

WP 10-AD3029

Revision 8

Calibration and Control of Monitoring and Data Collection Equipment

Management Control Procedure

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APPROVED FOR USE

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INTRODUCTION ¹

This procedure provides direction for the control and calibration of Monitoring and Data Collection (M&DC) equipment at the Waste Isolation Pilot Plant (WIPP), and assures traceability to NIST (National Institute of Standards and Technology) standards, international standards, or intrinsic standards. This procedure also establishes requirements and responsibilities for identifying recall equipment, and for obtaining calibration services for WIPP M&DC equipment. Performance of this procedure creates the following quality record:

- M&TE Out-of-Tolerance Notification (see Attachment 1 for an example)

This procedure does not apply to the following:

- Plant or field equipment
- Portable radiation detection instruments
- Laboratory equipment

REFERENCES

BASELINE DOCUMENTS

- DOE Order 433.1, *Maintenance Management Program for DOE Nuclear Facilities*
- WP 10-WC3011, Maintenance Process
- WP 13-1, Washington TRU Solutions LLC Quality Assurance Program Description
- WP 13-QA3012, Supplier Evaluation/Qualification
- WP 15-PM3509, Utilization and Disposal of Excess/Surplus Government Personal Property
- WP 15-PR, WIPP Records Management Program

REFERENCED DOCUMENTS

- ANSI/NCSL Z540-1994, *Calibration Laboratories and Measuring and Test Equipment General Requirements*
- ISO 10012:2003, *Measurement Management Systems*
- WP 10-AD3030, Calibration Label Application and Control

- WP 04-IM1000, Issues Management Program Processing of WIPP Forms
- WP 15-PC3044, Quality Credit Card Purchases
- WP 15-PC3609, Preparation of Purchase Requisitions
- EA04IM1000-1-0, WIPP Form

PERFORMANCE

NOTE

WP 15-PC3609 provides guidelines to obtain vendor services via the standard procurement process for calibration equipment. Calibration services are obtained from only those vendor locations listed in the Qualified Suppliers List (QSL). Any deviation from the QSL shall be approved by Quality Assurance (QA) before placing the contract.

NOTE

WP 15-PC3044 provides direction for obtaining vendor services via the Quality Credit Card (Q-Card) process for calibration equipment.

NOTE

Calibrations must be traceable to NIST standards, international standards, or intrinsic standards, in accordance with approved national standards (i.e., ANSI/NCSL [American National Standards Institute/National Conference of Standard Laboratories] Z540-1994, ISO [International Organization for Standards] 10012:2003). The Metrology Office may alter or waive these requirements on a case-by-case basis with QA concurrence.²

NOTE

On equipment where accuracy will not degrade when stored unused for extended periods of time (i.e., water level probes) the calibration date period may be set to begin with the first use of the equipment, rather than the actual calibration date. In such a case the calibration label, with adjusted due date, will not be issued by the Metrology Office until the equipment is removed from storage and placed back in service.

1.0 MASTER DATABASE³

1.1 Metrology Office, maintain a Master Database of M&DC equipment containing the following data for each item:

- Calibration date, calibration expiration date, and recall frequency

- Identification (ID) number, description, manufacturer, model number, serial number, and property tag number, where applicable
- 1.2 M&DC equipment owner (Owner), maintain a file/database of M&DC equipment containing the following data for each item:
- Accuracy specifications or location of the specifications for each piece of M&DC equipment
 - Calibration records
 - Location of operating manuals and/or operating instructions for using each piece of M&DC equipment
 - Records that reconcile "out-of-tolerance," damaged, or expired M&DC equipment calibration conditions
- 2.0 NEW M&DC EQUIPMENT
- 2.1 Owner, perform the following:
- 2.1.1 Tag, segregate, or otherwise control the equipment to prevent use until it has been calibrated.
 - 2.1.2 Transport M&DC equipment to the Metrology Office.
 - 2.1.3 Establish the recall frequency for each piece of M&DC equipment based on equipment manufacturer's recommendations, proposed equipment usage, and facility experience.⁴

NOTE

Recall numbers are serialized and not duplicated or reissued. They are attached to equipment using an appropriate label. All references to equipment are by means of these ID numbers.

- 2.2 Metrology Office, perform the following:
- 2.2.1 Assign a unique recall number for each item of new M&DC equipment and apply an ID label to the equipment.
 - 2.2.2 Enter the new equipment into the recall database.
 - 2.2.3 If calibrated by an approved vendor, review vendor's Calibration Certificate and data to verify they meet the requirements of the Metrology Office.

2.2.4 If requirements have been met, apply a calibration label per WP 10-AD3030 prior to releasing the equipment for use.

2.2.5 If not calibrated by an approved vendor, perform Section 3.0 (starting with Step 3.3).

3.0 M&DC EQUIPMENT CALIBRATIONS

3.1 If equipment is out of calibration, Owner, tag, segregate or otherwise control the equipment to prevent use until it has been transported to the Metrology Office.

3.2 Owner, transport M&DC equipment to be shipped off-site to the Metrology Office.

3.3 Metrology Office, perform the following:

3.3.1 If equipment is out of calibration, tag, segregate, or otherwise control the equipment to prevent use until it has been recalibrated.

3.3.2 Generate purchase documents or Q-Card procurement process per WP 15-PC3044 and shipping authorization for obtaining vendor services for M&DC equipment.

3.3.3 Notify Owner when purchase document and shipping authorization are completed and in need of signatures.

3.4 Owner, perform the following:

3.4.1 Collect completed purchase document and shipping authorization from the Metrology Office.

3.4.2 Obtain all necessary signatures.

3.4.3 Return documents to the Metrology Office.

3.5 Metrology Office, transport M&DC equipment to be shipped off-site, with purchase document and shipping authorization.

3.6 Warehouse personnel, perform the following:

3.6.1 Package equipment in a manner that will ensure the equipment should arrive at the vendor site in the same condition as delivered to the warehouse. The Metrology Office, at its discretion, will provide shipping containers for especially delicate or expensive equipment.

- 3.6.2 Ship M&DC equipment to the identified vendor within two working days.
- 3.6.3 When M&DC equipment is ready for delivery, notify the Metrology Office.
- 3.7 Metrology Office, perform the following:
 - 3.7.1 Transport M&DC equipment to the Metrology Office.
 - 3.7.2 Tag, segregate, or otherwise control the equipment to prevent use until Owner has received the equipment.
 - 3.7.3 Review all M&DC equipment calibration documents for acceptability and evaluate reliability.⁵
 - 3.7.4 Affix calibration labels to M&DC equipment per WP 10-AD3030.⁶
 - 3.7.5 Notify Owner that the equipment is ready to be picked up.
 - 3.7.6 Update the equipment's recall status as required.
- 3.8 Owner, perform the following:
 - 3.8.1 Inspect M&DC equipment for damage on receipt from the Metrology Office.
 - 3.8.2 Review Calibration Certificate and data for technical accuracy.
 - 3.8.3 Enter data from M&DC equipment calibration reports into the equipment files/database (upon request, the Metrology Office will assist in establishing a computer database).
 - 3.8.4 Store all certificates of calibration and data in a fireproof cabinet until transfer in accordance with the appropriate Records Inventory and Disposition Schedule (RIDS).
 - 3.8.5 Check each piece of M&DC equipment for a current calibration label before use.
 - 3.8.6 Tag, segregate, or otherwise control equipment with expired calibration labels to prevent its use until it has been recalibrated.

4.0 CALIBRATION RECALL FOR M&DC EQUIPMENT ⁷

NOTE

Calibration notification will be made before the first day of the month in which calibration is due. The calibration of equipment expires at midnight of the due date.

- 4.1 Metrology Office, each month notify Owner of M&DC equipment due for calibration.
- 4.2 Owner, perform the following:
 - 4.2.1 On or before the due date, tag, segregate, or otherwise control the equipment to prevent use until it has been recalibrated.
 - 4.2.2 Notify the Metrology Office of any equipment not accounted for past the calibration due date.
- 4.3 Metrology Office, record any equipment unaccounted for in the Master Database.

5.0 M&DC EQUIPMENT RECORDS ^{5,8}

NOTE

The Owner is responsible for maintaining an M&DC equipment calibration history indicating "as found" vendor calibrations. This can be used in determining if an adjustment in the recall interval is justified. This data also will assist in making decisions on retirement of equipment and special case, one-time, calibration recall extensions.

5.1 Owner, perform the following: ⁹

- 5.1.1 Maintain a calibration history for each piece of M&DC equipment.
-

NOTE

When justified, M&DC equipment that is assigned a periodic calibration interval may have its due date extended an additional 25 percent of the assigned interval by the Metrology Office. M&DC equipment that has had its calibration interval extended will be calibrated immediately after the extension expires, or the special use(s) for that equipment has ended.

- 5.1.2 When justified, change M&DC equipment recall frequency with the concurrence of the Metrology Office.
- 5.1.3 Include the justification for the recall frequency change and document it in the M&DC equipment files.

- 5.1.4 Record the justification for the recall extension in the M&DC equipment history file/database.

NOTE

The calibration frequency interval for M&DC equipment is based on the manufacturer's recommendation, M&DC equipment usage, and the historical reliability. The reliability target goal for M&DC equipment is 85 percent. This data will be used to aid in adjustments in recall frequency, decisions on retirement of equipment, and the need for additional equipment. The analysis shall consider data from the as-found vendor calibrations (i.e., in-tolerance or out-of-tolerance).

- 5.2 Metrology Office, perform the following:

- 5.2.1 Check similar M&DC recall dates periodically, and stagger recall dates as needed, to ensure availability for day-to-day and peak needs.
- 5.2.2 Apply a calibration label with the new expiration date per WP 10-AD3030.
- 5.2.3 Update the recall database.

6.0 M&DC EQUIPMENT USAGE TRACKING

- 6.1 Owner, perform the following:

- 6.1.1 Check each piece of M&DC equipment for a current calibration label before use.
- 6.1.2 Document the usage of M&DC equipment, procedure number, or description of use, date of usage, and the name of a user (upon request, the Metrology Office will assist in establishing a computer database for tracking usage).

NOTE

Assistance in functional tests of M&DC equipment should be requested from the Metrology Office.

7.0 FUNCTIONAL TESTING OF M&DC EQUIPMENT ⁷

- 7.1 Owner, perform the following:

- 7.1.1 If equipment is returned from use broken, dropped, or otherwise suspected of not operating properly, perform functional test of M&DC equipment in accordance with appropriate equipment manual.

- 7.1.2 Before use, verify the readiness of M&DC by applicable testing (e.g., perform battery checks, using pass/fail criteria as indicated by self-test function on each instrument).
- 7.1.3 Whenever doubt about the reliability, accuracy, or operability of an instrument exists, conduct a functional test to assure instrument meets manufacturer's specifications, or site-imposed limited specifications.
- 7.1.4 If performance is questionable, tag, segregate, or otherwise control the equipment to prevent use, and process for rework/recalibration.

8.0 OUT-OF-TOLERANCE REPORTING OF M&DC EQUIPMENT ¹⁰

8.1 Metrology Office, when a piece of M&DC equipment is determined to have been out-of-tolerance as evidenced by the vendor "as found" calibration data, perform the following:

- Provide the Owner and cognizant manager with the out-of-tolerance vendor data and Attachment 1.
- Provide the QA Manager with a copy of the out-of-tolerance vendor data attached to Attachment 1.

NOTE

Evaluation of out-of-tolerance data should be completed in a timely manner to identify corrective actions when required. Evaluation within 10 working days is recommended.

8.2 Owner, perform the following:

- 8.2.1 Generate an M&DC equipment "Usage List" containing all equipment and/or systems that might be affected by the out-of-tolerance M&DC equipment since the last calibration.
- 8.2.2 Evaluate the impact on the equipment and/or collected data where the out-of-tolerance equipment was used and take corrective actions as necessary.
- 8.2.3 If applicable, **GO TO** WP04-IM1000, generate a WIPP Form (EA04IM1000-1-0), and **RETURN TO** Step 8.2.4.
- 8.2.4 Route a copy of the completed Attachment 1 to QA.
- 8.2.5 File the final out-of-tolerance form and the included information package into the appropriate M&DC Equipment History file.

9.0 EXPIRED M&DC EQUIPMENT CALIBRATION USAGE REPORTING

9.1 Owner, when a piece of M&DC equipment has been used after the calibration expiration date, perform the following:

9.1.1 Generate a WIPP Form per WP 04-IM1000.

9.1.2 **GO TO** Section 3.0 and recalibrate the equipment.

10.0 STORAGE OF M&DC EQUIPMENT ¹¹

NOTE

M&DC used routinely in waste handling areas will be stored in the Waste Handling Area. Due to the cost of shipping and calibrating contaminated M&DC, the Owner will do a cost analysis to determine if those items will be recalibrated or retired and disposed of by Waste Handling Operations. The Owner is responsible for using M&DC in a manner that minimizes the possibility of external and internal contamination (e.g., being wrapped in clear plastic, being taped, and being isolated).

10.1 Owner, store M&DC equipment in such a manner that the equipment will not be subjected to extremes outside the manufacturer's recommendations for:

- Temperature
- Humidity
- Vibration
- Electromagnetic interference (if necessary)
- Dust control
- Accidental damage
- Radio frequency interference (if necessary)
- Fumes
- Radioactive contamination

10.2 Owner, clean instruments used on systems that contain oil, brackish water, etc., thoroughly after each use.

11.0 RENTAL M&DC EQUIPMENT

NOTE

Special equipment required for performance of data collection may be obtained from a qualified supplier.

11.1 Owner, obtain and control rental M&DC equipment as follows:

11.1.1 Obtain concurrence from QA.

11.1.2 Generate a purchase requisition identifying the vendor supplying M&DC equipment using the guidelines of WP 15-PC3609.

11.1.3 Review Calibration Certificate and data for technical accuracy.

11.1.4 Require the rented M&DC equipment be recalibrated when necessary.

NOTE

Calibrations must be traceable to NIST standards, international standards, or intrinsic standards, in accordance with approved national standards (e.g., ANSI/NCSL Z540-1994, ISO 10012:2003). The Metrology Office may alter or waive these requirements on a case-by-case basis with QA concurrence.

11.2 Metrology Office, perform the following:

11.2.1 Review vendor's Calibration Certificate and data to verify that they meet the requirements of the Metrology Office.

11.2.2 Assign and install an ID number and calibration label per WP 10-AD3030 on the rented M&DC equipment prior to releasing it to the field.

11.2.3 Verify labels are consistent with Section 2.0 of this procedure.

11.2.4 Enter the rented M&DC equipment into the Master Database.

11.2.5 Identify a recall date.

11.3 Owner, provide usage tracking to document the usage of the equipment.

Attachment 1 - Example M&DC Equipment Out-of-Tolerance Notification

MONITORING & DATA COLLECTION OUT-OF-TOLERANCE NOTIFICATION

| RECALL NUMBER | MANUFACTURER MODEL DESCRIPTION |
|---------------|--------------------------------|
|---------------|--------------------------------|

TO:

CC:

AS FOUND CONDITION OF ITEM

COMMENTS AND INFORMATION

X

METROLOGY OFFICE SIGNATURE

DATE

WIPP FORM GENERATED YES NO

IF NO CORRECTIVE ACTION TAKEN, GIVE JUSTIFICATION

COMMENTS:

OWNER RESPONSE
OR ADDITIONAL INFORMATION

NOTE: YOU ARE REQUIRED TO COMPLETE THIS FORM AND SEND A COPY TO Q. A. INSPECTION SERVICES.

X

COGNIZANT MANAGER SIGNATURE

DATE