GEOSCIENCES AND ENGINEERING DIVISION QUALITY ASSURANCE PROCEDURE	Proc. QAP–019 Revision 1 Chg 0 Page 1 of 4

Title: **QAP–019 CONTROL OF MEASURING AND TEST EQUIPMENT**

EFFECTIVITY AND APPROVAL

Revision 1 of this procedure became effective on September 9, 2005. This procedure consists of the pages and changes listed below.

Page No.	Change	Date Effective
All	0	09/09/2005

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Prepared By	Date	Approved By	Date
Robert L. Bruel	9/9/2005	Wesley Patton	9/9/2005

CONTROL OF MEASURING AND TEST EQUIPMENT

1. PURPOSE

The purpose of this procedure is to describe the controls for the use of measuring and test equipment by the Geosciences and Engineering Division (Division). This procedure applies to activities conducted at the Division and at other sites and facilities.

2. RESPONSIBILITIES

2.1 The principal investigator of the laboratory or field activity is responsible for assuring that equipment used during testing, investigation, or analysis is appropriate for the measurements being made and that equipment requiring periodic calibration is enrolled in the recall notification system.

2.2 Equipment users are responsible for assuring that equipment calibration is valid prior to use.

2.3 The Division equipment custodian is responsible for coordinating equipment recall and calibration. The equipment custodian is also responsible for submitting calibration records to Division Records Control.

3. PROCEDURE

3.1 Equipment Selection

Measuring and test equipment shall be selected based on the range and accuracy (i.e., uncertainty) required of the measurements being taken. Measuring and test equipment accuracy should be 10% or less of the required accuracy tolerance of the parameter being measured. The PI or equipment user should consult with SwRI Calibration Laboratory before purchasing new measuring and test equipment to determine if the SwRI calibration laboratory or its approved suppliers have the resources to calibrate the new equipment.

Prior to placing new measuring and test equipment into use, the PI or equipment user, in coordination with the Division equipment custodian, shall enroll the equipment in the SwRI Calibration Laboratory system, which provides recall and calibration services. Prior to use, new measuring and test equipment shall be calibrated by the SwRI Calibration Laboratory or its approved supplier.

3.2 Equipment Calibrated Before Each Use

3.2.1 Measuring and test equipment that is not scheduled for periodic recalibration shall be calibrated before use with appropriate measurement standards. Calibration standards should have accuracy tolerances 25% or less of the accuracy required of the equipment

being calibrated. Examples of equipment in this category include the total organic carbon analyzer, CO_2 atmospheric analyzer, pH meter, analytical equipment, and potentiostats.

3.2.2 As appropriate, equipment calibrated before use shall be subject to periodic checks to determine whether the calibration is still valid. Evidence of the calibrations before use shall be documented in logs or appropriate scientific notebooks.

3.3 Equipment Periodically Calibrated

3.3.1 Calibration intervals should be established when equipment is obtained based on the equipment manufacturer's recommended calibration interval or industry practice. Calibration intervals may be adjusted based on the equipment's history of stability in accordance with SwRI Quality Systems Procedure IQS–OP–761.

3.3.2 Each month, the SwRI Calibration Laboratory provides a list of measuring and test equipment due for recalibration to the equipment custodian. Within the month, the equipment custodian shall coordinate with the equipment user, either scheduling an on-site calibration (e.g., for balances) or shipping the equipment to the SwRI Calibration Laboratory for recalibration.

3.3.3 The SwRI Calibration Laboratory performs the calibrations or obtains calibration services in accordance with its ISO 17025 accredited system. Upon completion of the calibration, the equipment and a calibration certificate are provided to the Division equipment custodian. After in-processing, the equipment shall be returned to the user.

3.3.4 The equipment custodian shall forward the calibration certificates and related documentation to Division Records Control within two weeks of the calibration.

3.4 Equipment Use

Equipment users shall verify that the calibration due date of measuring and test equipment will not expire during the period of expected use. In addition, measuring and test equipment shall be examined before use to identify any equipment condition that may adversely affect measurement accuracy or precision. Equipment subjected to potential damage should be checked or recalibrated to determine whether the equipment is operating correctly. Equipment no longer capable of meeting accuracy and precision requirements shall be removed from service.

3.5 Use of Equipment Not Maintained by the Division

When measuring and test equipment is borrowed from other organizations or when Division measurements are made in the laboratories of other organizations, the responsible PI shall

ensure that equipment is properly calibrated before Division use by the SwRI Calibration Laboratory or its approved supplier.

3.6 Use of Measuring and Test Equipment by Other Organizations

If Division equipment is used by an organization outside the Division, the equipment custodian shall examine the equipment on return and, if necessary, require recalibration before use on Division activities. Necessary calibration and repair costs should be charged to the organization using the equipment.

3.7 Out-of-Tolerance Evaluations

The SwRI Calibration Laboratory sends out-of-tolerance notices to the equipment custodian when equipment is found to be out of tolerance upon recalibration. In such cases, the Division equipment custodian shall initiate nonconformance reports in accordance with QAP–009, Nonconformance Control. The responsible PI or equipment user shall determine the impact of the out of tolerance on affected measurements and test results, and determine the disposition of measurements made since the last valid calibration. The nonconformance investigation shall also identify any remedial action necessary to correct the nonconformance. Equipment no longer capable of meeting or maintaining required accuracy and precision for an appropriate period shall be removed from service.

4. RECORDS

Calibration documentation, including calibrations-before-use documented in scientific notebooks or logs, shall be retained as quality assurance records in accordance with QAP–012, Quality Assurance Records Control.