



Summer General Meeting

June 25-29, 1951

Toronto, Canada

Headquarters
Royal York Hotel



Downtown Toronto, and the Royal York hotel in the foreground

MEETING FEATURES

Plans for the technical, social, ladies entertainment, and sports programme for the Summer General Meeting to be held in Toronto, Ontario, Canada, June 25-29 are now complete. Headquarters for the meeting are in the Royal York Hotel in the heart of downtown Toronto, where ample facilities have been reserved for the many technical sessions of this meeting, together with the entertainment and social events. While room accommodations in the headquarters hotel and the King Edward Hotel may not be sufficient, other accommodations may be obtained at the Prince George, Barclay, and Walker House Hotels, which are within five minutes walk from the Royal York Hotel.

The technical programme for this meeting covers all phases of electrical engineering with particular emphasis on transmission and distribution. Included in the well organized and informative technical papers are two prepared by members of the Institute who reside in the United Kingdom on the subjects of Electronic Power Converters and Printed Circuit Techniques.

TRANSPORTATION: Toronto, Ontario, is accessible by highway, railway, and airline, from all major cities in the United States. For those motoring to the meeting, it is suggested that if possible, they plan their itinerary to enter Ontario at Niagara Falls where they can view one of the seven wonders of the world, and enjoy a delightful scenic drive from that city to Toronto over the magnificent Queen Elizabeth Highway, a modern traffic artery with center boulevard and cloverleaf overpasses. Other points of entry to Ontario offering interesting scenic drives from the border to Toronto are the Ivy Lea bridge near Alexandria Bay, the Peace bridge at Buffalo,

the Ambassador bridge at Detroit and the Blue Water bridge at Port Huron. Canadian railroads connect with all lines in the United States and through sleepers are available from all major terminals to Toronto. Trans Canada and American Airlines also serve Toronto from the larger cities in Canada and the United States.

INSPECTION TRIPS: A wide variety of trips and tours which should be of interest to all members has been arranged during the meeting week. Members making the trips and tours should wear their registration badges for identification purposes and it is not expected at this time that further identification will be necessary for access to the plants to be visited. A small nominal fee will be charged for transportation for most trips except where a specific fee has been listed with the trip description, in which case the specified fee will be charged to cover transportation and meals where the latter are scheduled.

Canadian Built Diesel Electric Locomotive (Monday, June 25, 11:00 a.m. to 6:00 p.m.) The Canadian National Railways will have on exhibit in the Union Station yards across the street from the headquarters hotel, the first diesel electric locomotive manufactured in Canada. Directions will be available at the Trips Desk and guides will be at the exhibit to describe this diesel electric giant.

Hydro-Electric Power Commission of Ontario Laboratories (Monday, June 25, 2:00 p.m.) The Hydro-Electric Power Commission of Ontario, the provincially-owned power authority which generates and transmits most of the power developed in Ontario, operates one of the most modern and complete research laboratories in

Canada at its Strachan Avenue premises. Many significant electrical developments including an ultrasonic device for testing large concrete structures, a pulse-type fault locator for high voltage transmission lines, and a holomotor are among the products of this laboratory. Transportation will be provided by bus.

Toronto Rapid Transit System (Tuesday, June 26, 9:00 a.m.) The Toronto Transportation Commission is presently building the first subway for a municipal transportation system in Canada. Much of the excavation of the combined tunnel and open cut construction has already been completed and sections close to the Royal York Hotel are already poured in concrete. A conducted tour will be made of this gigantic project which is being constructed beneath the false decks of Toronto's busiest thoroughfares. The trip will terminate in the Commissions Hillcrest Shops which are among the finest on the continent, and are recognized by electrical maintenance engineers for the efficient despatch with which electrical maintenance and repairs are effected on Toronto's 1,700 transportation units. This tour will commence from the Commissions offices at Yonge and Front Streets, one block from the hotel. Guides will escort the visitors through the subway and on emerging they will be taken by bus to the Hillcrest Shops.

Canadian General Electric Company and Ferranti Electric Limited (Tuesday, June 26, 9:00 a.m.) For those interested in large transformer design, a choice may be made of visiting the transformer plant of the General Electric Company or the Ferranti Electric Limited. In their Davenport works, the General Electric Company manufactures power transformers, distribution transformers and specialty transformers. A demonstration of artificial lightning by means of a three million volt impulse generator will be made. The Canadian branch of Ferranti Limited (England) designs and manufactures transformers, watt-hour meters and an unique type of voltage regulator in all ratings. X-ray equipment is also manufactured. Members will have an opportunity to select the plant to be visited before leaving the hotel by bus.

Canadian Westinghouse Company Limited and Steel Company of Canada (Tuesday, June 26, 1:00 p.m.) These plants are located in Hamilton, a delightful hour's drive from Toronto. The plant of the Westinghouse Company manufactures some of the largest central station equipment in the world including generators, motors, power transformers, and circuit breakers. This tour will also include the Westinghouse Research and Development Laboratory. This is the largest and most up-to-date industrial laboratory in Canada and includes physical, chemical, electrical, and mechanical facilities. The Steel Company of Canada is the largest steel mill in Canada. This tour will include a visit to the huge blast furnaces, coke ovens, open hearth furnaces, blooming and billet mills, bar mills, plate mills, and electrolytic tinning mills. Visitors will also see the electrical controls and drives for the new 15,000 H. P. cold rolling mill capable of producing 3,000 feet of sheet per minute. Transportation will be by bus and the charge will be \$1.50 per person. On arrival in Hamilton, the visitors will have the choice of the plant to be visited as it will not be possible to cover both plants in the same afternoon.

New Avro Jet Transport (Tuesday, June 26, 2:00 p.m.) This trip will provide an opportunity to inspect the first jet driven passenger transport manufactured on this continent. This plane designed by the A. V. Roe Company has recently made a number of record breaking trial flights in the United States, and Canada, cutting airline schedules in half. The trip is conditional on this aircraft being in Toronto on this date or some other date during the week. Members planning to make this trip should enquire of the actual date and time at the Trips Desk. Transportation will be by bus.

Bell Telephone Company's Elgin Building (Tuesday, June 26, 2:00 p.m.) Visitors taking the tour of the Bell Telephone Company of Canada's Elgin Building will see the largest long distance switchboard installation in Canada. Inward, outward, and tandem switchboards totalling 479 positions provide the long distance service for Toronto's 425,000 telephone stations. Terminating equipment in the toll terminal room provides for 2,300 toll circuits, including 600 'K' carrier telephone circuits operating through a vast network of cables linking the major telephone centres in Canada and the United States. This building also contains five units of step-by-step dial equipment. As this telephone centre is close to the headquarters hotel, guides will escort visiting parties, on foot, from the hotel.

Niagara Falls and the Welland Canal — All Day Trip (Wednesday, June 27, 9:00 a.m.) This trip will take visitors through the Niagara fruit belt, the garden of Ontario, and the extensive industrial



English Electric Co. of Canada, Ltd.

areas bordering the mammoth power generating centre at Niagara Falls. It will combine business and pleasure offering members an opportunity to see the mighty Niagara Falls, the adjacent parks and farms, and the strange paradox of industrial development sandwiched between fruit orchards and vineyards. Luncheon will be taken at Queenston Heights, an historic park of national interest to both Canadians and Americans and the return trip will be by way of the Welland Canal where the largest twin flight locks in the world will be inspected at Thorold. These are a duplication, side by side of three successive gigantic locks so constructed to permit up bound and down-bound lake and ocean-going vessels to pass without delay. The trip will be made by bus and the charge will be \$4.50 per person including luncheon.

Dunlap Observatory (Wednesday, June 27, 8:30 p.m.) The Dunlap Observatory located 15 miles north of Toronto and associated with the University of Toronto, is Canada's largest observatory. Included on its staff under the direction of Dr. J. S. Heard, is Dr. Helen Hogg, one of the foremost women astronomers in the world. A delightful evening's drive from Toronto, the trip should appeal to both members and their ladies. The Observatory Staff have arranged a conducted tour, and weather permitting, the visitors will be able to examine the heavens through the observatory's 74 inch reflecting telescope. It is expected that Dr. Hogg will be in attendance to welcome the ladies in the party. Transportation will be by bus from the hotel and the charge will be \$1.00 per person.

Canadian General Electric Company — Peterborough (Thursday, June 28, 8:30 a.m.) An all-day trip for this date has been arranged for members desiring to visit the plant of the Canadian General Electric Company at Peterborough, 90 miles northeast of Toronto. This mammoth Canadian affiliate of the General Electric Company manufactures water wheel generators larger than 100,000 KVA; and units for many of the major power developments currently in progress in Canada are being assembled at this plant. This trip will include a view of the highest marine lift lock in the world. Lunch will be provided through the courtesy of the Canadian General Electric Company. Transportation will be by car and the charge will be \$1.50 per person.

Leaside Industrial Plants (Thursday, June 28, 2:00 p.m.) This afternoon trip will embrace a number of electrical manufacturing plants in Leaside in the east end of Toronto, who produce a wide variety of electrical equipment and appliances. Included in the tour are the Sangamo Company Limited, Lincoln Electric Company of Canada Limited, Minneapolis-Honeywell Regulator Company Limited, and the Canadian Radio Manufacturing Corporation Limited, where visitors will see motors, meters, electrical welding equipment, regulating and control equipment, radio and television products together with many other electrical devices in the process of manufacture. Time will permit visiting only two of these plants in the afternoon and members will have an opportunity to select the plants in which they are most interested before leaving by bus.

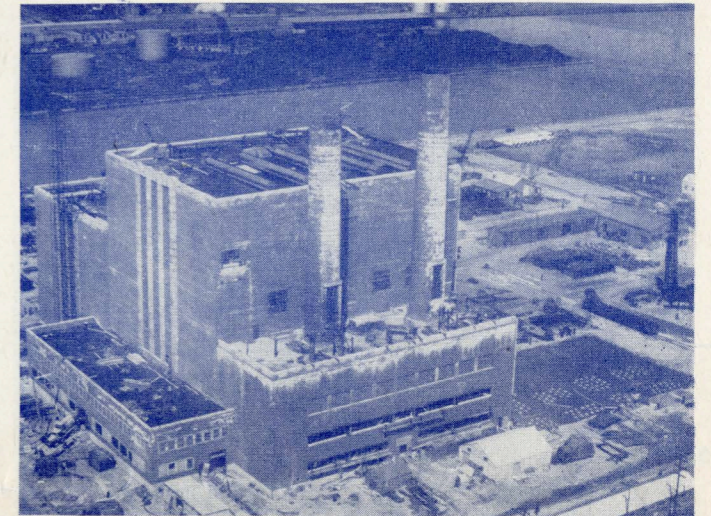
Bell Telephone Company's Carrier Systems (Thursday, June 28, 1:30 p.m.) This trip will include an inspection of three units which are typical of broad band carrier telephone systems. The first point to be visited will be an unattended 'K' carrier repeater station at Rosebank about 17 miles east of Toronto. The next place on the tour is the Oshawa office which is about 17 miles east of Rosebank. This office contains a variety of carrier equipment which includes terminals of the type C, H, and K systems, repeaters for the type K systems and group conversion equipment for joining together type J and type K systems. North of Oshawa, about thirty-five miles, the Cannington J repeater station will be inspected. This is the first repeater station on the J carrier route which extends from Oshawa over 1,200 miles to Winnipeg. This tour will be made by bus and the charge will be \$2.00 per person.

Many electrical manufacturers in the Toronto area have extended an invitation to the members to visit their plants on an informal basis during the meeting week. Members wishing to visit plants of particular interest should enquire at the Trips Desk for the list of manufacturers extending this invitation.

SOCIAL: During the meeting the evening hours will be free of arrangements of a technical nature and the programme provided will insure that the visitors evening hours are fully and enjoyably spent.

On Sunday, June 24, at the Royal York Hotel, **afternoon tea** will be served between 3:30 and 5:30 p.m. to welcome members and their wives who arrive in advance of the first meeting day. There will be no charge for this tea. The **luncheon** on Monday, June 25, will serve to officially open the meeting and welcome the members as guests of the Toronto Section. On Monday evening a buffet dinner will be served at 7:00 p.m. followed by the **President's reception** and dance commencing at 8:30 p.m. Tickets for the dinner and dance will be \$5.00 per person. An outstanding social event will take place at **Hart House**, University of Toronto on Tuesday evening at 8:45 p.m. Following a carillon welcome, there will be a theatre play, variety entertainment, and square and round dancing. The charge for the full evening's event will be \$3.50 per person. Wednesday evening, June 27, a **Color Salon** of movies and still pictures will be presented at the hotel, for which there will be no charge. The Toronto Camera Club will present a choice collection of colored stills followed by a delightful and interesting movie depicting Indian folklore. Thursday evening, June 28, the formal **dinner and dance** will wind up the social part of the meeting. Dinner will commence at 7:00 p.m. and dancing at 9:00 p.m. The Leslie Bell Singers, an all-girl choir of magnificent voices will entertain following dinner. Both events will take place in the Royal York Hotel and dinner will be \$4.00 per person and the dance \$2.00 per person.

LADIES' ENTERTAINMENT: In addition to the social events planned for the entertainment of the members and their families, a separate programme of trips and events has been prepared for the ladies. The **Sunday afternoon tea** on June 24 launches the ladies' programme followed on Monday, June 25, with a sightseeing tour commencing at the hotel at 1:30 p.m. After touring **Casa Loma**, Toronto's castle of Gothic architecture, the party will proceed to **Queens Park** where they will be received by the Lieutenant-Governor, the Honourable Ray Lawson at tea at 4:00 p.m. Tuesday, June 26, at 1:30 p.m., another sightseeing tour through the residential area of the city will culminate in a tea at the **T. Eaton Company's** College Street store where the guests will see an exhibition featuring a display of items purchased in every corner of the world and brought together for sale in the stores of this great company in Toronto and across Canada. On Wednesday evening the ladies will have the choice of accompanying the men on the trip to the **Dunlap Observatory** or enjoying the **Color Salon** of movies and still pictures at the hotel. Thursday's programme includes a tour of the city commencing at 2:00 p.m. and includes Toronto's lakefront and exhibition grounds and the delightful **James flower gardens**. Tea will be taken at the



Ontario Hydro's 536,000 HP. Richard L. Hearn Generating Station

Old Mill and the party will be returned to the hotel in ample time for the formal dinner and dance that evening. A charge of \$1.00 per person will be made to cover transportation for each of the above tours. There will be no other charges. Coffee will be served without charge to the ladies each morning, Monday to Thursday inclusive, between the hours of 10:00 and 11:00 a.m. in Parlour "C" at the Royal York Hotel.

SPORTS: Golf and tennis have been arranged for the pleasure of the registered male members and their guests. The annual golf tournament for the **Mershon Golf Trophy** will be held at the Elms Golf and Country Club on Tuesday, June 26. Entries should be registered at the Sports Information Desk. Green fees will be \$3.00 per player and transportation will be provided by the Sports Committee to start play between 8:30 and 10:30 a.m. Locker space, rental clubs, and caddie carts are available at this club and refreshments may be obtained at the Snack Bar. The Sports Committee will do everything within its power to insure that the handicaps are equitable. The Sports Committee reserves the right to alter any handicaps, which, upon investigation, are found to be inequitable. Each contestant's handicap will be based on the average of the five best scores made in 1950 at his regular course. This average and the Club's par must be turned in at the time of registration and the handicap will be computed in accordance with the "National Handicap Table." This handicap will be used in "medal" or "score" play. The Mershon Golf Trophy will be presented to the winner of 18 holes medal play and, in addition to the trophy, the winner will also receive a "Special Prize." There will be other prizes awarded for players with high gross and high net scores. Arrangements may be made with any member of the Committee, or at the registration desk, for non-competitive play on several other courses in the city.

The annual competition for the **Mershon Tennis Trophy** for men will be played at the Toronto Cricket Club on Tuesday, June 26, between 10:00 a.m. and 5:00 p.m. Entries should be registered at the Sports Information Desk. Fees will be \$2.00 per player and transportation and tennis balls will be provided by the Sports Committee. Locker space will be provided and refreshments will be available at the Snack Bar. The Mershon Tennis Trophy will be engraved with the winner's name, and the winner will be presented with a suitable memento of the event. The runner-up will also receive a prize.

REGISTRATION: It will be helpful to all concerned if the mailed advance registration card is filled in and returned promptly. Members are asked particularly to check off the trips and events which they plan to attend. The registration fee will be \$3.00 for members and \$5.00 for nonmembers. No fees will be required from students or families of members. Remittance should not be enclosed; fees will be collected when registering.

OF INTEREST TO U. S. MEMBERS: No passport or other document is required to enter or to leave Canada, and there is no entry fee or tax. Travellers returning to the United States may find that U. S. immigration officers require proof of identity and place of residence. Any of the following will prove satisfactory: an old passport,

Continued on page 8

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 as AIEE Proceedings and in the Transactions. Conference Papers denoted by CP.** are intended for presentation only, and are not available.

Monday, June 25

10:00 a.m. Annual Meeting

1. Report of Board of Directors. H. H. Henline, Secretary.
2. Report of Treasurer. W. I. Slichter.
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 F. O. McMillan.
(b) Response by Professor McMillan.
5. Presentation of Lamme Medal to Donald I. Bohn, Chief Electrical Engineer, Aluminum Company of America.
 - (a) The Establishment of the Medal. A. H. Kehoe, Chairman, Lamme Medal Committee.
 - (b) The Career of the Medalist. Thomas D. Jolly, Vice President and Chief Engineer, Aluminum Company of America.
 - (c) Presentation of Medal and Certificate by President LeClair.
 - (d) Response by Mr. Bohn.
6. Any other business that may be presented.
7. The Power to Progress. President T. G. LeClair.

2:00 p.m. Distribution

- 51-193. Economic Primary Circuit Design Beneficially Studied by Unit System. D. K. Blake, General Electric Co.
- 51-194. The Linascope Transmission Line Fault Locator. K. H. Kidd, The Hydro Electric Power Comm. of Ontario.
- 51-195. Current Carrying Capacity of ACSR Conductors. J. H. Waghorne, V. E. Ogorodnikov, The Hydro Electric Power Comm. of Ontario.
- CP.** Design Features of Rural Electrification in Ontario. R. E. Jones, The Hydro Electric Power Comm. of Ontario.

2:00 p.m. Electronic Power Converters

- 51-206. Inductive Coordination Aspects of D-C Systems Supplied by Rectifiers. Working Group on Report of Inductive Coordination Aspects of D-C Systems Supplied by Rectifiers.
- 51-207. Equivalent Machine Constants for Rectifiers. I. K. Dortort, ACO.* I-T-E Circuit Breaker Co.
- 51-209. Some British Electronic Power Converters. J. E. Boul, English ACO.* Electric Co., Ltd.
- 51-210. Analysis of the Three-Phase Inverter with Resistive Load. R. E. Turkington, Massachusetts Institute of Technology.
- 51-211. Commutating Reactor Control for Mechanical Rectifiers. E. J. Diebold, I-T-E Circuit Breaker Co. Presentation by title only for discussion.
- 51-212. Development of a Pumpless Ignitron. C. C. Herskind, E. J. Remscheid, General Electric Co. Presentation by title only for discussion.
- 51-227. Basic Heat-Transfer Data in Electron Tube Operation. Mrs. F. F. Buckland, General Electric Co.

2:00 p.m. Power Generation

- CP.** Simplified Measurement of Subtransient and Negative Sequence Reactances in Salient Pole Synchronous Machines.



Headquarters, Toronto Hydro-Electric System *Brigdens Limited*

F. K. Dalton, A. W. W. Cameron, The Hydro-Electric Power Comm. of Ontario.

- CP.** Differential Movement of Stator Coils and Iron in Turbine Generators. M. D. Ross, E. I. King, M. M. Matthews, Westinghouse Electric Corp.
- 51-196. Static Magnetic Exciter for Synchronous Alternators. H. F. Storm, General Electric Co.
- 51-197. Elements of System Capacity Requirements. C. W. Watchorn, Pennsylvania Water and Power Company.
- 51-198. Determination of Reserve Capacity by the Probability Method—Effect of Interconnections. G. Calabrese, New York University. Presentation by title only for discussion.

Tuesday, June 26

9:30 a.m. Transmission

- CP.** Transmission Systems of the Hydro-Electric Power Commission of Ontario. J. E. Sproule, F. L. Code, The Hydro-Electric Power Comm. of Ontario.
- 51-204. Analysis of Total and Incremental Losses in Transmission Systems. L. K. Kirchmayer, General Electric Co.; G. W. Stagg, American Gas and Electric Service Corp.
- 51-205. The Torsional Damper for Conductors—Service Experience and Further Experimental Work. T. J. Burgess, A. D. Hogg, The Hydro Electric Power Comm. of Ontario.
- CP.** Line Outages on Transmission Lines of 100 Kv and Above. Joint AIEE-EEI Subcommittee.

9:30 a.m. Hydroelectric Systems

- 51-213. The Progressive Development of Hydro-Electric Stations on the Upper St. Maurice River. E. V. Leipoldt, The Shawinigan Engg. Co., Ltd.
- 51-214. Prime Mover Equipment in New Ottawa River Developments at Des Joachims, Chenaux, and La Cave for the Hydro-Electric Power Commission of Ontario. A. E. Aeberli, G. F. Simson, Hydro-Electric Power Comm. of Ontario.
- CP.** Planning and Design of Beauharnois Powerhouse No. 2. H. F. Abbott, Beauharnois Light, Heat and Power Co.
- 51-216. Modern Trends in the Design of Vertical Waterwheel Generators. C. M. Laffoon, E. C. Whitney, R. A. Baudry, Westinghouse Electric Corp.

9:30 a.m. Electronic Instruments

- 51-217. On the Mechanics of Magnetic Amplifier Operation. R. A. Ramey, Naval Research Laboratory.
- CP.** Anodige, an Electrical Analogue— to — Digital Converter. M. L. Kuder, National Bureau of Standards.

- CP.** A Sweep Frequency Generator for the UHF Television Band. John Cornell, RCA Victor.
- 51-218. A Servo System for Heterodyne Oscillators. T. Slonczewski, Bell Telephone Labs., Inc.

9:30 a.m. Safety

- 51-281. Electric Shock. Wills Maclachlan, Maple, Ontario, Canada. ACO.*
- 51-282. Electric Insect Traps. C. F. Dalziel, University of California.

9:30 a.m. Land Transportation

- 51-220. Economic Factors Which Influence Dieselization and Electrification. Charles Kerr, Jr., Westinghouse Electric Corp.
- CP.** Railway Electrification, Diesel-Electric Locomotives and Some Future Aspects of Electric Traction. G. Huldshimer, College of the City of New York.
- 51-221. Economic Evaluation of Fuel and Energy Sources for Railway Motive Power. T. M. C. Martin, Bonneville Power Administration.
- 51-222. Railway Electrification—A Prospective Consumer of Central ACO.* Station Power. Llewellyn Evans, Tennessee Valley Authority.

2:00 p.m. Power

- 51-223. Static Capacitors for High Voltage Use in Japan. K. Kitagawa, Sumitomo Electric Industries, Ltd.; T. Omori, Nissin Electric Co., Ltd.
- 51-224. Line Insulator Loss Under Normal Conditions. (500 Kv-Test Project of the American Gas and Electric Company). O. Neaf, American Gas and Electric Service Corp.; R. L. Tremaine, A. R. Jones, Westinghouse Electric Corp.
- 51-225. Tensorial Analysis of Integrated Transmission Systems — I — The Six Basic Reference Frames. Gabriel Kron, General Electric Co.
- 51-226. Determination of Instantaneous Currents and Voltages by Means of Alpha, Beta, and Zero Components. W. C. Dueterhoeft, Edith Clarke, University of Texas; M. W. Schulz Jr.; General Electric Co.

2:00 p.m. Making an Electronics Research Project Successful

- CP.** Teamwork in Research Produces the Fluoricon. J. W. Coltman, Westinghouse Electric Corp.
- CP.** Getting Results from Research in Electronics. E. H. Schulz, Armour Research Foundation.
- CP.** Some Case Histories of Electronic Research. R. M. Bowie, Sylvania Electric Products, Inc.
- CP.** The Transistor — A Case History in Research and Development. J. B. Fisk, Bell Telephone Labs., Inc.

2:00 p.m. The Petroleum Industry in Canada

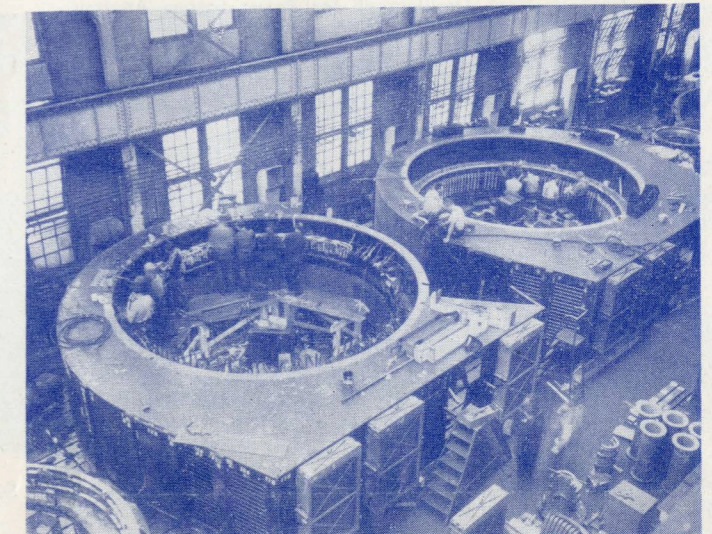
- CP.** The Development of the Petroleum Industry in Canada. J. F. Fairlie, Imperial Oil Limited.
- CP.** Features of a Gas Turbine Centrifugal Compressor Station for Gas Line Pumping. J. S. Quill, General Electric Co.
- CP.** Electric Installations in a Refinery. A. K. Meen, British American Oil Co.
- CP.** Submergible Pumps for the Petroleum Industry. Joe Carle, Reda Pump Co.

2:00 p.m. Telemetry

- 51-228. A High Speed Telemetry System with Automatic Calibration. W. E. Philips, Leeds and Northrup Co.
- 51-229. Choice of Telemetry Systems and Channels for a Power System. C. K. Duff, The Hydro-Electric Power Comm. of Ontario.
- CP.** FM/FM Telemetry. Leroy Walters, Johns Hopkins University.
- CP.** Recent Developments in Miniaturized PDM/FM Telemetry. A. N. Hill, Jr., ASCOP.
- CP.** A Historical Review of Telemetry. P. A. Borden, The Bristol Co.; W. J. Mayo-Wells, Johns Hopkins University.

2:00 p.m. Land Transportation

- 51-230. Rapid Transit Developments in Toronto. J. G. Inglis, Toronto Transportation Comm.



Canadian Westinghouse Generators for Ontario Hydro's Des Joachims Power Development

- 51-231. Conversion of 3000-Volt D-C Locomotive for Operation on ACO.* 600 Volts. F. D. Gowans, General Electric Co.
- 51-232. Regeneration with a Mercury Arc Rectifier on the Central Railway of Brazil. A. Schmidt, Jr., General Electric Company.
- 51-185. Power Supply Study and New Rectifier Installation for the United Electric Railways of Providence. W. C. Whitman, F. F. Schaller, New England Power Service Co. Presentation by title only for discussion.

2:00 p.m. Conference on Statistical Methods

- CP.** A New Method of Evaluating Meter Accuracies. F. H. Busch, General Electric Co.
- CP.** Applications of Statistical Methods to the Testing of Electronic Equipment. Leon Bass, General Electric Co..
- CP.** Statistical Applications in the Hydro-Electric Power Commission of Ontario. E. L. Hartman, Hydro-Electric Power Commission of Ontario.

Wednesday, June 27

9:30 a.m. Insulated Conductors

- CP.** Underground Domestic Distribution—Status in Canada. P. J. Croft, Canada Wire and Cable Co., Inc.
- 51-233. Electrical Characteristics of a Three Phase Delta Submarine Power Cable Circuit Using Earth as One Conductor. F. O. Wollaston, British Columbia Electric Railway Co., Ltd.
- 51-234. F-3 Lead Alloy Cable Sheath—Effect of Bending and Creep on Life. L. F. Hickernell, A. A. Jones, C. J. Snyder, Anaconda Wire and Cable Co.
- 51-235. Cables for Vertical Risers. W. T. Peirce, American Steel and Wire Co.

9:30 a.m. Carrier Current

- 51-236. Carrier Current Supervisory System for Distribution Circuits. L. Podolsky, S. Lubin, Sprague Electric Co.
- 51-237. Application of Power Line Outage Monitor. J. F. Atkinson, Rural Electrification Administration; J. D. Cooke, Central Virginia Electric Cooperative.
- 51-188. Signal and Supervision Systems Used on Carrier Current Communications Circuits. R. L. Mayer, Pacific Gas and Electric Co.
- CP.** Microwave Communication Systems. F. M. Rives, General Electric Co.

9:30 a.m. Basic Instruments

- 51-238. A Tachometer for Measurement of Instantaneous Variations in Angular Velocity. S. P. Bartles, Eastman Kodak Co.

Digests of most papers will appear in **ELECTRICAL ENGINEERING**

- 51-239. A Magnetic Tape Oscillograph for Power System Analysis. E. C. Schurch, F. R. Schleif, Bureau of Reclamation.
- 51-240. Some Engineering Applications of the Electrolytic Field-Analyzer. H. K. Farr, W. R. Wilson, General Electric Co.
- CP.** A Multi-Purpose Bridge-Type Phasemeter. G. A. Armstrong, Vancouver, B. C.

9:30 a.m. Wire Communications

- 51-241. Preservative Treatment of Poles. H. F. Bush, A. R. Colman, ACO.* The Bell Telephone Co. of Canada.
- 51-242. A Practical Application of Low Frequency Magnetic Induction Theory. R. N. E. Haughton, The Bell Telephone Co. of Canada.
- CP.** Canadian National Telegraph's Communication System. R. B. Steele, Canadian National Telegraphs.
- CP.** An Improved Telephone Set. A. H. Inglis, W. L. Tuffnell, Bell Telephone Labs., Inc.
- 51-286. Submerged Repeaters for Long Submarine Telegraph Cables. C. H. Cramer, Western Union Telegraph Co. Presentation by title only for discussion.

9:30 a.m. Electrostatic Processes

- 51-199. Electrostatic Sources of Ionizing Energy. J. G. Trump, Massachusetts Institute of Technology.
- 51-200. Particle Charging in Electrostatic Precipitation. H. J. White, Research Corp.
- 51-201. Electrostatic Precipitation of High-Resistivity Dust. G. W. Penney, Carnegie Institute of Technology.
- 51-202. Distribution of Charge in Electrostatic Separation. Foster Fraas, O. C. Ralston, Bureau of Mines.

9:30 a.m. District Branch Prize Papers

2:00 p.m. Protective Devices

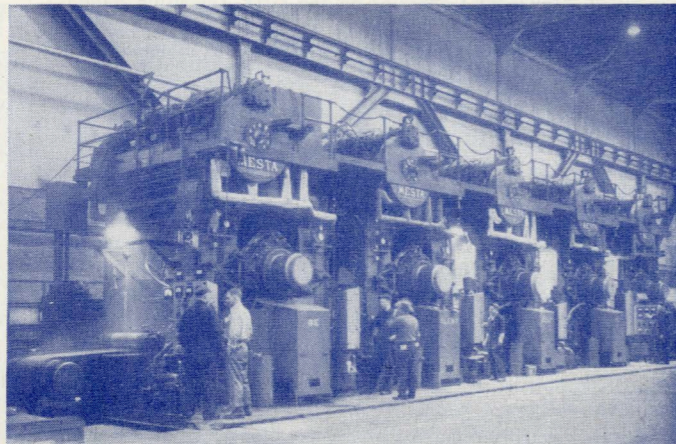
- 51-190. The Duty on Lightning Arresters for A-C Systems. Edward Beck, Westinghouse Electric Corp.
- 51-278. Long-Duration Surge Testing of Lightning Arresters. S. B. Howard, T. J. Carpenter, H. Schwartz, General Electric Co.
- 51-189. Spiral Arc Chokes Power Flow in New Arresters. Otto Ackermann, E. J. DeVal, Westinghouse Electric Corp.
- 51-285. Lightning Arrester Application Guide—Preliminary Working Group Report. Project Committee on Application Guide of Methods for Lightning Protection of Substations.
- 51-279. Transmission and Distribution Grounding in the Hydro-Electric Power Commission of Ontario. W. W. Loucks, W. A. R. Lemire, The Hydro-Electric Power Comm. of Ontario.
- 51-280. Standardization of Ratings of Neutral Grounding Reactors. J. L. Thomason, General Electric Co. Presentation by title only for discussion.

2:00 p.m. Carrier Current

- 51-187. A Study of Carrier-Frequency Noise on Power Lines I. Theoretical Considerations and Measuring Techniques. R. C. Cheek, J. D. Moynihan, Westinghouse Electric Corp.
- 51-245. A Study of Carrier-Frequency Noise on Power Lines II. Results of Field Measurements. R. C. Cheek, J. D. Moynihan, Westinghouse Electric Corp.
- 51-246. Transmission Considerations in the Co-ordination of a Power Line Carrier Network. G. E. Burrige, A. S. G. Jong, The Hydro-Electric Power Comm. of Ontario.
- 51-244. British Developments and Applications of Carrier Current Principles for Operating Requirements of Power Utilities. W. D. Goodman, General Electric Co., Ltd. of England.
- 51-192. Measurements and Tests on a Power Line Carrier Relaying System. R. H. Miller, A. R. Worthington, Pacific Gas and Electric Co. Presentation by title only for discussion.

2:00 p.m. Basic Instruments

- 51-182. Improvements in Transformer-Loss Compensators for Watt-Hour and Var-Hour Meters. G. B. Schleicher, Philadelphia Electric Co.
- 51-183. The Induction Galvanometer, A Sensitive Instrument Converter. R. W. Gilbert, Weston Electrical Instrument Corp.
- 51-184. Unbalance Measurements of Four-Branch Networks. B. M. ACO.* Wojciechowski, Western Electric Co.



Mathias & Thomas

56" Continuous Cold Mill-Delivery End, Steel Company of Canada

- 51-186. Results of a Questionnaire Covering Current Practices in Electrical Tests on Dielectrics in the Field. Subcommittee on Electrical Tests on Dielectrics in the Field. Presentation by title only for discussion.
- 51-247. The Hot Spot Rise Simulator. C. F. Book, V. V. Mason, The Hydro-Electric Power Comm. of Ontario.

2:00 p.m. Instruments and Measurements and Transformers

- 51-247. The Hot Spot Rise Simulator. C. F. Book, V. V. Mason, The Hydro-Electric Power Commission of Ontario.

2:00 p.m. Industrial Power Systems

- 51-248. Protective Relaying on Industrial Power Systems. C. M. Lathrop, C. E. Schleckser, Standard Oil Development Co.
- 51-249. An Industrial Power Distribution System. H. W. deSalis, ACO.* Canadian Westinghouse Co., Ltd.; J. D. Abell, International Harvester Co. of Canada, Ltd.
- CP.** A Design of a Canadian Petroleum Refinery Power System. James Guthrie, Imperial Oil Limited; H. C. Mayo, Kellogg Co.
- 51-250. Industrial Plant Power Sources. R. T. Woodruff, Aluminum Ore Co. Presentation by title only for discussion.
- CP.** A Down-to-Earth Discussion of Industrial System Neutral Grounding as Influenced by Overvoltages. R. H. Kaufmann, General Electric Co.
- 51-251. Problems Confronting the Designer in Starting Large Motors. C. M. Lathrop, C. E. Schleckser, Standard Oil Development Co.
- 51-252. High Voltage Motor Controllers Co-ordinated with Distribution Switchgear. T. B. Montgomery, T. H. Bloodworth, Allis-Chalmers Mfg. Co. Presentation by title only for discussion.

2:00 p.m. A Broad Band Transcontinental Radio Relay System

- CP.** Transcontinental Radio Relay System. T. J. Grieser, A. C. Peterson, Bell Telephone Labs., Inc.
- CP.** Unattended Radio Relay Repeater. R. W. Friis, K. D. Smith, Bell Telephone Labs., Inc.
- CP.** FM Broad Band Radio Relay Terminal. J. G. Chaffee, J. B. Maggio, Bell Telephone Labs., Inc.

2:00 p.m. Insulated Conductors

- 51-253. The Determination of Temperature Transients in Cable Systems by Means of an Analog Computer. J. H. Neher, Philadelphia Electric Co.
- CP.** Rapid Measurement of the Thermal Resistivity of Soil. V. V. Mason, M. Kurtz, The Hydro-Electric Power Comm. of Ontario.
- 51-254. Voids and Wax in Solid High Voltage Cables. F. J. Pohnan (Deceased). Presentation by A. L. Brownlee, Commonwealth Edison Co.
- CP.** Surface Discharges from Cable Sheaths and Their Relation to Electric Shock. E. W. Greenfield, Anaconda Wire and Cable Co.

Thursday, June 28

9:30 a.m. Switchgear

- 51-255. Field Tests on Single Tank 138 Kv 2500 Mva Oil Circuit ACO.* Breaker. G. W. N. Fitzgerald, The Hydro-Electric Power Comm. of Ontario; D. F. Rankine, Canadian General Electric Co., Ltd.
- 51-256. Field Tests at Grand Coulee Dam on 10,000 MVA 230 KV Low Oil Content Impulse Circuit Breaker. A. F. Darland, C. L. Killgore, Bureau of Reclamation; C. J. Balentine, E. B. Rietz, General Electric Co.
- 51-257. Interrupting Capacity Verification of 10,000,000 KVA 230 KV Oil Circuit Breakers for Grand Coulee Power Pant. A. F. Darland, W. H. Clagett, Bureau of Reclamation; W. M. Leeds, Westinghouse Electric Corp.
- 51-258. Operation of Bushings in Carbonized Oil. W. R. Wilson, L. Wetherill, General Electric Co. Presentation by title only for discussion.

9:30 a.m. Transformers

- 51-259. Operating Problems of Forced Oil Forced Air Cooled Transformers. A. L. Hough, The Shawinigan Water and Power Co.
- 51-208. Inhibited Oils for Transformers. Herman Halperin, H. A. Adler, Commonwealth Edison Co.
- 51-260. Relative Performance of Normal Oils with and without DBPC Inhibitor in Semisealed Transformers. E. D. Treanor, E. L. Raab, General Electric Co.
- 51-261. Field Screening Test for Judging the Condition of Used ACO.* Insulating Oils. R. G. Call, W. L. Webb, American Gas and Electric Service Corp.

9:30 a.m. Nucleonics

- 51-262. A Portable Electronic Pile Kinetic Simulator. Walter Pagels, Westinghouse Electric Corp.
- CP.** The Chalk River N.R.X. Nuclear Reactor in Operation. D. G. Hurst, National Research Council.
- CP.** The 70 MEV Synchrotron at Queens University. J. A. Gray, Queens University; R. N. Edwards, General Electric Co.

9:30 a.m. Mining and Metal Industry—Industrial Control

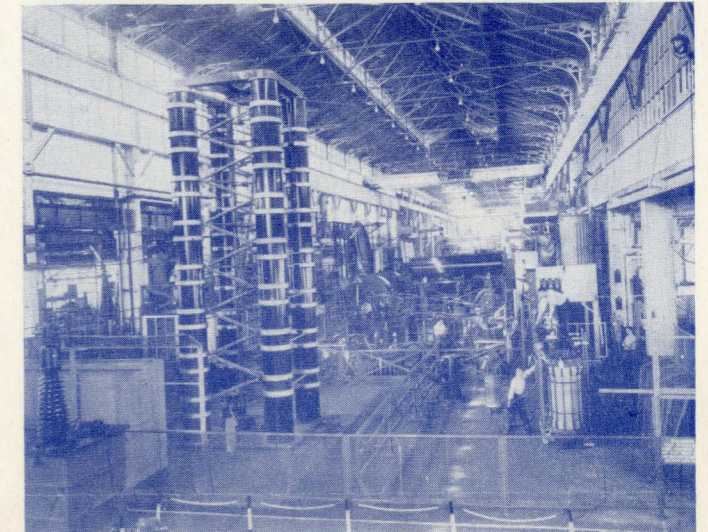
- CP.** The Coordination of Control and Drive Equipment on Electric Travelling Crane Bridges. D. C. McCrady, Steel Co. of Canada.
- CP.** A Heavy Duty Slip Regulator for Steel Mill Service. W. Schaelchlin, G. E. Mathias, Westinghouse Electric Corp.
- CP.** Rotating Regulator Applications in the Steel and Allied Metal Working Industry. W. R. Harris, Westinghouse Electric Corp.
- CP.** Types of Fault Indicating Control Used with Coordinated Electric Drives for Steel Mills. R. L. Houlton, General Electric Co.

9:30 a.m. Management

- CP.** Human Relations—Challenge to Management and to the Social Sciences. V. W. Balden, The University of Toronto.
- CP.** Measurement and Management. R. Presgrave, York Knitting Mills Limited.

2:00 p.m. Relays and Transformers

- 51-264. The Application of Class H Insulation to Transformers. M. L. Manning, Pennsylvania Transformer Co.
- CP.** Design Requirements for Large H.V. Power Transformers. W. G. James, Westinghouse Electric Corp.
- CP.** Calculation of Overvoltages in Series Saturable Circuits. A. Boyajian, G. Camilli, General Electric Co.
- CP.** Transient Characteristics of Capacitance Potential Devices. Subcommittee on Instrument Transformers.
- 51-284. Operating Experience with Ground Distance Relays. M. P. Osburn, P. L. Dandeno, The Hydro-Electric Power Commission of Ontario.
- 51-265. Temperature Testing of Transformers by Load Back Methods. ACO.* M. C. Hughes, Agricultural and Mechanical College of Texas.
- 51-266. The Inrush of Magnetizing Current in Single-Phase Transformers. L. A. Finzi, Carnegie Institute of Technology; W. H. Mutschler, Jr., Allis-Chalmers Mfg. Co. Presentation by title only for discussion.



Canadian General Electric Co. Ltd., Davenport Works Test Dept.

2:00 p.m. Feedback Control Systems

- CP.** The Use of Feedback Systems for the Control of Anesthesia. R. G. Bickford.
- CP.** An Electronic Apparatus for the Study of the Human Operator in a One-Dimensional Closed-Loop, Continuous Pursuit Task. C. E. Warren, P. M. Fitts, J. R. Clark.
- 51-267. Synthesis of Feedback Control Systems by Means of Pole and Zero Location of the Closed Loop Function. M. R. Aaron, The Franklin Institute, Philadelphia, Pa.
- 51-268. Stability of Varying-Element Servomechanisms with Polynomial Coefficients. M. J. Kirby, R. M. Giulianelli, Sperry Gyroscope Co.
- 51-269. Servomechanism Transient Performance from Decibel-Log Frequency Plots. H. Harris, Jr., M. J. Kirby, E. F. von Arx, Sperry Gyroscope Co. Presentation by title only for discussion.
- 51-270. A Direct Reading Phasemeter for Use in Sinusoidal Measurements on Carrier-Type Servomechanisms. R. J. Amorosi, Sperry Gyroscope Co.; W. E. Meserve, Cornell University.
- 51-271. An Electro-Mechanical A.C. Line Voltage Stabilizer. D. M. ACO.* Murray, N. L. Kusters, National Research Council.

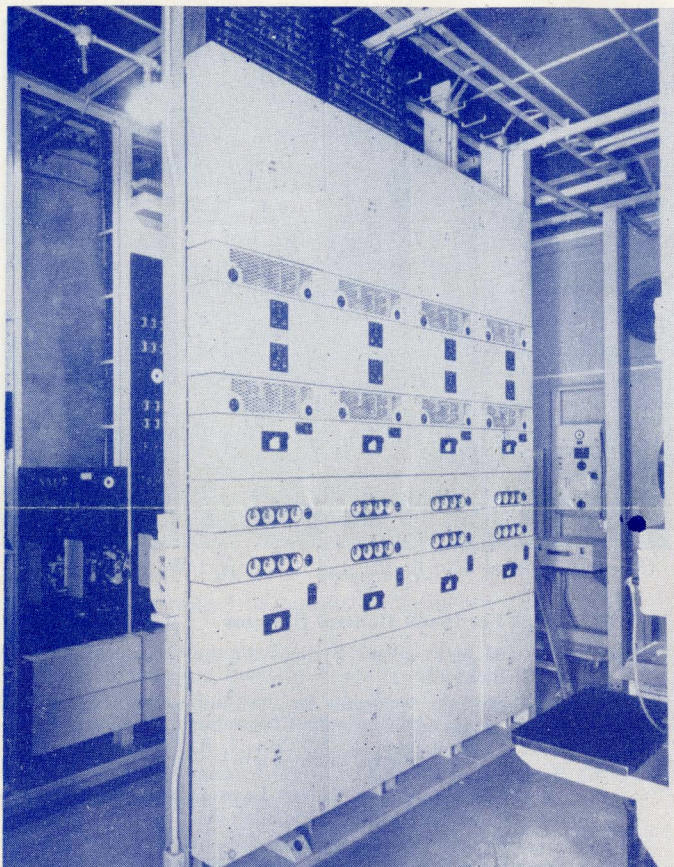
2:00 p.m. Mining and Metal Industry—Industrial Control

- CP.** The Part That A Program of Continued Education Can Play in the Mining Industry. G. T. Harley, International Minerals and Chemical Corporation.
- CP.** Amplidyne Mine Hoist Control. W. T. Fanjoy, General Electric Co.
- 51-272. Analysis of Power Costs of Bituminous Coal Mines. H. P. Musser, West Virginia Engg. Co. Presentation by title only for discussion.
- CP.** The Electrical Phase of Copper Mining at Noranda. C. W. Justice, B. C. Rochester, Noranda Mines Ltd.
- CP.** Electrical Applications in the Mining Operations of International Nickel Co. I. J. Simcox, International Nickel Co.

2:00 p.m. Metallic Rectifiers

- 51-273. Metallic Rectifiers in Telephone Power Plants. D. E. Truckess, Bell Telephone Labs., Inc.
- CP.** Selenium Rectifiers for Self-Saturating Amplifiers. J. R. Conrath, Vickers, Inc.
- CP.** Selenium Rectifiers as Power Supply and Selective Circuits in Business Machines. J. L. Wagner, International Business Machines.
- CP.** Selenium Rectifier Production. G. Ramsey, Fansteel Corp.
- CP.** Magnesium Copper Sulphide Rectifiers in Resistance Welding Machines. M. F. Gamble, P. R. Mallory Co.
- 51-274. Transient Conditions in a Transformer Supplying Energy to a Half-Wave Rectifier Circuit. P. N. Martin, Union Switch and Signal Co.

AIEE Summer General Meeting



A Bell Telephone Company of Canada's 'J' carrier repeater station

Friday, June 29

9:30 a.m. System Engineering

- Colfax Stability Tests. (Motion Picture). A. P. Hayward, Duquesne Light Co.
- CP.** Voltage Control on an A.C. Power System. H. B. Smith, Niagara Mohawk Power Corp.
- 51-275. Savings Resulting from Automatically Controlled Capacitors ACO.* Used in Conjunction with Generator Bus Voltage Regulation. D. R. Pattison, F. M. Reed, Pennsylvania Electric Co.
- CP.** Operations of AC Networks, Kansas City Power and Light Company. D. H. Cameron, H. W. Phillips, Kansas City Power and Light Co.
- CP.** Control of Voltage on a Hydro Electric Power System. J. M. Crawford, J. A. Smith, Shawinigan Water and Power Co.
- CP.** Control of Voltage Levels and Megavar Flow on 230 and 115 KV Systems of the Hydro-Electric Power Commission of Ontario. P. L. Dandeno, H. W. Nablo, The Hydro-Electric Power Comm. of Ontario.

9:30 a.m. Computing Devices

- CP.** The University of Toronto Model Digital Computer. J. Kates, University of Toronto.
- CP.** Notes on the Design of Eccles-Jordan Flip-Flops. M. Rubinoff, University of Pennsylvania.
- CP.** A Graphical Method of Flip-Flop Design. R. F. Johnston, A. G. Ratz, University of Toronto.
- CP.** Some Applications of the Additron. T. K. Cranston, G. C. Helwig, Ferranti Electric Ltd.
- 51-276. The Scotch Plaid Raster. J. Kates, V. G. Smith, University of Toronto.
- CP.** A Multiplying Counter. E. J. Miller, The Royal Canadian Navy.

9:30 a.m. Basic Sciences

- 51-277. Method for the Determination of Hysteresis Loop Area. W. B. Conover, General Electric Co.

- 51-191. A New Method for Treating Electron Tubes When Used as Oscillators in the Free as well as in the Synchronised States. A. El-Samie Mostafa, Farouk I University; M. El-Shishini Bey, Member of Egyptian Senate.

9:30 a.m. Industrial Control

- CP.** The Influence of Application Requirements on Control Design. K. A. Rapsey, Square D Co. of Canada, Ltd.
- CP.** Rheostatic Control of Shunt Fields. C. A. MacPherson, Canadian Controllers Ltd.
- CP.** The Application and Standardization of High Rupturing Capacity Current Limiting Fuses. J. W. Gibson, Canadian General Electric Co., Ltd.
- CP.** The Operation of the Approvals Laboratories, Division of Canadian Standards Association. G. Moes, F. R. Whatmough, Canadian Standards Association.

9:30 a.m. Round Table Conference Session on Temperature Correlation in the Connection of Insulated Wires and Cables to Electrical Equipment.

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

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

MEETING FEATURES—Continued from page 3

birth or baptismal certificate, voter's certificate, car license, driver's license, or letter of identification from a bank manager or a municipal office. Any document bearing signature and photograph may be used. Naturalized citizens should carry their naturalization certificates and non-naturalized residents of the United States must have a re-entry permit issued by the United States Immigration and Naturalization Service.

Automobiles enter Canada for personal transportation for a period up to six months without payment of duty or deposit. On reporting to Customs at the Port of Entry, a permit for the car is made out. State license cards should be carried. On leaving Canada a car must be cleared through Canadian Customs. Highway regulations in Ontario differ little from those in most of the United States.

Golf sets, camera equipment, slides or slide films and samples or other apparatus being brought into Canada for the purpose of demonstrations during the meeting, should be declared at the border crossing point, to the United States Customs Officers. This is important to facilitate the reentry of this material into the United States.

HOTEL ACCOMMODATIONS: Rooms have been set aside at the Royal York and King Edward Hotels for the convenience of the members attending. Applications for reservations should be made directly to the hotel of choice.

Room rates for these two hotels are as follows:

	<i>Rates Per Person</i>
<i>Royal York Hotel (Meeting Headquarters)</i>	
Single room	\$6.50 to \$ 8.00
Parlour-bedroom	9.50 to 10.00
Double room	5.25 to 6.00
Parlour-bedroom	6.75 to 7.00
Suites—single occupancy—bedroom and sitting-room	16.00 to 26.00
Suites—double occupancy—bedroom and sitting-room	20.00 to 31.00
<i>King Edward Hotel</i>	
Single room, bath (1 person)	\$5.00 to \$ 6.50
Double rooms, double bed, bath (2 persons) ...	8.50 to 10.00
Double rooms, twin beds, bath (2 persons) ...	9.00 to 10.00
Two connecting rooms (3 persons)	13.50 to 16.50
Two-room suites—single occupancy	12.00 to 15.00
Two-room suites—double occupancy	15.00 to 18.00
Three-room suites—single occupancy	18.00 to 36.00
Three-room suites—double occupancy	24.00 to 36.00

SUMMER GENERAL MEETING COMMITTEE

O. W. Titus, *Chairman*; W. R. Harmer, *Vice Chairman*; J. T. Fisher, *Secretary*; M. Fraresso, *Hotel and Registration*; M. J. McHenry, *Finance*; J. H. Smith, *Ladies Entertainment*; P. J. Croft, *Entertainment*; R. J. Brown, *Publicity*; W. J. Gilson, *Meetings & Papers*; J. G. Inglis, *Transportation*; G. A. Brace, *Inspection Trips*; M. C. Thurling, *Treasurer*; D. C. Brazier, *Sports*; A. H. Frampton, *Vice President Dist. 10.*

Issued by
AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS
33 West 39th Street, New York 18, N. Y.

PRINTED IN U.S.A.