Table of Contents

1.0 Purpose

This procedure defines the process for review and approval of calibration data. The guidance provided by this procedure is intended to ensure consistency and identify risk associated with incomplete or failed calibration.

2.0 Scope

This SOP applies to calibrated GMP and GLP equipment and instruments used to support the operations of the Biopharmaceutical Development Program (BDP). This procedure covers review and approval of calibration data that supports the use of equipment in the BDP program. Those reviewing and approving records should have, as a minimum, basic knowledge of the use of the instrument being calibrated, calibration procedures, industry standards, and process controls.

3.0 Authority and Responsibility

3.1 The Quality Engineering and Validation Manager, Biopharmaceutical Quality Assurance (BQA), has the authority to define this procedure.

3.2 BQA is responsible for implementing this procedure.

3.3 Facilities Maintenance and Engineering (FME) calibration staff and trained BDP staff are responsible for entering calibration records into Blue Mountain Regulatory Asset Manager.

3.4 BDP Engineering is responsible for maintenance of instrument records.

3.5 BQA and those with *Approval* credentials are responsible for performing calibration data review.

3.6 BQA is responsible for quality oversight of this procedure.

4.0 Procedure

4.1 In accordance with ***SOP 21508 - Equipment Calibration Program*** FME calibration technicians or an outside vendor calibrates the instrument and documents the data on a Calibration Data Sheet or enters it electronically into the Blue Mountain Regulatory Asset Manager (BMRAM) software program.

4.2 Electronic data entered directly will already have the first digital signature for Authorship applied by the calibration technician at the time of review.

4.3 Calibration data from a data sheet for calibrations performed by contractors or outside vendors will be maintained in hard copy in the Master Equipment File (MEF) and also digitally linked to the Work ID by staff entering the data into BMRAM. The person entering and linking data will provide their electronic signature for Authorship and the first level of review.

4.4 The second electronic signature for Approval will come from different BMRAM users with the proper credentials. Only users with a sufficient level of calibration knowledge and approved by BQA will be given such credentials by the system administrator.

4.5 Corrections to the raw data must be made by the person who originally recorded the data, by his/her supervisor, or by BQA. Each correction must be signed and dated either physically or electronically. Corrections made in the software will rescind any previously applied electronic signatures depending on the field corrected.

4.6 Corrective action must be initiated whenever an instrument fails to remain in calibration (calibrated range and tolerance) throughout the entire calibration interval. Typically, the corrective action is taken during the actual calibration as the technician will attempt to bring the unit back into tolerance.

4.6.1 The description of the corrective action will be documented, in most cases electronically, for the instrument.

4.6.2 Whenever an instrument has failed via Out-of-Tolerance (OOT), an investigation is required to determine whether any product impact has occurred. This process will be tracked in one of two ways. If the OOT can be shown to not have negative impact to product or processes and does not require input from persons other than those handling the calibration record, it may be handled with comments in the OOT fields and linked/attached documents as needed within BMRAM. If the investigation is more involved or has potential for impact, it will then be tracked by the Engineering Event Management Program, as per ***SOP 21526 - Engineering Event Management***.

4.6.3 Continued out-of-specification for the same instrument will require consideration of other corrective and/or preventive actions. The calibration interval may be reduced, the range or tolerance changed based on process needs, or other changes as documented in BMRAM and the EE. Other factors to consider are replacement of the instrument with a different type or model.

4.7 If As-Found data cannot be collected for any reason, such as equipment that is damaged, an investigation must be initiated to see what impact an OOT would have. In this case, true OOT status will usually be indeterminate making the process somewhat hypothetical and the selection of **Indeterminate** used for the field "Out of Calibration". If the instrument was a standard, recalibration or calibration verification of devices where the standard was used should generally be performed. The cause of the condition that did not allow the As-Found data should also be considered in the investigation to see if it can be remediated or the likelihood reduced.

5.0 Data Fields for Review as listed in Blue Mountain Regulatory Asset Manager

The following chart lists information that must be complete for Authorship and prior to Approval of the Work ID. These are some, but not all, of the considerations to be made before approval is given. They are separated as "Static" data that is part of the Equipment Master and does not routinely change and "Dynamic" data that is unique to a specific calibration Work ID or History Date.

Static Fields		
LABEL	**FIELD SHOULD CONTAIN**	**ERRORS TO LOOK FOR**
System ID	A number from one of the four accepted numbering systems, BDP#, NIH#, Serial# or FME utility#	Missing or incomplete number. Number from some other system.
Component ID	This field does not require an input but, when present, it should be from one of the accepted systems.	Incomplete number or number from some other system.
Equipment Type	The information here should correspond to the acceptable types listed in ***SOP 21555 - Use and Management of Blue Mountain Regulatory Asset Manager***.	Type is not listed in the SOP or is written in the wrong syntax.
Description	Information that helps the technician identify the unit.	Information that does not correspond to the equipment type.
Manufacturer	A company name when not a component of another system and company name	Names of distributors when Original Equipment Manufacturer (OEM) is available.
Model	The number should be for the specific equipment component being calibrated.	System for component model. Data code for model.
Serial Number	A number that is unique.	Date code without unique descriptor.
Department	The organization designation such as BDP, FME.	Names of individuals or locations.
Location [Building/Room]	Location of equipment being tested.	Location that does not correspond to the department listed.
Contact Person	The name of a person, not a position.	Person that does not correspond to the department listed. Person no longer working in the BDP.
NCI Decal Number	When present, number should start with alpha character.	No Alpha character

Static Fields		
LABEL	**FIELD SHOULD CONTAIN**	**ERRORS TO LOOK FOR**
Manufacturer Range	Data as determined by the equipment manufacturer.	Data not consistent with the type of equipment being tested. Absence of units.
MFG Tolerance	Data as determined by the equipment manufacturer.	Data not relative to industry standards.
Calibrated Range	Data that has been approved by the equipment owner and QA and is applicable for the intended use of the device.	Data not covering ≥70% of the range of the instrument. Single point and devices such as conductivity meters with limited standards may be exceptions.
Calibrated Tolerance	If different from the manufacture's tolerance, then this data should be approved by the equipment owner.	Tolerance more restricted than the equipment mfg. tolerance.
MEF (BDP) Number	BDP identifier if available and not listed for System ID.	Presence of non-MEF number.
Interval	Data should be in months or years for calibration interval.	Data will typically not exceed 1 year except for weights, spec standards, or mass flow meters. Intervals are usually increments of 6 months.
Dynamic Fields		
History Date	Should be month, day and year. This is the date of calibration.	Date should not be in the future. Date should match any external documents.
Comp. Status/Cal. Level	Data here should describe the calibration label affixed to the completed unit.	Label does not correspond to the correct level of calibration.
Out of Calibration	[No] [Yes] [Indeterminate], or blank when internal cal rule is not Yes.	Value reflecting manufacturers range/tolerance and not calibration range/tolerance. Verify data tables configured correctly. If marked [Yes], the Support field should contain additional information.
Reason	Scheduled, repair or requested.	Anything but scheduled, repair or requested. Label should match for History.
Pass/Fail	Pass or Fail	Field did not follow calibration tolerance, data tables configured incorrectly to populate field.
Units	Units of measure as read from the standard.	Units of the unit under test (UUT) or calculated units of measure.
Standard	The value as read from the standard instrument used.	Data from the UUT.
Instrument	The value as read from the UUT instrument.	Data from the standard
Standard Upper Limit	The standard value plus the positive cal tolerance.	The pre-cal value plus the positive cal tolerance.

Static Fields		
LABEL	**FIELD SHOULD CONTAIN**	**ERRORS TO LOOK FOR**
Standard Lower Limit	The standard value plus the negative cal. Tolerance	The pre-cal value plus the negative cal tolerance.
Standards Used	This should be a traceable number or description under Standard name and should contain all standards used.	Standard Name (ID) or due date is blank. Verify that standard measures the units of the UUT. Verify that the standard range is applicable and the accuracy of standard meets 4:1 or inability to meet 4:1 is noted in comments field with explanation as needed. Incomplete list provided.
Support Tab	If Out of Calibration [Yes], field should contain OOT Status, OOT Response status, and comments or reference to attached investigation report. (Investigations are performed per SOP 21508.	Missing and incomplete fields or selections that do not agree with the severity of the OOT.

6.0 Calibration Documents from Outside Vendors

6.1 The calibration documents will be accepted only if they contain, at a minimum, the following information. Verification of this information occurs as part of *Authorship* and *Approval* as they are part of the Work ID as links.

6.1.1 Description

The description should be such that the instrument is distinguishable. This description should contain enough information that would allow the acquisition of a replacement if required.

6.1.2 Name of Calibrating Organization

Identifies the organization so there is no dispute as to who performed the calibration.

6.1.3 Traceability Tag

There must be some means to track this document and to distinguish it from other documents of the same type.

6.1.4 List of Equipment

A list of the equipment used to calibrate the instrument is to be documented. The calibration due date of this equipment is to be documented and must exceed the calibration complete date for the unit under test. If this data cannot be provided the condition must be handled on a case-by-case basis and properly documented.

6.1.5 As-found Data

For other than initial calibrations, as-found or as-received data must be listed. This data should be taken before any adjustments have been made to the instrument. This data is used to qualify the calibration interval. If as-found data could not be gathered, see Section 4.7. If the vendor fails to adequately collect the as-found data, they must be made aware that this data is requested and required for our program and a failure to provide the data in the future may result in the loss of future business. (As-found data may not be able to be collected in cases where the instrument is damaged. In such a case, as-found data is considered to be OOT.)

6.1.6 As-left Data

This data may be the same as the "as-found." For new purchases, this data may come from the manufacturer or vendor. If the As-left data is ever incomplete or inaccurate for any reason, the calibration may need to be repeated if the data cannot be otherwise justified or corrected.

6.1.7 Calibration Dates

The calibration certificate must contain the date when calibration testing was completed and when the unit is recommended for the next calibration. The suggested calibration interval on a calibration certificate may differ from the interval used in BMRAM. The interval in BMRAM may be longer or shorter and is based on multiple factors including historical data, process needs, and risk assessment. Vendor interval recommendations should always be considered and are typically used as a default in the absence of other data.

6.1.8 Signature/Date

The calibration certificate must be signed (electronic signatures are acceptable) and dated by the calibrating technician or his/her supervisor. If there is a place for a "reviewed by" signature for vendor staff, then it must be signed and dated.

7.0 Documentation

7.1 Documentation shall be kept in the Master Equipment File (MEF) following the guidelines of ***SOP 21407 - Records Retention***. Documentation may be sent to off-site storage as necessary.

8.0 References and Related Documents

SOP 21407 *Records Retention*

SOP 21508 *Equipment Calibration Program*

SOP 21555 *Use and Management of Blue Mountain Regulatory Asset Manager*

SOP 21526 *Engineering Event Management*

[redacted]