



Reports from the SMPTE Technology Committees

Introduction from the Standards Vice President

By Raymond Yeung

The SMPTE Standards Community (SC) continues the core mission of harmonization and interoperability of media technologies. Under the guidance of the Standards Committee (ST), the SC is organized into seven Technology Committees (TCs) to focus on content creation (TC 10E), applications (TC 27C), infrastructure (TC 32NF), and media management (TC 30MR, 31FS, 34CS, 35PM). This report summarizes the significant progress in the Standards Community in 2025.

Going back in history, the SMPTE standards (also labeled as ANSI) printed in the *Motion Imaging Journal* were the foundation of public exhibitions, including the 35mm and 65mm film picture and sound formats, as well as broadcast television technology. Fast forwarding to today's file-based world of Material Exchange Format (MXF-TC 31FS) and Digital Cinema (TC 27C), SMPTE standards continue to ensure universal accessibility in theatrical entertainment worldwide. An important lesson learned over recent decades was partitioning complex systems specifications, most effectively demonstrated by the D-Cinema Distribution Master (ST 428 suite), Packaging (ST 429 suite), Operations (ST 430 suite), plus many other areas. This innovative design provides an agility in a documentation framework that parallels modular software development. The Interoperable Master Format (IMF – TC 35PM), ST 2067 suite, immediately comes to mind as it covers six published video codecs and four published “plug-ins,” with many more components in development. The Professional Media Over Managed IP Networks standard suite, or ST 2110 for short, has seen its full range of components deployed ubiquitously. The recently bestowed Emmy Awards to SMPTE for IMF by the National Academy of Television Arts and Sciences (NATAS) and for ST 2110 by the Academy of Television Arts & Sciences (ATAS) confirm the continuing value and achievements of SMPTE standards. Two ongoing

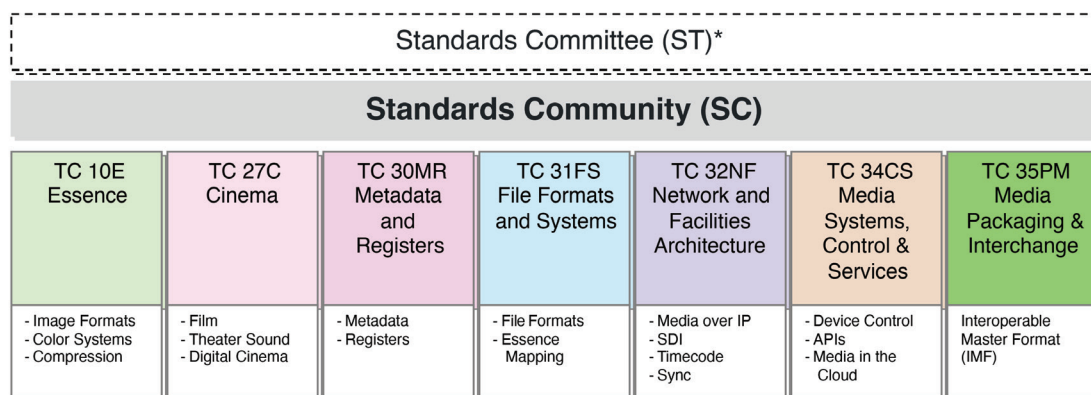
TC 10E standard suites further exemplify the modular approach:

- *ST 2094 suite—Dynamic Metadata for Color Volume Transform (DMCVT)* with four published applications and two in development for broadcast systems.
- *ST 2144 suite—Visible Difference Predictor (VDP)* with two planned metrics for image quality and a process description.

These future-looking projects, which will impact High Dynamic Range (HDR) imaging (ST 2094 DMCVT) and immersive visual quality assessment (ST 2144 VDP), are reported in the segment on TC 10E.

To complete highlighting the TC activities, a few fast-paced projects in 2025 are of interest. USB-C interconnect is prevalent today. The proposed standard, ST 2139 (TC 32NF), defines a USB-C Alternate Mode, referred to as Signal Sync Alternate Mode (SSAM), for conveying synchronization signals over a USB-C Connection. The capability to genlock USB devices with existing professional media equipment offers novel innovations in media production. Equally stimulating is the development of a media resource control system (ST 2138 Catena suite—TC 34CS) that provides an open standard and open-source approach to the challenge of securely connecting and controlling devices and services across any platform.

Following the footsteps of my predecessors, the ideals of free standards and web-first publication have achieved significant milestones in 2025, thanks to the efforts of SC membership and SMPTE headquarters. First, published SMPTE engineering documents—standards (ST), recommended practices (RP), engineering guidelines (EG), and registered disclosure documents (RDD)—are managed in a SMPTE-controlled modern platform, freely accessible to all SMPTE members. Second, on June 1, 2025, the SC mandated that the publication format be HTML, supplied by a docu-



* Closed Committee: SMPTE Leadership, TC Chairs, Standards Directors, Guests, SMPTE Standards Staff

ment editing workflow developed and validated over the past two years. The document development workflow leverages the agility and robustness offered by GitHub, long-favored by and well-aligned with the open-source community. The web-based repository holds the source of truth for the status of each document when accessed on the SMPTE website. The potential harm of outdated documents will be eliminated.

Before exploring the accomplishments of each TC in 2025, three significant study groups (SG) are tasked with reporting on fast-evolving, impactful topics. Study Groups are organized under the Standards Committee (ST) with regular meetings and participation from wider industry groups.

• **Joint ETC Task Force on Artificial Intelligence and Media** – The Joint Task Force was formed in 2020 in cooperation with the Entertainment Technology Center (ETC) at the University of Southern California (USC). The group focuses on identifying and pursuing opportunities for standardization around AI and its potential applications throughout the media industry. Since the first edition of the Engineering Report, ER 1010:2023, there have been significant changes to the landscape of AI in media. A second edition of the report, to be released publicly this year, recommends that SMPTE develop three standards. This work is now under way in TC 30MR and addresses the areas of AI model metadata, embeddings as metadata, and metadata generated by LLMs.

• **Study Group on Sustainability in Media** – The domain is the sustainability of motion picture and television

systems. The focus is to identify new or existing SMPTE engineering documents that could directly benefit systems or those with which they interact. Currently, the study group is conducting a survey to gather sustainability-related use cases, requirements, user stories, or improvements. These insights might inform the development or revision of SMPTE engineering documents on professional media, aiming to encourage sustainability improvements in technology and processes.

• **Study Group on Content Provenance and Authenticity (CPA) in Media** – This study group was formed mid-year 2025 to fast-track an assessment of current content provenance and authenticity (CPA) technologies that affect media production and distribution. The objective is to make recommendations on where SMPTE can update existing or create new standards to support the follow-up of CPA information. A survey has been distributed widely to media industry groups, including governmental agencies, international standards organizations, manufacturers, media producers, and interested individuals. The use cases and requirements gathered will be summarized and reported along with recommendations in one or more engineering reports in late 2025.

About the Author



Raymond Yeung is the head of tech standards at Amazon Studios Technology, where he serves in the Media Engineering and Innovation Group.