



# Winter General Meeting

January 19-23, 1953

Headquarters

Hotel Statler

7th Avenue and 33rd Street, New York, N. Y.

## TECHNICAL PROGRAM

### Monday, January 19

#### 10:00 a.m.—Land Transportation

- CP.\*\* Trends in Rapid Transit Car Design. S. H. Bingham, N.Y.C. Board of Transportation.
- CP.\*\* Extension of Rapid Transit Facilities in Boston. S. B. Lent, Metropolitan Transit Authority.
- CP.\*\* Development of Rapid Transit and Super-highways in Chicago. S. D. Forsythe, Chicago Transit Authority.
- 53-35. An Interurban Becomes A Railroad. C. H. Jones, Chicago, South Shore & South Bend R.R.

#### 10:00 a.m.—Insulated Conductors

- 53-28. Development of Training and Jointing Techniques to Prolong the Life of Lead Cable Sheath. G. H. Fiedler and E. J. Nelson, Rochester Gas & Electric Corp.
- 53-33. Gencalloy A Lead Alloy Cable Sheath Creep and Fatigue Characteristics. R. W. Atkinson, L. Meyerhoff and W. H. Cortelyou, General Cable Corp.
- 53-59. The Microbiological Deterioration of Rubber Insulation. J. T. Blake, D. W. Kitchin and O. S. Pratt, Simplex Wire & Cable Co.

#### 10:00 a.m.—Electric Circuit Theory

- 53-60. A Graphical Method for Flip-Flop Design. R. F. Johnson and A. G. Ratz, University of Toronto.
- 53-61. Analysis of a Comb Filter Using Synchronously Commutated Capacitors. W. R. LePage, C. R. Cahn and J. S. Brown, University of Syracuse.
- 53-62. The Rayleigh Method in Network Calculations. F. W. Schott and Jack Heilfron, University of California.
- CP.\*\* Block Diagram Solutions for Vacuum Tube Circuits. T. M. Stout, University of Washington.
- 53-64. Phase Plane Characterization of a Non-Linear Inductance. ACO.\* H. E. Ellithorn, Kenneth Kempf, University of Notre Dame; William Shewan, Valparaiso University;.

#### 10:00 a.m.—Industrial Power Systems

- CP.\*\* Equipment Grounding for Industrial Plants. L. J. Carpenter, General Electric Co.
- CP.\*\* Short-Circuit Protection for Small and Medium Size Industrial Plant Generators. F. L. Brightman, General Electric Co.

#### ADVANCE COPIES OF PAPERS

Members may obtain preprints of numbered papers at the uniform price of 30c each (60c each to nonmembers), by sending enclosed order form and remittance to the AIEE Order Department, 33 West 39th Street, New York 18, N. Y. 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 \$9 denominations are available for those who wish to avoid remittance by check or otherwise. Most of the papers ultimately will be published as AIEE Proceedings and in the Transactions. *Conference Papers* denoted by CP.\*\* are intended for presentation only, and are not available.

- CP.\*\* The Effect of Iron Conduit on Single Phase Circuit Impedance. E. A. Rockau, Consolidated Edison Co. of N. Y.

- CP.\*\* Problems Associated with the Installation and Operation of a 6900 Volt Grounded Neutral Industrial Power System. C. L. Eichenberg, Bethlehem Steel Co.

#### 10:00 a.m.—Electronic Power Converters and Substations

- 53-24. Capacitors in Power Systems with Rectifier Loads. A. Schmidt, Jr., General Electric Co.
- 53-65. Load Dropping Tests on a Large Ignitron Rectifier Installation. S. J. Pope, Kaiser Aluminum & Chemical Corp.; J. K. Dillard and C. R. Marcum, Westinghouse Electric Corp.
- 53-66. Industrial Electronic Rectifiers for Essential Service Duty. ACO.\* M. E. Reagan, Westinghouse Electric Corp.
- 53-26. Magnetic Amplifier Applications in D-C Conversion Stations. W. A. Derr and E. J. Cham, Westinghouse Electric Corp.
- 53-67. Oil Immersed 110 Kv 440 Kw Rectifier Unit for Resatron Plant Supply. R. P. Featherstone, Cheng Ling and P. A. Cartwright, University of Minnesota.

#### 10:00 a.m.—Conference on Education

Panel Discussion: Should Curriculum Options Continue? by G. S. Brown, Massachusetts Institute of Technology; K. B. McEachron, Jr., General Electric Co.; and J. R. North, Commonwealth Services, Inc.

#### 10:00 a.m.—Conference on Applied Mathematics

- CP.\*\* Induced Potentials. Garrett Birkhoff, Harvard University.
- CP.\*\* The Optimum Characteristic of a Non-linear Device for Producing Combination Frequencies. W. H. J. Fuchs, Cornell University.
- CP.\*\* The Theory of Queues. D. G. Kendall, Oxford and Princeton Universities.
- 53-29. A Mathematical Analysis of a Series Circuit Containing a Nonlinear Capacitor. L. A. Pipes, University of California.

#### 10:00 a.m.—Conference on AIEE Standard Number One

- CP.\*\* Proposed Revision in AIEE Standard Number One. G. L. Moses, Westinghouse Electric Corp.
- CP.\*\* IEC Proposals on Classification on Insulation. M. S. Hancock and P. C. Smith, Westinghouse Electric Corp.
- CP.\*\* Proposed Test Codes for Functional Evaluation of Insulation and Insulation Systems for Rotating Machinery. P. L. Alger, General Electric Co.
- CP.\*\* Proposed Test Codes for Functional Evaluation of Insulation and Insulation Systems for Transformers. J. L. Cantwell, General Electric Co.

#### 10:00 a.m.—Carrier Current

- 53-165. A Study of Carrier Frequency Noise, Part III—Interpretation of Field Measurements. J. D. Moynihan and B. J. Sparlin, Westinghouse Electric Corp.
- 53-166. A Flexible New Line of Power Line Carrier Equipment. F. B. Gunter, Westinghouse Electric Corp.
- CP.\*\* Optimum Selectivity for Existing Carrier Current Pilot Relay Channels. D. C. Pinkerton, General Electric Co.



CP.\*\* Methods of Rating Carrier Current Equipment. T. A. Cramer, General Electric Co.

53-167. Bibliography of Power Line Carrier Literature. Subcommittee ACO.\* on Bibliography.

## 2:00 p.m.—General Session

Edison Medal Presentation to Dr. V. K. Zworykin.

Establishment of the Edison Medal: Prof. J. F. Calvert, Chairman, Edison Medal Committee.

Career of the Medalist: Dr. E. W. Engstrom, Vice-President in charge of Research, R. C. A. Laboratories.

Presentation of Medal: President D. A. Quarles.

Response of the Medalist: Dr. V. K. Zworykin.

Presentation of Institute Prizes.

"Address," Dr. H. T. Heald, Chancellor, New York University.

## Tuesday, January 20

### 9:30 a.m.—Land Transportation

Introduction, L. S. Billau, Baltimore & Ohio R.R.

CP.\*\* The Diesel Locomotive—Its Real Meaning to the Railroads. Charles Kerr, Jr., Westinghouse Electric Corp.

53-68. Diesel-Electric Locomotives in Canada. J. D. Sylvester, Canadian National Railways and D. F. Haney, Canadian Pacific Railways.

53-69. Electric Transmission with Diesel Locomotives. P. A. McGee, Consulting Transportation Engineer.

53-70. Education and Training of Diesel-Electric Locomotive Maintenance Personnel. J. W. Tekler & E. R. Ainsworth, General Electric Co.

53-48. Dynamic Braking on Diesel-Electric Locomotives. A. V. Johansson and H. R. Stiger, General Electric Co.

### 9:30 a.m.—Electric Space Heating and Heat Pumps

CP.\*\* Problems of Design in Residential Electric Heating. H. B. Wilde, Wessix Electric Heater Co.

CP.\*\* Experience with Controlled Electric Space Heating. R. G. Giedd, Florida Power Corp.

CP.\*\* Electric Space Heating and Resulting System Load Factors. T. H. Allen, Memphis Light, Gas and Water Div.

CP.\*\* Air to Air Heat Pump Systems and Their Calculated Electric Characteristics. P. F. O'Neill, General Electric Co.

53-71. An Analytical Solution of Heat Flow vs Wire Temperature for Electric Cables Buried in Plaster. James E. Goff, Homes, Inc. Presentation by title only for discussion.

### 9:30 a.m.—Maintenance of Rotating Machinery

CP.\*\* Commutation Problems. Carl E. Boesmler, Dept. of Water & Power, City of Los Angeles.

CP.\*\* Insulation Maintenance Guide for Large A-C Rotating Machinery. (Subcommittee Report) G. L. Moses, Westinghouse Electric Corp.

CP.\*\* Standards for Repair Shops. Sam Heller, Consolidated Electric Motor Co.

CP.\*\* Maintenance of Large Rotating Electric Equipment on Shipboard. W. H. Fifer, Bureau of Ships.

### 9:30 a.m.—Magnetic Materials

CP.\*\* The Critical Material Situation for Magnetic Materials. F. H. Buttner, National Research Council.

CP.\*\* Properties of Bismantol Permanent Magnets. Edmund Adams, Naval Ordnance Lab.

CP.\*\* Magnetic Materials for High-Speed Pulse Circuits. D. R. Brown, Massachusetts Institute of Technology.

CP.\*\* Stressed Ferrites with Rectangular Hysteresis Loops. H. J. Williams, Bell Telephone Labs.

### 9:30 a.m.—Nucleonics

CP.\*\* 70 M.E.V. Medical Synchrotron. R. N. Edawards, General Electric Co.

CP.\*\* Nuclear Power Reactor. John Menke, N. D. A.

CP.\*\* Design Parameters of Beta Thickness Gauges. Harrison Faulkner, Tracerlab.

CP.\*\* New Focus Scheme of the Brookhaven Cosmotron. J. P. Blewett, Brookhaven.

CP.\*\* A Scintillation Detector with Extended Plateau. Earl Farmer, Tracerlab.

### 9:30 a.m.—Electronic Power Converters

53-53. Electronic Frequency Changer Used as Non-Synchronous Tie Between A-C Power Systems. Harold Winograd, Allis-Chalmers Mfg. Co.

53-36. Extended Regulation Curves for Six-Phase Double-Way and Double-Wye Rectifiers. I. K. Dortort, I-T-E Circuit Breaker Co.

53-54. Influence of A-C Reactance on Voltage Regulation of Six-Phase Rectifiers. R. L. Witzke, J. V. Kresser and J. K. Dillard, Westinghouse Electric Corp.

CP.\*\* Effect of European Practices on International Power Rectifier Standards. L. W. Morton, General Electric Co.

### 9:30 a.m.—Industrial Power Systems

CP.\*\* Large Industrial Plant Replaces Electrical System. E. N. Walton, Powell River Co., Ltd.

CP.\*\* Electrical Innovations in the Alcoa Building. L. N. Grier, Aluminum Co. of America.

53-72. 240/416-Volt, 3-Phase, 4-Wire Power and Lighting Supply for Modern Industrial Plants. William Shuler, Dayton Power & Light Co.

53-73. Electric Distribution and Control for Lighting Systems. W. H. Kahler, Westinghouse Electric Corp. and R. N. Bell, E. I. du Pont de Nemours & Co., Inc.

### 9:30 a.m.—Relays

53-13. Pilot Wire Circuits for Protective Relaying—Experience and Practice 1942-1950. Project Committee on Pilot Wires.

53-21. A Review of Back-up Relaying Practices. Project Committee on Transmission Line Protection.

53-14. Remote Tripping Schemes. Project Committee on Remote Tripping Schemes.

53-74. A New Inverse Time Overcurrent Relay with Adjustable Characteristics. W. K. Sonnemann, Westinghouse Electric Corp.

53-75. Principles of Induction Type Relay Design. W. E. Glassburn and W. K. Sonnemann, Westinghouse Electric Corp.

### 9:30 a.m.—Conference on Steel and Wood Towers

CP.\*\* Experience with Wood vs Steel Construction on the Public Service Company of Colorado Transmission System. L. M. Robertson, Public Service Co. of Colorado.

CP.\*\* Wood vs Steel Construction for Transmission Lines. K. T. Deutsch, Denver Federal Center.

CP.\*\* A Review of the Use of Wood for Transmission Line Structures. R. G. Yerck, Hughes Bros. Inc.

CP.\*\* Modern 220 Kv Steel Tower Transmission Line Construction. A. N. Shealy and Eduard Fritz, Pennsylvania Water & Power Co.

CP.\*\* A Study of Cost of High Voltage Transmission Lines in Alabama Using Wood and Steel Structures. L. B. Murray and C. P. Ussery, Tennessee Copper Co.

CP.\*\* Improvements in Performance of Steel and Wood Transmission Lines. C. A. Booker, New England Power Service Co.

CP.\*\* Wood vs Steel 110 kv Transmission Line from the Lightning Flashover Standpoint. J. A. Rawls, Virginia Electric & Power Co.

### 9:30 a.m.—UHF Television

CP.\*\* General Aspects of UHF Broadcasting. E. W. Allen, Jr., Federal Communications Commission.

CP.\*\* UHF Transmitting Equipment. Dana Pratt, RCA Victor Div.

CP.\*\* New Devices for Broadbanding UHF Television Transmitters. F. E. Talmage, RCA Victor Div.

CP.\*\* An Experimental Study of Wave Propagation at 850 Megacycles. D. W. Peterson and Jess Epstein, RCA Labs.

CP.\*\* Selection and Amplification of UHF Television Signals. J. W. Waring and W. P. Boothroyd, Philco Corp.

### 9:30 a.m.—Semiconductors

CP.\*\* Theory of Photoconductivity. H. Y. Fan, Purdue University.

CP.\*\* Properties of Photoconductors. A. Rose, R. C. A. Labs.

CP.\*\* Germanium Phototransistors. J. N. Shive, Bell Telephone Labs.

CP.\*\* Barrier Layer Phenomena in Titanium Dioxide. R. G. Breckenridge and N. Oshinsky, Bureau of Standards.

### 2:00 p.m.—Semiconductors

CP.\*\* Zener Breakdown as a Function of Material Resistivity. B. Sawyer, Bell Telephone Labs.

CP.\*\* A Tetrode Transistor. I. A. Lesk, General Electric Co.

CP.\*\* Theory of Alpha for Fused-Contact Transistors. E. L. Steele, General Electric Co.

CP.\*\* Radiochemical Studies on Germanium. G. H. Morrison, Sylvania Electric Products, Inc.

### 2:00 p.m.—Land Transportation

53-50. Design Factors Favoring Diesel Locomotive Electrical Maintenance. J. Stair, Jr., Pennsylvania R. R.

53-76. Equipment and Functions of a Modern Diesel Locomotive Heavy Electric Repair Shop. F. Thomas, New York Central System.

53-77. Diesel Electric Locomotive Ground Relays. G. R. McDonald, General Electric Co.

CP.\*\* Maintenance of Electrical Equipment of Diesel Electric Locomotives. W. H. Eunson and T. L. Weybrew, Westinghouse Electric Corp.

53-51. A New Control for Heavyweight Rapid-Transit Cars. I. W. Lichtenfels, General Electric Co.

53-78. An Axle-Driven Alternator-Rectifier System for Caboose Power Supply. A. H. Hoffer and G. W. Weber, General Electric Co.

### 2:00 p.m.—Transmission and Distribution

53-79. Comparative Cost of Distribution Systems with 4.16-Kv or 13.2-Kv Primary Feeders. H. G. Barnett and D. N. Reps, Westinghouse Electric Corp.

53-80. New Instrumentation of A-C Network Calculator with Automatic Features. L. L. Fountain, R. B. Squires and W. A. Hopkins, Westinghouse Electric Corp.

53-81. Real Power and Imaginary Power in Alternating Current Circuits. C. F. Estwick, Electrical Engineer.

### 2:00 p.m.—Transient Performance of D.C. Machines

53-82. Fault Transients and Frequency Spectrums of a D-C Generator. D. H. Schaefer, Naval Research Lab.

53-83. Flashover Torque of a D-C Generator. O. C. Coho, General Electric Co.

53-84. Transient Analysis of the Metadyne Generator. M. Riaz, Massachusetts Institute of Technology.

53-85. Transient Performance of D-C Machinery I. John Cybulski, E. L. Brancato and J. P. O'Connor, Naval Research Lab.

53-86. Flashing of DC Machines Caused by Short Circuits. A. T. McClinton and J. P. O'Connor, Naval Research Lab.

### 2:00 p.m.—Power Supply for Resistance Welding Machines

Introductory Remarks. E. L. Bailey, Chrysler Corp.

CP.\*\* Resistance Welders—Their Ratings and Characteristics of Their Load. W. E. Bostwick, Precision Welder and Machine Co.

CP.\*\* The Power Company Section of the Report on Power Supply for Resistance Welding Machines. H. W. Tietze, Public Service Electric and Gas Co.

CP.\*\* Power Supply for Resistance Welders. Section 6—Information for Power Users. W. K. Boice, General Electric Co.

CP.\*\* Typical Installations. C. E. Pflug, Nash Kelvinator Corp.

53-87. The Electric Arc in Argon and Helium. T. B. Jones, Merrill Skolnick and W. B. Kouwenhoven, Johns Hopkins Univ. Presentation by title only for discussion.

### 2:00 p.m.—Metallic Rectifiers

CP.\*\* Metallic Rectifier Review. I. R. Smith, Westinghouse Electric Corp.

CP.\*\* Problems to Consider in Applying Selenium Rectifiers. J. Gramels, Bell Telephone Labs.

CP.\*\* Metallic Rectifier Ratings. C. E. Hamann, General Electric Co.

CP.\*\* Methods of Testing Metallic Rectifiers. W. F. Bonner, Federal Telephone & Radio Corp.

CP.\*\* Protection of Selenium Rectifiers Against Salt, Moisture, Fungus. O. S. Aikman, Fansteel Metallurgical Corp.

### 2:00 p.m.—Magnetic Materials

CP.\*\* Present Status of Magnetic Theory: A Review of the Washington Conference on Magnetism. J. E. Goldman, Carnegie Institute of Technology.

CP.\*\* The Ferromagnetic Faraday Effect at Microwave Frequencies and Its Application. C. L. Hogan, Bell Telephone Labs.

CP.\*\* Improvements in Grain-Oriented Silicon-Iron Alloys. G. H. Cole, Armco Steel Corp.

CP.\*\* The Permeability of Silicon-Iron at Very Low Flux Densities. E. Both, Signal Corps Engineering Labs.

### 2:00 p.m.—Color Television

CP.\*\* Present Status of NTSC Color Television. D. B. Smith, Philco Corp.

53-91. Transmitting Terminal Apparatus for NTSC Color Television. Page Burr, Hazeltine Electronics Corp.

CP.\*\* The Synchronization Problem in Color Television. Donald Fink, Philco Corp.

CP.\*\* Network Transmission of Color Television Signals. J. G. Reddeck, RCA Labs. and H. C. Gronberg, National Broadcasting Co.

53-90. Democratic and Republican Political Conventions. R. W. Ralston and B. D. Wickline, Illinois Bell Telephone Co.

### 2:00 p.m.—Management

CP.\*\* Development of Executive Abilities. R. K. Greenleaf, American Telephone & Telegraph Co.

CP.\*\* Management Responsibility for Development of Engineers. F. K. McCune, General Electric Co.

### 2:00 p.m.—Sections Committee

### 2:00 p.m.—Nuclear Instrumentation

CP.\*\* Electronics in the Atomic Energy Commission. Bio-Medical Program. J. C. Bugher, Division of Biology and Medicine AEC.



- 53-31. Nuclear Power Plant Control Considerations. M. A. Schultz, Westinghouse Electric Corp.
- CP.\*\* Equipment Used in the Measurement of Gamma Radiation in Atomic Bomb Tests. Dr. L. Costrell, Nucleonic Instrumentation Section NBS.
- CP.\*\* A Summary of D.C. Amplifiers. D. L. Collins, The Victoreen Instrument Co.
- CP.\*\* A High Sensitivity Fission Counter. W. Baer, Westinghouse Electric Corp.

## Wednesday, January 21

### 9:30 a.m.—Communication Switching Systems

- CP.\*\* Communication Switching Systems as Complex Automata. W. Keister, Bell Telephone Labs., Inc.
- CP.\*\* The Maze-Solving Mouse. C. E. Shannon, Bell Telephone Labs., Inc.
- CP.\*\* Automatic Error Detecting and Correcting. R. W. Hamming, Bell Telephone Labs., Inc.
- CP.\*\* Mechanized Intelligence in Nationwide Dial Telephone Switching. J. B. Newsom, Bell Telephone Labs., Inc.

### 9:30 a.m.—Transmission and Distribution

- 53-92. Lightning Problems Solved with the Synchronograph. E. L. Harder and J. M. Clayton, Westinghouse Electric Corp.
- 53-93. Lightning Stroke Protection at High Altitude in Peru. C. M. Foust, General Electric Co.; B. C. Maine and C. Lee, Cerro de Pasco Corp.
- 53-16. Application and Performance of 13-138 KV Line Expulsion Arresters. Working Group on Line Expulsion Arresters.

### 9:30 a.m.—Elevators and Escalators

- CP.\*\* Vertical Transportation—Architects Viewpoint. G. B. Gusrae, Voorhees, Walker, Foley and Smith.
- CP.\*\* Operatorless Elevators. S. J. Clark, Otis Elevator Co.
- CP.\*\* The Widening Field of Moving Stairways. H. C. Hickock, Westinghouse Electric Corp.

### 9:30 a.m.—The Safety Aspects of Grounding Versus Insulating

- CP.\*\* Fundamentals and Principles Involved. L. S. Inskip, Bell Telephone Labs.
- CP.\*\* Primary and Secondary Distribution. T. J. Brosnan, Niagara Mohawk Power Corp.
- CP.\*\* Heavy Equipment and Industrial Installations. J. Steelman, Jr., International Nickel Co., Inc.
- CP.\*\* Domestic and Portable Appliances. A. W. Smoot, Underwriters' Labs., Inc.

### 9:30 a.m.—Hydro-Electric Systems

- 53-8. Combatting Frazil Ice in Hydro-Electric Stations. K. J. Granbois, Safe Harbor Water Power Corp.
- 53-95. Automatic and Supervisory Control of the Calgary Power Ltd. Hydro-Electric System—Some Design Features. T. E. Cardell, M. W. Clarke, and H. Randle, Calgary Power Ltd.
- 53-94. Automatic and Supervisory Control of the Calgary Power Ltd. Hydro-Electric System—Operating Experiences. T. E. Cardell, M. W. Clarke, and H. Randle, Calgary Power Ltd.
- 53-23. Electrical Features of the Owens River Gorge Project. O. L. ACO.\* Sidenfaden, Dept. of Water & Power.

### 9:30 a.m.—Synchronous Machinery

- 53-96. Effects of Negative Sequence Currents on Turbine Generator Rotors. E. I. Pollard, Elliott Co.
- 53-97. Turbine Generators Rotor Heating During Single Phase Short Circuits. M. D. Ross and E. I. King, Westinghouse Electric Corp.
- 53-98. Short-Circuit Capabilities of Synchronous Machines for Unbalanced Faults. P. L. Alger, R. F. Franklin, C. E. Kilbourne and J. B. McClure, General Electric Co.

- 53-99. Reduction of Noise Produced by Small and Medium Two-Pole Turbine Generators. L. P. Shildneck and A. J. Wood, General Electric Co.
- CP.\*\* Hunting Frequencies of Synchronous Motors. L. J. Money, Los Angeles, Calif.

### 9:30 a.m.—Conference on Basic Concepts

- CP.\*\* Program of the Basic Concepts Subcommittee. V. P. Hessler, University of Illinois.
- CP.\*\* The Development of Logical Deductive Disciplines in the Physical Sciences. Henry Margenau, Yale University.
- CP.\*\* What is Voltage? J. G. Brainerd, University of Pennsylvania.
- CP.\*\* Progress in the Standardization of Electric and Magnetic Magnitudes and Units. J. J. Smith, General Electric Co.
- CP.\*\* Rationalization and Its Relation to MKS Units. C. C. Chambers, University of Pennsylvania.

### 9:30 a.m.—Feedback Control Systems

- 53-42. Quick Methods for Evaluating the Closed-Loop Poles of Feedback-Control Systems. G. A. Biernson, Massachusetts Institute of Technology.
- 53-100. Correlation Between Frequency and Transient Response of Feedback Control Systems. Yaohan Chu, Cambridge, Mass.
- 53-103. Hydraulic Servos Incorporating A High Speed Hydraulic-Amplifier Actuated Valve. R. L. Scrafford, Cornell Aeronautical Lab.
- 53-101. Transient Measurement of Feedback Control Systems. F. H. Ferguson and C. H. Looney, Naval Research Lab.
- 53-102. Relative Stability of Closed Loop Systems. M. J. Kirby and D. C. Beaumariage, Sperry Gyroscope Co.

### 9:30 a.m.—Insulated Conductors

- 53-168. The Effect of Loss Factor on the Temperature Rise of Pipe Cable and Buried Cable. Working Group on the Effect of Loss Factor on the Temperature Rise of Pipe Cable and Buried Cable.
- 53-169. Cyclical Loading of Buried Cable and Pipe Cable. G. B. Shanklin and F. H. Buller, General Electric Co.
- 53-170. Procedures for Calculating the Temperature Rise of Pipe Cable and Buried Cables for Sinusoidal and Rectangular Loss Cycles. J. H. Neher, Philadelphia Electric Co.
- 53-171. An Empirical Method for Determining Transient Temperatures of Buried Cable Systems. Robert Wiseman, The Okonite Co.

### 2:00 p.m.—Electrostatic Hazards in Hospital Operating Rooms

- CP.\*\* Electrification in Hospital Operating Rooms—Its Generation and Behavior. Robin Beach, Robin Beach Engineers Assoc.
- CP.\*\* Electrostatic Problems in Hospital Operating Rooms and Their Resolution. C. W. Walter, Peter Bent Brigham Hospital.
- CP.\*\* Demonstrations Showing How Electrostatic Explosions Occur In Hospital Operating Rooms. P. G. Guest, U. S. Bureau of Mines.

### 2:00 p.m.—Transmission and Distribution

- 53-104. Performance of Electrical Joints Utilizing New Silver Coating on Aluminum Conductors. T. J. Connor and W. R. Wilson, General Electric Co.
- 53-105. An Investigation of the Performance of Power Connectors Used Outdoors with Aluminum Conductors. H. R. Harrison and R. H. Honebrink, General Electric Co.
- 53-106. System Stability Limitations and Generator Loading. H. C. Anderson, H. O. Simmons, Jr. and C. A. Woodrow, General Electric Co.
- 52-260. Economical Utilization of Electric Power Equipment. Herman Halperin, Commonwealth Edison Co. Presentation by title only for discussion.

### 2:00 p.m.—Relays

- 53-37. Generator Negative-Sequence Currents for Line-to-Line Faults. R. F. Lawrence and R. W. Ferguson, Westinghouse Electric Corp.

- CP.\*\* Back Up Protection for Generators. E. T. B. Gross, Illinois Institute of Technology. L. B. LeVesconte, Sargent & Lundy.

- 53-41. Application of Relays for Unbalanced Faults on Generators. J. E. Barkle, Westinghouse Electric Corp. and Frank von Roeschlaub, Ebasco Services, Inc.

- 53-52. Protection of Generators Against Unbalanced Currents. J. E. Barkle and W. E. Glassburn, Westinghouse Electric Corp.

- CP.\*\* A Negative-Phase-Sequence Overcurrent Relay for Generator Protection. L. E. Goff and W. C. Morris, General Electric Co.

### 2:00 p.m.—Electrostatic Processes and Power Generation

- 53-27. Air Pollution Prevention in Electric Generating Stations. H. ACO.\* A. Bauman, Consolidated Edison Co. of New York, Inc.
- 53-32. Electrostatic Precipitators for Electric Generating Stations. H. J. White, Research Corp.

- CP.\*\* The Application of Selenium Rectifiers to Power Supplies for Electric Precipitation. R. G. Schlawn and P. V. Hahn, General Electric Co.

- CP.\*\* Some Experiments on the Mechanism of Wire Vibration. G. W. Penney, Carnegie Institute of Technology.

### 2:00 p.m.—Fundamental Evaluation of Insulation

- 53-11. Studies of Impulse Strength and Impulse Testing Problems in High Voltage Generators. G. L. Moses and R. J. Alke, Westinghouse Electric Corp. By title only for discussion.

- 53-3. Testing Electrical Insulation of Rotating Machinery with High Voltage D. C. G. L. Hill, Pacific Gas and Electric Co. Presentation by title only for discussion.

- CP.\*\* Test Code for Evaluation of Systems of Insulating Materials for Random-Wound Electrical Machinery. Subcommittee Report by P. L. Alger.

- CP.\*\* A Method of Evaluating Insulation Systems in Motors. C. B. Leape, J. McDonald and G. P. Gibson, Westinghouse Electric Corp.

- CP.\*\* Motor Insulation Life as Measured by Accelerated Tests and Dielectric Fatigue. C. J. Herman, General Electric Co.

- CP.\*\* Progress Report on Functional Evaluation of Motor Insulation Systems. R. Harrington, General Electric Co.

- CP.\*\* Leakage-Voltage Characteristics of Insulation Related to D-C Dielectric Strength. J. S. Johnson and J. W. Clokey, Westinghouse Electric Corp.

### 2:00 p.m.—Electrical Properties of Gases

- CP.\*\* Detection of Nuclear Radiation. H. Kallman, New York University.
- CP.\*\* Ionization Chambers. H. W. Fulbright, University of Rochester.
- CP.\*\* Proportional Counters. J. B. H. Kuper, Brookhaven National Lab.
- CP.\*\* Geiger Counters. S. A. Korff, New York University.

### 2:00 p.m.—Instruments and Measurements

- 53-10. Watthour Meter Reading and Billing. J. R. Macintyre, General Electric Co. and W. C. Israel, Detroit Edison Co.
- 53-22. Accurate R-F Microvoltages. M. C. Selby, National Bureau of Standards.
- CP.\*\* Multi Range, Audio Frequency Thermocouple Instruments of High Accuracy. F. L. Hermach, National Bureau of Standards.
- CP.\*\* The C-1 Alarm and Control System for Use with Micro Wave Radio Relay. Harold M. Pruden.
- CP.\*\* A Special Purpose Digital Telemetry System. C. A. Piper.
- 53-1. Sensitivity and Output Formulas for the Resistance Bridge. P. M. Andress, Rubicon Co. Presentation by title only for discussion.

### 2:00 p.m.—Feedback Control Systems

- 53-107. A Differential Analyzer Study of Certain Nonlinearly-Damped Servomechanisms. R. R. Caldwell and V. C. Rideout, University of Wisconsin.

- 53-108. Coulomb Friction in Feedback Control Systems. V. B. Haas, Jr., University of Connecticut.

- 53-109. Limiting in Feedback Control Systems. R. J. Kochenburger, University of Connecticut.

- 53-110. Some Saturation Phenomena in Servomechanisms with Emphasis on the Tachometer Stabilized System. Emanuel Levinson, Sperry Gyroscope Co.

- 53-17. Drag-Cup A-C Tachometer with Constant-Current Excitation. R. H. Frazier, Massachusetts Institute of Technology. Presentation by title only for discussion.

### 2:00 p.m.—Communication Switching Systems

- 53-111. Automatic Call Recording and Accounting in the SATT System. J. E. Ostline, Automatic Electric Co.

- 53-112. A Subscriber Toll Dialing Tape Reader. W. H. Blashfield, North Electric Mfg. Co.

- 53-113. Principles of Tape-to-Card Conversion in the AMA System. W. B. Groth, Bell Telephone Labs., Inc.

- 53-114. Mechanized Billing of AMA Toll Messages. F. D. Slade, American Telephone and Telegraph Co.

### 2:00 p.m.—Petroleum Industry

- CP.\*\* Power Generation and Distribution in Petroleum Refineries. R. L. Lawrence and H. B. Thacker, Westinghouse Electric Corp.

- CP.\*\* Use of Outdoor Switchgear in Petroleum Refineries. E. R. Hoyle, Sinclair Refining Co.

- CP.\*\* Report on the Activities of the Electrical Equipment Subcommittee of the American Petroleum Institute—Refining Division. L. M. Goldsmith, Atlantic Refining Co.

## Thursday, January 22

### 9:30 a.m.—Radio Communications Systems

- CP.\*\* Communications for Civil Defense. C. A. Armstrong, American Telephone and Telegraph Co.
- CP.\*\* Conelrad. R. J. Renton, Federal Communications Commission.
- CP.\*\* The New Jersey Turnpike—A Unique Highway Communication System. J. R. Neubauer, RCA Victor.
- CP.\*\* Path Testing for Microwave Radio Routes. R. D. Campbell, American Telephone and Telegraph Co.

### 9:30 a.m.—Magnetic Amplifiers

- 53-117. Dynamic Hysteresis Loops of Several Core Materials Employed in Magnetic Amplifiers. H. W. Lord, General Electric Co. Presentation by title only for discussion.
- CP.\*\* Improved Techniques in Analyzing the Transient Response of Magnetic Amplifiers. W. A. Geyger, Naval Ordnance Lab.

- 53-18. An Instability of Self-Saturating Magnetic Amplifiers Using Rectangular Loop Core Materials. S. B. Batdorf and W. N. Johnson, Westinghouse Research Labs.

- CP.\*\* An Application of Magnetic Amplifier Circuits to Perform Multiplication. L. A. Finzi and R. A. Mathias, Carnegie Institute of Technology.

- 53-20. Saturable Reactors with Inductive D-C Load, Part II, Transient Response. H. F. Storm, General Electric Co.

### 9:30 a.m.—Protective Devices

- 53-118. Lightning Investigations at Two Major 115/230 KV Stations, 1947-1951. H. M. Ellis, Hydro-Electric Power Commission of Ontario.
- 53-119. Performance Characteristics of Lightning Protective Devices. Lightning Protective Devices Subcommittee.
- 53-15. Guide for Application of Ground-Fault Neutralizers. Working Group on Fault Limiting Devices. Presentation by title only for discussion.



53-120. Application Guide for the Grounding of Synchronous Generator Systems. Fault Limiting Devices Subcommittee.

## 9:30 a.m.—Transformers

53-38. Aging Evaluation of Dry-Type Transformer Insulating Systems. H. C. Stewart, L. C. Whitman and A. L. Scheideler, General Electric Co.

53-121. Transformer Cooling Equipment Has Optimum Operating Conditions. H. A. Fohrhaltz, General Electric Co.

53-122. Short Time Thermal and Mechanical Limits for Transformers and Reactors. J. E. Clem, Consulting Engineer.

53-123. A Solution of a Common Insulation Problem. G. I. Cohn, Illinois Institute of Technology and F. J. Vogel, Allis-Chalmers Mfg. Co.

CP.\*\* Analysis of the Delta Grounded Transformer. E. T. B. Gross and K. J. Rao, Illinois Institute of Technology.

53-39. A New Liquid Filled Current Transformer with Novel Features. L. W. Marks, General Electric Co.

52-190. 1,100,000 KVA Short-Circuit Transformer in the New High-Capacity Switchgear Testing Laboratory. B. A. Cogbill, General Electric Co. Presentation by title only for discussion.

## 9:30 a.m.—Power Generation and Induction Machinery

53-30. Under Excited Operation of Large Turbine-Generators on Pacific Gas and Electric Company's System. V. F. Estcourt, W. R. Johnson, Pacific Gas & Electric Co.; C. H. Holley, P. H. Light, General Electric Co.

53-124. Axial Magnetic Forces on Induction Machine Rotors. C. E. Bradford and R. G. Rhudy, General Electric Co.

CP.\*\* The Use of Motors Outdoors. R. B. Schultz, Elliott Co.

CP.\*\* Effect of Purchasers' Specifications and Industry Standards on Induction Motor Design. W. M. Schweder, General Electric Co.

## 9:30 a.m.—Dielectrics

CP.\*\* Intrinsic Electric Breakdown in Liquid Dielectrics. A. H. Sharbaugh, General Electric Co.

CP.\*\* Impulse Ionization and Breakdown in Liquid Dielectrics. C. J. Bute, E. L. C. Larson and G. M. L. Sommerman, Northwestern University.

CP.\*\* Effect of Corona Discharges on Electric Breakdown of Solid Insulation. T. W. Dakin and H. M. Philofsky, Westinghouse Electric Corp.

CP.\*\* Dielectric Breakdown of Sulfur Hexafluoride in Non-Uniform Fields. C. N. Works and T. W. Dakin, Westinghouse Electric Corp.

53-125. Non-Destructive Testing of Insulation. E. L. Brancato, Naval Research Lab.

53-126. Flourine Containing Gaseous Dielectrics. G. Camilli and R. E. Plump, General Electric Co.

53-6. Polyethylene Terephthalate—Its Use as a Capacitor Dielectric. M. C. Wooley, G. T. Kohman and W. McMahon, Bell Telephone Labs. Inc. Presentation by title only for discussion.

## 9:30 a.m.—Instruments and Measurements in Medicine and Biology

CP.\*\* A Liquid Level Indicator for Condensed Gases at Low Temperatures. W. E. Williams and E. Maxwell.

CP.\*\* Electronic Voltage Regulators as Used in X-ray Equipment. James Ball, Picker X-Ray Corp.

53-127. Wheatstone Bridge for Admittance Determinations of Highly Conducting Materials at Low Frequencies. H. P. Schwan, University of Pennsylvania and Karl Sittel, Franklin Institute.

53-128. Cathode-Ray Synchroscope and Automatic Synchroniser. Dr. M. Abdel-Halim Ahmed, Foad I University, presented by E. P. Felch, Bell Telephone Labs. Inc.

CP.\*\* Recent Developments in Potentiometer Pressure Pickups. V. C. Westcott.

## 9:30 a.m.—Non-Calculative Applications of Computers

CP.\*\* Use of Computers for Process Control. Eugene Ayres, Gulf Research and Development Co.

CP.\*\* An Automatic Inventory System for Air Travel Reservation. M. L. Haselton and E. L. Schmidt, Teleregister Corp.

CP.\*\* Program Control of Predictable Industrial Processes. William Pease, Massachusetts Institute of Technology.

CP.\*\* Use of Computers for Library Searching. J. W. Perry, Massachusetts Institute of Technology.

53-4. Adjustable Speed Drives for Deep Draw Presses. C. E. Robinson and A. P. DiVincenzo, Reliance Electric & Engineering Co. Presentation by title only for discussion.

## 9:30 a.m.—Industrial Control

CP.\*\* Methods of Rating High Interrupting Capacity Controllers. J. D. Leitch, Electric Controller & Mfg. Co.

CP.\*\* Motor Control Centers and Their Coordination with Power Distribution Systems. R. E. Gasparoli, General Electric Co.

CP.\*\* Overload Protection of Adjustable Voltage Drives. W. Schaefflin, Westinghouse Electric Corp.

53-129. The Application and Standardization of High Rupturing Capacity Current-Limiting Fuses. J. W. Gibson, General Electric Co. Presentation by title only for discussion.

53-19. Arcing-Time of High-Voltage Air-Break Contactors at Low-Currents. C. A. Lister, Electric Controller and Mfg. Co. Presentation by title only for discussion.

## 9:30 a.m.—Gas Tubes

CP.\*\* On the Design and Measurement of Hydrogen Thyatron Modulator Characteristics. S. Goldberg and K. J. Germeshausen, Edgerton, Germeshausen, and Greer, Inc.

CP.\*\* Some Factors Involved in Breakdown, Conduction and Recovery of the Hydrogen Thyatron. W. T. Allis, Massachusetts Institute of Technology, S. T. Martin, Consulting Engineer, and K. J. Germeshausen, Edgerton, Germeshausen, and Greer, Inc.

CP.\*\* Fast Response, High Current Thyatron Power Supplies for Inductive Loads. J. H. Burnett, Electrons, Inc.

CP.\*\* Experimental Studies and Applications of Explosive Pressures Produced by Sparks in Confined Channels. H. C. Early & W. G. Dow, University of Michigan.

## 2:00 p.m.—Magnetic Amplifiers

53-130. Dielectric Amplifiers, Part I. G. W. Penney, J. R. Horsch and E. A. Sack, Carnegie Institute of Technology.

Conference papers on Non-Linear Circuit Theory.

## 2:00 p.m.—Switchgear

53-131. A Fundamental Factor Controlling the Unit Dielectric Strength of Oil. W. R. Wilson, General Electric Co.

53-56. Stability of DBPC Inhibited Oil in Oil Circuit Recloser Operation. Kazumi Oura, R. N. Hazelwood and R. M. Frey, Line Material Co.

53-43. An Investigation of the Arc Quenching Behavior of Sulfur Hexafluoride. H. J. Lingal, A. P. Strom and T. E. Browne, Jr., Westinghouse Electric Corp.

53-46. A New High Voltage Outdoor Load Interrupter Switch. H. J. Lingal and J. B. Owens, Westinghouse Electric Corp.

CP.\*\* A New Coaxial Blade Transfer Switch. S. C. Killian and N. Polgov, Delta-Star Electric Co.

CP.\*\* Report of NEMA Activity on Bushing Standardization. M. H. Hobbs, Westinghouse Electric Corp.

## 2:00 p.m.—Transformers

CP.\*\* Transformer Models for Determination of Transient Voltages. P. A. Abetti, General Electric Co.

53-2. A New Method of Obtaining Insulation Coordination of Transformers. W. C. Sealey and F. J. Vogel, Allis-Chalmers Mfg. Co.

53-133. Natural Frequencies of Coils and Windings Determined by Equivalent Circuits. P. A. Abetti and F. J. Maginniss, General Electric Co.

53-134. A Sudden Gas Pressure Relay for Transformer Protection. R. L. Bean and H. L. Cole, Westinghouse Electric Corp.

CP.\*\* Bushing Standardization. NEMA Joint Committee.

## 2:00 p.m.—Power Generation and Induction Machinery

53-25. A New Regulator and Excitation System. J. T. Carleton, P. O. Bobo and W. F. Horton, Westinghouse Electric Corp.

CP.\*\* Economics of Boiler Feed Pump Drives. R. W. Ferguson and E. W. DuBois, Westinghouse Electric Corp.

CP.\*\* Matching Motor Characteristics to the Characteristics of the Driven Auxiliary Equipment. E. E. Edgell and W. H. Nichols, Westinghouse Electric Corp.

CP.\*\* Effect of Load Estimating Errors on Reserve Capacity as Determined by the Probability Method. G. Calabrese, New York University.

## 2:00 p.m.—Dielectrics

CP.\*\* New High Temperature Silicone Resins. J. F. Dexter, Dow Corning Corp.

CP.\*\* Tailoring of Silicone Rubber to Meet Electrical Requirements. M. G. Noble and D. A. Lupfer, General Electric Co.

CP.\*\* Applications of Teflon in the Electrical Industry. B. E. Ely, E. I. du Pont de Nemours & Co.

CP.\*\* The Electrical Decomposition of Sulfur Hexafluoride. D. Edelson, C. A. Beiling and G. T. Kohman, Bell Telephone Labs.

CP.\*\* The Corona Decomposition of Fluorocarbon Gases. N. M. Bashara and J. D. LaZerte, Minnesota Mining & Mfg. Co.

53-135. Some Fluorinated Liquid Dielectrics. N. M. Bashara, Minnesota Mining & Mfg. Co. Presentation by title only for discussion.

## 2:00 p.m.—Electrical Techniques in Medicine and Biology

CP.\*\* A High Pressure Ionization Chamber. P. A. Duffy and J. Borzin, Westinghouse Electric Corp.

CP.\*\* A Simple Gamma Radiation Monitor for Visual Warning or Telemetering. M. E. Hayes and Zane Collins, Westinghouse Electric Corp.

CP.\*\* The Localization and Mapping of Gamma-ray Sources with Collimated Scintillation Counters. Benedict Cassen, R. L. Libby and F. K. Bauer, Wadsworth General Medical and Surgical Hospital.

53-136. The Elements of Electrocardiographic Theory. Ernest Frank, Moore School of Electrical Engineering. Presentation by title only for discussion.

53-137. Application of Electrical and Acoustic Impedance Measuring Techniques to Problems in Diathermy. H. P. Schwan and E. L. Carstensen, Moore School of Electrical Engineering. Presentation by title only for discussion.

## 2:00 p.m.—Industrial Control

CP.\*\* Construction, Components and Control of Packaged Adjustable Voltage Drives. Gerald Secor, Cutler-Hammer, Inc.

CP.\*\* Electronic Packaged Drives. E. F. Kubler, General Electric Co.

CP.\*\* Packaged Drive Design Problems. E. H. Vedder, Westinghouse Electric Corp.

CP.\*\* Packaged Adjustable Voltage Drives. S. P. Finnegen, W. H. Turner, Jr. and L. Wolfson, General Electric Co.

## 2:00 p.m.—Wire Communications Systems

CP.\*\* L3 Coaxial System—System Design. C. H. Elmendorf, A. J. Grossman and R. D. Ehrbar, Bell Telephone Labs., Inc.

CP.\*\* L3 Coaxial System—Amplifiers. L. H. Morris, G. H. Lovell and F. R. Dickinson, Bell Telephone Labs., Inc.

CP.\*\* L3 Coaxial System—Equalization and Regulation. R. W. Ketchledge and T. R. Finch, Bell Telephone Labs., Inc.

CP.\*\* L3 Coaxial System—Television Terminals. J. W. Rieke and R. S. Graham, Bell Telephone Labs., Inc.

## 2:00 p.m.—High-Vacuum Tubes

CP.\*\* One-Kilowatt Transmitting Tetrode for UHF. W. P. Bennett and H. F. Kazanowski, Radio Corp. of America.

CP.\*\* A New 10-KW Air-Cooled Tetrode for VHF Television Service. M. B. Shrader, Radio Corp. of America.

CP.\*\* Cathode-Ray Target Tube for Pulse Height Analysis. John Hartman, Allen B Dumont Labs., Inc.

CP.\*\* Discussion of Electromagnetic and Electrostatic Focus for Picture Tubes. W. A. Dickinson, Sylvania Electric Products Inc.

53-173. High-Power Industrial Vacuum Tubes Having Thoriated-Tungsten Filaments. R. B. Ayer, Radio Corp. of America. Presentation by title only for discussion.

53-174. The Nickel Base Indirectly Heated Oxide Cathode. A. M. Bounds and P. N. Hambleton, Superior Tube Co. Presentation by title only for discussion.

53-175. The RCA Three-Gun Shadow Mask Color Kinescope. H. B. Law, Radio Corp. of America. Presentation by title only for discussion.

## 2:00 p.m.—Computing Devices

CP.\*\* Solution of Boundary Value Problems on Automatic Computer Equipment. Frank M. Verzuh, Mass. Inst. of Technology.

CP.\*\* Comparison of Analog Digital Methods in Solving the Relativistic Wave Equation. Keith R. Symon, Physics Dept., Wayne University.

CP.\*\* Application of Electric Analog Computers to Aircraft Design Problems. G. D. McCann, California Institute of Technology.

CP.\*\* Some Basic Problems and Techniques in the Application of Analog Computers to Aircraft Stability Problems. E. J. Povejsil, A. W. McCourt, R. D. Bidne and R. A. Manske, Air Arm. Div., Westinghouse Electric Corp., Baltimore, Md.

CP.\*\* Influence of Digital Computers on the Optical Lens Problem. Sol Rosen, Morris Rubinoff, Cornelius Eldert, University of Pennsylvania.

## Friday, January 23

### 9:30 a.m.—Power Generation and System Engineering

53-34. Historical Approach to Speed and Tie-Line Control. Robert Brandt, New England Power Co.

CP.\*\* Load Controlling System for Large and Quick Load Changes. A. F. Schwendner, Westinghouse Electric Corp.

53-55. Prime Mover Speed Governors and the Interconnected System. P. G. Ipsen and J. R. Norton, General Electric Co.

53-139. Controllability of High Pressure-High Temperature Reheat ACO.\* Steam Plants. P. S. Dickey, Bailey Meter Co.

53-140. Boiler Designs Developed for Controllability. P. R. Loughlin, ACO.\* Babcock & Wilcox Co.

### 9:30 a.m.—Switchgear

53-44. Operating Mechanisms for High Capacity High Voltage Oil Circuit Breakers. E. B. Rietz, General Electric Co.

53-58. A 161 Kv 10,000 MVA Steel Clad Impulse Breaker—The First of a Line of High Capacity, High Voltage, Breakers. C. J. Balentine, C. M. Ratliff Jr. and G. C. McBride, General Electric Co.

53-57. Improved Outdoor Oil Circuit Breakers for Medium Voltages. R. B. Shores and E. J. Olsen, General Electric Co.

CP.\*\* Is the European Circuit Breaker Rating System Really More Conservative than the American? R. C. Van Sickle, Westinghouse Electric Corp.

CP.\*\* Considerations in the Operation of Outdoor Switching Equipment Under Low Ambient Temperature Conditions. A. H. Powell and E. B. Rietz, General Electric Co.

### 9:30 a.m.—Rotating Machinery

53-141. Design of Single-Phase Motors to Minimize Voltage Dips. J. E. Williams, University of Illinois.

CP.\*\* Analysis of Induction Tachometer Generators. Kurt Burian, G-M Labs., Inc.

53-5. The Polyphase Induction Machine with Solid Rotor. H. M. McConnell, Carnegie Institute of Technology.

53-12. Determination of Network Constants of Polyphase Induction Motors. N. F. Tsang, University of Tulane and T. C. Tsao, Consolidated Edison Co. of N. Y., Inc.

53-142. Investigation of Magnetic Mixtures for Clutch Application. W. P. Jones, Naval Research Lab.

53-176. Bibliography of Electric Couplings. Subcommittee Report. Presentation by title only for discussion.

### 9:30 a.m.—Electrets

CP.\*\* Electrets. G. G. Wiseman, University of Kansas and E. G. Linden, Fort Monmouth.

CP.\*\* Plastic Electrets. H. H. Wieder, National Bureau of Standards.

CP.\*\* The Nature of Phenomena in Electrets. W. F. G. Swann, Bartol Research Foundation.

### 9:30 a.m.—Digital Computers

CP.\*\* Operating Experience with a Digital Computer. G. W. Hobbs, General Electric Co.

CP.\*\* Operating Efficiencies of ENIAC, ORDVAC and EDVAC. Homer Spence, Aberdeen Proving Ground.

CP.\*\* Non-Destructive Sensing of Magnetic Cores. D. A. Buck and W. I. Frank, Massachusetts Institute of Technology.



# WINTER GENERAL MEETING, NEW YORK, JAN. 19-23, 1953

CP.\*\* Checking Codes for Digital Computers. J. M. Diamond, Philadelphia.

53-7. Digital-to-Analog Shaft-Position Transducers. S. J. O'Neil, Air Defense Office. Presentation by title only for discussion.

## 9:30 a.m.—Complexity of Electronic Systems

CP.\*\* This Problem in the Signal Corps. E. L. Nelson, Signal Corps Engineering Lab.

CP.\*\* Are Our Military Electronic Systems Too Complex? J. M. Bridges, Bureau of Ordnance.

CP.\*\* Some Viewpoints of the Air Forces. Presented by representatives from the Wright Air Development Center.

CP.\*\* Complexity Versus Reliability in Military Electronic Systems. T. I. Paganelli, General Electric Co.

CP.\*\* A Manufacturer's Viewpoint. H. T. Budenbom, Bell Telephone Labs.

## 9:30 a.m.—Special Communication Applications

CP.\*\* Audio Frequency Filters on Negative Feed-Back Principle. Tadeusz Janisz, University of Detroit.

53-143. Maximum Impedance Transformations in Band-Pass Filters. T. J. O'Donnell, Gulf Research and Development Co. and E. M. Williams, Carnegie Institute of Technology.

53-144. Narrow Band Speech Spectrum in Relation to Reduced ACO.\* Channel Crowding. J. P. Neil, Palo Alto, Calif.

## 9:30 a.m.—General Industry Applications

CP.\*\* Operating Characteristics of Driving Elements in Regulated Systems. W. O. Osbon, Westinghouse Electric Corp.

53-145. Application and Operation of D-C Drives on Rubber Calenders. J. F. Sellers, A. C. Halter, Allis-Chalmers Mfg. Co.; B. G. Wheeler, Cutler-Hammer, Inc.

53-146. A Study of the Dual Motor Tandem Conveyor Belt Drive. G. ACO.\* H. Mather and R. K. Albright, Link-Belt Co.

## 9:30 a.m.—Production and Application of Light

CP.\*\* Ultraviolet Radiation for Air Sanitation and Product Protection. A. J. Dusault, Westinghouse Electric Corp.

CP.\*\* Photochemical Sources and Applications of Ultraviolet. L. J. Buttolph, General Electric Co.

CP.\*\* Industrial Applications of Infrared. I. J. Barber, Fostoria Pressed Steel Corp.

## 9:30 a.m.—Cathodic Protection

### 2:00 p.m.—Power Generation and System Engineering

53-49. Principles of Load Allocation Among Generating Units. E. E. George, Ebasco Services, Inc.

53-147. Techniques in Handling Load Regulating Problems on Interconnected Power Systems. C. Nichols, Leeds & Northrup Co.

53-40. A Simplified System of Centralized Load-Frequency Control. ACO.\* J. J. Larew, G. S. Lunge and E. E. Lynch, General Electric Co.

53-172. Tie-Line Power and Frequency Control of Electric Power Systems. C. Concordia and L. K. Kirchmayer, General Electric Co.

53-148. Effect of Swinging Loads on Steam Plant Economy. W. D. ACO.\* Wilder and H. J. Thielke, U. S. Dept. of Interior.

### 2:00 p.m.—Switchgear

53-149. New Line of Low Voltage Air Circuit Breakers. B. S. Beall, ACO.\* III, and V. N. Stewart, General Electric Co.

53-150. A New Design of Low Voltage Drawout Switchgear. F. W. ACO.\* Lewis, General Electric Co.

53-45. Switching Equipment for New Switchgear Development Laboratory. E. J. Casey, General Electric Co.

53-47. Effect of Voltage Recovery Rates on Interrupting Performance of Air-Blast Circuit Breakers. E. B. Rietz and J. W. Beatty, General Electric Co.

CP.\*\* System Recovery Voltage and Short Circuit Duty for High Voltage Circuit Breakers. I. B. Johnson, A. J. Schultz and W. F. Skeats, General Electric Co.

### 2:00 p.m.—Permanent Magnet Generators and Motors

53-151. Design Considerations of FHP Size Permanent Magnet Motors and Generators. D. D. Hershberger, General Electric Co.

53-152. New Method for the Optimum Design of Permanent Magnets Subjected to Demagnetizing Effects. H. K. Ziegler, Elberon, N. J.

53-153. Evolution of Permanent Magnet Fractional Horsepower Size Motors and Generators. W. R. Goss, General Electric Co.

53-9. Design Calculations for Permanent Magnet Generators. David Ginsberg and L. J. Misenheimer, Engineer Research and Development Labs.

### 2:00 p.m.—Basic Sciences

CP.\*\* Equations for Determining Current Distribution Among the Conductors of Busses Comprised of Double-Channel Conductors. C. M. Siegel, 11-R Copeley Hill Project, and T. J. Higgins, University of Wisconsin.

53-154. The Influence of a Transverse Magnetic Field on an Unconfined Glow Discharge. W. D. McBee, Sperry Gyroscope Co. and W. G. Dow, University of Michigan. Presentation by title only for discussion.

53-155. Experimental Investigation of Superregenerative Circuits. Abd El-Samie Mostafa, Farouk I University, and M. El-Shishini Bey, member of Egyptian Senate. Presentation by title only for discussion.

53-156. Oscillatory Circuits Containing Iron-Cored Inductances with a Generalised Analysis of Performance and Design of Static Stabilisers Using Such Circuits. Abd El-Samie Mostafa, Farouk I University, and M. El-Shishini Bey, member of Egyptian Senate. Presentation by title only for discussion.

53-157. Superregenerative Circuits under Signal Condition. Abd El-Samie Mostafa, Farouk I University, and M. El-Shishini Bey, member of Egyptian Senate. Presentation by title only for discussion.

53-158. Superregenerative Circuits Under No Signal Condition. Abd El-Samie Mostafa, Farouk I University, and M. El-Shishini Bey, member of Egyptian Senate. Presentation by title only for discussion.

53-159. Effects of Harmonics on the Frequency of Oscillation As Well as on the Asymmetry of the Resonance Curves. Abd El-Samie Mostafa, Farouk I University. Presentation by title only for discussion.

### 2:00 p.m.—Analog Computer Developments

53-160. A New Design 60 Cycle AC Network Analyzer. J. L. Davidson, Long Island Lighting Co. and R. E. Koll, System Analyzer Corp.

CP.\*\* New Electric Analog Computers for the Aircraft Industry. H. E. Criner and B. N. Locanthi, Computer Engineering Associates.

CP.\*\* Microsyn Electromagnetic Components. R. K. Mueller, Massachusetts Institute of Technology.

CP.\*\* Precision High Current Computer Power Supplies. Allen Rosenstein, University of California.

### 2:00 p.m.—Telegraph Systems

53-163. A Nonarmored Submarine Telegraph Cable. C. S. Lawton, Western Union Telegraph Co. and L. H. Hutchins, Jr., Simplex Wire & Cable Co.

53-164. Wire and Cable in the Telegraph Industry. W. F. Markley, Western Union Telegraph Co.

CP.\*\* A Switching System for Dispatcher Test Wires. P. R. Easterlin, Western Union Telegraph Co.

### 2:00 p.m.—Light Sources and Control Devices

CP.\*\* Filament Sources. Kirk Reid, General Electric Co.

CP.\*\* Mercury and Vapor Sources. Eugene Beggs, Westinghouse Electric Corp.

CP.\*\* Fluorescent Sources. Theodore Sargent, Sylvania Electric Products, Inc.

CP.\*\* Ballasts and Circuit Control Devices. W. C. Anderson, Jefferson Electric Co.

### 2:00 p.m.—Electrochemical Processes

CP.\*\* History and Development of the Magnesium Industry. T. M. Baxandall, Dow Chemical Co.

CP.\*\* History and Development of Major Electrolytic Processes. W. E. Gutzwiller, Allis-Chalmers Mfg. Co.

CP.\*\* Economics of Insurance of Generating and Converting Equipment for Chemical Process. J. N. Fogg, Ethyl Corp.

CP.\*\* Conference paper; no advance copies are available; not intended for publication in Transactions.

ACO.\* Advance copies only available; not intended for publication in Transactions.

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