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NUCLEAR WASTE MANAGEMENT PROGRAM PROCEDURE
SP 20-3
CALIBRATION, USE, AND MAINTENANCE OF
BALANCES USED FOR WASTE SURROGATE DEVELOPMENT
Revision 1

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1.0 Purpose and Scope

This procedure provides for the calibration, operation, maintenance of balances in Building 6600, Area 3 as part of the waste surrogate development research activities in support of the Waste Isolation Pilot Plant (WIPP) Project.

This procedure is applicable only for the balances in Building 6600. This document is not meant to substitute for the manufacturer's instruction manuals for the balances. The user is responsible for reading and understanding the appropriate manuals.

Acronyms and definitions not located in the glossary will be defined in the text of this procedure. Some acronyms and definitions used in this procedure are contained in the Nuclear Waste Management Program (NWMP) Glossary located by accessing the Sandia National Laboratories (SNL) NWMP On-Line Documents website which also provides access to controlled documents [NWMP procedures (NPs), Activity/Project Specific Procedures (SPs), forms, controlled documents such as technical operating procedures, and other quality assurance (QA) program information]. Website access is obtained by using either of the following:

<http://www.nwmp.sandia.gov>
or alternatively,
<http://132.175.140.247/onlinedocuments>

2.0 Implementation Actions

2.1 Prerequisites

The QA and environmental health and safety (ES&H) requirements that are prerequisites for this work are listed below.

2.1.1 Quality Assurance

All personnel providing technical support to WIPP are required to follow the Sandia WIPP QA Program as described in the document, "*U.S. Department of Energy, Carlsbad Area Office, Quality Assurance Program Document, CAO-94-1012*, most recent revision (revision 2 is currently in effect). The implementation of the Carlsbad Area Office (CAO) QA Program Document (QAPD) by the Sandia WIPP QA Program is through NPs. All personnel working under this procedure (SNL staff, contractors) will be required to view the Annual Refresher Training Video and complete forms NP 2-1-1 (Qualification and Training Form) and NP 2-1-2 (QA Training Roster) *prior to* beginning work.

All participants will be required to read this and any other pertinent procedure prior to beginning work. A copy of any required pertinent procedures will be available in the work area. The procedure for initiating, using and completing a scientific notebook, NP 20-2, most recent revision, is required to be read and followed for this work activity.

2.1.2 Environmental Safety and Health (ES&H)

There are no specific required safety procedures applicable to this work. However, basic environmental health and safety knowledge applies. All participants should have completed

ESH 100 ES&H Awareness

All participants are encouraged to assess work area hazards and protect themselves by wearing personal protective equipment (leather gloves, safety glasses, face shields, latex gloves. etc.) if indicated by the work being performed.

2.1.3 Work Description

The following balances are located in Building 6600 and their use and operation are addressed in this document.

Balance Manufacturer	Model	Serial Number (SN)	Range
Sartorius	1465	SN 3505161	0-420g
Mettler	PK 60	S/N40220	0-60,000g
Mettler	PM 1200	SN 1113380229	Range 0-1200g
Mettler	KCS 600	2258765	0-600 kg

2.1.3.1 Standards

Primary calibration will be performed annually by the Sandia Primary Standards Laboratory (PSL) using their procedures. The calibration certificate will be on file in the laboratory supporting this activity, and a copy will be placed in the project records.

Continuing or secondary calibration will be verified using commercially obtained weights that are traceable to the National Institute of Standards and Technology (NIST), or other nationally recognized

standards. The serial numbers and expiration dates (if any) of the certifications of the weights used shall be recorded in the laboratory notebook.

The weights shall not be used past the expiration date listed on the container by the certifying organization.

2.1.3.2 Frequency

The balance will be re-calibrated upon failure of a performance test, this calibration will be noted in the balance's scientific notebook.

The instrument's calibration shall be verified with performance tests immediately prior to use and during use whenever a major shift in the weight range of the materials being weighed occurs.

2.1.3.3 Performance Test Criteria

The secondary standard weight set is identified as Fisher Scientific Calibration Weight Set; 1-2000g (SN 2166). At least three NIST-traceable weights will be used, two of which are required to bound the expected "unknowns". For example, the materials to be weighed are expected to range from 5 to 18 grams. Appropriate performance tests weights would be 1g, 10, 25 g.

When handling weights, always use tweezers. Never touch the weights with your hands. Delicately remove chemicals, dust, and debris from the balance pan before you place the weights on it. Minimize dust accumulation on the weights by keeping them in their container with the lid closed. Be careful to prevent weight-set mix-ups by moving only one weight at a time from its box.

Performance tests will be done by weighing the NIST-traceable weights. The maximum acceptable deviations from the nominal values for each weight are as follows:

Weight	Maximum acceptable Deviation	Weight	Maximum acceptable deviation
600 kg	plus or minus 6.0 g		
100 g	plus or minus 1.0 g	500 mg	plus or minus 0.0001g
50 g	plus or minus 0.5 g	300 mg	plus or minus 0.0001g
30 g	plus or minus 0.3 g	200 mg	plus or minus 0.0001g
20 g	plus or minus 0.2 g	100 mg	plus or minus 0.0001g
10 g	plus or minus 0.1 g	50 mg	plus or minus 0.0001g
5 g	plus or minus 0.05 g	30 mg	plus or minus 0.0001g
3 g	plus or minus 0.03 g	20 mg	plus or minus 0.0001g
2 g	plus or minus 0.02 g	5 mg	plus or minus 0.0000g
1 g	plus or minus 0.001 g	3 mg	plus or minus 0.0000g
		2 mg	plus or minus 0.0000g
		1 mg	plus or minus 0.0000g

When using a weight (or combination of weights) not listed above, use the next lowest value as your maximum allowable deviation.

1. Record each weight number (the expected weight) and the "observed" balance reading in the scientific notebook.

2. Create a column header called tolerance. If the weights are the same record "0" in this column, If the weights are different, determine if the difference is acceptable (see below) or not and record "A" for acceptable or "not A" for unacceptable.
3. Any one measurement's deviation in excess of the maximum allowable deviation listed for that weight constitutes an unacceptable or failed performance test requiring corrective action.

2.1.3.4 Corrective Action

1. Reweigh the standard. If two consecutive acceptable readings are obtained, no further action is required. Document these measures.
2. Additional Corrective Action
Check the balance and work area for interferences such as an unstable weighing surface, air drafts, or a table that is not level, and correct the problem, and repeat the weighing. If the performance check still fails, recalibrate the balance as per its manual's instructions and repeat the performance check. Record the results. If the instrument still fails, it shall be tagged and taken out of service until repaired and recalibrated using a primary standard.. Record this problem in the scientific notebook.

2.1.3.5 Routine Weighing Procedure

Always weigh samples on weighing paper or in an appropriate container. Do not weigh objects heavier than those recommended by the manufacturer. Keep weighing pans/platforms clean of debris and spills.

2.1.3.6 Maintenance

Maintenance and routine calibrations will be performed annually by the Sandia PSL, unless required sooner by a failed performance check or the requirements in NP 12-1.

3.0 Records

Calibrations will be recorded in the laboratory notebook in accordance with Sandia National Laboratories Nuclear Waste Management Procedure, NP 20-2, Scientific Notebooks. Performance checks will be documented and when a significant deviation from expected results occurs, this occurrence and the corrective action steps implemented will be noted.

4.0 Appendices

Appendix A: Reviewers and Required Signatures

