

# The Commitment of SMPTE to Standardization

By Alex E. Alden

*The motion-picture industry, in addition to its dependence on artistry and creativity, is rooted in mechanical and scientific efforts to an extent seldom equaled in other industries. In 1916, realizing the need for standardization and cooperative effort, our Society was organized in an effort to bring order to the confusion created by the nickelodeon boom, when no two pieces of equipment were alike. The SMPTE has very effectively fulfilled that charge.*

Standardization is not a simple subject, and at times it can prove to be very controversial and costly. Questions are raised over and over, such as: what are standards, why do we need them, and how are they developed. Webster's Collegiate Dictionary 1977 ed., lists 15 different definitions of the noun. The one which the Society is most concerned with reads, "Something established by authority, custom, or by general consent as a model or example." The more cynical might add, "to the engineer standards are the Golden Rule; to the sales-oriented, a handicap."

SMPTE Standards are written technical standards developed by those substantially concerned with their use. They are published and made available to those who wish to review them and possibly use them. Thus, they become a common language between buyer and seller; the buyer may be an industrial, governmental, or retail user, and the seller, a manufacturer or producer. Or the buyer may be the individual consumer who buys products for his own use.

A standard may be a simple paragraph or it may be a voluminous document. It may cover only one facet of a product, or it may cover all recognizable facets of a system. A standard may be a unit of measurement, such as the inch or the mile, which were established by statute of Queen Elizabeth I of England. A light bulb fits into a socket because there are voluntary standards for the dimensions of the lamp bases and lamp-holders, as well as for the direction and size of the screw-threads.

The history of standards development was effectively

reviewed by Janet Staiger in her paper, "Standardization and Independence: The Founding Objectives of The SMPTE," in the June 1987 *SMPTE Journal*. It clearly illustrated that without standards, while there may be commerce, the customer, as well as industry itself, suffers from inherent confusion.

In the 1920s the "crusade for standardization" received its impetus from a survey report, "Waste in Industry," by the American Engineering Council of the Federated American Engineering Societies, whose president, Herbert Hoover, initiated the survey. The report disclosed that 25% of the costs of production could be eliminated, without affecting wages or labor, and that \$10 billion could be saved annually through standardization alone.

For 75 years the SMPTE has functioned as the organization for the development of industrial standards in the motion-picture world, both nationally and internationally. In 1950 the Society, then known as the Society of Motion Picture Engineers, recognized the newborn television industry and opened its facilities to assist in establishing the highly needed operational standards for film transmission. The name change to the Society of Motion Picture and Television Engineers resulted in a substantial gain in membership from the ranks of television, and now the Society proudly claims as members many television systems development and operations engineers, as well as broadcast management personnel.

The first set of standards, published in 1917, covered some 15 subjects and were simple statements of engineering practices, such as dimensions of motion-picture films, position of the frame line, splicing specifications, image area sizes, projector and camera speeds, and film sprockets. In the late 1920s the Society undertook the standardization of audio records accompanying the picture material. Today the Society holds the responsibility for maintaining American National Standards Institute (ANSI) Standards, and SMPTE Standards, Recommended Practices, and Engineering Guidelines in the motion-picture and television areas. It must be noted that SMPTE Standards and ANSI standards are not considered to be

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## THE COMMITMENT OF SMPTE TO STANDARDIZATION

different levels of standardization, and the existence of one does not preclude the existence of the other.

Historically the Society has dealt with subjects concerned primarily with the interchangeability of systems and associated equipment. While it has not developed performance standards, it has documented test materials to examine performance or check systems with respect to basic standards. These documents deal with interchangeability and typically cover dimensions and specifications for parts of systems, location and position of image areas of picture and associated audio and control signals, and electrical characteristics of signals that need to behave in a precise manner to effect a specific result such as sound or picture reproduction. Standardization of terms and nomenclature is restricted to operational subjects and does not include the basic terms established by organizations such as the International Commission on Illumination (CIE), National Bureau of Standards (NBS), or which have been accepted through literature or international agreements.

While the SMPTE is the only organization holding the responsibility for motion-picture standards, it is one of several organizations that develop standards in the operational aspects of television systems, and it maintains close liaison with these outside organizations. As in all rapidly expanding disciplines, the need for standards in the television area forced the initiation of procedures to allocate priorities and to avoid redundancy. In 1950 the Society joined forces with two organizations specifically concerned with broadcast television; the Institute of Radio Engineers (now the IEEE) and the Radio Manufacturers Association (now the EIA), and formed a coordinating committee known as the IRS. This group was later expanded to include the National Association of Broadcasters (NAB) and the National Cable Television Association (NCTA), and today it is known as the Joint Committee on Inter-Society Coordination (JCIC).

While historically the Society has followed marketplace acceptance before initiating a standardization effort, it has established a series of Study Groups that review and follow emerging technologies and recommend standards development once it is felt appropriate. In recent years the Society has broadened its areas of concern to include the standardization of electrical control signals such as time code, equipment control, and editing formats.

The decision to begin standardization on emerging technology is a matter of delicate timing. If started too soon, it may endanger innovation and competitive design; if too late, competitive duplication of systems flood the marketplace, which always harms industrial expansion and long-term economic success.

Senator Philip Hart once noted, "At first blush, there appears to be an inherent conflict between standards and antitrust. When a selected few sit down and agree upon a standard, the odds are the standard will hurt somebody who is likely to be making a similar product which does not

meet their standard. Nonetheless, standards are necessary." In 1922, Herbert Hoover, as Secretary of Commerce, requested an informal opinion of the Attorney General as to the legality of trade association activity in standards development. The Attorney General provided the following guide: "I can see nothing illegal in the exercise of the activities mentioned, provided always that whatever is done is not used as a scheme or device to curtail production or enhance prices, and does not have the effect of suppressing competition."

As a guide in the SMPTE standardization program, the Society always follows the basic concept set by the Sherman Act, which forbids any contract that "by reason of intent, and as the inherent nature of the contemplated acts, prejudices the public interest by unduly restricting competition or unduly obstructing the course of trade."

It is only when a responsible group, or organization such as the SMPTE, works through engineering committees to develop a voluntary standard with the intention that it be published and widely used, that an industry-wide standard or a nationally recognized standard can result. The initiation of a standards project may be at the request of a consumer group, an industry group, a professional society, a government agency, or any responsible person.

From time to time engineering practice is disturbed by the introduction of proposals that suggest changes in an established system so radical that some concern is raised in areas where the responsibility is primarily that of equipment investment. During such times of technical unrest, the Society is always under pressure to give guidance and direction. The exact role of the SMPTE in these cases is often misinterpreted and misunderstood.

This becomes most evident when the Society is asked to develop a standard for only one of several proposed systems, which in effect would make one system standard and others not. This the SMPTE cannot do. The SMPTE cannot dictate industrial policy or guarantee future engineering activities. For this Society, or any organization, to embark on such a program would contribute to technological stagnation and invite serious legal implications. J.W. McNair, who was at the time the technical director of the American Standards Association, pointed out: "It is the business of a gyro-stabilizer to keep the ship on an even keel when it is being buffeted by waves, not to stop the ship. Just so it is the business of a successful standard to help industry to maintain itself in 'dynamic equilibrium,' not in a 'static' condition."

Different standards-writing organizations vary in the procedural details of writing and publishing standards, but for the most part, two basic methods are accepted by ANSI in determining whether the standard can be approved as an American National Standard: one is the Committee Method, and the other the Canvass Method. Within the SMPTE the development of a standard, or any engineering document, is

## THE COMMITMENT OF SMPTE TO STANDARDIZATION

by the Committee Method, which is open to all interests substantially concerned with the subject of the standard under consideration. The technical phase of writing a standard is performed by one of the Society's Technology Committees. Every effort is made to establish and maintain the committee composition to be representative of the broadest sections of industry and users, consistent with the committee's purpose and scope. These committees, in writing standards and other engineering documents, reflect good engineering practice based on a consensus of those versed in the art, but clearly cannot dictate direction or choose one method or system over another.

It must be quite clear that the SMPTE cannot perform any function that would normally be the responsibility of business management. The Society can be instrumental in bringing together interested parties to find understanding on a common ground. However, in the absence of cooperative initiatives, the SMPTE can only act as a moderator in keeping the discussion going. Unlike the national law-type standards of some foreign countries, the American voluntary standard is intended as a guide to aid, not to compel the manufacturer, the consumer, or the general public. The establishment of a national or SMPTE Standard or Recommended Practice in no respect precludes anyone from manufacturing, marketing, or purchasing articles not conforming to the standard. Our standards are entirely voluntary, and the usage of standards is dependent completely on the personal affairs of the user. Similarly, the existence of a standard does not imply continuity of the life or value of the described subject matter. Consequently all American National standards and SMPTE Standards and Recommended Practices are subject to periodic review, usually every five years, to ensure that their contents are in harmony with up-to-date accepted methods and engineering practices.

In spite of our seemingly complicated standards structure, there is no doubt that it is the most imitated, used, and envied standards system on earth. In promoting our system of voluntary nongovernmental standards, we make an enormous contribution in the pursuit of international understanding in a most efficient manner, and in a way that prevents occurrence of unintended and unnecessary harm.

In addition to its responsibilities in the development and maintenance of national standards, the Society also recognizes its international responsibilities in its leadership role in the field of international standardization. In the area of television, the Society participates actively within the committees and working parties of three basic organizations. The Society works with the International Radio Consultative Committee (CCIR), a subgroup of the International Telecommunication Union (ITU). Via the U.S. State Department and the FCC, the Society offers recommendations developed by our Technology Committees. The Society also works through liaison with the European

Broadcast Union (EBU) on television broadcast questions. In 1965 the Society assisted in the organization of the IEC Technical Committee 60 on Magnetic Recording. Although the Secretariat was retained by Belgium, the chairmanships of all three subcommittees, Audio Recording, Video Tape, and Audio Visual, were filled by U.S. representatives.

In the motion-picture field the Society clearly established its leadership internationally when in 1948, through the efforts of Dr. Deane White, it affected the organization of the Technical Committee 36 on Cinematography under the International Organization for Standardization (ISO), and established the U.S. as its Secretariat. Since the beginning, the Society has assisted ANSI in the administration of the work, and in 1970 took over the total activity in ANSI's name. This responsiveness to world leadership has contributed significantly to SMPTE's reputation and helped a great deal in regard to a very favorable international balance of payments from the motion-picture business exported abroad.

For the last few years there has been concern regarding the growth of foreign and regional standards. The Society can and must do all it can to minimize this concern by working through our close liaison with many international organizations such as our sister societies, the British Kinematograph, Sound and Television Society (BKSTS), and Fernseh und Kino technische Gesellschaft (FKTG), as well as the international organizations listed previously.

Standards are the lubricant that eases the flow of international trade, and it is obvious that the nations that lead in the development of standards are in the best position to gain acceptance of their own technological and commercial practices. The SMPTE, with its large international membership, is in an excellent position to establish new liaisons and reinforce existing ones to strengthen communications, minimize misunderstanding, and help achieve common goals.

The importance of the development of standards cannot be overemphasized. Unlike conventional industries, standards output cannot be measured by number of widgets, services performed, or dollar volume of sales. Rather, like financing or brokerage, it is a vital intermediate service, without which the economy would not be able to function as efficiently. The SMPTE was formed on this very premise and should not lose track of that responsibility. Many organizations publish fine journals, organize excellent equipment displays, and put on good engineering conferences; however, only a few, such as the SMPTE, gain their national and international reputations through their standards programs. Without standardization the development, or even the existence, of a long term industry is not possible. Consequently, it is vital that we continue to participate fully in the preparation and maintenance of standards, both national and international. As members of the SMPTE, each of us has two important responsibilities. We

must sustain the basic concept that our Society speaks for our industries, and we must continue to be the strong leader in the technological world that we have been for so many years. As individual engineers, we have a definite responsibility to our profession.

It is very disturbing to see the degree of lack of understanding of the significance of standardization in relation to the marketplace. The company executive, to be successful, must know what is happening and how it affects his operations, and more important, his engineers must be urged to help in the preparation of the standards that his company may be compelled to follow. These two responsibilities can only be accomplished through strong liaison with our associates around the world. Without this effort, developing technology turns into a mad race to the marketplace in an

effort to ensure a short-term gain, although it is well known that under such conditions long-term economic stability is not possible.

The Society of Motion Picture and Television Engineers fulfills its responsibilities to our industries by maintaining a constant vigilance over their technical activities, through a large group of volunteer specialists working in a structure of Technology Committees, Working Groups, and Study Groups. These, some 800 members, devote a great deal of time to the preparation of proposed new standards and to the updating of existing standards. The hand of industry should be extended in gratitude to this group of engineers, whose voice and opinion the SMPTE reflects through its standardization program, as well as to the parent organizations that fund their participation.

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## A Short History of Standardization in the SMPTE

By Gordon A. Chambers

*In the October 1933 issue of the Journal, Dr. Loyd A. Jones published "A Historical Summary of Standardization in the Society of Motion Picture Engineers." This paper gave a review in considerable detail of the standardization activities of the Society since its founding in 1916.*

At the incorporation meeting in Washington, D.C. on 24 July 1916, Henry D. Hubbard of the National Bureau of Standards spoke on the desirability of standards in the industry. The dimensions he proposed for what we now call 35mm film were exceedingly close to what is used today.

### Frame-Line Location

One of the important problems in the early days was the lack of uniformity in frame-line location. This was early specified as coinciding with the center line of the perfora-

tions. Cameras of many different makes were in use, which resulted in various locations for the frame line. Even cameras of the same make gave negatives with different frame-line locations. It was not until the late

1920s that this problem was solved—when the studios rather than individual cameramen began to own and maintain the cameras. Conformance to standards in the United States is voluntary rather than a legal requirement as it is in many countries abroad.

Dr. Jones pointed out the association of the Society in the matter of standards with the American Engineering Standards Committee and its successor, the American Standards Association (ASA), currently the American National Standards Institute (ANSI). The standards adopted in early 1930 were published in May and reprinted in a booklet dated 20 September 1930, which carried the cachet of the ASA on its cover. It was not until 1941 that separate numbers were assigned to individual standards under the Sectional Committee Z22 designation. Z22 was changed to the designation PH22 in 1951.

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