

List of International Electrical Units adopted at the Chicago International Electrical Congress of 1893, with Abridged Definitions.

The *international ohm* based upon the ohm of 10^9 c. g. s. units of resistance, represented by the resistance of a uniform column of mercury 106.3 cms long and 14.4521 grammes in mass at the temperature of melting ice.

The *B. A. ohm* = 0.9866 international ohm.

The *B. A. ohm* = 0.9889 legal ohm of Paris Congress.

The *international ampere*, one-tenth of the c. g. s. unit of current will deposit 1.118 milligrammes of silver per second under definitely specified conditions.

The *international volt*.

The Clark cell has an *E. M. F.* of 1.434 international volts at 15° C. when prepared according to definite specifications.

The *international coulomb*, which is the quantity of electricity transferred by a current of one international ampere in one second.

The *international farad*, which is the capacity of a condenser charged to a potential of one international volt by one international coulomb of electricity.

The *joule* which is 10 megergs.

The *watt* which is an activity of one joule per second.

The *henry*, the unit of induction, which is the induction in a circuit when the electromotive force induced in this circuit is one international volt, while the inducing current varies at the rate of one ampere per second.

List of Names Provisionally Adopted by the Institute for certain C. G. S. Magnetic Units.

The *gilbert*, for the c. g. s. unit of magneto-motive force produced by 0.7958 ampere-turn.

The *oersted*, for the c. g. s. unit of reluctance. The reluctance of a column of space in the air-pump vacuum, one centimetre long and one square centimetre in cross-section, is one oersted.

The *weber*, for the c. g. s. unit of flux. The flux in a magnetic circuit of one oersted reluctance, under a *M. M. F.* of one gilbert.

The *gauss*, for the c. g. s. unit of flux density, or one weber per normal square centimetre.

Names and Meanings Adopted by the Institute at its General Meeting in Philadelphia, May, 1894.

Inductance.—A coefficient of induction. It may be a *self* inductance or a *mutual* inductance where the distinction is necessary. Unit the henry.

Reactance.—The wattless component of resistance in an alternating current circuit, or that quantity whose square added to the square of the resistance gives the square of the impedance.

[Adopted May 13, 1884.]

[Amended December 8, 1885, September 27, 1892, and May 15, 1894.]

RULES.

I.

OBJECTS.

The objects of the AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS are to promote the Arts and Sciences connected with the production and utilization of electricity and the welfare of those employed in these industries; by means of meetings for social intercourse, the reading and discussion of professional papers, and the circulation, by means of publications among its members and associates, of the information thus obtained.

II.

MEMBERSHIP.

The Institute shall consist of Members, Honorary Members, and Associates. Members shall be Electrical Experts, Electricians, or Electrical Engineers possessing such knowledge of the principles of electrical science and such familiarity with the practical applications of electricity in its several branches, as those branches imply.

Honorary Members shall be recommended by at least ten members or associates, and elected by the unanimous vote of the Council, but shall not be entitled to vote or serve as members of the Council.

Associate Members shall be such persons as are or have been connected with the utilization of electricity, or who by means of study or experimental investigation are qualifying themselves to become identified with electrical science, and such others to whose admission no objection shall be made by any member of the Council.

Proposals for admission shall be endorsed by at least three members or associates, and referred to the Council, which shall have power to elect to Associate Membership only.

All members and associates shall be equally entitled to the privileges of membership.

Transfers from associate membership to membership, may be made by the Council upon application, subject to the approval of a Board of Examiners, which shall have the power from time to time to provide rules to test the qualifications of applicants. Such rules must be approved by the Council. Any person rejected by the Board shall have the right of appeal first to the Council, and finally to any meeting of the Institute.

The Board of Examiners shall consist of five Members, (three of whom shall constitute a quorum), who shall be appointed by the President and approved by the Council. They may not be members of the Council, and at least three of them must reside within convenient distance of New York City.

Any member or associate may be stricken from the list by the vote of three-fourths of the members of the Council, due notice having been mailed in writing by the Secretary to the said member or associate.

III.

DUES.

The entrance fee shall be five dollars for each person. The dues of members and associates shall be ten dollars per annum, payable in advance, at the annual meeting, except that new associate members elected, shall pay in advance, *pro rata*, from the first of the month of their election until the next annual meeting. Honorary members shall not be liable to fees and dues. Any member or associate may become, by the payment of one hundred dollars at any one time, a life member or associate, and shall not be liable thereafter to annual dues. The dues of members residing in foreign countries—beyond the seas—shall be five dollars per year, but such members shall have no vote for election of members. Any member or associate in arrears may, at the discretion of the Council, be deprived of the receipt of publications, or stricken from the list of members when in arrears for one year; *Provided*, that he may be restored to membership by the Council on payment of all arrears, or by re-election after an interval of three years.

IV.

OFFICERS.

The affairs of the Institute shall be managed by a Council, consisting of a President, six Vice-Presidents, twelve Managers, a Secretary and a Treasurer, all of whom, except the Secretary, shall be elected from among the members and associates of the Institute at the annual meetings in the manner set forth below, and who shall hold office as follows:

The President, the Secretary and the Treasurer for one year the Vice-Presidents for two years, and the Managers for three years, (and no person shall be eligible for immediate re-election as President, who shall have held that office for two consecutive years); and no Vice-President or Manager shall be eligible for immediate re-election to the same office at the expiration of the term for which he was elected. At each annual meeting, a President, three Vice-Presidents, four Managers and a Treasurer shall be elected, and the term of office shall continue until the adjournment of the meeting at which their successors are elected.

The duties of all officers shall be such as usually pertain to their offices, or may be delegated to them by the Council or the Institute. The Council may in its discretion require bonds to be given by the Treasurer. At each annual meeting the Council shall make a report of proceedings to the Institute, together with a financial statement.

Vacancies in the Council may occur by death or resignation; or the Council may by a vote of the majority of all its members, declare the place of any officer vacant, on his failure for one year, from inability or otherwise, to attend the Council meetings or to perform the duties of his office. All vacancies shall be filled by the appointment of the Council, and any person so appointed shall hold office for the remainder of the term for which his predecessor was elected or appointed; *Provided*, that the said appointment shall not render him ineligible at the next annual meeting.

Five members of the Council shall constitute a quorum; but the Council may appoint an Executive Committee, or business may be transacted at a regularly called meeting of the Council, at which less than a quorum is present, subject to the approval of a

majority of the Council, subsequently given in writing to the Secretary, and recorded by him with the minutes.

V.

ELECTION OF OFFICERS.

During the first week in February of each year the Secretary shall mail to each full and associate member of the Institute a list of members; a list of the offices to be filled at the ensuing annual election in May, giving the names of the incumbents, and a copy of this rule with the request that nominations, propositions and suggestions as to desirable candidates be made promptly and prior to March 1st.

The Secretary shall submit all answers to the Council, who during the month of March shall prepare a complete ticket to be headed "Council Nominees," containing the names of members whom they deem best suited, all circumstances considered, for the offices falling vacant. This ticket shall be printed on the same sheet with a second list headed "General Proposal list" containing the names of all eligible members proposed, with a memorandum stating the reason of ineligibility of all other names proposed, and with the statement that the nominations by the Council are in wise governing, but are intended only to assist members in making a choice. Opposite the name of each nominee in each list shall be printed a number indicating the number of nominations received by him, and a suitable explanation of these numerals shall be placed on this sheet. The voting shall be restricted to the names on this sheet. This sheet, together with an envelope, on which shall be printed the address of the Secretary, and the words "Voting Envelope—Enclosing a Ballot Only," shall, not later than the 15th of April be mailed by the Secretary to every member in good standing. Provided, that the Secretary shall also mail such ballots, sheets and envelopes to members qualified after April 15th, before the annual meeting, and that any member not having ballots and envelopes shall be entitled to obtain them from the Secretary at any time before the calling to order of the annual meeting.

Each member may cast three votes for Vice-Presidents and he may cast all three votes for one candidate, or two for one and one for the second, or one for each of three. Each member may cast four votes for Managers, which he may in like manner divide between from one to four candidates. This division shall be specified by the appropriate numeral marked opposite the desired name.

All names voted for shall be written, printed or otherwise marked on a single ticket or ballot, which shall be enclosed in a sealed, unmarked and unidentified "Inner envelope" of any suitable character to be in its turn enclosed either in the "Voting envelope" (received from the Secretary or in any other envelope marked on its face "Non-official Voting Envelope—Enclosing a ballot only." The outer envelope of either class must be identified by the signature of the member on its face, and must be sealed, and must reach the Secretary prior to the hour of the actual opening of the annual meeting.

At the annual meeting, these outer "Voting Envelopes" shall be opened in the meeting room by two tellers, then and there appointed by the presiding officer. After all the inner envelopes shall have been thoroughly commingled, they shall be opened and the votes shall be counted by the tellers, who shall report the results in writing. The eligible persons receiving the greatest number of votes for the respective offices shall be declared duly elected. The tellers shall reject all names that do not appear on the "Council Nominee" list or the "General Proposal" list, and they shall also reject that part of a ballot which shall name for any office or offices more candidates than there are vacancies.

This method of election shall apply to the offices of President, Vice-President, Treasurer and Manager. No unsalaried officer except the President and Treasurer shall be eligible to immediate re-election to the same office (as provided in Rule IV). The Secretary and any other salaried officer shall be chosen each year from among the members of the Institute by the Council. The Secretary shall be a member of Council, but shall have no vote in its proceedings.

VI.

MEETINGS.

The annual meeting of the Institute shall take place on the third Tuesday of May, at which a report of the proceedings of the Institute, and an abstract of the accounts shall be furnished by the Council. Two other regular meetings of the Institute shall be held in each year, at such times and places as the Council shall select, and notice of all meetings shall be given by mail, or otherwise, to all members and associates, at least twenty days in advance. Special meetings may be called whenever the Council

sees fit; and the Secretary shall call a special meeting on a requisition signed by fifteen or more members. The notices for special meetings shall state the business to be transacted, and no other shall be entertained

Every question which shall come before any meeting of the Institute shall be decided, unless otherwise provided by these Rules, by the votes of a majority of the members then present. Any member or associate may introduce a stranger to any meeting, but the latter shall not take part in the proceedings without the consent of the meeting.

VII.
PAPERS.

The Council shall have power to decide on the propriety of communicating to the Institute any papers which may be received, and they shall be at liberty, when they think it desirable, to direct that any paper read before the Institute, shall be printed in the Transactions. Intimation, when practicable, shall be given, at each general meeting of the subject of the paper or papers to be read, and of the question for discussion at the next meeting. The reading of papers shall not be delayed beyond such hour as the presiding officer shall think proper; and the election of members or other business may be adjourned by the presiding officer, to permit the reading and discussion of papers.

The copyright of all papers communicated to, and accepted by the Institute, shall be vested in it, unless otherwise agreed between the Council and the author. The author of each paper read before the Institute shall be entitled to twelve copies, if printed, for his own use, and shall have the right to order any number of copies at the cost of the paper and printing, provided said copies are not intended for sale. The Institute is not, as a body, responsible for the statements of fact or opinion advanced in papers or discussions at its meetings, and it is understood that papers and discussions should not include matters relating to politics or purely to trade.

VIII.
AMENDMENTS.

These Rules may be amended at any regular meeting by a two-thirds vote of the members present, provided that written notice of the proposed amendment shall have been given out at a previous meeting.

American Institute of Electrical Engineers,

12 WEST 31st ST., NEW YORK.

CLASSIFIED LIST OF PAPERS PUBLISHED.

Alternating Current Practice.

Distribution of Electricity by Secondary Generators. Discussion, 1887. Vol. IV.	Price [Out of print]
Novel Phenomena of Alternating Currents. <i>Elihu Thomson</i> , 1887. Vol. IV. [Out of print]	
Phenomena of Retardation in the Induction Coil. <i>Wm. Stanley</i> , 1887. Vol. V. . . . .	.50
Alternating Current Electric Motors. <i>Louis Duncan</i> , 1888, Vol. V. . . . .	.50
A New System of Alternating Current Motors and Transformers. <i>Nikola Tesla</i> , 1888, Vol. V. . . . .	.50
Alternating Current Motors: The Evolution of a New Type. <i>F. J. Patten</i> , 1889, Vol. VI. . . . .	.50
Transformers. <i>H. J. Ryan</i> , 1889, Vol. VII.	[Out of print]
Some Tests on the Efficiency of Alternating Current Apparatus. <i>Louis Duncan</i> and <i>W. T. C. Hason</i> , 1890, Vol. VII. . . . .	.50
Phenomena of Alternating Current Induction. <i>Elihu Thomson</i> , 1890, Vol. VII. . . . .	.50
Practical Aspects of the Alternating Current Theory. <i>M. I. Pupin</i> , Vol. VII. . . . .	.50
Note on a New Photometer. <i>E. L. Nichols</i> , 1890, Vol. VII. . . . .	.50
Notes upon some Experiments with Alternating Current Apparatus. <i>H. J. Ryan</i> , 1890, Vol. VII. . . . .	.50
Efficiency of Transformers. <i>Calvin Humphrey</i> and <i>W. H. Poveil</i> , 1890, Vol. VII. . . . .	.50
Investigation of the Stanley Alternate Current Arc Dynamo. <i>W. E. Tobey</i> and <i>G. H. Walbridge</i> , 1890, Vol. VII. . . . .	.50
A New Method of Analyzing the Magnetic Reactions of Armatures Applied to the Stanley Arc-Light Alternating Current Machine. <i>Thorburn Reid</i> , 1890, Vol. VII. . . . .	.50
A New Method of Analyzing Armature Reactions of Alternators. <i>C. P. Steinmetz</i> , 1890, Vol. VII. . . . .	.50
Experiments with Alternate Currents of Very High Frequency and their Application to Methods of Artificial Illumination. <i>Nikola Tesla</i> , 1891, Vol. VIII. . . . .	.50
An Alternate Current Potentiometer. <i>G. S. Moler</i> , 1891, Vol. VIII. . . . .	.50
A Proposed System of Alternating-Direct Current Transformation. <i>F. J. Patten</i> , 1892, Vol. IX. . . . .	.50
Note on Some Experiments with Alternating Currents. <i>Louis Duncan</i> , 1892, Vol. IX. . . . .	.50
Hedgehog Transformer and Condensers. <i>Frederick Bedell</i> , 1893, Vol. X. . . . .	.50
Alternating Currents and Fuse Wires. <i>D. C. Jackson</i> and <i>R. J. Ochsner</i> , 1894, Vol. XI. . . . .	.50

Aluminium.

Electricity in the Production of Aluminium. <i>Alexander S. Broten</i> , 1891, Vol. VIII. . . . .	.50
The Future of the Aluminium Problem from the Chemical Standpoint. <i>W. H. Wahl</i> , 1891, Vol. VIII. . . . .	.50
Shall "Aluminium" be "Alum." <i>Oberlin Smith</i> , 1891, Vol. VIII. . . . .	.50