SWGDE Training Guidelines for Video Analysis, Image Analysis and Photography

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Table of Contents

1. Purpose

The purpose of this document is to provide guidelines and recommendations to assist organizations in designing a training program for forensic video analysts, image analysts, and photographers to ensure competency in the completion of forensic tasks and analyses.

2. Scope

This document will recommend topics and guidelines for training within the disciplines of video analysis, image analysis, and photography.

3. Terminology

The following definitions apply to this document. For additional definitions, please refer to the *SWGDE Glossary*.

- *Video Analysis:* the scientific examination, comparison, or evaluation of video in legal matters.
- *Image Analysis:* the application of image science and domain expertise to examine and interpret the content of an image, the image itself, or both in legal matters.
- *Photography:* the mix of art and science for the capture of images on a light sensitive surface.
- *Education:* the baseline degree(s), previous training, or prior experience of an analyst.
- *Competency:* an evaluation of the knowledge and ability of an analyst prior to independent completion of analysis.
- *Training:* the process of obtaining competency.
- *Proficiency:* an evaluation of the quality of performance of an analyst or an organization.
- *Continuing Education:* the process of maintaining proficiency, through additional training in evolving technology

4. Limitations

SWGDE recognizes that some organizations may include topics of training other than what is recommended in this document. Regardless of the exact training topics selected, the program should demonstrate and document the training selected is adequate to ensure competency for the specific tasks being undertaken by the trainee.

Training topics introduced in this document may not fit the needs of individual organizations, when job specific duties are limited to a subset of those listed. Each organization should determine the minimum training guidelines for examinations performed.

This document is intended to recommend topics for training. It will not endorse a specific vendor.

Training can quickly become obsolete, and continuing education is needed to maintain proficiency.

5. Introduction

Personnel that collect, preserve, process, analyze, and/or examine video, image, and photographic evidence (or supervise these functions) must be aware of the capabilities and limitations of specific technologies. Those engaged in the video, image, and photographic evidence process should be aware of the procedures commonly followed within the forensic community, and should strive to meet or exceed these recommendations. Maintaining awareness of new developments is part of every practitioner's job.

In support of these goals, the following recommendations are offered:

- Define and employ a quality assurance program for the implementation of a training program for the valid and reliable use of appropriate procedures.
- Training should include only the use of validated technologies and methods. Training should include awareness of and/or methods used for validating technologies.
- Commit to continuous learning in video, image, and photographic technologies and stay abreast of new findings, equipment, techniques, legal developments, and technological advances.
- Implement a program for continual assessment of employees' skills
- Pursue professional development and certification.

6. Categories of Training

Categories of training relevant to those who collect, preserve, process, analyze, and/or examine video, image, and photographic evidence (or supervise these functions) are identified and defined as follows:

6.1. *Awareness:* Training designed to provide personnel with a general knowledge of the major elements of video, image, and photographic evidence including the capabilities and limitations of methods, hardware, and software.

6.2. *Skills and Techniques:* Training designed to provide personnel with the ability to competently use specific tools and procedures.

6.3. *Knowledge and Application of Processes:* Training designed to provide personnel with an understanding of video, image, and photographic evidence procedures, the application of that understanding in various situations, and the knowledge of other forensic discipline requirements and their intended uses.

6.4. *Witness Testimony and Legal Aspects:* Training designed to provide personnel with the ability to present clear and unbiased video, image, and photographic evidence

based testimony in court. Legal implications for the integrity of collected and/or submitted evidence should be considered. (e.g. search and seizure authorization)

6.5. *Forensic Results Preparation:* Training designed to provide personnel with the ability to prepare accurate, clear, and concise documentation of results and/or opinions, and visual aids.

7. Job Categories

Organizations may choose to use different names, but responsibilities within this field are commonly defined below. Differentiation between job categories is based on the degree to which personnel are involved in the collection and examination process. However, since job categories frequently overlap, training programs should be specific to the tasks performed by the individual, and may contain topics related to several job categories.

7.1. *First Responder* Includes personnel who are the first to secure, preserve, and/or collect video, image, and photographic evidence at a crime scene. These personnel often have general crime scene evidence collection responsibilities.

7.2. *Field Photographer/Videographer* includes personnel who document and preserve conditions and evidence through photography or videography outside the laboratory.

7.3. *Technician* includes personnel whose primary responsibility is to collect and/or prepare video, image, and photographic evidence for examination and analysis.

7.4. *Laboratory Photographer* includes personnel whose primary responsibility is to document and preserve evidence through photography within the laboratory.

7.5. *Examiner/Analyst* includes personnel for whom examination, analysis, and/or recovery of video, image, and photographic evidence is a major component of their routine duties.

8. Training Sources

Training is obtained through different sources at various points in an individual's career. Such sources can include the following:

8.1. *Baseline education:* The possession and type of degree, and or prior experience of personnel. Baseline education may be dictated by the forensic discipline or the requirements of the agency. An assessment of an individual's knowledge, skills, and/or abilities, may affect the individual's specific training program.

8.2. *Internal Training:* A documented training program provides personnel with the relevant knowledge necessary to perform job related tasks. It may include written exercises, practical exercises, competency and proficiency testing, and supervised casework. Because experience is a critical training tool, personnel who train under a

competent practitioner can gain valuable experience, as well as knowledge and improved skills.

8.3. *External Training:* Training from entities and personnel outside an organization can result in exposure to new innovations and techniques, and assist with ensuring organizations are continuing to use best practices. External training can be obtained from conferences, trade shows, professional organizational memberships, professional publications, current literature, and specialized courses or workshops.

9. Training Evaluation and Documentation

Evaluation of a training program is necessary to ensure that the goals of the training are being met and to verify that personnel have the technical skills and abilities to perform the duties required of them.
A training program has:

- A written training program for each job description/category.
- A lesson plan for each topic.
- Feedback from trainees and reviews by management.
- Documentation of the training received, training notes, problems, questions, successes, and evaluations. There should be sufficient detail so that the employee, trainers, supervisors, and/or assessors clearly understand the training program. Such documentation should be maintained and reviewed as required.
- A means of testing an individual's competency with given tasks, in order to establish the end of the official period of training.
- A formal means to recognize the successful completion of training and the authorization for unsupervised work.
- A means of testing an individual's ongoing proficiency with specific tasks, as well as a schedule for the completion of testing.

Certification is one method to evaluate personnel. Certifications can be comprehensive, tool-based, or topic specific, and can be an additional tool in verifying technical skills and abilities. Comprehensive certifications generally require training be completed, as well as a specified amount of experience in the discipline, and the successful completion of an examination. Certifications can be beneficial and should be considered.

10. Training Topics According to Job Category

10.1. Field Photographer

- 10.1.1. Technical Foundations
  - 10.1.1.1. Selection, framing and composition of appropriate images
  - 10.1.1.2. Procedures for recording quality images in various situations
  - 10.1.1.3. Image handling and integrity
- 10.1.2. Equipment
  - 10.1.2.1. Camera suitable for job function
  - 10.1.2.2. Lighting Sources
  - 10.1.2.3. Ancillary equipment and accessories (tripods, removable media, scales, etc.)
  - 10.1.2.4. Software/applications
- 10.1.3. Techniques
  - 10.1.3.1. Various lighting techniques
  - 10.1.3.2. Comparative photography
  - 10.1.3.3. General crime scene documentation
  - 10.1.3.4. Subject (person) photography
  - 10.1.3.5. Specialized photography (e.g. trajectory, blood stain patterns, and techniques related to other forensic disciplines)
  - 10.1.3.6. Evidence handling and packaging
- 10.1.4. Legal Foundations
  - 10.1.4.1. Specific legal requirements and admissibility issues
  - 10.1.4.2. Courtroom testimony

10.2. Laboratory Photographer

10.2.1. Technical Foundations

10.2.1.1. Those topics included in 10.1.1

10.2.1.2. Photomicrography

10.2.1.3. Copy-stand photography

10.2.1.4. Scanner image capture

10.2.2. Equipment

10.2.2.1. Those topics included in 10.1.2

10.2.2.2. Copy stands

10.2.2.3. Microscopes

10.2.2.4. Scanners

10.2.3. Techniques

10.2.3.1. Those topics included in 10.1.3

10.2.3.2. Photomicrography

10.2.3.3. Other imaging technologies

10.2.4. Legal Foundations

10.2.4.1. Those topics included in 10.1.4

10.3. First Responder

10.3.1. Technical Foundations

10.3.1.1. Principles of digital video recording

10.3.1.2. Digital video security system concepts

10.3.1.3. Video formats, standards and file identification

10.3.2. Equipment

10.3.2.1. Recording and playback devices

10.3.2.2. Monitors and other output devices

10.3.2.3. Media types

10.3.3. Techniques

10.3.3.1. Video data recovery

10.3.3.2. Video verification and integrity

10.3.3.3. Evidence handling and Packaging

10.3.4. Legal Foundations

10.3.4.1. Those topics included in 10.1.4

10.4. Video Technician

10.4.1. Technical Foundations

10.4.1.1. Those topics included in 10.3.1

10.4.1.2. Principles of analog video recording

10.4.1.3. Compression artifacts

10.4.1.4. Analog video security system concepts

10.4.1.5. Basic audio principles

10.4.2. Equipment

10.4.2.1. Those topics included in 10.3.2

10.4.2.2. Hardware for duplication, conversion and optimization

10.4.2.3. Software for duplication, conversion and processing

10.4.2.4. Video signal measuring devices

10.4.3. Techniques

10.4.3.1. Those topics included in 10.3.3

10.4.3.2. Playback optimization

10.4.3.3. Video processing techniques

10.4.3.4. Image processing techniques

10.4.4. Legal Foundations

10.4.4.1. Those topics included in 10.1.4

10.5. Video Analyst

10.5.1. Technical Foundations

10.5.1.1. Those topics included in 10.4.1

10.5.1.2. Broadcast theory and history

10.5.1.3. Basic digital theory

10.5.1.4. Imaging science

10.5.1.5. Frequency fundamentals

10.5.1.6. Video signal standards

10.5.1.7. Video editing

10.5.1.8. Human factors relating to forming conclusions in analysis (e.g. bias)

10.5.2. Equipment

10.5.2.1. Those topics included in 10.4.2

10.5.2.2. Hardware for calibration and maintenance

10.5.3. Techniques

10.5.3.1. Those topics included in 10.4.3

10.5.3.2. Video editing

10.5.3.3. Advanced video enhancement techniques

10.5.3.4. Advanced image enhancement techniques

10.5.3.5. Signal analysis

10.5.3.6. Video media reconstruction

10.5.3.7. Content authenticity

10.5.3.8. Source authenticity

10.5.4. Legal Foundations

10.5.4.1. Those topics included in 10.1.4

10.5.4.2. Moot court exercises, including admissibility issues (e.g. Daubert, Frye, hearings, etc.)

10.5.4.3. Testimony Monitoring

10.6. Image Technician

10.6.1. Technical Foundations

10.6.1.1. Principles of video recording

10.6.1.2. Principles of traditional and digital photography

10.6.1.3. Principles of digital media, file identification, and recovery

10.6.1.4. Image types and formats

10.6.1.5. Compression artifacts

10.6.2. Equipment

10.6.2.1. Recording and playback devices

10.6.2.2. Monitors and other output devices

10.6.2.3. Media types

10.6.2.4. Hardware for duplication, conversion and optimization

10.6.2.5. Software for duplication, conversion and processing

10.6.3. Techniques

10.6.3.1. Video processing techniques

10.6.3.2. Image processing techniques

10.6.3.3. Evidence handling and packaging

10.6.4. Legal Foundations

10.6.4.1. Those topics included in 10.1.4

10.7. Image Analyst

10.7.1. Technical and Scientific Foundations

10.7.1.1. Those topics included in 10.6.1

10.7.1.2. Image science and technology

10.7.1.3. Image comparison theory

10.7.1.4. Optics

10.7.1.5. Photogrammetry theory

10.7.1.6. Data integrity and imaging artifacts

10.7.1.7. Specific domain knowledge for content analysis and comparison

10.7.1.8. Statistics

10.7.1.9. Human factors relating to forming conclusions in analysis (e.g. bias)

10.7.2. Equipment

10.7.2.1. Those topics included in 10.6.2

10.7.2.2. Capture, input and output devices

10.7.2.3. Digital storage devices and media

10.7.2.4. Software, including

10.7.2.4.1. File identification

10.7.2.4.2. Diagnostics

10.7.2.4.3. Calibration

10.7.2.4.4. Restoration of corrupted files

10.7.2.4.5. Analysis

10.7.2.4.6. Metadata determination

10.7.3. Techniques

10.7.3.1. Those topics included in 10.6.3

10.7.3.2. Photogrammetry

10.7.3.3. Comparison

10.7.3.4. Content authentication

10.7.3.5. Source authentication

10.7.3.6. Advanced video enhancement techniques

10.7.3.7. Advanced image enhancement techniques

10.7.4. Legal Foundations

10.7.4.1. Those topics included in 10.5.4

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History

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