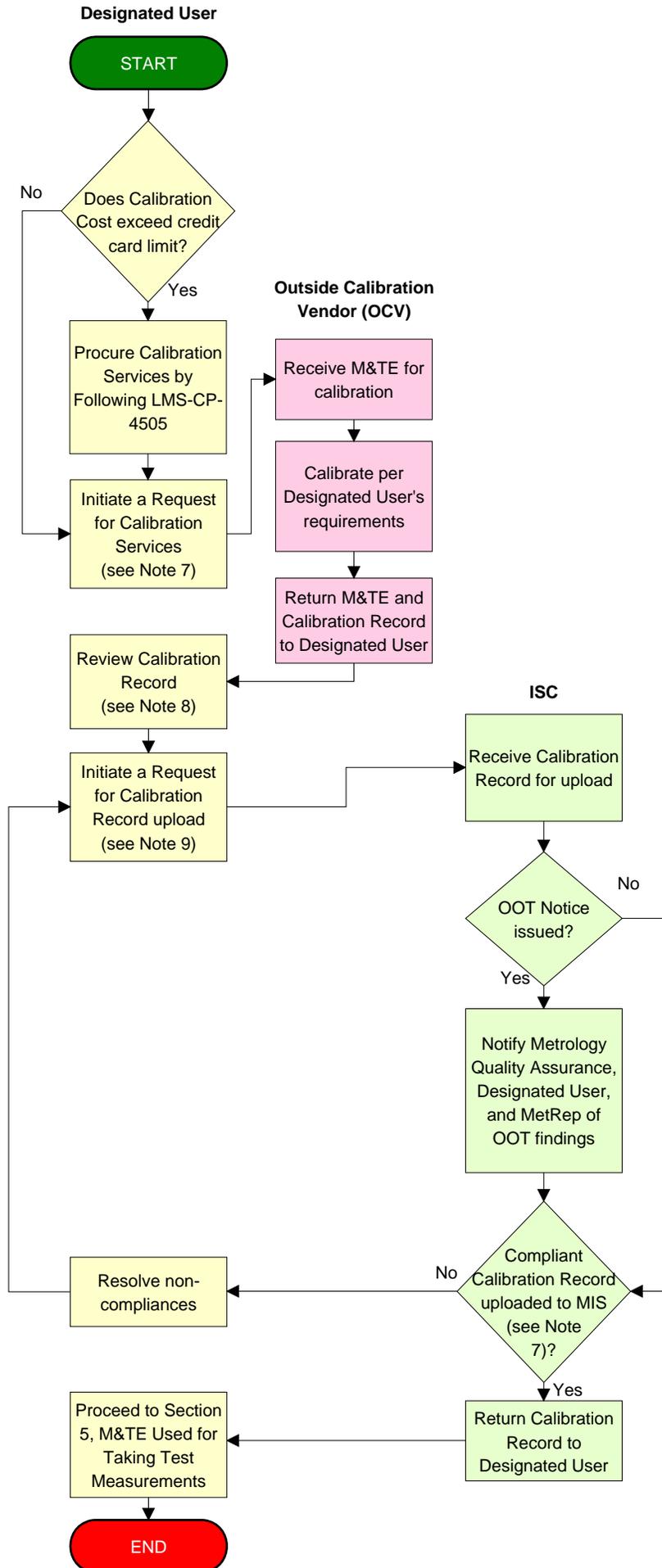
For on-site calibration of force related instruments, call Modern Machine and Tool at 757-873-8235 or 757-873-1212. Provide equipment MCNs, and a Work Order (WO) will be created for you. A CERDAAC Electronic Shipper may also be used, by entering the words "FIELD SERVICE" in the General Comments section for each item to which it applies.

Note 6

Calibration Records generated by either ISC (ROME or FMSS) will automatically be updated and stored in the MIS.

Section 3: Calibration of M&TE Using an Outside Calibration Vendor (OCV)

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Note 7
To have instruments calibrated by an OCV:

- Instruments shall be shipped (using LF 52, "Shipping/Transfer Document") or calibrated on site by a vendor that provides calibration service and records that are ANSI/NCSL Z540.1-1994 compliant as per NPD 8730.1 (also may be compliant to ANSI/ISO/IEC 17025:2005 or ANSI/NCSL Z540.3-2006 when appropriate).
- It is the Designated User's responsibility to request "as found" and "as left" data for Category 1 items (and Category 2 items if required). If performance requirements other than manufacturer's specification are required, Designated User supplied requirements shall be provided to the calibration laboratory.

Note 8
Calibration records shall be reviewed to ensure:

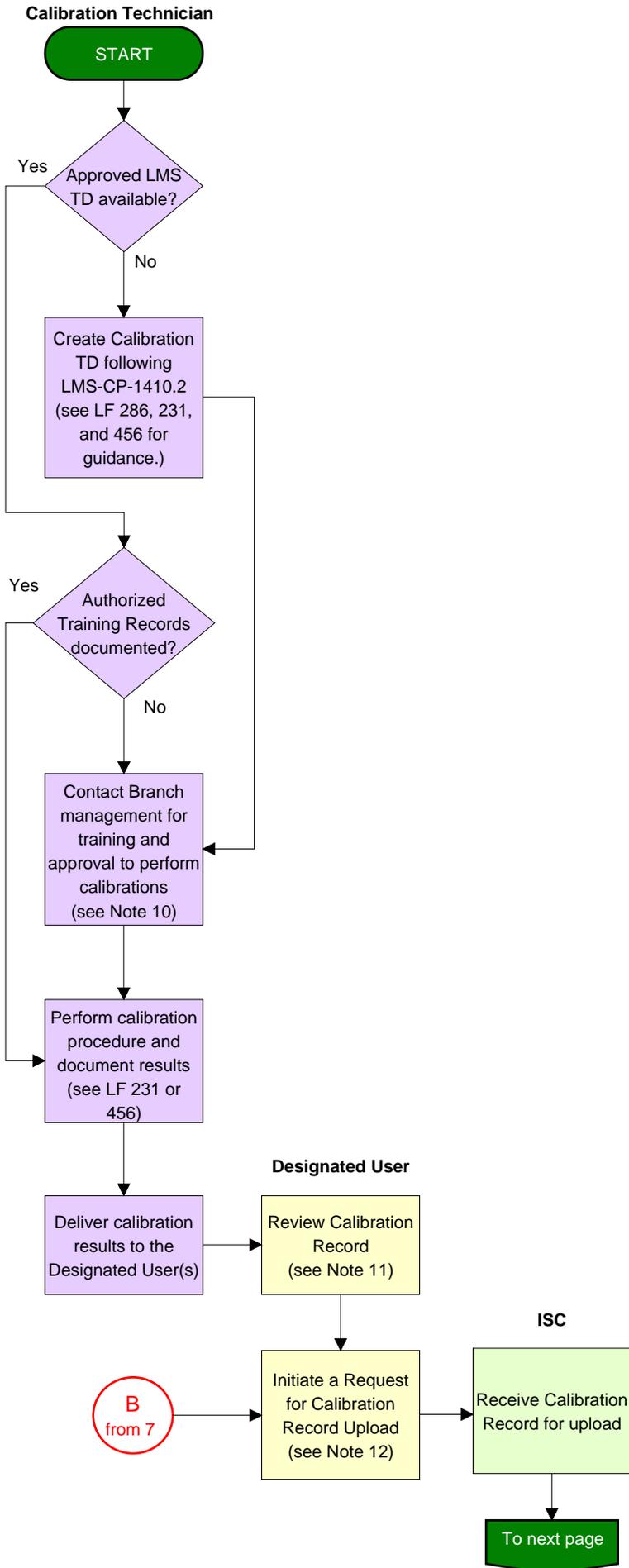
- Records are compliant with ANSI/NCSL Z540.1-1994 (also may be compliant to ANSI/ISO/IEC 17025:205 or ANSI/NCSL Z540.3-2006 when appropriate)

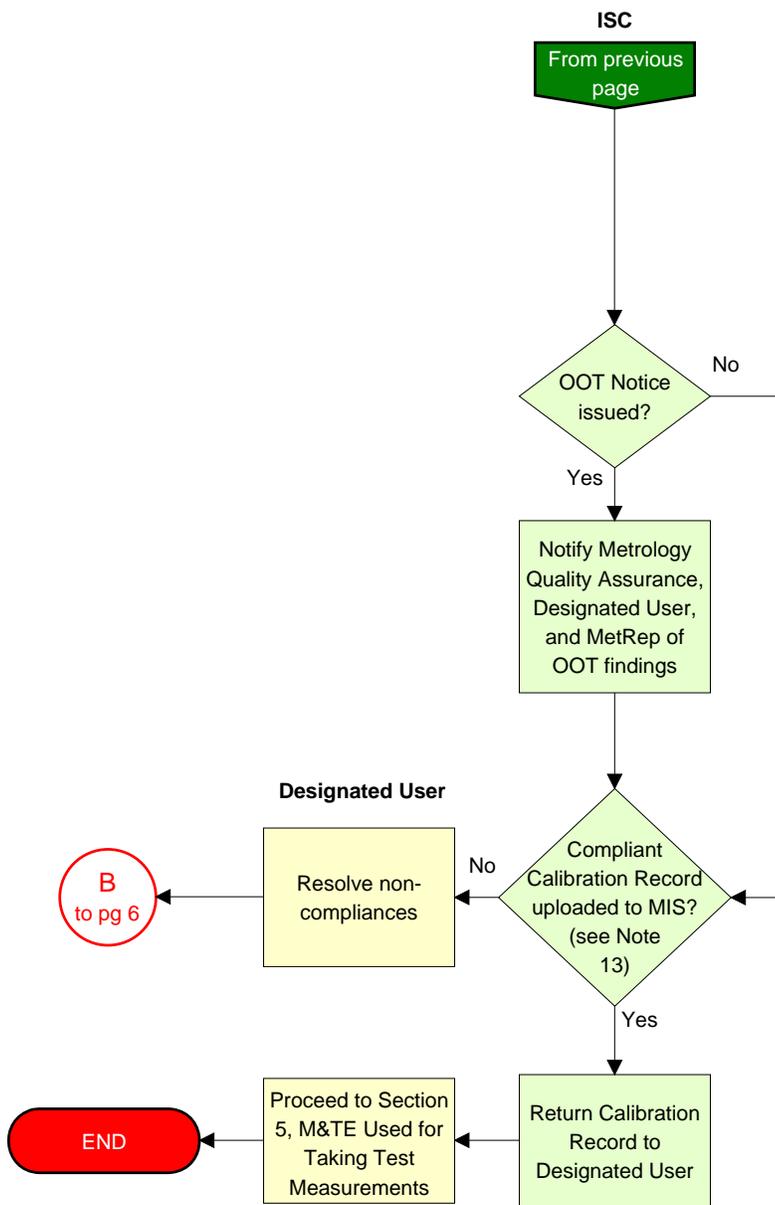
Note 9
To have "Paperwork Only" upload performed:

- SIMCO, ROME's metrology services sub-contractor, will provide instructions on how to submit a paperwork only CERDAAC Electronic Shipper. Contact SIMCO Electronics at 757-873-1978 to obtain a user account and password (new users), which is required to initiate a paperwork only upload request at www.cerdaac.simco.com. You may also call 757-864-7663 or access the ROME web site at <https://rome.ndc.nasa.gov>.
- In the General Comments section of the CERDAAC Electronic Shipper indicate if records were emailed or sent to MS 484. After the Shipper is submitted, email .pdf or .jpg calibration records to Larc_calibration_record_upload@simco.com or send hardcopies to MS 484.
- The RTN for a paperwork only upload is **A100000**.

Section 4: Calibration of M&TE Using an Approved LMS Task Description (TD)

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Note 10
The Branch Management of personnel performing the calibration and quality review of calibration records are responsible for ensuring that appropriate training related to LMS TD calibration activities are kept up-to-date and consistent with the employee assignments. Documentation of training, skills, experience, and competence related to LMS TDs may be controlled through SATERN and/or local records maintained by the Organizational Unit; the person(s) responsible for maintaining and approving local training records shall be identified.

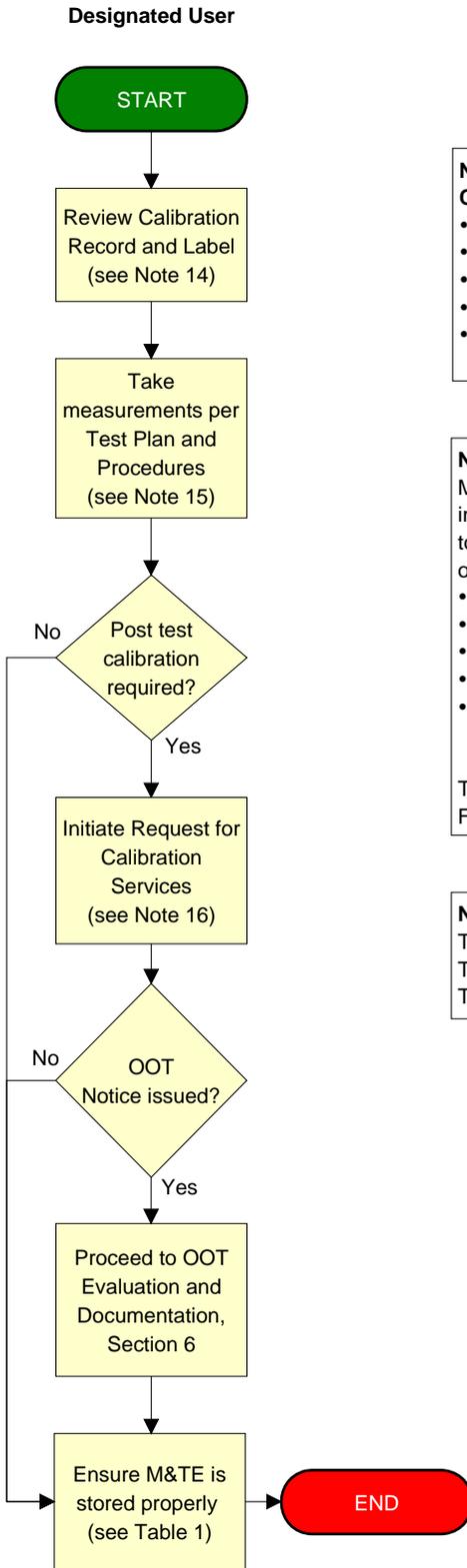
Note 11
Calibration records shall be reviewed to ensure:

- Records are compliant with ANSI/NCSL Z540.1-1994 (also may be compliant to ANSI/ISO/IEC 17025:2005 or ANSI/NCSL Z540.3-2006 when appropriate)

Note 12
To have a "Paperwork Only" upload performed:

- SIMCO, ROME's metrology services sub-contractor, will provide instructions on how to submit a paperwork only CERDAAC Electronic Shipper. Contact SIMCO Electronics at 757-873-1978 to obtain a user account and password (new users), which is required to initiate a paperwork only upload request at www.cerdaac.simco.com. You may also call 757-864-7663 or access the ROME web site at <https://rome.ndc.nasa.gov>.
- In the General Comments section of the CERDAAC Electronic Shipper indicate if records were emailed or sent to MS 484. After the Shipper is submitted, email .pdf or .jpg calibration records to Larc_calibration_record_upload@simco.com or send hardcopies to MS 484.
- The RTN for a paperwork only upload is **AI00000**.

Note 13
Calibration Records generated by LMS-TDs shall be compliant with ANSI/NCSL Z540.1-1994 compliant as per NPD 8730.1 (also may be compliant to ANSI/ISO/IEP 17025:2005 or ANSI/NCSL Z540.3-2006 when appropriate)



Note 14
Calibration record and label shall be reviewed to ensure:

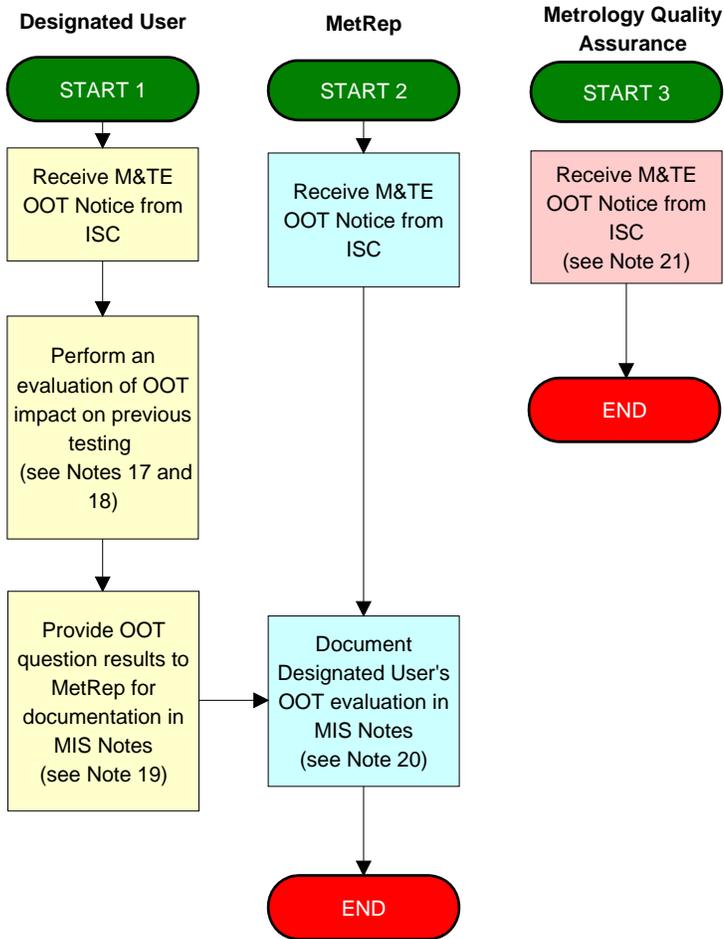
- the calibrated range is suitable for the application
- the calibration results meet the defined acceptance criteria
- all standards used are traceable to nationally or internationally recognized standards
- an acceptable calibration uncertainty statement is provided
- calibration label is in date and agrees with the information in the MIS; if the labeling on the instrument does not agree with the MIS, contact the Metrology Quality Assurance Office for resolution

Note 15
 Measurements requiring Category 1 or 2 equipment shall have records that link the M&TE to the test. This information is used to evaluate impacts to the test when measurement equipment is found to be out of tolerance when post test calibrations are performed. It also provides technical information about the origin of the test measurement and shall include the following:

- MCN of M&TE
- identification of application or test (test name, number, or other unique identifier)
- dates that M&TE was used for application or test
- M&TE Designated User name (name of person that selected/approved M&TE for use in the test)
- reference to evidence that any measurement related software used for test has been validated for functional accuracy and is under revision control

The records shall be identified, stored, and maintained in such a way that they are readily retrievable. Facilities also shall provide a suitable environment to minimize damage and prevent loss.

Note 16
 To calibrate M&TE using the ISC, proceed to **Section 2**.
 To calibrate M&TE using an OCV, proceed to **Section 3**.
 To calibrate M&TE using an Approved LMS TD, proceed to **Section 4**.



Note 17

OOT evaluation guidance

Designated Users of M&TE shall be familiar with where and when M&TE assigned to them is being used. M&TE is sometimes used in multiple applications with a wide variety of individuals or organizations (e.g. researchers, test engineers) involved with establishing application specific tolerance requirements. It is the responsibility of the Designated User to develop a reliable method for tracking the usage of their M&TE when it is used for accuracy sensitive measurements. The following questions are intended as a guide to help Designated Users when OOT notices are received from the calibration lab. OOT notices indicate assigned M&TE did not maintain its specified accuracy for the duration of the calibration interval and may have resulted in the failure to meet tolerance requirements of accuracy sensitive measurements.

1. What is the MCN number of the M&TE? Is there additional information about the nature and magnitude of the OOT in the MIS?
2. What individuals or organizations used the M&TE when it was OOT?
3. What accuracy sensitive measurements (especially critical measurements) were made with the OOT M&TE? What were the test names & dates?
4. Has the person or organization that established the specific tolerance limits for the accuracy sensitive measurement application been contacted and informed of the OOT condition?
5. Has the person or organization involved evaluated the OOT condition impact based on application accuracy requirements and magnitude of OOT?
6. Was a corrective action plan necessary? Who is responsible for ensuring any corrective actions are adequate and effective?
7. Has the MetRep documented the results of the OOT evaluation in the MIS?

Note 18

When "as found" calibration results do not meet the defined performance requirements, an assessment of the OOT condition on previous test results shall be performed and documented in the MIS Notes within 30 days (contact MetRep for assistance). All accuracy sensitive measurements, taken with the identified equipment since its last valid calibration, shall be evaluated. The significance of the error(s) shall be determined based on the performance requirements specified for the measurements application(s) involved. **NOTE: OOT Notices are issued for Category 1 or 2 M&TE as needed.**

If the OOT assessment indicates a significant risk, corrective action shall be defined and implemented. The customer(s) of any product considered at a significant risk shall be notified.

Note 19

Required MIS information for documentation of OOT Evaluation:

- **OOT Notice Number:** This is a unique number that identifies a specific OOT condition (number is referenced in e-mail notice).
- **Test Identifier/Name & Location:** Documents the test name, number or other unique identifier and also identifies the facility in which the OOT equipment was used for obtaining accuracy sensitive measurements during the previous calibration cycle. If the equipment was not used for accuracy sensitive testing during this period use the word **NONE** for the Test Identifier/Name.
- **Individual Performing Evaluation:** Documents the name of the individual performing the evaluation of the impact on previous testing (user of the equipment).
- **Results of OOT Evaluation:** The completed evaluation results provided by the Designated User to the MetRep for documentation.
- **Corrective Action Required:**
 - Y - Yes (provide additional information below)
 - N - No
 - N/A - Not Applicable
- **Any additional Information:** This section is for any additional information that may need to be added for clarification/informational purposes.

Note 20

MetRep's documentation of Designated User's OOT evaluation:

- go to EMIT Web site: <https://emit.ndc.nasa.gov/>
- select M&TE Notes/OOT Responses/Delay Calibration Justifications
- enter e-mail address & password
- enter MCN/ECN and select Submit
- select Note Type, choose OOT Responses
- after the questions from Note 19 appear, post the responses supplied by Designated User
- select Save Changes

Note 21

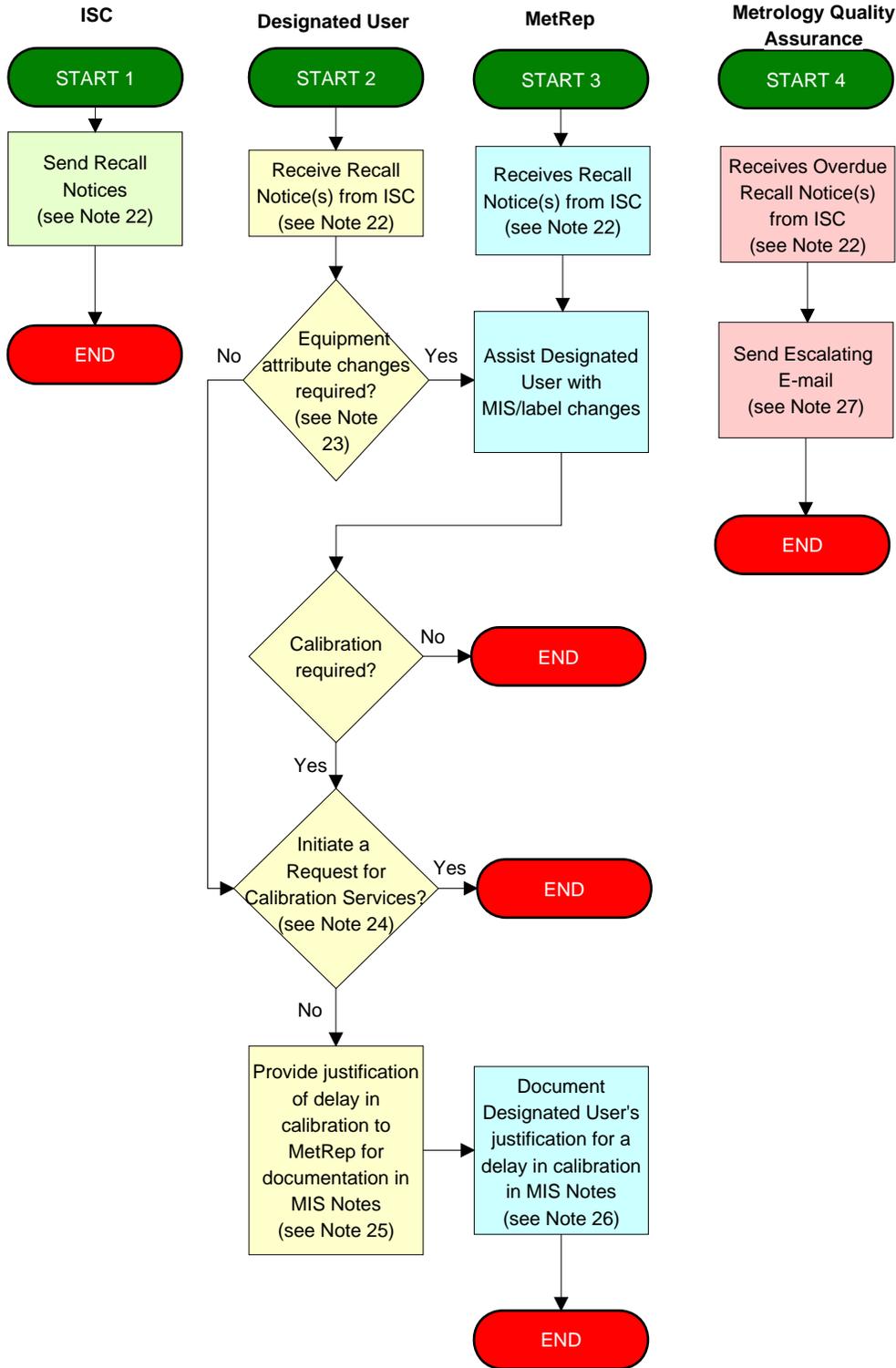
Send an e-mail to the Organizational Management of the Designated User & Metrology Representative when an OOT Notice evaluation has not been documented in EMIT within 30 days.

If the OOT Notice is unanswered after 30 days:

- Send an escalating e-mail to the Directorate Management of the Designated User & Metrology Representative and cc the Organization Management.

If this same OOT Notice is still unanswered after another 30 days:

- Send an escalating e-mail to the Center Director Office and cc the Directorate Management & Organizational Management of the Designated User & Metrology Representative.



Note 22

Designated User and MetRep receives Overdue Recall and 45 Day Coming Due Recall Notices for Category 1 M&TE on the 1st and 15th of each month.

Metrology Quality Assurance receives Overdue Recall Notices for Category 1 M&TE (Field Wide) on the 1st and 15th of each month.

Note 23

MetReps have the ability to change existing equipment category, label, location, and users when requested by the Designated User (see LAPD 8730.1 for responsibilities of Designated Users and MetReps and how they are appointed). See Table 1 for M&TE Category, Label, Record, and Storage Requirements. **Note: N-PROP is not affected by changes made in MIS.**

Note 24

To calibrate M&TE using the ISC, proceed to **Section 2**.
To calibrate M&TE using an OCV, proceed to **Section 3**.
To calibrate M&TE using an Approved LMS TD, proceed to **Section 4**.

Note 25

The Designated User shall have a justified reason for using Category 1 or 2 M&TE beyond its recommended calibration interval because of increased measurement risk.

This justification shall be documented in the MIS by the MetRep. Justifications are valid for 30 days and shall include the name of the Designated User approving the delay. Longer delays shall be re-justified every 30 days by adding a new note in the MIS. Data taken after interval expiration is considered non-compliant until M&TE is proven to be in tolerance when post calibration is performed. Overdue notices will continue to be sent, for Category 1 equipment, until sent for calibration.

Designated User Delay Calibration Justification information required in MIS:

- **Test Identifier / Name & Location:** Documents the Test Name, Number or other unique identifier and also identifies the facility in which the expired calibration equipment will be used.
- **Individual Approving Delay:** The Designated User is responsible for providing the MetRep with the individuals name approving the delay.
- **Reason for Delay Request:** The justification provided, by the Designated User approving the delay for continuing to use the equipment beyond the calibration due date.
- **Any Additional Information:** This section is for any additional information that may need to be added for clarification/informational purposes.

Note 26

MetReps documentation of Designated User's Delayed Calibration Justification:

- go to EMIT Web site: <https://emit.ndc.nasa.gov/>
- select M&TE Notes/OOT Responses/Delay Calibration Justifications
- enter e-mail address & password
- enter MCN/ECN and select Submit
- select Note Type, choose Delayed Cal. Justification
- after the questions from Note 25 appear, post the responses supplied by the Designated User
- select Save Changes

Note 27

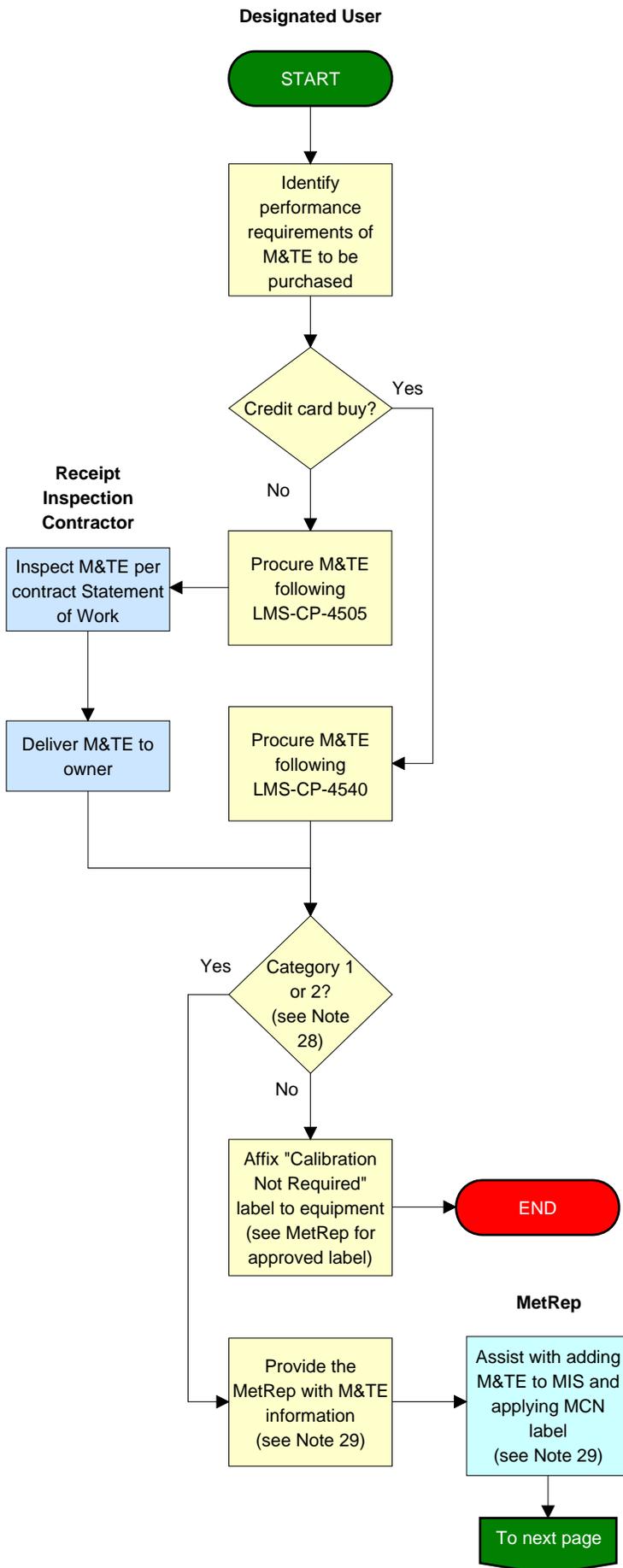
Send an escalating e-mail to the Organizational Management of the Designated User & Metrology Representative for all M&TE that appears on the Overdue Recall Report. (Repeat 1 time)

If this same instrument appears on the Overdue Recall Report for a 3rd time (a max of 45 days overdue):

- Send an escalating e-mail to the Directorate Management of the Designated User & Metrology Representative and cc the Organizational Management. **(Repeat 1 time)**

If this same instrument appears again on the Overdue Recall Report for a 5th time (a max of 75 days overdue):

- Send an escalating e-mail to the Center Director Office and cc the Directorate Management & Organizational Management of the Designated User & Metrology Representative.



Note 28

Equipment selected to perform measurements associated with the following functions shall be capable of satisfying measurement application performance requirements (e.g. environmental conditions, accuracy, range, resolution, response time) and be classified by the Designated User as Category 1 or 2 in the MIS; the equipment also shall have **ANSI/NCSL Z540.1-1994 compliant calibration records and LMS compliant labels affixed prior to use.** ANSI/Z540.1-1994 is available through the NASA Standards and Technical Assistance Research Tool on the LMS web site (<http://standards.nasa.gov/authentication/login>). See Table 1 for M&TE Category definitions including label, record, and storage requirements.

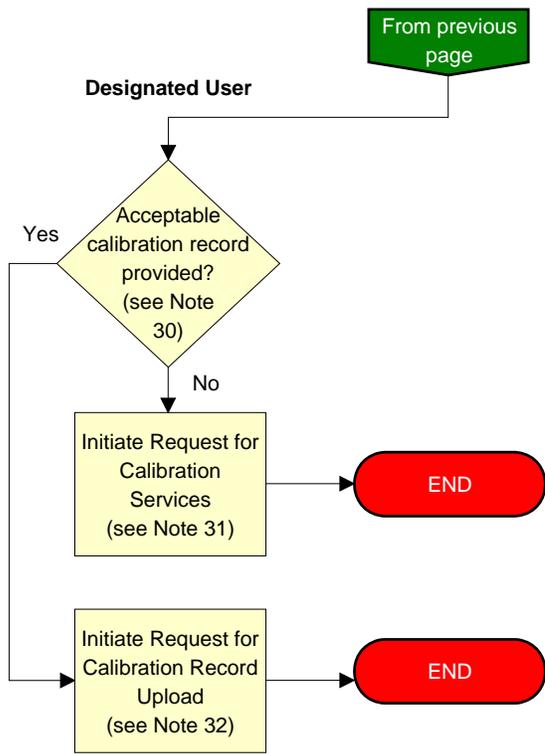
Functional areas requiring calibrated (Category 1 or 2) M&TE: (reference NPD 8730.1)

- Testing, qualification, certification, and/or acceptance measurements of flight hardware, ground support equipment, test systems, or other flight-related products
- Measurements essential to the safety of personnel and the public or for the protection of Government or private property, including hazardous and/or critical applications.
- Operation of telecommunications and transmission systems where exact signal interfaces and circuit confirmations are essential to mission success.
- Research and technology development (see NPR 7120.8), manufacturing, inspection, testing, operations, maintenance, support, or other applications where the accuracy of measurements is essential to achieve mission success.
- NASA publications or other documents released for external review whose conclusions/recommendations depend upon the accuracy of measurement results and that impact the safety or success of NASA missions. Excluded are preliminary research papers and research instruments under development that have not had traceable units of measurement established.
- Physical measurements used to apportion, levy, or otherwise assign cost(s), or ensure local, State, or Federal regulatory compliance.

Equipment that is used in applications where substantial accuracy is not required (used for "indication only" purposes in non-hazardous, non-critical applications) does not require compliant calibration records but shall be labeled with a Designated User authorized "Calibration Not Required" label. See Table 1 for M&TE Category N requirements.

NOTE: Industrial controls are not part of the calibration system and are not categorized in the MIS unless specifically requested by a Designated User. Industrial controls are maintained in the MAXIMO database and are normally used to establish approximate conditions that are then accurately monitored, as needed by Category 1 or 2 M&TE.

See LAPD 8730.1, "Metrology and the Control of Measuring, and Test Equipment" for responsibilities of the Designated User.



Note 29

MetReps have password accounts that enable them to make additions and changes to the MIS. MetReps shall also coordinate activities with the Designated User to assure MCN and appropriate calibration status labels are affixed to new M&TE prior to use.

New M&TE information required for MIS:

- MCN (see MetRep for labels) -MetRep Name
- Manufacturer - Designated User Name
- Model Number - Building Number
- Description - Room Number
- Serial Number

New M&TE shall be segregated from calibrated equipment and stored to prevent loss or damage in a controlled area to prevent use until acceptable records are entered into the MIS and appropriate labels are affixed (see Table 1). If needed for indication only measurements prior to calibration and labeling, the M&TE shall be labeled with a "Calibration Not Required - Limited to Non-Critical, Non-Accuracy Sensitive, or Non-Hazardous Measurements" or a "Calibrate Before Use" label. These labels, when used, shall remain in place until removed when acceptable calibration records have been uploaded to the MIS and calibration status labels have been affixed. Authorized "Calibration Not Required" and "Calibrate Before Use" labels are available from the MetRep.

Note 30

Records are compliant with ANSI/NCSL Z540.1-1994 (also may be compliant to ANSI/ISO/IEC 17025:2005 or ANSI/NCSL Z540.3-2006 when appropriate)

Note 31

To calibrate M&TE using the ISC, proceed to **Section 2**.
To calibrate M&TE using an OCV, proceed to **Section 3**.
To calibrate M&TE using an Approved LMS TD, proceed to **Section 4**.

Note 32

To have a "Paperwork Only" upload performed:

- SIMCO, ROME's metrology services sub-contractor, will provide instructions on how to submit a paperwork only CERDAAC Electronic Shipper. Contact SIMCO Electronics at 757-873-1978 to obtain a user account and password (new users), which is required to initiate a paperwork only upload request at www.cerdaac.simco.com. You may also call 757-864-7663 or access the ROME web site at <https://rome.ndc.nasa.gov>.
- In the General Comments section of the CERDAAC Electronic Shipper indicate if records were emailed or sent to MS 484. After the Shipper is submitted, email .pdf or .jpg calibration records to Larc_calibration_record_upload@simco.com or send hardcopies to MS 484.
- The RTN for a paperwork only upload is **AI00000**.

Table 1: M&TE Category, Label, Record, and Storage Requirements

M&TE CATEGORY AND DESCRIPTION	M&TE LABEL REQUIREMENTS	M&TE RECORD REQUIREMENTS For record retention see NPR 1441.1 AFS # 8730 item 41.5 "Calibration and Metrology Records"	M&TE STORAGE REQUIREMENTS Storage must be in suitable environment to prevent damage or degradation
<p>When Newly Purchased Measurement Equipment is Received:</p> <ul style="list-style-type: none"> • Must be Categorized & labeled <ul style="list-style-type: none"> – Category 1 – Category 2 – Category N <p>NOTE: Industrial controls are not part of the calibration system and are not categorized in the MIS unless specifically requested by a Designated User. Industrial controls are maintained in the MAXIMO database and are normally used to establish approximate conditions that are then accurately monitored, as needed by Category 1 or 2 M&TE.</p>	<p>Until valid calibration records are in MIS & calibration label is affixed</p> <ul style="list-style-type: none"> • Category 1 & 2 <ul style="list-style-type: none"> – MCN – Must be stored or labeled "Calibrate Before Use" • Category N <ul style="list-style-type: none"> – MCN optional – Must be stored or labeled "Calibration Not Required" 	<ul style="list-style-type: none"> • Category 1 & 2 <ul style="list-style-type: none"> – MIS Database: MCN, Manufacturer, MetRep, Designated User, Cost, Location, Model, Description, Serial Number, Category 1 or 2 assignment – Compliant calibration record for upload to MIS (send M&TE for calibration if compliant calibration record is not available) • Category N <ul style="list-style-type: none"> – See Category N below 	<ul style="list-style-type: none"> • New items not labeled must be stored in segregated area marked "un-calibrated equipment only" • Storage activities must not affect calibration: <ul style="list-style-type: none"> - Delicate handling - Appropriate packaging and containers - Adequate environmental conditions (e.g. temperature, humidity, vibration)
<p>Category 1:</p> <ul style="list-style-type: none"> • Used for product conformity measurement applications when compliant in-date calibration records are in the MIS and item is labeled with valid calibration sticker • Recalled prior to calibration due date in MIS <ul style="list-style-type: none"> – When recall is no longer needed, must be re-categorized in the MIS as Category 2, N or E (see category requirements below) 	<ul style="list-style-type: none"> • MCN • Valid in-date Calibration sticker <ul style="list-style-type: none"> – Use with an expired calibration sticker is allowed only when a delay calibration justification is documented in MIS 	<ul style="list-style-type: none"> • MIS Database: <ul style="list-style-type: none"> – MCN, Calibration Record, Manufacturer, MetRep, Designated User, Cost (if known), Location, Model, Description, Serial Number, Category 1 assignment – Delayed Cal Justification (if needed) – OOT impact evaluation (if OOT Notice issued) within 30 days • Retrievable locally maintained records that link M&TE usage to measurement application 	<ul style="list-style-type: none"> • Stored in area marked "calibrated equipment only" when calibrated and storage is necessary • Must be stored in area marked "un-calibrated equipment only" when expired • Storage activities must not affect calibration: <ul style="list-style-type: none"> -Delicate handling - Appropriate packaging and containers - Adequate environmental conditions (e.g. temperature, humidity, vibration)

Table 1: Continued

M&TE CATEGORY AND DESCRIPTION	M&TE LABEL REQUIREMENTS	M&TE RECORD REQUIREMENTS For record retention see NPR 1441.1 AFS # 8730 item 41.5 "Calibration and Metrology Records"	M&TE STORAGE REQUIREMENTS Storage must be in suitable environment to prevent damage or degradation
<p>Category 2:</p> <ul style="list-style-type: none"> Not recalled prior to calibration due date. Must be calibrated before product conformity measurements and have compliant in-date calibration record in the MIS and valid calibration sticker affixed 	<ul style="list-style-type: none"> MCN Valid in-date Calibration sticker when in use for product conformity measurements <ul style="list-style-type: none"> Use with an expired calibration sticker is allowed only when a delay calibration justification is documented in MIS Expired Calibration sticker allowed when stored segregated from calibrated equipment "Calibrate Before Use" label required if expired and not stored 	<ul style="list-style-type: none"> MIS Database: <ul style="list-style-type: none"> MCN, Calibration Record, Manufacturer, MetRep, Designated User, Cost (if known), Location, Model, Description, Serial Number, Category 2 assignment Delayed Cal Justification (if needed) OOT impact evaluation (if OOT Notice issued) within 30 days Retrievable locally maintained records that link M&TE usage to measurement application 	<ul style="list-style-type: none"> Stored in area marked "calibrated equipment only" when calibrated and storage is necessary Must be stored in area marked "un-calibrated equipment only" when expired and not labeled "Calibrate Before Use" Storage activities must not affect calibration: <ul style="list-style-type: none"> - Delicate handling - Appropriate packaging and containers - Adequate environmental conditions (e.g. temperature, humidity, vibration)
<p>Category N:</p> <ul style="list-style-type: none"> Measurement applications that do not require traceable calibrated M&TE (see Note 1 Section 1 for applications that require calibrated M&TE) Limited to Non-Critical, Non-accuracy Sensitive or Non-Hazardous measurements; must not be used to establish product conformity <p>Note: MetRep name will be removed from MIS when changed to Category "N"</p>	<ul style="list-style-type: none"> MCN optional Old calibration stickers removed or covered with signed "Calibration Not Required" label 	<ul style="list-style-type: none"> MIS Database when optional MCN applied: <ul style="list-style-type: none"> MCN, last known Designated User, Cost (if known), Location, Model, Manufacturer, Description, Serial Number, Category N assignment 	<ul style="list-style-type: none"> Stored in area marked "un-calibrated equipment only" when storage is necessary
<p>Category E:</p> <ul style="list-style-type: none"> Excessed items, removed from service and turned into Property Management for disposal Lost items <p>Note: follow LMS-CP-2722 for property disposal</p>	<ul style="list-style-type: none"> MCN until disposed of by Property Management 	<ul style="list-style-type: none"> MCN, Manufacturer, last known Designated User, Last Location, Model, Description, Serial Number, Category E assignment Historical records If item is LOST, document in EMIT Notes 	<ul style="list-style-type: none"> Stored in area marked "un-calibrated equipment only" until picked up by Property Management for disposal
<p>Category R:</p> <ul style="list-style-type: none"> Identifies MCN that is no longer affixed to instrument, physical MCN label has been destroyed or removed 	<p>N/A</p>	<ul style="list-style-type: none"> Historical records <p>Note: Cross reference new MCN record using Serial Number search in the MIS</p>	<p>N/A</p>