Standards Quarterly Report
June 2014

Result of the SMPTE® Standards Committee Meetings
Hosted by NHK, ITE
Tokyo, Japan

Thanks to our Sponsors for Making the June Standards Committee Meetings Possible:

Society of Motion Picture and Television Engineers®
3 Barker Avenue
White Plains, NY 10601 USA
www.smpte.org

SMPTE Standards Quarterly Report:
Executive Summary

As a result of SMPTE Standards Committee Meetings
2-6 June 2014
Tokyo, Japan
Hosted by NHK, ITE

Nine SMPTE Technology Committees and twelve subgroups scheduled meetings at this round, hosted by NHK and ITE, 2-6 June. The meetings immediately followed an Open Day at NHK's Science and Technology Research Labs on 1 June. NHK arranged for the SMPTE meeting attendees to visit the open day that showcased their broadcast technology developments - **more information**.

Over 60 members attended in person over the 5 days, and there was additional participation by remote access. This Executive Summary captures some of the more notable project developments. More information on the current status of the 160+ active projects is in the **detailed report**, below.

New Projects launched in the last quarter

- IMF Application #2 Mezzanine Film Format Details
- Study Group on HDR Ecosystem **Details**
- Two projects related to the ARRIRAW format:
  Draft RDD 30: ARRIRAW Image File Structure and Interpretation Supporting Deferred De-mosaicing to a Logarithmic Encoding **Details**
  Draft RDD 31: Deferred De-mosaicing of an ARRIRAW Image File to a Wide-Gamut Logarithmic Encoding **Details**
- Integer and Fractional Frame Rate Conversion **Details**
- UMID Resolution Protocol **Details**
- MXF Interoperability Specification of Sony AVC Products (RDD 32) **Details**

_____

Three SMPTE Study Groups completed their reports since the last meeting round - freely available on this **web page**. They are:
- Report of the Study Group on Immersive Audio Systems: Cinema B-Chain and Distribution
- Report of the SMPTE Study Group on Media Production System Network Architecture: "Beyond the Digital Conversion: The Integration of Information Technology and Professional Media"
- Report of the UHDTV Ecosystem Study Group

Society of Motion Picture and Television Engineers®
3 Barker Avenue
White Plains, NY 10601 USA
www.smpte.org

A project group on Stereoscopic Subtitle and Timed Text Rendering has been revising Digital Cinema documents to include stereoscopic provisions. Revision of "D-Cinema Distribution Master - Subtitle" is published and revision of "DCP Operational Constraints" and "Timed Text Track File" are underway. **Details**

The Interoperable Mastering Format (IMF) suite now has 6 documents published: Core Constraints; Composition Playlist; Essence Component; Common Audio Labels; Application # 2; Application # 3. Work continues on a set of Output Profile lists, Extensions to Application #2 and Sample Material Interchange. The first IMF plugfest was held in May. **Details**

A project defining how high-bandwidth essence can be carried on one, two and four 3Gb/s SDI interfaces has completed its work. The documents cover: 3D images that fit in one 3 Gb/s link; Single images that fit in two 3 Gb/s links; 3D images that fit in two 3 Gb/s links; 4K images that fit in four 3Gb/s links; 3D images that fit in four 3Gb/s links. **Details**

There are currently 16 MXF projects in process, adding features and mappings to this file-based suite of standards or creating constraints for improved interoperability. **Details**

The first two Parts of SMPTE video compression format VC-5 have published - Elementary Bitstream and Conformance Specification. Work continues on Image Formats and Subsampled Color Difference Components and an MXF wrapper for VC-5 will be developed. Then Metadata and some Advanced Features will be introduced. **Details**

SMPTE Standards Quarterly Report:
Detailed Account

As a result of SMPTE Standards Committee Meetings
2-6 June 2014
Tokyo, Japan
Hosted by NHK and ITE

The Society of Motion Picture and Television Engineers is the world leader in motion-imaging standards for the communications, media, and entertainment industries – and the only organization to connect the areas of motion-imaging research, standardization, education, and business success.

We encourage interested parties to contact Standards Committees to learn more about specific activities. Go to **www.smpte.org/standards** for more information.
*If you are interested in learning more about the SMPTE Standards program, please contact Peter Symes, Director of Standards and Engineering, at **psymes@smpte.org**.*

If you need help getting started with the SMPTE Standards process and some of the conventions / acronyms used in this report, please jump to the **Annex**.

A change was introduced quite recently to call the groups developing documents "Drafting Groups" (DGs) rather than "Ad-Hoc Groups". If you follow Drafting Group links in this report, you may find that some still show up as AHGs; projects started before the change are not renamed.

This report is a snapshot in time and should not be considered formal minutes or a positioning statement or analysis piece. Please provide your comments or suggestions at **standards@smpte.org**

Future Meetings
The next quarterly Standards meeting round will be held 17-21 September 2014 in Geneva, Switzerland and will be hosted by EBU.

Further quarterly Standards meeting rounds are planned for:
8-12 December 2014 in Burbank, California, USA hosted by Disney.
March 2015 – Arlington, Virginia, USA hosted by PBS
July 2015 - Sydney, Australia

This Quarterly Report provides a detailed account of the meetings of the following Technology Committees and their sub-groups:

Details from each Technology Committee meeting

Essence Technology Committee (TC-10E) chaired by Ed Reuss and Paul Gardiner

The application of the general scope as it applies to electronic capture, generation, editing, mastering, archiving, and reproduction of image, audio, subtitles, captions, and any other master elements required for distribution across multiple applications

Topic: TC-10E documents published in the last quarter

SMPTE RP 2077:2013, Full-Range Image Mapping
SMPTE ST 2073-1:2014 VC-5 Video Essence - Part 1: Elementary Bitstream
SMPTE RP 2073-2:2014 VC-5 Video Essence - Part 2: Conformance Specification

---

Topic: Video compression standards in SMPTE

DG Project: **Revision of SMPTE ST 2019 VC-3 Video Compression Documents**
This project extends the functionality of SMPTE VC-3 compression (based on AVID's DNxHD technology) by adding 5 new Compression IDs to support 4:4:4 sampling and RGB color space. This work affects two documents - ST 2019-1: VC-3 Picture Compression and Data Stream Format and RP 2019-2: VC-3 Decoder and Bitstream Conformance. In addition, ST 2019-4 is being revised in TC-31FS.

Status: ST 2019-1 passed DP ballot 2012-10-23. Some editorial corrections have since been applied. RP 2019-2 passed DP ballot on 2014-04-17 and is at ST Audit. IPR statements covering Parts 1, 2, 4

Society of Motion Picture and Television Engineers®
3 Barker Avenue
White Plains, NY 10601 USA
www.smpte.org

are being prepared so that ST Audit can be completed.

Business Impact: Interoperability between systems

DG Project**: Draft ST 2073: VC-5 Video Essence**
This project standardizes the Cineform / GoPro video compression system. The document suite plan currently comprises:
  – Part 1 - VC-5 Elementary Bitstream (Published)
  – Part 2 - VC-5 Conformance Specification (Published) Includes Reference Decoder, Sample Encoder, sample bitstreams
  – Part 3 - VC-5 Image Formats
  – Part 4 - VC-5 Subsampled Color Difference Components
  – Part 5 - Layers
  – Part 6 - Sections (this refers to a mechanism for implementing special functions without disturbing standard decoders)
  – Part 7- Metadata

Status: Parts 1 and 2 were published in the last quarter. It may be necessary to amend Part 2 to add materials for Parts 3 and 4, when those documents are ready for publication.
Part 3 is at FCD ballot, closing 2014-06-30.
Part 4 was submitted to TC-10E for pre-FCD-ballot review at the meeting.
Part 7 and then parts 5 & 6 will follow after the VC-5 team has completed work on an MXF wrapper for VC-5 in TC-31FS. This order of implementation was chosen to permit early use of VC-5 essence in MXF workflows that do not require advanced features.

Business Impact: Interoperability between systems

DG Project**: Amendment of ST 2042-1: VC-2 Video Compression Standard and RP 2042-3: VC-2 Conformance Specification**
This amendment of the SMPTE mezzanine video compression standard (based on BBC's DIRAC pro) adds a high quality profile to support Archiving and Production applications.

Status: The Part 1 revision was published 2012-08-30.
The bitstreams to complete Part 3 are awaited; there was no update available at this meeting round.

Business Impact: Interoperability between systems

DG Project**: RDD: JPEG 2000 Mezzanine Profile for HD Applications**
This project will create a JPEG2000 profile with consistent visual qualities so that in a multi-vendor environment, insert edits, assemble edits and concatenation can take place without significant visual

Society of Motion Picture and Television Engineers®
3 Barker Avenue
White Plains, NY 10601 USA
www.smpte.org

artifacts. This profile is currently deployed by a number of users and the RDD is proposed to aid interoperability.

> **Status:** Work on this RDD is proceeding and the DG Chair reported that it is trying to complete the draft in time for the next meeting.

Business Impact: Interoperability between systems

DG Project: **Draft SMPTE 2080 suite: Reference Display and Environment for Critical Viewing of Television Pictures**
This project group will draft the following suite of documents dealing with the use of fixed pixel matrix reference displays:
  ST 2080-1: Reference White Luminance Level and Chromaticity
  RP 2080-2: Measurement and Calibration Procedure for HDTV Displays (deals with parameters that can be regularly adjusted)
  ST 2080-x: Reference Display Characteristics
  ST 2080-x: Reference Viewing Environment Characteristics
  RP 2080-x: Full Measurement / Calibration
  EG 2080-x: Engineering Guideline to provide context and background

> **Status:** The Part 1 document passed FCD ballot on 2013-06-21 with 27 comments. A new draft (v3.0) addressing all comments has been produced. The drafting group recommends a second FCD ballot in view of the extent of the changes to the document; the draft is ready for pre-ballot review.
> The Part 2 document is ready for pre-FCD-ballot review; an Excel spreadsheet has been included in the package for calculating white chromaticity.
> The next document to be tackled will be the Reference Viewing Environment Characteristics.
> It has also been identified that RP 167-1995: NTSC Displays needs revision as it is still mistakenly regarded as a standard for setting up reference displays.

Business Impact: Users and industry have common standards to assess image quality on a reference display.

DG Project: **Revision of RP 219: High-Definition, Standard-Definition Compatible Color Bar Signal**
The proposal is to add optional components to part of the signal to exercise levels in the white overshoot region above level 940 and in the sub-black region below level 64 (10bit samples).

> **Status:** This draft document passed DP ballot on 2014-05-29. It will now go to ST Audit.

Business Impact: Improved interoperability between HD and SD color bar

Society of Motion Picture and Television Engineers®
3 Barker Avenue
White Plains, NY 10601 USA
www.smpte.org

DG Project: **Draft Depth Map Representation**
This project will define a standard for a data representation of depth maps in multi-view production and post-production to support interoperability and exchange between relevant processes.

> **Status:** A revised Working Draft was posted to the DG on 2014-05-23 for review. If there are no comments, it will be passed to the TC for pre-FCD-ballot review.

DG Project: **Revision of RP 173: Loudspeaker Placements**
This project will update the Recommended Practice in line with techniques adopted by the broader recording industry, as embodied by AES and ITU standards.

> **Status:** The DG Chair reported that the group has collected a number of documents related to surround speaker placement. He asked for a hiatus until October to allow work on other commitments.

Topic: Projects on Systems for High Dynamic Range and Wide Color Gamut

SG proposed Project: **Study Group on HDR Ecosystem**
Proposed scope: To identify the specific parameters and respective ranges that constitute "High Dynamic Range" (HDR). Based on the agreed definitions, review the impact to form a complete ecosystem for the creation, delivery and playback of HDR content across both linear and home entertainment distribution platforms. Deliverable is a report on existing standards that are impacted, identifying standards gaps which should be addressed, and recommendation on methodology and priority.

> **Status:** The project proposal has been updated and Chairs and document editors have been appointed for the group. Project approval can now proceed.

DG Project: **Draft ST 2084: High Dynamic Range Electro-Optical Transfer Function of Mastering Reference Displays**
The scope of this project is to define an expanded luminance range for next-generation entertainment content and to define a new Electro-Optical Transfer Function (EOTF) based on a human perceptual model.

> **Status:** This document passed FCD ballot on 2014-03-22 with 35 comments to resolve. At the TC meeting, 30 comments had been resolved and the remaining 5 comments were reviewed.

DG Project: **Draft ST 2085: Color Differencing for High Luminance and Wide Color Gamut Images**
The proposal is analogous to the transform from RGB to YUV, but in XYZ color space, allowing sub-sampling of the color difference channels.

> **Status:** The DG has reached consensus for the Working Draft to be submitted to the TC for pre-FCD-ballot review.

Society of Motion Picture and Television Engineers®
3 Barker Avenue
White Plains, NY 10601 USA
www.smpte.org

[DG Project](#)**: Draft ST 2086: Mastering Display Color Volume Metadata Supporting High Luminance and Wide Color Gamut Images**
The metadata is designed to convey both the color gamut and the dynamic range of the display used for mastering.

> **Status:** This document passed FCD ballot on 2014-03-31 with 29 comments to resolve. At the TC meeting, 14 comments had been resolved.

> **Business Impact**: A number of companies are proposing a "Next Generation" vision for delivering an enhanced viewing experience to the home. These three projects contribute to this vision.

_____

[DG Project](#)**: Television Lighting Consistency Index**
The project scope is to document the "Television Lighting Consistency Index (TLCI)" and the "Television Lighting Matching Factor (TLMF)". The introduction of LED lighting technologies is leading to unintended and possibly expensive consequences, including poor color matching between different light sources, and very hard to correct color reproduction. There is currently no standard method to quantify the quality of lighting with regards to color reproduction for Television.

> **Status:** The DG's draft document is close to completion.

[DG Project](#)**: Coding of Tactile Essence**
This project deals with technology to allow a remote viewer to receive and experience not only audio and video, but also the haptic or tactile "feeling" and "impact" of an event, regardless of the transmission means.

> **Status:** The DG is now in the process of evaluating specific proposals regarding means of transport as the basis for the Standard. The requirement of the Standard is to transport / transmit 1 – 3 axes (channels) of haptic-tactile data.

[DG Project](#)**: Draft RDD 30: ARRIRAW Image File Structure and Interpretation Supporting Deferred De-mosaicing to a Logarithmic Encoding**
This project documents the layout and the meaning of the image data and metadata in an ARRIRAW file.

> **Status:** The project was initiated after the last meeting round. It was reviewed in the DG and is currently at RDD ballot, closing 2014-06-11.

Society of Motion Picture and Television Engineers®
3 Barker Avenue
White Plains, NY 10601 USA
www.smpte.org

[DG Project](): Draft RDD 31: Deferred De-mosaicing of an ARRIRAW Image File to a Wide-Gamut Logarithmic Encoding
This project documents how the image data described in RDD 30 (above) are processed to produce a 'log' image that serves as an intermediate state between 'raw' and end-user-display-ready imagery.
>   **Status:** The project was initiated after the last meeting round. It was reviewed in the DG and is currently at RDD ballot, closing 2014-06-11.

[SG Project](): Integer and Fractional Frame Rate Conversion
The aim of this project is to determine whether practical high-quality conversion can be achieved, in real-time as well as in non-real-time, that could enable discontinuing the use of higher fractional frame rates - in particular, between UHDTV video at an integer frame rate of 120 fps and UHDTV and HDTV at conventionally used lower fractional frame rates.

>   **Status:** Project Chairs and a Document Editor have been appointed and the first meeting will be scheduled soon after the TC meeting.

[DG Project](): Revise ST 2036-1 for Additional Higher Frame Rates
This project will implement requests to add additional frame rates to SMPTE ST 2036-1, specifically 100fps and 120/1.001fps. Currently the only higher rate supported by ST 2036-1 is 120fps.

Status: A Working Draft was submitted by the DG on 9th January, but the project has been on hold pending wider consideration of the use of higher fractional frame rates. The situation was reviewed and it was decided that the proposed revision of ST 2036-1 should proceed to FCD ballot.

Topic: Other TC-10E Business

New project proposals were introduced for:
UHDTV Color Bars - a project proposal is being drafted.
SMPTE ST 2047-3, VC-2 Level 65 - the original proponent is investigating an issue - there may be an amendment put forward.
RDD Apple ProRes Decoder - There is currently no persistent documentation for this format. A project proposal is expected in the week after the TC meeting.

Film Technology Committee (20F) chaired by David Schnuelle

The application of the general scope as it applies to application of mastered essence to theatrical film distribution, including, media and component creation, marking, laboratory methods, reproduction, packaging, projection, and related topics. Additionally film capture, editing and recording.

This group does not meet during the quarterly sessions.

Society of Motion Picture and Television Engineers®
3 Barker Avenue
White Plains, NY 10601 USA
www.smpte.org

Digital Cinema Technology Committee (21 DC) chaired by John Hurst and Mike Radford

The application of the general scope as it applies to application of mastered essence to theatrical digital distribution, including compression, encryption, wrapping, marking, packaging, media, logging, playout, projection, reproduction, and related topics.

Topic: TC-21DC documents published in the last quarter

SMPTE ST 428-7:2014 (Revision of SMPTE ST 428-7:2010), Digital Cinema Distribution Master – Subtitle

_____

DG Project: Stereoscopic Subtitle and Timed Text Rendering
This DG will revise SMPTE standards in compliance with "Stereoscopic On-Screen Text – Study Group Report" version 1.2.
Documents affected:
- Revise ST 428-7: D-Cinema Distribution Master - Subtitle (Published)
- Revise ST 429-2: DCP Operational Constraints
- Revise ST 429-5: Timed Text Track File

Status: The revised draft ST 428-7 has been published in the last quarter.

Drafting Project: Revise ST 429-2: DCP Operational Constraints
This revision project will address issues that arose during the ST 428-7 revision**.**

Status: This project was approved since the last meeting round. A revised draft has been posted to the DG following the discussion of some descriptor constraints.

Drafting Project: Revise ST 429-5: Timed Text Track File
This revision project will address issues that arose during the ST 428-7 revision.

Status: This project was approved since the last meeting round. A revised draft has been posted to the DG; discussion continues.

Business Impact: Compatibility and Interoperability

Society of Motion Picture and Television Engineers®
3 Barker Avenue
White Plains, NY 10601 USA
www.smpte.org

DG Project: Draft ST 430-12: DCO - FSK Synchronization Signal
This project will define the modulation and protocol for a signal using a digital audio link that can be played back from a server and used to carry timing and identification information to accurately synchronize an external processor.

Status: This document passed ST Audit 2014-05-09 and is being prepared for publication.

Business Impact: Interoperability and quality improvements

DG Project: Draft ST 429-14: Auxiliary Data Track File, incorporating ST 429-15: DCP - Auxiliary Data Composition Asset
This DG will specify a method to carry data that does not fall into the existing Sound, Picture, and Subtitle track files in a SMPTE Digital Cinema Package. Examples are object-oriented sound, motion control, and effects programming (wind, fog, etc.).

Status: This document passed ST Audit 2014-05-15. It should be published in the near future.

Business Impact: Interoperability between systems

DG Project: Draft ST 429-16: Additional Composition Metadata and Guidelines
The DG will develop a new Standard "DCP CPL Metadata Asset item". Additional Composition Play List metadata items are needed. As a work-around, these items are currently encoded in the title of the composition, whose structure cannot accommodate the full range of desired metadata. As a result, metadata contained in the Composition Playlist is inconsistent and seldom utilized by exhibition equipment.

Status: The document is at DP ballot, closing 2014-06-17.

DG Project: Revision ST 429-9: D-Cinema Packaging - Asset Mapping and File Segmentation
This project will add support for multiple ASSETMAP.xml files in a single volume.

Status: The document passed FCD ballot on 2014-05-20 with 3 comments to resolve.

DG Project: Aux Data Sync Signal and Transfer Protocol
Project Scope is to develop standard(s) for the transmission and synchronization of Aux Data from a Media Block to one or more Processors in a D-Cinema system.
Applications include Immersive Sound and control for Motion Systems, e.g. motion chairs.

Status: This new project was transferred from TC-25CSS at the last meeting round. A project draft has been submitted to the DG and the timing model has been reviewed. Working Draft status is expected soon.

Society of Motion Picture and Television Engineers®
3 Barker Avenue
White Plains, NY 10601 USA
www.smpte.org

SG Project: D-Cinema Crypto Evaluation
This project will study and draft recommendations for current and future use of cryptography in the D-cinema distribution chain.
It is a follow-up to the SG that was set up some time ago to assess the impact of revisions to NIST and FIPS reference cryptographic algorithms, methods and/or standards.

> **Status:** The SG report was finalized and submitted to TC-21DC on 2014-05-21. A new Random Bit Generator algorithm needs to be added to ST 429-6: MXF Track File Essence Encryption and amendment is also required to ST 430-5: Security Log Event Class and Constraints.

DG Project: Draft RDD 29: Dolby Atmos Bitstream Specification
For real-time playback through a cinema sound processor, a Dolby® Atmos™ bitstream needs to contain information to support both channel-based and object-based audio. This document defines the syntax of a frame-based Dolby Atmos bitstream. The bitstream carries audio essence and metadata necessary to reproduce a complete audio program.

> **Status:** This document is at ST Audit (jointly with RDD 28), closing 2014-06-17.

DG Project: Draft RDD 28: Dolby Atmos Print Master File Specification
A Dolby® Atmos™ print master needs to contain information to support both channel-based and object-based audio, and therefore has several components. This document defines how to store the audio essence and metadata for a Dolby Atmos presentation. The files created with this specification are part of the DCDM and are passed on to other processes to package for distribution and playback.

> **Status:** This document is at ST Audit (jointly with RDD 29), closing 2014-06-17.

Television and Broadband Media Committee (24TB) chaired by Mike Dolan

The General Scope as applied to mastered essence for television and broadband distribution (both separately and for hybrid television/broadband environments), including compression, encryption, wrapping, marking, packaging, media, tracking/control, presentation, reproduction, and related topics.

Topic: TC-24TB documents published in the last quarter

SMPTE RP 2072:2014, (Revision of EG 32-1996), Emphasis and Preferred Sampling Rate for AES/EBU Digital Audio in Television

_____

Society of Motion Picture and Television Engineers®
3 Barker Avenue
White Plains, NY 10601 USA
www.smpte.org

DG Project**: Draft ST 2064 suite of documents on A-V Sync Measurement and Assessment**
The scope of this group is "Define recommended techniques for audio-video synchronization error measurement, and techniques and environment for synchronization assessment". It is developing a document suite based on audio and video fingerprints:
  − Part 1: Fingerprint Generation
  − Part 2: Fingerprint Stream Transport (includes VANC in SDI/HD-SDI, IP, MPEG)
  − Part 3: Fingerprint File Binding

  Status: Part 1 and Part 2 passed FCD ballot 2014-01-14; Part 1 had 45 voter comments to resolve and Part 2 had 22. Almost all comments have been addressed for Parts 1 and 2.
  Work will resume on Part 3 and on an additional EG.

  Business Impact: Improved quality of experience and interoperability between systems

SG Project**: Open binding technology for persistent content identification in A/V essence**
This project aims to define an open binding technology standard (e.g., watermarks, fingerprints, metadata sidecars, etc.) for embedding persistent content identifiers into audio/video essence in a way that survives compression and distribution through the supply chain.

  Status: The SG completed its report and submitted it to TC-24TB on 2014-05-29. At the TC meeting, the report was reviewed and accepted. Work will continue briefly on the report to make it suitable for public publication. A DG will then be set up to start the standardization work..

  Business Impact: Formulate an understanding of potential technologies that can be applied to content identification and future standards requirements.

DG Project**: Revision of Closed Captioning suite documents**
This project is a straightforward updating of references for documents ST 333:2008, ST 334-1:2007, ST 334-2:2007, and RP 2007:2007 that cover carriage of CEA-708 (and CEA-608) closed caption data over various interfaces.

  Status: ST 334-1 and ST 334-2 passed FCD ballot on 2014-05-26 with 7 and 5 comments respectively. The other two documents are taking more time to get to ballot.

DG Project**: Revision ST 2010: VANC Data Mapping of ANSI/SCTE 104 Messages**
This project is a straightforward updating of references.

  Status: The project scope was expanded to address a few other items that were discovered during pre-ballot review. Ballot pending final edits from DG.

Society of Motion Picture and Television Engineers®
3 Barker Avenue
White Plains, NY 10601 USA
www.smpte.org

DG Project: **Revision ST 2016-2: Format for Pan-Scan Information and ST 2016-4: Ancillary Data Mapping of Pan-Scan Information**
The project adds support for UHDTV signals, as well as updating references.

> **Status:** Both document revisions were raised to DP status by vote at the TC meeting.

DG Project: **Revision ST 2020-x: Audio Metadata in VANC**
The project is a straightforward updating of references for:
ST 2020-1: Format of Audio Metadata and Description of the Asynchronous Serial Bitstream Transport
ST 2020-2: Vertical Ancillary Data Mapping of Audio Metadata - Method A
ST 2020-3: Vertical Ancillary Data Mapping of Audio Metadata - Method B.
This suite of documents standardizes the carriage of Audio Metadata in VANC packets.
Part 1 defines the overall metadata format; Part 2 and Part 3 standardize methods for formatting the metadata into VANC packets.

> **Status:** 2020-3 passed ST Audit in May awaiting the other 2 document revisions, which were raised to DP status by KAVI vote just prior to the TC meeting. Part 1 and 2 proceeding to ST Audit,

DG Project: **Revision ST 2031: Carriage of DVB/SCTE VBI Data in VANC**
This project is a straightforward updating of references.

> **Status:** The document is at FCD ballot, closing 2014-06-18.

DG Project: **Revision of ST 96: 35- and 16-mm Motion-Picture Film — Scanned Image Area**

> **Status**: Revision work is proceeding. The diagrams in the standard are being clarified and expanded.

SG Project: **UHDTV Ecosystem**
The study group scope is to determine the requirements for interfacing/exchanging 4K and 8K in an end-to-end chain (e.g., with a reference diagram visualizing the areas where new exchange standards are needed). The group will identify gaps and make recommendations for future standardization work.

> **Status:** The final SG report was published in time for NAB, and is available **here**.
> The group will be disbanded. SMPTE is also preparing a UHDTV wallchart.

Business Impact: Formulate an understanding of future standards requirements in the full UHDTV eco chain.

Society of Motion Picture and Television Engineers®
3 Barker Avenue
White Plains, NY 10601 USA
www.smpte.org

Cinema Sound Systems (25CSS) chaired by Brian Vessa and Kurt Graffy

The application of the general scope as it applies to standards for theater sound and cinema B-Chain systems, including performance, measurements, setup, calibration, acoustics and related topics.

SG Project: **Immersive Audio Systems: B-Chain and Distribution Study Group**
This group is developing a report on existing immersive cinema audio systems in order to determine what standards and recommended practices are needed. The B-chain and distribution requirements of the various systems will be studied. The National Association of Theater Owners (USA) and the International Union of Cinemas (Europe) have jointly submitted their Immersive Sound Requirements to the group.

> **Status:** The SG's report was published and is available **here**. There are a number of attachments that will be reorganized into one zip file for each Annex of the document.

DG Project: **Analysis of SMPTE B-Chain Study Group Theater Testing Data Report**
This group will compile and analyze the theater testing data that was collected by the earlier B-Chain Study Group Theater Testing group and produce a report with analysis, comparisons and recommendations.

> **Status:** The report analyzing the venues (4 cinemas, 2 dubbing stages) is substantially complete. A small group within the DG is reviewing the draft, after which it will be submitted to the whole DG for review and then to TC-25CSS. A desirable target for publication is before the SMPTE October conference; if possible, before the September IBC. The DG is considering presenting the material for non-expert readers.

DG Project: **Draft ST xxxx: Calibration Reference Wideband Pink Noise Signal and Test File**
Examination of various "reference" noise files has revealed inconsistency in both RMS and Peak amplitude values. This group will create a pink-noise calibration Standard, and produce a reference pink-noise .wav file and a DCP containing the file. The pink noise defined in ST 202:2010 and RP 200-2012 will be used and the algorithm used to generate the pink-noise file will be specified.

Status: The group is in the process of final reviews and editing on the draft Standard. It is also nearing completion with creating the code and algorithm for generating the pink noise signal within the required signal file parameters and tolerances. FCD ballot is predicted for Q3 2014.

DG Project: **Draft RP xxxx: Digital Cinema Sound System Setup and Calibration ("B-chain Modern Calibration Procedure")**
This group will create a Recommended Practice that codifies and expands currently-practiced measurement methodology using today's technology and analyzers into step-by-step procedure(s) for measuring and calibrating the frequency response and sound pressure levels of the B-chain sound system in indoor theater spaces.

Society of Motion Picture and Television Engineers®
3 Barker Avenue
White Plains, NY 10601 USA
www.smpte.org

Status: The RP draft has undergone some iterations within a small group that is developing the draft. It is estimated that by late July, the text of the RP will be posted to the TC for pre-FCD-ballot comments (illustrations and graphics also need to be completed).

WG Project: Interoperability of Immersive Sound Systems in Digital Cinema
This working group will identify areas of the D-Cinema architecture that require standardization to achieve interoperability of audio for systems with capability greater than 7.1. It will create engineering documents as needed, including standardizing a single object-based distribution file format and related protocols for interoperable playback into a variety of theatrical speaker configurations.

The group will also address recommended calibration methods for these audio playback systems as well as any other standards the group determines to be necessary to achieve D-Cinema interoperability. A suite of documents is anticipated. The working group will liaise with TC-21DC and work closely with them in the creation of these standards.

Status: This WG has held 6 well-attended telecons since its formation in December 2013. Input documents on the MDA and Dolby Atmos systems have been submitted. An AHG has been working on a roadmap and workflow. A drafting group has been formed on "Immersive Sound Model and Bitstream". There is also discussion on specifying a Reference Renderer.

Other TC-25CSS Business

Loudness in Movie Theaters
This topic came up at the previous TC meeting. The TC Chair reported that there has since been interest in this work and gave some analysis of what SMPTE could do if proponents can be found.

EBU Audio Metadata model
The EBU has invited TC-25CSS members to a tutorial on its new metadata model from Tech 3364 - to be held on June 26.

Society of Motion Picture and Television Engineers®
3 Barker Avenue
White Plains, NY 10601 USA
www.smpte.org

Metadata and Registers Committee (30MR) chaired by Ingo Hoentsch with Phil Tudor and Paul Treleaven pro-tem

The application of the general scope as it applies to definition and implementation of the SMPTE Registration Authority, used to identify digital assets and associated metadata. Additionally, the common definition of metadata semantic meaning across multiple committees.

DG Project: EG 2061: Glossary of Stereoscopic 3D Terms
This project takes as its starting point the glossary developed last year by the 3D Home Master project in TC-35PM.

Status: The draft document closed FCD-ballot on 2013-10-24 with 6 comments to resolve. Comment resolution is held awaiting further definitions from a "Depth Map Representation" document in TC-10E.

Business Impact: Understanding and common use of terms

Topic: UMID Projects

The Chair of the following two closely-related projects gave a status report.

SG Project: Application of the Unique Material Identifier (UMID)
The UMID is standardized in ST 330 and RP 205 covers application of UMIDs in Production and Broadcast Environments. This SG is studying ways to make the UMID more useful, particularly in Material location across various systems. The SG is preparing two reports:
- Study Report on UMID Applications Part 1 (UMID Application Principles, Best Practices) - complete and submitted to HQ.
- Study Report on UMID Applications Part 2 (Additional Technology that needs Standardization)
    - Part 2.1: UMID Resolution Protocol, UMID-based Program Package Exchange
    - Part 2.2: UMID Applications in MXF

Status: Since the last meeting round, Part 2.1 was submitted to the TC for review and was approved.
An initial draft of Part 2.2 of the report was submitted to the SG; it may reveal additional requirements for technologies to be standardized.

Society of Motion Picture and Television Engineers®
3 Barker Avenue
White Plains, NY 10601 USA
www.smpte.org

DG Project: UMID Resolution Protocol

This project will draft a new SMPTE standard that specifies an industry-standard method for a given UMID to be converted into the corresponding URL of its audiovisual (AV) material. It follows from SG report Part 2.1.

> **Status:** This project completed TC and ST approval. However, at the TC-30MR meeting, there was discussion about whether the project would be better suited to TC-34CS. The SVP will make a decision on the most appropriate TC for the work.

DG Project: Revision of RP 205: Application of Unique Material Identifiers in Production and Broadcast Environments

This project incorporates improvements identified in the Study Group report Part 1.

> **Status:** This document passed DP ballot on 2014-05-20. The DG Chair has received an email regarding a possible patent related to this work; HQ will investigate.

———————————

DG Project: SMPTE Core Metadata Set

This group's scope is to define an interoperable minimum core set of descriptive metadata for professional motion imaging applications and users.
Existing SMPTE metadata is application-specific and is not supported right through media workflows.

> **Status:** Drafting work on the Standard "SMPTE Core Metadata" is under way. It defines extensions to Dublin Core metadata elements.

Business Impact: potential foundation for Metadata

SG Project: HQ implementation of On-line Registers

TC-30MR's metadata registers are currently spreadsheet-based and it has long been recognized that an online database is required. This SG has completed a report listing requirements for an online system.

> **Status:** There has been a change of direction since the demonstrations of a prototype system during the 2014-03 meeting round. SMPTE HQ is now in discussion with another potential supplier.

Business Impact: Efficient and accurate maintenance of Universal Label assignments.

Society of Motion Picture and Television Engineers®
3 Barker Avenue
White Plains, NY 10601 USA
www.smpte.org

SG Project: Metadata Strategy
This review of the role of the TC started in the 2012-03 meeting round, examining how the focus of the TC should expand beyond the registration of metadata and towards standardizing metadata schemes and XML projects.

> **Status:** The SG Chair has revised the draft report to address comments received in the SG. When there is SG consensus, the report will be submitted to the TC.

Topic: Register Structure Document Projects

There are several SMPTE standards defining the structure of various metadata registers defined by ST 336: Data Encoding Protocol Using Key-Length-Value. They are all being updated to include new requirements such as including xml symbols. Three of these updates are now published:
− ST 335:2012 Metadata Element Dictionary Structure
− ST 400:2012 SMPTE Labels Structure
− ST 2003:2012 Types Dictionary Structure

DG Project: Revision ST 395: Groups Register Structure

> **Status:** The document passed ST Audit 2013-12-18. Publication had been held awaiting the ballot of the contents spreadsheet, but there was a decision at the last TC meeting to go ahead with the publication so that the requirements for Groups register items can be easily obtained by potential registrants.

DG Project: Draft STxxxx: SMPTE Essence Element Key Register Structure
This project creates a controlling standard for SMPTE ULs used as essence keys in MXF standards.

> **Status:** A new project Chair has been appointed. The document is now close to ready for pre-FCD-ballot review.

––––––––––––––––––––

DG Project: Draft ST 2024: Registry XML Interchange Format
This work defines a format for exchanging data with the SMPTE metadata registry. It comprises a prose document and a schema.

> **Status:** The DG Chair is no longer available to work on this project. There was also discussion about the value of having an online register resource available when the provisions of the ST 2024 draft are being assessed. It was decided to suspend the project.

Society of Motion Picture and Television Engineers®
3 Barker Avenue
White Plains, NY 10601 USA
www.smpte.org

DG Project: Revision ST 336: Data Encoding Protocol Using Key-Length-Value
Revise ST 336 to update references and review whether its provisions reflect current register operation.

> **Status:** A group has been set up to start the work. A first draft of the document in the current template has been submitted to the DG.

Drafting Project: RPxxxx: Ad-ID Identifier Representations
This document is closely associated with the **TC-31FS project** developing an Ad-ID "digital slate". The two projects share a 31FS drafting group "Ad-ID Digital Ad Slate for MXF".

> **Status:** A draft document has been submitted for informal review by TC-30MR. The RP should be in a form suitable for two week pre-FCD review shortly after the Tokyo meetings.

WG Project: Metadata Definition
This Working Group (30MR10) co-ordinates a number of DG projects for adding or maintaining metadata items in registers. Because the registers are updated frequently, a version number identifies each revision.

> **Status:** A new WG Chair (pro-tem) has been appointed. There have been automated verification tests run on the Elements, Groups and Types registers and some issues have been identified and will be corrected. Resources have been regrouped in preparation for ballots.
> The status on the following registers was also updated:

DG Project: Update Metadata Element Dictionary Contents (RP 210)

> **Status:** The RP 210v14 draft needs some corrections before 2-week pre-FCD-ballot review.

DG Project: Update Metadata Labels Register Contents (RP224)

> **Status**: The RP 224v13 draft is believed to be in good shape for 2-week pre-FCD-ballot review.

DG Project: Create and Update Groups Register Contents
For some while, an informal Groups Register has being maintained. The register is awaiting publication of the ST 395 revision (its controlling document).

> **Status:** Editing to correct the issues found is underway.

DG Project**: Create and Update Types Register Contents**
For some while, an informal Types Register has being maintained.
Now that the defining structure document, ST 2003, is published this register can be introduced formally for ballot.

> **Status:** Editing to correct the issues found is underway.

Society of Motion Picture and Television Engineers®
3 Barker Avenue
White Plains, NY 10601 USA
www.smpte.org

DG Project: Create and Update Essence Element Register Contents
The group will create a register of SMPTE ULs for use as essence keys and process requests for register additions, modifications and deprecations.

   Status: WD in preparation

File Formats and Systems Committee (31FS) chaired by Thomas Bause Mason and Pierre Lemieux

The application of the General Scope as it applies to definition of common wrappers, file formats and file systems for storage, transmission, and use in the carriage of all forms of digital content components.

Topic: 31FS Publications in last quarter

SMPTE RDD 25:2014 AVC MXF Proxies
SMPTE ST 436-1:2013 (Revision of SMPTE 436M-2006), MXF Mappings for VBI Lines and Ancillary Data Packets
SMPTE ST 2001-1:2013, XML Representation of SMPTE Registered Data (Reg-XML) — Mapping Rules

_____

Topic: Material Exchange Format (MXF)

MXF defines a file format for Video, Audio and Data essence along with associated Metadata, for use in production systems (rather than final delivery).
There are several MXF projects under way. Some define new MXF features / applications, others revise existing documents for better interoperability.

   Business Impact of all MXF-related work items: Interoperability between systems in file-based production

DG Project: Draft ST 377-2: KLV-encoded extension syntax (KXS)
This work specifies an alternative approach to the 'Application Metadata Plug-ins' specified in SMPTE 377-1.

   Status: The document passed a second FCD ballot on 2013-11-17 with 70 comments. The DG Chair and Document Editor can no longer continue with this work, so at the TC-31FS meeting, it was decided that the project would be disbanded if no volunteers came forward within 2 weeks.

DG Project: Revision ST 434: XML representation of MXF metadata
 Update ST 434 to take account of changes to ST 377-1 and other MXF documents

Status: This document passed FCD ballot on 2014-04-07 with 41 comments. Many comments have been resolved and work on the remaining ones continues.

DG Project: Revision ST 380: MXF – Descriptive Metadata Scheme-1

Status: This revision failed to achieve numeric consensus at FCD ballot that closed 2014-02-24 with 10 voter comments to resolve. At this meeting round, it was announced that the DG Chair was no longer available to continue with the work and it was decided that the group would be disbanded if a replacement had not volunteered in 2 weeks.

DG Project: Revision EG 42: MXF Descriptive Metadata
Changes that arose during the ST 380 revision have been incorporated in the EG 42 draft.

Status: This revision passed FCD ballot on 2014-02-24 with 8 voter comments to resolve. There was discussion of one comment topic at the TC meeting about the need to avoid "implied" normative language in an EG.

DG Project: Draft ST 2042-4: Wrapping VC-2 Video Essence in the MXF Generic Container

Status: This document failed FCD ballot (closed on 2013-05-23). All 43 ballot comments are now resolved, but one non-voter comment needs to be resolved. A second FCD ballot is now required.

DG Project: Draft ST 2070 (suite): Stereoscopic 3D in MXF for Operations
Document suite comprises: ST 2070-1 Common Provisions
                             ST 2070-2 OP1a mapping
                             ST 2070-3 OP-ATOM or Single Track OP-1a Mapping

Status: Parts 1-3 passed ST Audit on 2014-05-12 and are being prepared for publication.

DG Project: Revision ST 422:2006: JPEG2000 in MXF
The main purpose of this revision is to add provisions for interlaced images.

Status: A problem with the recently published document was identified at the previous meeting round - a Universal Label that had been assigned some while before still appears as "TBA". An amendment (amd1) to specify the correct UL has passed ST Audit and this DG will be disbanded when the amendment is published.

Society of Motion Picture and Television Engineers®
3 Barker Avenue
White Plains, NY 10601 USA
www.smpte.org

RDD Project: RDD 25 – AVC MXF Proxies
This RDD defines an MXF Application Profile for AVC proxies with MPEG-2 AAC audio per Operational pattern 1A (OP1a).

   Status: The document is published and the group will be disbanded.

DG Project: Revision ST 436: MXF Mappings for VBI Lines and Ancillary Data Packets
This project will create ST 436-1 (compatible with current ST 436) and will compile a list of topics for a separate project, ST 436-2, which will add new features or constraints that are possibly incompatible with ST 436-1.

   Status: The Part 1 document has been published. There is some uncertainty about whether work to create Part 2 will now proceed; more information is expected at the September TC meeting.

DG Project: Revision ST 2019-4: Mapping VC-3 Coding Units into the MXF Generic Container
Five new Compression IDs need to be added (triggered by changes to ST 2019-1 in TC-10E), plus a cleanup of normative references as necessary.

   Status: This document passed DP ballot on 2014-02-03. There was no report from the DG Chair, but the document has not yet been sent for ST Audit.

DG Project: AAC Family Compressed Digital Audio in MXF
A new MXF mapping document is proposed that will cover all the variants of AAC that are used in broadcast applications.

   Status: The DG met during this meeting round and discussed the best structure for a family of Universal Labels for AAC. It is hoped that a draft document will be ready for the September meeting round.

RDD Project: RDD 26: MXF OP-1b specification for AVC with Chunk audio
This RDD specifies constraints on OP-1b to facilitate interoperability for tape-less camera recording.

   Status: This RDD passed ST Audit on 2014-05-08 and is on the verge of publication.

SG Project: MXF Timecode Mapping and Labeling
It has been identified that a number of topics on the use of timecodes in MXF require additional guidance or definition. This project will review requirements, existing techniques and documents, and if necessary propose revision or new documents.

   Status: A new SG Chair has been appointed.

DG Project: RP 2089: Carriage of EIDR Identifiers in MXF files
This project will specify the carriage of EIDR Identifiers (as specified in RP 2079) in MXF files using the Descriptive Metadata Scheme mechanism specified in SMPTE ST 377-1:2011 and ST 377:2004.

Status: This document passed FCD ballot on 2014-04-07 with 8 comments to resolve. At the TC meeting, it was explained that no response to the proposed resolution had been received for 4 weeks and there was agreement to mark the comments as resolved (non-responsive). However, there has since been response from the commenter and it appears that satisfactory resolution is close. The document will then go to 2 week pre-DP-review.

DG Project: Ad-ID Digital Ad Slate for MXF
The group will develop a Recommended Practice, with principal input document being AMWA AS-12 (which this document will ultimately replace). An associated **Ad-ID representation project** is underway in TC-30MR.

Status: The group will begin work on this document shortly after the end of this meeting round. It has been working on the associated TC-30MR document.

RDD Project: RDD 32: MXF Interoperability Specification of Sony AVC Products
Additional constraints need to be specified to facilitate interoperability between Sony AVC products and others.

Status: A draft document will be submitted soon.

Topic: Archive Exchange Format (AXF)

This Working Group (31FS-30) will define an archive format that will promote interoperability between all forms of archive media. A multipart suite of documents is planned:
Part 1 deals with 'AXF Structure and Semantics' and includes an XML schema.
Part 2 will cover "External Uses of XML Schema".
A new AXF project will:
- Prepare Reference AXF Objects
- Prepare Reference AXF Media or at least Media Structures
- Verify AXF Objects and Structures
- Develop Tools for AXF Object & Media Verification
- Develop Utilities for AXF Object Recovery on Various OS's

Business Impact: Interoperability and more cost effective handling of technology migration issues in archives

Society of Motion Picture and Television Engineers®
3 Barker Avenue
White Plains, NY 10601 USA
www.smpte.org

WG Project: Draft ST 2034-1: Archive eXchange Format (AXF) - Part 1: Structure & Semantics
This document includes a schema file.

> **Status:** The draft Part 1 document passed FCD ballot on 2013-12-02 with 271 comments to resolve. all comments are now resolved and the document will be submitted for 2 week pre-DP-review.

WG Project: Draft ST 2034-2: Archive eXchange Format (AXF) - Part 2: External Uses of XML Schema
Part 2 covers the use of AXF Structures in "Unwrapped" form, enabling aggregation of files into a "Bundle". The schema can serve as a manifest and it can apply hierarchical structure to files. It is intended for use from file capture on set through to archive input. There was a strong end-user demand for this work.

> **Status:** Most structures have been defined. Document drafting continues. The first draft of the schema has been created.

―――――――――――――

DG Project: Draft ST 2001: XML Representation of SMPTE-registered Data (Reg-XML)
ST 2001 is about representing <u>instances</u> of SMPTE-registered data in XML.
There are two Parts: ST 2001-1: Mapping Rules (includes 2 schemas)
                                    ST 2001-2: AAF and MXF data (includes an XML meta-dictionary and schema)

> **Status:** Part 1 has been published in the last quarter. A minor issue on missing xml elements has been brought to the attention of SMPTE HQ.
> Part 2 should go to ST Audit shortly.

DG Project: XML Schema for Audio and Related Metadata
This DG will develop an XML Schema for audio and related metadata focusing on the technical aspects and harmonizing the work with existing SMPTE audio metadata efforts.

> **Status:** The work of this group has been suspended; an EBU model has been submitted and the group may defer to that data model. A gap analysis is underway in a **TC-32NF project**.

Other TC-31FS Business

AHG: ST 379-1 and New Mappings
This AHG was formed at the December 2013 meeting round to study which Part of the Generic Container (ST 379-1 or ST 379-2) should be used for new mappings that have no legacy implications.

> **Status**: The AHG has produced a document of its conclusions. It was accepted by the TC and decided that HQ would be requested to issue the document as an Engineering Report.

Society of Motion Picture and Television Engineers®
3 Barker Avenue
White Plains, NY 10601 USA
www.smpte.org

5-Year Review of ST 268: File Format for Digital Moving-Picture Exchange (DPX)
The TC is awaiting a version with redline wrt the published version. An administrative vote will then be held to approve a roll-up including the 2012 amendment (for ACES application). Another vote will then be held, proposing that the rolled-up document be made stable.

Network and Facilities Architecture Committee (32NF) chaired by Friedrich Gierlinger and John Snow

The application of the general scope as it applies to definition and control of elements supporting the infrastructures of content production and distribution facilities, including file management, transfer protocols, switching mechanisms, and physical networks that are both internal and external to the facility excluding unique final distribution methods.

Topic: 32NF Publications in last quarter

SMPTE ST 12-1:2014 (Revision of SMPTE 12M-1-2008), Time and Control Code
SMPTE ST 12-2:2014 (Revision of SMPTE 12M-2-2008), Transmission of Time Code in the Ancillary Data Space
SMPTE 425-0:2014 (Revision of SMPTE 425-0:2012-06), SMPTE Bit-Serial Interfaces at 3Gb/s – Roadmap for the 425 Document Suite
SMPTE ST 425-3:2014, Image Format and Ancillary Data Mapping for the Dual Link 3 Gb/s Serial Interface
SMPTE ST 425-5:2014, Image Format and Ancillary Data Mapping for the Quad Link 3 Gb/s Serial Interface
SMPTE ST 425-6:2014, Quad 3 Gb/s Serial Digital Interface for Stereoscopic Image Transport

―――――――――――――

[WG Project](): **SDI Interfaces**
This Working Group (32NF40) scope is:
Manage Engineering Documents dealing with electrical and optical SDI interfaces with nominal link rates up to 3Gb/s as well as 10Gb/s and 25Gb/s optical interfaces including the mapping of essence, data, and metadata and the details of the physical interfaces.

The **business impact** of all WG 32NF40 work items concerns interoperability between systems.

Society of Motion Picture and Television Engineers®
3 Barker Avenue
White Plains, NY 10601 USA
www.smpte.org

DG Project: **ST 425 suite of 3Gb/s Multi-Link Interfaces**
To create 3G SDI interface mappings for the real time transport of image formats: 1920x1080; 1280x720; currently approved 2k and 4k; UHDTV-1; UHDTV-2, including stereoscopic images.
Document Set: ST 425-2 (3D images that fit in one 3 Gb/s link), now published
                    ST 425-3 (Single images that fit in two 3 Gb/s links), now published
                    ST 425-4 (3D images that fit in two 3 Gb/s links), now published
                    ST 425-5 (4K images that fit in four 3Gb/s links), now published
                    ST 425-6 (3D images that fit in four 3Gb/s links), now published

> **Status:** The Part 3, Part 5, Part 6 documents were published in the last quarter, completing the set. The projects will be disbanded.

DG Project: **UHDTV Colorimetry Signaling**
This DG is drafting amendments to ST 425-3 and ST 425-5 to add Payload ID signaling for UHDTV colorimetry.

> **Status:** The DG has reached consensus on the colorimetry amendments (the original scope) and on additional change to Ancillary Data description, but not on an additional item on interlink delay; the delay value has not been agreed. It was decided that the amendments would move forward without specifying interlink delay as they are urgently needed.

DG Project: **Amendment ST 425-1: Source Image Format and Ancillary Data Mapping for the 3 Gb/s Serial Interface**
Some issues with ST 425-1 were discovered during its 5 year review and the 3G Multi-Link work.

> **Status:** The amendment passed ST Audit on 2014-05-12. It has been "rolled up" into a revision of ST 425-1 and will be published shortly.

DG Project: **Document suite 2076: Stereoscopic 3D (S3D) Production Timing and Synchronization**
This group is developing a document suite on 3D timing and sync for:
Part 1: (ST) Camera Systems
Part 2: (ST) Live Production Systems
Part 3: (ST) Physical Layer for Video Transport
Part 4: (EG) Physical Layer and System Guidance

> **Status:** The four documents closed FCD ballot 2013-09-10. Comments received. The DG is working continues to work on comment resolution.

Society of Motion Picture and Television Engineers®
3 Barker Avenue
White Plains, NY 10601 USA
www.smpte.org

DG Project: **SDI Audio Track Allocation Signaling**
This project will define a signaling mechanism, likely to be carried in Vertical Ancillary Data Space, that provides serial digital interfaces with a means to clearly identify the configuration parameters of any given SMPTE ST 299-1 or -2 embedded audio track. The DG is coordinating its work with 31FS and EBU Core.

   Status: A gap analysis is currently being undertaken to identify where additional effort is required.

DG Project: **EG on SDI Interfaces**
This group will draft EGs to provide an overview of the many SMPTE SDI interface standards and technologies, including how they relate to each other, what image formats are carried, performance.

   Status: The DG has started to collect information on all of the interfaces and work to classify them in tabular form is underway. The group has recruited a document editor.

DG Project: **Draft ST 2062: 25 Gb/s Serial Signal/Data Interface**
Documents: Part 1: Image Format Mapping   Part 2: Optical Fiber Interface

   Status: These documents both passed FCD reballot on 2012-08-22. Draft ST 2062-1 had comments to resolve, draft ST 2062-2 had comments to resolve. All comments on both Parts are addressed. The group reported significant progress and they feel they are now close to solutions for the outstanding issues (2 on each document). The plan is to complete comment resolution before the September meeting and the DG will consider whether a 3rd FCD ballot is needed.

DG Project: **Revision RP 184: Specification of Jitter in Bit-Serial Digital Systems
and Revision RP 192: Jitter Measurement Procedures in Bit-Serial Digital Interfaces**

   Status: The documents have cleared all internal comment resolution and DG reviews. Document packages have been created ready for 2 week pre-FCD-ballot review. It was decided that a proposal to cover jitter in optical interfaces be deferred until RP 184, RP 192, RP 198, EG 34 are completed.

DG Project: **Revision EG 34: Pathological Conditions in Serial Digital Video Systems
and Revision RP 198: Bit-Serial Digital Checkfield for Use in High-Definition Interfaces**

   Status: Progress on these documents will resume now that drafting of RP 184 and RP 192 is complete.

Society of Motion Picture and Television Engineers®
3 Barker Avenue
White Plains, NY 10601 USA
www.smpte.org

DG Project: **Revision ST 297: Serial Digital Fiber Transmission System for ST 259, ST 344, ST 292 and ST 424 Signals**
Scope is to revise ST 297:2006 to update only the normative references and responsible TC.

Status: There was debate within the 32NF70 WG (see below) as to whether 6G-SDI and 12G-SDI parameters should also be included in this revision of ST 297 (and removed from that suite of documents). This issue was presented to the TC for a decision and it was decided that those parameters would be added to ST 297. There was an understanding that this work would be completed quickly and that the revised ST 297 would go to a 3 week FCD ballot in order to reduce the delay to the 32NF70 work.

DG Project: **UHDTV Multi-link 10Gb/s interfaces**
The project tasks are:
- Create a new document for the new mapping method to transport UHDTV-1 and UHDTV-2 images as specified in ST 2036-1:2013 including the frame rate of 120fps by using the 12-bit-width container.
- Revise the existing ST 2036-3 document, and ST 352, for better harmonization with ST 2036-1:2013 and the new interface document.

Status: A proposal to change the scope of this project was submitted. An additional document is proposed, covering physical connectors and cables for this interface. It was pointed out that the revision work on ST 2036-3 had been omitted from the proposal and that this work is needed, at least for colorimetry information. It was agreed that this needs to be added back.
Two working drafts have been submitted to the DG:
ST 2036-3 revision to constrain original document to UHDTV1 formats up to 60Hz carried in a 10-bit container
ST 2036-4 covering UHDTV1 @ 100Hz / 120Hz and UHDTV2 24Hz to 120Hz carried in a 12-bit container

DG Project: **Ruggedized Optical Connector System for SDI**
This project will create a standard for a ruggedized optical connector suitable for SDI as used in HDTV and UHDTV systems. The system also has the following features: automatic dust protection; automatic laser source eye protection; high durability; Low maintenance; Small size.

Status: The project has recently completed approval. A strawman draft has been submitted for review by the DG.

_____

WG Project: **Video Over IP**
This Working Group (32NF60) was established to handle projects related to IP transport of media; currently the ST2022 family of documents comprise 7 published Parts.
Status: There was no report.

Society of Motion Picture and Television Engineers®
3 Barker Avenue
White Plains, NY 10601 USA
www.smpte.org

DG Project: Amendment ST 2022-6: Mapping of High Bit Rate Media Signals on IP Networks
Interoperability tests have revealed minor implementation variations; this amendment to ST 2022-6:2012 will add clarification regarding RTP Timestamps

   Status: There was no report.

_____

WG Project: Ultra HD SDI Interfaces
This Working Group (32NF70) was established to create a hierarchy of single-link, dual-link and quad-link electrical and optical SDI interfaces with nominal link rates of 6Gb/s, 12Gb/s and 24Gb/s.

   Status: The group holds a monthly telecon and also held a meeting during the Tokyo round. The Drafting Groups (see below) hold telecons 3 weeks out of every four. Several ballot comments on ST 2081-2 and ST 2082-2 were referred to the TC for resolution. The issue was whether these documents should normatively refer to ST 297 as published or whether ST 297 should be revised to cover the ST 2081-2 and ST 2082-2 requirements. The TC decision was that ST 297 should be revised, but on a fast timescale with a 3-week FCD ballot.
   A separate issue is how much inter-link delay should be permitted. This remains open at present.

   The Dual link (ST 208x-11) and Quad link ST 208x-12) mapping documents will be completed and the Stereoscopic mapping documents will be started.

DG Project: Draft ST 2081 suite: 6Gb/s Signal/Data Serial Interfaces
This project scope is to:
   - Develop a 1,2 and 4-link 6G SDI standard document suite including electrical and optical physical layer, mapping and image format structures (including stereoscopic) as necessary.
   - Document transport of multi-stream 1.5G and 3G links on a 6G SDI interface.

   Status: ST 2081-1 (electrical), ST 2081-2 (optical), ST 2081-10 (single-link mapping) passed FCD ballot 2014-02-11. Voter comments were received.
   All comments on ST 2081-1 are resolved. The decision on revising ST 297 (see 32NF70 WG above) means that work on ST 2081-2 will be abandoned. Comment resolution on ST 2081-10 continues.

Society of Motion Picture and Television Engineers®
3 Barker Avenue
White Plains, NY 10601 USA
www.smpte.org

DG Project: Draft ST 2082 suite: 12Gb/s Signal/Data Serial Interfaces

This project scope is to:

- Develop a 1,2 and 4-link 12G SDI standard document suite including electrical and optical physical layer, mapping and image format structures as necessary that builds on the hierarchy and mapping structures defined by the UHD SDI 6G drafting group.
- Document transport of multi-stream 1.5G, 3G and 6G links on a 12G SDI interface

Status: ST 2082-1 (electrical), ST 2082-2 (optical), ST 2082-10 (single-link mapping) passed FCD ballot 2014-02-11. Voter comments were received.

All comments on ST 2082-1 are resolved. The decision on revising ST 297 (see 32NF70 WG above) means that work on ST 2082-2 will be abandoned. Comment resolution on ST 2082-10 continues.

―――――――――――――――

WG Project: Time Labeling and Synchronization

This Working Group (32NF80) was established to handle projects for next-generation synchronization of systems using packetized networks and time labeling of essence in both digital and analog forms. It had formerly been a Technology Committee, TC-33TS.

Status: The WG met during the Tokyo meeting round. At the meeting, there was a request that the SMPTE PTP Profile (draft ST 2059-2) be published as soon as possible, rather than waiting for ST 2059-1 to be ready. Potential users need a document to get master clock suppliers to implement support for the SMPTE profile and thus permit early familiarization and testing of the system. This was agreed.

It was asserted that there is a "bug" in some formulas in EG 40 - Conversion of Time Values Between SMPTE 12-1 Time Code, MPEG-2 PCR Time Base and Absolute Time. The WG will recommend that the TC initiate a limited-scope revision project.

Business impact of WG 32NF80 work items: Network-based synchronization schemes and new functionalities for time labeling.

DG Project: New Synchronization System

This is an "umbrella" project. The group facilitates development of a suite of Synchronization documents that are tracked in DG projects below.

Status: This DG has been working primarily on ST 2059-1 and its simulation work.

Drafting Project: **Draft ST 2059-1: The SMPTE Epoch and generation and alignment of interface signals**
This document contains:
Definition of epoch used for synchronization system
Alignment of video and audio signals at the epoch
Formulas for generating video, audio, ST 12 time code and ST 309 date from TAI time via PTP and additional metadata

Status: The document passed FCD-ballot on 2013-09-26 with many comments to resolve. Comment resolution is underway.
Status of the Simulation work: The group is meeting weekly. Over the last quarter, the group has been looking at the numerical accuracy of tools it is using (Excel, C, floating Point). Independent simulations are being run and results are being compared.

Drafting Project: **Draft ST 2059-2: Precision Time Protocol SMPTE profile for time and frequency synchronization in a professional broadcast environment**
This document defines the IEEE 1588 PTP profile for the SMPTE synchronization system.

Status: The document passed FCD-ballot on 2013-09-26 with comments. As noted above, this document will move forward without waiting for ST 2059-1 and the formal 2-week comment resolution period will start after the document editor makes some additional edits.

DG Project: **Development of a set of Engineering Guidelines "EG 2059-1x"**
This is an "umbrella" project. The group facilitates development of a suite of Engineering Guidelines related to the ST 2059-1 and ST 2059-2 Synchronization documents.

Status: 4 EG drafting projects have been set up:

Drafting Project: **Draft EG 2059-10: Introduction to the New Synchronization System**

Status: An updated draft document has been submitted to the DG.

Drafting Project: **Draft EG 2059-11: Time Discontinuities**

Status: Project initiated.

Drafting Project: **Draft EG 2059-12: Facilities Migration Guide**

Status: Project initiated.

Society of Motion Picture and Television Engineers®
3 Barker Avenue
White Plains, NY 10601 USA
www.smpte.org

Drafting Project: **Draft EG 2059-13: Best Practices for Large Scale SMPTE ST 2059-2 PTP implementations**

Status: Initial draft has been submitted.

DG Project: **Time Labeling (TL)**
This is an "umbrella" project. The group facilitates development of a suite of Time Labeling documents that will have drafting projects set up.

Status: There are four label proposals being developed. They currently have the names: "Generic Time Label"; "Full-featured Time Labels"; "Date-Time Terms and Definitions"; "Simple Time Label".

DG Project: **Revise ST 318: Synchronization of 59.94-Hz or 50-Hz Related Video and Audio Systems in Analog and Digital Areas – Reference Signals**
This project has been set up to add alignment information for ST 2059-1, update references and general editorial cleanup.

Status: A draft of the revised document has been submitted.

_____

DG Project: **Code-point Extension Mechanism for the ST 337 family**
This is an "umbrella project" to manage individual DG projects for each document. There is a shortage of free code points for identifying non-linear PCM formats in AES-3. The extension mechanism will be documented in ST 337: Format for Non-PCM Audio and Data in an AES3 Serial Digital Audio Interface and the extended data types will be documented in ST 338: Format for Non-PCM Audio and Data in AES3 — Data Types. The DG will revise any other documents in the family that are impacted by the change.

Status: Drafting Projects are set up for:

Drafting Project: **Revise ST 337: Format for Non-PCM Audio and Data in an AES3 Serial Digital Audio Interface**

Status: This document failed FCD-ballot on 2014-04-18 due to lack of numeric consensus. It had comments to resolve. The comments are resolved and the revised document can proceed to FCD reballot.

Drafting Project: **Revise ST 338: Format for Non-PCM Audio and Data in AES3 - Data Types**

Status: This document failed FCD-ballot on 2014-04-18 due to lack of numeric consensus. It had comments to resolve. The comments are resolved and the revised document can proceed to FCD reballot.

Society of Motion Picture and Television Engineers®
3 Barker Avenue
White Plains, NY 10601 USA
www.smpte.org

[Drafting Project](#): **Revise ST 340: Format for Non-PCM Audio and Data in AES3 - Data Types**

Status: This document failed FCD-ballot on 2014-04-18 due to lack of numeric consensus. It had comments to resolve. The comments are resolved and the revised document can proceed to FCD reballot.

[Drafting Project](#): **Revise ST 339: Format for Non-PCM Audio and Data in AES3 - Generic Data Types**

Status: This document passed FCD-ballot on 2014-05-28. It had comments to resolve. The comments are resolved and the revised document can proceed to 2 week pre-DP-ballot review.

[SG Project](#): **Media Production System Network Architecture**
There are several SMPTE standards projects that involve IP networks. This SG was formed to identify parameters to consider in network design for professional media production.

Status: The report of the SMPTE Study Group on Media Production System Network Architecture: "Beyond the Digital Conversion: The Integration of Information Technology and Professional Media" has been published **[here](#)**. The group has been disbanded.

[SG Project](#): **Study Group on Embedded Audio**
The group will study the support that SDI infrastructure provides for single link 3Gb/s, multi-link 3Gb/s and how much of that supports the full 32-channels of audio per link. It will recommend any standardization work that it finds necessary.

Status: The SG produced a survey that went out just before the previous meeting round. Unfortunately, the response was poor. It was decided to send the survey out again, this time with a longer deadline of 6 weeks.

[DG Project](#): **Draft ST xxxx: Mapping of ETSI TS 103 190 (AC-4) over AES3**
A new document will be drafted and ST 338 data-type 24 will be requested.

Status: This project has been approved in the last quarter. Work has not yet started.

[DG Project](#): **Draft RDD xx: Mapping of Dolby-E over AES3**
A new document will be drafted. It was discovered in the Code-Point Extension project that there is no publicly-available reference document for implementation of data-type 28.

Status: This project has been approved in the last quarter. Drafting is under way.

Other 32NF Business

Presentation "Synchronously Switching Packetized Video"

Society of Motion Picture and Television Engineers®
3 Barker Avenue
White Plains, NY 10601 USA
www.smpte.org

This presentation described 3 ways to synchronously switch packetized video. The methods are called "Source-Timed", "Switch-Timed" and "Destination-Timed". The Pros and Cons of each method were presented and the conclusion was that Source Timed switching was the best option in the proponent's opinion.

Media Systems, Control and Services Committee (34CS) chaired by Chris Simons and John Footen

The General Scope as applied to the implementation of media services, methods of managing and controlling hardware devices and software systems, and the management of media workflow processes, including associated signaling and control mechanisms.

Topic: 34CS Publications in last quarter

SMPTE RDD 24:2013, Specification of the FIMS Media SOA Framework

_____

Topic: BXF Suite of Documents

This TC is responsible for the suite of documents defining the Broadcast Exchange Format, comprising:
    ST 2021-1: General Information and Informative Notes
    ST 2021-2: Protocol
    EG 2021-3: Use Cases
    EG 2021-4: Schema Documentation
    RP 2021-5: Ad-ID / EIDR in BXF
    RP 2021-9: Implementing BXF
It is primarily an XML-based system that standardizes exchange of Schedule, As-run and Content-related metadata. The group has an XML AHG.
Features are steadily being added to BXF and these are batched into versions. The current published version is BXF 3.0.

WG Project: BXF 4.0
Some topics initially slated for BXF 4.0 are: trading partner registry; MVPD route data; live schedule files (a la OATC); BXF/MXF mapping; PMCP support; time code in and out support; alternate captioning support

   Status: The bulk of BXF 4.0 is schema work; an XML AHG meets weekly. The document suite has been revised to add these BXF 4.0 new features:
       Live Schedule Files / OATC; Backup Events; Exclude From EPG Data; Timecode in and out improvement; Low-res proxy support; Revisions to Formats.
   These BXF 4.0 new features still need to be worked on:

Trading Partner Registry; Support for multiple episodes within one show; CC/Subtitling new option; MVPD Route Data; FIMS compatibility; BXF/MXF Mapping; PMCP.

———————————

DG Project: Media Device Control over IP
This project is developing a suite of documents:
ST 2071 Part 1: Media Device Control Framework - Now Published
ST 2071 Part 2: Wire Level Protocol - Now Published
ST 2071 Part 3: Discovery (describes how various existing Service Discovery Protocols work with the Media Device Control Framework, including a "zero configuration" mode)
ST 2071 Part 4: Core Capability Interfaces

Status: Parts 1, 2 and 3 are in the publication queue awaiting some housekeeping steps prior to being available in the library. Detail:
Part 3 passed ST Audit on 2013-10-23 and publication was held until revisions to Parts 1 and 2 are also ready for publication.
Drafting Project: Revision of ST 2071-1 to incorporate some improvements that have come to light during the development of Part 3. Passed ST Audit on 2014-05-12.
Drafting Project: Revision ST 2071-2 to incorporate some improvements that have come to light during the development of Part 3. Passed ST Audit on 2014-05-12.

The continuing work is on Part 4, describing an API for a "Capability Interface Registry".

 Business Impact: Interoperable Media Device Control

Media Packaging and Interchange Committee (35PM) chaired by Annie Chang

The General Scope as applied to the packaging of media elements, to facilitate interchange and interoperability of formats within specific integrated application ecosystems in the professional fields of media creation, production, post-production archiving and related topics.

Business Impact: Interoperability between systems, cost effective exchange of master formats in file form and new functionalities.

Topic: 35PM Publications in last quarter

SMPTE ST 2067-2:2013, Interoperable Master Format — Core Constraints
SMPTE ST 2067-8:2013, Interoperable Master Format — Common Audio Labels
SMPTE ST 2067-20:2013, Interoperable Master Format — Application #2
SMPTE ST 2067-30:2013, Interoperable Master Format — Application #3

WG Project: 2067 Document Suite: Interoperable Master Format (IMF)
This Working Group (35PM-50) co-ordinates the activities of a number of DGs defining various aspects of IMF. IMF comprises a master set of file-based elements for any downstream distribution using multiple composition playlists. The master set of files will be used as the input to subsequent processing that will create deliverables.
Published IMF documents:
ST 2067-2:2013, Interoperable Master Format — Core Constraints
ST 2067-3: Interoperable Master Format – Composition Playlist
ST 2067-5: Interoperable Master Format – Essence Component
ST 2067-8:2013, Interoperable Master Format — Common Audio Labels
ST 2067-20:2013, Interoperable Master Format — Application #2
ST 2067-30:2013, Interoperable Master Format — Application #3

Status: The WG held 3 telecons in the last quarter. The CPL/OPL DG held 3 telecons. The Sample Material Interchange group met once. The first IMF Plugfest was held May 6, 2014 in Burbank, CA with 10 implementers and over 50 attendees.

DG Project: **Draft ST 2067-20: IMF Application #2, JPEG 2000**

Status: Published.

DG Project: **Draft ST 2067-30: IMF Application #3, MPEG-4 Visual Simple Studio Profile (SStP)**

Status: Published.

Society of Motion Picture and Television Engineers®
3 Barker Avenue
White Plains, NY 10601 USA
www.smpte.org

DG Project: Draft ST 2067-2: IMF Core Constraints

Status: Published.

DG Project: IMF CPL and OPL
This group's Composition Playlist has been published for a while and it has now been working on Output Profile List (OPL) documents.

Status: The following Output Profile List documents were at FCD ballot at the time of the meeting:
ST 2067-100 IMF Output Profile List - Core
ST 2067-101 IMF Output Profile List - Image
ST 2067-102 IMF Output Profile List – Common Pixels
ST 2067-103 IMF Output Profile List - Audio

DG Project: IMF Wrapping, Security & Packaging
This group has developed ST 2067-5: Interoperable Master Format – Essence Component

Status: ST 2067-5 is published.

DG Project: IMF Data (Text) Essence

Status: Mapping from ST428-7: D-Cinema Subtitle to SMPTE-TT is currently under way in **TC-24TB**.

DG Project: IMF Audio
  Project: ST 2067-8: IMF Common Audio Labels.

   Status: Published.

 AHG Project: IMF Sample Material Interchange
This group has been set up to facilitate interoperability testing by making sample material available online.

Status: The group met once in the last quarter.

DG Project: Draft ST 2067-21: Extensions to IMF Application #2, JPEG 2000
This extension is proposed to support higher specifications including resolution, frame rates and multiple color space encodings.

Status: This document was at DP ballot at the time of the meeting.

Society of Motion Picture and Television Engineers®
3 Barker Avenue
White Plains, NY 10601 USA
www.smpte.org

DG Project : IMF Application #2 Mezzanine Film Format
This standard will extend the capabilities of IMF Application #2 to include amendments to satisfy cinematographic needs including (but not limited to) resolutions up to 8K, lossless J2K, XYZ and 16 bits. Intended for film archive applications.

Status: This project was approved in the last quarter. It is at the input document stage.

Society of Motion Picture and Television Engineers®
3 Barker Avenue
White Plains, NY 10601 USA
www.smpte.org

Notes on this report and the SMPTE Standards Process

*SMPTE Technology Committees (**TC's**) are tasked with the development and ongoing maintenance of engineering documents relevant to Television, Broadband, Film and Digital Cinema. TC's are set up by the Standards Vice President (**SVP**) and are overseen by the Standards Committee (**ST**).*

*The standards process operates under the **SMPTE Standards Operations Manual** .*

*Within Technology Committees, there may also be Working Groups (**WGs**), Study Groups (**SGs**) Drafting Groups (**DGs**) and Ad-Hoc Groups (**AHGs**).*
*'Standards Community' (**SC**) is a "parent group" that includes all Technology Committees. It is used to convey information that is relevant to all TC's, such as meeting logistics and registration information. An SC meeting is held during each meeting round.*

SMPTE document development process
The document stages are:
WD = Working Draft   **CD** = Committee Draft   **FCD** = Final Committee Draft
DP = Draft Publication, which initiates **ST Audit** - a due process check by the Standards Committee

SMPTE document-type abbreviations

ST = Standard   **RP** = Recommended Practice
EG = Engineering Guideline   **RDD** = Registered Disclosure Document

SMPTE document review
The SMPTE Operations Manual calls for review of published documents:
- One Year after original publication - to check whether comments have been received during initial implementations and revise as required
- At Five Year intervals after original publication - to check whether the provisions need to be revised
There may be proposals to Revise or Amend documents, or they may be reaffirmed, made stable or withdrawn.

All trademarks appearing herein are the property of their respective owners.

Society of Motion Picture and Television Engineers®
3 Barker Avenue
White Plains, NY 10601 USA
www.smpte.org

Documents Published in the Digital Library

	Document No.	Title	Date Added to DL
1	SMPTE RP 291-2:2013	Ancillary Data Space Use – 4:2:2 SDTV and HDTV Component Systems and 4:2:2 2048x1080 Production Image Formats	6/20/2013
2	SMPTE 352:2013 (Rev. of SMPTE ST 352:2011)	Payload Identification Codes for Serial Digital Interfaces	6/20/2013
3	SMPTE EG 377-3:2013	Material Exchange Format (MXF) – Engineering Guideline	6/20/2013
4	Amendment 2:2013 to SMPTE ST 382:2007	Material Exchange Format – Mapping AES3 and Broadcast Wave Audio into the MXF Generic Container – Amendment 2	6/20/2013
5	SMPTE ST 392:2013 (Rev. of SMPTE 392M-2004)	Material Exchange Format (MXF) – Operational Pattern 2A (Play-List Items, Single Package)	6/20/2013
6	SMPTE ST 428-12:2013	D-Cinema Distribution Master Common Audio Channels and Soundfield Groups	6/20/2013
7	Amendment 1:2013 to SMPTE ST 429-2:2011	D-Cinema Packaging – DCP Operational Constraints – Amendment 1	6/20/2013
8	SMPTE ST 2022-5:2013 (Rev. of SMPTE ST 2022-5:2012)	Forward Error Correction for Transport of High Bit Rate Media Signals over IP Networks (HBRMT)	6/20/2013
9	Amendment 1:2013 to SMPTE RP 2057:2011	Text Based Metadata Carriage in MXF – Amendment 1	6/20/2013
10	SMPTE RDD 9:2013 (Rev. of RDD 9-2009)	MXF Interoperability Specification of Sony MPEG Long GOP Products	7/25/2013
11	SMPTE ST 2065-4:2013	ACES Image Container File Layout	7/25/2013
12	SMPTE ST 2067-3:2013	Interoperable Master Format – Composition Playlist	7/25/2013
13	SMPTE ST 2067-5:2013	Interoperable Master Format – Essence Component	7/25/2013
14	SMPTE ST 2071-2:2013	Media Device Control – Part 2: Protocol (MDCP)	7/25/2013
15	SMPTE ST 2075:2013	Mapping EBU TECH 3264 (STL) into the MXF Generic Stream Container	7/25/2013
16	SMPTE ST 381-3:2013 (Rev. of RP 2008-2008)	Material Exchange Format – Mapping AVC Streams into the MXF Generic Container	10/7/2013
17	SMPTE ST 428-11:2013 (Rev. of SMPTE 428-11-2009)	Additional Frame Rates for D-Cinema	10/7/2013
18	SMPTE ST 2036-0:2013 (Rev. of SMPTE 2036-0:2012)	Ultra High Definition Television - Roadmap	10/7/2013
19	SMPTE ST 2036-1:2013 (Rev. of SMPTE 2036-1-2009)	Ultra High Definition Television – Image Parameter Values for Program Production	10/7/2013
20	SMPTE 2052-0:2013 (Rev. of SMPTE 2052-0:2010)	SMPTE-TT and Format Translation – Roadmap for the 2052 Document Suite	10/7/2013
21	SMPTE ST 2052-1:2013 (Rev. SMPTE ST 2052:1-2010)	Time Text Format (SMPTE-TT)	10/7/2013
22	SMPTE RP 2052-10:2013 (Rev. of RP 2052-10:2012)	Conversion from CEA-608 Data to SMPTE-TT	10/7/2013

Society of Motion Picture and Television Engineers®
3 Barker Avenue
White Plains, NY 10601 USA
www.smpte.org

23	SMPTE RP 2052-11:2013	Conversion from CEA-708 Caption Data to SMPTE-TT	10/7/2013
24	SMPTE ST 2068:2013	Stereoscopic 3D Frame Compatible Packing and Signaling for HDTV	10/7/2013
25	SMPTE EG 2074:2013	SMPTE Metadata Naming Guidelines	10/7/2013
26	Amendment 1:2013 to SMPTE ST 12-1:2008	Time and Control Code – Amendment 1	10/7/2013
27	Amendment 1:2013 to SMPTE ST 12-2:2008	Transmission of Time Code in the Ancillary Data Space – Amendment 1	10/7/2013

28	SMPTE ST 125:2013	SDTV Component Video Signal Coding for 4:4:4 and 4:2:2 for 13.5 MHz and 18 MHz Systems	1/10/2014
29	SMPTE ST 422:2013	Material Exchange Format – Mapping JPEG 2000 Codestreams into the MXF Generic Container	1/10/2014
30	SMPTE RP 2021-5:2013	Using Ad-ID and EIDR as Alternate Identifiers in SMPTE BXF and ATSC PMCP	1/10/2014
31	SMPTE ST 2022-7:2013	Seamless Protection Switching of SMPTE ST 2022 IP Datagrams	1/10/2014
32	SMPTE RP 2079:2013	Digital Object Identifier (DOI) Name and Entertainment ID Registry (EIDR) Identifier Representations	1/10/2014
33	SMPTE RDD 24:2013	Specifications of the FIMS Media SOA Framework	3/26/2014
34	SMPTE ST 436-1:2013	MXF Mappings for VI Lines and Ancillary Data Packets	3/26/2014
35	SMPTE ST 2001-1:2013	XML Representation of SMPTE Registered Data (Reg-XML) – Mapping Rules	3/26/2014
36	SMPTE ST 2067-2:2013	Interoperable Master Format – Core Constraints	3/26/2014
37	SMPTE ST 2067-8:2013	Interoperable Master Format – Common Audio Labels	3/26/2014
38	SMPTE ST 2067-20:2013	Interoperable Master Format – Application #2	3/26/2014
39	SMPTE ST 2067-30:2013	Interoperable Master Format – Application #3	3/26/2014
40	SMPTE RP 2077:2013	Full-Range Image Mapping	3/26/2014
41	SMPTE ST 12-1:2014	Time and Control Code	3/26/2014
42	SMPTE ST 12-2:2014	Transmission of Time Code in the Ancillary Data Space	3/26/2014
43	SMPTE EG 16:2014	Measurement Methods for Film and Digital Motion-Picture Camera Acoustical Noise – Field Method	3/26/2014
44	SMPTE ST 2051:2014	Two-Frame Marker for 48(/1.001)-Hz, 50-Hz and 60(/1.001)-Hz Progressive Digital Video Signals on 1.5 Gb/s and 3 Gb/s Interfaces	3/26/2014

45	SMPTE RP 2072:2014	Emphasis and Preferred Sampling Rate for AES/EBU Digital Audio in Television	3/26/2014
46	SMPTE 425-0:2014	SMPTE Bit-Serial Interfaces at 3 Gb/s – Roadmap for the 425 Document Suite (12 pages)	4/10/2014
47	SMPTE ST 425-3:2014	Image Format and Ancillary Data Mapping for the Dual Link 3 Gb/s Serial Interface (44 pages)	4/10/2014
48	SMPTE ST 425-5:2014	Image Format and Ancillary Data Mapping for the Quad Link 3 Gb/s Serial Interface	4/10/2014
49	SMPTE ST 425-6:2014	Quad 3 Gb/s Serial Digital Interface for Stereoscopic Image Transport	4/10/2014
50	SMPTE RDD 25:2014	AVC MXF Proxies	4/23/2014
51	SMPTE ST 428-7:2014	Digital Cinema Distribution Master – Subtitle	4/23/2014
52	SMPTE ST 2073-1:2014	VC-5 Video Essence – Part 1: Elementary Bitstream	4/23/2014
53	SMPTE RP 2073-2:2014	VC-5 Video Essence – Part 2: Conformance Specification	4/23/2014
54	SMPTE RDD 26:2014	MXF OP-1b Specification for AVC with Chunk Audio	6/30/2014
55	SMPTE ST 422:2014	Material Exchange Format – Mapping JPEG 2000 Codestreams into the MXF Generic Container	6/30/2014
56	Amendment 1:2014 to SMPTE ST 422:2013	Material Exchange Format – Mapping JPEG 2000 Codestreams into the MXF Generic Container – Amendment 1	6/30/2014
57	SMPTE ST 425-1:2014	Source Image Format and Ancillary Data Mapping for the 3 Gb/s Serial Interface	6/30/2014
58	Amendment 1:2014 to SMPTE ST 425-1:2011	Source Image Format and Ancillary Data Mapping for the 3 Gb/s Serial Interface – Amendment 1	6/30/2014
59	SMPTE ST 429-14:2014	D-Cinema Packaging – Aux Data Track File	6/30/2014
60	SMPTE ST 430-12:2014	D-Cinema Operations – FSK Synchronization Signal	6/30/2014
61	SMPTE ST 2070-1:2014	Stereoscopic 3D in MXF for Operations – Common Provisions	6/30/2014
62	SMPTE ST 2070-2:2014	Stereoscopic 3D in MXF for Operations – OP1a Mapping	6/30/2014
63	SMPTE ST 2070-3:2014	Stereoscopic 3D in MXF for Operations – OP-Atom or Single Track OP-1a Mapping	6/30/2014
64	SMPTE ST 2071-1:2014	Media Device Control Framework (MDCF)	6/30/2014
65	SMPTE ST 2071-2:2014	Media Device Control Protocol (MDCP)	6/30/2014
66	SMPTE ST 2071-3:2014	Media Device Control Discovery (MDCD)	6/30/2014