



SMPTE Standards Webcast Series  
SMPTE Professional Development Academy – Enabling Global Education



# Standards Update

Alan Lamshead, SVP Standards  
Howard Lukk, Director of Engineering and Standards  
February 9, 2017

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## SMPTE Standards Update Webcasts



- Series of quarterly 1-hour online (this is 90 minutes), interactive webcasts covering select SMPTE standards
- Free to everyone
- Sessions are recorded for on-demand viewing convenience SMPTE.ORG and YouTube

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## Your Host

**Joel E. Welch**

*Director of Education  
SMPTE*



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## Today's Guest Speakers



**Alan Lamshead**  
SMPTE Standards Vice President  
SMPTE Fellow  
  
SMPTE Board of Governors



**Howard Lukk**  
Director of engineering and  
standards  
  
SMPTE Staff



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# SMPTE Standards Report



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- *SMPTE Standards Committee Meetings*
  - 5 - 9 December 2016
  - Burbank, CA, USA
  - ***Hosted by Disney***

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# December Plenary

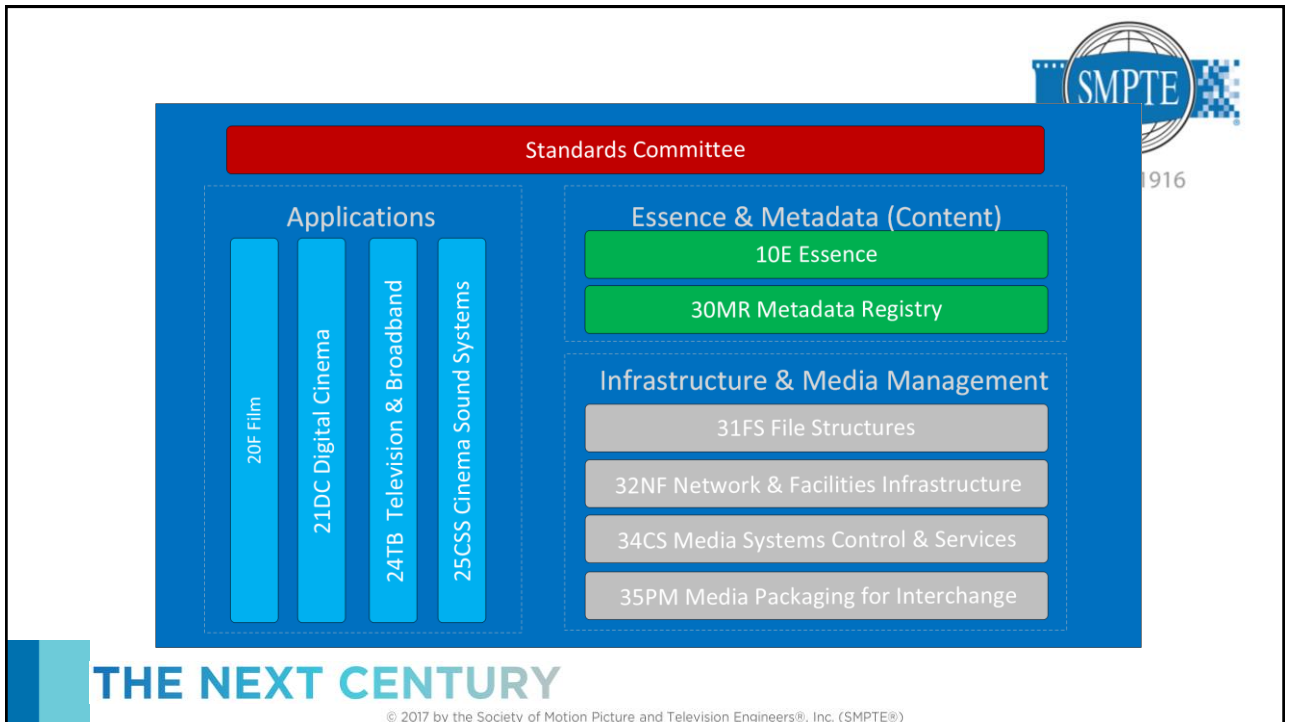


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- Nine SMPTE Technology Committees and 17 subgroups scheduled meetings at this round.
- Over 90 members attended in person over the five days, and there was additional participation by remote access.
- There are currently over two hundred active projects.

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## SMPTE Technology Committees



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- Essence (10E)
- Digital Cinema (21 DC)
- Television and Broadband Media (24TB)
- Cinema Sound Systems (25CSS)
- Metadata and Registers (30MR)
- File Formats and Systems (31FS)
- Network and Facilities Architecture (32NF)
- Media Systems, Control and Services (34CS)
- Media Packaging and Interchange (35PM)

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## **Essence Technology Committee (TC-10E) chaired by Ed Reuss and Michael Zink**



- *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*

### **TC-10E documents published last quarter :**

- **SMPTE RP 219-2:2016**, Ultra High-Definition, 2048 × 1080 and 4096 × 2160 Compatible Color Bar Signal

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## 10E Projects



- **Video compression standards in SMPTE**
  - SMPTE 2073 Document Suite: VC-5 Video Essence
  - Revision of SMPTE 2042 and 2047 Document Suite: VC-2 video compression
  - New Standard SMPTE RP 2047-5: VC-2 Level 66 Compression of UHD for use with HD Infrastructure
- SMPTE 2080 Document suite: Reference Display and Environment for Critical Viewing of Television Pictures
- New Standard (suite): ST 2094: Content-Dependent Metadata for Color Volume Transformation of High Luminance and Wide Color Gamut (WCG) Images
- New Document: RP 2093 - Television Lighting Consistency Index
- New Document: ST 2100-1 - Definition and Representation of Haptic-Tactile Essence

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## **Film Technology Committee (20F)** **chaired by John Miller**



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- *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.*
- 20F did not meet during the December quarterly sessions. The next meeting of 20F will be during the CinemaCon conference in Las Vegas, March 2017.

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## **Digital Cinema Technology** **Committee (21DC) chaired by Dean** **Bullock and Chris Witham**



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- *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.*

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## 21DC Projects



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- **Facility List Management projects**
  - Revision of ST 430-7 – Facility List Message
  - New Document ST 430-15 - Facility List Message Exchange Protocol
- **Stereoscopic Subtitle / Timed Text projects**
  - Revision of ST 428-7: D-Cinema Distribution Master – Subtitle
  - Revision of ST 429-2: Digital Cinema Packaging - DCP Operational Constraints
  - Revision of ST 429-5: Digital Cinema Packaging - Timed Text Track File
  - New Standard ST 429-17: Digital Cinema XML Constraints

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## 21DC Projects (cont'd)



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- **D-Cinema Operations; Encryption projects**
  - D-Cinema Crypto Evaluation (FIPS Revisions)
  - Revision of ST 430-1: D-Cinema Operations - Key Delivery Message
  - Revision of ST 430-2: D-Cinema Operations - Digital Certificate
  - Amendment to ST 429-6: Digital Cinema Packaging - MXF Encryption
- **Additional Frame Rates**
  - Working Group to integrate the separate documents for Additional Frame Rates into the main documents 428-1 and 428-2 (DCDM) and 429-2 (DCP), add HFR to DCP

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## 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.*

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## 24TB Projects



- New document EG 2064-x: Tutorial on A-V Sync Measurement and Assessment
- New ST 2017 document suite on Open binding technology for persistent content identification in A/V essence
- Revisions
  - Closed Captioning suite documents
  - ST 2010: VANC Data Mapping of ANSI/SCTE 104 Message
  - ST 2016-1: AFD and Bar Data

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## **Cinema Sound Systems (25CSS) chaired by Brian Vessa and Bill Redmann**



- *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.*

### **25CSS documents published in the last Quarter**

- **SMPTE RDD 41:2016:** MDA D-Cinema Application
- **SMPTE RDD 42:2016:** MDA Program Specification
- **SMPTE RDD 43:2016:** MDA Bitstream Specification

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## **25CSS Projects**



- New document (suite): RP 2096: Digital Cinema Sound System Setup and Calibration (“B-chain Modern Calibration Procedure”)
- *Interoperability of Immersive Sound Systems in Digital Cinema projects*
  - New Document ST 2098-1: Immersive Audio Metadata Definitions
  - New Document ST 2098-2: Immersive Sound Model & Bitstream
  - New Document EG 2098-3: Immersive Audio Renderer Behavior
  - New Document RP 2098-4: Immersive Audio Renderer Testing
  - Study Group: Immersive Audio Implementation

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## Metadata and Registers Committee (30MR) chaired by John Hurst and Mike DeValue



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- *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.*

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## 30MR Projects



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- **UMID Projects**
  - Application of the Unique Material Identifier (UMID)
  - UMID Resolution Protocol
  - Proposed ST 330 Revision Project
- New Standard ST 2102: SMPTE Core Metadata Set
- New Standard ST 2088: SMPTE Essence Element Key Register Structure
- Revision ST 336: Data Encoding Protocol Using Key-Length-Value
- Amendment of RP 2092-1 Advertising Digital Identifier (Ad-ID®) Representations
- Create and Update Essence Element Register Contents
- New Standard ST 2114: Cinema Content Creation Cloud (C4) ID
- Revision of RP 2079: Digital Object Identifier (DOI) Name and Entertainment ID Registry (EIDR) Identifier Representations
- Working on finalizing new procedures for Registry Submissions

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## **File Formats and Systems Committee (31FS) chaired by Bruce Devlin and Paul Gardiner**



- *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.*

### **31FS Documents Published in the last quarter**

- **SMPTE ST 2065-5:2016:** Material Exchange Format – Mapping ACES Image Sequences into the MXF Generic Container
- **SMPTE ST 2042-4:2016:** Mapping a VC-2 Stream into the MXF Generic Container

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## **31FS Projects**



### **Material Exchange Format (MXF) Projects**

- New Document: ST 377-2 - KLV-encoded extension syntax (KXS)
- Revision ST 380: MXF Descriptive Metadata Scheme 1
- New Document: ST 381-4: AAC Family Compressed Digital Audio in MXF
- MXF Timecode Mapping and Labeling
- New Document: RP 2092-2 - Ad-ID Digital Ad Slate for MXF
- New Standard ST 2073-10: VC-5 Mapping into the MXF Generic Container
- New ST 2094-2: Dynamic Metadata for Color Volume Transformation – Encodings
- New RDD 44: Mapping Apple ProRes into the MXF Generic Container

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## 31FS Projects (cont.)



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### **Archive Exchange Format (AXF)**

- Revision ST 2034-1: Archive eXchange Format (AXF) - Part 1: Structure & Semantics
- New Document: ST 2034-2 - Archive eXchange Format (AXF) - Part 2: External Uses of XML Schema

### **Other TC-31FS Business**

- New document ST 268-2: Constrained Application of ST 268:2014 – DPX for HDR and WCG

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



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- *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.*

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## 32NF Documents Published



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- **32NF documents published in the last quarter**

- SMPTE RP 2076-1:2016, Production Timing and Synchronization for Stereoscopic (S3D) or Multi-Camera Array
- SMPTE EG 2076-2:2016, Image Identification, Alignment, Transport and System Guidance for Stereoscopic (S3D) or Multi-Camera Array
- SMPTE RDD 40:2016, Essence-independent IP Live Networked Media Transport
- Amendment 1:2016 to SMPTE ST 2081-1:2015, 6 Gb/s Signal/Data Serial Interface – Electrical – Amendment 1
- Amendment 1:2016 to SMPTE ST 2082-1:2015, 12 Gb/s Signal/Data Serial Interface – Electrical – Amendment 1

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## 32NF Projects



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- **Working Group on SDI Interfaces (32NF-40)**

- New Document: EG on SDI Interfaces
- Revision of EG 34: Pathological Conditions in Serial Digital Video Systems and  
Revision of RP 198: Bit-Serial Digital Checkfield for Use in High-Definition Interfaces
- New Document: ST 2091 - Broadcast and Video Serial Digital Fiber Transmission Systems – Ruggedized Connector Interfaces
- New document ST 2100-2: Transport of Haptic-Tactile Essence in AES3
- New document ST 2100-3: Transport of Haptic-Tactile Essence in VANC
- New Standard: ST 297-2 CWDM optical interface for multi-link SDI
- HDR and WCG Signaling on Streaming Interfaces – revised payload ID

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## 32NF Projects (cont'd)



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### ***Working Group on Video Over IP (32NF-60)***

- New document suite: ST 2110 Professional Media over IP
  - ST 2110-10: System Timing and Definitions
  - ST 2110-20: Uncompressed Active Video
  - ST 2110-21: Compressed Active Video (currently a suggested additional part)
  - ST 2110-30: PCM Digital Audio
  - ST 2110-31: Full AES3 Transport (currently a suggested additional part)
  - ST 2110-40: Ancillary Data
  - ST 2110-50: SDI as an Essence (SMPTE 2022-6 transport)
- Revision of ST 2022-7: Seamless Protection Switching of SMPTE ST 2022 IP Datagrams

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## 32NF Projects (cont'd)



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### ***Working Group on Ultra HD SDI Interfaces (32NF-70)***

- New document ST 2081-30: Transport of Multiple 3Gb/s or 1.5Gb/s signals on a 6G-SDI link
- New document ST 2082-30: Transport of Multiple 6Gb/s, 3Gb/s or 1.5Gb/s signals on a 12G-SDI link
- 1 year and reviews of previously published ST 2081 and ST 2082 documents

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## 32NF Projects (cont.)



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### ***Working Group on Time Labeling and Synchronization (32NF-80)***

- **SMPTE 2059 New Synchronization System**
  - New Document: EG 2059-10 - Introduction to the New Synchronization System
  - New Document: EG 2059-11 – Management of Time Discontinuities
  - New Document: EG 2059-12 - Systemization Considerations for using SMPTE ST 2059
  - New Document: EG 2059-14 - Best Practices for Large Scale SMPTE ST 2059-2 PTP deployments
  - SMPTE 2059 interoperability testing
  - One year review of ST 2059-1 and ST 2059-2
- **New Time Labeling System (Under Review after Time Code Summits)**
  - SMPTE 2103 Suite: Generic Time Label
  - SMPTE 2105 Suite: Time Related Label (TRL)
  - RP 2104 Suite: Date-Time Terms and Definitions

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## 32NF Projects (cont.)



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- **ST 337 family of documents**
  - New document ST 2041-4: MPEG-H 3D Audio Streams (MHAS) in AES3
  - New Standard ST 2106: DTS Audio over AES3
  - New document: Multi Dimensional Audio (MDA) over AES3
  - New document: Audio Metadata over AES3
- **Flow Control in Professional Media Networks**

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## **Media Systems, Control and Services Committee (34CS)** **chaired by Chris Lennon and Karl Paulsen**



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- *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.*

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## **34CS Projects**



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- **BXF Suite of Documents**
  - Revise EG 2021-4 to incorporate BXF 5.0 changes
  - New Recommended Practice RP 2021-6: BXF SDK
- **Media Device Control over IP**
  - SMPTE 2071 work picking back up

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## **Media Packaging and Interchange Committee (35PM)** **chaired by Pierre Lemieux**



- *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.*

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## 35PM Projects



- **WG 35PM50: IMF Document Maintenance and Sample Material Interchange**
  - Amend/Revise ST 2067-2: IMF Core Constraints
  - Amend/Revise ST 2067-3: IMF Composition Playlist
  - Amend/Revise ST 2067-5: IMF Essence Component
  - Amend/Revise ST 2067-20: IMF Application #2, JPEG 2000
  - Amend/Revise ST 2067-21: Application #2
- **IMF Output Profile Lists**
  - Amend ST 2067-102 (IMF Common Image Pixel Color Schemes)
- **IMF Audio Essence**
  - **New Document: IMF Audio Content and Element Kind Definition**
- New Document ST 2067-50: IMF Application #5 ACES

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## Meeting Outcome Reports



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- To learn more about the Standards activities see:  
<https://www.smpete.org/standards/engineering-committees>.
- To download the most recent meeting outcome report:  
<https://www.smpete.org/standards/meeting-reports>

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## Verbal Questions



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