Summary

ISO/IEC 17025:2005 is the general requirement for the competence of testing and calibration laboratories and is the main ISO standard used by testing and calibration laboratories in most major countries. We will also be referencing DOM05 Practices for Instrument Calibration and Maintenance for specific guidance for submittal to ANAB for accreditation. In this proposal I will outline how ISO/IEC 17035 and DOM05 are used as a roadmap to help ensure our forensics lab runs smoothly and efficiently and in compliance for accreditation. We will outline the accreditation requirements, give some equipment lists and ensure that the equipment is being maintained properly. I will also talk about personnel requirements and training for those personnel. I will discuss quality assurance and continuous improvement including some things as upgrading and properly maintaining lab equipment, ensuring facilities are laid out properly and safely. Discuss security requirements for equipment loss or lab contamination. This is not an exhaustive list. This will provide an outline for a plan for a medium size laboratory for this police department.

Accreditation Plan

To begin an accreditation for a digital forensic lab for International Standard ISO/IEC 17025:2005 a lab must apply for "General Requirements for the Competence of Testing and Calibration Laboratories" and provide evidence of ownership of this document prior to applying for accreditation. This plan will use the ANAB and ISO 17025:2005 standards for accreditation. The following steps will be used to start the accreditation process:

a) For initial laboratories only: Prior to the submission of this application, the laboratory must submit proof of purchase of the ISO/IEC 17025/2005 standard or other applicable requirements and, if necessary, request a copy of the current Site Assessment Checklist.
    a. A licensed copy of the International Standard, if applicable to the program for accreditation (e.g., ISO/IEC 17025 for testing/calibration, ISO/IEC 17020 for inspection)
    b. The MA 3033 accreditation manual
    c. Accreditation scheme Requirements (AR 3125 for testing/Calibration, AR 3021 for inspection, AR 3181 for property and evidence control units)
    d. Application and draft scope documents
    e. If applicable, additional requirements (e.g., FBI Quality Assurance, state and local required standards)

b) Completion of indicated sections of the site assessment checklist, and submission of the completed checklist with the application is required. There will then be a document review of submitted documents, an assessment of accreditation, and any corrective actions that need to be made. Once all that is complete a decision will be made and then the lab will be under surveillance and reassessment and must continue to operate within the standards of accreditation.

c) Contact the ANSI-ASQ National Accreditation Board (ANAB) website for information on accreditation. http://www.anab.org/lab-related-accreditation/request-for-quote

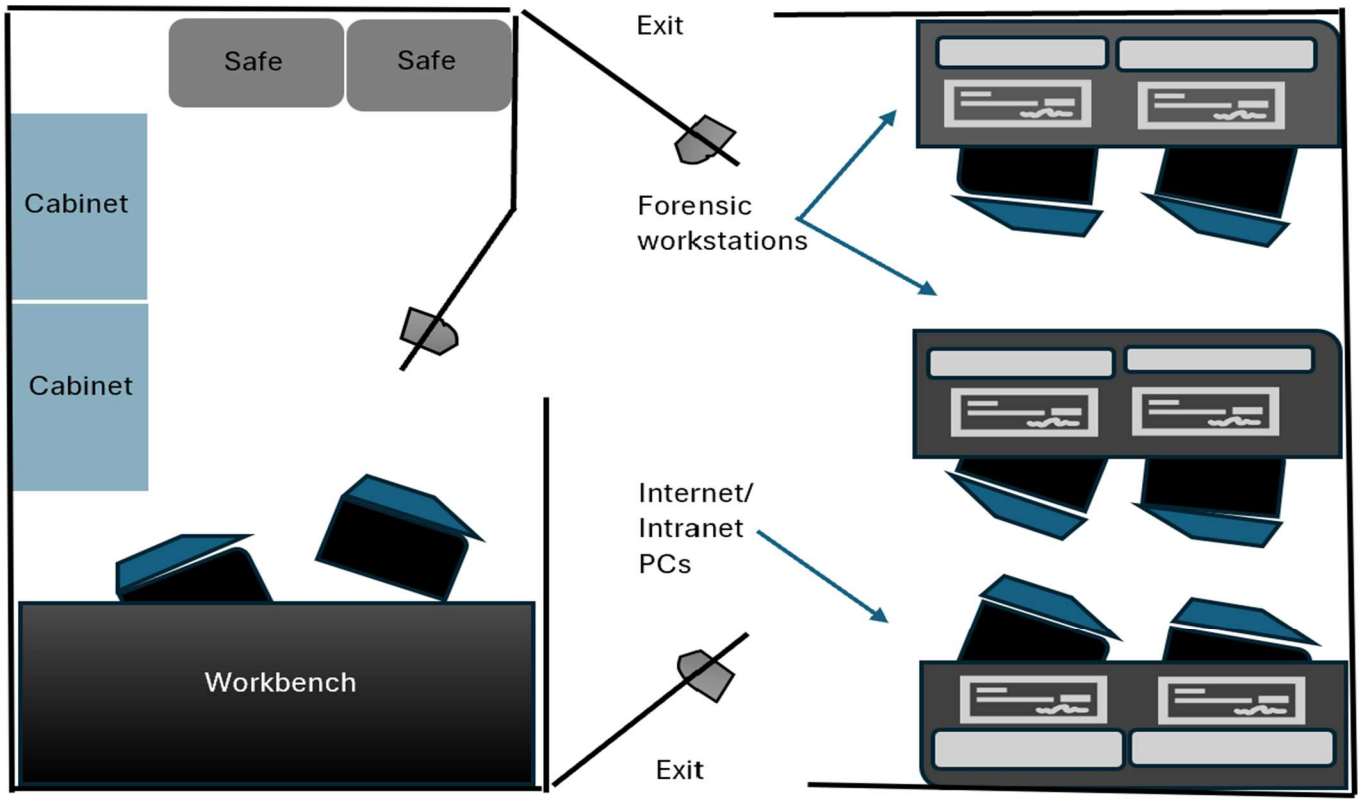
d. List of Approved Accreditation Organizations in the US:
    a. The ANSI-ASQ National Accreditation Board and their recent acquisitions of L-A-B and ASCLD-LAB which are now both [http://www.anab.org/ ANAB
    b. The American Association for Laboratory Accreditation [http://www.a2la.org]
    c. The International Accreditation Service (IAS) [iasonline.org]

The laboratory must be familiar with and comply with all relevant ISO/IEC 17025:2005. The table below serves as a sample for the ISO checklist for an accreditation application. The necessary steps for accreditation are listed:

Policy Topic	Attachment Number	Submission Examples Required	ISO Reference	Initial	Reaccreditation	FoT Addition
ISO/IEC 17025	**6A.1**	**This standard specifies the general requirements for a laboratory to conduct tests and carry out calibrations. This standard is applicable to all organizations performing these tests**	**All**			
Site Assessment Checklist	**6A.2**	**The laboratory shall provide a checklist that details a plan for security measures for personnel and equipment. Outlines provisions for environmental safety for personnel and equipment and include the proper facility to conduct lab functions properly.**	**All**			
Organization Chart	**6A.3**	**The laboratory shall have technical and managerial roles that are clearly defined. Have the authority to conduct their clearly defined duties and process improvements. Lab shall maintain technical staff and managerial staff at the appropriate level to conduct normal lab operations**	**ISO 4.1.5.e**			
Document Control	**6A.4**	**The laboratory shall establish and update procedures to control all documents. These could include employee records, policies and procedures, equipment records and calibrations records. All documents shall be kept in a place available for personnel to review and update as necessary as laws and regulations change.**	**ISO 4.3.1**			
Corrective Action	**6A.5**	**The laboratory shall have documents and procedures in place that provide instructions in case the results of the lab testing do not conform to its own policy. Procedures for notification of staff and immediate corrective actions. Lab shall establish a policy to designate authorities to implement corrective action when nonconforming work is conducted.**	**ISO 4.9.1 4.11.1**			
Preventive Action	**6A.6**	**The lab shall establish procedures to identify risks prior to any nonconformities exist and when improvements can be made provide staff with a procedure with providing those improvements.**	**ISO 4.12.1**			

Internal Audit	**6A.7**	**Lab shall implement policy to ensure they are regularly assessing risks associated with lab process and take proactive measures to ensure the safety of lab personnel**	**ISO 4.14.3 2A.4.14.1**			
Management Review	**6A.8**	**Regularly conduct planned internal audits and keep records of those audits to ensure you are following lab policies**	**ISO 4.15.2**			
QA Reports	**6A.9**	**Regularly conduct QA reports to ensure lab policies are not producing unintended consequences and ensure those recommendations are implemented immediately.**	**2A.4.15.2**			
Facilities	**6A.10**	**The laboratory shall ensure the lab layout supports testing activities without a risk to personnel, equipment or testing results.**	**2A.5.3**			
Test Methods	**6A.11**	**The laboratory shall use appropriate methods and procedures for testing and calibrations within established policy and manuals.**	**ISO 5.4.1**			
Traceability	**6A.12**	**The laboratory shall have procedures in place to ensure all equipment is tested and calibrated prior to being put into service. Lab should ensure testing and calibration methods are being conducted per manufacturer specifications and equipment manuals.**	**ISO 5.6**			
Uncertainty of Measurement	**6A.13**	**The laboratory shall have and correctly apply procedure to estimate the uncertainty of the outcome of the test.**	**ISO 5.4.6 5.10.3.1c**			
Final Report	**6A.14**	**Reports must comply with ISO/IEC 17025 requirements during production and shall have a review process to ensure accuracy and compliance with policies.**	**2A.5.10**			
Proficiency Testing	**6A.15**	**The laboratory shall monitor its performance by comparison with the results of other laboratories. Labs should take part in proficiency testing with service that are in compliance with ISO/IEC 17043 accredited service providers. Lab shall ensure any process that do not meet interlaboratory comparisons or proficiency testing service shall establish personnel and policies to correct inefficiency immediately.**	**Module 6**			

Forensic Laboratory Floor Plan



Inventory

Hardware	
Graphics cards, both Peripheral Component Interconnect (PCI) and Accelerated Graphics Port (AGP)	Computer Chairs (6)
Assorted FireWire and USB adapters	PC Power Cables
An external CD/DVD drive	20 IDE Cables
A digital camera	20 SATA Cables
Assorted Antistatic bags	Secure Storage Room
Ribbon cables for floppy disks	Cisco 3560 Switch
Extra USB 3.0 or newer cables and SATA cards and associated cables	20 CAT 6E cables
Extra SCSI cards	Fluke Network Cable Tester
A variety of hard drives and USB drives	Spectrum Analyzer
2 2.5-inch adapters from notebook IDE hard drives to standard IDE/ATA drives, SATA drives	PC Components (Adapters, Cables, etc.)
Evidence Storage Units (10)	Write Blockers (2)
Pen Testing Systems	Forensic Workstations (4)
Server Stations (2)	Smart Phone
IDE cables, both ATA-33 and ATA-100 or faster	Faraday Bags
Portable Workstation	Safes/Evidence Lockers (2/2)
Alternative Power Supply	4 High Speed Forensic Computers
Portable AC Unit	2 High Speed Forensic Laptops

Flashlights	Various Computer Micro Tools (screwdrivers, wrenches, etc.)
2 Regular Internet Connected	Regular sized tool set
Software	
Kali Linux	Helix Pro
Wireshark	Digital Imaging Tools
Autopsy/Sleuth Kit	Anti-Malware/Antivirus
FTK Imager	Encase
Volatility	Magnet AXIOM

Maintenance Plan

These practices establish calibration and maintenance requirements to ensure the accuracy and reliability of instrumental results. These best practices comply with the required standards of the Department of Forensic Sciences (DFS) Forensic Science Laboratory (FSL) Quality Assurance Manual, the accreditation program standards for ISO/IEC 17025:2005, and supplemental standards based on your location/jurisdiction.

Definitions

The following terms shall have the designated meaning:

DFS: Department of Forensic Sciences

DOM: Departmental Operations Manual

FSL: Forensic Science Laboratory

SOP: Standard Operating Procedures

SI: International Standard Units

QAM: Quality Assurance Manual

Shall: Indicates a requirement

Should: Indicates a recommendation or preferred option

Must: Also implies mandatory actions

May: Indicates permission or option

Can: Indicates a possibility or a capability

Scope

These practices apply to casework units of the FSL with instrumentation and equipment that influence the legitimacy of forensic examinations.

Roles/Responsibilities

Forensic Laboratory Manager

Job Description:

Oversees Daily Operations: Manages the daily operations of the forensic computer lab, ensuring all forensic investigations are conducted efficiently and with the utmost integrity.

Personnel Management: Supervises forensic analysts and technicians, ensuring they are proficient in digital forensic techniques, trained in legal evidence handling, and adhere to strict forensic protocols.

Quality Assurance and Control: Implements and oversees quality control measures specific to digital forensics, ensuring the integrity of digital evidence from collection to presentation.

Equipment and Inventory Management: Responsible for the acquisition, maintenance, and calibration of forensic hardware and software tools, managing inventory to ensure all necessary forensic tools are available and in working order.

Procedure Development: Develops and updates forensic procedures to incorporate new technologies and methodologies in digital evidence analysis, ensuring compliance with legal standards.

Regulatory Compliance: Ensures the lab's operations comply with legal standards for digital evidence handling, preparing for and managing forensic audits and legal scrutiny.

Data Analysis: Reviews and interprets digital forensic findings, ensuring they are presented accurately in reports and court-ready formats.

Certifications, Degrees, and Experience:

Degree: A Bachelor's degree in Computer Science, Information Technology, Digital Forensics, or a related field is required. An advanced degree (MS/Ph.D.) in Digital Forensics or Cybersecurity could be preferred.

Certifications:

Certified Computer Examiner (CCE) or Certified Forensic Computer Examiner (CFCE)

EnCase Certified Examiner (EnCE) or AccessData Certified Examiner (ACE)

Knowledge or certification in ISO/IEC 27037 (Guidelines for identification, collection, acquisition, and preservation of digital evidence).

Quality Assurance Liaison for Digital Forensics

Job Description:

Quality Assurance Oversight: Monitors and enhances the quality assurance practices within the forensic lab, focusing on the integrity and admissibility of digital evidence.

Regulatory Compliance: Ensures all digital forensic practices comply with legal and regulatory standards, including managing forensic audits and preparing for courtroom scrutiny.

Training and Development: Develops and delivers training programs on forensic standards, legal compliance, and best practices for digital evidence handling to lab staff.

Documentation and Reporting: Reviews forensic analysis documentation for legal compliance, tracks issues or discrepancies, and ensures all QA activities are thoroughly documented for legal proceedings.

Investigation and Resolution: Leads investigations into potential breaches of forensic protocols, collaborates with legal teams for resolution, and implements corrective measures to prevent recurrence.

Third-Party Management: Manages interactions with third-party forensic experts or labs, ensuring their work meets the lab's quality and legal standards.

Certifications, Degrees, and Experience:

Degree: A Bachelor's degree in a field related to Digital Forensics, Cybersecurity, or Computer Science.

Certifications:

Certified Information Systems Security Professional (CISSP) with a focus on digital forensics.

Certified Forensic Analyst (GCFA) or similar certifications specific to digital forensics.

Knowledge of ISO/IEC 27001 for information security management could be advantageous.

Experience in ensuring integrity and chain of custody of digital evidence.

Understanding legal standards related to digital evidence.

Maintenance Practices

The Laboratory Manager, Quality Assurance Liaison, or designee will ensure that each unit maintains a record of instruments and equipment that require calibration. This record will include, at a minimum: the identity of the item of equipment and its software; the manufacturer's name, type identification, and serial number or other unique identification; checks that equipment complies with the specification; current location, where appropriate; the manufacturer's instructions, if available, or reference to their location; dates, results and copies of reports and certificates of all calibrations, adjustments, acceptance criteria, and the due date of next calibration; the maintenance plan, where appropriate, and maintenance carried out to date; any damage, malfunction, modification or repair to the equipment. In addition to these records, all equipment under the control of the laboratory and requiring calibration shall be labeled, coded or otherwise identified to indicate the status of calibration, including the date when last calibrated and the date or expiration criteria when recalibration is due.

Calibration Procedures

Instruments and/or equipment requiring calibration will have documented procedures for performing calibrations and a due date of calibration of next calibration. If for any reason, there is a suspicion of defective equipment. These instruments shall be removed from service and documented in the Equipment Binder and Quality Binder the date of removal from service, signature of removing member and reason why instrument was removed.

A new calibration will be conducted each time a piece of equipment is removed from the laboratory and used by outside personnel.

Reference Standards, Certified Reference Materials and Reference Materials

Where practicable, the laboratory will use standard traceable to SI units (International System of Units) or other certified to calibrate the piece of equipment. If the above methods are unavailable, an FSL-prepared standard or other authorized reference may be used. Lab personnel will ensure that any reference material used for calibration are suitable for its intended purpose. All reference standards, certified reference materials or reference materials used for calibration will be uniquely identified. Certificate of traceability, if applicable, will be retained to ensure traceability

Calibration Interval

Lab personnel will ensure that the calibration interval is documented for each piece of equipment, when applicable. To determine the correct calibration interval, personnel should consult the manufactures' operating and inspection guidelines. If a scenario arises where a piece of equipment is used infrequently or you suspect it may need calibrating prior to the recommended interval, instruments will be recalibrated, or the calibration will be verified prior to use. The calibration interval will be documented for each instrument requiring calibration. New instruments and equipment, or instruments and equipment that have undergone repair or maintenance that affect calibration, will be calibrated or have their calibration verified before being used in casework. The Laboratory Manager, Quality Assurance Liaison, or other designated personnel will ensure appropriate actions are taken to comply with calibration intervals.

Maintenance

Instruments and equipment will be properly maintained by the manufacturer's specifications. The Laboratory Manager or other designated personnel will ensure that any maintenance on the equipment is properly recorded, and that maintenance is being conducted according to the manufacturers' recommended maintenance cycle and unit policy. This record will include the identity of the item and its software, the name of the manufacturer, its type, current location, serial number and

any other unique identifying characteristics. The Laboratory Manager or designated personnel will check that equipment complies with the specification; current location, where appropriate; the manufacturer's instructions, if available, or reference to their location; dates, results and copies of reports and certificates of all calibrations, adjustments, acceptance criteria, and the due date of next calibration; the maintenance plan, where appropriate, and maintenance carried out to date; any damage, malfunction, modification or repair to the equipment. Instruments and/or equipment having a direct effect on the quality of the examination or evidence process will have documented procedures for the maintenance activities. Maintenance procedures may be a stand-alone maintenance document, may be incorporated into the appropriate technical SOP, or may be manufacturer-supplied procedures for maintenance. These procedures will reflect current maintenance requirements and will be readily available to appropriate unit personnel.

Where applicable, and to ensure proper functioning and prevent contamination, the laboratory shall handle, store, transport, use, and conduct planned maintenance of all measuring equipment according to the manufacturer's recommendations and instructions.

Preventive Maintenance

Preventive maintenance will be performed according to a regular, predetermined schedule, based on manufacturer's recommendations (as available and relevant), historical observations of problems, operating experience, and how often the instrument or equipment is used. Preventive maintenance will be documented in the maintenance records.

Corrective Maintenance

IF an instrument cannot be properly calibrated or its accuracy is in question, the item will be immediately taken out of service and properly labeled, allowing personnel to know that the item is unusable. until the discrepancy can be corrected and the item be maintained and calibrated. Only when it is shown by calibration or a performance check to operate correctly can the instrument be returned to service. Any corrective maintenance will be documented in the maintenance records

Performance Checks

In instances where calibration is not required or appropriate, performance checks should be carried out at appropriate intervals to verify that the equipment or instrument is functioning as expected. Performance check procedures may be included in the standard operating procedure (SOP) in which the instrument/equipment is used or may be written as a stand-alone SOP for performance checks. These procedures will reflect current performance requirements based on the use of the instrument/equipment and will be readily available to appropriate lab personnel. If an instrument can be affected by a power interruption, unit personnel will check the performance after a shut-down, whether deliberate or otherwise.

Malfunctioning Equipment

Equipment that has been subjected to overloading or mishandling, gives suspect results, or has been shown to be defective or outside specified limits shall be taken out of service and properly labeled and isolated. The equipment will remain in this state until necessary repairs have been made and shown by calibration or test to perform correctly. Lab personnel will determine the effect of the malfunction, determine if the item needs to be sent out for repairs. Any equipment that is required to be sent off site for repairs will be properly packaged according to the requests of the vendor to conduct the required repairs or according to the manufacturer's instructions.

Equipment Security

Test and calibration equipment, including both hardware and software, shall be safeguarded from adjustments which would invalidate the test and/or calibration results. Such safeguarding will be conducted by placing passwords, where applicable, on equipment/software and security of the laboratory areas. Also, only authorized and appropriately trained individuals will be permitted to handle or use laboratory equipment or software.

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