

Report of the Engineering Vice-President for the Year 1995

By Kenneth P. Davies

As we come to the end of the year and to the end of my term of office, I would like to report to all SMPTE members on the engineering activities of the Society, both to record the activities and to make all aware of the critical role that they play in the organization. It is important that the two major activities of SMPTE, Sections and Standards, be highly visible to all so that the necessary synergism can exist. The future of our technology is contained in the engineering work of standards development, while the resources of the Society are determined by the membership. For SMPTE to achieve its goals and to discharge its responsibilities effectively, the two must work closely together, with Engineering providing technical leadership and meeting the needs of the SMPTE constituency, while the membership has a duty to provide the necessary resources to carry this activity forward. This report, given in the past at the opening of the fall conference, is presented here so that all members will have the opportunity to gain an overview of the Engineering activities.

First let me establish the technical environment. It is clear that the digital era has now almost completely arrived. A real search is needed to discover analog elements among the digital mass. The digital revolution is over, and it would seem that the digital era is in place. This is quite an amazing achievement in a very short time. When I first became Engineering Vice-President in 1991, taking over from Stan Baron, the discussions were about convergence, possibilities and objectives, the free interchange of programming among differing media, and



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future convergence and strategies for implementations. The digital era had just begun its emergence. Now we stand with the digital era largely accomplished — digital production, digital broadcasting, digital satellite, and cable are either up and running, or nearly so.

I am not sure that we have made all the right decisions yet, in view of the rumblings about formats and frame rates and modes that continue. The viewers still are faced with a plethora of incompatibility in seemingly compatible systems, in encryption and conditional access. Yet enormous progress has been made. SMPTE has exercised a major role in leading this and in building the necessary consensus to bring reasonable order to the content industries involved. The Society continues to evolve new ways to bring systems, equipment, and material together in an organized, standardized way, to the benefit of all.

My four-year term has seen major progress, to be sure, not only in technology but also in the engineering activities, priorities, and participation. We have moved heavily into electronic

communication to speed the work, to attract and enable more interests to participate globally, and to make SMPTE accessible in the information age. But in so doing, we have not neglected our roots in motion pictures and television, as these industries move into the greater world of electronic imaging. The engineering work of SMPTE continues to be respected worldwide as the authoritative source for enlightened standards.

It has been a challenge and a pleasure to serve as your Engineering Vice-President, working with the officers, the Headquarters staff, and all the volunteers in the various projects, many of whom have become real friends. I hope that none have been permanently offended as decisions have been made and directions established that are supported by consensus but not always unanimously. But now I must move on, two strikes in terms of office or four strikes in years. In spite of the binary ambiguity the officers are replaced, making way for new blood, new ideas, and the continuing growth and evolution of the Society. I am sure that my successor will find the tasks ahead challenging, and I wish him every success and a pleasurable experience in managing the work of engineering.

But enough of the generalities. Where are we now? Where are heading tomorrow? And what are the challenges ahead of us?

Where Are We?

Environment for Standards

In the last few months, I have participated in a number of standards meetings internationally and in North America, and one cannot fail to notice the increasing tempo of development, of new products, and of services that heretofore were unknown. The

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standards underlying this activity must then be timely and enabling of the future, rather than protective of the past. Compatibility is certainly an issue, but in this era, standards must use technology aggressively and seek the widest possible application and acceptance, if they are to succeed, while taking a realistic view of the economic impacts. The best standards, such as SMPTE 125M, enable the future through their basic simplicity and foresight. It is now almost 15 years since that standard was written, but it has been a good vehicle for a number of updates and developments and is a worthy example.

It is also noteworthy that video services are moving increasingly towards the inclusion of some degree of interactivity, making nonlinear, multimedia programming of increasing importance and adding new dimensions to the production and distribution process. SMPTE is continuing to expand its horizons in these new areas, as resources allow, and to prepare the necessary standards that its constituency of interests will require to develop and distribute content in this evolving environment.

Development of Standards

The work of standards development and the maintenance of existing engineering documents proceeds well, within the current structures. During the year considerable attention has been focused on the standards related to production for ATV, compression, and packet transmission (non-real time) in the production environment and HDTV interfacing. In recording standards, work has been completed on the D-5 format and on D-6, but it is disappointing that other formats, using compression, remain undocumented. The recent beginning of work on the 1/2-in. DVC-PRO format is a positive step, and the studies of the TRRT in regard to documentary standards for compressed formats is a good enabling force.

Consideration of the need for new standards in the area of production for interactive services and for multimedia is moving ahead and has resulted in the formation of a new working group under the Committee on Hybrid Technology, which will detail the nec-

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essary work and carry it forward. This work will require a broad base of interests to be involved, and I am happy to report that a cooperation with IMA has been established.

In addition I would like to report that the ARRT, the Projection Technology Committee, and the Motion Picture Laboratory Practices Technology Committees have received new chairmen in the persons of Ioan Allen, Ron Uhlig, and Dave Harrington, respectively. I would like to thank the outgoing chairs for their efforts over the years and for their leadership. To the new chairs, my thanks for undertaking these challenging tasks and my best wishes for their success. I regret that I must also report that the Chair of the Television Recording and Reproduction Technology Committee (TRRT), Tom Cavanagh, CBC, has recently resigned from this position due to his early retirement from CBC Engineering. He has been a very active member of the TRRT (and its predecessor, VRRRT) for many years, making major contributions to the development of standards for analog and digital recording. We are fortunate to have a volunteer to carry on in this important position.

Last, but far from least, I would like to record the retirement of the Society's Director of Engineering, Si Becker, who handed over the reins to Carl Girod at the end of June.

Liaison Activities

EBU

Liaison with the technical activities of the EBU at the peer level have been reestablished, following the rearrangement of the EBU structures into a project-based structure. A liaison meeting was held between SMPTE and EBU groups during the Montreux Symposium; a number of joint interests

were identified and the necessary communications put in place. EBU members were strongly encouraged to participate in the SMPTE network, and it was agreed that SMPTE would dedicate a small section of its network capability in SEEC and the Internet to EBU activities, on an interim basis.

ATSC

A close working relationship exists between SMPTE and ATSC in ATV-related work. The EVP is a member of the ATSC Executive Committee, and other SMPTE members participate in ATSC committees. It is expected that ATSC will be wound up within the next year, as its primary work in ATV comes to an end. At that time, it is proposed that NAB take over maintenance of those ATV delivery standards that are not part of the FCC rules, and that SMPTE continue to maintain the related production standards. JCIC action may be needed on a number of other cross-industry standards and harmonization issues.

DAVIC

The informal liaison between DAVIC and SMPTE has continued, with SMPTE standards now formally listed in the DAVIC Technology TC. At the present time there is no need for formal liaison, as DAVIC is currently dealing with VOD and similar interactive issues. This may change in the near future, as SMPTE takes on a stronger role in multimedia.

CIE

SMPTE has, at present, only an informal working relationship with the CIE, the international body concerned with illumination and colorimetry. CIE has requested SMPTE participation in its JTAG-2 Workshop in Vienna, in April 1996. SMPTE will prepare a contribution summarizing

the excellent progress in colorimetry for television systems that has been made in recent years. A contribution is proposed that will define a uniform colorimetry worldwide for digital TV systems, at all levels of resolution and with compatible normal and extended color gamuts, based on the work of SMPTE WG-Col.

ITU-R

I am pleased to report the contribution of SMPTE standards in the work of the ITU-R. A number of recommendations (Rev. Rec. BT.709, Rec. [11/31], A Target Standard for Digital TV in the Studio, Rev. Recs. 601 and 656), based on SMPTE standards, were adopted in the June meetings of ITU-R SG-11 (TV Broadcasting) as international standards. They include SMPTE 240M, SMPTE 274M for HDTV, and SMPTE 125M, as well as related documents on digital interfacing, geometry, and centering. SMPTE remains a major source of information for SG-11; in the near future, with a proposed reorganization of the structure of SG-11 to include a specific working party on production matters, SMPTE documents will be of particular value.

IMA

An agreement has been reached with the IMA for SMPTE to take an active responsibility, in cooperation with IMA, for standards covering certain aspects of interactive multimedia, such as authoring, interfaces (both hardware and software), and release standards. This work will benefit those members of the SMPTE constituency who are increasingly active in the merger of computers and recording.

MPEG

Through the AHG - Compression, SMPTE is participating in the development and testing of the 4:2:2 Professional Profile of MPEG-2, aimed at production and distribution applications in the region of 20 to 50 Mbits/sec. Work is currently in progress for the testing and qualification of the performance of this profile for production and post-production. A completion date early in 1996 is anticipated.

ATV Demonstrations, New Orleans Conference

As most of you are aware, the ATV system proposed for North America specifies the use of the MPEG-2 Main Profile @ High Level, which imposes certain cost impacts on the ATV receiver and makes the design of a really low-cost receiver impracticable. This may delay the introduction of ATV or the penetration of receivers necessary for the broadcasters to implement ATV services widely.

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During the New Orleans conference, SMPTE Engineering, in cooperation with Hitachi America, presented a demonstration of one possibility for implementing "decoder scalability" of the high-level compressed bit stream to obtain a lower level picture with what is essentially a main-level decoder. This approach could have a significant effect on the cost and penetration of ATV receivers, ensuring that all receivers, even the low-level ones, can receive and display all formats. SMPTE is grateful to Hitachi America for its kindness in arranging this demonstration.

SMPTE on the Networks, SEEC and the Internet

SMPTE continues to expand its presence in the electronic information networks, SEEC and the Internet, both to improve the efficiency and effectiveness of its work and to make its work and the results more widely

available to an expanding community. The Internet WWW site is now operational and already contains much useful information regarding SMPTE activities, organization, standards, meetings, etc. The Society is grateful for those members who have made this possible, and in particular to Rene Villeneuve and Charles Poynton, who have devoted much time and effort to the project. Contributions from a number of sources are now possible, under the control of Carl Girod at Headquarters.

The SMPTE site is also cross-referenced at a number of other sites, such as IEEE and ATSC. For the first 25 days of operation (July 7 to 31), we had 6,422 requests for a total of 42 Mbytes of data. Of this, the highest demand were for the Standards Subject Index and Standards Scopes. As mentioned earlier, SMPTE is also cooperating with the EBU to assist in bringing international standards activities closer together.

Where Are We Heading Tomorrow?

SMPTE standards development is challenged continually to maintain a coherent set of standards, primarily for production and release of motion picture and television programs, content in the current vernacular, in the face of rapidly changing technology and a highly dynamic business environment. Its standards development programs must then be timely, efficient, and focused on the next requirement before many in the affected areas may realize that there is a need. The challenge is complicated by the need of some manufacturers to maintain some level of confidentiality regarding their emerging or developed products, thus compromising the goal of open standards and interfaces on which our industries heavily depend to obtain the efficiencies in their specific applications. The pioneering work of TRRT to document what should and what should not be part of a standard is to be commended.

As mentioned earlier, the coming year will see a major move into standards for data compression in production, packet transmission of video data in production and distribution, and the production and application of interactive

and multimedia content. Further work is also required to align the standards for digital TV with the needs of ATV and the computer industries, as more flexible formats develop from those currently in place.

These moves into new areas may necessitate a revision to the division of work among the Technology Committees and perhaps the creation of a new one, more tightly focused on the future needs of the SMPTE constituency. Generally, though, the current organization is working well, thanks in large measure to the foresight of the Engineering Directors, Rami Mina and David Fibush, and to the hard work of the Technology Committee chairs, so there is no urgent need to rush into changes and to suffer the attendant temporary loss of efficiency.

What Are the Challenges Ahead of Us?

For a moment, I would like to focus on the long-term future, at a time when the current reengineering of the entertainment and information content industries has passed its birth phase and the necessary adjustments to business, legislation, regulation, and the like are in place. What will the industry look like? What will be the needs for standards, or will standards still be needed at all? How will these standards be developed, by whom, and with what resources?

I do not claim to have a crystal ball of unqualified resolution and range, but it seems to me that these questions must be addressed, as there is still a need — probably an enlarged need — for standards as the open, accessible, electronic highway delivers the goods of electronic publishers. Similarly, content will be produced in a variety of forms and delivered in conventional, as well as innovative digital forms, some with added security through encryption and keyed access. The need for openness of standards, interoperability, flexibility for applications, and growth seem obvious, but in today's environment of change are all too easily forgotten in a push to obtain a temporary competitive edge in the busi-

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ness arena. Is this a sound approach? I think not.

SMPTE can point to eight decades of solid progress in standards development, in leadership, and in achieving a worldwide reputation for sound, solidly based standards of benefit to our community of interest and to those coming into it. The future needs this approach, involving the widest range of interests in the processes, seeking standards that are inclusive of the largest segment of industries and applications, that have the openness, flexibility, and room for the future, to make them useful as the basis of content making and release, SMPTE's business. We must move in a meaningful, determined fashion to take in new interests, to innovate with new applications, and to seek new resources for the work; to use the most efficient means to do the work, but to be aware of the obligation not to exclude any affected interests thereby. But we should not lose the traditions of four decades of experience.

Standards are achieved by consensus. They are useful only if the interests agree. Consensus is not obtained by narrow voting, relying on procedural approaches to stifle valid objection, or by writing standards that are equally objectionable to all competing interests. Consensus requires some give and take, future vision, and breadth of view, but ultimately it is the only approach that will lead to the future. SMPTE standards development will surely change radically in the new environment, with new interests, new industries, and new technologies, but the underlying principles will not change drastically if we are to succeed.

Conclusion

As this will be my last report to you as Engineering Vice-President, I would like to take the opportunity to thank you all for the cooperation received in carrying out my duties over the last four years. In that time major changes have taken place in the industries we serve and in the approach that we are taking to standards development and distribution, CD-ROM, SEEC, and the Internet-WWW being examples of this change.

I believe that the next Engineering Vice-President will have plenty of challenges to meet, as ATV is introduced, the NII moves to become a useful highway, and fully digital, interoperable delivery mechanisms supersede the current somewhat closed approaches. I wish him well in his endeavors and pass on to him an organization, both at Headquarters and in all the Technology Committees, which has given me great support and for which I am most grateful.

I must also acknowledge the tremendous support of the two Engineering Directors, Rami Mina for Motion Pictures, and Dave Fibush for Television; and of the Director of Engineering, Si Becker and, more recently, Carl Girod. All of them have provided so much wise advice and enthusiastic support to the work. Finally, I must also thank the many volunteers, who have contributed so much to keeping SMPTE standards at the forefront of technological advances worldwide.

Thanks to them all, it has been a most pleasant and rewarding experience.