Engineering Report

By Stanley N. Baron
Engineering Vice-President

Today, in the fourth and last of my annual reports to the Society, I want to touch on some important issues that your Society is working to resolve and talk somewhat of our past and our future.

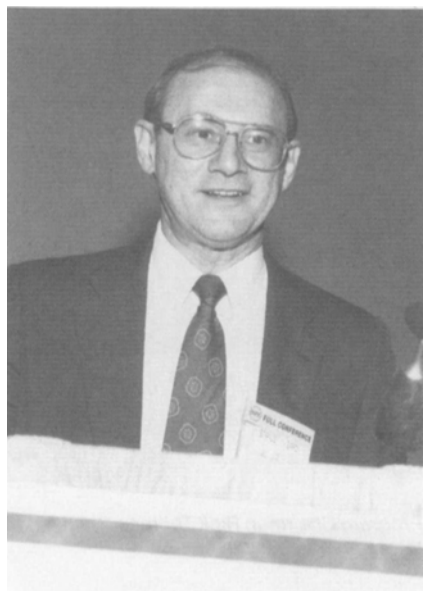
In analyzing what makes our Society work, we realize that the total spectrum of the motion-picture, television production, and allied arts and sciences can be divided into a series of interdependent disciplines or areas of interest. The level of activity within the Society in each discipline or area of interest must achieve a certain critical mass for the Society to be effective. The Society has been successful in its 75 years of service, in part, because it has recognized when certain disciplines have reached sufficient critical mass to warrant the Society's attention; it has embraced these disciplines and in doing so, it has provided valued service to the technologies it serves.

In 1916, the founders of the Society recognized the need to create standards in the field of motion-pictures and helped to bring technological order to an industry that is still an important economic force in the world community. In the 1950s, an electronic form of imaging, television, became an essential part of the technologies the Society already served, and the Society expanded its role to incorporate this new technology and help it grow. As we enter the 1990s, the Society is again faced with the challenge of a new set of technologies.

Convergence of Imaging Sciences — The Future Imaging Media World

Some years ago, our then Engineering Vice-President, and today's keynote speaker, Rollie Zavada, suggested that in the very near future the various imaging sciences would converge into one integrated environment.

Today, most everyone can agree that the advent of personal computers and advanced microprocessors and advances in related hardware and software technology have begun to make that prediction a practical reality. Recent advances in both hardware and software technology are dramatically affecting the industries served by the Society. The combination of these various technologies now affords both the possibility of low-cost, desktop, multimedia production services and high-end, high-resolution, and ultra-high-resolution imaging services. The total spectrum of the motion-picture, television production, and allied arts and sciences has been impacted. Specifically, the new multimedia technologies provide:



Engineering Vice-President Stanley N. Baron delivering his report to the conference attendees.

- The creative artist with low-cost means of preparing treatments or storyboards to visually demonstrate the final product.
- Newsgathering organizations with a low-cost means of creating graphics, editing, and producing news programs in an environment in which speed of access, portability, and cost goals are below current product offering capabilities. The new media makes practical the concept of full-field or off-line production organizational structures producing final product for integration at the distribution point.
- Industrial organizations with a system that will support training, sales, and internal communications with better cost/performance goals in a practicable manner.
- Other media, such as print, with services that are appropriate for their requirements *and* provide interoperability with the technologies currently served by the Society.
- Schools, industry, business, or other settings with interactive presentations that can be used in learning and training situations.
- Multimedia presentations are also finding use as a general communications tool. It is reasonable to expect that multimedia hardware and software will begin in less sophisticated applications and progress to more sophisticated applications.

SMPTE has a 75-year history in the standardization of moving-image technologies and associated audio. To ensure future success, imaging media will require standardization of the input devices, interfaces, scripts, image file structures, headers and descriptors, etc. Many of the input devices and the interface signals that provide full-motion images have already been standardized by the SMPTE, and in fact, it is these interfaces and devices (for example, videotape players, digital video signal formats, etc.) that represent one of the most technically difficult areas in constructing a functional, integrated imaging-media environment.

Another difficult area is establishing a means of communication between the various motion-imaging standards. It is now clear that different industries will each adopt image standards that most effectively and efficiently meet the needs of the markets they serve. What is needed is an agreement on a common communications protocol for exchanging information and an understanding of how these standards relate to each other on a hierarchical basis.

Report on the Digital Systems Information Exchange Task Forces

The Advanced Television Systems Committee, the Institute of Electrical and Electronic Engineers, and the SMPTE jointly sponsored Digital Systems Information Exchange meetings in November 1990 and March and

September 1991. The purpose of these exchanges is to bring together those parties in the computer, motion-picture, and television industries who are actively engaged in HDTV and HRS (high-resolution systems) related activities.

At the end of the two-day session in March, there was agreement to begin joint investigations into two areas of common interest. The first concerns the communications protocol I mentioned earlier, a digital interface header/descriptor protocol to permit the exchange of digitized images across industry and standards boundaries. The second was a study of a possible hierarchy of standards to meet various industries' requirements. It was agreed that the studies would be conducted within the standards activities of the Society of Motion Picture and Television Engineers.

With this agreement, the Society formed the Task Force on Headers/Descriptors, which has been assigned the task of recommending a protocol to enable the exchange of images, image files, and image sequences in digital form between systems. Such a common protocol will facilitate the exchange of images created under different standards.

The group presented a status report on its work to date at the third session of the Digital Systems Information Exchange in September, and expects to have its report completed, as scheduled, by December 31, 1991. Areas where detailed investigation is taking place include the header kernel, appropriate error-correcting codes, and block-length specification.

The Society has also formed the Task Force on Digital Image Architecture, which has been assigned the task of developing a structure for a hierarchy of digital standards to facilitate interoperation of high-resolution display systems. The resulting system of standards will be open (nonproprietary), scalable to various performance levels, and extensible to new technologies. This task force also intends to complete its work by December 31, 1991.

Your Society is deeply involved in opening the doors to the future integration of the imaging technologies. The challenge is to create a pathway to imaging media that considers the full range of imaging needs from multimedia applications to 70mm motion pictures and beyond.

The 1992 Annual Conference and Equipment Exhibit in Toronto

To further assist in creating the critical mass necessary to make this integration of the various media a success, the Society will develop and promote paper sessions, workshops, and a specific exhibition area, called "Multimedia World," within the 1992 Annual SMPTE Conference and Equipment Exhibit in Toronto. The purpose of this focus on the imaging-media disciplines at this and future conferences will be to provide an opportunity for the expression of the economic benefits and application of these technologies within the technologies we serve. The 1992 conference in Toronto will actually be the second step in addressing the needs of the imaging media world.

The 1992 Advanced Electronic Imaging and Television Conference in San Francisco

The first step will begin to address the needs of the high-resolution imaging environment and includes papers that will be presented at this conference and at the Society's Advanced Electronic Imaging and Television Conference in San Francisco next February, where a program of papers, tutorials, and workshops are planned. The theme of this event is "Collision or Convergence: Digital Video/Audio, Computers, and Telecommunications," and it will address the need for technological compatibility between television and computers.

Opening the Door to the Future

The Society now faces another challenge and opportunity similar to the ones it faced in 1916 and in the 1950s. The challenge will be to sort out the essential issues concerning interoperability between all of the imaging media that affect the technologies and industries served by the Society. The opportunity lies in opening the door to the future world of communication via the imaging technologies and firmly placing the Society in the center of the action.

The Society is well positioned to lead the way to the future. The Society has a 75-year-old, proven history as a developer of voluntary standards in the moving-image disciplines and associated arts and sciences. The Society's Engineering Department has, in the past four years, instituted necessary changes to prepare us to meet the future demands of the industry. These changes include: revising our practices so that the minimum cycle to produce a standards document was cut in half; implementing a desktop publishing system that enables us to better support the standards creation activity, improves the cycle time for publishing the results, and reduces significantly (at $100 per page) the cost of production; and reorganizing the scope of work of the technology committees to allow us to accommodate the changing needs of the Society's focus.

Conclusion

When I assumed the responsibility of the office of the Engineering Vice-President of the Society, I did so with some idea of a set of goals. My goal was to prepare the Society's Engineering Department for that future predicted by Rollie Zavada. I believe *we* have accomplished that goal.

I am proud of the accomplishments of the past four years and want to express my appreciation to all of those who made it possible. The entire list of individuals is too long to recite here, there being some 600 individuals who have volunteered some of their time to contribute to our standards process and other Engineering Department efforts, but certainly thanks must be given to the three Society Presidents who have given me the benefit of their guidance: Carlos Kennedy, Maurice French, and Blaine Baker, and to the three Engineering Directors who helped share the work load of this office: John Baptista, Rami Mina, and the man who will assume those burdens of office in January, Ken Davies. I want to take this opportunity to commend Si Becker, the Society's Director of Engineering, for the high level of professionalism he brings to this office, the support he provides to all aspects of the Engineering Department's work, his breadth of knowledge in the fields of television and motion pictures and the allied arts and sciences, and his understanding of standards activities outside the Society within which we must function. My efforts on behalf of the Society would not have been possible without the support, at NBC, of Peter Smith and Michael Sherlock. And finally, my thanks to the members for the honor of allowing me to serve as Engineering Vice-President.