Training Guidelines for the Fire Debris Analyst

Lesson Plan (Module) 16

Date: November 2003 **Instructor:** Qualified Instructor

Subject: Quality Assurance/Validation Methodology **Total Time:** 4 hours

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Learning Objectives

- To understand the differences between quality assurance and quality control
- To understand what is present in a quality management system
- To recognize the components of a training program
- To articulate the steps to ensure integrity of the evidence
- To recognize full documentation of standard operating procedures or protocols
- To understand the importance of instrument monitoring
- To recognize the importance of certified reference materials
- To understand the functions of a proficiency test
- To understand the validation and verification process
- To understand the scope of laboratory accreditation and the certification of an analyst.

Suggested Reading

1. American Society of Crime Laboratory Directors Laboratory Accreditation Board Manual, http://www.ascld-lab.org/aslab021.html
2. ASTM E 1301, Standard Guide for Proficiency Testing by Interlaboratory Comparisons
3. Encyclopedia of Forensic Sciences, Academic Press, 2000, Vol. 3, pp 1307-1314
4. Recommended Minimum Standards for the Validation of Analytical Methods for Seized Drugs
5. http://www.swgdrug.org/SWGDRUG_Method_Validation_Recommendation.html

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Introduction

This session will provide an opportunity for the trainee to determine how standards set the pace in the forensic laboratory and evaluate the degree to which the laboratory defines quality assurance and implements quality control.

Outline

1. Obtain definitions for the following terms focusing on how they relate to forensic

science and then specifically to fire debris discipline.

a. Quality Assurance
b. Quality Control
c. Standard Operating Procedures
d. Protocols
e. Certified Reference Materials
f. Proficiency Test
g. Validation and related terms
h. Verification

2. Determine what constitutes a training program.
   a. Timelines
   b. Documentation; trainee and management
   c. Peer mentoring
   d. Testing (oral, written)
   e. Formal completion of program
   f. Continuing education

3. Compare ASCLD/LAB manual, “Management and Operations”, section 1.4 “Controlling” to those procedures learned in module 8.

4. Review the laboratory’s written procedures to establish whether they represent each step of a procedure and include all the necessary specifics.

5. Review the instrumentation utilized by the section. Establish what constitutes a maintenance program and why this is required.

6. What reference standards are utilized, how they are acquired, stored and documented and what constitutes a certified reference material.

7. What type of proficiency test is utilized in the unit, origin of the test, tracking within the unit and what is the purpose of the selected method (internal vs. external)? Determine management’s established mode for corrective measures if a problem with the proficiency test is obtained.

8. Are utilized methods or protocols used in your fire debris unit validated or verified?

9. Select an ignitable liquid recovery method used in your laboratory and develop the steps required to reach validation.

Teaching Aids

Handouts

PowerPoint presentation

Summary

The quality assurance process provides a solid foundation upon which the evidence can reach the court process. It is essential that the trainee understand that the whole evidential process must be supported through well-documented steps and that each step has its own set of requirements. It is also beneficial that the QA/QC of each step is understood so that any analyst can provide a lucid and well-informed explanation for each standard operating procedure or protocol. The quality assurance process completes the analysis triangle, which is composed of the knowledgeable examiner, the supporting unit or laboratory and how all aspects meet QA/QC.

Test Questions

1. Quality Control is the planned and systematic action that provides confidence that a laboratory's product will satisfy a given requirement. True or **False**

2. The instrument has been calibrated; therefore it is ready for a case sample injection. True or **False**

3. A certified reference material can be obtained:
   a. by running a case sample and comparing the generated spectrum to a literature source
   b. through a source that will provide documented certification
   c. by direct collection from an authorized gasoline station

4. Each qualified fire debris examiner must conduct a proficiency test:
   a. as soon as it is determined an error resulted in analysis
   b. once every five years
   c. as determined by the accredited laboratory management
   d. bi-annually

5. A method must be verified before it can be validated. True or **False**