PDF/X: Frequently Asked Questions-Part IV

Unfortunately, there's still a lot of misinformation and misunderstanding about PDF/X that lead people to reject it in favor of specifications and workflows that are far more risky and less reliable.

BY MARTIN BAILEY

This is the final article in the series *PDF/X FAQs*, which was designed to ensure that accurate information is freely and widely available to all. We wish to thank Martin Bailey and Global Graphics for making this series available for publication in the *IPA Bulletin*. See the previous three issues of the *Bulletin* for the first three articles.

I'm an application developer, what should I develop for? If you're developing tools for page design, preflight, file conversion or prepress, you should take the time to investigate PDF/X fully. Depending on your target market sector, you should seriously consider developing support for PDF/X-1a:2001 or PDF/X-3:2002.

If you're already supporting one or more of these, keep an eye on market acceptance of the new revisions—PDF/X-1a:2003 and PDF/X-3:2003 (see "2003 revisions"). If you're starting from scratch, you might consider adding both the current and the new revisions together. Given the level of market penetration and understanding of the PDF/X standards as a whole, it would be unwise to develop only for the new revisions at this time.

On the other hand, if you're developing for PDF/X-1a:2001 or PDF/X-3:2002, you may find it useful to read the 2003 version as well. Several important clarifications are included in the later releases that could help you in development of products for the earlier standards.

Developing to PDF/X-1:1999 or PDF/X-1:2001 (without an "a") is extremely unlikely to be useful (see *Obsolete PDF/X Standards* in the *PDF/X FAQs* article in January/February 2006 issue *IPA Bulletin*).

Please also consider developing an application data sheet for your products, showing how they can be configured to process PDF/X files correctly (see *What tools should I use for creating and processing PDF/X?* in the March/April issue of the *IPA Bulletin*). Writing this kind of document in parallel with product definition can also be useful in helping to identify any oversights or awkward user interfaces at an early stage of development.

One important aspect of the user interface for PDF/X creation tools is that it should enable the operator to enter accurate details about the print characterization for which the file was prepared as easily as possible (see *Which characterized printing condition should I label files as using?* in the January/February *IPA Bulletin* for more detail).

Developers should also read the PDF/X application notes available at **www.npes.org** (see *Where can I get more information?* on page 28).

Who's developing these standards? With apologies for the alphabet soup, the PDF/X standards are being worked on by a number of organizations.

PDF/X-1a and PDF/X-2 were initially developed by Subcommittee 6, Task Force 1 of the Committee for Graphic Arts Technical Standards (CGATS SC6 TF1) at the request of the DDAP Association (Digital Distribution of Advertising for Publications) and NAA (Newspaper Association of America). CGATS is accredited by ANSI (American National Standards Institute) to generate national standards for the graphic arts in the United States.

Initial development of PDF/X-3 was driven largely by the Swiss and German representatives to Technical

Photo: Dreamstime.com

Committee 130 of the International Standards Organization (ISO TC 130), with additional funding from BvDM (German printers' association), UGRA/EMPA (Swiss standards and research institute) and IFRA (international newspaper organization), and with active support from the ECI (European Color Initiative) and FOGRA (German printing research institute).

At the international level PDF/X work is done by the ISO TC 130 Working Group 2, Task Force 2 (ISO TC 130/WG2/TF2). Technical development of all PDF/X standards is now shared between CGATS SC6 TF1 and ISO/TC 130/WG2/TF1, with the ISO task force as the senior partner.

NPES The Association for Suppliers of Printing, Publishing and Converting Technologies provides secretariat services to CGATS and administrative and technical support services to ISO TC 130/WG2. Without their assistance and support it's unlikely that these standards could ever be completed.

Why don't these standards come out faster? The latest version of PDF available is 1.6 (Acrobat 7), and both PDF/X-1a:2001 and PDF/X-3:2002 are based on PDF 1.3 (Acrobat 4). Even the "new" revisions published in 2003 are only based on PDF 1.4. Why the mismatch?

Two important issues that come into play here are results of the fact that CGATS and ISO are open consensus organizations, i.e., they operate by allowing everyone with expertise in the relevant area to make contributions.

One consequence of that is that they cannot work under a non-disclosure agreement from a third party, so it's not possible to see, for instance, the specification for a new version of PDF before it's officially published by Adobe. Thus, the work to determine which pieces of functionality offered by a new version should be supported cannot start until the PDF specification is made public.

A second consideration is that it's very difficult to determine the real-world implications of a new version of PDF on professional print production without real experience. It took some significant time, for instance, to evaluate the impact of PDF transparency in PDF 1.4 on processes such as trapping or color management for proofing, and to understand the effects of different implementations of rendering workflows for those objects.

The third is that both ISO and CGATS have very formal balloting processes to ensure that all interested parties are given the chance to express opinions. From submission of a new revision of PDF/X for the final voting process to publication usually takes on the order of 12 months.

Finally, and most important, it's inappropriate to require all users to keep on the cutting edge of technology for all stages in their workflows in order to accept a standardized file format. It usually takes some time after the release of a new version of PDF to generate the tool sets that can handle them, often even longer before those tool sets become stable enough to rely on in a production environment, and longer still before it's reasonable to assume that they are in common use in prepress and print service providers.

The standards groups involved are still attempting to determine what the most appropriate release cycle

More Information On...	Is available at...
PDF/X-1a	www.pdf-x.com, www.ipa.org and www.ddap.org
PDF/X-3	www.eci.org, www.pdfx3.org and www.pdfx.info
Future PDF/X Developments	groups.yahoo.com/group/pdfx_revision
Ghent PDF Work Group	www.gwg.org
Printing Across Borders	www.printingacrossborders.org
ICC Color Profiles & Printing Characterizations	www.color.org
ISO, including purchasing standards	www.iso.org
CGATS, including SC6/TF1	www.npes.org/standards/cgats.html

for PDF/X updates should be. (See *Future Plans* in the *PDF/FAQs* article in January/February *IPA Bulletin*.)

How can I get involved? Both the CGATS and the ISO PDF/X task forces welcome representatives from interested parties such as vendors, user organizations, and users themselves. They both cover market segments from ad agencies through prepress and repro companies as far as printing companies. If you think you can help to build better standards please contact NPES at **standards@npes.org** or me at **martin.bailey@globalgraphics.com**.

More informal discussions aimed at PDF/X development take place on an email listserve. Anyone can join this group by filling in the form at **groups.yahoo.com/group/pdfx_revision**.

Where can I get more information? Published and final draft (DIS & FDIS) ISO standards may be purchased directly from ISO or from national standards bodies around the world (NPES in the United States, **www.npes.org**, BSI in the United Kingdom, DIN in Germany, etc.). See the above chart.

CGATS SC6/TF1 has also created application notes covering some issues that were not appropriate for inclusion within the standards themselves, but which are designed to assist developers and systems integrators. These are available from **www.npes.org/standards/workroom.html**. Note that this document is revised periodically to keep abreast of new revisions of the standard or simply to convey additional information as it is discovered to be important to the target audience. Copies of several supporting documents required for developers to implement PDF/X in their products may be downloaded from the CGATS pages on the NPES web site.

What are PDF/A, PDF/E and PDF/UA? The PDF/X standards were developed as a focused subset of PDF for the graphic arts industry, but PDF is flexible and powerful enough to provide great value in other markets too. An initiative, started by AIIM International (the Association for Information and Image Management International) and NPES in the United States, was moved into ISO (under TC171/SC2) and has developed a format called PDF/A, which is an equivalent subset for long-term archival of documentation. It's likely to also become a format of choice for internal use in enterprise, legal and government document exchange. At the time of writing, the standard is approved and publication is expected very soon. It will be published as ISO 19005-1:2005.

Slightly after work on PDF/A started, two more initiatives were formed, also under the auspices of AIIM. One aim is to develop a PDF subset format for the exchange of engineering documents to be called PDF/E. This has now also moved to TC171/SC2 in ISO. The other is developing a standard for the creation of PDF files accessible by physically impaired users, especially by the blind and partially sighted, to be called PDF/UA (universal access).

More information on all three programs is available from **www.aiim.org**.

What do the PDF/X standards restrict? This section provides a very brief overview of the main points of the PDF/X-1a:2001 and PDF/X-3:2002 standards. The 2003 versions differ slightly in some respects, but those are nothing like as commonly used, so I've not included the full details here.

This information is intended to give a feel for the requirements of the standards, but is definitely not complete enough to implement a product that creates or verifies PDF/X, or a PDF/X compliant reader. Anyone intending to produce a PDF/X compliant product really needs to buy the full standards.

Technical terminology used in this section is taken from the PDF 1.3 and PDF 1.4 reference manuals.

PDF Version-Both these standards are based on PDF 1.3, although the version number in the header and in the catalog should not be used to determine the conformance of a file to that version of the PDF reference.

A PDF/X-compliant rendering of the file must follow all requirements and stipulations of the PDF reference.

Fonts-All fonts used in the file must be embedded in the file, including their associated widths and encoding data. Only fonts that may legally be embedded should be used.

All font formats supported in PDF 1.3 may be used, including TrueType, multiple master and CID fonts (OpenType may not be used, that's not supported before PDF 1.6).

Color-All data in the file must be prepared for a single characterized printing condition. For a PDF/X-1a file, that printing condition must be defined in CMYK; for PDF/X-3 it may be gray, RGB or CMYK, although the vast majority of PDF/X-3 files are created for CMYK conditions.

The printing condition is identified using an output intent, much as described in the PDF 1.4 reference manual. The output intent must contain an embedded ICC profile if the characterized printing condition is not in the registry of CMYK characterizations on the ICC web site, or (in the case of PDF/X-3) if any device independent color data is used in the file.

In a PDF/X-1a file, all color data must be defined in DeviceGray, DeviceCMYK, Separation or DeviceN color spaces, or in Indexed or Pattern color spaces based on one of those.

In a PDF/X-3 file, any of the PDF 1.3 color spaces may be used, but with restrictions that ensure that all colors are defined colorimetrically.

Pre-separated files, where each PDF "page" represents a single separation of a final page, are prohibited.

Encryption-PDF/X files may not be encrypted, which means that they may not have either a user or an owner password.

File References-In PDF/X-1a file references are allowed, but cannot be accessed through OPI or reference XObjects. In PDF/X-3 (and in PDF/X-1a:2003) file references are prohibited completely.

Metadata-The files must be marked as PDF/X using extra keys in the Info dictionary: GTS_PDFXVersion in the case of PDF/X-3:2002 and both GTS_PDFXVersion and GTS_PDFXConformance in the case of PDF/X-1a.

The files must include creation and modification dates, a title, and a file ID in the Info dictionary. It is recommended that they also contain the creator and producer fields. Use with PDF/X-2 introduces requirements for more metadata, this time in XMP.

Page Boxes-Each page must include one (but not both) of ArtBox and TrimBox. It's recommended that BleedBox should also be included if the job is intended to bleed off the page.

PostScript-Embedded PostScript is prohibited, both as a PS XObject and using the PS operator in a contents stream.

Alternate Images-The default image for print must be the same as the default image used for display.

Graphics State-PDF/X files may not set halftone phase and may not use threshold screens. A PDF/X compliant reader is free to ignore all halftone information within the file.

The PDF/X standards were developed as a focused subset of PDF for the graphic arts, but PDF is flexible and powerful enough to provide great value in other markets too.

Transfer functions are prohibited within the graphics state, and are allowed in halftones only to the extent that they are required by the PDF reference.

Annotations and Interactive Features-Annotations are allowed, but all except TrapNet annotations must lie entirely outside the ArtBox/TrimBox/BleedBox of the page. This includes the Widget annotations used to represent AcroForms.

A PDF/X-compliant reader is not required to print any annotations other than TrapNets, even if their Print flags are set.

Actions and javascript are prohibited.

Compression-Any or all of JPEG, Flate, Run-Length, and CCITT fax compression are allowed. LZW, JPEG2k, JBIG2 are all prohibited, the last two because they were added to the PDF specification after PDF 1.3.

Trapping-The trapping requirements of the file must be recorded using the Trapped key in the Info dictionary. A value of False means that the file has not been trapped (trapping is required); True means that the file has been adequately trapped (trapping is not required); the value Unknown is not allowed.

Files marked as having been trapped should not be re-trapped. IPA

This is the final article in the four-part series on "PDF/X FAQs." Special thanks to Martin Bailey and Global Graphics for allowing IPA to run this article.