



Standards Quarterly Report

Result of the SMPTE® Standards Committee Meetings March 2014
Hosted by Semtech Corporation
Niagara-on-the-Lake, Ontario, Canada



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SMPTE Standards Quarterly Report Executive Summary

As a result of SMPTE Standards Committee Meetings
3-7 March 2014
Niagara-on-the-Lake, Ontario, Canada
Hosted by Semtech Corporation

Nine SMPTE Technology Committees and eighteen subgroups scheduled meetings at this round, hosted by Semtech Corporation, 3-7 March. There has been a change to the Technology Committee structure, and the Time Labeling and Synchronization TC and its sub-groups have now moved to a Working Group of the Network and Facilities Architecture TC.

Two subgroups did not need their allocated time and an excellent high-speed tutorial on color science by Charles Poynton was fitted in at very short notice.

Some 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 projects. More information on the current status of the 160+ active projects is in the [detailed report](#), below.

New Projects launched at the Niagara Meeting Round

- Coding of Tactile Essence - adding the “feeling” and “impact” of an event. [Details](#)
- Two additional project proposals for revisions related to Digital Cinema Stereoscopic Subtitle and Timed Text rendering. [Details](#)
- Two Registered Disclosure Document projects on Dolby® Atmos™. [Details](#)
- A system for synchronizing auxiliary data in D-Cinema; applications include Immersive Sound and control for Motion Systems. [Details](#)
- Two new projects related to Ad-ID. [Representation of Ad-ID data](#) and [Ad-ID Digital Ad Slate for MXF](#).
- Four new projects have been added to the suite of documents on a new network-based synchronization system. They are Engineering Guidelines on “Introduction to the New Synchronization System”, “Time Discontinuities”, “Facilities Migration Guide” and “Best Practices for Large Scale SMPTE ST 2059-2 PTP implementations”. [Details](#)
- Further [revision projects](#) have been added to the project on extending the code-space for the ST 337 family, as well as [two new projects](#) for the carriage of AC-4 and a reference document for carriage of Dolby® E over AES3.
- A presentation was given on a ruggedized optical connector suitable for use with many SMPTE optical standards including the emerging multilink SDI interfaces. A standard is proposed. [Details](#)



A substantial piece of work from the SMPTE study group on Media Production System Network Architecture has been completed. Their report “Beyond the Analog to Digital Conversion - The Integration of Information Technology and Professional Media” has been sent for Technology Committee review and approval. It is anticipated that the report will be available in time for NAB. [Details](#)

The Study Group on the UHDTV Ecosystem has added a lot of material to its initial report and the final version will be available in time for NAB. [Details](#)

The Study Group on Immersive Audio Systems: B-Chain and Distribution have completed their work and the report will be sent for Technology Committee review and approval, with a planned publication in time for NAB. . [Details](#)

A further four documents in the Interoperable Mastering Format suite will be published shortly (around 20th March), bringing the published total up to six. Work continues on an Output Profile List, an extended format for higher specifications (resolution, frame rate, color space) and Sample Material Interchange. [Details.](#)

There has been good progress in the last quarter on projects aimed at extending the bandwidth capacity of real-time video interfaces.

- Three more Parts in a [document suite](#) defining how sets of two and four 3Gb/s SDI interfaces can be combined will publish around 20th March.
- Six draft standards from a [Working Group](#) defining 6, 12 and 24Gb/s SDI interfaces (targeting UHD) have passed Final Committee Draft ballot. Further standards in these suites are being drafted.
- A [project](#) on UHDTV Multi-link 10Gb/s interfaces will extend the ST 2036 suite to include transport of 120fps UHDTV-1 and UHDTV-2.

There are currently 14 MXF projects in process, adding features to this file-based suite of standards or creating constraints for improved interoperability. [Details](#)

The 3 High Dynamic Range video projects mentioned last time have moved on quickly, with 2 of them already at ballot. There is also a Study Group examining all the issues involved with creating “better pixels” and how this can fit in with established standards. [Details](#)



SMPTE Standards Quarterly Report Detailed Account

As a result of SMPTE Standards Committee Meetings
3-7 March 2014
Niagara, Ontario, Canada
Hosted by Semtech Corporation

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 recently introduced to call the groups developing documents “Drafting Groups” (DGs) rather than “Ad-Hoc Groups”. If you follow any Drafting Group links in this report, you will find that many 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

The next quarterly Standards meeting round will be held 2-6 June 2014 in Tokyo, Japan and will be hosted by NHK / ITE. Attendees will also be able to visit the NHK Science and Technology Research Labs Open Day on 1 June.

Further quarterly Standards meeting rounds are planned for:
17 - 21 September 2014 - EBU, Geneva, Switzerland



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

[**Essence Technology Committee \(10E\)**](#)

[**Digital Cinema Technology Committee \(21 DC\)**](#)

[**Television and Broadband Media Committee \(24TB\)**](#)

[**Cinema Sound Systems Committee \(25CSS\)**](#)

[**Metadata and Registers Committee \(30MR\)**](#)

[**File Formats and Systems Committee \(31FS\)**](#)

[**Network and Facilities Architecture Committee \(32NF\)**](#) -now including the projects of the Time Labeling and Synchronization TC, 33TS

[**Media Systems, Control and Services Committee \(34CS\)**](#)

[**Media Packaging and Interchange Committee \(35PM\)**](#)

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 ST 125:2013 (Revision of SMPTE 125M-1995), SDTV Component Video Signal Coding 4:4:4 and 4:2:2 for 13.5 MHz and 18 MHz.

Publication imminent (by 20th March)

SMPTE RP 2077:2013, Full-Range Image Mapping

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 will close FCD ballot 2014-03-10 - so far, there are 15 voter comments to resolve. Part 1 is being held until Part 2 is ready.

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 - Elementary Bitstream
- Part 2 - Conformance Specification (includes Reference Decoder, Sample Encoder, sample bitstreams)
- Part 3 - Image Formats
- Part 4 - Color Difference Component Sub-sampling
- Part 5 - Layers
- Part 6 - Sections (this refers to a mechanism for implementing special functions without disturbing standard decoders)
- Part 7- Metadata

Status: Part 1 passed ST Audit 2013-07-29. It will be held until Part 2 is ready. Part 2 passed FCD ballot 2014-01-23 and comments are resolved. Part 2 was raised to DP status by a vote at the TC meeting. The Part 3 draft has been submitted to TC-10E for pre-FCD-ballot review. Part 4 is an extension to Part 3 and it is planned for submission to TC-10E for pre-FCD-ballot review in April. Parts 5, 6 & 7 will follow after the VC-5 team has completed work on an MXF wrapper for VC-5 in TC-31FS.

Business Impact: Interoperability between systems

DG Project: Revision of ST 2042-1: VC-2 Video Compression Standard and ST 2042-3: VC-2 Conformance Specification

This revision 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; this probably should not have been done, because it is normal to wait until the reference decoder/bitstream files - Part 3 - are available. The bitstreams to complete Part 3 are almost complete, but not yet submitted. The conformance document will then be updated to reference these materials and proceed to pre-FCD ballot review.

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 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 close to completion.

Business Impact: Interoperability between systems

DG Project: Draft SMPTE 2080 suite: Reference Display and Environment for Critical Viewing of Television Pictures

The task of this project is to 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. About 8 comments remain unresolved in the latest draft v2.5. Work is still required on the document's annexes.

The Part 2 document is close to being ready for pre-FCD-ballot review; a Normative Annex documenting offsets in u' v' color space to overcome an error in the original 1931 color matching equations needs completion.

It has been identified that RP 167-1995: NTSC Displays needs revision as it is still mistakenly regarded as a standard for setting up reference displays. A new project will be set up to do the revision.

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 FCD-ballot on 2013-08-26 with 61 comments to resolve. Most comments are resolved and the remaining issues were discussed briefly at the TC meeting. These



concerned conflicting statements about whether the signal should be used for monitor setup, and the lack of coverage for 625 lines.

Business Impact: Improved interoperability between HD and SD color bar

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 Working Draft has been created and it is hoped that the document will be completed for pre-FCD-ballot before the June meetings round.

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 and hopes to have a draft document for the June meeting round.

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 is at FCD ballot, closing 2014-03-22.

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 developed a draft document and hopes to gain DG consensus that the upcoming version can be submitted to the TC for pre-FCD-ballot review.

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 is at FCD ballot, closing 2014-03-31.



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.

New Study Group related to the 3 projects above:

SG proposed Project: Study Group on HDR Ecosystem

Proposed scope: To clarify the definition of “High Dynamic Range (HDR)” and the elements needed to form an HDR ecosystem, what new standards might be required, and how existing standards might be impacted.

Status: The project proposal is still being drafted; project approval is expected shortly. The project came about because there was confusion about the applicability of the 3 projects above as well as requirements for “better pixels” in applications such as UHDTV.

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 to the DG on 9th January. There was debate at the TC meeting about whether this project should be put on hold whilst work is done in a new SG to identify whether there are acceptable alternatives to fractional higher frame rates, particularly conversion to and from legacy HD material. There was also debate about whether this DG should proceed with just adding 100fps. ITU-R is faced with a similar decision later in 2014-03, so it was decided to see what they do (without necessarily following that decision).

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 project has completed its approval process. The DG Chair would like more participation from AMPAS and from lumiere manufacturers.

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 the haptic or tactile “feeling” and “impact” of an event, regardless of the transmission means.

Status: The DG Chair informed the TC meeting that the group’s kick-off meeting would be held in the following week and that a strawman draft would be presented.



Topic: Other TC-10E Business

Proposed Withdrawal statements

The recently-published ST 125 revision incorporates and updates the provisions of two documents that will now be withdrawn:

ST 267 – Bit-parallel Digital Interface – Component Video Signal 4:2:2 16x9 Aspect Ratio

RP 175 – Digital Interface for 4:4:4:4 Component Video Signals (Dual Link)

A draft withdrawal statement was reviewed and some changes were agreed.

Film Technology Committee (20F) chaired by David Schuelle

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.

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 429-2:2013 (Revision of SMPTE ST 429-2:2011), D-Cinema Packaging – DCP Operational Constraints

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
- Revise / Amend ST 429-2: DCP Operational Constraints
- Revise / Amend ST 429-5: Timed Text Track File

Status: The revised draft ST 428-7 has passed ST Audit and is in the publication queue.

For ST 429-5 revision, some attribute changes have been reviewed together with liaison from TC-35PM requesting some work on ST 429-5. A [project proposal](#) has been drafted.



There have been ST 429-2 related discussions on font size range and colorspace and a [project proposal](#) has been drafted.

Business Impact: Compatibility and Interoperability

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 FCD ballot 2014-02-15 with 26 voter comments to resolve. It was agreed at the TC meeting that the only remaining unresolved comment could be disposed as “commenter unresponsive”.

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: An administrative vote on the amalgamation of the two documents was held. 3 comments were made, but they were out-of-scope for the amalgamation process.

Business Impact: Interoperability between systems

DG Project: Draft ST 429-16: Additional Composition Metadata and Guidelines

The DG will develop DCP CPL Metadata Asset item as a new Standard.

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 passed FCD ballot 2014-01-10 with 14 comments. All comments were resolved and the document was sent for DP ballot, but the pre-DP ballot review was accidentally omitted. The ballot was cancelled and the document was posted for review, closing 2014-03-20.

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 Chair reported that the situation identified in the report 2 years earlier has not changed. At some time, ST 429-6 will need to define a new Random Number Generator and specify a flag for Media Blocks to determine which RNG had been used.

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 DG Chair reported that the document was at 2 week pre-FCD-ballot review, closing 2014-03-12.

Topic: TC-21DC projects proposed in the last quarter

DG Project: RDD 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 RDD ballot, closing 2014-03-28.

DG Project: RDD Dolby Atmos Bitstream 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 RDD ballot, closing 2014-03-28.

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.

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.

The group continues to consider approaches for Part 3.

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 issued an RFI that closed 2014-01-31. 6 formal and 2 informal replies were received. The SG is assessing the responses that proposed audio watermarking, video watermarking, audio fingerprinting, video fingerprinting, XDS carriage, Time Reference Label.

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: There was no further progress to report this quarter (priority given to other projects).

DG Project: Revision ST 2010: VANC Data Mapping of ANSI/SCTE 104 Messages

This project is a straightforward updating of references.

Status: There was no further progress to report this quarter (priority given to other projects).

DG Project: Revision ST 2016-2: Format for Pan-Scan Information and ST 2016-4: Ancillary Data Mapping of Pan-Scan Information

The project will ensure these documents provide support for UHD TV signals, as well as updating references.

Status: Both document revisions are at FCD ballot, closing 2014-04-07.



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: The 3 documents passed FCD ballot 2014-01-01. Parts 1, 2, 3 have 7, 6, 0 voter comments respectively to resolve.

DG Project: Revision ST 2031: Carriage of DVB/SCTE VBI Data in VANC

This project is a straightforward updating of references.

Status: Only minor edits are required. Revision has started by formatting the document into the current template.

DG Project: Draft RP 2072: Emphasis of AES/EBU Audio in Television Systems and Preferred Audio Sampling Rate This project started as a Revision of EG 32, but as that document contains conformance language it was thought better to issue it as a new RP. EG 32 will be withdrawn when RP 2072 publishes.

Status: The document has passed ST Audit and will be prepared for publication. The DG will be disbanded.

Business Impact: Interoperability between systems

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 recreated for clarity.

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 [initial SG report](#) was published 2013-09-15 and the group has been refining some sections and adding material in order to complete a [final](#) SG report (currently 45pp) in time for NAB. This report was posted to the TC for 2 week review. Any comments will be discussed by the SG and a final draft created.



The group may continue in order to draft a second report focusing on UHDTV-2.

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

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 submitted to the TC 2014-03-01. It was reviewed in the TC meeting and some terminology in the speaker layout diagrams was improved for consistency with other parts of the report. When these changes are incorporated, the report will be ready for publication.

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 3 well-attended telecons since its formation at the last meeting round. An AHG has been formed to define a "deliverables roadmap". A project proposal to define an Interoperable File Format is being drafted for review at the WG meeting 2014-03-19, with the goal of starting DG work in April. Work that may follow from this is to specify a Reference Renderer and a Calibration Methodology.

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 newly-approved project was part of the WG's program of work, but was moved to TC-21DC at this meeting round.

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 and is undergoing some reformatting. 3 meetings are scheduled for discussion of the results after which the draft will be released for comment around 2014-05-07.

DG Project: Draft STxxxx: 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 has held a field-test session to compare signals that complied with the agreed upon parameter targets and tolerances. It will draft the final wording for the standard, submit the standard for TC and AES liaison review and hopefully start FCD ballot.

DG Project: Draft RPxxxx: 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.

Status: The latest RP draft is undergoing a major editorial pass for release to the DG early April. The forecast for submission to the TC for pre-FCD-ballot comments is early June.

Other TC-25CSS Business

Loudness presentation

A presentation was given, highlighting issues of loudness in movie theaters. It included video clips from news programs that measured excessive levels in theaters. The presentation also noted the first signs of



legislation in both Europe and the USA on this issue. A draft work statement was submitted on this subject.

Metadata and Registers Committee (30MR) chaired by Phil Tudor and Paul Treleven

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.

Topic: 30MR Publications in last quarter

SMPTE RP 2079:2013, Digital Object Identifier (DOI) Name and Entertainment ID Registry (EIDR) Identifier Representations

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. A revised comment resolution document should be available mid-April.

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)

Status: The Part 2 report has been split into two further Parts:

Part 2.1: UMID Resolution Protocol

UMID based Program Package Exchange

Part 2.2: UMID Applications in MXF

Part 2.1 was submitted to the TC for review at this meeting round.



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

This project will incorporate improvements identified in the Study Group report.

Status: This document is at FCD ballot, closing 2014-03-11.

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: The review of candidate attributes based on Dublin Core and extensions (EBUCore, CEN, etc.) is now completed. Drafting work on the draft standard will start shortly.

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: The group held two sessions during the meeting round during which a submission of an online register product (from company Metaglue) was demonstrated. Further online testing, discussion and training will be held 2014-05-06 with a report of the results at the 2014-06 meeting round.

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

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 is revising the draft report to address comments received from 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 this 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 DG comment against the WD standard was received and the commenter agreed at the TC meeting to submit a marked-up draft. It is thought that the document will then be 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 reported that this work is currently paused, in order to complete work on the set of metadata structure documents. Work should restart soon.

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: This new project completed the approval process 2014-02-03. A group will be set up to start the work.

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: The WG Chair showed an Excel workbook with sheet tabs for each register. Combining the registers in this way allows linking between items in each sheet.
The status on the following registers was also updated:

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



Status: The RP 210v14 draft is ready for 2-week pre-FCD-ballot review.

DG Project: Update Metadata Labels Register Contents (RP224)

Status: The RP 224v13 draft will be posted for 2-week pre-FCD-ballot review approximately one month after the TC meeting date.

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: A draft of the Groups register is expected to be ready for TC pre-ballot review approximately one month after the TC meeting date.

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: A draft of the Types register is expected to go for 2-week pre-FCD ballot review approximately one month after the TC meeting date.

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

New TC-30MR Business

DG proposed Project: RP on Representation of Ad-ID

This new project proposal was presented at the TC meeting. It is associated with a new project in TC-31FS on an Ad-ID digital ad slate for MXF. The project will now move forward through the approval process.

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 ST 422:2013 (Revision of SMPTE 422M-2006), Material Exchange Format - Mapping JPEG 2000 Codestreams into the MXF Generic Container

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 reported that FCD ballot comment resolution continue.

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: The draft revision is now at FCD ballot, closing 2014-04-07.

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.

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.

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 but one comment are now resolved. A second FCD ballot will take place.



DG Project: Draft ST 2070: 3D in MXF Operations

The project deals with “Stereoscopic 3D in interleaved MXF for TV”.

Document suite comprises: ST 2070-1 Common Provisions document
ST 2070-2 OP1a mapping
ST 2070-3 OP-ATOM mapping

Status: Parts 1-3 passed DP ballot 2014-03-05. The three documents will now be sent for ST Audit. Part 4 has not been started yet.

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 published document has been identified. A Universal Label that had been assigned some while before still appears as “TBA”. It was agreed that the problem will be identified in an Advisory Note (approved at the meeting) and that an amendment will quickly be introduced to specify the correct UL.

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 closed RDD ballot on 2013-07-26 with 21 comments. A TC vote approved a motion to recommend to the SVP that four unresolved comments be appended to the RDD for publication.

DG Project: Revision ST 436: MXF Mappings for VBI Lines and Ancillary Data Packets

It has been decided that 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: This revised document on the point of publication and the DG will be disbanded.

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. The TC Chairs will check with the proponent that the document can move on to 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 the Niagara round and has agreed a plan for a family of labels. A document for pre-FCD-ballot review is targeted before the next meeting round.

RDD Project: RDD xx: MXF OP-1b specification for AVC with Chunk audio

This RDD will specify constraints on OP-1b to facilitate interoperability for tape-less camera recording.

Status: This document is at RDD ballot, closing 2014-03-26.

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: The SG Chair informed the TC that he plans to hold the group's inaugural meeting shortly.

DG Project: RP xxxx: 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 is at FCD ballot, closing 2014-04-07.

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 Part 3 is expected to be an RP on applying AXF to the various media types.

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

WG Project: Draft ST 2034-1: Archive eXchange Format (AXF) - Part 1: Structure & Semantics

Status: The draft Part 1 document passed FCD ballot on 2013-12-02 with 271 comments to resolve. 224 comments have been addressed; resolution continues.

WG Project: Draft ST 2034-2: Archive eXchange Format (AXF) - Part 2: External Uses of XML Schema



Status: The document scope is written and 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 instances 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: The Part 1 document is being prepared for publication.

Part 2 passed DP ballot 2014-02-03 and will be submitted for ST Audit.

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: A joint meeting was held with the TC-32NF "[Audio track allocation signaling](#)" group. An EBU liaison statement on audio modeling has been received and their model will be compared with this group's schema (whose WD is quite well-advanced).

New TC-31FS Project Proposals

RDD MXF Interoperability Specification of Sony AVC Products - proposal will be available soon

DG proposed 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).

Other TC-31FS Business

AHG: ST 379-1 and New Mappings

This AHG was formed at the last 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. The Chair was not available to report progress.

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 2022-7:2013, Seamless Protection Switching of SMPTE ST 2022 IP Datagrams

SMPTE ST 12-1 Amendment 1:2013, Time and Control Code — Amendment 1

SMPTE ST 12-2 Amendment 1:2013, Transmission of Time Code in the Ancillary Data Space - Amendment 1

SMPTE ST 2051 Amendment 1:2013, Two-Frame Marker for 50-Hz and 60(/1.001)-Hz Progressive Digital Video Signals on 1.5 Gb/s and 3 Gb/s Interfaces — Amendment 1

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 the 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.

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)
 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)
 [ST 425-6](#) (3D images that fit in four 3Gb/s links)

Status: The Part 3, Part 5, Part 6 documents are in publication queue with a plan to publish by 2014-03-20.

DG Project: UHDTV Colorimetry Signalling

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 but is also considering adding information on interlink delay; the delay value has not been agreed.

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 FCD ballot on 2014-02-27 and the 2 voter comments have been resolved. The WG recommended that the resulting document be posted for 2 week pre DP review, followed by a Kavi DP vote.

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 were: Part 1 - 38; Part 2 - 32; Part 3 - 15; Part 4 - 5. The DG is working on comment resolution and, as part of that process, the suite may be re-thought and reduced to 3 documents.

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 co-ordinating 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. An initial idea (that may not be the decision of the new Chair) was to expand the existing EG 2069 document on optical networks into a document suite:

Part 1 – Overview of SDI interface standards; Part 2 – Copper SDI networks; Part 3 – Optical SDI networks

Status: The DG has started to collect information on all of the interfaces. The Chair, with assistance from a DG member, is developing the document structure.



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 rebalot on 2012-08-22. Draft ST 2062-1 had 36 comments to resolve, draft ST 2062-2 had 13 comments to resolve. All comments on both Parts are addressed.

By the time of the TC meeting, Part 1 had one comment left to resolve and Part 2 resolution was complete (though formal acceptance of some comments in Kavi is awaited).

It was decided that the DG would meet one more time to attempt resolution of the remaining comments. The DG was also tasked with making a consensus decision on whether there is a need for a third FCD ballot on Part 1.

**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: All comments on RP 184 are resolved and it is ready for pre ballot review. For RP 192, the main issues were presented at the DG meeting at the Niagara round and some fixes for problems with diagrams were agreed.

**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: There has been no progress for several meeting cycles; it may be necessary to consider a new plan to resume progress.

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 only update the normative references and responsible TC.

Status: No status report was available.

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: Two working drafts have been posted 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

WG Project: Video Over IP

This Working Group (32NF60) was established to handle projects related to IP transport of media; this is the ST2022 family of documents currently comprising 7 published Parts.

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 held a meeting during the Niagara round. WG decisions were made on 2 issues that were raised as part of comment resolution on the balloted documents below. There was discussion on how much inter-link delay should be specified. 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. A presentation on a new optical connector for multilinks was given - see TC-32NF new project proposal below.

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 to resolve were: Part 1, 29; Part 2, 13; Part 10, 52.

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 to resolve were: Part 1, 27; Part 2, 15; Part 10, 37.

WG Project: Time Labeling and Synchronization

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

Status: The WG Chair gave a report detailing the considerable restructuring that is underway.

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

DG Project: Time Labeling (TL)

This is an “umbrella” project. The group facilitates development of a suite of Time Labeling documents that are tracked in DG projects below.

Status: This DG has just been set up as a replacement for the Time Labeling WG under TC-33TS.

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 just been set up as a replacement for the Synchronization WG under TC-33TS.

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 and additional metadata

Status: The document passed FCD-ballot on 2013-09-26 with 142 comments to resolve. Comment resolution is underway with 35 comments remaining open.

Status of the Simulation work: The AHG is focusing on the simulation of ST 12-1 generation; no work has started on video and audio simulation. 3 errors in draft ST 2059-1 formulas have been detected and corrections are being submitted to the document editor.

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 46 comments to resolve. Comment resolution is underway with 23 comments marked as accepted.

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: Initial draft has been submitted, reviewed by DG and comments are being incorporated.

Drafting Project: Draft EG 2059-11: Time Discontinuities

Status: Project initiated.

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

Status: Project initiated.

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: Revise ST 318: Synchronization of 59.94-Hz or 50-Hz Related Video and Audio Systems in Analog and Digital Areas – Reference Signals

A new project has been set up to add alignment information for ST 2051-1 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: Substantial progress has been made on ST 337, ST 338 and ST340 revision. Work is well-advanced for ST 339 revision (Drafting Project needed). See “New TC-32NF Project Proposals” for related projects covering AC-4 and Dolby-E carriage in AES3. 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

Working draft submitted to 32NF for 2 week pre-FCD-ballot review.

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

Working draft submitted to 32NF for 2 week pre-FCD-ballot review.

Drafting Project: Revise ST 340: Format for Non-PCM Audio and Data in AES3 - Data Types

Working draft submitted to 32NF for 2 week pre-FCD-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 group met during the Niagara round. It has completed the report and changed its title to “Beyond the Analog to Digital Conversion - The Integration of Information Technology and Professional Media”. The report was submitted to the TC for 2 week review and the Kavi system is being used for comment collection.

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 Chair informed the TC that the survey had gone out the previous week. It has grown to include a number of questions on features supported for 1.5G and 3G single link, 3G dual link, and 3G quad link systems.

New TC-32NF Project Proposals

DG proposed Project: Draft RDD xx: Mapping of Dolby-E over AES3

New document; drafting under way. It was discovered in the Code-Point Extension project that there is no publicly-available reference document for implementation of data-type 28.

DG proposed Project: Draft ST xxxx: Mapping of ETSI TS 103 190 (AC-4) over AES3

New document. ST 338 data-type 24 will be requested.



DG proposed Project: Draft ST xxxx: Ruggedized Optical Connector and Cable Interfaces for UHD TV SDI Interfaces

A new optical connector system for UHD-SDI applications has been proposed with the following features: ruggedness; automatic dust protection; automatic laser source eye protection; high durability; Low maintenance; Small size. The project is proposed to be WG 32NF40.

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 RP 2021-5:2013, Using Ad-ID and EIDR as Alternate Identifiers in SMPTE BXF and ATSC PMCP

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 (currently meeting weekly).

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.

These BXF 4.0 new features still need to be worked on:

Trading Partner Registry; FIMS compatibility; BXF/MXF Mapping; CC/Subtitling new option; MVPD Route Data; 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: Part 3 passed ST Audit on 2013-10-23 and publication will be held until revisions to Parts 1 and 2 are also ready for publication.

Parts 1 and 2 have been revised to incorporate some improvements that have come to light during the development of Part 3.

[Drafting Project:](#) Revision ST 2071-1 passed FCD ballot on 2014-01-09 and all 22 voter comments are resolved.

[Drafting Project:](#) Revision ST 2071-2 has progressed to DP ballot, closing 2014-03-19.

The main focus of discussion this round was Part 4 and related proposals for a “Capability Interface Repository”; the general feeling was that SMPTE should implement a sample repository to help test the design, but the plan is that manufacturers may wish to construct their own. There was a call for the concept to be demonstrated for a hypothetical device, to illustrate the idea.

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.

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 2067-3: Interoperable Master Format – Composition Playlist

ST 2067-5: Interoperable Master Format – Essence Component

Status: The WG held one telecon in the last quarter and the CPL/OPL and Sample Material Interchange groups have also met. With the imminent publication of four more IMF documents (see -2, -8, -20, -30 below), a good part of this group's documents are completed.

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

Status: Passed ST Audit 2013-08-28 and about to be published.

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

Status: Passed ST Audit 2013-08-28 and about to be published.

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

Status: Passed ST Audit 2013-08-28 and about to be published.

DG Project: IMF CPL and OPL

This group Composition Playlist has been published for a while and it is now drafting ST 2067-4: Output Profile List (OPL)



Status: The draft OPL document has strawman drafts for OPL Core Framework Macro, OPL Audio Routing Macro, OPL Image Fill Macro and OPL Image Scale Macro.

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: Passed ST Audit 2013-08-28 and about to be published. A separate document on audio metadata requirements has been prepared for passage to TC-31FS which has work on this subject.

AHG Project: IMF Sample Material Interchange

This group has been set up to facilitate interoperability testing by making sample material available online.

Status: Progress is slow and there was an appeal for more content and manufacturer involvement.

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 is in pre-FCD ballot review. The TC was shown a “roadmap” of further extension possibilities. JPEG has created tables that would support these Application #2 extended formats.



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.

Other Notes

This report describes each active **Project** in each TC. Occasionally, there is more than one project group working on a particular technology field. In this case, those projects are grouped under a **Topic** headline.

SMPTE manages its standards documentation, meetings and ballots in an online system called **Kavi**.

Kavi has a **Project View** feature that includes a project summary page. It is used to state the project justification at the proposal stage and to track progress through to completion.

In this report access to the project view is via a hyperlink in the [Project](#) word in the title.

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2013 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



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