

CONTROL OF MEASURING AND TEST EQUIPMENT

1.0 SCOPE

This performance assessment guide for control of measuring and test equipment (M&TE) will be used to carry out the oversight responsibility of the U.S. Department of Energy (DOE) Brookhaven Group. This guide was prepared to assist in conducting performance-based assessments of DOE prime contractors and subcontractors to ensure that their programs to control M&TE identify, disposition, and take corrective action on issues that affect satisfactory facility performance. The goals are to ensure that laboratory employees and the public do not experience injuries and illness as a result of control of M&TE safety activities and that there is little or no economic loss to the Government.

Control of M&TE assessments will be directed at all prime contractors and subcontractors working at DOE sites. DOE line management must ensure that contractors comply with DOE Orders and Federal and State regulations. Information developed from this assessment will determine the degree to which this is being done as well as the effectiveness of the laboratory's program.

2.0 ATTRIBUTES AND LINES OF INQUIRY

This section provides lines of inquiry to help assess whether the laboratory has implemented a program that ensures that control of M&TE requirements are incorporated into line activities. This section will be used to evaluate the laboratory's line organization.

- 2.1** Laboratory management has identified the organizations and established policies and responsibilities within the facility where control, storage, issue and calibration of M&TE concerns exist.
- Does the scope of the laboratory's guidance include the following types of areas: health physics, emergency planning, metrology facilities, worker safety, and industrial hygiene?
 - How are the organizations apprised of their responsibilities for meeting M&TE program responsibilities?
 - Are management policies clearly presented in the facility QA Manual and other implementing procedures as appropriate?

2.2 The laboratory's training programs ensure that individuals working in the program for the control of M&TE are qualified to conduct calibration activities and other program responsibilities.

- Are the applicable governing regulations and standards addressed or described in the training programs?
- Does the training program clearly address safety concerns, requirements, and practices to be followed at the facility such as how to minimize the possibility of contamination of M&TE?
- Does the training clearly identify who has responsibility for implementing the program for the control of M&TE?
- Are personnel who are in a position to authorize and control performance of work in the program for the control of M&TE appropriately trained and instructed so that the required level of safety is maintained?
- Is the training of technicians in the program for the control of M&TE provided on a periodic basis?
- Does a review of the training documentation show that the course content is comprehensive and teaching materials and conditions appropriate?
- When training has not yet been received, how is assurance provided that the correct and necessary actions will be carried out by the assigned individual?
- Do interviews with workers show that they understand the importance and application of programs for the Control of M&TE at the facility?
- Is there special training or certification requirements for individuals who handle M&TE such as in control and issue points or calibration facilities?
- Are vendor training programs reviewed to the same standards as in-house programs?

2.3 Facilities are provided for the storage, calibration, and issue of M&TE that ensure that equipment is protected from damage in storage, is properly maintained, and is readily retrievable.

- Is a system established for the unique and permanent identification of all M&TE requiring calibration?
- Is all M&TE captured by a master list?
- Is the M&TE calibration documentation received from offsite calibrating organizations reviewed for accuracy?
- Does the calibration facility maintain all certification and calibration records for controlled M&TE?
- Are certification and calibration of standards for the use by the facility traceable to the NIST or other national standards?
- Are measurement uncertainties and calibration intervals of M&TE provided for M&TE serviced by the onsite calibrating facility?
- Is the servicing and calibration performed by the onsite organization performed in accordance with procedures?
- Do procedures require the following information: precautions or limitations, accuracy of calibration standards used, calibration instructions and data sheets for the as-found and as-left data, and acceptance criteria for each scale, expressed as a range and in units being measured (e.g., actual values rather than as 9.75 volts +/- 0.25 percent)?
- Does the M&TE issue facility have a system to report M&TE that is out of tolerance, lost, or damaged?
- Do calibration procedures ensure that the uncertainty of the standard used in a calibration is less than the uncertainty of the equipment being calibrated or tested?
- Do storage facilities provide a controlled environment (i.e., temperature, humidity, vibration, cleanliness, and other controllable factors) as required for calibration activities as specified by vendor or manufacturer documentation and are conditions documented at the time of calibration?
- Does the M&TE facility have a system to notify user organizations when the certification will expire and the M&TE is to be calibrated?
- Does the storage facility have the ability to segregate M&TE that is suspect or otherwise defective and not ready for use? This should be a physical and distinctively marked separation.

- Does the facility have procedures that describe how to protect M&TE that must be shipped offsite for calibration?
- Does M&TE received from offsite calibration facilities receive an operational check to ensure that shipping has not affected calibration?
- Does the equipment issued from the calibration facility carry a calibration adjustment seal that would indicate the settings may have been tampered with (lacquer, label, wire seal, etc.)?

2.4 The laboratory has a comprehensive and effective program for the recall and evaluation of M&TE.

- Is the traceability of M&TE provided to support the timely evaluation of instruments and other equipment that has been associated with M&TE that was determined to be deficient?
- Is each M&TE user recorded?
- Is each time and each measurement made recorded, such as on maintenance work requests or confined-space-entry permits?
- Are the ranges used or values read by the M&TE recorded?
- Do the laboratory's procedures ensure that contractors are aware of their responsibilities with respect to the use and control of M&TE?
- Are the results of M&TE calibrations trended and corrective actions specified for any M&TE reliability problems?
- Does the recall system use a calibration sticker or other means to designate when calibration is due?
- Is M&TE that has limited use (on oil or oxygen systems, saltwater, etc.) clearly designated as to the restrictions?
- Have predictive techniques identified or contributed to any program upgrades or improvements such as adjusting calibration frequencies, correcting procedures, or deleting M&TE?
- When the calibration seal on controlled instruments is broken or missing, is the M&TE considered to be out of calibration?

2.5 Each organization periodically reviews all aspects of the implementation of its own program for the control of M&TE to ensure that the program is comprehensive and effective.

- Have the program reviews been timely and thorough?
- What types of changes have been made to the program? Why were they made? Have they been effective?
- What is the laboratory's current assessment of the status of their performance in implementing the program for the control of M&TE?
- Does the training efforts include student feedback on the quality of instruction?
- Does the M&TE program designate what organization must assign measurement uncertainties and calibration intervals to M&TE calibrated by offsite calibrating organizations or vendors and endure documentation in a calibration system?
- What procedural documents provide the guidance that is used to implement the process of the control of M&TE?
- Do maintenance procedures and records indicate that the applicable controls and requirements are described and satisfied that will ensure the traceability of M&TE by the user to each of its applications?
- Are there operational controls for control of M&TE and its use in contaminated areas?
- Are all monitoring and measuring instruments in a calibration program and used by qualified individuals trained on their uses and limitations?

2.6 A walkthrough of the facility indicates that the laboratory's program is effective in ensuring that the program for control of M&TE is implemented.

- Does the walkthrough of the facility indicate that all M&TE that is in use is in the facility M&TE program?
- Do facility walkthroughs indicate that good practices are being followed by contractor employees while working with M&TE?
- Does a walkthrough of the facility indicate that all M&TE is properly identified?
- Do the findings of the walkthrough confirm the effectiveness of the self-assessment organization?
- Is the use of M&TE in contaminated spaces done in a manner to minimize the potential for instrument contamination?
- Does a document review of maintenance work requests indicate that requirements exist that would ensure that any M&TE used would be completely and properly recorded?
- Does a document review of confined space permits indicate that considerations were included to record and validate the calibration dates of any measuring equipment used?
- Do technicians performing surveys of spaces perform the functional tests specified in procedures and on measuring equipment to validate operability?
- Are functional checks required to ensure that equipment operability is clearly indicated for each piece of equipment?
- Do the functional checks include the desired response or acceptance criteria?
- Are calibration seals in place?

3.0 STANDARDS AND REQUIREMENTS

3.1 Specific DOE Orders and Standards.

- DOE O 232.1A, "Occurrence Reporting and Processing of Operations Information."
- DOE O 440.1A, "Worker Protection Management for DOE Federal and Contractor Employees."

- DOE 2300.1B, "Audit Resolution and Followup."
- DOE 2321.1B, "Auditing of Programs and Operations."
- DOE 4330.4B, "Maintenance Management Program."
- DOE 5480.4, "Environmental Protection, Safety, and Health Protection Standards."
- DOE 5700.6C, "Quality Assurance."

3.2 Title 10 CFR Requirements.

- INPO 85-038 REV. 1, "Quality Assurance Requirements for DOE Nuclear Facilities."

3.3 Industry-Consensus Codes and Standards.

- INPO 85-038 REV. 1, "Guidelines for the Conduct of Maintenance at Nuclear Power Plants."

4.0 **GUIDANCE TO ASSESSOR**

This assessment guide is intended to assist in conducting a performance assessment of control of measuring and test equipment. It is not to be considered as all-inclusive, inflexible, or limiting reasonable assessment concentration when lines of inquiry responses dictate that an area must be more thoroughly probed.

M&TE includes all tools, gauges, instruments, devices, or systems used to inspect, test, calibrate, measure, or troubleshoot in order to control or acquire data for verifying the conformance of an instrument or piece of equipment to specified requirements. M&TE does not include permanently installed facility process or control instrumentation, nor does it include test equipment used for preliminary checks where data obtained will not be used to determine acceptability or verify conformance to established criteria.