



Summer General Meeting

June 15-19, 1953

Atlantic City, N. J.

Headquarters
Hotel Chalfonte-Haddon Hall



Chalfonte-Haddon Hall Hotel and Beach

CELEBRATING THE 50th ANNIVERSARY OF THE PHILADELPHIA SECTION

For those who attend the Summer General Meeting this year in Atlantic City, there awaits a full week of stimulating technical sessions and social entertainment. With America's foremost seaside resort the site and members of the Philadelphia Section as hosts, we can assure our guests a most enjoyable and well spent week. Headquarters for the meeting will be the Chalfonte-Haddon Hall Hotel on the Boardwalk.

The program for the week will open with the annual meeting at 10.00 A.M. Monday in the Main Ballroom of the Chalfonte-Haddon Hall Hotel where the election of officers will be announced and President Donald A. Quarles will deliver the main address. A feature of this meeting will be the presentation of the Lamme Medal to Mr. I. F. Kinnard of West Lynn, Massachusetts. The medal is being presented to Mr. Kinnard "for his outstanding contributions in design and developments in the field of instrumentation and measurements."

INSPECTION TRIPS: WFG-TV, Atlantic City, N. J. Visitors will see this new UHF-TV Station on both the afternoons of Tuesday and Wednesday, June 16 and 17.

The Bell Telephone Co. of Pa., Phila., Pa. (Thursday and Friday, June 18 and 19). The Automatic Message Accounting Center recently established in Philadelphia, has been designed to mechanize the operations which summarize and compute data on telephone calls for the purpose of billing the customer. As calls are dialed by the customers all of the items of information relating to a call are recorded on paper tape by means of perforations. At the accounting center, these data are collated automatically and the charges for the calls computed. This is one phase of the development which will, in the not too distant future, enable the customer's bill to be printed automatically. It has been jointly developed along with the means for enabling customers to dial nation-wide calls from their telephones.

Westinghouse Electric Corp., Lester, Pa. (Thursday and Friday, June 18 and 19). Members making this trip will see, in the process of manufacture, assembly and test, such apparatus as Industrial and Central Station turbines for driving generators, mechanical-drive turbines, surface condensers, heat exchangers, circulating and condensate pumps, evaporators and feed water heaters.

Proof of citizenship will be required by those planning on making this trip.

General Electric Co. Switchgear Development Laboratory (Thursday and Friday, June 18 and 19). Located in Philadelphia, it is the largest and most modern laboratory of its type in the world. In its control building you will see its centralized control and instrumentation equipments which indicate or record every electrical phenomenon which proves or disapproves the value of circuit breaker performance under short circuit conditions. From these devices 400 miles of wire reach out to every device within the entire laboratory. In a matter of seconds a film record of electrical phenomena that took place in a Switchgear interrupting device during a regular or short circuit test is on the reading tables in the control room for observation.

Within the generator room are two huge generators, the largest ever built for short circuit testing. They are designed to absorb the tremendous shocks produced during short circuit tests. The stator of each generator is supported on huge spring-steel legs. Under the most severe short circuit, developing a whopping 8 million foot pounds of torque, frame rotation is about $\frac{1}{2}$ inch each way at the point of attachment of the springs. These "legs" allow the stator to rotate through this small angle and still remain in perfect alignment with the rotor shaft. These spring-legs take the brunt of the short instead of the windings under short circuit conditions.

In the high voltage yard you will observe huge power transformers capable of stepping up the voltage to 400,000 volts for testing circuit breakers and other equipments capable of harnessing and controlling the country's increasing electrical power needs. In this same area are capacitor banks for simulating actual conditions such as charging currents on high voltage transmission lines up to 200 miles in length at 230,000 volts. Switchgear circuit breakers capable of opening electric loads of $2\frac{1}{2}$ million Kva must now be constructed to interrupt loads up to 25,000,000 Kva—ten times the previous ratings.

Limited accommodations available. Reservation must be made at Atlantic City at time of registration.

LADIES ENTERTAINMENT: The Ladies Committee under the chairmanship of Mrs. Houston R. Paxson has arranged a program which should be thoroughly enjoyable as well as delightfully interesting and entertaining. The Sun Porch of Haddon Hall has been reserved as the Ladies' Headquarters. Coffee and coffee cake will be served there every morning from 10 to 11 A.M., Monday through Thursday. This will be an excellent place to meet and form groups to walk on the Boardwalk later and plan other activities.

On **Sunday** afternoon an informal tea will be held between 4 and 6 P.M. in the Garden Room for AIEE members and their families.

On **Monday** afternoon there will be a complimentary sight-seeing trip around the island and down to Ocean City with a stop on the way back at the Atlantic City Country Club for tea. Busses will leave Haddon Hall promptly at 2 P.M.

There will be a luncheon and millinery show on **Tuesday** at 12:30 P.M. in the Rose Room of the Marlborough-Blenheim Hotel which is on the Boardwalk at Park Place. At the millinery show following the luncheon hats will be modeled by the visitors and one of the hats will be presented as a door prize. Luncheon tickets will be \$3.00 each.

A marine sightseeing trip has been scheduled for **Wednesday** morning. Busses will leave Haddon Hall promptly at 10:30 A.M. for Captain Starn's Inlet Pier. Both bus and boat trip are complimentary. After the boat trip which will take about an hour and a half those who wish may have lunch (at their own expense) at Captain Starn's Seafood Restaurant.

On **Thursday** morning an inspection tour through the Haddon Hall kitchens and laundry will start at 11 A.M. from the Ladies' Headquarters on the Sun Porch.

All the ladies' events are complimentary excepting the Tuesday luncheon.

SPORTS: The sports program under the leadership of A. D. Brown has been rounded out to include arrangements for the duffer and amateur as well as seasoned golfer and angler.

Golf—Facilities will be available for this sport at the Atlantic City Country Club which is located at Northfield, N. J., about eight miles from AIEE headquarters hotel. Transportation by bus from near Chalfonte-Haddon Hall Hotel, or of course, taxicab. Green fee \$4.00 weekdays. Ladies, as well as men, may participate and the facilities of the pitch and putt course and putting greens may also be used. Golf scores and scores for the pitch and putt course and putting contests should be turned into the AIEE Sports Committee representative. There will be prizes for both ladies and men.

Fishing—Half-day trips leaving from Starn's Boat Dock—Atlantic City Inlet at 8:30 A.M. for return at noon and 12:30 P.M. for return at 5:30 P.M. will be available at approximate cost of \$3.25 per person. All day fishing boats leave docks at intervals from 7 A.M. to 9 A.M. Deep sea sport fishing can be arranged on a day's notice. These boats will accommodate six persons and the rate is approximately \$65.00 for weekdays. Tackle may be rented by the hour or day. There will be prizes for the largest and smallest fish. Men, women and children may compete.

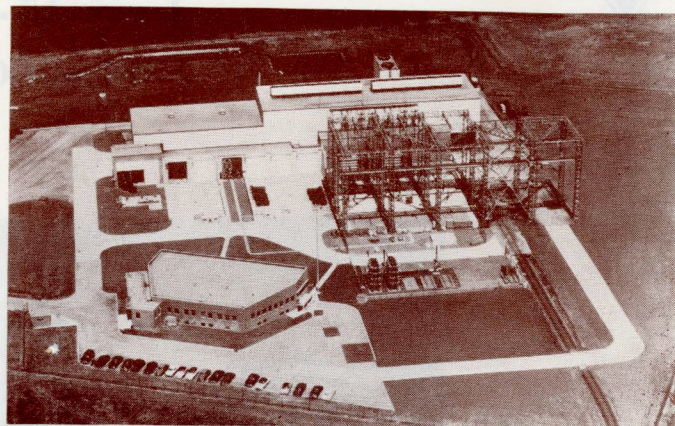
You-Drive-It small power boats can be had for \$12.00 rental for the day or special hourly rates and can accommodate five persons.

HOTEL RESERVATIONS: The philosophy under which the Hotel Committee has operated rests on the premise that the Summer General Meeting, while it assuredly has its serious technical side, is also a vehicle for a pleasant vacation. The selection of Atlantic City, one of the world's foremost vacation spots, as the meeting area, foresees a pleasurable sojourn on the part of those who will journey from far and near to attend the General Session. This idea has remained uppermost in our minds in attempting to assign the magnificent facilities of the Chalfonte-Haddon Hall Hotel to make attendance at this meeting both profitable and enjoyable.

A Hotel Accommodations Desk, devoted exclusively to the best utilization of the hotel's 1,000 rooms and its numerous activities, will be established in the registration area. It will be manned continuously by members of the Hotel Committee. Members of the Committee, resident in Atlantic City, with full knowledge of the area, will be available at this location.

ENTERTAINMENT: The social activities planned for the evening entertainment by J. B. Harris and his committee start Monday evening, June 15th, and end Thursday evening, June 18th.

Monday Evening—June 15th—A Bingo and Card Party will be held in the Chalfonte-Haddon Hall Hotel from 9 to 12 P.M. This is informal, for ladies and gentlemen, for which there will be no charge. There will be prizes provided and refreshments.



GE Switchgear Development Laboratory

Tuesday Evening—June 16th—Cocktails at 5:45 P.M. preceding dinner at 7:00 P.M. and show featuring Vivian Della Chiesa, outstanding soprano; Conrad Thibault, well known baritone; the Harmonicaires, well known and popular harmonica band; and one of the nation's finest dance teams, Laurette and Clymas. This very fine selection of talent will be accompanied by Howard Lanin's superb orchestra. Price per ticket \$8.50 at the ticket desk.

Wednesday Evening—June 17th—A Cabaret Dance will be held at Haddon Hall from 9 P.M. until 1 A.M. Cocktails and other beverages will be served. Howard Lanin's orchestra will be featured accompanied by an outstanding female vocalist and roaming musicians during intermission. A square dance group will perform and arrangements have been made for calling square dances for the entire group. Price per ticket—\$2.50 at the ticket desk.

Thursday Evening—June 18th—Moonlight Boat Trip on Captain Starn's boat along the coast of Atlantic City. There will be bus transportation to and from the hotel to Captain Starn's dock. Troubadours will furnish the romantic moonlight setting. Price per ticket—\$2.00 at the ticket desk.

TRANSPORTATION: All lines of travel lead to Atlantic City.

1. By bus from Philadelphia and New York City.
2. By train from 30th St. Station, Philadelphia via Pennsylvania—Reading Seashore Lines.
3. By auto from New York City via the New Jersey turnpike thence on Route #43, also Route #9.
4. By auto from Philadelphia on Route #43.
5. By plane from New York's Idlewild Airport and Philadelphia's International Airport.

REGISTRATION: The Registration Desk will be open Sunday afternoon, June 14 from 2:30 to 4:30 and daily thereafter from 8:30 A.M. to 4:30 P.M. for the duration of the meeting. A registration fee of three dollars will be charged all members and five dollars for non-members. Enrolled students and guests will be registered without payment of any registration fee.

Directors, officers and delegates will be registered in advance and may receive credentials from a desk provided for this purpose in the registration area.

SCIENCE THEATRE: In the Viking Room of Haddon Hall every afternoon, Monday through Friday, June 15 to 19, there will be a showing of moving pictures covering industrial and educational subjects.

The members of the **1953 SUMMER GENERAL MEETING COMMITTEE** are L. R. Gaty, General Chairman; B. L. England and W. F. Henn, Vice-Chairmen; R. W. Wilbraham, Treasurer; A. C. Muir, Institute Director; R. M. Pfalzgraff and D. B. Smith, Members-at-Large; J. C. Strasbourger, Vice-President District #2; W. F. Denkhous, Arrangements; J. B. Harris, Jr., Entertainment; R. W. Wilbraham, Finance; H. F. Davis, Hotels; Mrs. H. R. Paxson, Ladies; M. L. Stoughton, Publicity; T. E. Stieber, Registration; A. D. Brown, Sports; Arthur Pringle II, Inspection Trips and Science Theatre; S. R. Warren, Students; W. R. Clark, Technical Program; W. G. Salmonson, Transportation.

ADVANCE COPIES OF PAPERS

Members may obtain preprints of numbered pages 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 in the Bimonthlies and in the Transactions. *Conference Papers* denoted by CP.** are intended for presentation only, and are not available.

Monday, June 15

10:00 a.m.—Annual Meeting

1. Report of Board of Directors, H. H. Henline, Secretary.
2. Report of Treasurer, W. J. Barrett.
3. Report of Committee of Tellers on:
 - (a) Votes for nominees for AIEE offices.
 - (b) Proposed Constitutional amendments.
4. (a) Introduction of, and presentation of President's badge to Elgin B. Robertson.
 - (b) Response by Mr. Robertson.
5. Introduction of District Branch Prize Winners.
6. Presentation of Lamme Medal to I. F. Kinnard, General Electric Co., West Lynn, Mass.
 - (a) The Establishment of the Medal. Lester L. Bosch, Chairman, Lamme Medal Committee.
 - (b) The Career of the Medalist. Everett S. Lee, Editor, General Electric Review, Schenectady, N. Y.
 - (c) Presentation of the Medal and Certificate by President D. A. Quarles.
 - (d) Response by Mr. Kinnard.
7. Any other business that may be presented.
8. Address by President D. A. Quarles.

2:00 p.m.—Protective Devices

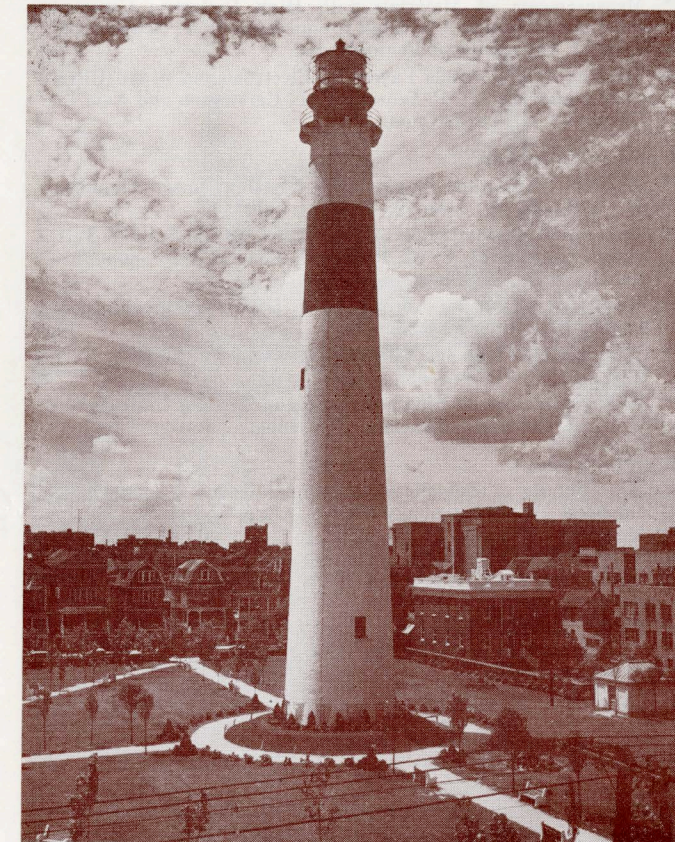
- 53-272. Change in Resistance of Aircraft Current Limiters and Its Effect on Current Division in Networks. Henry Oman, Boeing Airplane Co. Re-presented for discussion.
- 53-183. The Duty on Expulsion Type Lightning Arresters for Distribution Systems. Otto Ackermann, Westinghouse Electric Corp. Re-presented for discussion.
- 53-273. Use of 10 x 20 Current Waves for Lightning Arrester Tests. H. A. Cornelius, Public Service Co. of Northern Illinois. Re-presented for discussion.
- 53-274. Ground Fault Neutralizer Grounding of Unit-Connected Generators. H. R. Tomlinson, New England Power Service Co.
- 53-201. Application Guide on Methods of Neutral Grounding of Transmission Systems. Working Group of the AIEE Subcommittee on Fault Limiting Devices. Re-presented for discussion.

2:00 p.m.—Electronic Power Converters

- 53-288. Water Cooling Systems of Mercury-Arc Rectifiers. Working Group on Water Cooling Systems of Mercury Arc Rectifiers. CP.** Low Temperature Operation of Ignitrons. H. E. Zuvers and J. L. Zehner, General Electric Co.
- CP.** Mechanical Rectifier Circuits and Transformer Connections. E. J. Diebold, I-T-E Circuit Breaker Co.
- 53-242. Voltage Regulation of Twelve-Phase Double-Way Rectifiers. R. L. Witzke, J. V. Kresser and J. K. Dillard, Westinghouse Electric Corp.
- 53-271. Equivalent Machine Constants for Rectifiers. I. K. Dortort, I-T-E Circuit Breaker Co. Re-presented for discussion.

2:00 p.m.—Substations

- 53-104. Performance of Electrical Joints Utilizing New Silver Coating on Aluminum Conductors. T. J. Connor and W. R. Wilson, General Electric Co. Re-presented for discussion.
- 53-237. Substation One-Line Diagrams. Working Group on One-Line Diagrams of the Committee on Substations.



Abescon Light

- 53-238. Reclosing Fuses, Automatic Oil Circuit Reclosers and Automatic Reclosing Circuit Breakers in the Distribution Substation. Working Group on Breakers vs Reclosing Fuses of the Committee on Substations.
- 53-239. Grounding Grids for High Voltage Stations. E. T. B. Gross, Illinois Institute of Technology; B. V. Chitnis, American Gas & Electric Service Corp. and L. J. Stratton, Armour Research Foundation.
- 53-240. Design Charts for Determining Optimum Ground Rod Dimensions. J. Zaborszky and J. W. Rittenhouse, University of Missouri.
- 53-241. Lightning Protection in Extra-High-Voltage Stations—Influence of Multiple Circuits. I. W. Gross, American Gas & Electric Corp.; L. B. LeVesconte, Sargent & Lundy; J. K. Dillard, Westinghouse Electric Corp.

2:00 p.m.—Facsimile

- 53-297. A Level Compensator for Telephotograph Systems. T. A. Jones and W. A. Phelps, Bell Telephone Labs., Inc.
- CP.** Transmitting X-Ray Photographs by Facsimile. K. R. McConnell, Times Facsimile Corp.
- CP.** The Facsimile Transmission of News and News Photographs for Television. J. V. L. Hogan, Hogan Labs., Inc. and Dewey Frezzolini, International News Photos.
- CP.** A Discussion of Synchronizing Systems. F. T. Turner, Western Union Telegraph Co.

2:00 p.m.—Storage Batteries

Tuesday, June 16

9:00 a.m.—Section Delegates Conference

9:00 a.m.—Electrical Techniques in Medicine and Biology

- CP.** Miniature Electrostatic Sources of High Voltage for Radiation Instrumentation. S. R. Gilford and S. Saito, National Bureau of Standards.
- CP.** An Electronic Flowmeter. H. P. Kalmus, National Bureau of Standards.

- CP.** Measurements of Materials with High Dielectric Constant and Conductivity at Ultrahigh Frequencies. H. P. Schwan and Kam Li, University of Pennsylvania.
- 53-206. Heating of Fat-Muscle Layers by Electromagnetic and Ultrasonic Diathermy. H. P. Schwan, E. L. Carstensen and Kam Li, University of Pennsylvania.

9:00 a.m.—Television

- CP.** A UHF Transmitter Employing a Klystron Power Amplifier. W. H. Sayer, Jr., Allen B. DuMont Labs.
- 53-299. Technical Characteristics of FTL Type No. 20-B UHF Television Transmitter. E. M. Bradburd, Federal Telecommunication Labs.
- CP.** Review of Television Abroad. E. A. Laport and C. W. Slaybaugh, RCA International.
- CP.** Engineering Plans for Theatre Television. A. Forman, Tele-Tech.
- CP.** The Chromatron, A Single or Multigun Tricolor Cathode-Ray Tube. R. Dressler, Chromatic Television.

9:00 a.m.—Relays

- 53-195. An Analysis of Polyphase Directional Relay Torques. C. J. Baldwin, Jr., Westinghouse Electric Corp. and B. N. Gafford, University of Texas.
- 53-200. A Pilot Wire Relaying Scheme Utilizing the Product Differential Relay. R. I. Ward and D. W. Gilman, Commonwealth Edison Co.
- 53-210. Field Experience—Electronic Mho Distance Relay. H. C. Barnes, American Gas & Electric Service Corp. and R. H. Macpherson, General Electric Co.
- 53-211. Phase Comparison Carrier Relaying for Three-Terminal Lines. H. W. Lensner, Westinghouse Electric Corp.

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

- 53-286. Pulse Response Characteristics of Rectangular Hysteresis Loop Ferromagnetic Materials. Joseph Wylen, Burroughs Adding Machine Co.
- CP.** A High Speed Special Purpose Computer Using a Magnetic Drum Memory. R. T. Gordon, General Electric Co.
- CP.** Phase System of Magnetic Recording as Used for the EDVAC Drum Memory. Donald Eadie, University of Florida.
- 53-287. A Progressive Code Digital Quantizer. Floyd Raasch, Minneapolis-Honeywell Regulator Co.

9:00 a.m.—Instruments and Measurements

- 53-281. 40 to 4000 Microwatt Power Meter. R. W. Lange, Bell Telephone Labs., Inc.
- 53-197. The Use of Steel Sheet for the Construction of Shielded Rooms. A. M. Intrator, U. S. Naval Civil Engineering Research and Evaluation Lab.
- CP.** Precise Measurement of Repeater Transmission. T. Slonczewski, Bell Telephone Labs., Inc.
- CP.** The Quasi-Peak Voltmeter. C. W. Frick, General Electric Co.

9:00 a.m.—Utility Charges for Service to Resistance Welders

- CP.** Fundamentals of Electric Rate Making. L. R. Lefferson, Ebasco Services, Inc.
- CP.** Utility Metering of Resistance Welding Loads. M. A. Faucett, C. A. Keener, University of Illinois.
- CP.** Why Special Utility Charges for Resistance Welders? R. E. Young, Public Service Co.
- CP.** A High Output—Low Demand Resistance Welding Machine. R. S. Phair, The Budd Co.
- 53-296. Design of Transformers for Resistance Welding Machines. D. L. Knight, National Electric Welding Machines Co. Re-presented for discussion.

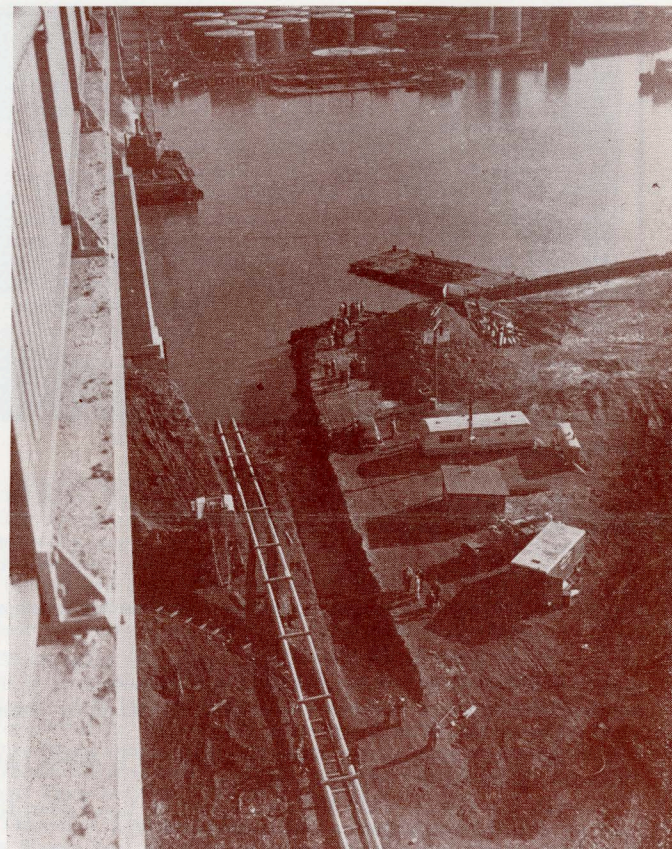
1:30 p.m.—Section Delegates Conference

1:30 p.m.—Management

- CP.** An Outline of the Principles, Skills and Tools of Management. R. M. Besse, The Cleveland Electric Illuminating Co.
- CP.** Engineering Economy as a Tool of Management. E. D. Ayres, Ohio State University.

1:30 p.m.—Binaural Broadcasting

- CP.** Binaural Transmission by FM Multiplex. M. G. Crosby, Crosby Labs.



Pipe Type Cable Crossing at Penrose Avenue Bridge on Schuylkill River, Philadelphia Electric Co.

- CP.** Stereophonic Recording Equipment. R. J. Tinkham, Ampex Electric Corp.
- CP.** Better Realism with Binaural Sound Reproduction. H. T. Sherman, Sherman Studios.
- CP.** Engineering and Subjective Aspects of the Binaural Medium. E. Cook, Cook Labs.

1:30 p.m.—Electron Tubes

- CP.** A New UHF Amplifier Tube. Byron Stokes, Sylvania Electric Products, Inc.
- CP.** A Monoscope Tube for Computer and Other Appliances. John Hartmann, Allen B. Dumont Labs., Inc.
- 53-307. Heat Transfer from Electron Tubes at High Altitudes and High Ambient Temperatures. Mrs. B. O. Buckland, General Electric Co.

1:30 p.m.—Instruments and Measurements

- 53-291. Preliminary Development of a Magnetron Current Standard. E. P. Felch, Bell Telephone Labs., Inc. and J. L. Potter, Rutgers University.
- 53-292. A Commutatorless Direct-Current Tachometer. A. R. Eckels and W. R. Peck, University of North Carolina.
- 53-293. An Automatic Transfer Function Measuring and Recording System. R. J. Ehret, E. F. Hochschild, J. M. Embree and E. C. Grogan, Minneapolis-Honeywell Regulator Co.
- CP.** A Small Aircraft Instrument Servomotor. L. T. Akeley and J. R. Macintyre, General Electric Co.

1:30 p.m.—Insulated Conductors

- 53-228. A Critical Soil Moisture Condition Affecting Buried Transmission Cables. W. A. Hadley and R. Eisenstadt, Columbia University.
- 53-230. A Simplified Mathematical Procedure for Determining the Transient Temperature Rise of Cable Systems. J. H. Neher, Philadelphia Electric Co.
- 53-214. Tests of Fittings on Insulated Aluminum Cable. Joel Tompkins and E. K. Lanctot, Aluminum Co. of America. Re-presented for discussion.

Wednesday, June 17

9:00 a.m.—Land Transportation

- 53-264. Controlling D-C Arcs. R. L. Hurtle, General Electric Co.
- CP.** Service Performance of New Trolley Coach Equipment. B. F. Krings, Westinghouse Electric Corp.
- CP.** Trolley Coach vs. Motor Coach—Here's 15 Years of Competitive Operating Costs. L. W. Birch, Ohio Brass Co.

9:00 a.m.—Switchgear

- CP.** An Analysis of an Analogue Solution Applied to the Heat Conduction Problem in a Cartridge Fuse. A. E. Guile, Queen Mary College—University of London; E. B. Carne, Remington Rand, Inc.
- 53-212. Testing Inhibited Oils in Circuit Breakers. W. M. Leeds, Westinghouse Electric Corp., and R. F. Seubert, Koppers Co., Inc.
- 53-231. Features of the Philadelphia Switchgear Development Laboratory. W. F. Skeats and R. L. Williams, General Electric Co.

9:00 a.m.—Insulation of Rotating Machinery

- 53-301. Motor Insulation Life as Measured by Accelerated Tests and Dielectric Fatigue. C. J. Herman, General Electric Co. Re-presented for discussion.
- 53-207. A Method of Evaluating Insulation Systems in Motors. C. B. Leape, J. McDonald and G. P. Gibson, Westinghouse Electric Corp. Re-presented for discussion.
- CP.** The Evaluation of Class H. Motor Insulation Systems. J. F. Dexter and E. Earleywine, Dow-Corning Corp.
- CP.** Aging Effects on Insulation Resistance at High Temperatures. J. L. Fuller and P. H. Kabelin, Reliance Electric & Engineering Co.
- CP.** Effect of Voltage and Vibration on Insulation. A. T. McClinton, Naval Research Lab.
- CP.** Statistical Analysis in Functional Evaluation of Insulation. John Cybulski, Naval Research Lab.

9:00 a.m.—Magnetic Recording

- CP.** Present Status of Magnetic Recording. R. E. Zenner, Armour Research Foundation.
- 53-300. Synchronized Magnetic Tape Recording. R. H. Ranger, Rangertone, Inc.
- CP.** Structure and Performance of Magnetic Transducer Heads. L. L. Anderson and O. Kornei, Brush Development Co.
- CP.** Performance Characteristics of Ferrite Recording Heads. J. F. Jewett, Ferroxcube.

9:00 a.m.—Electronic Systems Reliability

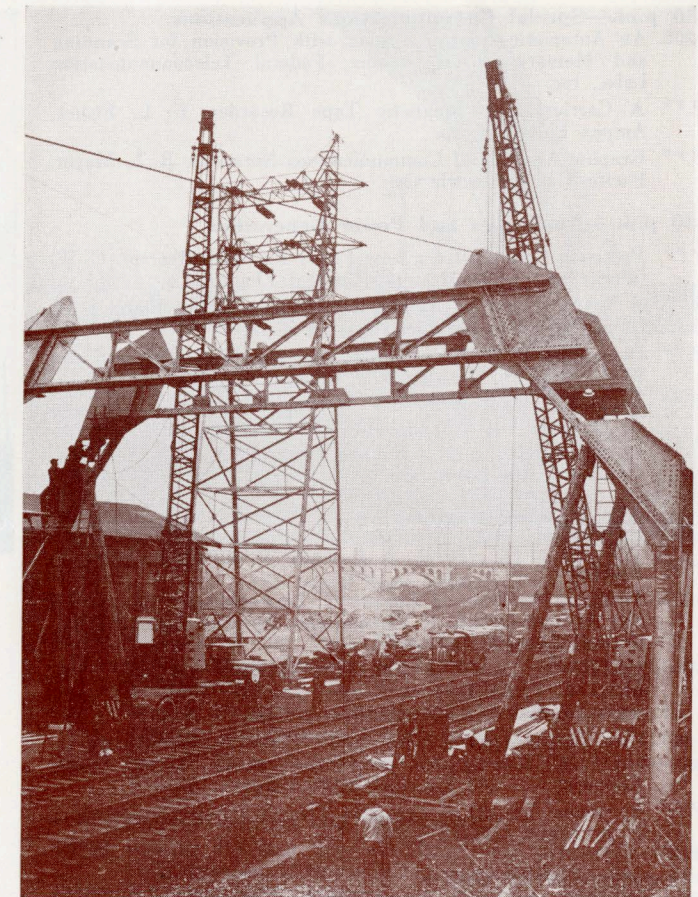
- 53-208. Reliability in Industrial Electronic Equipment. E. D. Cook, General Electric Co.
- CP.** The Human Being in Man-Machine Systems. F. R. Naka, Massachusetts Institute of Technology.
- CP.** Equipment Reliability as Applied to Analogue Computers. Herbert Jacobs, Jr., Massachusetts Institute of Technology.
- CP.** Achieving Higher Reliability and Accuracy from Electronic Components by Utilizing Components in Parallel. P. B. Montgomery, Goodyear Aircraft Corp.

9:00 a.m.—Nucleonics and Power Generation

- CP.** Major Factors in the Approach to Atomic Power. B. R. Prentice and R. G. Lorraine, General Electric Co.
- CP.** The Nature of Nuclear Power. J. W. Landis, Atomic Energy Commission.
- CP.** Nuclear Reactors for Power Generation. R. L. Witzke, J. M. Stein and E. U. Powell, Westinghouse Electric Corp.
- CP.** Considerations for Discontinuous Type Power Regulation of Nuclear Reactors. J. M. Harrer, Argonne National Lab.
- CP.** A Photomultiplier Log Level Period Meter for Reactor Control. V. G. Shaw, Westinghouse Electric Corp.
- CP.** Maintenance Problems with Reactor Auxiliaries and Instruments. C. B. Wagner, General Electric Co.

9:00 a.m.—Instruments and Measurements

- 53-294. Generator Stator Copper Temperature Indicator. A. L. Brownlee and H. E. Brown, Commonwealth Edison Co.



66 kv. Transmission Line Over-Build Tower on the Reading Railroad

- 53-205. Integrating Instruments for Simplified Quality-Control Measurements. D. M. Longenecker, General Electric Co.
- 53-295. Correction of Frequency Errors in Wattmeters. J. R. Freeman, Massachusetts Institute of Technology.
- CP.** Designing a Line of D-C Portable Instruments. R. M. Rowell, General Electric Co.

1:30 p.m.—Transistor Standardization

1:30 p.m.—Switchgear

- 53-309. Bushing Current Transformers for Oil Circuit Breakers. R. B. Shores and C. E. Wollerton, General Electric Co.
- 53-232. Considerations in the Operation of Outdoor Oil Circuit Breakers Under Low Ambient Temperatures. E. B. Rietz, General Electric Co.
- 53-233. Hydraulic Operating Mechanisms for High Capacity Circuit Breakers. E. E. Briggs, R. D. Hambrick and D. M. Umphrey, Pacific Electric Mfg. Corp.
- 53-234. A New Compressed Air Circuit Breaker for Arc Furnace Switching Duty. J. E. Schrameck and J. K. Walker, Westinghouse Electric Corp.

1:30 p.m.—Rotating Machinery

- 53-302. Calculation of No-Load Waveshape of Salient-Pole A-C Generators. D. Ginsberg and A. L. Jokl, Engineer Research & Development Labs., and L. M. Blum, Bureau of Standards.
- 53-303. Factory Testing of Large Turbine Generators. R. W. Stevens and M. D. Ross, Westinghouse Electric Corp.
- 53-304. D-C Dynamic Braking of Squirrel Cage Induction Motors. W. La Pierre, Columbia University and N. Metaxas, Athens & Pireus Electricity Co.
- 53-305. Commutation of Low Voltage DC Aircraft Generators. P. W. Franklin, Consultant with the Naval Air Development Center. Re-presented for discussion.
- 53-306. Leakage-Voltage Characteristics of Insulation Related to D-C Dielectric Strength. J. S. Johnson and J. W. Clokey, Westinghouse Electric Corp. Re-presented for discussion.

1:30 p.m.—Special Communications Applications

- 53-202. An Automatic Control System with Provision for Scanning and Memory. N. H. Young, Federal Telecommunication Labs., Inc.
- CP.** A Carrier Type Magnetic Tape Recorder. L. L. Fisher, Ampex Electric Corp.
- CP.** Graphic Analysis of Communications Networks. R. L. Mayer, Pacific Gas & Electric Co.

1:30 p.m.—Nucleonics and Power Generation

- CP.** Precision Controls for a Low Power Research Reactor. C. W. George and J. L. Matrone, General Electric Co.
- CP.** A Simple Electrical Analog to a Nuclear Power Plant. J. N. Grace, Westinghouse Electric Corp.
- CP.** Direct Linear Motion in Sealed Systems. R. C. Robinson and W. E. McCown, Westinghouse Electric Corp.
- CP.** Position Control in Sealed Systems. W. H. Esselman and W. H. Hamilton, Westinghouse Electric Corp.
- CP.** Present Feasibility of a Nuclear Power Plant. T. G. Le Clair, Commonwealth Edison Co.

1:30 p.m.—System Engineering

- CP.** Austrian Power Supply. E. J. Schubert-Drinawehr, Salzburg, Austria.
- 53-255. Tensorial Analysis of Integrated Transmission Systems—IV The Interconnection of Transmission Systems. Gabriel Kron, General Electric Co.
- 53-256. Analysis of Losses in Loop-Interconnected Systems. A. F. Glimm, L. K. Kirchmayer, General Electric Co.; G. W. Stagg, American Gas and Electric Service Corp.
- 53-209. Loss Formulas Made Easy. A. F. Glimm, R. Habermann, Jr. and L. K. Kirchmayer, General Electric Co.; G. W. Stagg, American Gas and Electric Service Corp.
- CP.** Economic Aspects of European Electric Power Development. P. A. Abetti, General Electric Co.

1:30 p.m.—Carrier Current

- 53-204. Series Resonant Circuits for Carrier Trapping of Resonant Taps. S. Lubin and N. M. Levinson, Sprague Electric Co.
- 53-282. Telecommunication Equipment for Power Systems. Developments and Application in Sweden. U. Hecht, ASEA; S. Rodhe, Telefonaktiebolaget L. M. Ericsson; H. J. B. Nevitt, Ericsson Telephone Sales Corp.
- CP.** Operation of Single Sideband Power Line Carrier. P. Taylor, Central Light & Power Co., and B. M. Ray, Westinghouse Electric Corp.
- CP.** New Carrier Current Telephone Equipment for Modern Electric Utility Communications. Paul Crooker, General Electric Co.
- CP.** Experience and Reliability of Carrier Relaying Channels. Carrier Current Project Subcommittee #5.

Thursday, June 18

9:00 a.m.—Electrical Safety Standards and Practices

- CP.** Edison Electric Institute, National Safety Council, American Society of Safety Engineers. W. F. Brown, Consolidated Edison Co. of New York, Inc.
- CP.** National Electrical Manufacturers Association, American Institute of Electrical Engineers. H. H. Watson, General Electric Co.
- CP.** American Standards Association, Canadian Standards Association, National Bureau of Standards. W. C. Wagner, Philadelphia Electric Co.
- CP.** Underwriters' Laboratories, Inc., National Fire Protection Association, National Board of Fire Underwriters. Karl Geiges, Underwriters' Laboratories, Inc.

9:00 a.m.—Magnetic Amplifiers

- 53-283. A Transient Analyzer for Magnetic Amplifiers. E. J. Smith, Polytechnic Institute of Brooklyn.
- 53-284. Theory of Magnetic Amplifiers with Square-Loop Core Materials. H. F. Storm, General Electric Co.



Pennsylvania's Morning Congressional

- 53-215. Problems to Consider in Applying Selenium Rectifiers. J. Gramels, Bell Telephone Labs., Inc.
- 53-285. An Application of Magnetic Amplifier Circuits to Perform Multiplication and other Analytical Operations. L. A. Finzi and R. A. Mathias, Carnegie Institute of Technology. Re-presented for discussion.

9:00 a.m.—Wire Communications

- 53-221. The L3 Coaxial System. C. H. Elmendorf, R. D. Ehrbar, R. H. Klie and A. J. Grossman, Bell Telephone Labs., Inc.
- 53-222. L3 Coaxial System—Amplifiers. L. H. Morris, G. H. Lovell and F. R. Dickinson, Bell Telephone Labs., Inc.
- 53-223. L3 Coaxial System—Equalization and Regulation. R. W. Ketchledge and T. R. Finch, Bell Telephone Labs., Inc.
- 53-224. L3 Coaxial System—Television Terminals. J. W. Rieke and R. S. Graham, Bell Telephone Labs., Inc.
- CP.** Companders for General Use on Wire and Radio. R. S. Caruthers, Lenkurt Electric Corp.

9:00 a.m.—Power Generation, Station Design

- CP.** Modern High Capacity Steam Generator Protection. J. A. Elzi and J. C. Beres, Commonwealth Services, Inc.
- CP.** Electrical Safety Features Used for Boiler Protection in Several Large Generating Stations in the Southeast. A. H. Mergenthaler, Southern Services, Inc.
- CP.** Boiler Protection and Interlocking on the American Gas and Electric System. H. C. Barnes, American Gas and Electric Service Corp.
- CP.** Operating Protection Devices for a Reheat Pressurized Boiler. G. R. Hahn, Consolidated Edison Co. of New York, Inc.
- CP.** Electrical Safety Features Used for Boiler Protection at Delaware Station. E. E. Brown, Philadelphia Electric Co.

9:00 a.m.—High Dielectric Constant Ceramics

- 53-235. Dielectric Breakdown of Sulfur Hexafluoride in Non-Uniform Fields. C. N. Works and T. W. Dakin, Westinghouse Electric Corp. Re-presented for discussion.
- 53-236. The Effect of Minor Constituents in High Dielectric Constant Titanate Capacitors. W. W. Coffeen, Metal & Thermit Corp.
- CP.** Tailoring Ceramic High K Dielectrics for Specific Applications. R. J. Dew, Jr., American Lava Corp.
- CP.** High K Ceramic Dielectrics Made From Zirconate and Titanate Materials. Shelton, Bunting and Kopell, National Bureau of Standards.
- CP.** New Developments in Ceramic Dielectrics for Capacitors. A. K. Das Gupta, K. R. Clark and S. Hedelman, Solar Mfg. Corp.

9:00 a.m.—Electronic Circuit Principles

- CP.** Some Physical Considerations in the Analysis of Transistor Transient Response. J. J. Suran, General Electric Co.

- CP.** Temperature Stabilized DC Amplifier Employing Junction Transistors. Edward Keojian, General Electric Co.
- CP.** Wide Deviation Frequency Modulated Oscillator. D. J. Gray, V. P. Gurske and W. E. Morrow, Massachusetts Institute of Technology.
- CP.** Analysis of Power Distributed Amplifiers. P. H. Rogers, University of Michigan.

9:00 a.m.—Electronic Instruments

- 53-298. A Universal Meter for Measuring Voltages at High Impedances, Micro-Microamperes, and Insulation Resistance. W. R. Clark, R. E. Watson and G. C. Mergner, Leeds & Northrup Co.
- 53-308. Vacuum Tube Voltmeter Concepts in the Mid-Frequency Range. G. B. Hoadley, North Carolina State College.
- 53-244. A-C Null-Type Recorder with Balancing Amplifier Which Provides Damping and Suppresses the Quadrature Component. A. J. Williams, Jr., and J. F. Payne, Jr., Leeds & Northrup Co.
- CP.** Design Criteria for Mutual Inductance Micrometers. H. Joseph, National Bureau of Standards.
- CP.** Sheet and Plated Metal Measurements with a Phase Angle Type Probe. W. A. Yates and J. L. Queen, National Bureau of Standards.

1:30 p.m.—Magnetic Amplifiers

- CP.** Frequency and Temperature Insensitive Regulated Power Supplies. M. A. Pahlavan, INET, Inc., and A. B. Rosenstein, University of California.
- CP.** Design Considerations of the Half-Wave Bridge Magnetic Amplifier. C. W. Lufcy and H. H. Woodson, U. S. Naval Ordnance Lab.
- CP.** Magnetic Amplifier Servo Compensation. H. H. Woodson, U. S. Naval Ordnance Lab.
- CP.** An Application of Compensated Half-Wave Bridge Magnetic Amplifiers. E. T. Hooper, U. S. Naval Ordnance Lab.

1:30 p.m.—Wire Communications

- 53-203. Protection of Wire Communication Facilities Serving Power Stations and Substations. T. W. Alexander, Bell Telephone Co. of Pennsylvania.
- 53-225. Coordination of M1, N1, and O1 Telephone Carrier Systems. E. P. Smith, L. P. Cornell, Jr. and M. G. Jerome, Pacific Tel. & Tel. Co.
- 53-226. The Control of Noise and Crosstalk on N1 Carrier Systems. A. J. Aikens, Bell Telephone Labs., Inc., C. S. Thaeler, American Tel. & Tel. Co.
- 53-227. Transmission Design of Intertoll Telephone Trunks. H. R. Huntley, American Tel. & Tel. Co.

1:30 p.m.—Power Generation, Hydro-Electric Systems

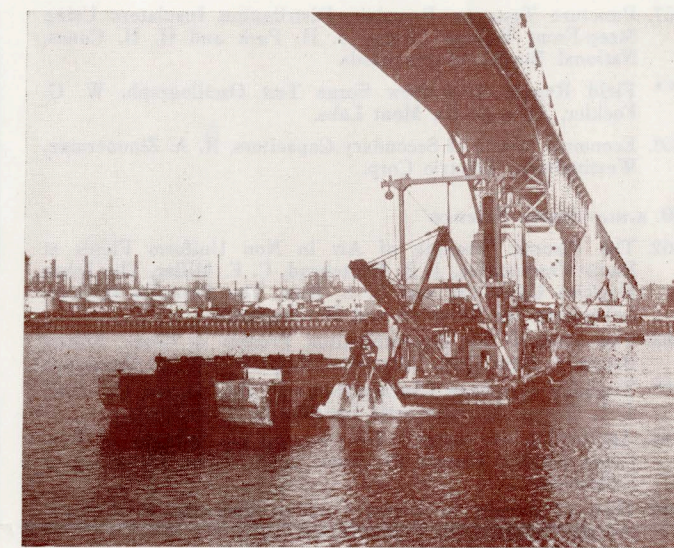
- 53-220. Unique Outdoor Hydro-Electric Plant. H. E. Rhoades, Northern States Power Co.
- CP.** Important Economic Factors in the Development or Rehabilitation of Small Capacity Hydroelectric Stations. H. H. Brown, Wisconsin Michigan Power Co. and A. R. Klann, Allis-Chalmers Mfg. Co.
- CP.** Progress Report by the AIEE Joint Subcommittee on Application Probability Methods to Power System Problems, Power Generation and System Engineering.

1:30 p.m.—Magnetics

- 53-259. The Permeability of Silicon-Iron at Very Low Flux Densities. Eberhard Both, Fort Monmouth, N. J. Re-presented for discussion.
- 53-260. Stressed Ferrites Having Rectangular Hysteresis Loops. H. J. Williams, R. C. Sherwood, Matilda Goertz and F. J. Schnettler, Bell Telephone Labs., Inc. Re-presented for discussion.
- 53-261. Mathematical Description of Core Losses. J. W. Hale, Allegheny Ludlum Steel Corp.; F. R. Richardson, General Electric Co. Re-presented for discussion.

1:30 p.m.—Transformers

- 53-275. Analytical Approach to the Variable Turns-Ratio Auto-Transformers. E. Mishkin, Hebrew Institute of Technology, Israel.
- CP.** Measurement of Ambient Air Temperature During Temperature Test on Transformers. M. F. Beavers, General Electric Co.



Phila. Electric's 66 kv. Interconnection between Southwark Station and Island Road Substation

- 53-270. Analysis of the Delta Grounded Transformer. E. T. B. Gross, Illinois Institute of Technology; K. J. Rao, Vern E. Alden Co.
- CP.** Modern Forced Air Cooling of Power Transformers. W. D. Albright, Westinghouse Electric Corp.
- 53-276. Special Three-Phase Core Arrangements. F. C. Roeding, Westinghouse Electric Corp.

1:30 p.m.—Instruments and Measurements

- 53-289. Forcing Function Generator Employing Conductive Plastic. L. W. Norman, Minneapolis-Honeywell Regulator Co.
- 53-290. A Permeability Analyzer for Magnetic Amplifier Cores. Philip Siskind, Sperry Gyroscope Co.
- CP.** Basic Theory and Experimental Verification of the Alternating-Current Galvanometer. T. J. Higgins, University of Wisconsin, and William Kneen, Pullman Corp.
- CP.** An Emission Characteristic Plotter for Thermionic Cathodes. Lewis Marzetta, National Bureau of Standards.

Friday, June 19

9:00 a.m.—Communication Switching

- 53-216. An Application of Boolean Algebra to the Design of Electronic Switching Circuits. S. H. Washburn, Bell Telephone Labs., Inc.
- 53-217. The Map Method for Synthesis of Combinational Logic Circuits. M. Karnaugh, Bell Telephone Labs., Inc.
- CP.** Circuit Action Charts. A. C. Reynolds, IBM Corp.
- 53-218. Transistors and Their Circuits in the 4A Toll Crossbar Switching System. P. Mallery, Bell Telephone Labs., Inc.
- 53-219. Telephone System Applications of Recorded Machine Announcements. W. Bennett, Bell Telephone Labs., Inc. Re-presented for discussion.

9:00 a.m.—Transformers

- CP.** Crepe Papers and Crepe Paper Cables for Transformers. G. Camilli, L. Mulligan and E. L. Crandall, General Electric Co.
- 53-277. A New Low-Liquid-Content Current Transformer. L. W. Marks, General Electric Co.
- CP.** External and Internal Factors Affecting H. V. Bushing Withstand Values. S. Terpak and D. L. Johnston, General Electric Co.
- 53-278. An Impulse Generator Circuit for Chopped Wave Tests on Transformers. G. H. Johnson, Line Material Co.

9:00 a.m.—Transmission and Distribution

- 53-229. Physical Concepts of Corona in Capacitors. J. R. Nye, General Electric Co.

AIEE Summer General Meeting

- 53-257. Puncture Tests on Porcelain Distribution Insulators Using Steep-Front Voltage Surges. J. H. Park and H. H. Cones, National Bureau of Standards.
- CP.** Field Report on a New Surge Test Oscillograph. W. G. Fockler, Allen B. Du Mont Labs.
- 53-258. Economic Merits of Secondary Capacitors. R. A. Zimmerman, Westinghouse Electric Corp.

9:00 a.m.—Basic Science

- 53-262. The Electric Strength of Air in Non Uniform Fields at Radio Frequencies. J. B. Whitehead, C. F. Miller, The Johns Hopkins University and D. L. Bix, The Franklin Institute Laboratory for Research and Development.
- 53-263. The Electron Ion Recombination Process in Gases. Sidney Borowitz, New York University. Re-presented for discussion.
- CP.** Tracking Response Characteristics of the Human Operator. J. I. Elkind, Massachusetts Institute of Technology.
- 53-265. Applications of Integral Equations to the Solution of Non-linear Electric Circuit Problems. L. A. Pipes, University of California.
- 53-266. Flow of Energy in Direct Current Machines. E. I. Hawthorne, University of Pennsylvania.

9:00 a.m.—Power Generation, Prime Movers

- CP.** Methods of Starting Gas Turbine Generator Units. W. B. Boyum, R. W. Ferguson and J. G. Partlow, Westinghouse Electric Corp.
- CP.** Can Human Engineering Help in Reaching Decisions in Instrumentation and Control? B. J. Cover, Dunlap and Associates, Inc.
- CP.** Generating Plant Costs in 1952. A. E. Knowlton, Electrical World Magazine.

9:00 a.m.—Petroleum Industry

- CP.** Modern Electric Distribution System for an Oil Refinery. V. Nealy, Texas Co.
- CP.** Design Factors of Refinery Electric Distribution. H. G. Buch, Socony Vacuum Co.
- CP.** Turbo Generators and Heat Balance of Refinery Applications. J. C. Spahr, Westinghouse Electric Corp.
- CP.** High Voltage Motor Control for Semi-Hazardous Locations. Ray Maynard, General Electric Co.
- CP.** Motor Lubrication Practices in an Oil Refinery. F. H. Walker, Atlantic Refining Co.

9:00 a.m.—Transient Response of Systems

- 53-247. A Relative Damping Criterion for Linear Systems. J. F. Koenig, National Bureau of Standards.
- 53-248. Approximation of Transient Response from Frequency Response Data. C. H. Dawson, University of Rochester.
- 53-249. The Synthesis of Optimum Transient Response: Criteria and Standard Forms. Dunstan Graham and R. C. Lathrop, Wright Air Development Center.
- 53-250. Bibliography on Feedback Control Part I. Subcommittees on Bibliography of the Committees on Industrial Control and Feedback Control Systems.
- 53-251. Bibliography on Feedback Control Part II. Subcommittees on Bibliography of the Committees on Industrial Control and Feedback Control Systems.

1:30 p.m.—Radio Communications

- 53-198. Frequency Generating Equipment for Million Watt Navy Transmitter. D. G. Robertson, Radio Corporation of America.
- 53-199. A Million Watt Naval Communication Transmitter. J. C. Walter, Radio Corporation of America.
- 53-196. Aircraft Protection from Thunderstorm Discharges to Antennas. J. M. Bryant, University of Minnesota; M. M. Newman and J. D. Robb, Lightning and Transients Research Institute.
- 53-213. The New Jersey Turnpike—A Unique Highway Communication System. P. F. Godley, Paul Godley Co.; J. R. Neubauer and D. R. Marsh, Radio Corporation of America. Re-presented for discussion.



The Beach at Atlantic City, N. J.

1:30 p.m.—Transformers

- 53-246. Temperature Classes for Dry Type Transformers as Determined by Functional Tests. Paul Narbut, Westinghouse Electric Corp.
- 53-243. Life Expectancy of Oil-Immersed Insulation Structures. W. A. Sumner, G. M. Stein and A. M. Lockie, Westinghouse Electric Corp.
- 53-279. Field Theory of Wave Propagation Along Coils. H. Poritsky, P. A. Abetti and R. P. Jerrard, General Electric Co.
- 53-245. Sealed Dry Type Transformers Proved Safe by Test. E. W. Tipton, Westinghouse Electric Corp.
- 53-280. Propagation Mechanism of Impulse Corona and Breakdown in Oil. T. W. Liao and J. G. Anderson, General Electric Co.

1:30 p.m.—Non-Linear Systems

- 53-252. Optimization of Nonlinear Control Systems by Means of Non-Linear Feedbacks. R. S. Neiswander and R. H. MacNeal, California Institute of Technology.
- 53-253. Open Loop Frequency Response Method for Nonlinear Servomechanisms. R. L. Cosgriff, Ohio State University.
- 53-254. Describing Function Method of Servomechanism Analysis Applied to Most Commonly Encountered Nonlinearities. H. D. Greif, Hughes Aircraft Co.
- CP.** The Finger-Type Voltage Regulator. T. F. McHenry, Electric Regulator Corp.

1:30 p.m.—Basic Science

- 53-267. The First-Order Behavior of Separable Oscillators. D. C. Depackh, Naval Research Lab.
- CP.** Acceleration Plane Method for Analysis of a Circuit with Nonlinear Inductance and Nonlinear Capacitance. Y. H. Ku, Moore School of Electrical Engineering.
- 53-268. Basic Concepts in the Analysis of Stationary Electric Circuits. D. W. Spence, Syracuse University and C. R. Cahn, Niagara Mohawk Power Corp.
- 53-269. Block Diagram Solutions for Vacuum Tube Circuits. T. M. Stout, University of Washington. Re-presented for discussion.

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

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