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| **OWM On-the-Job Training and Mentoring**  **Worksheet Form** | | | | | |
| **Employee/Trainee Name:** | | | | | |
| **Trainer/Mentor Name:** | | | | | |
| **Topic/Procedure: Mass Echelon I (SOP 28, with SOP 2, 29 & 34, GMP 10, 11, 12, & 13, GLP 4)** | | | | | |
| **GENERAL Measurable Training/Learning Objectives Applicable for all SOPs** | | | **Trainee Initials and Date** | | **Mentor Initials and Date** |
| DESCRIBE (and FOLLOW/USE) applicable safety and protective equipment requirements for this SOP | | |  | |  |
| DESCRIBE (and PERFORM) laboratory process for receipt, handling, storage, and return of related customer standards (noting issues unique to this SOP) | | |  | |  |
| DESCRIBE (and FOLLOW) laboratory process for preparing calibration certificates (and amendments) | | |  | |  |
| DESCRIBE (and FOLLOW) laboratory process for documenting non-conformities to laboratory procedures and/or ISO/IEC 17025 | | |  | |  |
| PERFORM this SOP while DESCRIBING steps as if for an assessor | | |  | |  |
| EARNED Mass Echelon II OJT approval | | |  | |  |
| **SOP 28 Measurable Training/Learning Objectives** | | | **Trainee Initials and Date** | | **Mentor Initials and Date** |
| Section 1.1, Metrologist can:  IDENTIFY and FIND the documentary standards (NISTIR 5672,  ASTM E 617, OIML R111);  LOOK UP tolerance limits for a sampling of nominal values; and  DESCRIBE the purpose and application of weight classes in general - including the most likely procedure for each set of classes (See GMP 12). | | |  | |  |
| Section 1.2, After observing, reading, and performing this calibration procedure, the metrologist can:  DESCRIBE and PERFORM the procedure in such a way that it would satisfy an internal auditor or accreditation auditor. | | |  | |  |
| Section 1.2, the metrologist can:  IDENTIFY location of laboratory calibration certificates for working standards, laboratory traceability hierarchy, and status of calibration due dates; (ASSESSMENT of the laboratory traceability records is part of the LAP Problems).  SELECT appropriate values and uncertainties from the calibration certificate for use - or verification of embedded values in laboratory software;  DESCRIBE good weighing techniques based on reading GMP 10 and observing demonstrated SOP 28 calibration;  IDENTIFY and VERIFY that laboratory facility is operating within limits and  DESCRIBE what happens if environmental limits are not met (non-conformity; should be an Admin Procedure and Action Item Forms);  DISCUSS how staff members use check standards and control charts to monitor balance operation and DESCRIBE the maintenance service  and/or calibration procedure for laboratory balances;  VERIFY that standards to be calibrated have equilibrated the requisite amount of time (DESCRIBE Admin Procedure for Care and Handling of Submitted/Laboratory Standards). | | |  | |  |
| Section 2.4.1.4, the metrologist can:  PLACE the restraints and unknown weights in balance chamber or near the balance for 24 hours to ensure the weights attain thermal equilibrium. | | |  | |  |
| Section 2.4.2, the metrologist can:  CHOOSE the appropriate weighing design from NISTIR 5672 and build an input file to be able to use the Mass Code 4.1 (masscomp4\_absoft\_2014\_02\_20\_20160926.exe)  CREATE Mass Echelon I data sheets using form NCM18 | | |  | |  |
| Read SOP 34. Mentor to share practices in the laboratory for selection and use of sensitivity weights. Section 2.4.1.4 and SOP 34, the metrologist can:  DESCRIBE laboratory practices for using sensitivity weights (ensuring it is consistent with SOP 34); and  IDENTIFY and SELECT appropriate sensitivity weight consistent with SOP 34 and laboratory practices. | | |  | |  |
| Section 3, the metrologist can:  COMPILE the Mass Code report using MC4.1. Save as MC41-XXX.doc, where XXX is the three-digit number from the NC Test Number.  VERIFY the series passes the F-Test and t-test.  ENTER the new observed standard deviation and observed value of the check standard into the appropriate control chart.  ENTER the sw & sb into the input file and compile a second time.  SAVE the .doc file as a .docx and create the appropriate cover sheet.  PRINT the .docx file. Print Page 1 as a full page, then the rest of the document as two pages per printed page. | | |  | |  |
| Section 5, the metrologist can:  For now - until Uncertainties are covered:  REVIEW "official laboratory uncertainties" and  DETERMINE:  1. Whether uncertainties are sufficiently small for applicable tolerances (< 1/3) per the documentary standards  2. Whether the absolute mass value plus the uncertainty is within the tolerance limits (be able to look up tolerances on a table and verify  values if used in the laboratory spreadsheets). | | |  | |  |
| Read SOP 29 and be able to LIST and DESCRIBE the 8 steps in the uncertainty process in the context of SOP 28.  Step 1. SPECIFY - refers to SOP 28 and the measurement equations listed in the SOP (e.g., see Equations in Section 5).  Step 2. Metrologist should be able to IDENTIFY, DESCRIBE, SELECT, QUANTIFY, CONVERT all sources/components from Uncertainty Budget to  CALCULATE the COMBINED uncertainty using a root sum square method.  COMPARE and EVALUATE - this section and with the official laboratory uncertainties. (Part of the LAP Problems).  VERIFY calculations in the laboratory spreadsheets for uncertainty using this SOP. | | |  | |  |
| CREATE uncertainty budget from the Excel spreadsheet provided by OWM. NC has modified this spreadsheet to include our NVLAP values and then report the greater of the NVLAP or real time uncertainty.  ADD the Type A from the mass code report.  ADD the bias from the control chart after the second iteration.  UPDATE the degrees of freedom from the control chart. | | |  | |  |
| Section 6.1, the metrologist can:  CREATE a calibration certificate that COMPLIES with SOP 1 and items that must be included per SOP 28.  LAP Problems include evaluation of laboratory templates against section 7.8 in ISO/IEC 17025 and SOP 1. Laboratory administrative  procedures for calibration certificates to be reviewed and assessed for compliance as part of the LAP Problems as well. | | |  | |  |
| Section 6.2, the metrologist can:  DESCRIBE the two requirements for conformity assessment that are listed in this section and assess the measurement results and  uncertainties per section 2.9 for compliance with the applicable documentary standards. | | |  | |  |
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| **Trainee Final Observations/Assessments Summary:** | | | | | |
| Describe how confident you are with finding all the files and resources in your laboratory that are needed to perform this calibration, prepare a certificate, and return items to customers. What additional training do you think you need to improve? How much additional time performing this calibration do you think you need to feel confident? What additional questions do you have or follow up would you like to see? | | | | | |
| **Trainer Observations/Assessments Summary:** | | | | | |
| Describe in your own words: How closely did the trainee follow the SOP? How many times and what nominal values/standards/equipment were used when you demonstrated the procedure AND when you observed the trainee performing the procedure? How did your measurement results agree? How did their values look on the laboratory control chart(s)? Were they able to describe the procedure to your satisfaction? Were gaps observed? Is additional follow up needed? What additional assessments did you observe that help to ensure that learning objectives were met? | | | | | |
| **Objective Evidence Assessed by Trainer/Mentor (***maintenance of electronic records is encouraged***):** | | | | | |
| * Reading Outline (completed by trainee, reviewed by trainer/mentor, discussed) * Video of Demonstration/Performance (optional, recommended) * Data Sheet(s) of completed measurements * Traceability Assessment of Laboratory Standards Used completed by trainee (Using GMP 13 forms, with list of laboratory files/locations) * Spreadsheet File(s) PDF print-out of data entry of completed measurements * Control Chart record showing trainer/mentor data and trainee data and evaluation of control charts with SOP 9 checklist evaluation * Independent Uncertainty analysis following applicable SOP and SOP 29, comparison with official laboratory uncertainties * Calibration Certificate for calibrations performed by trainee * Calibration Certificate marked up as reviewed for compliance with SOP 1 and applicable SOP * List of laboratory files reviewed by trainee:   + Template Spreadsheet File:   + Completed Spreadsheet File(s): | | | | | |
| **Applicable Proficiency Test(s):** | **Date of Calibration:** | | | **PT Evaluation Report**  (*Name, Date*) | |
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| **Employee/Trainee Signature:** | | **Trainer/Mentor Signature:** | | | |
| **Recommended for Approved Signatory Status (Name, Title, Signature):** | | | | | |
| **Approved for signatory status by NIST Office of Weights and Measures (name & date);** | | | | | |