

Progress Report from the Technology Committees

This progress report from the activities in the technology committees falls into a remarkable period of developments in the professional world of broadcasting and content production.

In the past, many production applications had to perform their intended role only in standalone modes such as the first NLE-systems operating in islands or niches of the broadcast chain. Today, the demands of broadcast users have drastically changed. They are asking for versatility and replaceable technology-layers. System components, such as servers, should be able to handle audio tasks as well as television production applications, and universal networking is required to exchange content across all departments of a station. The file formats in use, for example, should not need to bother whether to carry metadata, compressed or uncompressed audio, and video signals. All data becomes “just” information in a multi-user and multivendor integrated environment. The offerings of the information technology (IT) world seem to fit perfectly to this demand of handling “just” information. It is true that the information industry can provide a perfect service in many areas of the broadcast chain. In accord with this, professional users recognized that many affordable IT and multimedia consumer solutions performed as well as high-end professional products some years ago. However, at a time when broadcast users start to request huge file delivery in realtime, or a service for SD/HD live events in fully networked environments, conventional IT solutions are still approaching their limits. In these cases, users either apply specialized (and expensive) technologies, derived from the IT world, or simply count on traditional serial digital interface (SDI) or HD-SDI technologies. In contrast to many other areas of the media environment, it remains questionable whether the last “bastions of realtime performance” will be taken up by a generalized IT world in a short period of time. The main reason for this is simply the fact that the professional motion picture production will remain a niche market (compared to the multimedia mass-market) and, consequently, it is hardly conceivable that the IT mass-market will provide products to meet the performance criteria for live SD/HD event productions in the near future.

The professional broadcast user’s priorities for interoperability, open systems, and stability for product

investments remain unchanged. Many professional users report that these priorities are best supported by standards, particularly in an IT-dominated environment. However, there are two particular emerging challenges for standard-setting bodies such as SMPTE: first, to provide standards in a reasonable time, because of the shortened product innovation cycles, and second, to widen the “scope for standards” for a variety of applications resulting from the convergence between IT and professional broadcast technology.

To meet the first challenge, SMPTE has the continual objective to optimize the standardization process (i.e., flexible ad-hoc group meetings and the introduction of registered documents). But the natural balance between the due process rules and time required for ballot resolutions may require patience from all parties involved. In order to serve the second requirement, SMPTE is rather flexible in its different engineering activities. Some broadcast applications, such as film, still require individual and niche standards, but others, such as digital television, digital audio, and digital cinema often have overlapping applications. The MXF (Material eXchange Format) standardization, for example, has shown that a standard developed in one committee can often be relevant for other applications as well (e.g., MXF file format application in digital cinema).

Consequently, more and more SMPTE specifications will become “interdisciplinary standards,” able to serve different communities including the IT environment. SMPTE still maintains on its standards the nomenclature “for Television” or “for Motion-Picture Film,” and some might argue that this nomenclature does not reflect the final use or application of a particular standard or simply implies an unnecessary constraint. Others may suggest that titles such as “for Television” are required to give some sort of background for the origination and intended use of a standard. However the discussion on this ends, the major objectives remain: the outcome of the standardization work in the different technology committees has to meet user requirements and guarantee interoperability and stability of products on the market, regardless of whether the standard originated in television, audio, film, or digital cinema.

—Hans Hoffmann, Television Engineering Director

STATUS REPORTS

System Technology Committee, S22

William Miller, Chair

Time Code and Reference Signals

This work, comprising ten new or revised documents, is a major update of SMPTE's time code and reference signal standards. Among other items, SMPTE 12M, the basic standard for time code in the film, television, and many other industries is brought up to date. Provisions for 24, 50, and 60 frame/sec progressive-scan operation are included. The Vertical Interval Time Code (VITC) specifications of RP 159 into the standard are also being added. A new series of documents will define how SMPTE time code, originally developed as a label for identifying frames of film and video, can be modified for use in precision time-keeping. An engineering guideline is being developed to provide a top-level description of how the system works.

Event Durations in Automation Systems

A separate effort is under way to reconcile the differing interpretations used by different automation system vendors of how to express event durations. Some issues are unique to drop-frame environments whereas others are common to all systems. The existing SMPTE time code and editing standards provide good guidance, but it remains to be seen whether it is possible to get general agreement among all automation vendors, as there are so many legacy systems.

Management Information Bases (MIBs)

Newer television equipment is designed to be interconnected and managed with standard IT LAN hardware and software. The Simple Network Management Protocol (SNMP) is used for monitoring and administration; in this protocol, the characteristics of each type of device are described by means of a MIB. An effort is under way to see if, for newer devices, it is possible to achieve some level of commonality among the MIBs and to write a recommended practice defining this commonality.

Data and Metadata Systemization

Within the television plant, the need to manage and transport large amounts of data and metadata is growing daily. This is currently being done in a variety of ways; the large variety of points in the process in which data and metadata must be entered, extracted, and modified makes implementation difficult. A new

effort to systematize this flow model, called the DataChain, is about to get started.

Image Technology Committee, I23

Dave Bancroft, Chair

This committee documents the fundamental electronic representation of "conventional" images—for television applications prior to any compression. I23 is currently dealing with a number of issues, which are categorized into the following working areas.

Image and Signal Representation

Subgroup on Transfer Characteristic: This group is working on a way to prepare images for transport through existing industry-standard (SMPTE 292M) HDTV serial digital interfaces with a bigger subjective dynamic range by adopting a different dynamic transfer characteristic than the normal "CRT-gamma" curve. This will probably be some form of logarithmic characteristic. One application will be perceptual encoding to get a 12-bit linear processing space from a camera head to post-production, even though most of the intervening interfaces and recording channels are limited to 10-bit depth.

Defining Critical Areas in the Image: A legacy SMPTE RP that defines "safe" areas for action and titles has been revised to accommodate the shift to widescreen; new flat-panel display technologies may also have an influence. Further work is being undertaken to investigate discrepancies with titles occurring during down-conversions from HD to SD. A related RP is also being updated to assist manufacturers of standards converters in adopting common practices for positioning image center and blanking during up- and down-conversions.

Advanced Television Production

DVD Mastering: This is a subgroup with a very substantial remit. It is working on RPs for a Cutting Master format, on requirements for correct encoding to support progressive scan display of DVDs, and for emulation and verification in DVD quality-control.

Test Materials

Test materials can be both objective (e.g., color bars), or subjective (e.g., real image sequences). Television production systems need both: the former for calibration purposes and determination of readily measurable parameters; the latter for visual comparison of processes that are difficult to measure objectively or numerically such as compression algorithms.

In the former case, work is continuing on adopting the familiar SMPTE EG-1 color-bar signal from its origins as EIA-189 into a new SMPTE RP, at the same

time extending existing format options to cover 16:9 and digital, while reaffirming the existing EG-1 as a vital legacy standard for many years to come.

A further work item is the 50-Hz version of the SMPTE RP 219 HD/SD compatible color-bar signal.

Compression Technology Committee, C24

Ingo Hontsch, Chair

C24 defines specifications for the signal compression layer of future professional technologies in professional motion picture production. During the years this has become particularly important, due to the need for reduced storage and bandwidth requirements. Data reduction and compression technologies have been, for example, widely introduced in recording, production, post-production, contribution, and archive applications. The lessons of early compression formats such as M-JPEG have taught that the compression system constitutes an important layer of interoperability.

Throughout the past years, the standardization efforts of SMPTE C24 have resulted in a number of image compression related specifications, which help to establish interoperability in the compression layer. Recent documents produced in C24 have been RP 213 (MPEG-2 Operating Ranges), SMPTE 342M (HD-D5 Compressed Video for 1080i and 720p Systems—Encoding Process and Data Format), the SMPTE 356M (Type D-10 Stream Specifications—MPEG-2 4:2:2P@ML for 525/60 and 625/50), SMPTE 367M (Type D-11 HDCAM Picture Compression and Data Stream Format), and SMPTE 370M (Data Structure for DV-Based Audio, Data, and Compressed Video at 100 Mb/Sec: 1080/60i, 1080/50i, 720/60p).

Ongoing work includes the revision of SMPTE 342M (HD-D5 Compressed Video 1080i and 720p Systems—Encoding Process and Data Format) to include additional frame rates and the specification of a new data reduction method for the MPEG-2 Video Recoding Data Set in order to allow SMPTE 327M (MPEG-2 Video Recoding Data Set) data within DIF streams. Both of the work items are expected to be completed in 2003.

It is hard to predict the future, because it depends on input from users (requirements) and proponents (proposals for documentation of technology). However, during the years, the increases in computational power for hardware- and software-based implementations has enabled considerable improvements in compression technology and fundamental

new technologies such as multiresolution coding. It can be expected that these developments may soon be reflected in new proposals brought to SMPTE. For example, Microsoft has approached SMPTE to investigate possibilities for a standardization of the Windows Media Player, version 9.

Audio Technology Committee, A29

Steve Lyman, Chair

The main work items for the technology committee on Audio are as follows:

RP 155—Audio Reference Level Signal

An updated and simplified definition of the audio reference level signal that is used to calibrate the system gain and to ensure transparent audio transfers between devices and facilities has been completed. It has been submitted to trial publication for comment from the public.

EG 26—Audio Channel Assignments for Digital Television Recorders (DTRs) with AES/EBU Digital Audio Inputs

The increasing use of multichannel audio has spawned nearly as many different audio channel to recorder track assignments as there are production facilities. This guideline brings consistency to the industry and makes it much less likely, for example, that the center channel dialog will turn up in the wrong place. If there are no objections on the upcoming ballot, the document will go to trial publication for comment from the public.

RP 120—Measurement of Intermodulation Distortion in Motion Pictures

This recommended practice was originally devised for use with motion picture devices, but has been much more widely applied for many years. The title was changed to reflect this during its reaffirmation, and has been submitted to trial publication.

With the recent trend to use digital audio (AES-3) channels to store or transport nonaudio data, a number of unanticipated problems have appeared. Operations, such as truncation, addition of dither, and so forth, which are perfectly legitimate audio operations, change the datastream and therefore destroy its usefulness. The "Requirements for Equipment Compatibility with Non-PCM AES3 Streams" document presents a set of guidelines for equipment and systems designers, which eliminates the problem. It is being balloted and should soon be ready for trial publication.

SMPTE 324M—Serial Interface for Multiplexing Eight AES3 Data Streams

This standard defines a high-speed multiplex that handles multichannel audio streams. It consolidates up to eight AES pairs (16 individual channels) in one stream, eliminating timing errors between channels or channel swapping while reducing the number of connectors and cables required. The last ballot resulted in several comments and an issue that has to be dealt with. Consequently, it is expected that another ballot will provide the consensus before the document can go to trial publication.

The next major project is the revision of SMPTE 222M—Control and Review Rooms, which monitors system electroacoustic response. The methods in the current version are seen as outdated, so a major revision is required. The Chairman is looking for experts in the field to help with the revision.

Wrappers and Metadata Technology Committee, W25

Mike Cox, Chair

The work in W25 currently falls into seven broad but inter-related headings:

- Exchange of program material as bitstreams: General Exchange Format, Material Exchange Format.
- Metadata Registries: the Metadata Dictionary, Groups, Types, and other Registries.
- Metadata Encoding: KLV (Key-Length-Value), Sets and Packs, XML Schemas.
- Descriptive Metadata: Descriptive metadata schemes, harmonization with other organizations (ISO, EBU, TV Anytime, Dublin Core).
- Material Identification: the Unique Material Identifier.
- Specialist Application: Extended Copy Control, private data.
- Legacy Issues: Digital Picture Exchange Format, Serial Digital Transport Interface-Content Package (SDTI-CP).

Exchange of Programme Material as Bitstreams

This is the major part of the work of the committee and is a direct consequence of the final report from the "EBU/SMPTE Task Force for Harmonized Standards for the Exchange of Programme Material as Bitstreams," published in August 1998. The two major work items in W25 under this heading are the General Exchange Format (GXF), SMPTE 360M, which is a current file format in widespread use, and the Material

Exchange Format (MXF).

MXF is a new format nearing standardization and is being developed to meet the currently foreseeable needs of users for a file container for pictures and sound in any format (MPEG, AES audio, uncompressed video, BWAV, DV, etc.) as well as metadata for business or program interchange purposes.

The June committee meeting in Portland, ME, reviewed a suite of 19 documents for MXF and noted the probability that more documents will be written as the standard is adopted in new products and applications. Of these 19 documents, 13 were passed on as draft standards for trial publication, including the draft File Format Standard (SMPTE 377M), the draft Engineering Guideline (EG 41), the draft Generic Container Standard (SMPTE 379M), and four draft Operational Pattern Standards.

MXF is probably one of the largest work items ever handled by SMPTE—hence the need to break it down into many bite-sized and manageably layered chunks. Documents are developed in SMPTE ad-hoc groups, which meet regularly by telephone conference as well as face to face when necessary or the opportunity presents itself. Preparing, revising, updating, and tracking such a large suite of complicated documentation while ensuring thorough peer review and steering them through the standardization process is a mammoth task—many thanks are due to the editorial team. Future work on MXF will include new operational patterns, subtitling, descriptive metadata (see later in this text), new essence plug-in, as well as particular specification for use in the digital cinema environment.

Metadata Registries

Throughout the program supply chain, applications will totally be reliant on unambiguous metadata if the concept of the end-to-end data chain is to be realized. If information is fed into one end of a system, it must pass through all the system interfaces and arrive at the other end intact, with its meaning unchanged, if it is to be of any use. This is no small requirement. In systems reliant on humans, errors often occur as information subtly changes at interfaces, and machines will blindly carry on where a person would challenge the accuracy. Hence the need for registering metadata (and other data) to ensure unambiguous meanings. Current work in W25 addresses this through four metadata registries (Elements, Groups, Labels, Types), with a fifth (Enumerations) as possible future work. Each registry is issued as a recommended practice and for each the document structure is governed by its own controlling standard.

As an example, the SMPTE Metadata Dictionary (more properly called the SMPTE Register of

Metadata Elements) is controlled by SMPTE 335M, with the actual registry being RP 210. To give the necessary flexibility, RP 210 is a dynamic document, which means that it can be updated as necessary with the addition of new elements (although old ones can never be removed). RP 210 has fields for the name of each element, a unique ISO-registered data key, a brief definition (which can further be focused by an application if necessary), any normative controlling standard for the element, its data type, and expected length.

The June committee meeting in Portland approved version-5 updates to RP 210 (Elements), bringing the total number of registered elements to over 1,250. Also approved were version-3 updates to RP 224 (Labels), and work is in progress on Groups (the controlling standard is currently in trial publication although committee work has not yet started on the registry itself) and will start soon on Types.

Metadata Encoding

In order to carry data or metadata through a system, it has to be encoded into the datastream. This can be done in many ways. Traditionally, SMPTE has approached the problem from a low level—in fact, right at the bit-level. SMPTE 336M (key, length, value encoding) is a current example and also underpins the MXF work. On the other hand, computer-based systems encode at a higher level—HTML or XML are current examples.

Both KLV encoding and XML encoding are a continuing work item for the W25 committee. In the case of KLV, the standard is currently being revised to take account of developments over the past few years. During the June committee meetings, the early draft of the KLV revision was explained. The draft revised standard should be available in July 2003.

Two ad-hoc groups met during the June meetings and continued their work at the September meetings in Geneva—one to take a high-level view of metadata schemes and the interfacing of KLV and MXF-based TV gear to computer-based systems; the other to begin work on representing SMPTE metadata in registries and KLV encoding schemes as XML documents. Both groups had plenty to do!

Descriptive Metadata

Descriptive metadata has always played its part in program making—in libraries and archives, a researcher's filo-fax, or in business administration. Until now, it has always been stored and manipulated separately from the pictures or sound, frequently taking the form of a piece of paper inside a tape can, a jotting in a notepad, or electronic entries in disparate

databases. When program content is exchanged, the paperwork has to accompany it—or at least, it should accompany it.

The MXF file has provision for a “plug-in” to accept descriptive metadata schemes and can accept several simultaneously. For some time, W25 has had a work item to exploit this capability, and interest has been steadily rising in this aspect of the metadata work. During the June meeting round, an engineering guideline explaining descriptive metadata in MXF was approved by the committee for trial publication. Earlier in the year, the first descriptive metadata scheme standard was approved by the technical committee, and it was agreed this would be reviewed thoroughly until the September meetings, to give the opportunity for specialist expertise to help review the document.

Ad-hoc group meetings for descriptive metadata were held at both NAB and during the June meeting and these were well attended, with valuable input from the Information Science and XML communities. The group's work also includes harmonization with other descriptive metadata systems such as TV Anytime, EBU P/Meta, MPEG-7, and Dublin Core. The results of this work, to date, have been encouraging and led to constructive inputs in both directions.

Material Identification

One of the outputs from the EBU/SMPTE Task Force for Harmonized Standards was the recognition of the need to be able, on a global basis, to identify uniquely and unambiguously recorded material within a system. This must identify a specific instantiation of pictures or sound in terms of actual physical recording and not in terms of content or business—for instance, in the case of film it would be a specific piece of celluloid.

A standard for a Unique Material Identifier was published by SMPTE in 2000 (SMPTE 330M-2000). Since then, developers have given useful feedback, which has been useful input to the Unique Identifiers ad-hoc group, so that during the June meetings this year a backwards-compatible revision of SMPTE 330M was approved for trial publication.

Specialist Application and Legacy

Although the bulk of the W25 committee work has focused on the topics above, there is always a continuing thread of specialist application and legacy work. Two such specialist work items were on the June agenda for W25: a “Lite” version of a new Extended Copy Control Information data-block, and methodology for the carriage of private data (be it data or metadata) through SMPTE KLV compliant systems. In both cases the committee was able to review pro-

posed documents and move the work forward to the point where it can be incorporated into new or existing standards.

Similarly, the revision of both the Digital Picture Exchange Standard (SMPTE 268M) and Element and Metadata Definitions for the SDTI-CP (SMPTE 331M), both of which pre-date much of the current metadata work and standards, have passed through the committee's hands during the past year on their way to publication.

Data Essence Technology Committee, D27

Mike Dolan, Chair

The technology committee on Data Essence is concerned with matters that are not video, audio, or metadata. The classic example is teletext, subtitling, and captioning formats, and also includes interactive television (ITV).

A new profile of Declarative Data Essence (DDE) has recently been defined, called "Transitional" with the acronym DDE-T. It has concluded trial publication and is assigned the standard number, 397M. This specification will be published very soon.

The current and future work of the committee is focused on developing generic authoring and distribution formats for the emission standards that were developed by the Advanced Television Systems Committee (ATSC), Digital Video Broadcasting (DVB), and the Association of Radio Industries and Businesses (ARIB), and also include DDE-1. The ITV-related work includes an ad-hoc group on Application Metadata and Wrappers and one on DDE-2. These two ad-hoc groups are focused on ITV packaging issues during distribution and XHTML-based "next generation" DDE, respectively. This work is primarily driven by the interest in getting ITV data bound to and distributed with video and audio and providing some sort of common authoring format.

A new ad-hoc group was recently formed to address the carriage of teletext (according to ITU BT.653-3 and ETSI 300706) in the ancillary data (ANC) space of SMPTE 259M (SDI) and 292M (HD-SDI). This work will most likely result in an amendment to 334M, which will include the wrappers for the teletext payload. The ad-hoc group is also investigating an XML encoding of generic teletext that could be used in distribution instead of the emission-specific encoding of the ITU and ETSI standards.

It has been proposed that RP 208 (carriage of AMOL and Gemstar/TVGuide information) be balloted

for withdrawal. In its place, a definition of the generic carriage of "dark information" is being proposed in the W25 committee on Wrappers and Metadata.

D27 is in the process of establishing a more formal and closer liaison with the World Wide Web Consortium (W3C), and an Internet Engineering Task Force (IETF) discussion list relating to matters of interest to both organizations is also planned. More details on both of these activities should be available in the next report.

Network and File Management Technology Committee, N26

Johann Safar, Chair

At present, N26 is revising many of the existing documents with intentions to remove "circular references" and inclusion of additional information relevant to specific standards. This work is needed from time to time to assure current and updated standards. The technological progress in today's market is so fast that document updates become an important part of the committee's work. Documents must be consistent and relevant to the existing technology in the field. In detail, N26 is dealing with the following work items.

a) Revision of SMPTE 125, one of the basic signal format documents. Due to the fact that S125 presently covers only 4:2:2 signal format in the 525-line TV system, it was deemed appropriate to expand the scope to include additional signal formats as well. These would be 4:4:4 signal format inclusion of the 625-line TV system.

b) Revision of SMPTE 259 is being conducted to resolve issues of proper references.

c) Revision of RP 178, RP 160, and RP 174 is being done as a response to the five-year document revision cycle.

d) The ongoing implementation work of the MXF file system has proved that some of the current standards might contain minor mistakes not seen in the past. As a result of that, SMPTE 322 is being revised. The correction is only minor and no information of technical substance is affected.

e) The SMPTE 360M is the first file format (GFX) that was developed under the SMPTE auspices. The ongoing revision is to expand the scope of the document toward, for example, HD applications.

f) Revision of SMPTE 297—Digital Fiber Transmission for SMPTE 259-type signals (SDI). SMPTE procedural rules require that if there is input from the field to a published document, a document revision must be initiated. This document covers

transmission of SMPTE 259-type signal over fiber. The fiber technology has significantly changed since this document was drafted, therefore, an update to reflect the present technology status is required.

g) Revision of SMPTE 272—Embedded Audio in SDTV Serial Digital Interface. This document is quite old, however, implementation by different manufacturers proved that some ambiguities present in the document led to implementation errors. These ambiguities affect interoperability between some products, and purpose of this revision is to clarify these issues.

h) Revision of SMPTE 299M—Embedded Audio in HDTV Serial Digital Interface. This revision is of a more important nature due to the technical change that affects additional HDTV systems that were added since the document's conception. At issue is the number of bits defining the expansion of the audio clock-phase from 12 bits to 13 bits. Reason for this expansion is that at the time of S299 development, 720/24p format did not exist whereas in today's environment such format is available.

Besides the update of documents, N26 is also working on new documents that continuously improve and create interoperability between different systems, which is in fact the main goal of the committee. Part of this task is also to educate users. Following work creating new documents is shown below.

a) Recommended Practice on Closed-Captioning (CC) in DTV Systems document. Stations are currently converting from analog transmission to digital transmission, and the CC process is affected as well. While this document is of more of an educational nature, it contains comprehensive information on how CC is applied in DTV systems. This document represents an excellent compilation of existing methods developed by advanced DTV users.

b) Mapping MPEG recoding data into 50 Mbit/sec DV-based document. This document provides for additional interoperability between MPEG-coded and DV-based systems. The issue is to enable transmission of MPEG recoding data through the DV datastream, thereby enabling seamless operation of mixed coding systems with maximum transparency.

c) Mapping SMPTE 259 into ATM. This document provides for mapping SMPTE 259M-type signals into an ATM interface. The document is part of a document set that enables full transmission of 270 Mbit/sec serial digital signal through AAL1-based interface.

The overall work of the committee progresses at a normal pace. Documents are revised, presented to the committee, then balloted. The revision cycle for a

document lasts about 6 months whereas a development cycle for a new document is longer, about 9 to 12 months. This is due to the requirement of more ballots to assure that all users have the opportunity to provide their input to the document. While some members believe that this pace is too slow, the experience has proved time and time again that documents rushed through the SMPTE approval system usually require additional work after approval.

Recording and Reproduction Technology Committee, V16

Neil Neubert, Chair

V16 is currently working on three important fields (videotape recording, optical disk, and handling of tape and other media). Concretely, the following work is carried out.

Videotape Recording

Two new digital videotape recording documents were introduced for standardization at the September 2002 meeting of V16, held in Geneva, Switzerland. The first will be known as type D-14 and is a 1/2-in. uncompressed digital videotape recorder for 525/60 and 625/50 standard-definition television systems that supports recording of eight audio channels. Second will be D-15, a high-definition television 1/2-in. compressed DVTR that supports recording of the 1080/59.94i, 720/59.94p, 1080/50i, 1080/24p, 1080/23.98p HDTV video formats, and also eight audio channels. Both of these are eight audio channel variants of the Panasonic D-5 and D-5-HD recorders.

Both D-14 and D-15 use the videotape cassette specified in SMPTE 263M. This cassette was used originally with the D-5 videotape recording format. SMPTE 263M has been revised to provide a visual indication on the outside of the cassette for the user to identify if the recorded tape within it is that of D-5, D-14, or D-15.

The SMPTE Type D-6 DVTR standard documents, SMPTE 277M-1996, and SMPTE 278M-1996 remain in a reaffirmation process at this time. The D-6 DVTR format has changed somewhat since the original standards were published, and the proponent is still considering whether or not to update and revise them. V16 completed reaffirmation review of about 30 long-term recording standards documents at its meeting on December 9, 2002. Many of the 29 documents were transferred to the new Archive Status in the SMPTE library, rather than being reaffirmed or withdrawn. Archive status creates a permanent home for classic legacy standards, so they can always be

found and retrieved even though they are no longer active.

Optical Disk Recording

SMPTE V16 has embarked on an effort to develop a standard for a digital video disk-recording system intended for broadcast applications such as news gathering and program acquisition and production. There has been very good interest and participation in this activity by manufacturers and world broadcasters. V16 is concentrating on the development of a comprehensive user-requirements document from which interoperable disk-recording products might be designed and produced. Significant user-requirements contributions have been received from many major broadcast organizations. Compilation of these contributions is complete and will lead to the development of a single comprehensive user-requirements document.

Care, Handling, and Storage of Videotape and Other Media

Work continues to update and reaffirm SMPTE RP 103-1995—Care, Storage, Operation, Handling, and Shipping of Magnetic Recording Tape for Television. A large amount of informative and normative information has been contributed to this activity. A new draft document encompassing this information has been prepared and is nearly ready for its first ballot.

Registration and Identification Technology Committee, R30

Merrill Weiss, Chair

The committee on registration and identification technology (R30) is responsible for the development of standards supporting the implementation of many of the digital techniques being put into place across the electronic motion-imaging industry. It also has responsibility for the online publication of data from all SMPTE standards that will automatically be accessible to future equipment and systems.

The work of R30 is intended to make practical and efficient the use of the new digital techniques for all electronic motion-imaging technologies, including television. Given the potential complexities of the new digital systems and the fact that standards for digital sys-

tems will continue to evolve, it is important to make it possible for equipment and systems of the future to update themselves without operator intervention. Registration and identification functions will also enable the operation of production, post-production, and distribution systems more efficiently with respect to the workloads of operators.

Among the projects currently under way within R30 is the development of a content identification system in conjunction with the International Standards Organization (ISO). This will harmonize identifier systems in use for a variety of purposes throughout the electronic motion-imaging industry and register a multiplicity of labels and code points that determine how a variety of complex systems operate. R30 is also responsible for publication on the SMPTE Registration Authority website of the data for standards that provide for updating on a dynamic basis (SMPTE "Dynamic Documents"). This allows those standards to keep up with the progress of technology without undergoing the inherent delay of the full standardization process.

Specific R30 projects include:

a) Development of a registration number for identifying versions of completed works, such as motion pictures, television programs, commercials, and the like. The identifier, being developed jointly with a working group of ISO, is called the Versioned International Standard Audiovisual Number (V-ISAN) and is an extension of the ISAN, previously developed jointly with the ISO working group. The V-ISAN will enable a wide range of metadata tracking and the automation of distribution and release functionality. A recently completed activity is a report, published in the July/August 2003 *SMPTE Motion Imaging Journal*, on harmonization of the four major identifiers being developed on a worldwide basis, including V-ISAN, UMID, CID, and CRID. The report showed that the four identifiers do not overlap in their purposes and can be made to interoperate harmoniously.

b) Preparation of the SMPTE Registration Authority (RA) website (www.smpte-ra.org) for online publication of the SMPTE Metadata Dictionary and other metadata structures. The RA website will be the location from which varied data updates will be served to online applications in years to come, along with human-readable versions of the same information.