## J17 Document Abnormalities Related to Portable Document Format (PDF) Technology

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**Learning Overview:** The goal of this presentation is to increase Forensic Document Examiner (FDE) understanding of document content abnormalities that can occur through the use of PDF digital file technology.

**Impact on the Forensic Science Community:** Questions as to the origin and genuineness of disputed documents frequently require FDEs to consider the effects of PDF technology. This presentation will impact the forensic science community by providing samples to assist FDEs in increasing their understanding of PDF technology and some of the document content abnormalities that can occur through use of PDF digital file technology. Knowledge gained during this presentation should assist FDEs in recognizing and correctly identifying similar features they may observe in future examinations of machine-generated documents.

FDEs are frequently tasked with assessing the origin and/or genuineness of disputed machine-generated documents. While an FDE may correctly opine that a disputed signature is written by the same writer of submitted known signature samples, in some cases the FDE completely neglects their obligation as a forensic expert if they concurrently fail to assess evidence within the same document that demonstrates the signature was inserted as a digital image, thereby confirming the document to actually be a cut-and-paste production.

Adobe® Systems Inc. introduced PDF digital file technology in 1993. In July 2008, Adobe's® PDF version 1.7 became International Organization for Standardization (ISO) 32000-1, the Standard for Electronic Document Archiving. Members of ISO/TC 171/SC 2/WG 8 (working group) continued development of the specification, culminating in the publication of version ISO 32000-2 or PDF 2.0. Today, there are numerous applications/software resources involving PDF technology.

PDF digital file technology use has flourished since its introduction in 1993, becoming an integral aspect today of worldwide machine-generated document production in homes, schools, businesses, and government. The proliferation of PDF technology in document production logically requires the FDE to have a fundamental understanding of PDF technology and its potential effects on machine-generated documents.

Beginning in the mid-1990s, several examinations were conducted of disputed documents that contained feature abnormalities of texts, images, and other content. During the same period, many FDE colleagues were assisted, primarily in the United States, in identifying PDF technology tools and their functions as sources for the various feature content abnormalities within disputed documents.

Research to isolate PDF technology tools, their functions, and nuances of interactions with other software and hardware was conducted by recreating the abnormalities in the documents being examined. Practical testing for the research involved using "period materials" contemporary with the purported dates of respective document problems. For example, testing for documents dated 1996 was conducted with computers having operating systems no newer than Windows® 95, Microsoft® Office Word no newer than Word 1995, and Acrobat® PDF versions no newer than 3.0 (PDF 1.2), released in 1996, as well as office-machine printers manufactured no later than 1996.

This presentation will include examples of abnormalities observed within actual documents from FDE casework, source(s) for which were confirmed by practical testing. Brief descriptions will relate the respective feature/function interactions between application software, hardware, and PDF technology that resulted in the respective abnormalities within printed copies of respective machine-made documents, their associated PDF archive digital files, and examples of discrepancies between PDF digital files and the documents they purportedly contain.

**PDF, Documents, Abnormalities**



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