Standard for the Examination of Documents for Alterations

1. Introduction

1.1 An alteration is a revision, modification, or discrepancy within a document. An alteration can be made to a document by physical, chemical, electronic, or mechanical means. Alterations can generally be categorized as an addition, deletion, or substitution of information and can be revealed by a variety of techniques.

1.2 This standard provides the best practices to be used by Forensic Document Examiners (SWGDOC Standard for Scope of Work of Forensic Document Examiners) for the examination of documents for alterations.

2. Scope

2.1 The procedures in this standard are grounded in the generally accepted body of knowledge and experience within the discipline of forensic document examination.

2.2 The procedures in this standard are applicable whether the examinations are of questioned and known item(s), or exclusively a questioned item(s).

2.3 The procedures described in this standard are for the purpose of determining the:

2.3.1 Presence of alterations

2.3.2 Method(s) of alteration

2.3.3 Source(s) of a modified document (for example, master document, template, or copy)

2.3.4 Visualization, decipherment, or interpretation of the original information

2.4 Various examinations can be used to aid in the detection of an alteration and to determine the content of the original information.

2.5 The particular methods used in an examination depend on the nature of the material available for examination, comparison, and evaluation.

2.6 This standard cannot anticipate all aspects of examinations of unusual substrates or other variables involved in the creation and handling of the documents prior to submission.

2.7 This standard cannot replace the requisite knowledge, skills, or abilities obtained through education, training (SWGDOC Standard for Minimum Training Requirements for Forensic Document Examiners), and experience specific to forensic document examination.

2.8 This standard does not address all safety concerns, if any, associated with its use. The user is responsible for establishing appropriate health and safety practices prior to use.

3. References

3.1 ASTM and SWGDOC Standards:

ASTM E131 Standard Terminology Relating to Molecular Spectroscopy

ASTM E284 Standard Terminology of Appearance

ASTM E1732 Terminology Relating to Forensic Science

SWGDOC Standard for Scope of Work of Forensic Document Examiners

SWGDOC Standard for Test Methods for Forensic Writing Ink Comparison

SWGDOC Terminology Relating to the Examination of Questioned Documents

SWGDOC Standard for Physical Match of Paper Cuts, Tears, and Perforations in Forensic Document Examinations

SWGDOC Standard for Examination of Handwritten Items

SWGDOC Standard for Indentation Examinations

SWGDOC Standard for Non-destructive Examination of Paper

SWGDOC Standard for Minimum Training Requirements for Forensic Document Examiners

SWGDOC Standard for Examination of Documents Produced with Liquid Ink Jet Technology

SWGDOC Standard for Examination of Documents Produced with Toner Technology

SWGDOC Standard for Examination of Typewritten Items
SWGDOC Standard for Use of Image Capture and Storage Technology in Forensic Document Examination
SWGDOC Standard for Examination of Dry Seal Impressions
SWGDOC Standard for Examination of Rubber Stamp Impressions

4. Terminology

4.1 Definitions of Terms Specific to These Procedures:

4.1.1 *alteration, n*—a change (revision or modification) in a document that occurs by physical, chemical, electronic, or mechanical means and can include additions, subtractions, or substitutions.

4.1.2 *digital image, n*—an image that is stored in numerical form.

4.1.3 *digital image processing, n*—any activity that transforms a digital image.

4.1.4 *electrostatic detection device (EDD), n*—an instrument that uses electrostatic charge as the mechanism to visualize paper fiber disturbances (for example, indentations and erasures) (SWGDOC Standard for Indentation Examinations).

4.1.5 *erasure, n*—the area where material has been removed from a document by chemical, abrasive, or other means.

4.1.6 *fluorescence, n*—a process by which radiant flux of certain wavelengths is absorbed and reradiated non-thermally at other, usually longer, wavelengths (SWGDOC Standard for Test Methods for Forensic Writing Ink Comparison, ASTM E284).

4.1.7 *infrared (IR), n*—referring to radiant flux having wavelengths longer than the wavelengths of light, usually wavelengths from about 760 nm to about 3 mm (SWGDOC Standard for Test Methods for Forensic Writing Ink Comparison, ASTM E284).

4.1.8 *infrared luminescence (IRL), n*—the emission of radiant energy during a transition from an excited electronic state of an atom, molecule, or ion to a lower electronic state (fluorescence or phosphorescence, or both), where the spectrum of the excitation source is in the ultraviolet (UV) or visible region of the electromagnetic spectrum, or both, and the spectrum of the emitted energy is in the far red or infrared (IR) region of the electromagnetic spectrum (SWGDOC Standard for Test Methods for Forensic Writing Ink Comparison).

4.1.9 *infrared reflectance (IRR), n*—non-absorbed radiant infrared (or far red) energy.

4.1.10 *light, n*—electromagnetic radiant energy that is visually detectable by the normal human observer: radiant energy having wavelengths from about 380 to about 760 nm (SWGDOC Standard for Test Methods for Forensic Writing Ink Comparison, ASTM E284).

4.1.11 *luminescence, n*—the emission of radiant energy during a transition from an excited electronic state of an atom, molecule, or ion to a lower electronic state (SWGDOC Standard for Test Methods for Forensic Writing Ink Comparison, ASTM E131).

4.1.12 *magnetic properties detector, n*—a device used to detect or measure magnetic properties in ink and toner.

4.1.13 *side lighting, n*—illumination from a light source that is at a low angle of incidence, or even parallel, to the surface of the item. Syn., *oblique lighting, grazing illumination*.

4.1.14 *transmitted light, n*—illumination that passes through a substrate.

4.1.15 *ultraviolet (UV), n*—referring to radiant flux having wavelengths shorter than the wavelengths of light, usually wavelengths from about 10 to 380 nm. Long-wave UV usually refers to the spectral range of UV-A, with wavelengths from about 315 to 380 nm. Mid-wave UV usually refers to the spectral range of UV-B, with wavelengths from about 280 to 315 nm. Short-wave UV usually refers to the spectral range of UV-C, with wavelengths from about 100 to 280 nm (SWGDOC Standard for Test Methods for Forensic Writing Ink Comparison).

5. Limitations

5.1 Items submitted for examination can have limitations that interfere with the procedures in this standard. Limitations can be due to the submission of non-original documents; the condition, quantity, or

comparability of the material submitted; or from limited individualizing characteristics. Note and document limitations.

5.2 Document examinations should be conducted prior to any destructive processing. Items should be handled appropriately to avoid compromising subsequent examinations. Prior storage conditions, handling, testing, or destructive processing can interfere with the examination.

5.3 Care shall be taken in the evaluation of characteristics indicative of alteration as they might have occurred during normal preparation, handling, and storage of the document.

5.4 Some alterations might not have observable physical characteristics or be detectable based on the type of examination(s) suggested in this standard. The absence of observable physical characteristics does not ensure the absence of an alteration.

6. Equipment

6.1 Appropriate light source(s) to distinguish fine detail. Natural, incandescent, fluorescent, light emitting diode (LED), or fiber optic lighting sources are generally used. Transmitted, side, and vertical incident lighting are useful techniques. Focusable light sources are particularly helpful.

6.2 Optical magnification to resolve fine detail.

6.2.1 The best practice is to utilize an optical device having a minimum of 4x magnification.

6.2.2 A reducing lens can be useful in deciphering faint material, such as faded or erased writing.

6.3 Image capture device(s) capable of producing true and accurate images with sufficient resolution to record significant detail.

6.4 Infrared (IR) image conversion device or system with appropriate light sources and filters for use in infrared reflectance (IRR) and infrared luminescence (IRL) examinations.

6.5 Long-wave, mid-wave, and short-wave ultraviolet (UV) sources.

6.6 Measuring devices as needed, such as a paper micrometer, alignment grids, rulers, magnifier(s) with reticule(s), and measuring software.

6.7 Electrostatic detection device (EDD) (SWGDOC Standard for Indentation Examinations).

6.8 Magnetic properties detector.

6.9 Software for digital image processing as needed.

6.10 Time and facilities necessary to complete all applicable procedures.

6.11 Other equipment used for validated procedures that can be relevant to the examination of documents for alterations, as deemed appropriate by the examiner. (for example, radiography system or X-ray source).

7. Procedures

7.1 Perform applicable procedures and contemporaneously document the examinations performed and relevant observations. The results and accompanying notes should have sufficient detail to allow for an independent review and assessment of the conclusions by a Forensic Document Examiner. Include all relevant facts, equipment used, methods, evaluations, as well as any conclusions, opinions, or interpretations.

7.2 These procedures do not have to be performed in the order given. It is within the discretion of the examiner to discontinue the procedure at any point during the examination. Document the reason(s) for such a decision.

7.3 Material(s) removed from the item under examination might be of evidentiary value and should be documented prior to removal and preserved separately for subsequent examination(s). These materials can include staples, other binding devices or attached documents, and trace materials.

7.4 The procedures in this standard can require significant changes to an item in order to facilitate the examination process. Prior to making any permanent changes to an item, obtain and document permission from the responsible party involved in the examination request. This may entail discussions with investigators, owners, and attorneys.

7.4.1 It is best practice that the responsible party requesting the examination be informed as to potential benefits of these changes and the extent of possible physical changes to the document. The responsible party should inform attorneys or other interested parties.

7.4.2 It is also best practice to capture images of the item before and after making significant changes.

7.5 The examination of the original item(s) is always preferable. Request the original item(s) if not previously submitted.

7.5.1 If the original item(s) is not available for examination, assess the quality of the best available copy.

7.5.2 If the significant details have been reproduced with sufficient clarity for examination purposes, continue with the applicable procedures to the extent possible.

7.6 Conduct an initial assessment of the document to determine the appropriate examinations, sequence of examinations, and potential limiting factors.

7.7 The examination of a document can include the following:

7.7.1 Handwriting (SWGDOC Standard for Examination of Handwritten Items)

7.7.1.1 Overwriting or obliteration of entries

7.7.1.2 Crowded or awkward spacing of writing

7.7.1.3 Inconsistent handwriting features (evidence of multiple authorship)

7.7.1.4 Characteristics of the writing media, such as variation in color and intensity or class of writing instrument

7.7.2 Printing processes and defects (SWGDOC Standard for Examination of Documents Produced with Liquid Ink Jet Technology, SWGDOC Standard for Examination of Documents Produced with Toner Technology, and SWGDOC Standard for Examination of Typewritten Items)

7.7.2.1 Variation in printing processes

7.7.2.1.2 Type of printing process

7.7.2.1.3 Color or intensity of printing media

7.7.2.1.4 Physical characteristics of the print media, such as the morphology, magnetic, infrared, and ultraviolet properties

7.7.2.2 Use of different fonts, sizes, styles, spacing, and margins

7.7.2.3 Crowded or awkward placement of printed text, such as irregular vertical and/or horizontal alignment

7.7.2.4 Different individualizing characteristics, such as artifacts and misspellings

7.7.3 Paper or substrate characteristics (SWGDOC Standard for Non-destructive Examination of Paper)

7.7.3.1 Area(s) of discoloration or other physical changes to the optical properties of the substrate (for example, abrasions, fiber disturbance, changes to the optical properties, damage to the security laminate)

7.7.3.2 Paper fiber or substrate disturbance

7.7.3.3 Variation in paper or substrate characteristics, such as, thickness, length, width, opacity, guillotine marks, watermarks, and UV fluorescence

7.7.3.4 Paper cuts, tears, perforations, and folds (SWGDOC Standard for Physical Match of Paper Cuts, Tears, and Perforations in Forensic Document Examinations)

7.7.3.5 Indentations (SWGDOC Standard for Indentation Examinations)

7.7.4 Fastening or binding characteristics

7.7.4.1 Inconsistent or multiple binding methods

7.7.4.2 Presence, absence, or removal of adhesives

7.7.4.3 Presence, alignment, and number of staples and staple holes, hole punches and perforation patterns

7.7.4.4 The makeup, condition, placement, and effect of paper clips on a document

7.7.4.5 Presence or absence of expected markings

7.7.5 Miscellaneous characteristics

7.7.5.1 Presence of an obscuring substance

7.7.5.2 Smearing of printing/writing media

7.7.5.3 Sequence of line intersections, such as those involving writing media, mechanical impressions, folds, printed text, and other anomalies (SWGDOC Standard for Examination of Dry Seal Impressions and SWGDOC Standard for Examination of Rubber Stamp Impressions)

7.7.5.4 Cutting and pasting or substitution(s)

7.7.5.5 Insertion(s) or omission(s) of page(s) or entries

7.8 Subsequent to the completion of the initial assessment proceed to the applicable examinations.

NON-DESTRUCTIVE EXAMINATIONS

7.9 9 Non-destructive examinations are those that do not damage or otherwise change the document. Non-destructive procedures shall be performed when applicable and need not be performed in the order given.

7.9.1 Visually examine both sides of the document macroscopically and microscopically.

7.9.2 Make appropriate observations, measurements, or both, to include:

7.9.2.1 Paper or substrate (SWGDOC Standard for Non-destructive Examination of Paper and SWGDOC Standard for Physical Match of Paper Cuts, Tears, and Perforations in Forensic Document Examinations)

7.9.2.2 Letter, word, line, and margin spacing

7.9.2.3 Color

7.9.2.4 Fastening and binding marks

7.9.2.5 Facsimile transmitted terminal identifiers (TTI)

7.9.2.6 Trash, roller, and picker bar marks

7.9.3 Examine the document using various optical techniques and light sources, such as side lighting, transmitted lighting, UV, IRR, and IRL (SWGDOC Standard for Indentation Examinations and SWGDOC Standard for Test Methods for Forensic Writing Ink Comparison).

7.9.4 Examine the document with imaging techniques, such as photography or digital image processing (SWGDOC Standard for Use of Image Capture and Storage Technology in Forensic Document Examination).

7.9.5 Process the document using an EDD (SWGDOC Standard for Indentation Examinations).

7.9.6 Examine the print media with a magnetic properties detector.

7.9.7 Decipher and document visualized entries.

7.10 Analyze and compare the observed features and characteristics of the document to known items (if available), and evaluate the findings.

7.11 Form a conclusion based on the results of the above examinations, comparisons, and evaluations and report accordingly.

7.12 Proceed to destructive examinations, if they be deemed necessary by the examiner.

DESTRUCTIVE EXAMINATIONS

7.13 Destructive examinations are those that damage or otherwise change the document. They should be performed only after non-destructive methods have been conducted.

7.13.1 Prior to making any permanent changes to an item, obtain and document permission from the responsible party involved in the examination request. This may entail discussions with investigators, owners, and attorneys.

7.13.1.1 It is best practice that the responsible party requesting the examination be informed as to potential benefits of these examinations and the extent of possible physical changes to the document. The responsible party should inform attorneys or other interested parties.

7.13.2 The use of destructive examinations can interfere with other types of forensic examinations (for example, chemical analysis of ink or latent print examinations).

7.13.3 Prior to using these techniques, the physical condition or appearance of the item(s) shall be documented.

7.13.4 Consideration should be given to the order in which destructive examinations are performed.

7.14 When an obscuring substance is present, the obscured information can be visualized by several destructive methods.

7.14.1 When using solvents or physical removal techniques, testing should be performed prior to general application to each item in order to determine the best course of action.

7.14.1.1 It is best practice that initial testing be performed on items not related to the matter that are made of similar materials. Adapt and adjust materials and techniques as required prior to application to the item submitted for examination.

7.14.2 Apply a solvent or other visualization substance to make the paper translucent for visualization of the obscured entry. Document visualized entry.

7.14.3 Apply a solvent capable of removing the obscuring substance.

7.14.3.1 Exposure to solvents, in an attempt to remove the obscuring substance, can have a deleterious effect on inks, toner, or substrate.

7.14.4 Physically remove (for example, abrade, scrape, lift, or peel) the obscuring substance from the entry.

7.14.5 Entries physically obscured by synthetic or biological substances (such as blood, grease, tape, or gum) can be recovered by removal of the substance after freezing.

7.15 For chemical ink examinations refer to SWGDOC Standard for Test Methods for Forensic Writing Ink Comparison.

7.16 Analyze and compare the observed features and characteristics of the document to known items (if available), and evaluate the findings.

7.17 Form a conclusion based on the results of the above examinations, comparisons, and evaluations and report accordingly.

7.18 Conduct other forensic document examinations as appropriate.

8. Reporting

8.1 Reports generated as the result of the procedures used in this standard should be complete and thorough. The report should contain examinations conducted, results, conclusions or opinions, and as appropriate, sources of uncertainty.

8.2 The report should also include the stated purpose or reason for conducting the examination, observations, limitations, and the bases and reasons for the conclusions or opinions being reported.

8.3 The conclusions or opinions resulting from the procedures in this standard may be reached after an examination has been conducted. The number and nature of examinations are dependent on the material being evaluated.

8.4 The conclusions or opinions in the report may also address:

8.4.1 Whether or not characteristics indicative of alterations were observed

8.4.2 Whether or not any altered entries were decipherable

8.4.3 The text or description of altered and original entries

8.4.4 Method or sequence of alterations

8.4.5 Images of alterations and original entries

8.4.6 Apparent alterations in documents that can be the result of software, hardware or user caused variations and can occur during normal or legitimate document production

9. Bibliography

9.1 *Annual Book of ASTM Standards*, www.astm.org, 2013.

9.2 Scientific Working Group for Forensic Document Examination (SWGDOC), www.swgdoc.org, 2013.

9.3 Scientific Working Group on Imaging Technologies (SWGIT) Definitions and Guidelines for the Use of Imaging Technologies in the Criminal Justice System, Forensic Science Communications, July 2001, Vol. 3, Num. 3.

10. Keywords

10.1 alterations; erasures; forensic sciences; insertions; obliterations; overwriting; questioned documents; substitutions; additions; modifications