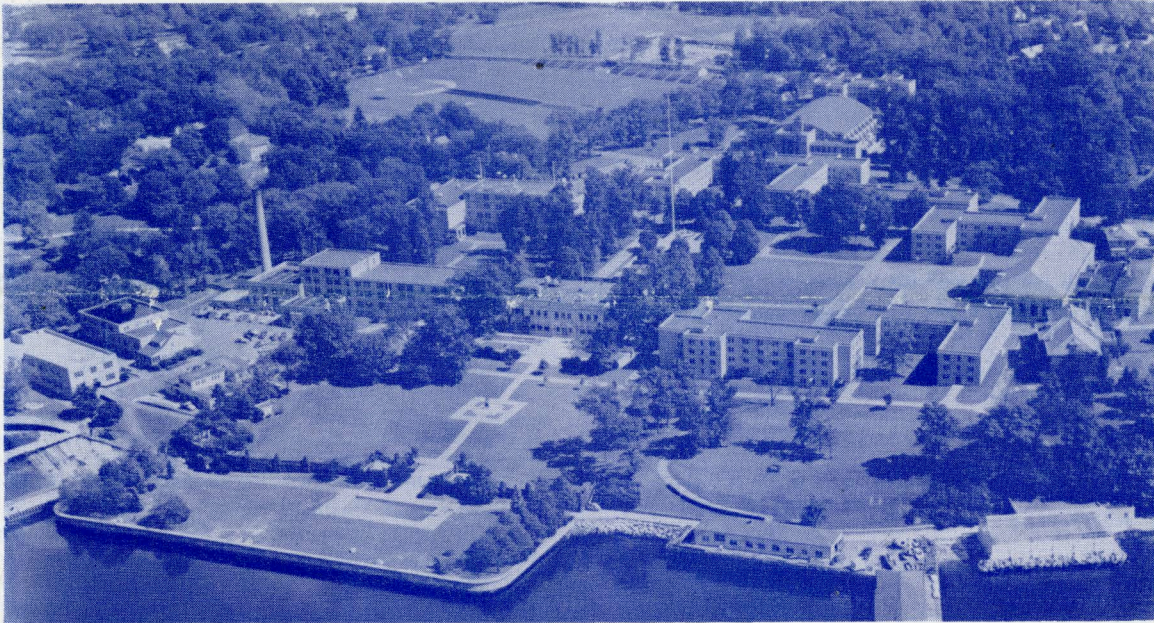


Winter General Meeting

January 30 - February 3, 1956



Headquarters
Hotel Statler



United States Merchant Marine Academy, Kings Point, New York

The AIEE Winter General Meeting to be held at the Hotels Statler and Governor Clinton in New York, New York, January 30 to February 3, 1956, will feature the largest technical program in the history of the Institute. The social activities, for which the Winter General Meeting is known, again will be one of the outstanding features. A group of varied and interesting inspection trips has been arranged, closely allied with the technical sessions.

GENERAL SESSION: At the General Session on Monday, January 30 at 2:00 p.m., Roger Blough, Chairman of the Board of Directors of the United States Steel Company, will give the principal address. Just prior to Mr. Blough's remarks Past President James F. Fairman will be awarded an honorary membership in the Institute. At this time also the Alfred Noble Paper Prize will be awarded to Mr. R. L. Bright of the Carnegie Institute of Technology. At this same meeting the Institute Paper Prizes will be awarded. President M. D. Hooven will open the session with his report to the membership.

At a special session Tuesday 1:45 p.m., the Edison Medal will be presented to Mr. L. A. Umansky of the General Electric Company. The public is cordially invited to these two sessions.

TECHNICAL SESSIONS: Over 500 papers will be presented in some 100 technical sessions ranging through the five broad fields of Institute activities—communications, general applications, industry, power and science and electronics. In addition sessions will be sponsored by general committees of the Institute in the fields of ethics, management, safety, education and research. Among the forty odd sessions of the Power Division, one session on the 330 KV System to be held Tuesday morning, will be devoted to the transmission, transformation, switching and relaying of this high voltage. At this meeting three new committees are sponsoring sessions on the subjects of information theory, dielectrics and solid state devices.

Under the sponsorship of the Committee on Research three important sessions will be held one of which will be on the subject of research and education. The first of these sessions will be composed of reports on research by and for the electric power industry in Sweden, Italy, Japan and Great Britain. The third session will be composed of papers on the subject of research in the field of fuels. Of note are two joint sessions. The first will be sponsored by the Committees on Wire Communications and Transmission and Dis-

tribution and the second will be organized by the Committees on Television and Aural Broadcasting and Production and Application of Light. The Marine Transportation Committee has again selected the Winter General Meeting to sponsor a session in this important field. The Committee on Industrial Power Rectifiers, formerly known as Electronic Power Converters will also sponsor two sessions on Wednesday.

INFORMAL TEA: This social gathering before the formal program begins has been enjoyed by more and more people each year. Please make it a point to attend this year—Sunday afternoon, January 29, from 4 to 6 p.m., in the Georgian Room of the Statler. There will be no charge.

During this period the registration facilities will be open for those wishing to avoid the Monday morning rush.

HOTEL RESERVATIONS: Blocks of rooms have been set aside at the Governor Clinton, Statler, and nearby hotels for members and guests attending the meeting. Requests for reservations should be sent to the hotel of your choice, specifically referring to the AIEE meeting in your letter. Please do not write to more than one hotel. If your request cannot be filled, the hotel will automatically refer your request to the Hotel Accommodations Committee whose duty it is to obtain a similar reservation at another of the convention hotels for you. The hotel will confirm directly to you. No guarantee that you will be housed satisfactorily can be made if your request is received after January 16, 1956.

Because of the crowded conditions in New York hotels, it is suggested that your reservation be made for arrival on Sunday, January 29, 1956, thereby avoiding delays in registration or unavailability of rooms in the early morning of subsequent days. It is also suggested that a request for reservation prior to Christmas is more likely to be filled at the hotel of your choice.

Rooms have been allotted for our use by the following hotels at the daily rates indicated below:

Hotel Statler (meeting headquarters), 7th Avenue, 32nd to 33rd Sts.

Single room	\$ 7.00 to \$11.00
Double room	10.00 to 14.00
Twin bedroom	10.50 to 18.00
Suites	29.00 to 30.00

AIEE WINTER GENERAL MEETING

Hotel Governor Clinton (also used for meetings), 7th Avenue at 31st Street

Single room	\$ 6.00 to \$11.00
Double room	8.50 to 14.00
Twin bedroom	10.00 to 16.00

Hotel McAlpin, Broadway and 34th Street

Single room	\$ 5.50 to \$10.50
Double room	8.00 to 15.00
Twin bedroom	9.50 to 15.50

Hotel Commodore, Lexington Avenue and 42nd Street

Single room	\$ 6.00 to \$11.50
Double room	9.50 to 14.00
Twin bedroom	11.00 to 17.00

Hotel Martinique, Broadway and 32nd Street

Single	\$ 5.00 to \$11.00
Double room	8.00 to 14.00
Twin bedroom	8.00 to 14.00

All rooms have private bath and the rates quoted are subject to a 5 per cent New York City hotel room tax.

There will be no rooms available at the New Yorker or Roosevelt this year due to conflicts with other meetings, but allotments have been increased at other hotels accordingly.

THEATER TICKETS: As in the past, tickets to the following shows currently playing in New York will be available to AIEE members during the week of the meeting. All prices shown are brokers' prices.

	Evenings	Matinees
	M,T,W,T	F,S W
A View from the Bridge	\$6.85....\$6.85....\$5.15	
Arthur Miller with Van Heflin, J. Carroll Naish		
Bus Stop	5.70.... 6.85.... *5.15	
William Inge with Kim Stanley		
Fanny	8.60.... 8.60.... 5.40	
Walter Slezak, Nicola Moscona		
Inherit the Wind	*5.70.... 6.85.... 5.15	
Melvyn Douglas		
The Pajama Game	8.00.... 8.00.... 5.15	
Helen Gallagher, John Raitt		
Plain and Fancy	8.00.... 8.00.... 5.25	
Richard Derr		
Silk Stockings	8.60.... 8.60.... 5.90	
Cole Porter with Don Ameche, Hildergarde Neff		
The Tea House of the August Moon.....	5.70.... 7.35.... 5.15	
Eli Wallach, John Beal		
Tiger at the Gates	6.85.... 6.85.... 5.15	
Michael Redgrave		
Witness for the Prosecution	5.70.... 6.85.... *5.15	
Agatha Christie with Francis L. Sullivan, Patricia Jessel		

* Mats. Thurs.

Checks should be made payable to: "Theater Ticket Committee, AIEE." Requests also should include first and second choice of both name and date of show, and should be sent to: Theater Ticket Committee, AIEE, c/o S. Friend, Jr., 75 Buena Vista Drive, Dobbs Ferry, N. Y.

SMOKER: A highlight of the Winter Meeting will be the Smoker to be held on Tuesday evening January 31, 1956. Good food, good fellowship, and top quality entertainment will feature this event which will be held in the Hotel Statler.

Attendance will be limited to improve the comfort of guests and ticket requests should therefore be made at an early date. They should be addressed to D. Halloran, Room 1250 S, 4 Irving Place, New York 3, N. Y., and should be accompanied by checks made payable to "AIEE Smoker Committee." The ticket price will be \$10 per person.

REGISTRATION FEES: With this General Meeting, registration fees have been increased to \$5 for members and \$8 for nonmembers. However, nonmembers applying for membership in the Institute within 30 days will receive a \$3 credit toward their entrance fee.

DINNER-DANCE: The Dinner-Dance, climax of the social affairs planned for the Winter General Meeting, is scheduled for Thursday, February 2, 1956 at 7:00 P.M. in the Grand Ballroom of the Hotel Statler, New York. Music will be by Charles Peterson and the food

will be better than ever. Dress will be formal. Plan now and write soon for tables for 10 or individual places. Address requests to: E. J. Doyle, American Telephone and Telegraph Co., 195 Broadway, New York 7, N. Y. Tickets are \$12.00 each and checks should be made payable to "AIEE Dinner-Dance Committee."

INSPECTION TRIPS: A Program of inspection trips of both technical and general interest has been arranged for those attending the Winter General Meeting. Since the number of people who can be accommodated on these trips is limited, members who plan to take any of these trips are urged to make arrangements at the Inspection Trips' desk immediately after registering.

Fairless Steel Plant—Fairless, Pa. (Tuesday, all day)—The Fairless Works is U. S. Steel's first integrated steel plant in the East and covers 3,900 acres of land near Trenton, New Jersey, of which 175 are under roof. The Inspection Party will see all of the operations from the stock pile of raw materials (iron ore, coal and limestone) through the Blast Furnaces and Open Hearth Plant to the Hot Strip Mill and Tin Finishing Mills.

This plant has an annual capacity of approximately 1,200,000 tons of pig iron which, when used in the plant's nine open hearth furnaces, furnish 1,800,000 tons of steel. The large amount of electric equipment used for driving and controlling various operations in the mills will also be of interest to our members.

Radio City Music Hall—New York, N. Y. (Tuesday A.M.)—This ever popular trip has been scheduled again. Spectacular stage shows distinguished by unique lighting effects have made the Radio City Music Hall an outstanding attraction for visitors from all over the world. Members will see the backstage facilities as well as unusual features, such as, the revolving sectionized stage, elevating orchestra pit, motorized curtains and the multitude of electric and mechanical controls required for the special stage and lighting effects.

International Business Machines Corp.—New York, N. Y. (Tuesday A.M., Wednesday P.M. and Thursday P.M.)—The International Business Machines Company will demonstrate and explain the operation of their Type 705 Electronic Data Processing Machine, Type 704 Electronic Data Processing Machine, Type 650 Magnetic Drum Data Processing Machine and High Speed Printer. In addition, numerous other electronic devices will be exhibited and the operation explained by technical personnel.

Charles Pfizer & Co.—Brooklyn, N. Y. (Tuesday P.M.)—An inspection and illustrated lecture at the main plant of the world's largest producer of antibiotic drugs. You will see modern laboratories engaged in the research that leads to the invention and discovery of new drugs including vitamins and hormones as well as antibiotics. In the search for new antibiotics, Pfizer has screened more than one million soil samples in the last eight years. In addition to the laboratories you will see how the pharmaceutical industry has developed and invented new machinery for the processing and packaging of drugs. You will see how capsules, tablets and other medicines are produced through the use of the most modern equipment.

Kearny Generating Station—Kearny, N. J. (Tuesday P.M.)—This new generating station of the Public Service Electric and Gas Company contains two 145,000-kilowatt steam turbine-generator units. These tandem-compound, 3,600-rpm turbine-generators are unique in respect to their elevated steam conditions: 2,350 psig, 1,100F at throttle and 1,050F reheat temperature. The boilers, each as tall as an 11-story building, produce a million pounds of steam an hour and feature controlled circulation, pressurized firing, twin furnaces, and flue-gas recirculation. Each of the twin furnaces is equipped for tilting tangential corner firing of either coal or oil. The modern soundproofed and air conditioned control room is equipped with over 500 instruments and controls including television apparatus for the control and supervision of these two turbine-generator units.

Brookhaven National Laboratory—Upton, N. Y. (Wednesday, all day)—The facilities at the location are operated by Associated Universities, Inc., under contract with the Atomic Energy Commission, and constitute the Northeastern Center for nuclear research and development in the fields of physics, chemistry, biology, medicine and engineering. Among the important exhibits that our members will see are the atomic pile, the cosmotron and the hot laboratory. A complete tour has been arranged in great detail and competent guides, engineers and scientists will be on hand to explain fully the extensive facilities and exhibits which have been erected at this vast site. Members must sign up for this trip before 12 noon, January 31, 1956. U. S. citizens only. *Continued on page 12*

TECHNICAL PROGRAM

ADVANCED COPIES OF PAPERS

Members may obtain preprints of numbered papers at the uniform price of 40c each (80c 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 \$10 denominations are available for those who wish to avoid remittance by check or otherwise. The Transactions Papers will also be published in the bimonthly publications.

Note: Unnumbered Conference Papers (CP.*) may be available at or after the meeting, if copies are provided by the author. They are not intended for publication in the Transactions and are not presently scheduled for reproduction in any form by the Institute.

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

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

Monday, January 30

10:00 a.m.—Carrier Current

- 56-64. Attenuation Measurements, Bureau of Reclamation, Alva B. Adams Tunnel, 69KV Cable, R. W. Beckwith, D. C. Pinkerton. General Electric Co. and C. H. Murray, Bureau of Reclamation.
- 56-65. The Application of Power Line Carrier to a Combined Cable and Overhead Circuit. J. D. Moynihan, Sprague Electric Co., and E. G. Allyn, Detroit Edison Co.
- 56-11. Bibliography of Power System Communication Literature. III Subcommittee on Bibliography.
- CP.* Symposium—Application of Microwave Equipment to Power Systems. T. A. Cramer, General Electric Co.

10:00 a.m.—System Engineering

- 56-158. A New Approach to Forecasting Daily Peak Loads. D. K. A. Gillies, B. Bernholtz and P. J. Sandiford, The Hydro-Electric Power Commission of Ontario.
- 56-58. What Do Losses Cost in Hydro, Thermal and Combined Systems? V. W. Ruskin, British Columbia Electric Co., Ltd.
- CP56-159. An Equitable Method for the Distribution of Power Pool Savings. H. W. Phillips, Philadelphia Electric Co.
- CP56-160. The Calculation of Block Tariffs. T. D. Oswald, Electricity Department, Singapore.
- CP56-161. Maintenance Costs as an Electrical Design Consideration. C. J. Slatt, W. S. Acton and C. C. Diamond, Bonneville Power Administration.

10:00 a.m.—General Circuit Theory

- CP56-117. Analysis of Electric Circuits Containing Nonlinear Resistance. L. A. Pipes, University of California.
- CP56-118. The Existence of an Electric Analogue of a Magnetic Circuit Established by the Basic Laws Defining Magnetostatics. E. C. Koenig, Allis-Chalmers Mfg. Co.
- CP56-119. An Analysis and Design of the Ferroelectric Resonant Trigger Pair. C. E. Gremer, USN, Naval Guided Missile School.
- CP56-120. Eddy Currents in a Frog-Leg Winding. A. I. Dvoracek, Research and Resettlement Branch, USAREUR.
- 56-121. Representation of Non-linear Characteristics by Linear Elements. M. S. M. Abou-Hussein, University of Cairo.
- 56-122. Impedance Tensor of General Electric Machine. Yao-nan Yu, I National Taiwan University.

10:00 a.m.—Instruments and Measurements

- CP56-97. Electric Potential Changes at Surfaces as a Means of Measuring Odorous Atmospheric Contamination. C. R. Chapman and J. R. Eaton, Purdue University.
- 56-98. Two New Total Radiation Pyrometers. W. Derganc and I S. N. Howell, Servo Corp. of America.
- CP.* Automatic Digital Recording of Flight Test Data. S. Cohen and L. Goldfischer, General Precision Labs., Inc.

CP56-99. Segmental Multi-Recording Instruments. George Keinath, Larchmont, N. Y.

10:00 a.m.—Solid State Devices

- CP.* High Frequency Junction Transistors. J. M. Early, Bell Telephone Labs., Inc.
- CP.* Discussion of a New Type Power Transistor. Joseph Maupin, Minneapolis-Honeywell Regulator Co.
- CP.* Recent Developments in Silicon Power Rectifiers. R. L. Bright, Westinghouse Electric Corp.
- CP.* Partial Transistorization of a Communication Receiver. G. A. Allard, General Electric Co.

CP56-276. Temperature Stabilization in Transistor Amplifiers. L. M. Vallese, Polytechnic Institute of Brooklyn.

CP56-94. Transistor Power Amplifiers with Switched Mode of Operation. A. G. Milnes, Carnegie Institute of Technology.

56-252. Field Effect Transistor Application. Chaang Huang, Melvin Marshal and B. H. White, Sylvania Electric Corp. Re-presented for discussion.

56-251. Power Transistor Switching Circuits. Edwin Slobodzinski and I Chaang Huang, Sylvania Electric Corp. Re-presented for discussion.

55-667. Optimum Design of Common Emitter Transistor Audio Amplifiers. L. M. Vallese, Polytechnic Institute of Brooklyn. Re-presented for discussion.

56-261. Transistor Analogue Computing Amplifiers for Flight Simulators. R. C. Weyrick, Goodyear Aircraft Corp. Re-presented for discussion.

10:00 a.m.—Land Transportation

- CP56-95. Modernization of the Long Island Rail Road Passenger Car Fleet. P. H. Hatch, Long Island Railroad Co.
- CP56-256. The Light Weight Train—Its Power Supply and Auxiliaries. J. L. Swarner, Pullman Standard Car Mfg. Co.
- CP56-96. Outline of Improvements Made in the Design, Maintenance and Operation of the Milwaukee Railroad Electrification. Laurence Wylie, Chicago, Milwaukee, St. Paul and Pacific R. R.
- 55-627. Harmonics from Railroad Rectifiers on Power System Reduced by Filters. S. J. Bozzella, Long Island Lighting Co., J. L. Kennedy, Long Island Railroad Co., M. Mahr, Jr., New York Telephone Co., and H. W. Wahlquist, Ebasco Services, Inc.

10:00 a.m.—Communication Switching Systems

- 56-162. Several-Valued Combinational Switching Circuits. C. Y. Lee, I Bell Telephone Labs., Inc. and W. H. Chen, University of Florida.
- CP.* A Serial Method for Numbering the Slots on a Magnetic Drum. J. J. Yostpille and A. E. Joel, Bell Telephone Labs., Inc.
- CP.* New Telephone Network Switching Facilities. A. E. Batchelet, C. A. Collins and E. R. Taylor, Bell Telephone Labs., Inc.
- CP.* Principles of Operation of the North By-Path Crossbar System. Eric Brooke, North Electric Co.

10:00 a.m.—Corrosion of Line Hardware

- 56-230. Corrosion as it Affects Insulator and Conductor Hardware. III A. W. Bardeen and J. M. Sheadel, The Ohio Brass Co.
- CP56-270. Field Experience with Corrosion of Distribution Material. A. S. Hadfield, Virginia Electric and Power Co.
- CP.* Trends in the Availability, Cost and Use of Longer-Life Materials for Overhead System Construction. L. P. Schmitt, D. B. Hamister and D. H. Fletcher, The Joslyn Co.
- CP.* Corrosion Considerations in the Design of Electrical Distribution Equipment. R. M. Amundson, Line Material Co.
- CP.* Corrosion of Line Hardware. John Eberle, Hubbard Co.

10:00 a.m.—Power Systems for the Steel Industry

- CP.* Distribution Systems Practice in Steel Plants. B. J. Auburn, Auburn and Associates, Inc.
- CP.* Power Generation in the Steel Industry. W. P. Gavit and R. R. Wagstaff, United Engineers and Constructors, Inc.
- 56-66. The Application of Reactance in the Design of Steel Mill Distribution Systems. G. B. Scheer, Kaiser Engineers.
- 56-22. Economic Studies Applied to Industrial Power Systems. II H. B. Backenstoss, Jackson & Moreland.

10:00 a.m.—Ethics in Engineering Practice

- CP.* The Unfinished Business of Engineering Ethics. P. L. Alger. Panel Discussion of Case Problems. Opportunity for audience to express views on problems of ethics in discussion from the floor and through the "opinion meter." Members of Panel: C. T. Chave, M. S. Coover, D. F. Langenwalter, C. F. Savage and E. C. Starr.

10:00 a.m.—Wire Communications and Transmission and Distribution

- 56-237. Coordinated Protection for Open Wire Joint Use—Present Trends. W. R. Bullard, Ebasco Services, Inc. and H. E. Weppler, American Tel. & Tel. Co.
 56-239. Coordinated Protection for Open Wire Joint Use—Minneapolis Tests. A. E. Dietz, Bell Telephone Labs., Inc., E. G. Albrecht, Northwestern Bell Telephone Co., E. W. Christoferson and J. C. Slothower, Northern States Power Co.
 56-238. Coordinated Protection for Open Wire Joint Use—Ontario Tests. H. M. Ellis, R. E. Treen, Hydro-Electric Power Commission of Ontario, J. W. Phelps and C. L. Roach, Bell Telephone Co.

2:00 p.m.—General Session

- "Address." President M. D. Hooven.
 Presentation of the Institute paper prizes.
 Presentation of the Alfred Noble Prize to R. L. Bright.
 "Address." Roger M. Blough, Chairman of the Board of Directors, U. S. Steel Corp.

Tuesday, January 31

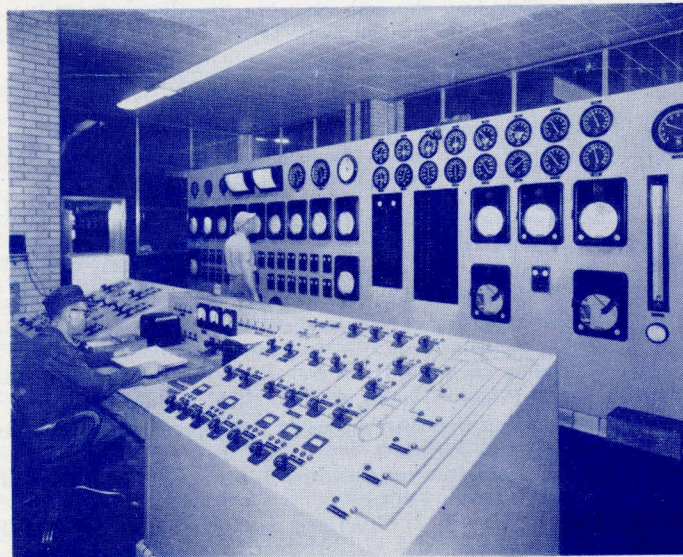
9:30 a.m.—Section Delegates Conference

9:30 a.m.—Substations

- 56-123. Short Circuit Tests on 138 Kv Busses. D. W. Taylor and C. M. Stuehler, Public Service Electric and Gas Co.
 56-7. New Design of Control Installations in Transmission Stations. G. M. Mulhern and D. W. O'Neill, Electricity Supply Board, Ireland.
 CP56-42. Location and Design of Distribution Substations in Residential Areas. J. W. Erven, Los Angeles Dept. of Water and Power; C. S. Fiske, Baltimore Gas and Electric Co.; P. F. Hargreaves, Puget Sound Power & Light Co.; E. M. Hunter, General Electric Co.; P. R. Pierson, Westinghouse Electric Corp.; and O. J. Rotty, Union Electric Co. of Missouri.

9:30 a.m.—Insulated Conductors

- 56-67. The Penetration of Electromagnetic Radiation into Ferromagnetic Material. C. A. Adams, Philadelphia, Penn.



Control Room Unit No. 1, 59th Street Power Plant, N. Y. C. Transit Authority

- 56-68. Oil Flow and Pressure Calculations for Self-Contained Oil-Filled Cable Systems. F. H. Buller, General Electric Co., J. H. Neher, Philadelphia Electric Co., and F. O. Wollaston, British Columbia Electric Co., Ltd.

- 56-69. Charging Current Limitations in Operation of High-Voltage Cable Lines. C. S. Schifreen and W. C. Marble, Philadelphia Electric Co.

9:30 a.m.—330 Kv System

- 56-231. Lightning and Corona Performance of 330 Kv Lines on the American Gas and Electric and Ohio Valley Electric Corporation Systems. W. S. Price, S. C. Bartlett and E. S. Zoble, American Gas & Electric Service Corp.

- 56-232. Line Dropping Tests on a 330 Kv Oil Circuit Breaker. Otto Naef, American Gas & Electric Service Corp. and R. E. Friedrich, Westinghouse Electric Corp.

- 56-233. 330 Kv Power Transformer with Compensation to Provide Accurate Low Voltage Metering Potential. P. S. Pugh, American Gas & Electric Service Corp. and T. G. Gerwing, Westinghouse Electric Corp.

- 56-234. Relay Protection for the Ohio Valley Electric Corporation 330 Kv System. H. C. Barnes, A. Hauspurg and J. H. Kinghorn, American Gas and Electric Service Corp.

- 56-235. Sleet Melting on 330-Kv Lines of American Gas and Electric Co. and Ohio Valley Electric Corp. Systems. C. F. DeSieno, C. A. Imburgia and G. H. McDaniel, American Gas & Electric Service Corp.

9:30 a.m.—Linear Circuit Theory

- CP56-124. Non-Singular Transformation from Primitive to Network Equations. N. B. Saunders, Weston, Mass.

- 56-125. Some Mathematical Properties of Root Loci for Control-System Design. F. M. Reza, Syracuse University. Re-presented for discussion.

- 56-126. Synthesis of Transfer Functions with Poles Restricted to the Negative Real Axis into Two Parallel R-C Ladders and an Ideal Transformer. M. G. Malti, Cornell University and H. H. Sun, Drexel Institute of Technology.

- CP56-127. Design of a Minimum Transmission Loss Tschebycheff Two-Pole Matching Network. J. L. Dautremont and P. H. Rogers, University of Michigan.

- 56-128. Note on the Approximation Problem. Norman Balabanian, Syracuse University. Re-presented for discussion.

9:30 a.m.—Instruments and Measurements

- 56-60. Galvanometer Efficiency as a Design Parameter. F. K. Harris, National Bureau of Standards.

- CP56-100. Advanced Design in a Small Clamp Volt-Ammeter. R. F. Estoppey, Weston Electrical Instrument Corp.

- CP56-101. A Miniaturized Temperature Compensated Meter Rectifier. E. L. Pagano, Bradley Labs., Inc.

- CP56-102. Differential Speed Indicator. A. H. Wolferz, Weston Electrical Instrument Corp.

- 56-265. An Instrument for Measuring Spot Size. R. B. Kuhn and I. D. Levine, Goodyear Aircraft Corp. Re-presented for discussion.

9:30 a.m.—Management

- CP.* Effective Salary Administration. C. J. Beller, Cleveland Electric Illuminating Co.

- CP.* Systems Engineering Administration. J. H. Rubel, Hughes Aircraft Co.

9:30 a.m.—New Electron Tubes

- 56-86. Application of Statistical Techniques to Electron Tubes for Use in a 4,000 Mile Transmission System. W. Van Haste, Bell Telephone Labs., Inc. Re-presented for discussion.

- CP.* Design of a Five-Kilowatt Ceramic Power Tetrode. F. C. Johnstone, Eitel-McCullough, Inc.

- CP.* Microwave Applications of Gaseous Discharges. P. E. Dorney, Roger White Electron Devices, Inc.

- CP.* Developments in the Retarding-Field Oscillator. C. J. Carter and W. H. Cornet, Jr., Ohio State University.

- CP.* Some Characteristics and Uses of Traveling Wave Tubes. R. E. White, Roger White Electron Devices, Inc.

9:30 a.m.—Land Transportation

- CP.* Modernization of Electrical Equipment on Diesel Electric Locomotives. W. A. Kirsch, Westinghouse Electric Corp.

- CP.* Modernization of Electrical Equipment on Alco Diesel-Electric Locomotives. J. F. Russell, Alco Products, Inc.

- CP.* Modernization During Factory Rebuilding of Diesel-Electric and Electric Locomotives. K. O. Anderson, General Electric Co.

9:30 a.m.—Telegraph Systems

- CP.* Tests of Intercity Transmission of Teletypewriter Signals at 600 Words Per Minute. H. A. Rhodes, American Tel. & Tel. Co.

- CP.* Interconnection of Overseas and Domestic Teletypewriter Exchange Services. D. S. Rau, RCA Communications, Inc.

- 56-28. Simplified Printing Telegraph Switching and Integrated Data Processing. J. B. Booth and R. H. Klich, Teletype Corp.

- CP.* Transistor-Type Printing Telegraph Transmitter-Distributor. H. C. Isaacs, Western Union Telegraph Co.

9:30 a.m.—Industrial Power Systems

- CP56-129. Low-Voltage Switching and Protective Device Characteristics. H. W. Huening, Jr., General Electric Co.

- CP.* Electric Power Distribution in New York's Mammoth Coliseum Building. H. D. Kurt and L. E. Fisher, General Electric Corp.

- CP56-277. Selection of Utilization Voltages for Large Commercial Buildings with Primary Service. D. L. Johnson and D. Beeman, General Electric Co.

- CP56-130. Molded Case Circuit Breakers and Their Application in Commercial Buildings. N. J. Schwartz, Heinemann Electric Co. and J. B. Clapp, General Cable Corp.

- CP56-250. Fault Protection in Large Buildings Supplied by 265/460V Network. William Deans, I-T-E Circuit Breaker Co., J. DeLellis and A. J. Bisson, Consolidated Edison Co. of New York, Inc.

- CP.* Emergency Service for Commercial Buildings. E. P. Peabody, General Electric Co.

9:30 a.m.—System Engineering and Computers

- 56-163. Loss Evaluation—IV. Economic Dispatch Computers Principles and Application. E. L. Harder, Westinghouse Electric Corp. and W. H. Osterle, West Penn Power Co.

- 56-57. Loss Evaluation—V. Economic Dispatch Computer—Design. R. B. Squires, R. T. Bverly, Westinghouse Electric Corp., H. W. Colborn and W. R. Hamilton, West Penn Power Co.

- 56-164. Digital Computer Solution of Power Flow Problems. J. B. Ward and H. W. Hale, Purdue University.

- 56-18. The Use of Analogue Computers in Power System Studies. J. E. Van Ness, Northwestern University and W. C. Peterson, Michigan State University.

1:45 p.m.—Edison Medal Presentation to L. A. Umansky

- Establishment of the Edison Medal. E. P. Yerkes, Chairman, Edison Medal Committee.

- Career of the Medalist. F. M. Roberts, Manager, Systems Application Engineering Section, General Electric Co.

- Presentation of Medal and Certificate, President M. D. Hooven.

- Response of the Medalist. L. A. Umansky.

2:30 p.m.—Section Representatives—Public Relations Forum

2:30 p.m.—Insulated Conductors

- 56-70. Experimental 138 Kv Cable and Accessories. Herman Halperin, Commonwealth Edison Co.

- 56-48. Guide to Joint Design for Rubber, Varnished Cambric and "Solid" Type Paper Insulated Cable. J. E. Johnson, Philadelphia Electric Co.

- 56-71. Application of Polyethylene-Insulated High Voltage Power Cable in Chemical Plants. S. J. Rosch, Anaconda Wire & Cable Co.

- 56-8. Current Rating of Aluminum Multiplex Cable. L. F. Roehmann, Kaiser Aluminum & Chemical Corp.

2:30 p.m.—Relays

- 56-13. A Survey of Relay Test Methods. Project Committees on Relay Test Methods.

- 56-165. Relay Protection of Motors in Steam Power Stations with 4 KV Grounded Neutral Systems. W. F. Neff, Ohio Valley Electric Corp., S. H. Horowitz, American Gas and Electric Service Corp. and R. B. Squires, Westinghouse Electric Corp.

- CP56-280. New Thermal Overload with Instantaneous Magnetic Trip on Faults. W. L. Smith and C. A. Lister, Electric Controller and Mfg. Co.

- CP.* Application of Low Voltage Switchgear for Motor Control. E. W. Davis, E. I. duPont de Nemours and Co., Inc.

2:30 p.m.—General Basic Sciences

- 56-131. Electrical Formulas in Inch Units of Length. J. W. Williams, Cleveland, Ohio.

- 56-132. Properties of a D.C. Arc in a Magnetic Field. L. P. Winsor, Rensselaer Polytechnic Institute and T. H. Lee, General Electric Co.

- 56-133. Magnetic Effects of Compressional Stress at Low Field Intensities. R. E. Fischall, Naval Ordnance Laboratory.

- CP.* Economics of Multimillion Watt-Second Energy Storage. H. C. Early, University of Michigan.

- 56-49. Analogue Computer Synthesis and Error Matrices. P. M. Honnell, Washington University and R. E. Horn, Westinghouse Electric Corp.

2:30 p.m.—Instruments and Measurements

- 56-25. An A-C Kelvin Bridge for the Audio Frequency Range. B. L. Dunfee, National Bureau of Standards.

- CP56-103. Wattmeter, Voltmeter, and Ammeter Bridge Circuit. N. Vrana, Cornell University.

- 56-26. The Use of an A-C Bridge to Measure Core Loss at High Inductions. I. L. Cooter and W. P. Harris, National Bureau of Standards.

- 56-104. Measuring 1,800,000 Kw Demand. J. A. Morris and H. C. Thomas, General Electric Co.

- CP56-287. A Voltage-Dip Amplifier. H. R. Lenz, Philadelphia Electric Co.

2:30 p.m.—Safety

- 56-72. Electrostatic Explosion Controls in Hospital Operating Rooms. Robin eBach, Robin eBach Engineers Associated. Re-presented for discussion.

- 56-6. Effect of Capacitor Discharges on the Heart. W. B. Kouwenhoven, The Johns Hopkins University.

- CP56-278. Emergency Power for Hospitals. N. L. Griffin, U. S. Department of Health, Education and Welfare.

- CP.* Emergency and Exit Lighting in Theatres. S. R. Todd, City of Chicago.

- CP56-279. Throwover Equipment and Unit Equipment for Emergency Lighting. Carl Ippolito, Dual-Lite Co., Inc.

2:30 p.m.—Land Transportation

- CP56-105. An Air-Cleaning Blower for Ventilating Traction Equipment. J. J. Gallagher, General Electric Co.

- CP56-286. A High Voltage D.C. Insulation Tester and Its Application to Railway Electrical Equipment. J. K. Hewson, Hewson Co., Inc. and D. E. Stafford, National Electric Coil Co.

- CP.* D. C. High Voltage Testing and Maintenance of D. C. Traction Motors. P. G. Lessman and W. Schneider, Westinghouse Electric Corp.

2:30 p.m.—Telegraph Systems

- 56-106. Static Elimination on Bell System Teletypewriters. H. Bayley, Massachusetts Dept. of Labor and Industries, D. B. Perry, American Tel. & Tel. Co. and B. S. Swezey, Bell Telephone Labs., Inc.

- 56-107. Delay Distortion Correction. W. D. Cannon, Western Union Telegraph Co.

- 56-108. A Flat-Bed Facsimile Telegraph Transmitter. W. D. Buckingham, Western Union Telegraph Co.

- CP.* Effect of Multipath Transmission on Facsimile Signals. P. R. Marzan, Times Facsimile Corp.

2:30 p.m.—Electric Welding

- CP56-109. Influence of Atmospheric Water Vapor on High Current D-C Arcs. R. H. Benner II, Erlton, New Jersey and T. B. Jones, The Johns Hopkins University.

- 56-110. Cathode Instability in Argon Atmospheres. H. C. Ludwig, II Westinghouse Electric Corp.
- 56-111. Let-Go Currents and Voltages. C. F. Dalziel, University of California and F. P. Massoglia, San Francisco Naval Shipyard.
- 56-112. Inert Gas-Shielded Welding Arc Behavior and Metal Transfer Characteristics. G. M. Skinner and D. M. Yenni, Linde Air Products Co.

2:30 p.m.—System Engineering and Power Generation

- 56-19. Evaluation of Unit Capacity Additions. M. J. Steinberg and V. N. Cook, Consolidated Edison Co. of N. Y., Inc.
- CP.* A New Automatic Dispatching System for Electric Power Systems. B. R. Shepard, D. W. Halfhill and K. N. Burnett, General Electric Co.
- CP56-166. Stability Considerations in Reactive Support Programs. D. W. Spence, D. D. Nadkarni and J. E. Ziegler, Syracuse University.

2:30 p.m.—Electrostatic Processes

- CP.* Measurements of Charge Imparted to Fine Particles by a Corona Discharge. G. W. Penney and R. D. Lynch, Carnegie Institute of Technology.
- CP.* The Charging of Small Particles for Electrostatic Precipitation. G. W. Hewitt Westinghouse Electric Corp.
- 56-113. A New Technique for the Measurement of Corona Field Strength and Current-Density in Electrical Precipitation. P. Cooperman, Research-Cottrell, Inc.
- CP.* Proposed Industry Standard for Electrostatic Precipitation Power Supply Equipment. J. W. Farr, General Electric Co. and G. R. Monroe, Westinghouse Electric Corp.
- 56-114. Practical Applications of Electrostatic Phenomena to Particulate Matter. O. C. Ralston, Bureau of Mines.
- CP56-116. A New Scrapless Lamination for Transformers. H. L. Garbarino, American Research Foundation.

2:00 p.m.—New Electron Tubes

- CP.* Electrical Loss Problems Encountered in UHF Ceramic Tube Development. R. L. Bailey, General Electric Co.
- CP.* Hot Cathode Design for Gas Tubes. S. Goldberg and K. J. Gerneshausen, Edgerton, Gerneshausen and Grier, Inc.
- CP.* A New Subminiature Thyatron for Airborne Applications. H. J. Prager, Radio Corp. of America.
- CP.* A New Micro-Miniature Ceramic Triode. J. M. Connelly, General Electric Co.

Wednesday, February 1

9:30 a.m.—Rotating Machinery Insulation

- 56-45. Experience and Development in Non-Destructive D-C Testing for Maintenance of High-Voltage Stators. A. W. W. Cameron and A. M. Sinclair, The Hydro-Electric Power Commission of Ontario.
- 56-51. Testing of Main Turbine Generator Insulation. J. E. Mulvey, The Detroit Edison Co.
- CP.* Compatibility in Motor Insulation Systems. H. R. Sheppard and G. L. Mullen.
- CP.* Evaluation of Modified Silicone Insulation Systems and Motors. H. R. Sheppard and G. L. Mullen.
- 56-177. A Statistical Method for Predicting Insulation Life from Experimental Data. W. H. Horton, Westinghouse Electric Corp. Re-presented for discussion.

9:30 a.m.—Transmission and Distribution

- 56-3. Operating Experience with 14.4/24.9 Kv as a Rural Distribution Voltage. W. M. Edmunds and L. B. Crann, Rural Electrification Admin. Re-presented for discussion.
- 56-167. 4 Kv vs 13.8 Kv Distribution on the Boston Edison Company System. L. J. Weed, Boston Edison Co.
- 56-168. Overhead Distribution at 14.6 Kv and 12.47 Kv in Urban Areas. J. R. Oberholtzer and F. E. Sanford, Commonwealth Associates, Inc.
- 56-169. Improve Existing 4 Kv Expand at 12 Kv. G. A. Davis, Southern Calif. Edison Co.
- CP.* General Purpose Overhead Distribution Above 5 Kv. W. R. Bullard, Ebasco Services, Inc.

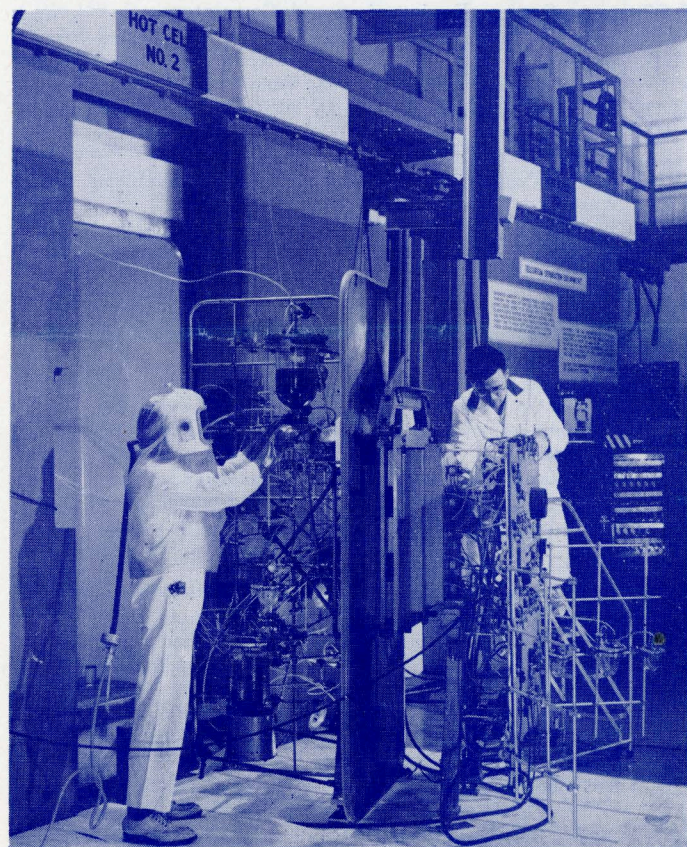
- CP56-170. Higher Voltage Primary Distribution. A. J. Pansini, Long Island Lighting Co.
- 55-171. Is Conversion to Higher Distribution Voltage Justified? H. G. Dallas and J. W. Gallagher, Philadelphia Electric Co.
- 56-172. Use of Distribution Voltages Above 4 Kv. E. V. Sayles, Consumers Power Co.

9:30 a.m.—Power Generation

- 56-136. The Operations Recorder—A High Speed Printing Annunciator. J. R. Leslie and G. M. Keyser, The Hydro-Electric Power Commission of Ontario.
- CP56-137. Operation of Large Synchronous Generators in the Dynamic Stability Region with a Modern Amplidyne Voltage Regulator—Part I—Recommendations for Setting the Under-excited Reactive Ampere Limit. R. A. Phillips and A. S. Rubenstein, General Electric Co.
- CP56-138. Operation of Large Synchronous Generators in the Dynamic Stability Region with a Modern Amplidyne Voltage Regulator—Part II—Operating Tests and Analytical Studies. K. R. McClymont, P. L. Dandeno, The Hydro-Electric Power Commission of Ontario, R. A. Phillips and A. S. Rubenstein, General Electric Co.
- CP.* Fire Protection for Generating Stations. Working Group on Fire Protection in Generating Stations.

9:30 a.m.—Gaseous Dielectrics

- CP.* On the Electric Breakdown of Electronegative Gases. R. W. Crowe and J. C. Devins, General Electric Co.
- CP56-291. Electrical Breakdown of Gases and Vapors of Chloro-fluoro-hydrocarbons. C. N. Works and W. E. Lindsay, Westinghouse Electric Corp.
- CP.* The Effect of Solid Insulation and Contaminants on Gaseous Insulation in Insulation Structures. G. Camilli and T. W. Liao, General Electric Co.
- 56-115. Calculations of Corona Starting Voltage in Air-Solid Dielectric Systems. M. C. Halleck, General Electric Co.
- 56-258. Considerations in Specifying Corona Tests. C. W. Ross and E. B. Curdts, J. G. Biddle Co.



"Hot Cell" Apparatus, Brookhaven Laboratory

9:30 a.m.—The Management of Cooperative Engineering Education Program

- CP.* Cooperative Education in the United States. H. H. Armsby, U. S. Office of Education.
- CP56-284. Philosophy and Operation of an Undergraduate Cooperative Program of Engineering Education. J. A. M. Lyon and C. E. Watson, Northwestern University.
- CP.* The Role of Elective Cooperative Programs in Modern Engineering Education. S. B. Wiltse, Rensselaer Polytechnic Institute, E. M. Strong, Cornell University and E. W. Boehne, Massachusetts Institute of Technology.
- CP.* An Industry View of Cooperative Engineering Education. H. G. Hutton, General Electric Co.

9:30 a.m.—Magnetic Computer Circuits—Analogue and Digital

- 56-134. Transcendental Function Analogue Computation with Magnetic Cores. D. H. Schaefer and R. L. Van Allen, U. S. Naval Research Lab.
- CP56-135. Special Purpose Magnetic Core Circuits. R. D. Kodis, Raytheon Mfg. Co.
- CP.* Megacycle Magnetic Amplifiers. T. H. Bonn, R. D. Torrey and J. P. Eckert, Eckert-Mauchly Computer Corp.
- CP.* Power Gain of High Frequency Series Pulse Magnetic Amplifiers. R. D. Torrey and R. W. Spencer, Eckert-Mauchly Computer Corp.
- CP.* Logical Circuits with Pulse Magnetic Amplifiers. B. K. Smith and W. H. Steagall,

9:30 a.m.—Domestic and Commercial Applications

- CP.* Serving the All-Electric Home. W. R. New, Tennessee Valley Authority.
- CP56-236. Heat as a Means of Air Purification. J. C. Beckett, Wesix Electric Heater Co. and C. E. Clifton, Stanford University.
- CP.* Effect of Air Conditioning Loads on System Power Factor. W. M. Penney, Union Electric Co. of Missouri.
- CP56-253. Trends in Electric Space Heating Controls. J. C. Beckett, Wesix Electric Heater Co.
- CP.* Panel Discussion—Electric Space Heating. J. E. Goff, Ceilheat, Inc., R. L. Boyd, Jr., Commercial Controls Corp. and C. F. Kreiser, Edwin L. Wiegand Co.

9:30 a.m.—Communication Theory

- 56-73. A First Look at Random Noise. S. O. Rice, Bell Telephone Labs., Inc.
- CP.* Photographic Simulation of One Type of Bandwidth Reduction of Television Signals. W. C. Morrison, K. Karstad and J. W. Tuska, RCA Labs.
- 56-74. Principles of Noise Reduction in Communication Channels. I. L. S. Schwartz, New York University.

9:30 a.m.—Industrial Power Rectifiers

- 56-44. Rectifier Power Supply for a Modern Rod Mill. R. A. Buchanan and W. R. Hodgson, Westinghouse Electric Corp.
- 56-173. Sealed Ignitron Principles Extended to Large Tubes. J. L. Boyer and A. P. Colaiaco, Westinghouse Electric Corp.
- CP.* Application of Power Rectifiers to Regenerative Drives. A. A. Schmidt, Jr. and M. M. Morack, General Electric Co.
- CP56-174. Service Life of Pumpless Ignitrons. E. J. Remscheid, General Electric Co.

9:30 a.m.—Radio Communications

- CP.* Time Division Multiplex/ARQ. A. Kahn and A. Liguori, RCA Labs.
- CP.* Design and Application of Ruggedized Traveling Wave Tubes. A. G. Peiffer and W. N. Weber, Federal Telephone & Radio Co.
- CP.* Radial Transmission Line Cavities—Non-symmetrical Modes. H. Havstad, Federal Telephone & Radio Co.
- 56-32. Standing-Wave-Ratio of Inaccessible Load. C. Polk, University of Pennsylvania.
- 56-257. Design of Electronic Equipment for Radio Interference Reduction. A. L. Albin and H. M. Sachs, Armour Research Foundation. Re-presented for discussion.

9:30 a.m.—Light Amplifiers, Fluorescent Light, Radio Interference and TV Studio Lighting

- CP.* Light Amplifying Phosphors. F. E. Williams, General Electric Research Labs.
- 56-75. Evaluation of Radio Influence Voltages in Fluorescent Lighting Installations. F. H. Wright and S. A. Zimmermann, General Electric Co.
- 56-76. Conversion of Studio Lighting from Black and White to Color TV. P. W. Wygant, TV Station WBAP-TV.
- CP.* Reduction of TV Studio Temperatures Using Heat Control Coatings. G. T. Howard, General Electric Co. and A. F. Turner, Bausch and Lomb Optical Co.

9:30 a.m.—Electrothermal Processes

- CP.* Transformers for Electric Furnaces. E. F. Christensen and G. Kardsaen, Jr., General Electric Co.
- CP.* Electric Arc Furnace Controls. C. W. Vokac, Whiting Corp.
- CP56-249. The Synchronous Condenser for Arc Furnace Loads. S. E. McDowell, Allis-Chalmers Mfg. Co.
- CP.* Problems Associated with Arc Furnace Melting of Copper. F. D. Shaw, American Smelting & Refining Co.

2:00 p.m.—Synchronous Machines and Insulation

- 56-12. On Some Poly-Field A.C. Amplifiers. E. Mishkin, Polytechnic Institute of Brooklyn.
- 56-175. The Theory of Anisotropic Field Structures in Synchronous Machines. J. F. H. Douglas, Marquette University.
- 56-5. Physical Effects of Thermal Cycling on Stator Coil Insulation of Turbine Generators. J. S. Johnson and J. C. Botts, Westinghouse Electric Corp. Re-presented for discussion.
- 56-176. Corrections for Dielectric Absorption in High Voltage D-C Insulation Tests. F. R. Schleif, U. S. Bureau of Reclamation.

2:00 p.m.—Transmission and Distribution

- 56-178. Residential Distribution—An Analysis of Systems to Serve Expanding Loads. S. B. Griscom and R. F. Lawrence, Westinghouse Electric Corp.
- 56-179. Economic Comparison of Secondary Voltages, Single- and Three-Phase Distribution for Residential Areas. R. A. Zimmerman and H. E. Lokay, Westinghouse Electric Corp.
- 56-180. The Primary Service Unit System for Residential Distribution. III A. M. Lockie and H. B. Thacker, Westinghouse Electric Corp.
- 56-181. Unbalanced Open-Wye Open-Delta Transformer Banks. J. C. Neupauer, Westinghouse Electric Corp.
- 56-182. Calculating and Factors Affecting Customer Minutes Outage in Radial Feeders. R. A. Hamilton, General Electric Co.

2:00 p.m.—Power Generation

- CP56-144. Generator Field Tests in a One-Unit Hydro Plant. H. O. Britt, U. S. Bureau of Reclamation.
- 56-145. Pump/Turbine Unit 2 Addition at TVA Hiwassee Hydro Plant. L. R. Sellers and J. E. Kirkland, Jr., Tennessee Valley Authority.
- CP56-275. Alignment Tolerances for Vertical Hydroelectric Generators. J. J. Hart, Westinghouse Electric Corp. and J. Fisch, S. Morgan Smith Co.
- 56-146. Economic Comparison of Steam Turbine vs. Motor Driven Boiler Feed Pumps. A. G. Mellor, R. C. Muir, J. F. O'Mara and J. F. Ransom, General Electric Co.

2:00 p.m.—Liquid Dielectrics

- CP.* The Effect of Electrode Configuration on the Electric Strength of Hexane. A. H. Sharbaugh, E. B. Cox, R. W. Crowe and P. L. Auer, General Electric Research Lab.
- 56-139. Area Effect and Its Extremal Basis for the Electric Breakdown of Transformer Oil. K. H. Weber and H. S. Endicott, General Electric Co.
- CP.* The Effect of Hydrostatic Pressure and Applied Voltage Duration on the Breakdown Strength of Insulating Oil. P. K. Watson, National Research Council of Canada.
- CP56-140. Phenomena Accompanying Transient Low-Voltage Discharges in Liquid Dielectrics—II. Cathode Phenomena at Low Currents. E. M. Williams and R. E. Smith, Carnegie Institute of Technology.
- CP56-141. A New Technology of Insulating Oils of Petroleum Origin. F. C. Doble, Doble Engineering Co.

2:00 p.m.—Research

- CP.* Research by the Electric Power Industry in Sweden. Ivar Herlitz, Allmänna Svenska Elektriska Artiebolaget and Gunnar Jancke, Swedish State Power Board.
- CP56-267. Research by the Central Electricity Authority. J. S. Forrest, Central Electricity Research Labs.
- CP.* Research in the Italian Electrical Industry. Edilio Pautrie, Societa Edison.
- CP56-282. Research for the Electric Power Industry in Japan. K. Masui, Central Research Institute of Electric Power Industry.

2:00 p.m.—New Curricula in Engineering Education

- CP.* A New Educational Program in Energy Conversion. A. Kusko and D. C. White, Massachusetts Institute of Technology.
- CP.* Course Content and Modern Aims in Electrical Engineering Education. L. A. Finzi and E. R. Schatz, Carnegie Institute of Technology.
- CP56-290 The Engineering Science Curriculum at The Pennsylvania State University. E. A. Walker and W. E. Wilson, The Pennsylvania State University.
- CP56-281. Science Engineering at the University of Michigan. H. W. Welsh, Jr., University of Michigan.

2:00 p.m.—Digital Computer—Circuits and Input-Output

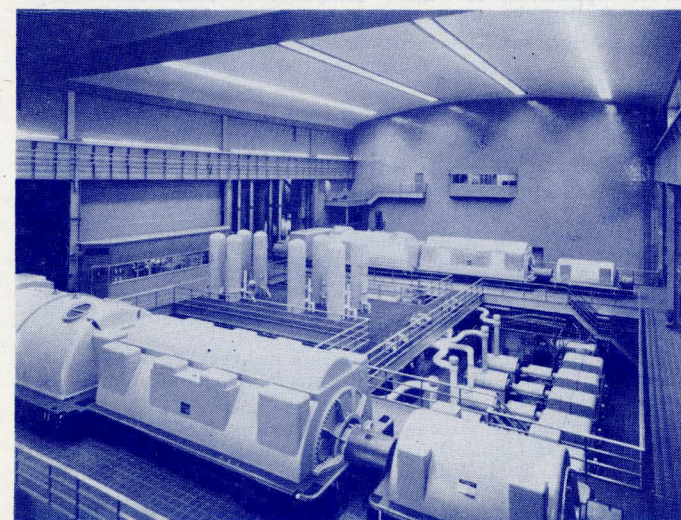
- CP.* Materials for High Frequency Magnetic Amplifiers. T. H. Bonn, C. M. Lipkin and Fred Bernstein, Eckert-Mauchly Computer Corp.
- 56-142. Shifting Counters. C. Eldert, H. J. Gray, Jr., H. M. Gurk and I. M. Rubinoff, University of Pennsylvania.
- CP.* A Paper Tape Leader Using Germanium Photo Diodes and Transistor Amplifiers. A. E. Slade and R. D. Potts.
- 56-21. Cyclic Decimal Codes for Analog to Digital Converters. J. A. O'Brien, Radio Corporation of America.
- 56-143. A New Five-Digit Plugboard System for Card-Programmed Calculator. S. B. Williams and N. M. Noonan, General Electric Co.

2:00 p.m.—Marine Transportation

- 56-183. Aluminum for Marine Switchgear. H. F. Harvey, Jr. and E. J. Dawson, Newport News Shipbuilding and Dry Dock Co.
- 56-184. Shipboard Use of 400 Cycle Electric Power. J. M. Apple and II E. W. Lusby, Navy Dept.
- CP.* Complete Ship Wiring with Mineral Insulated Cable. L. M. Goldsmith, The Atlantic Refining Co.

2:00 p.m.—Radio Communications

- CP.* An Explanation of Microwave Fading and Its Correction by Frequency Diversity. Henry Magnuski, Motorola, Inc.
- CP.* A Low Cost Microwave Radio Communications System. C. N. Gillespie and D. W. Smith, Raytheon Mfg. Co.
- CP.* New Low Cost 960 Mc. Multiplex Systems. William Fingerle, Budelman Radio Corp.



Kearny Generating Station, Public Service Electric & Gas Company

- CP.* Microwave for the Telephone Industry. W. C. Fisher, Lenkurt Electric Co., Inc.
- 56-16. A Seventy-Two Channel Radio System for Toll Telephone Service. M. C. Harp and M. H. Kebby, Lenkurt Electric Co., Inc. Re-presented for discussion.

2:00 p.m.—Industrial Power Rectifiers

- 56-185. A New High Power Cathode Circuit Breaker. L. D. McConnell, Canadian Westinghouse Co., Ltd. and J. D. Findley, Westinghouse Electric Corp.
- 56-186. Tests and Operating Experience with the Triple-Diameter Rectifier. R. V. Wachter, Aluminum Co. of America. C. S. Hague and C. R. Marcum, Westinghouse Electric Corp.
- 56-187. Methods of Measuring Arc-Drop Voltage on Mercury-Arc Rectifiers. H. Winograd, Allis-Chalmers Mfg. Co. and W. E. Lawton, Aluminum Co. of America. Re-presented for discussion.
- 56-188. Harmonic Analysis by Direct Area Measurement. I. K. Dortort, I-T-E Circuit Breaker Co.
- CP56-189. A New Method for Reducing Arc-Back Currents in Rectifiers. A. Schmidt, Jr., General Electric Co. and L. J. Harris, Aluminum Co. of America.

2:00 p.m.—Research and Chemical Industry

- Part I—Research on Unconventional Energy Sources
- CP.* Galvanic Fuel Cells. Friedrich Kornfeil, Signal Corps Labs.
- CP.* Nuclear Batteries. William Shorr, Signal Corps Labs.
- Part II—Panel Discussion of Cathodic Protection Energy Sources
- CP.* Rectifiers with Impressed Current Anodes. R. M. Wainwright, University of Illinois, J. P. Oliver, National Carbon Co., and W. A. Luce, Duriron Co.
- CP.* Sacrificial Anodes. Bert Douglas, Dow Chemical Co. and H. W. Wahlquist, Ebasco Services, Ince.

Thursday, February 2

9:30 a.m.—Synchronous Machines

- 56-199. Third Harmonic Voltage Generation in Salient Pole Synchronous Machines. G. Angst and J. L. Oldenkamp, General Electric Co.
- 56-50. Harmonics of the Salient-Pole Synchronous Machine and Their Effects—Part I—MMF Harmonics Produced by the Armature and Damper Winding. M. Liwshitz-Garik, Polytechnic Institute of Brooklyn.
- 56-1. Hunting of a Salient-Pole Synchronous Machine During Starting. C. Concordia, General Electric Co.
- 56-56. A New Approach to the Calculation of Synchronous Machine Reactances—Part II. M. E. Talaat, Elliott Co.
- 56-259. Calculation of Fault Currents for Internal Faults in Motors. R. A. Schmidt, General Electric Co.

9:30 a.m.—Transmission and Distribution

- 56-2. Planning Kilovars and Capacitors for the Southern California Edison System. J. H. Drake and G. A. Davis, Southern California Edison Co.
- 55-711. D-C Circuit Gives Easy Method of Determining Value of Capacitors in Reducing I²R Losses. R. A. Schmidt, General Electric Co. Re-presented for discussion.
- 56-63. Pennsylvania Electric Company's Capacitor Program. I. L. Phillips and F. M. Reed, General Public Utilities System.
- 56-193. Some Considerations in the Protection of High-Voltage Capacitor Banks. N. R. Sheppard and N. R. Schultz, General Electric Co.
- 56-194. The Natural Frequency of Parallel Capacitor Banks. W. H. Cuttino and Miles Maxwell, Westinghouse Electric Corp.
- 56-17. Bibliography on Power Capacitors—1952-1954. AIEE Working Group of the Capacitor Subcommittee.

9:30 a.m.—Switchgear

- 56-33. High Voltage Power System Fault Current Asymmetry. M. J. Lantz, Bonneville Power Administration.
- 56-34. Calculation of Electric Power System Short Circuits During the First Few Cycles. Report of Working Group on Circuit Breaker Application.

- 56-27. Calculated Symmetrical and Asymmetrical Short Circuit Current Decrement Rates on Typical Power Systems. Report of Working Group on Circuit Breaker Application.

9:30 a.m.—Research and Education

- Note: Special Publication S82 will be 80¢ per copy.
- S-82. Needs and Supply of Engineers for Electric Utilities. Frank Sanford, Commonwealth Services, Inc.
- S-82. Magawatts vs. Microwatts. C. R. Joy and C. C. Boone, Ebasco Services, Inc.
- CP.* Engineers in Our Company. Murray Joslin, Commonwealth Edison Co.
- S-82. The Personal Problem of the Public Utilities in the Colleges. J. D. Ryder, Michigan State University.
- S-82. The Electric Utility and the Student Engineer. J. S. Johnson, Purdue University.

9:30 a.m.—Analog Computer Applications and Developments

- 56-20. A Modern D-C Network Analyzer. C. H. Hoffman, Public Service Electric & Gas Co. and M. Lebenbaum, Airborne Instrument Lab., Inc.
- 56-147. Linear Programming on an Electronic Analog Computer. I. B. Pyne, Princeton University.
- 56-148. Use of GEDA Analog Computer in Generating Various Probability Distributions for Operations Research and "Monte Carlo" Applicators. N. D. Diamantides, Goodyear Aircraft Corp.
- CP56-149. Electronic Analog Solution of Free Surface Problems. W. J. Karplus, Los Angeles, Calif.

9:30 a.m.—Metallic Rectifiers

- 56-77. High-Temperature Selenium Rectifiers—A Survey of Manufacturers Data. T. S. Shilliday, Battelle Memorial Institute.
- 56-78. Germanium Rectifiers for Industrial Applications. L. W. Burton, General Electric Co.
- CP.* Performance Analysis of Selenium Rectifiers at High Temperature. N. F. Bechtold and E. W. Morris, Signal Corps Engineering Labs.
- CP.* On the Dynamic Characteristics of Rectifiers. Bruce Seddon, General Electric Co.
- CP56-285. The Rectaloy Rectifier—An Improved Copper Oxide Device. C. L. Meyer, K. E. Hassler and T. S. Shilliday, Battelle Memorial Institute.

9:30 a.m.—World Television and Color TV

- CP.* TV in World Today. C. J. Hirsch, Hazeltine Labs.
- CP56-271. Color Television System Performance Requirements. R. C. Kennedy, National Broadcasting Co., Inc.
- CP.* The Vitascan Live Flying-Spot Color Scanner. J. H. Haines and G. R. Tingley, Allen B. DuMont Labs., Inc.

9:30 a.m.—Feedback Control

- 56-195. Two Types of Zero-Velocity-Error Servomechanisms. E. Levinson, Sperry Gyroscope Co.
- 56-196. Block Diagram Transformations for Systems with One Non-linear Element. T. M. Stout, Schlumberger Instrument Co.
- 56-197. Analysis and Performance of a Valve-Controlled Hydraulic Servomechanism. D. V. Stallard, Massachusetts Institute of Technology.
- 56-198. The Analog Computer Study of an Application of a Phase-Space Type Predictor Control System to the Control of an Airframe. A. M. Hopkin and Morimi Iwama, University of California.

9:30 a.m.—Transformers

- 56-262. The Poly-Unit Saturable Reactor. K. I. Selin, The Royal Institute of Technology.
- 56-263. Experimental Characteristics of the Three-Phase Poly-Unit Saturable Reactor. K. I. Selin, The Royal Institute of Technology and A. Kusko, Massachusetts Institute of Technology.
- 56-264. A New Apparatus Bushing with Improved Voltage Distribution. L. W. Spooner and J. E. Bergain, General Electric Co.
- CP56-88. Design of the Resistively Loaded Static Frequency Doubler. P. P. Biringer, University of Toronto.
- CP.* Proposed Guide for Maintenance of Insulating Oils. Insulating Fluids Subcommittee.

9:30 a.m.—Coordinating Committee No. 4

- CP56-247. Problems of AIEE Standards Coordinating Committee No. 4 in Revising AIEE Standard No. 1. A Progress Report of Coordinating Committee No. 4
- 56-248. Guiding Principles in the Thermal Evaluation of Electrical Insulation. L. J. Berberich and T. W. Dakin, Westinghouse Electric Corp.
- CP.* Evaluation of Thermal Life of Systems. G. L. Moses, Westinghouse Electric Corp.
- CP.* Evaluation of Thermal Life of Materials. J. F. Dexter, Dow-Corning Corp.

9:30 a.m.—Symposium—Preventive Maintenance of Large Rectifier-Substations in Electrolytic Plants

2:00 p.m.—Synchronous Machines

- 56-190. The Design and Performance of Modern Large Turbine Generators. B. M. Cain and Dean Harrington, General Electric Co.
- 56-53. Gap-Pickup Conductor Cooling of Turbine-Generator Fields; Ventilation Arrangements and Analysis of Performance. D. M. Willyoung, General Electric Co.
- 56-191. Liquid Cooling of Turbine Generator Armature Windings. C. E. Kilbourne and C. H. Holley, General Electric Co.
- 56-192. Operation of Large Steam Turbine-Generators. J. H. Carter and R. E. Gorman, General Electric Co. Re-presented for discussion.
- 56-193. Operation and Maintenance of Hydrogen Systems for Turbine-Generators. S. C. Barton and W. H. M. Olson, General Electric Co. Re-presented for discussion.

2:00 p.m.—Transmission and Distribution

- 56-200. Potential of a Transmission Line Tower Top When Struck by Lightning. E. F. Koncek, Commonwealth Edison Co.
- 56-201. Anomalous Flashovers on Transmission Lines. C. J. Miller, III, The Ohio Brass Co.
- 56-202. Switching Surges and Arrester Performance on High Voltage Stations. L. O. Barthold, I. B. Johnson and A. J. Schultz, General Electric Co.
- 56-203. Impulse Flashover of Combinations of Line Insulators, Air Gaps and Wood Structural Members. AIEE Lightning and Insulator Subcommittee.
- CP.* Reduced Insulation in Power Systems. The Problem it Presents. P. L. Bellaschi, Portland, Oregon.

2:00 p.m.—Digital Computer in Transformer Design

- 56-79. Application of a Digital Computer to the Design of Power Transformers to Specification. C. L. Moore, W. T. Duboc and P. A. Zaphyr, Westinghouse Electric Corp.
- CP.* Digital Computers as an Aid in Transformer Design. G. L. Tauscher, Allis-Chalmers Mfg. Co.
- 56-59. Transformer Reactance Calculations with Digital Computers. III L. Rabins, General Electric Co.
- 56-80. Application of Digital Computers to Transformer Design. I S. B. Williams, P. A. Abetti and E. F. Magnusson, General Electric Co.
- CP.* Digital Computer Design of Repetitive Manufacture Power Transformers. J. C. Dutton and E. F. Magnusson, General Electric Co.

2:00 p.m.—Symposium on Field Breakers

- 56-52. Introduction of Hydraulic Operation to Low Voltage Air Circuit Breakers. H. L. Peek and M. G. Dyer, Allis-Chalmers Mfg. Co.
- CP.* Application of Field Discharge Circuit Breakers to Electrical Machines. M. Temoshok and B. S. Beall III, General Electric Co.
- CP56-289. Application of Main-Field Breakers to Synchronous Machines. R. F. Karlicek, Westinghouse Electric Corp.
- CP.* Application of Air Circuit Breakers to Excitation Systems of Salient Pole Synchronous Machines. C. L. Killgore and H. O. Britt, U. S. Bureau of Reclamation.

2:00 p.m.—Solid Dielectrics

- 56-150. The Surface Failure of Dielectrics. L. J. Frisco and J. J. Chapman, The Johns Hopkins University.
- 56-151. Tracking Resistance Test Methods. M. W. Albright and W. T. Starr, General Electric Co. Re-presented for discussion.

Friday, February 3

- CP.* Dielectric Effects Produced by Solidifying Certain Organic Compounds in Electric or Magnetic Fields. W. McMahon, Bell Telephone Labs., Inc.
- CP.* Recent Developments in Polyethylene Insulating Materials. J. A. Snyder and R. J. Lurie, Bakelite Co.
- CP.* The Dielectric Properties of Polyethylene. D. W. McCall, Bell Telephone Labs., Inc.
- 2:00 p.m.—Magnetic Amplifiers**
- 56-204. The Operation of the Self-Balancing Magnetic Amplifier. I. A. D. Krall and E. T. Hooper, U. S. Naval Ordnance Lab.
- 56-205. A Magnetic Amplifier Switching Matrix. David Katz, Bell Telephone Labs., Inc.
- 56-10. Analysis of Instability and Response of Reactors with Rectangular Hysteresis Loop Core in Series with Capacitance. J. T. Salihi, University of California.
- 56-206. Hysteresis Loops in Dielectric Amplifiers. Earl Wingrove, I. General Electric Co., L. Depian and W. L. Shevel, Carnegie Institute of Technology.
- CP56-207. A Single-Transistor Magnetic-Coupled Oscillator. Kan Chen, Westinghouse Electric Corp. and A. J. Schiewe, Purdue University.
- 2:00 p.m.—Industrial TV and Broadcast Transmitters**
- CP.* Engineering of TV Installations. J. W. Belcher, General Precision Labs.
- CP.* A New Color Camera and TV System for Closed Circuit Applications. L. E. Anderson, Radio Corp. of America.
- CP.* Electron Color Microscope. J. J. Reeves, CBS Labs.
- CP.* A 50 KW Ampliphase Broadcast Transmitter. T. J. Boerner, Radio Corp. of America.
- 2:00 p.m.—Research**
- CP.* Need for Research in the Field of Fuels. Engene Ayres, Gulf Oil Co.
- CP56-266. Electro-Chemical Cells as Energy Converters. A. M. Adams, Central Electricity Research Labs.
- CP.* Solar Energy—A Supplementary Energy Source. H. B. Sargent, American and Foreign Power Co.
- 2:00 p.m.—Feedback Control**
- 56-208. Synthesis and Critical Study of Sampled-Data Control Systems. E. I. Jury, University of California.
- 56-209. Factors in the Design of Digital Controllers for Sampled-Data Feedback Systems. J. E. Bertram, Columbia University.
- 56-210. Digital Compensation of Continuous-Data Feedback Control Systems. K. K. Maitra and P. E. Sarachik, Columbia University.
- 56-211. Syntheses of Feedback Control System by Gain-Contour and Root-Contour Methods. V. C. Yeh, New York University.
- 2:00 p.m.—Chemical Processes**
- CP.* The Gas Turbine—A Versatile Servant for the Process Industries. W. R. Welton, General Electric Co.
- CP56-14. Electrical Inspection of Petrochemical Plant Construction. N. D. Casdorph and J. H. Wieting, Carbide & Carbon Chemicals Co.
- CP.* Automatic Control in the Chemical Industry. W. A. Crawford, E. I. DuPont de Nemours and Co.
- CP.* Electricity and Titanium. F. H. Vandenburgh, Mallory-Sharon Titanium Corp.
- CP.* Titanium Today. H. B. Goodwin, Battelle Memorial Institute.
- 2:00 p.m.—Electromagnetic Radiation from High Frequency Cables**
- CP56-288. Electromagnetic Radiation from Coaxial Cables—Surface Transfer Impedance. J. P. Quine, Rensselaer Polytechnic Institute.
- CP56-268. Analysis of Interference from Flexible Coaxial Cables. A. V. Eastman, University of Washington.
- CP56-246. Investigation of Measurement Techniques for the Shielding Effectiveness of Flexible Coaxial Cables. O. D. Cozine.
- CP56-283. Measurement of Energy Leakage from Radio Frequency Cables at VHF and Microwave Frequencies. J. W. E. Griemsmann, Polytechnic Institute of Brooklyn, S. Greenblatt and L. Birenbaum, New York Naval Shipyard.
- CP.* Radiation Fields from a Coaxially Shielding. M. E. Taylor and E. R. Shartz,

- 9:30 a.m.—DC Machines**
- CP56-39. Determination of Stray Load Loss in Direct-Current Machines. R. L. Sieron, Connecticut Light and Power Co. and D. A. Grant, Worcester Polytechnic Institute.
- 56-38. The Null Point Method of Commutation Adjustment. S. J. Roumanis, General Electric Co.
- 56-36. On Wire Banding. E. C. Appleby and P. G. Lessmann, Westinghouse Electric Corp.
- CP56-254. Basis and Background of the Proposed Revision of Test Code for D-c Machines, AIEE-501. E. P. Smith, General Electric Co.
- CP56-255. Revision of Test Code for D-c Machines. AIEE-501. Report of D. C. Machinery Subcommittee.
- 56-4. Determining the Parameters of a Short-Circuited Winding that Represents Eddy-Current Paths. K. A. Fegley, University of Pennsylvania.
- 9:30 a.m.—Transmission and Distribution**
- 56-212. Quantitative Relationships in Conductor Vibration Damping. III. J. S. Tompkins, Aluminum Co. of America, L. L. Merrill, Stevens Institute of Technology and B. L. Jones, Jones-Hettelsater Construction Co.
- 56-213. Progress Report on the Investigation of Galloping of Transmission Line Conductors. A. T. Edwards and A. Madeyski, The Hydro-Electric Power Commission of Ontario.
- CP56-214. Wind Tunnel Investigation of Conductor Vibration Using Rigid Models. F. B. Farquharson and R. E. McHugh, Jr., University of Washington.
- 56-215. An Economic Study of High-Voltage Transmission. J. M. Henderson and A. J. Wood, General Electric Co.
- 56-216. Power Supply Development for the Atomic Energy Commission's Paducah Area Gaseous Diffusion Plant. E. E. George, Ebasco Services, Inc., K. E. Haggood, Tennessee Valley Authority, and F. W. McCloska, Sargent & Lundy.
- 9:30 a.m.—Transformers**
- 56-62. The Performance of Transformer Oil under Special Conditions. W. E. Elliott, F. J. Vogel and D. N. Hiu, Allis-Chalmers Mfg. Co.
- CP.* A Study of the Coordination of Modern Arresters and Transformer Insulation. E. J. Adolphson and F. J. Vogel, Allis-Chalmers Mfg. Co.
- 56-54. Coordination of Dry-Type Transformer Models with Transformer Geometry. L. C. Whitman, General Electric Co.
- 56-29. A Study of Models for Use in Evaluating Dry-Type Transformer Insulating Systems. T. R. Walters and A. L. Scheideler, General Electric Co.
- CP56-61. Silicones in Combination with Organic Based Materials for Use in Dry-Type Transformers. H. M. Broderick, A. L. Scheideler and G. F. Simmons, General Electric Co.
- 9:30 a.m.—Switchgear**
- 56-47. A New Top Rating for the 161 Kv Oil Circuit Breaker with Multi-Break Type Interrupters—15,000 MVA. G. J. Easley and F. L. Reese, Westinghouse Electric Corp.
- 56-40. Control of Voltage Gradients in High-Voltage, Watch Case, Multi-Break Oil Circuit Breakers. B. P. Baker and R. E. Friedrich, Westinghouse Electric Corp.
- 56-217. A New Canadian Compressed Air Circuit Breaker. C. C. Smith and D. H. McKeough, Canadian Westinghouse Co., Ltd.
- 56-55. Development of a Three-Cycle High Voltage Airblast Breaker with Interrupting Ratings up to 25000 MVA. H. E. Thommen and W. R. Streuli, Brown Boveri.
- 9:30 a.m.—Thermal Evaluation of Magnet Wire**
- 56-152. Magnet Wire Performance in Product Life Tests. R. L. Balke, General Electric Co. Re-presented for discussion.
- 56-153. Thermal Evaluation of Enamelled Magnet Wire. J. F. Dexter, I. Dow Corning Corp. Re-presented for discussion.
- CP.* Long Range Heat Aging Tests on Alkanex. W. W. Wareham, General Electric Co.
- CP.* Report of Results of Cooperative Test Program on Test Procedure for Evaluation of the Thermal Stability of Rectangular Magnet Wire. Working Group Report.

- CP.* The Thermal Classification of Enamelled Magnet Wire. Working Group Report.
- 9:30 a.m.—Magnetic Amplifiers**
- 56-9. Full-Wave Bridge Magnetic Amplifiers with Inductive Loads. I. H. H. Woodson, Massachusetts Institute of Technology.
- 56-218. Measurements on High-Speed Magnetic Servo Amplifiers with Two-Phase Motor Load. W. A. Geyger, U. S. Naval Ordnance Lab.
- 56-219. Flux Reversal in Magnetic Amplifier Cores. F. J. Friedlaender, Purdue University.
- 56-220. Low Impedance Operational Characteristics of Toroidal Cores Used in Magnetic Amplifiers. C. L. Boyajian, General Electric Co.
- CP56-272. Dynamic Core Behavior and Magnetic Amplifier Performance. L. A. Finzi and D. L. Critchlow, Carnegie Institute of Technology.
- 9:30 a.m.—Medicine and Biology**
- CP.* Control of Radio Interference from Medical Electronic Equipment. A. L. Albin and H. M. Sachs, Armour Research Foundation.
- CP.* The Use of Radio Frequency Power in Making Lesions in the Brain. Saul Aronow, Massachusetts General Hospital.
- CP.* Radar Radiation Health Hazard. H. P. Schwan and Kam Li, University of Pennsylvania.
- CP.* Radiation Monitoring Aboard the U. S. S. Nautilus. M. E. Hayes, Westinghouse Electric Corp.
- CP56-23. Performance of a Large Area Photoconductive X-Ray Pickup Tube. J. E. Jacobs and Harold Berger, General Electric Co.
- 56-81. Physical Response Requirements of Pressure Transducers for the Reproduction of Physiological Phenomena. E. H. Wood, University of Minnesota. Re-presented for discussion.
- 9:30 a.m.—Wire Communications**
- 56-240. Objectives and General Description of the Type P1 Carrier System. R. C. Boyd, Bell Telephone Labs., Inc.
- 56-241. Application of Type P1 Carrier System to Rural Telephone Lines. J. D. Howard, American Tel. & Tel. Co.
- 56-242. Circuit and Equipment Descriptions of the Type P1 Carrier System. E. K. Eberhart, F. J. Hallenbeck and E. H. Perkins, Bell Telephone Labs., Inc.
- 56-243. Power Supplies for the Type P1 Carrier System. D. H. Smith, I. Bell Telephone Labs., Inc.
- CP.* Field Trial Experience with the Type P1 Carrier System. T. W. Thatcher, Jr., Bell Telephone Labs., Inc.
- 9:30 a.m.—Industrial Control**
- CP56-82. Design of Heavy Duty Electric Brake. L. J. Parkinson, General Electric Co.
- 56-31. Interruption Tests on High-Voltage Air-Break Contactor. II. C. A. Lister, Electric Controller & Mfg. Co.
- CP56-83. Analysis of the Shading Coil Magnet. H. J. Kubiak, University of Wisconsin.
- CP56-269. Applying Industrial Controllers for Safe Operation. G. W. Heumann, General Electric Co.
- 56-84. A Two-Motor A-C Mine Hoist Control System. A. H. Myles, II. Electric Controller & Mfg. Co. Re-presented for Discussion.
- 9:30 a.m.—Electronic Circuits and Systems**
- CP56-84. Magnetic Trip Amplifier. R. B. Hodson and E. W. Manteuffel, General Electric Co.
- 56-41. Transistor Voltage Regulator. R. H. Spencer and T. S. Gray, I. Massachusetts Institute of Technology.
- CP56-85. Magnetic Voltage and Frequency Regulator for an Aircraft Inverter. E. W. Manteuffel, General Electric Co.
- CP.* System Engineering for Guided Missile Installations. J. Kraus, Vitro Labs.
- CP.* A CW Radar Rate-of-Climb Meter for Vertical Take-Off Aircraft. S. H. Logue, CONVAIR.
- CP.* Micropower Operation of Silicon Transistors. E. Keonjian, General Electric Co.
- 2:00 p.m.—Computers in the Design of Machines and Systems**
- 56-154. Synchronous Motor Starting Performance Calculation. J. C. III White, General Electric Co.

- 56-43. Fundamental Equations for Analog Studies of Synchronous Machines. D. B. Breedon and R. W. Ferguson, Westinghouse Electric Corp.
- CP.* Computer Simulation of a Switching Network. S. Katz, Wolfe & Mann Mfg. Co.
- 56-155. A Digital Computer Program for Determining Atomic Wave Functions. W. W. Piper, General Electric Co.
- 56-156. Automatic Network Analysis with a Digital Computation System. S. Y. Wong, Philco Corp. and M. Kochen, Paul Rosenberg Associates.
- 2:00 p.m.—Transmission and Distribution**
- 56-221. Field Studies of Noise at Television Frequencies from Power Circuits. J. R. Leslie and P. W. Waddington, The Hydro-Electric Power Commission of Ontario.
- 56-222. The Calculation of the Radio Interference Level of Transmission Lines Caused by Corona Discharges. G. E. Adams, General Electric Co.
- 56-223. Variations in Radio and Television Interference from Transmission Lines. H. H. Newell, Worcester Polytechnic Institute and F. W. Warburton, New England Power Service Co.
- CP.* Relationship Between Corona & Radio Noise on Transmission Lines—Laboratory Studies—Part I—Point & Conductor Corona. T. W. Liao, General Electric Co.
- CP.* Application of Power System Harmonic Filters. R. W. Ferguson and W. A. Munson, Westinghouse Electric Corp.
- 2:00 p.m.—Transformers**
- 56-87. Methods for Measuring the "Q" of Large Reactors. Chester III Peterson, B. L. Dunfee and F. L. Hermach, National Bureau of Standards.
- CP.* Switching Surges and Continuous Possibilities of Transformer Insulation. W. C. Farneth and F. J. Vogel, Allis-Chalmers Mfg. Co.
- 56-89. Controlled Temperature and Insulation Protection in the Operation of Power Transformers. J. A. Klingensmith, Westinghouse Electric Corp.
- 56-90. Leakage Reactance of Transformers. A. A. Halacsy, Jeffries III Transformer Co.
- 2:00 p.m.—Switchgear**
- 56-46. Short Circuit Protection of Busway Systems with Current Limiting Fuses. J. B. Cataldo and N. Shackman, Bulldog Electric Products Co.
- 56-224. Use and Properties of Extruded High Strength Aluminum for Electrical Bus Conductors. W. Switney and C. L. Carlson, Westinghouse Electric Corp.
- 56-225. Vacuum Switches for Power Systems. J. E. Jennings, Jennings Radio Mfg. Corp., A. C. Schwager, Schwager-Wood Corp. and H. C. Ross, Jennings Radio Mfg. Corp.
- 56-35. New Type Current Transformers for Low Oil Content-Circuit Breaker. A. N. Arman, Pirelli-General Cable Works, Ltd. and W. H. Clagett, Pacific Oerlikon Co.
- 2:00 p.m.—Thermal Evaluation of Insulation**
- CP.* Evaluation of Insulating Materials in Simple Combinations. K. N. Mathes, General Electric Co.
- CP.* A Fundamental Description of the Mechanical Behavior of Silicone Resins. J. R. McLoughlin, General Electric Co.
- 56-157. Effects of Insulation Thickness on the Aging of Organic Insulation in Air. L. C. Whitman and A. L. Scheideler, General Electric Co.
- CP.* A Statistical Approach to Insulation Evaluation. E. F. Seaman, Dept. of Navy.
- CP56-260. Measurement of the Complex Dielectric Constant of Very High Dielectric Constant Material at Microwave Frequencies. Isidore Bady, Oakhurst, N. J.
- 2:00 p.m.—Magnetic Amplifiers**
- 56-226. A Signal Discriminating Magnetic Amplifier. G. E. Lynn I and J. F. Ringelman, Westinghouse Electric Corp.
- 56-227. A Line Voltage Regulator Having Magnetic Amplifier Control. F. W. Anderson, Bell Telephone Labs., Inc.
- CP56-30. The Pulse Stretch Coupling Circuit. H. W. Patton, Airpax Products Co.
- CP56-228. Core Volume Derivation for Magnetic Pulse Modulators. J. E. Sunderlin, Westinghouse Electric Corp.

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CP56-229. Magnetic Frequency Multipliers and Their Rating—Part I—Frequency Triplers. W. McMurray, General Electric Co.

2:00 p.m.—Wire Communications

CP.* Objectives, Progress and Promises of Telephone Transmission. H. R. Huntley, American Tel. & Tel. Co.

56-244. Development of Transcontinental Communications in Canada. I. J. W. Noyes, S. Bonneville and G. Gaudet, Bell Telephone Co. of Canada, Ltd.

56-245. A New Four-Channel Open-Wire Carrier System Employing Transistors. R. S. Caruthers, W. S. Chaskin and H. K. Krengel, Lenkurt Electric Co., Inc.

CP*. Experimental Modulator Wiring Using Coded Input. R. F. Mallina, Bell Telephone Labs., Inc.

2:00 p.m.—Industrial Control

CP56-91. Magnetic Logic Circuits for Industrial Control Systems. W. G. Evans, W. G. Hall and R. I. Van Nice, Westinghouse Electric Corp.

CP56-273. Overcurrent Protection of Adjustable Speed D.C. Motors Operating from Phase Controlled Rectifiers. D. R. Kanitz and A. G. Mueller, Square D Co.

CP56-274. Proposed Standard for Electronic Motor Control Electronics Sub-Committee.

56-15. An Automatic Output Regulator for Power Oscillators. E. G. Hopkins, New South Wales University of Technology and H. J. Fraser, Amalgamated Wireless Valve Co., Pty., Ltd.

2:00 p.m.—Electronic Circuits and Systems

CP56-92. A Magnetic-Amplifier Simulator. R. E. Fitts, Rome, New York.

56-24. DC Graphical Analysis of Junction Transistor Flip-Flops. I. T. R. Bashkow, Bell Telephone Labs., Inc.

CP.* The Use of the Anodyne, Discussed as a Multiplier. T. G. Calhoun and R. C. Shreckengost, The Johns Hopkins University.

CP.* Three-Dimensional Flight Simulator Supply. E. P. Long-erich, Bendix Aviation Corp.

CP56-93. VHF Transistor Noise-Figure Test Set. E. J. Burke, General Electric Co.

56-37. A Comparison of Three Common Emitter Transistor Servo I Pre-amplifiers. A. N. DeSautels, Minneapolis-Honeywell Regulator Co.

CONTINUED FROM PAGE 2

Western Electric Company—Kearny, N. J. (Wednesday, all day)—It is one of the largest manufacturing plants of this supply organization for Bell Telephone. Included in this tour will be the multi-conductor cable shop, relay blade manufacturing, and assembly of manual and automatic switchboard equipment.

American District Telegraph Co.—New York, N. Y. (Wednesday A.M.-Thursday A.M.)—This trip covers working demonstrations and explanatory commentary on ADT's electric protection systems against burglary, holdup, intrusion, fire and special hazards. These include a number of electronic systems using modulated photoelectric, body capacitance, sound detection and ultrasonic equipment.

Ford Motor Company—Mahwah, N. J. (Wednesday A.M.)—This plant, located on a 177-acre tract, is the largest automobile and truck assembly plant in the world. A 1-story building 2,115 feet long and 792 feet wide (provides 40 acres under one roof) is capable of turning out 1,080 cars and trucks in a 2-shift 16-hour day. Extensive receiving and shipping facilities permit the unloading of 96 railroad cars within the plant at one time. Over 11 miles of conveyor belts and a lighting system designed to give 30 foot-candles of light on a 30-inch plane throughout the plant (requires 31,500-8-foot light tubes) makes this new plant, that was dedicated in September 1955, the pride of the Ford Company.

New York, New Haven and Hartford Railroad Shops—New York, N. Y. (Wednesday A.M.)—Van Nest Shops is a brick structure, 800 feet long by 260 feet wide. It is divided into two sections, one for inspection of locomotives and cars and the other for major repairs and overhaul.

There are approximately 400 employees engaged in the maintenance of 74 electric locomotives and 200 multiple unit cars. All work on this equipment with the exception of daily inspection and miscellaneous minor repairs is done at Van Nest Shops.

Van Nest has an excellent motor repair shop with well-qualified

armature winders to repair and rewind motors of any size and all of this type of equipment on the system is taken care of at this point.

Otis Elevator Company—New York, N. Y. (Wednesday P.M.)—A model Autotronic Elevator System installed in a miniature 10-story building will be demonstrated and the operation of the controlling electronic brain will be explained. This model has been exhibited in various parts of the United States and Canada. The demonstration will be followed by a question and answer period.

U. S. Merchant Marine Academy—Kings Point, N. Y. (Thursday, all day)—This trip will consist of a general inspection of the facilities at the Academy. The outstanding features are the engineering laboratories and the laboratories relating to nautical science such as navigation, seamanship, naval architecture, etc. All the laboratories contain equipment found on board ship and all equipment is in operating condition. The electrical laboratory contains an actual turbine electric propulsion system, while the Electronics Laboratory has radar, loran, radio detection finder, fathometer, gyro compasses, degaussing systems, radio transmitters and telephonic equipment.

Triangle Conduit and Cable Company—New Brunswick, N. J. (Thursday A.M.)—Founded in Brooklyn in 1916 as a flexible steel conduit and armored cable plant, Triangle Conduit and Cable Company has grown to be one of the leaders in the manufacture of quality insulated wire and cable conduit, both rigid and E.M.T.

The present wire and cable facilities alone consist of a 335,000 square foot plant in New Brunswick, New Jersey, now the headquarters of the company. In this plant you will see copper enter the factory in the form of bars and go out as high quality insulated wire and cable. In between, you will see the interesting processes involved—the rod mill where the copper bar is first heated and rolled into long lengths, the drawing operation where the rod is further drawn to the precise required size, tinning, stranding and insulating processes, vulcanizing, application of the fibrous braid, saturating, painting, printing and inspecting. No Ladies will be permitted on this trip.

Bell Telephone Laboratories—Murray Hill, N. J. (Thursday P.M.)—This always popular trip is being presented again this year. In response to the Committee's request, twice as many visitors than last year will be permitted. Highlights will be a showing of the repeater for the submerged telephone cable being laid in the North Atlantic Ocean, a demonstration of the Bell Solar Battery, which converts light into electrical energy with some degree of efficiency and at least one of the interesting machines for which Mr. Claude Shannon is famous.

New York City Transit Authority Power Plant—New York, N. Y. (Thursday P.M.)—An unusual opportunity will be provided to see in close contrast the new and the old in generating equipment. A 7,500-kw cross-compound Corliss engine with its 35-ft diameter generator rotor represents the very old, while the new equipment consists of a 60,000-kw high-pressure turbine with a hydrogen-cooled generator and an air-conditioned control room is a feature of this unique installation.

LADIES ENTERTAINMENT: The committee has arranged an interesting program which includes a "Get Acquainted Tea" on Monday afternoon in the Washington Room at the Hotel Statler. On Tuesday a tour of Upper New York including the "Cloisters," a Luncheon and Bridge at the Engineering Woman's Club and a Dinner and floor show at night in the Penn Top with many attractive door prizes. For Wednesday a Tour through the United Nations buildings. Breakfast at Altman's, Luncheon and Fashion Show in the Cotillion Room of the Hotel Pierre on Thursday. Ladies must be registered with their husbands before signing up at Ladies Headquarters in the Washington Room which will be open from 2 to 4 P.M. on Sunday, January 30th.

WINTER GENERAL MEETING COMMITTEE: Members of the 1956 Winter General Meeting Committee are: A. J. Cooper, chairman; D. M. Quick, vice-chairman; J. J. Anderson, secretary; J. P. Neubauer, Vice-President District 3, and budget co-ordinator; J. D. Tebo, chairman, Committee on Technical Operations; F. S. Black, public relations; R. T. Weil, general session; Avery Gould, dinner-dance; D. V. Buchanan, hotel accommodations; J. V. O'Connor, inspection trips; Morris Brenner, registration; R. W. Gillette, smoker; R. R. Meola, monitors; S. Friend, Jr., theater and broadcast tickets; Mrs. Merwin Brandon, ladies' committee; C. T. Hatcher, ex-officio member (past chairman).

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