

**American Institute of
Electrical Engineers**



FALL

GENERAL

MEETING

Program

*Please retain for use during
entire meeting*

CHICAGO, ILL.

OCTOBER 3-7

1955

Meeting Headquarters

MORRISON HOTEL

GENERAL INFORMATION

This meeting in Chicago, Illinois, is the ninth of the general meetings which are held annually each Fall in the Middle West. It is the second of three successive meetings to be held in Chicago. Both the technical program and the inspection trips were planned with the wide interests of the membership in mind.

The General Session is scheduled for Monday afternoon, October 3rd, when we will be welcomed by A. V. Kahler, President of the Illinois Bell Telephone Company. President M. D. Hooven will respond. We are also honored with the presentation of an address by J. A. Hutcheson, Vice-President of the Westinghouse Electric Corporation.

On the social side there will be a Get-Acquainted Tea, Sunday afternoon; a Smoker; and an NEC Party, as well as special entertainment for the ladies.

Registration Fees Required. In accordance with the policy as set up by the Board of Directors, a registration fee of \$3.00 has been established for members and a fee of \$5.00 for nonmembers. This is to help make the meeting self-supporting. Student members and the immediate families of members will not be required to pay any fee.

Information on all features may be obtained at the registration desk. Efforts will be made to deliver telegrams and messages promptly. Members who expect to receive mail are asked to inquire frequently at the mail and registration desk.

Technical Sessions and Discussions are covered by the "Technical Sessions Guide" at the discretion of the presiding officers. Usually 10 minutes will be allowed for the presentation of each paper and 5 minutes for each discussion. To receive consideration for publication, discussions on TRANSACTIONS Papers in duplicate must be left with the chairman and/or sent to Edward C. Day, Assistant Secretary, Committee on Technical Operations, AIEE, 33 W. 39th Street, New York 18, N. Y., before October 21, 1955. Discussions received later may not be included, depending upon the printing schedule of the paper to which the discussion is directed. The original type-written double-spaced copy, together with original illustrations as photographs or inked tracings should be submitted.

Advance Copies of Papers may be purchased by members at the registration desk at the uniform price of \$.40 each (\$.80 each to nonmembers). Only numbered papers are available. Mail orders, particularly from out-of-town members, are advisable inasmuch as an adequate supply of each paper at the meeting cannot be assured. Coupon Books in \$10.00 denominations are available for those who wish to avoid remittance by check or otherwise. Mail orders should be addressed to the AIEE Order Department, 33 West 39th Street, New York 18, N. Y. The TRANSACTION Papers will also be published in the Bimonthly Publications. Note: Unnumbered Conference Papers (CP.*) may be available for sale at or after the meeting, if copies are provided by the author. They are not intended for publication in the TRANSACTIONS and are not presently scheduled for reproduction in any form by the Institute.

Fall General Meeting

SCHEDULE OF EVENTS

SUNDAY, OCTOBER 2

- 3:00 p.m. Registration
- 4:00 p.m. Get Acquainted Tea

MONDAY, OCTOBER 3

- 8:00 a.m. Registration
- 9:00 a.m. Instruments and Measurements
 - X-Ray Engineering
 - Safety
 - Mining and Metal
 - Solid State Devices
- 2:00 p.m. General Session
- 5:00 p.m. Smoker
 - Ladies' Cocktail Party and Dinner

TUESDAY, OCTOBER 4

- 8:30 a.m. Trip to Prudential Building
- 9:00 a.m. Basic Sciences
 - Transmission and Distribution
 - DC Machines
 - Land Transportation
 - Closed Circuit Television I
- 10:30 a.m. Trip to Prudential Building
- 1:30 p.m. Trip to Electro-Motive Plant of General Motors Corp.
 - Trip to Rauland Corp.
- 2:00 p.m. Transmission and Distribution
 - Single Phase Machines
 - Closed Circuit Television II
 - Industrial Power Systems and Chemical Industry
- 6:00 p.m. NEC Party

WEDNESDAY, OCTOBER 5

- 8:30 a.m. Trip to Standard Oil Refinery (all day)
- 9:00 a.m. New Developments in the Design of Digital Computers
 - Insulated Conductors
 - Switchgear
 - System Engineering
 - Telegraph Systems
- 12:30 p.m. Style Show and Luncheon (Ladies' Trip)
- 1:00 p.m. Trip to Will County Station
- 2:00 p.m. Insulated Conductors
 - System Engineering and Computers
 - Improved Utilization of Engineers and Technicians
 - Wire Communications
- 7:30 p.m. Forum of Technical Committee Chairmen

THURSDAY, OCTOBER 6

- 8:30 a.m. Trip to Ford Aircraft Engine Division
 9:00 a.m. System Engineering
 Induction Motor—Noise Symposium
 Electric Storage Batteries
 Effects of Radiation and Arcs on Dielectrics
 10:30 a.m. Trip to Museum of Science and Industry
 1:30 p.m. Trip to McCook Plant of Reynolds Metals
 2:00 p.m. Power Generation
 Induction Motors
 Carrier Current and Relaying
 Arc Resistant Dielectric Materials

FRIDAY, OCTOBER 7

- 9:00 a.m. Radio Communication Systems
 Motor Protection Symposium
 Transformers
 Feedback Control Systems
 2:00 p.m. Rotating Machinery and Relays
 Transformers
 Feedback Control Systems
 Communication Switching Systems

Monday, October 3

9:00 a.m.—Instruments and Measurements
Committee on Instruments and Measurements
 Hollywood Room
 R. J. PARENT, Presiding

- 55-737. A Method of Making Screen Room Interference Measurements. K. E. Mortenson and C. J. Truax, Rensselaer Polytechnic Institute.
 CP.* Calorimetric Power Meters. Max Sucher, Polytechnic Institute of Brooklyn.
 CP.* Reproducing a Shaft Rotation by Digital Coding. Ivan Flores, Queens, New York.

9:00 a.m.—X-Ray Engineering
Committee on Electronics
 Embassy Room
 R. F. WILSON, Presiding

- CP.* Cine-Radiography with Image Amplification. F. J. Euler and P. A. Virbal, Westinghouse Electric Corp.
 CP.* Engineering Progress in the Design of Rotating Anode X-Ray Tubes. R. W. Cobean, Dunlee Corp.
 CP.* Design Concepts of Modern Phototimers. R. Godbarsen, Jr., General Electric Co.
 CP.* Description of Automatic X-Ray Spectrometer. D. C. Miller, North American Phillips Co., Inc.
 55-739. Use of Proportional Counters in X-Ray Diffraction. H. R. I Laird and M. J. Zunick, General Electric Co. Re-presented for discussion.
 55-740. A Symmetrical Transistor Oscillator with Low Second-Harmonic Distortion. W. M. Grim, Jr., General Electronic Labs, Inc. Represented for discussion.

9:00 a.m.—Safety
Committee on Safety
 Venetian Room
 H. B. WHITAKER, Presiding

- CP.* Factoring the Human Equation into Electrical Testing. C. R. DeReamer and H. E. Vann, General Electric Co.
 CP.* Serviceableness of Flexible Cord from the Standpoint of Safety to Life and Property. F. V. Paradise, Underwriters' Labs., Inc.
 CP.* The Grounding of Electrical Equipment in Farm and Rural Occupancies. O. K. Coleman, Duncan Electric Co.

9:00 a.m.—Mining and Metal
Committee on Mining and Metal Industry
 Room 427
 C. O. WOOD, Presiding

- CP.* Characteristics and Ratings of Electric Motors for Drills in Mines. Ben Harbage, Jeffrey Mfg. Co.
 CP.* Effect of Voltage Variations on Mining Machine Motor Performance. Frank Terrant and F. R. Hugus, Reliance Electric & Engineering Co.
 CP.* AC Drives for Mine Belt Conveyors. W. R. Morton, General Electric Co.
 CP.* Modern Diesel-Electric Railway Cranes. S. E. Wallin, Bucyrus-Erie Co.

9:00 a.m.—Solid State Devices

Committee on Solid State Devices

Ballroom

PAUL JORDAN, *Presiding*

- CP.* Square Loop Materials for the Timing of Multivibrators. H. J. Venema.
- CP.* The Ferroresonant Trigger Pair: Analysis and Design. C. F. Spitzer, General Electric Co.
- CP.* Switching Wave Shapes in Ferroelectric Storage Capacitors. C. F. Pulvari.
- CP.* Major and Minor Hysteresis Loops in Dielectric Amplifiers. Earl Wingrove and Louis Depian, Carnegie Institute of Technology.

2:00 p.m.—General Session

Ballroom

Chairman F. A. COX, *Presiding*

- Introduction of General Committee, F. A. Cox, Chairman
- Address of Welcome. A. V. Kahler, President, Illinois Bell Telephone Co.
- Response. President M. D. Hooven
- "Address." J. A. Hutcheson, Vice-President, Westinghouse Electric Corp.

Tuesday, October 4

9:00 a.m.—Basic Sciences

Committee on Basic Sciences

Room 427

S. B. BATDORF, *Presiding*

- 55-705. Analysis of a Triode Oscillator with Losses Associated with the Inductive Branch and Signal Applied in Grid Circuit. I A. E. Mostafa, Alexandria University.
- 55-706. Transfer Functions for Amplitude Modulated Signals. H. I Hellerman, Syracuse University.
- 55-707. What is a Minimum-Phase Network? N. Balabanian and W. I R. LePage, Syracuse University.
- 55-708. The Underwater Spark; A Photographic Light Source of High Intrinsic Brilliance. H. C. Early and E. A. Martin, University of Michigan.
- CP.* Equations for the Inductance and Short-Circuit Forces of Busses Comprised of Right-Angled Conductors Back to Back. T. J. Higgins and Hsu Chen, University of Wisconsin.

9:00 a.m.—Transmission and Distribution

Committee on Transmission and Distribution

Ballroom

F. V. SMITH, *Presiding*

- 55-709. Bibliography and Summary of Fault Location Methods, An III AIEE Working Group Report. General Systems Subcommittee.
- CP55-757. Practice of Fault Location in the Georgia Power Company System, T. J. Allen, Georgia Power Co.

TUESDAY (continued)

- CP.* Practice of Fault Location in the Boston Edison Company. D. F. Tulloch, Boston Edison Co.

- CP.* Fault Location Methods. R. F. Stevens, T. W. Stringfield and L. R. Spaulding, Bonneville Power Administration.

9:00 a.m.—DC Machines

Committee on Rotating Machinery

Venetian Room

M. A. BAKER, *Presiding*

- CP55-723. Design Factors Affecting the Electromechanical Time Constant of Ward-Leonard Transmission with Inertia Load. B. B. Young, The Franklin Institute.
- 55-677. Dynamics of D-C Machine Systems. M. Riaz, Massachusetts II Institute of Technology.
- CP55-727. New N.E.M.A. Standards for D.C. Motors and Generators. J. F. Davis, General Electric Co.

9:00 a.m.—Land Transportation

Committee on Land Transportation

Hollywood Room

E. A. FOSTER, *Presiding*

- CP.* Detection and Significance of Flaws in Traction Gearing. J. B. McPherson and Mr. Brucknicki, General Electric Co.
- CP.* Maintenance Inspection of Traction Motor Gears and Pinions. M. C. Winstanley, Westinghouse Electric Corp.
- 55-754. Automation for Gravity Freight Classification Yards. A. V. II Dasburg, General Railway Signal Co.
- CP.* High Potential D-C Testing of Insulation. M. C. DuBois, DuBois Engineering and Mfg. Co.

9:00 a.m.—Closed Circuit Television I

Committee on Television and Aural Broadcasting Systems

Embassy Room

W. L. EVERITT, *Presiding*

- 55-687. Developments in Closed Circuit Television. M. H. Kraus, Jerold Electronics Corp. I
- CP.* The Application of Wired Television to Augment and Extend Human Vision. John Day, Kay Labs.
- CP.* Color Television in Medical Education. Michael Klein, University of Kansas Medical Center.
- CP.* Closed Circuit Television in the Bell System. C. A. Bartlett, American Tel. & Tel. Co.

2:00 p.m.—Transmission and Distribution

Committee on Transmission and Distribution

Ballroom

T. J. RROSNAN, *Presiding*

- 55-710. Report on the Operation of Switched Capacitors. AIEE Ca-III capacitor Subcommittee.
- CP55-711. D-C Circuit Gives Easy Method of Determining Value of Capacitors in Reducing I²R Losses. R. A. Schmidt, General Electric Co.
- 55-712. Insulation Characteristics of Wood and Suspension Insulators III in Series. J. M. Clayton and D. F. Shankle, Westinghouse Electric Corp.

TUESDAY (continued)

55-713. Efficiency of Grounding Grids with Nonuniform Soil. J. Zaborzky, University of Missouri.

CP55-756. The Arresters Without Power Follow Current. Operating Experience and Design Features. C. L. Stroup, A. C. Westrom and Alex Vitkus, Hubbard & Co.

2:00 p.m.—Single Phase Machines

Committee on Rotating Machinery
Venetian Room
E. P. CODLING, *Presiding*

55-728. Developing Iron Loss Curves for Small Motors from Motor Tests. V. C. Shaneman, Westinghouse Electric Corp.

55-729. Single-Phase Induction Motor Noise Due to Dissymmetry Harmonics. D. F. Muster and G. L. Wolfert, General Electric Co.

55-684. Equivalent Circuits for Single-Phase Motors. G. R. Slemon, University of Toronto.

55-730. Design Principles of Flux-Switch Alternators. S. E. Rauch, University of California and L. J. Johnson, Hufford Machine Works.

55-108. Metadyne Transients. K. A. Fegley, University of Pennsylvania. Re-presented for discussion.

2:00 p.m.—Closed Circuit Television II

Committee on Television and Aural Broadcasting Systems
Embassy Room
C. M. BRAUM, *Presiding*

CP.* The Use of Television by the Biological Research Organization—Pilot Study. M. C. Brown, National Institute of Health.

CP.* Closed Circuit Television at the State University of Iowa. C. H. Menzer, State University of Iowa.

CP.* High Intensity Color Television for Very Large Screen Projection. C. L. Ellis, General Electric Co.

2:00 p.m.—Industrial Power Systems and Chemical Industry

Committees on Industrial Power Systems and Chemical Industry
Hollywood Room
A. C. FRIEL, *Presiding*

CP55-688. Maintenance Problems of Electrical Equipment Which Affect Design Considerations. H. R. Walker, The Dow Chemical Co.

CP55-672. A Unique Industrial Distribution System. Leo Dolkart, Commercial Light Co.

CP55-753. Modernization and Extension of Electrical Facilities at a Heavy-Equipment Industrial Plant. F. H. Carlton, Sargent and Lundy and A. Ewy, Allis Chalmers Mfg. Co.

55-674. Problems Associated with the Development of a Power System for a Manufacturing Plant. W. C. Heinz, General Electric Co.

55-689. System Neutral Grounding for Chemical Plant Power Systems. D. S. Brereton and H. N. Hickok, General Electric Co. Re-presented for discussion.

55-690. Surge Protection on Industrial Systems. C. L. Wagner, Westinghouse Electric Corp. Re-presented for discussion.

Wednesday, October 5

9:00 a.m.—New Developments in the Design of Digital Computers

Committee on Computing Devices
Hollywood Room
F. J. MAGINNISS, *Presiding*

CP55-742. The Wisconsin Integrally Synchronized Computer—A University Research Project. J. L. Asmuth, C. H. Davidson, J. B. Miller, D. S. Noble and A. K. Scidmore, University of Wisconsin.

CP55-735. Arithmetic Design for a Transistorized Digital Computer. R. A. Isaacs and J. L. Maddox, Philco Corp.

55-719. The Design of the IBM Type 702 System. C. J. Bashe, P. W. I Jackson, H. A. Mussell and W. D. Winger, International Business Machines Corp.

CP55-736. The Interconnection of Two Digital Computers. M. E. Stevens, National Bureau of Standards.

9:00 a.m.—Insulated Conductors

Committee on Insulated Conductors
Ballroom
M. W. GHEN, *Presiding*

55-691. Aluminum Sheathed Control Cable. E. E. McIlveen, The Okonite Co.

55-692. Research on the Electric Breakdown of Fully Impregnated Paper Insulation for High-Voltage Cables. P. Gazzana Priaroggia and G. Palandri, Pirelli, Milan.

55-679. Characteristics of Single-Conductor Electric Cable at High Frequency. J. T. Sabol, Ohio Crankshaft Co.

9:00 a.m.—Switchgear

Committee on Switchgear
Embassy Room
J. D. WOOD, *Presiding*

55-722. A New High Capacity Anode Air Circuit Breaker. S. A. Bottonari and J. H. Sprow, Westinghouse Electric Corp.

CP55-721. A New 5 KV, 50,000 KVA, De-Ion Air Circuit Breaker. Russell Frink and J. M. Kozlovic, Westinghouse Electric Corp.

CP.* New High Capacity Service Entrance Protector for Industrial and Commercial Buildings. L. L. Baird and V. N. Stewart, General Electric Co.

9:00 a.m.—System Engineering

Committee on System Engineering
Venetian Room
R. T. PURDY, *Presiding*

55-720. A New Method of Determining Constants for the General Transmission Loss Equation. E. D. Early, Southern Services, Inc. and R. E. Watson, Leeds & Northrup Co.

CP.* General Circuit Theorems of Power Flow in Linear Networks. J. F. Calvert and T. W. Sze, University of Pittsburgh.

55-743. Two Large Electric Arc Furnaces—Electrical Characteristics and Corrective Equipment. S. W. Luther, J. D. Ghesquiere and C. E. Quick, Detroit Edison Co.

CP.* Guide for Application of Arc Furnaces on Power Systems. Preliminary Report by Working Group on Arc Furnaces.

WEDNESDAY (continued)

9:00 a.m.—Telegraph Systems

Committee on Telegraph Systems
Room 427

R. B. SHANCK, *Presiding*

- 55-175. A Polar Relay Using Momentum Transfer. H. L. Garbarino and K. E. Bisshopp, Armour Research Foundation of Illinois Institute of Technology. Re-presented for discussion.
- 55-734. An Envelope Delay Measuring Instrument in the Audio Frequency Range. W. D. Cannon, Western Union Telegraph Co.
- CP.* A New 18" Wide Continuous Web Facsimile Recorder. A. G. Cooley, Times Facsimile Corp.
- CP.* Applications of a Frequency Shift Carrier Telegraph System in the Telephone Plant. C. W. Smith, American Tel. & Tel. Co.
- CP.* A New Semi-automatic Teletypewriter Message Relaying System. R. J. Anspach, P. A. Tamasi and J. T. Neiswinter, American Tel. & Tel. Co.

2:00 p.m.—Insulated Conductors

Committee on Insulated Conductors
Venetian Room

L. E. FOGG, *Presiding*

- 55-678. Some Performance Characteristics of High-Voltage, Rubber-III Insulated Cables. S. J. Rosch, Anaconda Wire & Cable Co.
- 55-668. Design and Evaluation of Butyl Rubber Insulated Power III Cable. J. C. Carroll, A. R. Lee and R. B. McKinley, General Electric Co.
- 55-693. Modern High Voltage Rubber Insulations. W. H. Couch, G. III H. Hunt, N. D. Kenney and P. H. Ware, Simplex Wire & Cable Co.

2:00 p.m.—System Engineering and Computers

Committees on System Engineering and Computing Devices
Embassy Room

L. B. LE VESCONTE, *Presiding*

- CP55-744. Use of Digital Computers by Ontario Hydro in System Engineering Problems. L. J. Lacey and P. L. Dandeno, Hydro-Electric Power Commission of Ontario.
- 55-680. Digital Calculation of Network Impedances. A. F. Glimm, III R. Habermann, Jr., J. M. Henderson and L. K. Kirchmayer, General Electric Co.
- CP55-745. Digital Load Flow Studies for Loss Allocation. L. A. Dunstan, Bonneville Power Administration.

2:00 p.m.—Improved Utilization of Engineers and Technicians

Committees on Education and Management
Ballroom

E. A. WALKER, *Presiding*

- CP.* The Technician—His Training and His Role in Industry. E. A. Williford and W. W. Wood, Link Aviation.
- CP.* The Graduate Engineer—His Training and His Full Utilization in Industry. S. B. Ingram, Bell Telephone Labs.
- CP.* Optimum Utilization of Engineers and Technicians—The Management Problem. J. N. Stanbery, Illinois Bell Telephone Co.
- CP.* Case Histories of Effective Utilization. J. N. Stanbery, Illinois Bell Telephone Co.

2:00 p.m.—Wire Communications

Committee on Wire Communications Systems
Hollywood Room

D. G. GEIGER, *Presiding*

- 55-683. Combined Operation of 24-Channel Cable Carrier and 12-III Channel Open-Wire Carrier Systems. G. W. Searle (deceased) and R. A. Schaefer, Wisconsin Telephone Co.
- 55-682. A Pole-Mounted, A-C Operated Repeater for 12-Channel III Open-Wire Carrier System. G. W. Searle (deceased) and R. A. Schaefer, Wisconsin Telephone Co.
- CP55-758. Local Television Facilities and Their Performance. J. H. Enenbach, Illinois Bell Telephone Co.
- CP55-759. Video Frequency Attenuation Equalizers. H. R. Stevens, Illinois Bell Telephone Co.
- CP.* Developments in Communications in the Lower St. Lawrence Valley. F. C. Douk, Quebec Telephone Corp.

Thursday, October 6

9:00 a.m.—System Engineering

Committee on System Engineering
Ballroom

G. S. WHITLOW, *Presiding*

- 55-673. Principles and Practices of Modern System Planning. A. P. III Fugill, Detroit Edison Co.
- 55-746. Rural Electric System Planning. J. H. Rixse, Jr., Rural Electrification Administration.
- 55-669. General Study of Area Supply Methods. J. A. Casazza, Public Service Electric & Gas Co., and J. R. Rankin, Rutgers University.
- CP55-747. System Planning for Reinforcement of the Iowa Division Union Electric Power Co. A. A. Musler, C. C. Marxer, Union Electric Co. of Missouri and D. P. Ayers, J. C. Endahl, Sverdrup & Parcel, Inc.
- CP55-748. An Approach to System Planning. W. D. Johnson, Illinois Power Co.

9:00 a.m.—Induction Motor—Noise Symposium

Committee on Rotating Machinery
Embassy Room

C. G. VEINOTT, *Presiding*

- 55-724. Sonac Design for Large Induction Motors. R. L. Wall, III General Electric Co.
- 55-725. Apparatus Noise Measurement. R. J. Wells, General Electric III Co.
- 55-726. Predetermination of Sound Pressure Levels of Magnetic Noise III of Polyphase Induction Motors. E. Erdelyi, Syracuse University.
- 55-731. Measurement of Resistance of Energized A-C Motor Wind-III ings. K. J. Waldschmidt, A. O. Smith Corp.

9:00 a.m.—Electric Storage Batteries

Committee on Chemical Industry
Venetian Room

H. C. RIGGS, *Presiding*

- CP.* Motor Generator Battery Charging. J. K. Haggerty, Electric Products, Inc.

THURSDAY (continued)

- CP.* Nickel Cadmium Batteries in Industrial Service. O. S. Sandburg, Nife, Inc.
- CP.* Internal Resistance Short Circuit Current and Other Lead Acid Battery Characteristics. E. A. Hoxie, The Electric Storage Battery Co.
- CP.* Rotating Battery Charges in Railway Service. W. R. Govett, H. F. Orlip Co. and K. H. Gordon, Pennsylvania Rail Road.
- CP.* Metallic Rectifier Battery Charging. W. Warburton, General Electric Co.

9:00 a.m.—Effects of Radiation and Arcs on Dielectrics

Committee on Dielectrics
Hollywood Room
L. J. BERBERICH, *Presiding*

- CP.* A General Survey and Some Experimental Work on the Radiation Effect on High Polymers. K. H. Sun and W. R. Thomas, Westinghouse Electric Corp.
- CP.* The Generation of High Energy Electrons for Industrial Processing. J. W. Ranftl, General Electric Co.
- 55-741. The Effects of High-Energy Gamma Radiation on Dielectric Solids. P. H. Klein and C. Mannal, General Electric Co.

- 55-694. The Effect of Reactor Irradiation on Electrical Insulation. I J. C. Pigg, C. D. Bopp, O. Sisman, Oak Ridge National Lab., and C. C. Robinson, Wright Air Development Center.

2:00 p.m.—Power Generation

Committee on Power Generation
Ballroom
C. F. PAULUS, *Presiding*

- 55-681. Economic Selection of Auxiliary Drive Motors in Power III Plants. E. T. B. Gross and V. F. Bobrowicz, Illinois Institute of Technology.

- CP55-697. Auxiliary Transfer Scheme at Eastlake Proven by Operation. C. F. Paulus and J. P. Fitzgerald, Cleveland Electric Illuminating Co.

- CP55-760. Integrated Steam Station Protection. Working Group on Steam Station Protection.

- 55-749. Operation of a Nuclear Power Plant on an Integrated Electric System. N. E. Wilson, Westinghouse Electric Corp. Re-presented for discussion.

2:00 p.m.—Induction Motors

Committee on Rotating Machinery
Embassy Room
J. F. HEIDBREDER, *Presiding*

- 55-676. Double Energy Conversion in an Air Gap—A Novel Asynchronous Frequency Changer. W. La Pierre and J. Y. Louis, Columbia University.

- 55-675. Equivalent Circuit for the Concatenation of Induction Motors. III Y. H. Ku, University of Pennsylvania.

- 55-732. Ten Part Winding Arrangements in Sample 4 Pole Induction III Motor. J. J. Courtin, Westinghouse Electric Corp.

2:00 p.m.—Carrier Current and Relaying

Committees on Carrier Current and Relays
Venetian Room
L. G. EATON, *Presiding*

- 55-695. Future Application Needs of Carrier Pilot Relaying. T. A. III Cramer and F. C. Krings, General Electric Co.

- CP.* Frequency Shift Carrier for Distance Relaying. H. W. Lensner, Westinghouse Electric Corp.

- CP.* Standards for Carrier Radiation. Project Subcommittee #8 of the Committee on Carrier Current.

- 55-698. Power Line Carrier Coupling: An Analysis. M. G. Bienhoff, III Los Angeles, Calif.

2:00 p.m.—Arc Resistant Dielectric Materials

Committee on Dielectrics
Hollywood Room
K. N. MATHES, *Presiding*

- CP.* Problems in Evaluating Arc Resistance of Insulating Materials. L. J. Goldberg, General Electric Co.

- CP55-699. Non-Tracking Organic Insulations. R. S. Norman, R. A. Pfuntner and A. A. Kessel, General Electric Co.

- CP55-755. Arc Resistant Molding Materials and Finishes. R. F. Sterling, Westinghouse Electric Corp.

- CP.* Tracking Resistance Studies. M. Walbright and W. T. Starr, General Electric Co.

Friday, October 7

9:00 a.m.—Radio Communication Systems

Committee on Radio Communication Systems
Hollywood Room
A. A. MACDONALD, *Presiding*

- 55-750. Presentation of Data on Broadband and Pulse Transformer I Cores. P. R. Gillette, K. Oshima, K. W. Henderson and R. M. Rowe, Stanford Research Institute.

- CP.* A Simplified Approach to a 960 Mc. Multi-channel Radio System. Curt Schultz, Motorola Mobile Systems Engineering.

- CP.* A New Broad Band Microwave Antenna System. A. S. May and R. W. Friis, Bell Telephone Labs., Inc.

- 55-751. VHF Radio Link Between Puerto Rico and the Virgin I Islands. Roger McSweeney, American Cable and Radio Corp. Re-presented for discussion.

- 55-752. The Seattle-Victoria Radio System. R. E. Kistler, The Pacific I Tel. & Tel. Co. Re-presented for discussion.

9:00 a.m.—Motor Protection Symposium

Committees on Rotating Machinery and Relays
Embassy Room
E. C. BARNES, *Presiding*

- CP55-761. Induction Motor Temperature Characteristics. J. F. Heidbreder, Westinghouse Electric Corp.

- CP.* Squirrel Cage Motor Characteristics Useful in Setting Protective Devices. F. R. Karr, Westinghouse Electric Corp.

- CP.* Factors Influencing the Starting Duty of Large Induction Motors. V. J. Picozzi, General Electric Co.

- CP55-733. Advancements in Synchronous Motor Control and Protection. John Baude, Allis-Chalmers Mfg. Co.

9:00 a.m.—Transformers

Committee on Transformers
Ballroom
J. R. MEADOR, *Presiding*

- 55-714. Transformer Temperatures on Short Circuit. W. C. Sealey, III Allis-Chalmers Mfg. Co.

FRIDAY (continued)

- 55-671. Sequence Impedances of Symmetrical 3-Phase Transformer III Connections. B. A. Cogbill, General Electric Co.
- CP.* The Rigorous Solution of a Field Problem by Means of the Card Programmed Calculator. L. Rabius and J. R. Faillace, General Electric Co.
- 55-686. Experiences with the Use of Aluminum in Windings for Dry III Type Power Transformers. E. W. Tipton, Westinghouse Electric Corp. Re-presented for discussion.
- 9:00 a.m.—Feedback Control Systems**
Committee on Feedback Control Systems
 Venetian Room
 H. W. CORY, Presiding
- 55-700. Simple Analytic Method for Linear Feedback System Dynamics. M. E. Clynes, Bogue Electric Mfg. Co.
- 55-701. Estimating Transient Responses from Open-Loop Frequency II Responses. G. A. Biernson, Massachusetts Institute of Technology.
- 55-670. Quasi-Linearization Techniques for Transient Study of Non-linear Feedback-Control Systems. Kan Chen, Westinghouse Electric Corp.
- CP.* New General Stability Criterion for Servo Mechanisms (and other Feedback Systems) With Time-Lag. N. H. Choksy, The Johns Hopkins University and T. J. Higgins, University of Wisconsin.

2:00 p.m.—Rotating Machinery and Relays
Committees on Rotating Machinery and Relays
 Embassy Room
 H. C. BARNES, Presiding

- CP55-696. Problems in Medium-Size-Motor Protection. O. A. Lentz and T. Neissink, Commonwealth Associates, Inc.
- CP* Problems of Applying Thermal Protection to Motors. J. M. Bisbee, Consolidated Edison Co. of NY., Inc.
- CP.* Motor Protection for Steam Power Stations with 4 kv Grounded Neutral Systems. W. F. Neff, Ohio Valley Electric Corp., S. H. Horowitz, American Gas & Electric Service Corp., and R. B. Squires, Westinghouse Electric Corp.
- CP.* Protecting Motors with Low-voltage Air Circuit Breaker Series Trips. F. P. Brightman and P. J. Reifschneider, General Electric Co.

2:00 p.m.—Transformers
Committee on Transformers
 Ballroom
 J. A. ADAMS, Presiding

- 55-715. The Application of a New Non-Tracking Butyl to High Voltage Instrument Transformers. R. A. Pfuntner, R. S. Norman and B. W. Wilterdink, General Electric Co.
- CP55-716. Recent European Developments in Current and Potential Transformer Designs. H. H. Schwager, Schwager-Wood Corp.
- 55-717. Controls for Step Voltage Regulators. T. C. Lennox, General III Electric Co.
- 55-718. Contact Life of Voltage Regulating Relays. C. W. Schoendube III and R. L. Elliott, General Electric Co.

2:00 p.m.—Feedback Control Systems
Committee on Feedback Control Systems
 Venetian Room
 R. P. FORRESTAL, Presiding

- 55-703. Feedback in Contouring Control Systems. F. J. Ellert, General II Electric Co.

FRIDAY (continued)

- 55-702. An Analysis and Analog Computer Study of a Force-Reflecting II Positional Servomechanism. M. G. Spooner, University of Wisconsin and C. H. Weaver, University of Tennessee.
- CP55-704. Transfer Function and Parameter Evaluation for D-C Servomotors. G. J. Thaler and W. A. Stein, U. S. Naval Post-graduate School.
- 55-685. Short-Time Memory Devices in Closed-Loop Systems—Steady II State Response. T. W. Sze and J. F. Calvert, University of Pittsburgh. Re-presented for discussion.
- 2:00 p.m.—Communication Switching Systems**
Committee on Communication Switching Systems
 Hollywood Room
 W. KEISTER, Presiding
- 55-762. Roll Welding Precious Metals for Telephone Contacts. A. L. I Quinlan, Western Electric Co.
- 55-763. Development of a Wire Contact Relay. R. E. Markle, International Business Machines Corp. I
- CP.* New Developments in Wire Spring Relays. H. M. Knapp, Bell Telephone Labs., Inc.
- CP.* Dry Reed Switches and Relays O. M. Hovgaard and G. E. Perreault, Bell Telephone Labs., Inc.

Note: The TRANSACTIONS papers will be printed in the bimonthly publications as follows:

- I COMMUNICATIONS AND ELECTRONICS.
- II APPLICATIONS AND INDUSTRY.
- III POWER APPARATUS AND SYSTEMS.

INSPECTION TRIPS

A number of interesting inspection trips are planned for the week of the meeting. Among these are trips to the Ford Aircraft Plant, the Standard Oil Refinery at Whiting, Ind., The Electro-Motive Plant of General Motors Corp. at LaGrange, Ill., the Rauland Corp., the new Will County Station of the Commonwealth Edison Company, Reynolds Metals, and the new Prudential Building.

Members are asked to register in advance for all trips as the number than can be taken on the various trips is limited. In making reservations for these trips please include names, nationalities, business connections, and checks for bus fees if required. Aliens should give advance notice of plans to make inspection trips. Transportation for the trip to Will County Station will be furnished at no charge by the Commonwealth Edison Company, and transportation for the Electro-Motive Plant will be furnished at no charge by the Electro-Motive Division of General Motors Corp. The Prudential Building is within easy walking distance of the Morrison Hotel. Bus fees for other inspection trips will be \$2.00 each except for the Museum of Science and Industry which is \$1.50. Tickets will be held in members' names at the Trips Registration Desk for pick-up during the convention.

Ford Aircraft Engine Division—Thursday, October 6, 8:30 a.m.—This plant is known as United States Air Force Plant No. 39. It is the largest government owned manufacturing facility in the country. The property includes 476 acres of land and 19 major buildings with six and one-half million sq. ft. of floor space. The Engine Plant, which is the largest building, has approximately four and one-half million sq. ft. of floor area and is the largest single story manufacturing building known to exist—87 acres under one roof with more than 6,500 machine tools. Just for comparison, the area of the Engine Plant is equivalent to 66 football gridirons.

This is a well-integrated facility including a forge plant, magnesium foundry, aluminum foundry, and machining and assembly and test areas. The fuel facility has a capacity of approximately one and one-half million gallons of aviation fuel.

This plant made the R-4360 piston engine which was the first engine the Division contracted to build. It is the largest piston engine in the world. Each of the 28 cylinders on the R-4360 engine is capable of delivering as much horsepower as the engine of a higher priced automobile.

The Aircraft Engine Division completed its R-4360 program in August of last year. The Division is now making the J-57 engine which is an axial-flow dual compressor type engine having excellent power and fuel consumption characteristics. It weighs approximately 4,200 pounds and is in the 10,000 pound thrust class.

Standard Oil Refinery—Wednesday, October 5, all day, Luncheon will be provided by the Standard Oil Company. The largest oil refinery in the midwest, the Whiting Refinery of the Standard Oil Company of Indiana is a landmark in the world-famous Calumet industrial district. About 50,000 motorists drive daily along US Routes 12 and 20 past its 1700 acres bordering the southwest shore of Lake Michigan. The refinery, begun in 1889, is now equipped to process

an annual average of 210,000 barrels per day of crude oil. The daily production of gasoline is 3,700,000 or 3-1/3 billion gallons per year.

The Whiting Refinery generates and distributes all of the power required for the operation of the entire refinery. There is no connection with a utility company. The total generating capacity is 64,000 kw. Power is generated in two power stations. Steam is generated at pressures of 1400 and 400 psi to supply turbine-generators and process.

The electrical distribution system comprises three interconnected systems with respective voltages of 13,200, 4160 and 2400. The lower voltage systems are radial and the 13,200 volt system is a spot network system. The Refinery has one of the largest independent local telephone systems (1500 telephones) in the midwest. There is a two-way radio installation so that all mobile equipment can be contacted immediately.

The Company's Research Department and the Engineering Research Department are also located in Whiting. The latter is responsible for developing new mechanical equipment and processes. A new analogue computer has recently been installed for use in studying process control and instrumentation problems.

The Refinery maintains its own fire-fighting forces and equipment. It has its own pumping plant and has pumped 285,000,000 gallons of water in one day or more than 1/4 as much as the city of Chicago pumps to a population of 4,000,000 with all of its industries. Pipelines bring crude oil to the refinery from Texas, Kansas, New Mexico, Oklahoma, Wyoming and Colorado. The most distant producing fields are more than 1400 pipeline miles away. Products pipelines carry more than 1/3 of the refinery's average daily output to market terminals such as Lafayette and Indianapolis, Ind., Moorehead, Minn., and River Rouge, Mich. Nearly 1/3 of the 8100 people employed at Whiting are used to maintain the equipment. The remainder work on new construction, operation, or research.

McCook Plant of Reynolds Metals—Thursday, October 6, 1:30 p.m.—The McCook Plant was built for the Government during the second world war. It was leased to Reynolds in 1946 and was purchased in 1949. It has facilities for remelting and alloying aluminum, a large hot mill, a cold mill, and associated equipment. The McCook plant has produced more aluminum sheet in a day than any similar plant in the world.

The original cost of the McCook plant was \$43,000,000. It has 2,344,000 sq. ft. of floor space and there are 55 acres of the plant under roof. There are 122 furnaces in service, heated by electricity, oil, coal and gas. An almost endless number of electric motors are in operation, some rated as high as 5000 horsepower. A special 138,000 volt power line brings electricity into the McCook substation which distributes power throughout the plant. Included among the 36 buildings are a 10,000 sq. ft. cafeteria, locker rooms, a two-story office building and a first aid station.

The McCook boiler house produces 40,000 pounds of steam per hour at 150 psi.

Will County Station—Wednesday, October 5, 1:00 p.m.—The new Will County Station of the Commonwealth Edison Company is the newest addition to the Company's great power system serving North-

ern Illinois. It was formally placed in operation in March of this year and is the twelfth large generating plant to become part of the Commonwealth Edison System.

Will County Station has been under construction for more than three years. The initial installation consists of a 160,000-kw generating unit but the installation of a second machine of the same size is being completed this summer and is expected to be in operation at the time of the AIEE Fall General Meeting. A third unit of 250,000-kw capacity is scheduled for completion in 1957.

The station is located on a 216-acre tract on the Chicago Sanitary Ship Canal near Lemont, Ill., about 19 miles southwest of Edison's Ridgeland Station and 11 miles northeast of its Joliet Station. This new station incorporates all the latest improvements in electric generating station construction and operation. A coal-burning plant, it will require less than one pound of Illinois coal per kilowatt of electricity. This compares with one and one-half pounds per kwh in some older stations and an average of 1.23 lb per kwh for the Commonwealth Edison system in 1954. The boilers for each of the two 160,000-kw units will burn about 1600 tons of coal in a normal day's operation. Will County brings the Edison system's installed capacity to 3,582,000 kw.

Electro-Motive Plant of General Motors Corp.—Tuesday, October 4, 1:30 p.m.—Since the first diesel-powered streamlined train in the U.S. made its initial run in 1934, Electro-Motive Division of General Motors has devoted its manufacturing facilities and engineering abilities to the mass production of diesel-powered mobile electric generating plants—diesel-electric locomotives.

More than 15,000 locomotives have been built and placed in service since the first General Motors diesel electric locomotive was produced in the LaGrange plant in 1936. This is the only plant building all major components of such locomotives—diesel engines, electric generators, traction motors, car bodies, and trucks. At the present time, in addition to locomotive production, this plant is building the new Electro-Mobile generating units. These are complete diesel-powered electric generators designed especially to meet fringe area electric power generating requirements. These units are made in four capacities, 350 kw, 500 kw, 750 kw and 1000 kw. They are mounted either on automobile trucks, on railroad flat cars or they can be installed on steel bases for permanent or semi-permanent locations. The units are completely automatic both as to starting, synchronizing, and operation. Visitors to the Electro-Motive plant will see the production of all the equipment that goes into these units.

Rauland Corporation—Tuesday, October 4, 1:30 p.m.—The Rauland Corporation is of interest in that it has facilities for the mass production of television tubes and advanced electronic equipment.

Museum of Science and Industry—Thursday, October 6, 10:30 a.m.—This is a trip being planned by the ladies and will be of great interest to every engineer. This great institution, founded by Julius Rosenwald, occupies the reconstructed Fine Arts Building of the World's Columbian exposition of 1893. The structure is one of the finest examples of classic architecture in the world. With a total floor area of some 14 acres it contains exhibits of scientific and industrial progress, many of them in full operation. They are arranged by

subject into sections, such as "fuels and metals." Each section is grouped into sequence, often tracing an idea from its invention to its mass production.

Prudential Building—Tuesday, October 4, 8:30 a.m. or 10:30 a.m.—The Prudential building is Chicago's newest office building. This \$40,000,000 structure is perhaps the most modern office building in the world. It has the highest electrical design load of any building in the United States, the fastest high-rise elevators in the world, and also the highest intensity lighting.

SOCIAL ACTIVITIES

Reception Tea and Hospitality Hour—Social activities will begin Sunday afternoon, October 2, from 4:00 to 6:00 p.m., with an informal reception tea, and with a hospitality hour sponsored by the Chicago Section, AIEE, for members of the AIEE and their families.

Smoker—A Smoker is planned for Monday evening, October 3. This event coincides with a cocktail party and dinner for the ladies. The Smoker will consist of a dinner and excellent entertainment in the Terrace Casino of the Morrison Hotel. Members wishing to attend this Smoker should get their reservations in early. The capacity of the Terrace Casino is limited to about 1,100 persons and the high quality of last year's program together with the fact that the National Electronics Conference, being held in Chicago this week, has been invited to participate in the Smoker, virtually insures a sell-out. Tickets are \$10.00 each.

Dinner Dance—Since the date of the AIEE Fall General Meeting this year coincides with that of the National Electronics Conference, arrangements have been made to have members of the AIEE attend the NEC Party rather than to stage one in competition with NEC. The NEC Party will be held Tuesday night, October 4, at the Sherman Hotel. Tickets to the NEC Party cost \$6.50.

LADIES' PROGRAM

A full and varied program for the ladies has been arranged by Mrs. Robert B. Gear and her committee. This includes the informal reception tea on Sunday afternoon, and a cocktail party and dinner on Monday night, October 3, when the men attend the Smoker. The cocktail party will be held from 5:00 to 7:00 p.m. at the Gold Key Club of Chez Paree and is by courtesy of General Cable Corporation. All will then enjoy a famous Chez Paree dinner and entertainment, including three door prizes. Tickets, not including transportation, will be \$5.50.

On Wednesday at 12:30 p.m. there will be a style show and luncheon at Marshall Field and Company, courtesy of Delta-Star Electric Division of H. K. Porter Company. At this luncheon there also will be door prizes.

Other social events for the ladies include a card party with door prizes and a tea, courtesy of the Allis Chalmers Company.

Trip to Museum of Science and Industry—On Thursday, at 10:30 a.m. there will be a trip to the Chicago Museum of Science and Industry to which the men are also invited. This will provide an opportunity of seeing hundreds of interesting exhibits from all sciences and industry, and a special show in the theatre.

You Pick It—We'll Take You—Since no pre-arranged schedule can meet all desires, ladies are invited to name the places they would like to visit and hostesses will be available to help arrange the trips of their choice. Among these might be: Chicago Historical Society, Chicago Art Institute, Adler Planetarium, Shed Aquarium, Chicago Natural History Museum, Retail Stores, Marshall Field and Company, Carson Pirie Scott and Company, and others, Chicago University, Northwestern University, etc.

Coffee Hour—From 9:00 to 10:30 each morning coffee and rolls will be served in the Ladies' Headquarters, and hostesses will be in attendance to explain the program and help ladies choose their entertainment for the day.

RADIO, TELEVISION, AND THEATER TICKETS

Free radio and television tickets for all days of the convention will be available. Tickets should be secured a day in advance and information concerning programs, show times and seating will be available at Headquarters.

Theater tickets and tickets for sporting events will be available only from the Hotel ticket broker in the lobby.

FALL GENERAL MEETING COMMITTEE

OFFICERS

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H. R. Stevens, *Secretary* R. W. Jones, *Treasurer*

DINNER DANCE

M. J. Adams, *Chairman* E. A. Schmidt
E. L. Bradley, *Vice-Chairman* D. K. Chinlund
John Romano L. R. Janes
L. E. Randall S. E. Hutchins
N. A. Miller

ENTERTAINMENT

F. A. Larson, *Chairman* A. W. Schaefer
T. H. Maguire, Jr., *Vice-Chairman* R. Schadt
G. L. Erickson J. R. Cooper
B. G. Treece J. Agosta
R. E. Volbrecht

FINANCE AND BUDGET

F. M. Scott, *Chairman* E. H. Finch
M. J. Adams, *Vice-Chairman*

GENERAL MEETING

E. R. Whitehead, *Chairman* D. L. Hemmenway
T. A. Abbott C. T. Hesselmeyer
M. J. Adams S. E. Hutchins
Edward Allen D. L. Levine
D. K. Chinlund John A. M. Lyon
Randon Ferguson M. S. Markese
E. H. Finch A. L. Ungrodt
 R. E. Zenner

HOSPITALITY

E. H. McNeill, *Chairman* Nelson Hanson
J. F. Bracken, *Vice-Chairman* J. A. Schneider
P. J. McLaughlin Henry McGreer
Robert McGeever G. E. Johnson
James Murray R. A. Pinkley
R. C. Young D. L. Love
G. L. Landgren W. G. Carey
J. F. Heitert K. A. Fahse
H. M. Porter O. M. Bercaw, Jr.
John Banas A. A. Koehler
Raymond Michelletti R. H. Hartson
Jack Hille W. F. Bergmann
Tom Jackson John Andres

HOTEL ARRANGEMENTS

G. L. Welch, *Chairman* F. D. Hurd
B. T. Carmody, *Vice-Chairman* E. F. Koncel, Jr.
J. N. Banky C. E. Pigue
A. N. Eliason J. H. Easley
A. J. Gartner R. S. Roeing
R. G. Gilbert D. J. Ryan
B. W. Glynn A. A. Tseng
J. B. Holloman E. G. Wear

PUBLICITY

A. W. Kramer, *Chairman* R. B. Russell
J. T. Tyner, *Vice-Chairman* W. O. Schnell
Russell Johnson R. D. Talmage

REGISTRATION

G. E. Buchanan, <i>Chairman</i>	L. O. Nordeen
D. L. Levine, <i>Vice-Chairman</i>	E. K. Olendzki
M. R. Gowing	G. C. Pappas
W. C. Kottemann	Robert Schadt
G. C. Law	Alec Sapphire

SALE OF PAPERS

M. J. O'Laughlin, <i>Chairman</i>	W. J. Decker
R. J. Spillar, <i>Vice-Chairman</i>	F. J. Krase
E. G. Ross	D. F. Hayworth
Herald Fossum	John Clark
F. D. Geyer	John Kocik
G. L. Hammerschmidt	

SMOKER

E. H. Finch, <i>Chairman</i>	M. S. Markese
D. H. Beal, <i>Vice-Chairman</i>	

PROGRAM

R. M. Bergslien, <i>Chairman</i>	H. J. Ingram
C. A. Hatstat, <i>Vice-Chairman</i>	John A. M. Lyon
B. A. Fisher	E. L. Nicolson
C. F. Hill	W. H. Wickham
T. W. Hissey	

TRIPS AND TRANSPORTATION

D. C. Percy, <i>Chairman</i>	E. B. Josler, Jr.
Warren Oplitiz, <i>Vice-Chairman</i>	

LADIES' ACTIVITIES

Mrs. R. B. Gear, <i>General Chairman</i>	Mrs. John Romano,
Mrs. G. E. Buchanan,	<i>Ass't. General Chairman</i>
<i>Ass't. General Chairman</i>	

RECEPTION TEA

Mrs. F. A. Cox, <i>Chairman</i>	Mrs. W. M. Ballenger
Mrs. Stanley Goodell, <i>Co-Chairman</i>	Mrs. E. R. Whitehead

REGISTRATION DESK

Mrs. F. A. Larson, <i>Chairman</i>	Miss J. Glessner
Mrs. L. R. Janes, <i>Co-Chairman</i>	Mrs. A. L. Ungrodt
Mrs. H. G. Krohn	Mrs. W. L. Peterson
Mrs. F. W. McCloska	

LADIES' COFFEE HOUR

Mrs. M. J. Adams, <i>Chairman</i>	Mrs. E. G. Norell
Mrs. R. P. Dodds	Mrs. H. M. Porter
Mrs. H. R. Heckendorn	Mrs. F. M. Scott
Mrs. Titus LeClair	Mrs. E. A. Schmidt
Mrs. Walter Lederman	

LADIES' DINNER

Mrs. E. H. Finch, <i>Chairman</i>	Mrs. J. C. Woods
Mrs. E. N. Clark	Mrs. Dale Skylingstad

LUNCHEON

Mrs. H. R. Stevens, <i>Chairman</i>	Mrs. R. W. Jones
Mrs. G. L. Welch, <i>Co-Chairman</i>	Mrs. H. S. McGee
Mrs. W. C. Kottemann	Mrs. E. G. Norell

TEA

Mrs. W. E. Bergmann, <i>Chairman</i>	Mrs. R. L. Boyd
Mrs. N. M. Mintz, <i>Co-Chairman</i>	Mrs. H. J. Pfandhoefer
Mrs. T. A. Abbott	

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President

M. D. HOOVEN

Past Presidents

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BRADLEY COZZENS	S. M. SHARP
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E. R. JONES	C. M. SUMMERS
W. J. MILLER	J. R. WALKER
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J. H. FOOTE	C. S. PURNELL
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W. J. BARRETT

Secretary

N. S. HIBSHMAN

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W. R. Clark	Hendley Blackmon
<i>Vice-Chairman</i>	<i>Secretary</i>
E. C. Day	R. S. Gardner
<i>Assistant Secretary</i>	<i>Assistant Secretary</i>
<i>Technical Papers</i>	<i>Technical Activities</i>
H. A. Affel	J. E. Hobson
W. R. Brownlee	Guy Kleis
I. S. Coggeshall	L. J. Linde
J. B. Coleman	A. C. Muir
L. R. Gaty	R. L. Oetting
E. I. Green	B. G. A. Skrotzki
C. T. HATCHER	R. C. Sogge
G. W. Heumann	S. Reid Warren, Jr.
L. F. Hickernell	H. B. Whitaker
W. Scott Hill	

COMMITTEE MEETINGS

Monday, October 3

- 12:00 noon—Luncheon—Television and Aural Broadcasting..Rm. 434
- 12:00 noon—Luncheon—Mining and Metal Industry..Burgundy Rm.
- 12:00 noon—Luncheon—SafetyRoom 632

Tuesday, October 4

- 8:30 a.m.—Breakfast—Industrial Power Systems.....Room 634
- 9:00 a.m.—System EngineeringBurgundy Room
- 9:00 a.m.—Electrical Techniques in Medicine & Biology..Rm. 426
- 9:00 a.m.—Planning and CoordinationRoom 440
- 9:00 a.m.—Power DivisionRoom 434
- 10:00 a.m.—ManagementRoom 632
- 10:00 a.m.—Communication DivisionRoom 424
- 12:00 noon—Luncheon—Communication DivisionRoom 424
- 12:00 noon—Luncheon—Science and Electronics Division...Rm. 426
- 12:00 noon—Luncheon—DC Machinery Subcommittee...Room 634
- 12:00 noon—Luncheon—Land TransportationRoom 434
- 2:00 p.m.—Dielectric Devices SubcommitteeRoom 424
- 2:00 p.m.—Short Circuit Calculations Guide Working GroupRoom 634
- 2:00 p.m.—Planning and CoordinationRoom 440
- 2:00 p.m.—Radio Communications SystemsRoom 632
- 2:00 p.m.—EducationBurgundy Room
- 4:00 p.m.—Solid State DevicesRoom 426
- 7:30 p.m.—Basic SciencesRoom 632

Wednesday, October 5

- 9:00 a.m.—District #5 Executive...Western Soc. of Engineers Bldg.
- 9:00 a.m.—Relay Working GroupRoom 530
- 9:00 a.m.—Relay Working GroupRoom 532
- 9:00 a.m.—Relay Working GroupParlor G
- 9:00 a.m.—Public RelationsRoom 424
- 9:00 a.m.—Standard #32 Revision Working Group.....Room 434
- 9:00 a.m.—Industry DivisionRoom 426
- 9:00 a.m.—General Applications DivisionRoom 440
- 9:00 a.m.—Carrier Current Subcommittee #3Room 634
- 9:00 a.m.—Edison MedalRoom 632
- 12:00 noon—Luncheon—Technical OperationsRoom 440
- 12:00 noon—Luncheon—Elect. Systems for Commercial Bldgs. Sub.Burgundy Room

- 2:00 p.m.—District #5 Executive...Western Soc. of Engineers Bldg.
- 2:00 p.m.—R.M. Administrative SubcommitteeRoom 424
- 2:00 p.m.—Standard #32 Revision Working Group....Room 434
- 2:00 p.m.—Chemical IndustryRoom 634
- 2:00 p.m.—Relay SubcommitteeRoom 530
- 2:00 p.m.—Relay SubcommitteeRoom 532
- 2:00 p.m.—Telegraph SystemsParlor G
- 2:00 p.m.—Research.....President's Room, University Club
- 2:00 p.m.—Automatic and Supervisory Control SubcommitteeRoom 632
- 4:30 p.m.—Wire Communications Systems.....Burgundy Room
- 7:30 p.m.—Forum of Technical Committee Chairmen..Embassy Rm.

Thursday, October 6

- 9:00 a.m.—Carrier CurrentRoom 634
- 9:00 a.m.—RelaysRoom 434
- 9:00 a.m.—Board of DirectorsSuite 440
- 10:00 a.m.—Power GenerationBurgundy Room
- 12:00 noon—Luncheon Induction Machinery Subcommittee..Rm. 634
- 12:00 noon—Luncheon—Board of DirectorsSuite 440
- 2:00 p.m.—Board of DirectorsSuite 440
- 2:00 p.m.—Rotating Machinery Noise Working Group...Room 632
- 2:00 p.m.—RelaysRoom 434
- 2:00 p.m.—Substations Executive Subcommittee.....Room 424
- 2:00 p.m.—Single Phase and Fractional Horsepower SubcommitteeRoom 426
- 2:00 p.m.—Radio Communications Systems.....Burgundy Room
- 4:00 p.m.—R.M. Insulation SubcommitteeRoom 426

Friday, October 7

- 9:00 a.m.—SubstationsBurgundy Room
- 9:00 a.m.—Code of Principles of Professional Conduct...Room 424
- 10:00 a.m.—Communication Switching SystemsRoom 426
- 2:00 p.m.—SubstationsBurgundy Room

LOCATION OF ALL MEETING ROOMS

Lower Level	Terrace Casino
Street Level	Hotel Lobby
Mezzanine Floor	Burgundy Room Cotillion Room Embassy Room Hollywood Room
First Floor	Parlors A, B, C, D Grand Ballroom
Second Floor	Venetian Room Parlor F, G Walnut Room
Third Floor	Madison Room
Fourth Floor	Rooms 424 to 440
Fifth Floor	Rooms 530 and 532
Sixth Floor	Rooms 632 and 634

SOUTH CLARK ST.

WEST MADISON ST.

GRAND BALLROOM

HEAD-QUARTERS ROOM

SALE OF PAPERS ROOM

REGISTRATION AREA

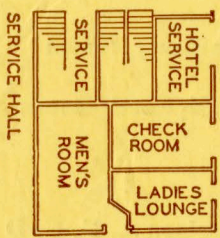
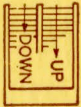
TO NEW EAST BALLROOM

CHECK ROOM

LADIES LOUNGE

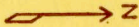
MEN'S ROOM

ELEVATORS



SERVICE HALL

FIRST FLOOR PLAN MORRISON HOTEL



SEE INSIDE COVER FOR LOCATION OF ALL MEETING ROOMS