



Standards Quarterly Report December 2014

Result of SMPTE® Standards Committee Meetings
8-12 December 2014 in Burbank, CA
Hosted by The Walt Disney Studios



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SMPTE Standards Quarterly Report: Executive Summary

As a result of SMPTE Standards Committee Meetings
8-12 December 2014
Burbank, California, USA
Hosted by Disney

Nine SMPTE Technology Committees and twelve subgroups scheduled meetings at this round, hosted by Disney, 8-12 December.

Over 100 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 150+ active projects is in the [detailed account](#), below. In anticipation of the introduction of a new revision of the Standards Operation Manual, effective 2015-01-31, a training session on the changes was held.

New Projects launched in the last quarter

- New document: Time Address for High Frame Rate signals and its data structure in the ancillary data space [Details](#)
- New document: Open binding technology for persistent content identification in A/V essence [Details](#)
- New document: Transport of Haptic-Tactile Essence [Details](#)
- Amendment 1 to ST 2059-2: SMPTE Profile for use of IEEE-1588 Precision Time Protocol in Professional Broadcast Applications [Details](#)
- Revision of VC-3 image documents to add resolution independence [Details](#) and associated project to add this capability to ST 2019-4:2014 – Mapping VC3 into the MXF Generic Container [Details](#)
- Revision of ST 430-7 - Digital Cinema Facility List Message (Extended) [Details](#) and associated project Facility List Management Exchange Protocol [Details](#)
- Revision of EG 40 - Conversion of Time Values Between SMPTE 12-1 Time Code, MPEG-2 PCR Time Base and Absolute Time (Errors were recently found in formulae) [Details](#)
- Revision ST 2034-1:2014 Archive eXchange Format - Part 1: Structure and Semantics [Details](#)

High Dynamic Range (HDR) Video Projects This topic has gained importance as it has been recognized that the next step beyond HDTV requires improvement in more than just pixel-count. Improvements to parameters such as color gamut, displayed dynamic range, frame rates, electro-optical transfer function all contribute to the improved viewing experience that is needed to justify launching new services.



SMPTE has a Study Group that is compiling a report on the High Dynamic Range Ecosystem. It also has a new project defining Dynamic Metadata for Color Transforms of High Dynamic Range and Wide Color Gamut Images.

Two SMPTE HDR projects have recently published their standards – “ST 2084 - High Dynamic Range Electro-Optical Transfer Function of Mastering Reference Displays” and “ST 2086 - Mastering Display Color Volume Metadata Supporting High Luminance and Wide Color Gamut Images”. A third document in this set “ST 2085 - Color Differencing for High Luminance and Wide Color Gamut Images” will shortly go for Draft Publication ballot. [Details](#)

SMPTE Compression Standards SMPTE has standardized five compression standards – VC-1 to VC-5. Current work on video compression standards comprises:

- Development of a suite of documents defining the VC-5 compression system (developed from a GoPro system). Two Parts of the suite are published, two more are close to publication. Current work has switched to a Standard defining VC-5 mapping in the MXF Generic Container. 3 Further documents in the suite are planned after that. Details [here](#) and [here](#).
- Amendment of a suite of documents defining the VC-3 compression system in order to add Image Resolution Independence and some other improvements (Developed from Avid DNxHD). The MXF container document for VC-3 is also being amended. Details [here](#) and [here](#)
- Amendment and revision to two VC-2 documents (developed from BBC’s Dirac pro system). One project adds a high quality profile for Archive and Production, the other is a clarification of a published VC-2 document. [Details](#)

Cinema Sound Systems Projects Since the last meeting round, SMPTE published a report “B-Chain Frequency And Temporal Response Analysis Of Theaters And Dubbing Stages”, developed in a Drafting Group within this Technology Committee. This substantial report is available [here](#). There is also a project to develop a “Calibration Reference Wideband Pink Noise Signal and Test File”. [Details](#)

Another project group is developing a Recommended Practice “Digital Cinema Sound System Setup and Calibration”. [Details](#)

The Technology Committee also has a Working Group on Interoperability of Immersive Sound Systems in Digital Cinema. Its goal is to standardize a single object-based distribution file format and related protocols for interoperable playback into a variety of theatre speaker configurations. Current Working Group projects are focused on Immersive Audio Metadata. [Details](#)



Open binding technology for persistent content identification in A/V essence

This work had its foundations in a Study Group report, available [here](#).

This project will develop an open binding technology standard for embedding end-to-end persistent content identifiers into audio/video essence in a way that survives processing, compression and distribution. The group's first task is to draft a Request for Proposals (RFP) for technology that could be the basis for the standard. The RFP will be completed early in 2015. [Details](#)

Network – based Synchronization for the Professional Broadcast Environment

Two documents defining a system for distributing synchronization packets over a data network are nearing completion, thanks to a great deal of effort in the last quarter on the part of a group that has been simulating the equations involved.

One document defines the behavior of the master, “ST 2059-2: Precision Time Protocol SMPTE profile for time and frequency synchronization in a professional broadcast environment” and the other defines the behavior of the slaves “ST 2059-1: The SMPTE Epoch and generation and alignment of interface signals”, allowing them to create any synchronized video, audio or timecode signal.

The system uses a SMPTE profile for the Precision Time Protocol (IEEE 1588 v2) that provides acceptable lock-up time, jitter and accuracy whilst providing metadata that allows timecode generators to make adjustments for time discontinuities such as leap seconds and daylight saving during “daily jam”.

ST 2059-2 is ready for publication and ST 2059-1 is now a Draft Publication and should be ready for publication early in 2015. There is an amendment to ST 2059-2 underway to provide more metadata for the daily jam function. It is expected that this amendment will proceed quickly through the ballot process to publication. [Details](#)

Material Exchange Format – MXF There are currently 11 MXF projects in process, adding features and mappings to this file-based suite of standards or creating constraints for improved interoperability.

[Details](#)



SMPTE Standards Quarterly Report: Detailed Account

As a result of SMPTE Standards Committee Meetings

8-12 December 2014

Burbank, California, USA

Hosted by Disney

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](#).

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 2-5 March 2015 in San Jose, California, USA and will be hosted by Altera.

Further quarterly Standards meeting rounds are planned for:

July 7-10 2015 – Sydney, Australia, hosted by Randwick TAFE (Technical and Further Education) – these meetings precede the SMPTE Conference in Sydney.

September 2015 – Europe, immediately following the Amsterdam IBC.

December 2015 – USA or Canada, location to be determined



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 \(32NF\)](#)
[Media Systems, Control and Services Committee \(34CS\)](#)
[Media Packaging and Interchange Committee \(35PM\)](#)

In addition, there are brief reports from the two [Joint Task Forces](#) in which SMPTE currently participates.

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 RDD 30, ARRIRAW Image File Structure and Interpretation Supporting Deferred Demosaicing to a Logarithmic Encoding

SMPTE RDD 31, Deferred Demosaicing of an ARRIRAW Image File to a Wide-Gamut Logarithmic Encoding

SMPTE ST 2036-1:2014 (Revision of SMPTE ST 2036-1:2013), Ultra High Definition Television – Image Parameter Values for Program Production

SMPTE ST 2086:2014, Mastering Display Color Volume Metadata Supporting High Luminance and Wide Color Gamut Images



Topic: Video compression standards in SMPTE

DG Project: Revision of SMPTE ST 2019 VC-3 Video Compression Documents to add Resolution

Independence

VC-3 is a compression format defined in a suite of documents:

ST 2019-1:2014 – VC-3 Picture Compression and Data Stream Format

RP 2019-2:2014 – VC-3 Decoder and Bitstream Conformance

ST 2019-3:2008 – VC-3 Type Data Stream Mapping over SDTI

ST 2019-4:2014 – Mapping VC-3 Coding Units into the MXF Generic Container

This project adds "image resolution independence" to the list of VC-3 capabilities by revising ST 2019-1 and includes new bit patterns for conformance testing in RP 2019-2. The additions are backwards compatible and no current features are deprecated.

Note: A separate project has been launched in TC-31FS to update ST 2019-4 to support this feature in MXF.

Status: This is a newly-launched project, awaiting the formation of a drafting group. The proponent explained that the revision would permit pixel resolutions from 1x1 to 16384x16384, with added support for 12 bits, Rec. ITU-R BT.2020 colorspace.

Business Impact: Interoperability between systems

DG Project: New 2073 Document Suite: VC-5 Video Essence

This project standardizes the Cineform / GoPro video compression system. The planned document suite comprises:

- ST 2073-1 - VC-5 Elementary Bitstream (Published Q2-2014)
- RP 2073-2 - VC-5 Conformance Specification (Published Q2-2014) Includes Reference Decoder, Sample Encoder, sample bitstreams
- ST 2073-3 - VC-5 Image Formats
- ST 2073-4 - 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 are published, but Part 2 is being revised to add test materials to support Parts 3 and 4 – the latest source code has been uploaded.

Part 3 is awaiting publication.

Part 4 passed a Draft Publication vote at the meeting and will be sent for ST Audit.

Part 7 and then parts 5 & 6 will follow after the VC-5 group has completed work on an MXF wrapper for VC-5 in TC-31FS. The TC-10E and TC-31FS work is proceeding in joint meetings every 2 weeks.

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.

Business Impact: Interoperability between systems

DG Project: Revision of SMPTE RP 2047-3: VC-2 Level 65 Compression of High Definition Video Sources for use with a Standard Definition Infrastructure

The revision will correct errors that have been identified with "override" operation. It is necessary to specify overriding the pixel aspect ratio and the clean area as well as the base video format, together with consequent adjustments to informative Annex A.

Status: A drafting group has been set up for this project. There was no status report at the meeting.

Business Impact: Interoperability between systems

DG Project: New 2080 Document 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 2080-3: Reference Viewing Environment Characteristics
- RP 2080-x: Full Measurement / Calibration
- ST 2080-x: Reference Display Characteristics
- EG 2080-x: Engineering Guideline to provide context and background

Status: The Part 1 document is in final review with the SMPTE editor.
The Part 2 document closed ST Audit just after the TC meeting. ST Audit passed without comment.
Part 1 and Part 2 will proceed to publication together.

Drafting on Part 3 is underway and some diagrams were reviewed in the TC meeting. The remaining documents in the suite will follow in the above order. Some research work was presented that identified a need for standardized spectral power distributions for display primaries (necessary to deal with diversity of human perception of color).



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

DG Project: New Document: ST 2087 - 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: The document passed FCD ballot on 2014-10-28 with 11 comments to resolve. The DG Chair believes that the comments will not be difficult to resolve.

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 project has been under hiatus to allow the Chair to work on other commitments. However, the task of creating drawings has been completed,

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

SG Project: Study Group on HDR Ecosystem

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 SG held a 3-hour meeting during this round. HDR Technology Proposals from the BBC, Philips, Technicolor and NHK were presented. The SG’s report is underway and it was agreed to add a section on viewing environment. A sub-group that is developing a glossary of HDR/WCG terms presented its work-in-progress.

DG Project: Dynamic Metadata for Color Transforms of HDR and WCG Images

This project will develop multi-part standards for specifying the semantics and representation of content-dependent metadata needed for color volume transformation of high dynamic range and wide color gamut imagery to smaller color volumes (e.g. BT.709 or Digital Cinema) in mastering applications.

Status: This is a newly-approved project. It was awaiting drafting group resources that were provided shortly after the meeting.



DG Project: New Document: 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 published and the project is closed.

DG Project: New Document: 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: This document passed FCD ballot on 2014-10-31 with 19 comments to resolve. The DG met during the meeting round and completed comment resolution. When the resolution is accepted on the ballot system, the document will go for pre-DP-ballot review.

DG Project: New Document: 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 published and the project is closed.

Business Impact of ST 2084, 2085, 2086: 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.

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: The SG held a meeting during this round. It completed a “Request For Information” that will be sent to organizations that are aware of the performance available from conversion technology. The group proposed an extension to its scope to include conversions between fractional and existing integer rates; the change was agreed by the TC. There was support for developing a second RFI for feedback on operational aspects of conversion (and associated issues such as drop-frame timecode). It is hoped that technology demonstrations can be arranged with a target timeframe of March 2015 (not necessarily during the next Standards meeting round).



DG Project: New Document: RP 2093 - 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 Chair reported that text has been imported from the original EBU document into the RP 2093 draft document. Some clean-up of the mathematical formulae is still required.

DG Project: New Document: ST 2092-1 - Definition and Representation of Haptic-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. There is an [associated transport project](#) in TC-32NF.

Status: The draft ST 2092-1 document is almost ready to be posted for its 2-week pre-FCD-ballot review.

DG Project: New Document: RP219-2 - UHDTV Color Bar Signal

RP 219-2 will specify the parameters needed to apply color bars to UHDTV and 2k, 4k production image formats (per ST 2048-1). It will scale the spatial parameters from the HDTV spatial parameters of RP 219-1.

Status: At the last meeting round, there was some opposition to the project’s original scope that mentioned D-Cinema. This was resolved at the TC meeting this time by changing the words to reference the 2k and 4k image formats defined by ST 2048-1. It was clarified that the intent is to have a test signal for use on interfaces, rather than designing the best possible test signal for critical examination of the production chain.

DG Project: Draft RDD: Apple ProRes Decoder

This project will produce an RDD that documents the Apple ProRes decoding functionality and the Apple ProRes video bitstream. It will contribute sample ProRes bitstreams and the resulting images, as well as a reference decoder.

Status: The RDD has undergone some clean-up by the proponents and the DG Chair in the last quarter and it will be ready for RDD ballot after some further small edits.

RDD Project: Draft RDDxx: Sony Low Latency Video Codec within an IP Network Environment

This RDD describes a codec scheme implemented in Sony equipment which supports a degree of compression whilst providing low latency and high picture quality.



Status: The project Chair has requested Drafting Group resources and expects the draft document to be available by March 2015.

Proposed RDD Project: IntoPIX TICO lightweight Codec used in IP Networked or SDI infrastructures

A presentation was given explaining the need for this document that defines lightweight compression to support multiple HD and UHD streams on 10G IP networks or 3G-SDI infrastructure. The project is in the approval phase.

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.

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, layout, projection, reproduction, and related topics.

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

SMPTE ST 429-16:2014, Additional Composition Metadata and Guidelines

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



Drafting Project: Revise ST 429-2: DCP Operational Constraints

This revision project will address issues that arose during the ST 428-7 revision.

Status: The TC reviewed an issue that has arisen with the draft revised ST 429-2. The published document has specified a PNG/Text colorspace of sRGB for 5 years but some implementations have used XYZ colorspace. Arguments were made for retaining sRGB and for changing the document to specify XYZ. The TC left the issue to be resolved in the drafting group.

Some recommendations on XML constraints for D-Cinema packages have been proposed.

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: There have been some updates to the draft in the last quarter. The scope has been expanded to include IMF application, references to MXF now allow different Generic Containers, optional Timed Text Descriptor items have been added (including Stereoscopic Subtitles).

Business Impact: Compatibility and Interoperability

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 ST Audit on 2014-11-20 and is close to publication. The project will be closed.

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: At the time of the meeting, the document was at FCD ballot, closing 2014-12-24.

DG Project: Revision of ST 430-7 – Facility List Message

Add the Extended Facility List Message with the objective of minimizing changes over current practice, while simplifying extensibility and introducing additional features as required.

Status: This is a new project. A kickoff meeting will be scheduled in January 2015.

DG Project: New Document - Facility List Message Exchange Protocol

Project scope: Specify a protocol to efficiently publish, retrieve, synchronize and submit aggregate FLM instances over the web, based on current industry practices.

Status: This is a new project. A kickoff meeting will be scheduled in January 2015.



Television and Broadband Media Committee (24TB) chaired by Michael 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: For Parts 1 and 2, a number of FCD ballot comments will require additional work with the commenters to resolve them. When these parts are ready for Draft Publication, work will get started on the file binding document, Part 3. The scope and contents for an additional EG are being established. Encouragement was expressed in the TC meeting to get this work completed.

Business Impact: Improved quality of experience and interoperability between systems

DG Project: New Document: Open binding technology for persistent content identification in A/V essence

This project will develop an open binding technology standard (e.g., watermarks, fingerprints, metadata sidecars, etc.) for embedding end-to-end persistent content identifiers into audio/video essence in a way that survives processing, compression and distribution. This work had its foundations in a SG report, available [here](#).

Status: The group has held meetings weekly for the last two months. It is developing a Request for Proposals (RFP) for technology that can be standardized for this application. The RFP will be completed early in 2015.

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 are ready for ST Audit.
ST 333 and RP2007 are held up due to shortage of editor’s time.



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

This project is a straightforward updating of references.

Status: A draft revision was posted for TC review. Comments were received and are being addressed.

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

This project is a straightforward updating of references.

Status: The document passed DP ballot on 2014-11-13 and ST Audit will be started.

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

Status: Revision work is continuing. The diagrams in the standard are being redrawn to improve clarity.

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.

DG Project: SMPTE B-Chain Study Group Theater Testing Data Report

This group is compiling and analyzing the theater testing data that was collected by the earlier B-Chain Study Group Theater Testing group. It is producing a report with analysis, comparisons and recommendations.

Status: The report was approved at the last TC meeting and was published as “B-Chain Frequency and Temporal Response Analysis of Theatres and Dubbing Stages” on 2014-10-01. The report is available [here](#). The group is considering how to present the report’s findings in the SMPTE Journal.

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 draft standard and the signal-generation algorithm are well advanced. Work in the last quarter has focused on setting a level (around -18.5dbFS) that gives good agreement with Dolby DMU noise. There will be further field tests and a draft for pre-ballot-review is expected early in 2015, with completion predicted for mid 2015.



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.

Status: Revision 3 of the draft RP was completed in September 2014 and sent to AES for review in October. No response had been received at the time of the TC meeting. A final working draft will be prepared for pre-FCD ballot review, but there is a dependency on the pink noise standard that should be balloted first.

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 moved much of its work to its DG (25CSS-10, Immersive Sound Model and Bitstream), whose first draft document is “Immersive Audio Metadata”. The document is progressing well, but there is still much work to do. The WG is revisiting other project tasks. A new AHG has been formed to work on Static Metadata.

Metadata and Registers Committee (30MR) chaired by Ingo Hoentsch

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 by the 3D Home Master project in TC-35PM.

Status: The draft document closed FCD-ballot on 2013-10-24 with a total of 16 comments. Comment resolution is now complete and the document can proceed to pre-DP review when comment resolution on a related document (ST 2087 – Depth Map Representation) is complete.

Business Impact: Understanding and common use of terms



Topic: UMID Projects

The Chair of the following three 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 – approved 2014-06
 - Part 2.2: UMID Applications in MXF

Status: Part 2.2 of the report has been updated. Remaining work includes a section on Examples of UMID Apps in MXF and a proposed section on The Domain of Media Identity.

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 is a newly-launched project and an initial strawman draft was submitted to the DG on 2014-12-05.

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 is on the point of publication; the group will be disbanded.

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 DG is drafting the Standard "SMPTE Core Metadata". All definitions are complete apart from "Relation" that will be done on the next teleconference. A draft schema is also being developed.

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 and will remain available to assist SMPTE HQ with implementation issues.

Status: The SG Chair proposed that the group should be disbanded, as it has only been kept open to assist with implementation and that function is being provided now in the Metadata Definition WG; see below. It was agreed to disband the group.

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: 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. Four 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
- ST 395:2014 Groups Register Structure

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: Some comments were made during DG review and they will be incorporated in the current draft. It will then be posted for pre-FCD-ballot review.

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: The DG Chair has submitted a revised draft, in line with proposals for revision that were previously submitted to the DG. The current revision deals with the first half of the document, the remainder needs to be done.



Drafting Project: RP 2092-1: 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: The document passed FCD ballot on 2014-09-25. All comments are resolved and the document is ready for pre-DP review to be started.

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 has carried out a considerable amount of validation work on the register contents in the last quarter. For the period of time before the online registry is in place with a user-friendly interface, it was decided that the current spreadsheet format would be replaced by xml I/O with a stylesheet that would convert the xml file into a tabular form. It is expected that pre-FCD-ballot review will take place in 2015-02.

The FCD ballot will be for approval of the register transformation as well as approval of the new contents.

The individual register projects below will not be updated while the transition work is in process, and it is likely that they will be replaced or amended by the new process.

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

DG Project: Update Metadata Labels Register Contents (RP224)

DG Project: Create and Update Groups Register Contents

For some while, an informal Groups Register has being maintained.

DG Project: Create and Update Types Register Contents

For some while, an informal Types Register has being maintained.

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.



Other TC-30MR Business

As part of the register clean-up work, it was decided that all entries should have a namespace. This will include the two register classes that are “Organizationally Registered for Public Use” (class 13) and “Organizationally Registered for Private Use” (class 14). The organizations concerned will be contacted to supply a suitable namespace name. If any organization fails to supply a namespace name, a unique one will be assigned by the Metadata Definition WG.

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 RP 2089:2014, Carriage of EIDR Identifiers in MXF Files

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: New Document: 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. All comments have been resolved and the DG Chair called for a 2-week pre-DP review period to start.

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 DP ballot on 2014-12-08 and the document will progress to ST Audit.



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

Status: This DG is disbanded, but at the last TC meeting, there was a proposal for the document to be stabilized and a subject-matter expert agreed to review the document for stabilization. The review is continuing.

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. At the last TC meeting, it was agreed that the 2 commenters would work together to draft a revision that would resolve all their comments. This was done and the revised document will be submitted to the TC.

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

Status: This document failed FCD ballot (closed on 2013-05-23). Most comments are resolved. A revised document for a second FCD ballot will be submitted to the TC by February 2015.

DG Project: New Document: 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 Chair expects that the draft is close to completion and that it will be ready for pre-FCD-ballot review soon.

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 met during the meeting round and continued compiling the list of issues to tackle, including some recognition that new HFR timecodes are on the way. It is proposed to divide the problem into application areas: timecode storage; file access by timecode; media / tape preservation; contiguous timecode.

DG Project: New Document: 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 is published and the project will be closed.



DG Project: New Document: RP 2092-2 - 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 document passed FCD ballot on 2014-11-20 with 33 voter comments to resolve. 13 have been resolved, resolution work continues.

RDD Project: New Document: 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: This document passed ST Audit 2014-11-20 and is being prepared for publication.

DG Project: New Document: VC-5 Mapping into the MXF Generic Container

This project will draft a standard for mapping a VC-5 bitstream into an MXF Generic Container.

Status: The Working Draft continues to be developed with added support for Subsampled Alpha channel and Bayer RRGB images. It is planned that a draft for pre-FCD review will be submitted to the TC in Q1 2015.

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



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

This document includes a schema file.

Status: The Part 1 document is published. However, initial implementation work has shown up some inconsistencies between the prose and the XSD file and a [revision project](#) has been started.

WG Project: New Document: 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: A new document editor is needed and work is suspended until a new editor is appointed.

DG Project: 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: Part 1 was published 2014-Q2. An issue about missing xml elements was discovered soon after publication. The missing elements will be added and Part 1 will be submitted for DP rebalot. Part 2 was published 2014-Q3.

DG Project: New Document: 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 is suspended; an EBU model has been submitted and the group may defer to that data model. A gap analysis using the EBU model as a baseline has recently been submitted and it will be distributed. See also the related [TC-32NF project](#).

Other TC-31FS Business

DG Project: Revision of ST 2019-4:2014 (Mapping VC-3 into the MXF Generic Container)

This project will add support for image resolution independence.



**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.

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.

Status: The WG Chair gave a report on its projects, detailed below.

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

DG Project: Amendments for UHD TV Colorimetry Signaling

This DG is drafting amendments to ST 425-3 and ST 425-5 to add Payload ID signaling for UHD TV colorimetry.

Status: The FCD Ballot for ST 425-3 AMD1 and ST 425-5 AMD1 is complete and all comments have been resolved. The pre-DP review period will now start.

DG Project: New document suite 2076: Stereoscopic 3D (S3D) Production Timing and Synchronization

This group is developing a document suite on 3D timing and sync.

Status: The four documents that were balloted (ST 2071-1 Camera Systems, ST 2071-2 Live Production Systems, ST 2071-3 Physical Layer for Video Transport, EG 2071-4 Physical Layer and System Guidance) have been reorganized in line with ballot comments as:

- RP 2076-1, "Production Timing and Synchronization – for S3D or Multi-View Camera Systems"
- EG 2076-2, "Synchronization for Stereoscopic 3D (S3D) or Multi-view Images- Alignment, Transport and System Guidance".

These reorganized documents will be reballoted and RP 2076-1 is ready for 2 week pre-FCD-ballot review. EG 2076-2 is almost complete.

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 developing a "gap analysis" using work



from EBU Core, the TC-31FS DG on Audio Metadata, ST377-4 MXF Multichannel Audio Labeling Framework etc.

Status: It has been agreed that the DG Chair, the 31FS DG Chair and the ST 337-4 Editor will work together to complete an initial review of available references by the year's end. The DG Chair will then get the various documents posted once reviewed.

DG Project: New Document: EG on SDI Interfaces

This group will draft EGs to provide a tutorial on the many SMPTE SDI interface standards and technologies, including how they relate to each other, what image formats are carried, performance.

Status: There is potential for this project to grow unmanageably large, so the following baseline of work was defined:

- What are the standards?
- What image formats are carried by each interface?
- What is the payload bandwidth of each interface?
- Network or system aspects that can affect the performance of the interface.

DG Project: Revision of 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 both passed FCD ballot on 2014-07-20 and both had 21 comments to resolve. All comments have been addressed and the formal 2-week response period has started, ending 2014-12-17.

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

It was agreed that RP 198 – HD Check-field – is higher priority than EG34, in order to get 3Gb/s interfaces specified, and should be completed first.

Status: The focus is on RP198. The DG has reviewed the current draft and identified areas needing work, including a clean-up on some text from earlier editing. The DG is working to add new tables to include the codes for 3Gb/s signals.

DG Project: Revision of ST 297: Serial Digital Fiber Transmission System for ST 259, ST 344, ST 292 and ST 424 Signals

Scope was to revise ST 297:2006 to update only the normative references and responsible TC; now extended to include details for ST 2081 and ST 2082 projects.

Status: ST 297 will close ST Audit 2014-12-11. Publication will need to wait for the 6Gb/s and 12Gb/s SDI single-link mapping documents ST 2081-10 and ST 2082-10 (see [WG 32NF-70](#)) as a result of a normative reference chain.



DG Project: UHDTV Multi-link 10Gb/s interfaces

The DG is working on 2 documents:

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

Status: ST 2036-4 passed FCD ballot 2014-09-04 with 39 voter and non voter comments.

Comment resolution was close to complete at the time of the TC meeting; it completed shortly after the meeting.

The ST 2036-3 revision has not yet gone to ballot.

DG Project: New Document: ST 2091 - Broadcast and Video Serial Digital Fiber Transmission Systems – Ruggedized Connector Interfaces

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: Since the last meeting round, work to include a dual-link connector variant and methods for identifying various interface protocols in terms of color coding and link assignment has been in progress.

DG Project: New Document: Transport of Haptic-Tactile Essence

This project has been split away from the TC-10E project on Coding of Tactile Essence in order to focus on defining the *transport* of this essence.

Status: The first DG meeting is planned for 2015-01-15. It was agreed that the project scope would be amended to make it clearer that this work only relates to the professional broadcast environment, rather than means for final distribution.

WG Project: Video Over IP

This Working Group (32NF60) was established to handle projects related to IP transport of media. The WG's documents are the 7-Part ST2022 family.

Status: There has been no activity in this WG for some time and there was discussion about closing it. However, it was pointed out that amendments to both ST 2022-5 and ST 2022-6 are needed. As a result, it was agreed that the TC Chairs should pursue an action item from the last meeting round to attempt to recruit a new WG Chair.

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: New Document suite: 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 WG requested the TC to hold a DP elevation vote for the 6Gb/s and 12Gb/s mapping documents (ST 2081-10, ST 2082-10). The vote passed for both standards and they will start ST Audit.

DG Project: ST 2081 suite: 6Gb/s Signal/Data Serial Interfaces

This project is developing documents:

ST 2081-1: 6Gb/s Signal/Data Serial Interface – Electrical

ST 2081-10: 2160-line and 1080-line Source Image and Ancillary Data Mapping for **Single**-link 6G-SDI

ST 2081-11: 2160-line and 1080-line Source Image and Ancillary Data Mapping for **Dual**-link 6G-SDI

ST 2081-12: 4320-line and 2160-line Source Image and Ancillary Data Mapping for **Quad**-link 6G-SDI

There are also 3 documents (like -10,-11,-12) planned for stereoscopic content and a multistream mapping document (multiple 1.5G and 3G over 6G).

Status: ST 2081-1 is ready for publication, awaiting ST 2081-10 that was elevated to DP at this round's TC meeting (ST 2081-10 is a normative reference). It had been hoped that ST 2081-11 and ST2081-12 could have advanced to FCD ballot, but there is still an issue concerning timecode in higher frame rates; there is a new project for this work.

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

This project is developing documents:

ST 2082-1: 12Gb/s Signal/Data Serial Interface – Electrical

ST 2082-10: 2160-line and 1080-line Source Image and Ancillary Data Mapping for **Single**-link 12G-SDI

ST 2082-11: 2160-line and 1080-line Source Image and Ancillary Data Mapping for **Dual**-link 12G-SDI

ST 2082-12: 4320-line and 2160-line Source Image and Ancillary Data Mapping for **Quad**-link 12G-SDI

There are also 3 documents (like -10,-11,-12) planned for stereoscopic content and a multistream mapping document (multiple 1.5G, 3G, 6G over 12G).

Status: ST 2082-1 is ready for publication, awaiting ST 2082-10 that was elevated to DP at this round's TC meeting (ST 2082-10 is a normative reference). It had been hoped that ST 2082-11 and ST2082-12 could have advanced to FCD ballot, but there is still an issue concerning timecode in higher frame rates; there is a new project for this work.



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 Geneva meeting round. Most of the time was spent on the two Synchronization documents, ST 2059-1 and ST 2059-2 (see below). In particular, agreeing the content of Amendment 1 to ST 2059-2.

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 in drafting projects below.

Drafting Project: New Document: 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 was ready for a vote, except that one comment regarding patents needed to be overridden by the TC; this was done at the meeting. A vote to elevate ST 2059-1 to DP status was then taken. The vote passed, so the document will proceed to ST Audit.

Drafting Project: New Document: 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: ST 2059-2 passed ST Audit 2014-12-11 (but after the TC meeting finished). A [project](#) to amend ST 2059-2 has also been started recently. This is because the simulation group working on ST 2059-1 found that there was a problem with its algorithm for implementing timecode “Daily Jam” at the autumn change from daylight saving to standard time. It was decided that the best way to overcome this was to modify the format of data specified in ST 2059-2. It was agreed that this amendment to ST 2059-2 would go straight to FCD ballot as soon as possible.

DG Project: Development of a set of synchronization 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 in the drafting projects below.



Status: A Chair for this DG is sought (the pro-tem Chair is unable to devote enough time to get the work moving). The four EG drafting projects below have been set up, and a draft exists for a possible fifth one on “Local Time”.

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

Status: An updated draft document was submitted to the DG 2014-04-01. No progress in the last quarter.

Drafting Project: New Document: EG 2059-11 - Time Discontinuities

Status: Project initiated. No progress in the last quarter.

Drafting Project: New Document: EG 2059-12 - Facilities Migration Guide

Status: Project initiated. No progress in the last quarter.

Drafting Project: New Document: EG 2059-14 - Best Practices for Large Scale SMPTE ST 2059-2 PTP implementations

Status: An updated WD was submitted 2014-11-26.

DG Project: New Time Labeling System

This is an “umbrella” project. The group facilitates development of a suite of Time Labeling documents that will have drafting projects set up.

Status: A Chair for this DG is sought (the pro-tem Chair is unable to devote enough time to get the work moving). There are four label documents being developed:

- **Full-featured Time Labels** (aka “TRL”)

Status: A version was uploaded 2014-09-17.

- **Generic Time Label**

Status: An updated version was uploaded 2014-11-11.

- **Date-Time Terms and Definitions**

Status: At the last DG meeting, the group spent some time walking through this document and feeding back comments to the editor (such as the need for this document to have conformance language as it is intended to be a Normative Reference for other documents). However, no updated draft has been uploaded.

- **Simple Time Label** (this one is less certain and may be considered a “Super 12-1” label)

Status: Currently no draft.



DG Project: Revision of 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: The draft revised document passed FCD ballot 2014-10-22 with 31 comments to resolve. Comment resolution is proceeding well.

DG Project: Amendment EG 40: Conversion of Time Values Between SMPTE 12-1 Time Code, MPEG-2 PCR Time Base and Absolute Time

This project will make small corrections to formulas where errors had been pointed out during the 2014-06 meeting round.

Status: Project has been approved.

DG Project: New Document: Time Address for High Frame Rate signals and its data structure in the ancillary data space

Project Scope: To create a standard specifying time address for HFR and its data structure in the ancillary data space that is extensible to cover rates of up to 960 fps.

Status: This is a new project, approved 2014-11-17, and awaiting the setting up of group resources. The new document may be “ST12-3”.

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 carried by AES-3. The extension mechanism will be documented in ST 337 and the extended data types will be documented in ST 338. The DG will revise or add any other documents in the family that are required for 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 passed FCD rebalot on 2014-07-21 with 2 comments - now resolved. Ready to pass to the TC for pre DP ballot review.



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

Status: This document passed FCD rebalot on 2014-07-21 with 2 comments - now resolved. At the TC meeting, it was agreed to insert RDD 33 as the reference document for data-type 28 and then pass to the TC for pre DP ballot review.

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

Status: This document passed ST Audit on 2014-10-12. It is pending publication, awaiting ST 337, ST 338.

Drafting Project: Revise ST 339: Format for Non-PCM Audio and Data in AES3 - Generic Data Types

Status: This document passed ST Audit on 2014-10-12. It is pending publication, awaiting ST 337, ST 338.

Drafting Project: New Document - 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 document is in DG review.

Drafting Project: New Document: RDD 33 - Mapping of Dolby-E over AES3

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 document passed RDD ballot on 2014-12-03 with 5 comments (all now resolved).

Other 32NF Business

Ancillary Data in RTP

A presentation on “RTP Payload for SMPTE ST 291 Ancillary Data” was given to the TC. There are standard ways to handle uncompressed video and audio over RTP, but not Ancillary Data. The proposal is based on SMPTE ST 2038 and review is invited before its submission to Payload group at IETF (registering the Payload type as “ANC”).

Proposed DG Project: New document: MPEG-H in AES3

MPEG-H provides for carriage of immersive and interactive audio in the form of channels and objects and also in the form of Higher Order Ambisonics (HOA). The project will develop a standard to specify the format for carriage of MPEG-H data for professional applications as Non-PCM audio using the AES3 serial digital audio interface defined by ST 337. The next step will be project approval.



Media Systems, Control and Services Committee (34CS) chaired by Chris Lennon 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: 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

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 support; Addition of Backup Events; Ability to Exclude From EPG;
Time Code In/Out Option; Low Res Proxy URL; Format sub element definitions;
Multiple episode support; Schedule Episode number; etc.

Status: Final review of the revised documents is scheduled for 2014-12-19 BXF WG meeting. If it is the Consensus of the WG, it will recommend updated 2021-x docs for pre-FCD comment period in the TC, with the hope of achieving DP by the next meeting round.

The WG will turn its attention to compiling potential BXF 5.0 work items; possibly some items deferred from BXF 4.0 are candidates.



DG Project: Media Device Control over IP

This project is developing a suite of documents for the control of media-centric devices and services utilizing Internet Protocol and well-established Internet/IT standards and best practices wherever possible.

ST 2071-1: Media Device Control - Framework - Published in 2012, updated in 2014.

2015 Revision under development to add support for FIMS v1.2.

ST 2071-2: Media Device Control - Protocol – Published in 2012, updated in 2014.

2015 Revision under development to add support for FIMS v1.2.

ST 2071-3: Media Device Control - Discovery – Published in 2014.

Describes Zero Configuration (ZeroConf) and Device, Service, and Capability discovery operations for Media Device Control using well established and widely used Internet Protocol based standards.

ST 2071-4: Media Device Control - Capability Interface Repository – CD ballot passed.

WSDL & XML Schemas are under development for final ballot.

Defines the Capability Interface definitions/API and systemic requirements for a repository/registry that can contain Capability Interface definitions, their corresponding documentation, programmatic artifacts, unit tests, and test cases. Provides a common infrastructure and API with which vendors and SDOs can register Capability Interface Definitions, their documentation, unit tests, and test cases and where Developers, Customers, and Interface Consumers can query the definitions, documentation, and tests for the Capability Interfaces implemented by Devices and Services used within their systems.

ST 2071-5: Media Device Control - RESTful Protocol – New project proposal for better FIMS integration.

Status:

Parts 1, 2, and 3 were published in 2014.

Part 4 passed FCD ballot 2014-10-20 with 2 comments to resolve. The TC Chair made an appeal for vendors to get involved with this work now, to help prove the concepts.

Parts 1 and 2 are undergoing revision to better support inclusion into FIMS v1.2.

The revision work is supported by new project proposals to [update ST 2029](#) to include the URNs in ST 2071-1, as well as improvements to ST 2071-1 to [add URI Fragment notation](#) and [extend MapEntry representation](#) to support XML data types. These project proposals were not properly assigned to the TC and will be resent for approval.

Business Impact: Interoperable Media Device Control



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

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 is used as the input to subsequent processing that creates deliverables.

Published IMF documents:

ST 2067-2:2013, Interoperable Master Format — Core Constraints (nearing its 1 year review)

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 2067-21:2014, Interoperable Master Format – Application #2 Extended

ST 2067-30:2013, Interoperable Master Format — Application #3

Status: The bulk of the IMF standardization is complete.

Four OPL documents (see below) passed ST Audit just before the TC meeting.

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.

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.

The OPL Group began drafting new documents in July focusing on core OPL information.

Status: The following Output Profile List documents all passed ST Audit 2014-12-11:

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: Adopting W3C IMSC-1 Profile as a constraint for subtitling and captioning.

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 Sample Material Interchange Group (SMI) held 3 meetings, plus a plugfest on 2014-10-24 at which interoperability between 7 working systems was tested. The tests included both HD and UHD files. Bug tracking (some arising from plugfest) has been initiated at dev.imfforum.com/bugs and will result in edits to ST 2067 suite documents.

DG Project: Draft ST 2067-21: Extensions to IMF Application #2, JPEG 2000

This extension supports higher specifications including resolution, frame rates and multiple color space encodings.

Status: Published.



DG Project : New Document: ST 2067-40 - IMF Application #4 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: An initial draft has been posted to the WG.

Task Force Updates

SMPTE forms a “Joint Task Force” with other industry bodies from time-to-time to investigate a particular technology issue that faces the industry.

Status: SMPTE currently participates in the following two Task Forces:

Joint Task Force on Networked Media – JT-NM

This Task Force was formed by EBU, SMPTE and VSF.

Context: Transition from purpose-built infrastructure to IT-based packet networks

Goal: Drive the development of an interoperable network-based infrastructure for live media production, encompassing file-based workflows.

Key Events: Collected “User Stories” 2013-06. Issued a Request for Technology 2013-09. Issued “Gap Analysis” Report 2013-12. Started Phase 2, definition of Reference Architecture, 2014-04-30.

Status: The following report was submitted 2014-11-19:

The Admin team recently established a Reference Architecture Integration (RAI) group composed of the Chairs of the Modeling (Dr Richard Cartwright-Quantel), Systems (Karl D. Schubert, Ph.D. - Technova Consulting) and Minimum Viable Approach (Thomas Edwards-FOX) groups as well as Admin Team members Felix Poulin – EBU and Brad Gilmer - VSF. It was formed to integrate and harmonize the work that has been done so far with the goal to complete a Phase 2 “Interim” report by December 8, 2014. The Interim report will be sent to the sponsors (EBU, SMPTE and VSF) for approval, with a target publication date of December 31, 2014.

We anticipate holding two face-to-face briefings for all JT-NM members sometime after the New Year with publication of the Phase 2 Final report by June 30, 2015.

Joint Task Force on File Formats and Media Interoperability – JTFFMI

This Task Force was formed by NABA, EBU, SMPTE, AMWA, 4A’s (American Association of Advertising Agencies), ANA (Association of National Advertisers). The activity was kicked off by a report from NABA that identified the need for this work.

Status: The JTF has developed a high-level conceptual workflow/roadmap, starting in 2014-07 and ending with a report to the JTF steering committee submitted in 2014-12. Decisions will then be made about further work that is required (e.g. standards, shims for standards).



Notes on this report and the SMPTE Standards Process

SMPTE Technology Committees (TCs) are tasked with the development and ongoing maintenance of engineering documents relevant to Television, Broadband, Film and Digital Cinema. TCs 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](#) (this revision effective from 2015-01-31).

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.



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