

HISTORY OF THE INSULATED CABLE ENGINEERS ASSOCIATION

This history covering the period up to 1962 was written by William A. Del Mar, Past President and one of the founders. Since then it has been edited and up-dated by Edward E. McIlveen, Secretary - Treasurer.

Strange as it may seem, the history of IPCEA begins several years before it came into being, but that is not unique, as neither man nor his organizations is born without a period of preparation before the final form is accomplished.

It is hard to settle upon a date when events leading to the formation of IPCEA began to take shape. Perhaps the most practical date is the year 1920, when the National Electric Light Association issued a specification for impregnated paper insulated cables which covered what we now designate as cables of the "Solid-Type," that being the only type of impregnated paper insulated cable then extant.

This specification was probably the best that could have been written at the time, but several outstanding engineers in the larger utility companies, such as D.W. Roper, of the Commonwealth Edison Co., Philip Torchio, of the New York Edison Co., W.M. Cole, of the Boston Edison Co., and P.H. Chase, of the Philadelphia Electric Co., had been carrying on investigations which indicated that the NELA specification could and should be revised to include requirements for higher quality cables.

The First World War, by greatly increasing industrial power loads and restricting cable production, had imposed unprecedented loads on existing cables with resultant increase of thermal failures. The high and uncontrolled dielectric loss in these cables was shown to be largely responsible for these failures, and a demand arose for a controlled lowering of this loss.

While the original NELA specification recognized the existence of dielectric loss, it merely required that it "shall not exceed the values submitted by the manufacturer with his proposal."

As Mr. Roper said of the 1920 issue:

"It was founded, not on a scientific basis, but rather upon ignorance and hope which must be replaced with knowledge." (Proc. NELA 1926, Vol. 83, p.1516)

These progressively minded engineers in the NELA accordingly set to work on a revision dated June 1922 which contained a number of clauses which manufacturers' engineers considered undesirable. They thought that the utility men needed some guidance from them lest, in their ignorance of process limitations, specifications might be issued containing requirements of an impracticable or uneconomical nature. They accordingly apprised their respective managements of this situation and advised that appropriate action be taken to enable them to work in concert with the utility engineers responsible for revisions of the NELA specification.

The Associated Manufacturers of Electrical Supplies (AMES), predecessor of the present NEMA, had no section or committee dealing specifically with paper insulated cables, and it was proposed to create a section or committee for that purpose.

Accordingly, on February 28, 1925, Mr. Frederic Nicholas, General Secretary of AMES, issued a call for a meeting to consider the formation of a Paper Insulated Power Cable Section of AMES.

In response to this, an organization meeting was held March 5, 1925, in the rooms of AMES, 30 E. 42nd St., New York. The attendance was as follows:

H.D. Kersey	American Brass Co.
H.G. Burd	
E.H. Hammond	American Electrical Works
G.H. Wagenseil	(Later the Kennecott Wire & Cable Co.)
J.I. Waters	
C.F. Hood	American Steel & Wire Co.
W.S. Clark	General Electric Co.
J.S. Worley	Habirshaw Wire & Cable Co.
W.A. Del Mar	
F.J. Newbury	John A. Roebling's Sons Co.
I.T. Faucett	Safety Insulated Wire and Cable Co.
G.M. Haskell	(Later the General Cable Corp.)
W.I. Middleton, Sr.	Simplex Wire & Cable Co.
P.H.W. Smith	Standard Underground Cable Co.
D.M. Simmons	(Later the General Cable Corp.)
R.W. Atkinson	
F. Nicholas	Associated Manufacturers of Electrical Supplies

After a long discussion, it was decided to form, instead of a section of AMES, an independent organization to be known as the Power Cable Engineers Association. The reason for this was that it was thought that utility engineers would prefer to cooperate with an engineering society.

In order to obtain a true perspective of happenings in the cable field at that time, it should be known that the years 1920-1922 marked a great improvement in cable quality. Dielectric loss was brought under control at comparatively low values, electric strength was greatly increased, mechanical uniformity improved, and factory test failures reduced to insignificance. It is important to note these dates, lest it be thought that these cable improvements were due to the new specifications, when, as a matter of fact, the new specifications reflected that a new quality of cables had become available. However, the pressure exerted by succeeding issues of the AEIC specifications has been, in general, helpful in improving and maintaining quality.

The first step in the organization of the new society was the election of the following officers:

Wallace S. Clark	President
P.H.W. Smith	Vice President
G.M. Haskell	Secretary-Treasurer

After appointing a committee to draft a Constitution and By-Laws, the group proceeded to consider changes in the proposed 1922 specifications of the NELA.

Looking back from the present magnitude and breadth of interests in IPCEA, it is hard for the newer members to realize that IPCEA began essentially as a paper insulated cable organization, with no thought of expansion into other fields.

The second meeting, March 20, 1925, at the Engineers' Club, New York, approved the proposed Constitution and By-Laws. The first article gave the Association its name, "Insulated Power Cable Engineers Association." The second article defined its purpose, as follows:

The purpose of this Association shall be to advance the compilation, study and standardization of technical specifications for the manufacture and testing of cables for the transmission of electrical power; and for the consideration of engineering problems connected with their installation and use.

The third article provided that: Membership in this Association shall be individual and shall be limited to officers and members of the technical staffs of manufacturers of impregnated paper insulated cables.

This constitution remained in force until 1932 when a first revision was issued, and other revisions followed in the years to come, including a major change in 1975.

The NELA and AEIC Specifications

The second meeting continued the discussion of proposed revisions of the NELA specifications.

The third meeting was held May 20, 1925, at the Yale Club, New York.

Copy of a letter from President Clark to D.W. Roper, Chairman, Cable Insulation Research Subcommittee of the Underground Systems Committee of NELA, giving suggested changes in the NELA specifications, was read, discussed and approved.

It was decided that "super high tension cables," i.e. those involving tests more severe than 165 volts per mil of insulation, should be regarded as experimental.

The fourth meeting was on July 15, 1925. The minutes refer to a letter from Mr. Roper to President Clark, in reply to the latter's letter of recommendation, saying that "the present specifications altered in accordance with that letter, will have the form of cable specifications, but not the substance."

The fifth meeting was held September 30, 1925 at the Yale Club. R.J. Wiseman, Chief Engineer of the Okonite-Callender Co., who had not participated in the original set-up, was elected member.

The proposed action of AIEE to raise the permissible operating temperature of impregnated paper insulated cables from 85-E* to 90-E*, was discussed and it was decided to recommend that this change be regarded as tentative and further action postponed pending the results of tests at the Massachusetts Institute of Technology, on wood-pulp paper cables.

The sixth meeting was held at the Engineers' Club, New York, February 25, 1926, at which a paper cable specification by Brooklyn Edison Co. was studied and suggestions made for changes.

The seventh meeting was held at the Yale Club, March 17, 1926. At Mr. Roper's request, it was agreed to send samples of wood-pulp paper used by the manufacturers to M.I.T. for test.

The eighth meeting was held at the Yale Club, March 24, 1926. Here, for the first time, paper cable specifications by the Association of Edison Illuminating Companies (AEIC), issued November 1924, made their appearance. Proposed changes were prepared and the Secretary was instructed to communicate them to Mr. Philip Torchio, Chairman of the AEIC Committee.

*FOOTNOTE: - E = minus rated KV.

Arrangements were made to entertain foreign engineers attending the New York meeting of the International Electrotechnical Commission.

The ninth meeting was held at the Yale Club, September 2, 1926, when the NELA specifications were again discussed and additional changes proposed.

While the NELA specifications continued in use until the early 1930's they were gradually to become identical with those of the AEIC. The last mention of the NELA specifications occurs in the Minutes of December 1927. In a summary of cable inspected during 1930, of a total of 7,493,570 feet, less than 7 per cent were under NELA specifications. (Proc. NELA 1932, Vol. 89, p. 1094). With the dissolution of NELA, the specifications went out of use, leaving the field to the AEIC. Revisions of the original 1924 AEIC specifications were made over the years, and continues to this day, all with IPCEA cooperation on the technical features.

The First Expansion

The early meetings of IPCEA were confined to paper insulated cables and their accessories and assisting other associations in the preparation of specifications. No thought of preparing specifications of its own or departing from the subject of paper cables is revealed by the minutes until the tenth meeting, which was in November 1926, when two revolutionary steps were proposed by two ambitious members, whose names are not enshrined in the minutes, but were probably W.I. Middleton, Sr., and R.J. Wiseman. It is doubtful whether these two members realized how revolutionary their proposal turned out to be. What they were proposing was in effect—

1st, that IPCEA expand its horizon beyond paper cables.

2nd, that IPCEA become a specification writing organization, instead of only helping others to write specifications.

At that time there were several organizations writing wire and cable specifications, but they lacked the technical knowledge that could be obtained only by an organization able to call upon the full knowledge of qualified engineers from the cable industry.

It was decided that such specifications would have to consist of recommended practices and that there would be no compulsion to abide by their requirements unless so specified by the purchaser.

The first case that demanded attention was varnished cloth (then known as varnished cambric) insulated cables. Russell Bellezza, of the General Electric Co., was active in promoting this project.

Varnished Cloth

Several varnished cloth insulated cable specifications were either in use or in process by various organizations, but they insured neither quality nor economy.

IPCEA decided on the bold step of writing a specification of its own, and at its tenth meeting, November 18, 1926, appointed W.I. Middleton Sr., Chairman of a committee charged with the preparation of a specification for varnished cloth insulated cables.

There was a third and equally important result of the proposal of the two unknown members. As there were companies other than those in the paper cable business which made varnished cloth insulated cables, and as it was important to have the cooperation of their engineers, provision had to be made for the admission of their engineers to the Association, by a constitutional amendment, which admitted them to a new class of membership called Associate.

First Rubber Insulated Cable Committee

According to Newton's First Law of Motion, once you start a ball rolling, it will continue to move in a straight line until some force deflects or stops it. So it was with IPCEA. Having embarked on specifications of its own, it was quite natural for President Haskell, at the October 1929 meeting, to propose standards for rubber insulated wires and cables.

A committee was appointed to study the appropriate insulation thicknesses of rubber insulated wires and cables over a range of sizes and voltages. This work attracted the attention of engineers familiar with rubber insulated cables who were not members of IPCEA, and it was deemed important to obtain their cooperation in the rubber cable project.

There were also a great many other engineers who were not members of the Association, and it was foreseen that solution of this problem would require the full cooperation of the industry.

A Rubber Committee or Section was tentatively proposed in January 1932 but was not adopted because there was a Rubber Insulated Wire Committee in the National Electrical Manufacturers Association (NEMA), and a new committee might involve duplication or inconsistencies.

Division into Sections and Revisions of the Constitution

The problem posed by the rubber covered wire engineers was solved by the division of the IPCEA into sections, each devoted to wires and cables insulated with a particular material.

The first serious proposal to adopt this plan was made at the meeting of December 1931 and was put into effect by the adoption of a second Constitution in January 1932.

The first two articles of this Constitution were the same as those of the first constitution, but the third article was different. It read as follows:

There shall be two classes of membership—Full and Associate. Full membership shall be individual and shall be limited to officers and members of companies manufacturing paper insulated power cable. Associate membership shall be individual and shall be limited to officers and members of the technical staffs of companies manufacturing varnished-cambric insulated power cable.

Thus the old members, tried and true, protected the Association from any radical innovations from their new and inexperienced Associates.

An amended Constitution was issued in January 1934, which was known as "The Second Constitution as Amended October 1933." It differed from the original Second Constitution only in adding to the Associate membership the engineers of rubber insulated power and communication cables. They issued The First Rubber Insulated Power Cable Specification in 1935.

The Third Constitution, adopted July 20, 1953, but modified July 23, 1953, provided for four Sections as follows:

- Paper Insulated Cables
- Varnished Cloth Insulated Cables
- Rubber Insulated Power and Control Cables
- Thermoplastic Insulated Power and Control Cables

The scope of the organization was re-defined as follows:

Art. I, Sec 3 - The activities of the Association shall be confined to matters related to insulated power cable engineering and research including, without limitation, consideration, preparation and publication of engineering specifications for insulated power cable and consultation and collaboration with other organizations and agencies in the preparation and publication of engineering standards and specifications for insulated power cables.

In spite of the limitation to "power cable" in Art. I, Sec. 3, Art. II, Sec. 3 (c) includes "communication cable."

A new class of membership was created, that of "Honorary Member."

The Fourth Constitution, adopted in May 1956, added two new Sections. The Sections as re-constituted were as follows:

- Paper Insulated Cables
- Varnished Cloth Insulated Cables
- Rubber Insulated Power and Control Cables
- Thermoplastic Power and Control Cables
- Overhead Bare and Covered Conductors
- Communication Cable

When the Fourth Constitution was drafted, it was clear that the Associate Members no longer needed the experience and guidance of the full members. Accordingly, the class of Associate Membership was abolished and all members were made eligible for office.

The Fifth Constitution, dated August 27, 1957, differed from the Fourth in procedural details which had proved unsatisfactory. It was superceded by a Sixth Constitution dated September 11, 1958, which was in effect until 1966.

Each Section was given the right to have its own Vice President, and these officers, with the President, constituted the Executive Committee.

There were some amendments during the next ten years as necessitated by the changing of times. Then on January 1, 1976, a new constitution was adopted which, in effect, established four autonomous Sections as far as technical activity was concerned, and eliminated the very cumbersome Joint Sections meeting. A series of understandable amendments followed to facilitate the operations of a reorganized Association.

On March 7, 1979, three major steps were taken by the Association, (1) the name was changed to Insulated Cable Engineers Association to better reflect the true and broader scope of our activities, (2) the Association would be incorporated to provide liability protection and, (3) a Portable Cable Section was added to focus more directly on an important and growing area. Constitutional amendments were duly adopted at that time to achieve these significant changes.

At the September 24, 1980 Annual Meeting, five items were amended, perhaps the most important being a provision for amending the Constitution by letter ballot. It is obvious from the foregoing history that constitutions must be amended as technology and circumstances change if an Association is to remain viable.